Measuring Media Coverage of Electricity Public Policy in New Zealand for the period 2006-2007 : A new approach

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Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Jeanette Elley

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Special mention of course must go to my two children Cat and Mike, who bore the brunt to a greater extent than anyone else, as they lived with the direct effects of my preoccupation on the household (especially the reduction in my "mothering" duties) day in and day out for eight years.

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Abstract

This study measured media coverage relating to electricity public policy using an original content analysis technique, simultaneously responding to calls for more research on the media-policy nexus, and for more precise content analysis methods. The project involved the collection of more than 6000 electricity articles online from nzherald for the period 2006-2007 (about 5% of all articles). Articles were systematically analysed for keywords and a categorisation framework was iteratively compiled, in order to facilitate automated content analysis. The goal was to identify trends relating to electricity policy, and broader trends relating to the underlying paradigm within the media, by analysing phrase repetition frequencies.

A unique prototype text analysis tool was developed, incorporating customised key indicators which distinguished between explicit (actual), literal (bonus), and implicit (hidden) coverage. Utilising aspects of natural language processing (NLP) the automated tool also handled exceptions and nick names, enabling the recognition of extended "coverage" of a search target over multiple sentences, even in the absence of proper names. Issues such as climate change, peak oil, fossil fuels vs. renewables, carbon tax vs. emission trading, sustainability vs. growth, SOE privatisation, and the Muliaga disconnection were examined, key players identified, and ranked lists compiled to indicate relative coverage in each case. Phrase recognition using an unvalidated prototype tool encountered certain limitations of performance and interpretation but nonetheless allowed an extent and precision unavailable in similar manually coded studies.

Major findings were the dominance of the financial sector (especially the stockmarket), governments, and fossil fuels. Climate change received significantly increased coverage in the second year of the study, as did the concept of sustainability. However, biofuels and energy efficiency received limited coverage. Furthermore, the peak oil issue, alternative energy sources (e.g. marine and solar power), and distributed generation received very little coverage at all, reflecting a missed opportunity on the part of the media to contribute to a more resilient society in the face of looming environmental threats.
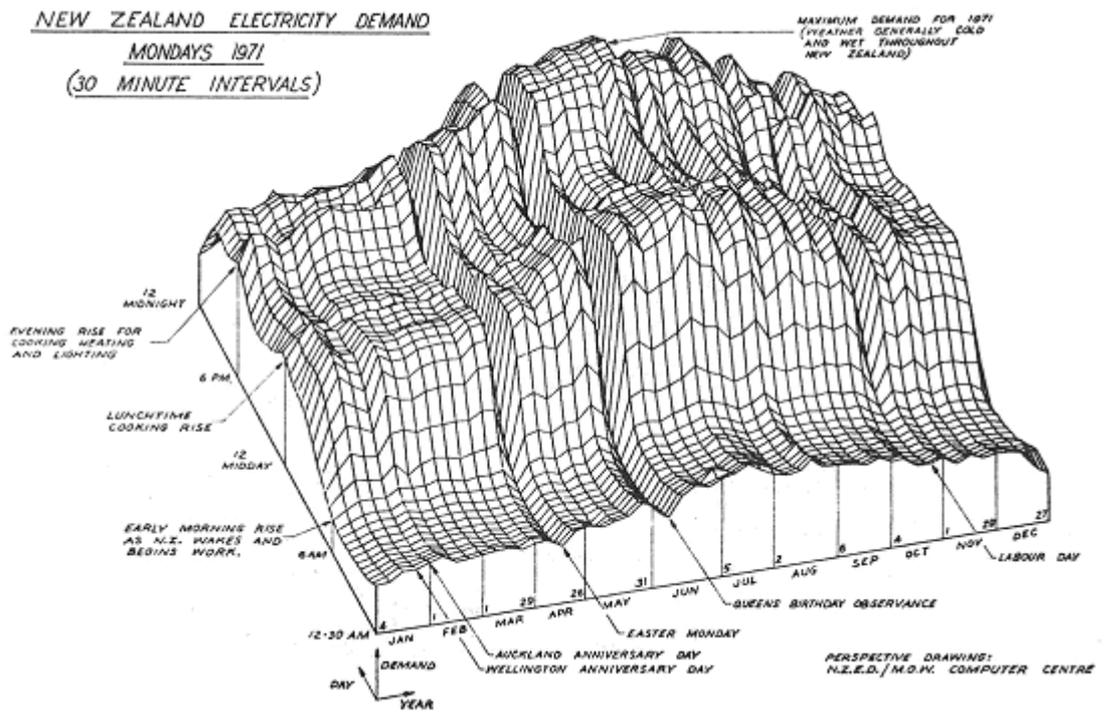
Figure 1.1.1.1 – New Zealand Electricity Demand Mondays 1971 (Bellamy 1974)

Chapter 1 – Introduction

> *'There's nothing so absurd that it cannot be believed as truth if repeated often enough', said American psychologist William James, brother of novelist Henry James, anticipating Hitler's Big Lie theory of propaganda by several decades[1].*

1.1 Overview

1.1.1 Preamble

As an active participant in a political campaign for the first time in 2002 I quickly became fascinated by "media power". Judith Lichtenberg's assertion that "the mass media … is one of the primary actors on the political scene, capable of making or breaking political careers"[2] became very apparent to me during that period.

At the same time, observing the high level of fossil fuel dependence within society, I was concerned about the lack of public and political engagement with its social and environmental consequences. I thought that the very real prospect of climate change effects, and peak oil constraints, should have logically led to a prompt policy focus upon renewable energy, especially within the crucial electricity sector. I could not help but wonder whether the power of media influence could be implicated in helping or hindering this essential transition.

Debate continues about the extent to which the media are able to influence actual personal or societal outcomes, and this question has been studied extensively for many topics such as television violence, suicide, gender studies, and foreign policy, as well as the more widely traversed (and more easily measured) topic of political campaigns[3]. Closely related to politics, though one step removed, is the conundrum of how much influence the media can and do wield over public policy. Related again is the question of how to measure such influence, and within that, how best to

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[1] Thomas (2010:53).
[2] Lichtenberg (1990:1).
[3] E.g. King et al. (2003), McKenna et al. (2010), GMMP (2005), Herman & Chomsky (1988), and McCombs & Laidlaw (2008) respectively.

measure media coverage (i.e. content) in a way which is specifically appropriate to that task.

This thesis occupies that specific niche, in partial response to Pamela Shoemaker and Stephen Reese's concern that media content studies are over-simplified, heralding an urgent "need to develop precise and valid measures … [for] a more sophisticated awareness of [media] content"[4]. As a software developer by profession, I found myself particularly drawn to the content measurement question.

Traditionally, the field of artificial intelligence (AI), or more specifically, the study of natural language processing (NLP) within computational linguistics, has been quite separate from the field of media studies content analysis research. The former employs ever-more complex algorithms in an attempt to mimic human behaviour, conversation, and understanding, while the latter has mostly continued to use either simple automated word-counting techniques[5], or the long-standing manual technique of using human coders to interpret text into customisable categories.

There is rich unexplored territory between these two fields which will no doubt be increasingly traversed as technology advances and overlap becomes more feasible. While robot (e.g. Siri[6]) conversations, Bing language translation tools (e.g. utilised by Facebook), Twitter theme analysis, and Google predictive text functionalities seem to leap ahead on a daily basis (often helpfully motivated by the commercial marketing imperative), social research methods seem to have stubbornly lagged behind. Slowly, step-by-step, we have seen rudimentary "intelligence" added to research tools such as Nvivo (e.g. optional synonym handling was included with 2010 version 9), and it was my impatience for this kind of researcher assistance (and more) that led me to develop my own analysis tool for this project, which included exploring the challenge of an appropriate categorisation framework. The unique method employed by this customised tool, and the thinking behind it, has crucially

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[4] Shoemaker & Reece (1990:650-651).
[5] Text analytics is a fast-growing field in social media research.
[6] "Siri" is the name given to the automated conversational interface on the Apple iPhone which is able to "talk to" the user. See http://www.apple.com/ios/siri/

contributed to the originality of this study, and sits alongside the significance of the results, which must be examined with regard to the new method employed.

1.1.2 Aim

This thesis tells two parallel stories. One is about the development of a new computer-aided content analysis technique designed to cumulatively measure certain characteristics of media articles that would be difficult to measure manually. The other is about the use of that technique, within a public policy context, to measure media coverage characteristics relating to policy considerations in the real world. The policy focus in this case is electricity, chosen because of the crucial environmental and social challenges which arise from ongoing societal energy consumption (typically within first-world nations but increasingly aspired to by others). New Zealand's small size, recent neo-liberal market-based electricity reforms, and only a few agglomerated privately owned newspaper companies make it a particularly suitable location for an electricity study with media influence connotations. The country's largest newspaper by readership, *The New Zealand Herald* (henceforth referred to as nzherald) provided the online source articles for 2006-2007.

Content analysis research cannot claim to measure influence, but it can highlight notable thematic or linguistic features of a group of texts and make inferences from the findings. That information could at a later date be used to test hypotheses about media influence if additional complementary "audience effects" research along those lines were undertaken. This particular study is about a close examination of just the one (content analysis) stepping stone along the path towards measuring media influence. Assertions cannot be made about actual media influence with any confidence, although conjectures can be made based upon the observed results.

The special type of content analysis described in this thesis incorporates complex structural relationships, allowing a drilling down beneath the surface of the text, to various inter-connected layers of meaning. The intent of this exploration is to identify repeated conceptual themes (online over a two year period) that represent underlying cultural assumptions embedded within the text, but which may not be as

apparent with more superficial searches. This approach broadly aligns with George Gerbner's cultivation theory (see section 2.2.5). Borrowing from the fields of psychology and sociology, it is proposed that strongly featured threads and memes within media articles over time are likely to perform a re-inforcing role upon the reader (called "priming" in some circumstances[7], and "agenda setting" in others[8]), and this underpins the expected usefulness of this work. Similarly, neglect by the media of certain concepts or sectors of the population are also potential influencing factors worthy of note.

I contend further that certain uniquely illuminating results (over and above those arising from traditional uni-dimensional methods) are obtainable if (relatively simple) syntactical aspects of NLP (such as synonyms, nick names, and exception handling) alongside relational hierarchies (such as organisational ownership and personal allegiances, as well as concept links) are incorporated into a content analysis tool, providing a richer, multi-layered picture of news coverage. The enhanced automated analysis technique employed in this study has provided one small but significant contribution towards the challenge of measuring media influence, in this case undertaken with a focus on New Zealand electricity policy.

Theorists examining media influence upon public policy have postulated that when extended into the policy realm there are two broad mechanisms at work. If the reader is a policy-maker, the expectation of media influence can be extended to an effect upon policy, either a) by direct influence of the media upon public opinion, or b) via the assumption by that policy-maker that the media perspective represents public opinion[9] (see section 2.2.7). However, the media-policymaker relationship is complex, and many studies find apparently stronger influences in the other direction (of politicians, as policy-makers, upon the media)[10]. This latter case

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[7] E.g. See Hindmoor (2008:83).
[8] Priming is generally referred to as agenda setting in media studies. See Weaver (2007:145). Note that "framing" is different, and is closely aligned with "second level agenda setting".
[9] Koch-Baumgarten & Voltmer (2010:xvi), Campbell (2012:22), O'Sullivan et al. (2012:52).
[10] E.g. Jones & Wolfe (2010:20-23) cite a number of such studies.

represents a counter scenario, where rather than influencing policy, the media instead may assist policy-makers to influence the public.

1.2 Fields of Investigation

1.2.1 Related Academic Disciplines

This thesis primarily bridges three disciplines, namely public policy (via the subject of electricity policy), media studies (via the source material), and research methods (via the enhanced content analysis methodology). However, it also touches upon environmental engineering (via electricity technology), psychology, marketing, information systems, and linguistics, as illustrated in Figure 1.2.1.1. It is a multi-disciplinary work filling a distinct 'gap' in the research literature both by extending the traditional technique of content analysis, and by selecting to study media coverage for the particular public policy area of electricity.
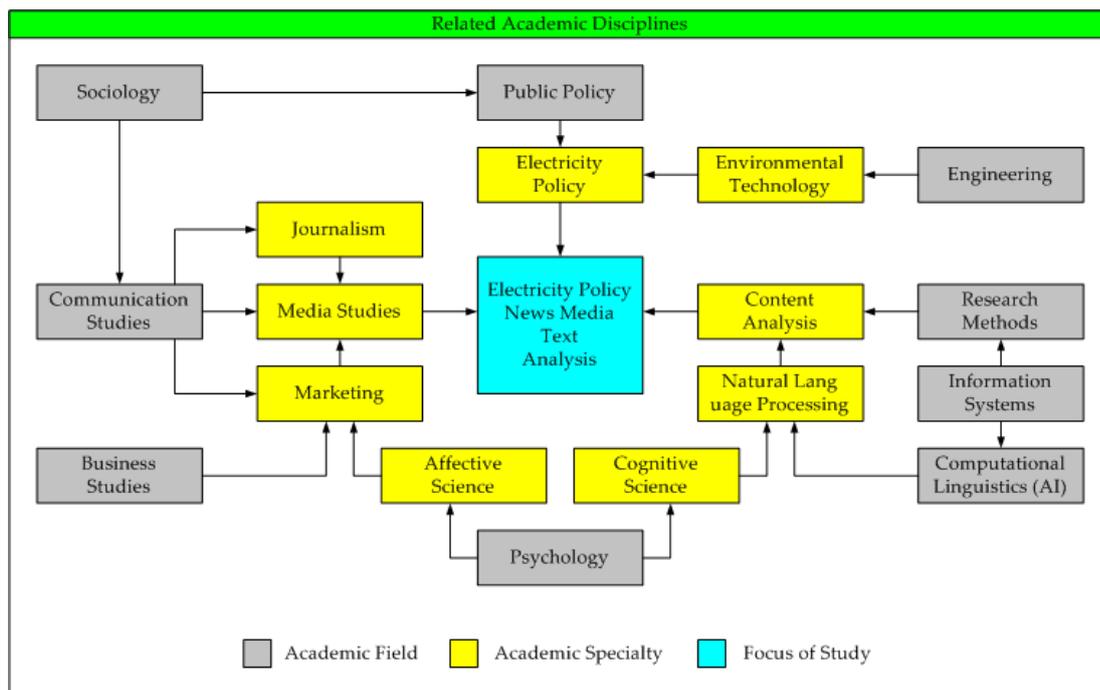
Figure 1.2.1.1 – Related Academic Disciplines

The arrows shown in Figure 1.2.1.1 do not represent all possible links between disciplines (of which there are many), and the boxes do not illustrate all relevant specialties (more of which could no doubt be identified), but the diagram is intended to stylistically demonstrate at least some of the links which are pertinent to this particular study.

Though psychology is not a major focus of the study, its referential inclusion is important as certain psychological phenomena are assumed to underpin media influence effects (see section 2.2.6). There is an increasing awareness that psychology plays an important role across almost all fields of human endeavour, from policy perspectives and consumer choices to leisure activities and waste disposal[11].

1.2.2 Thesis Questions

Utilising a text analysis method developed specifically to provide a unique in-depth approach (as outlined above, and further described in chapter 4), online nzherald news articles mentioning electricity over the period 2006-2007 were examined and the following areas of enquiry were specifically addressed.

1. Which sectors of society, organisations, and/or individual persons, were the prominent voices within the selected media texts, and which were missing?

2. Which issues, political ideologies and electricity policy concepts were given the most media coverage, and which were missing?

From a technical perspective, these further questions were posed.

3. Was it possible and practical to develop a text analysis technique to systematically measure and compare the relative cumulative coverage of a wide range of entities and concepts relating to electricity policy, and which illuminated useful textual features not readily found with more traditional content analysis techniques?

4. Were meaningful indicators and rankings able to be derived to assist with such analysis?

1.2.3 Approach

All online articles within the prescribed two year time period from the selected publisher (nzherald), and containing keywords relating to electricity, were collected

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[11] E.g. See Kahneman (2011).

and quantitatively analysed. The sample size was large (over 5% of all published articles within the period) and contained the full population (not just a sample) of articles relating to electricity.

Coverage and prominence analysis was performed (for a wide range of players and topics) on the full set of sampled articles, and also upon selected subsets (such as those with varying degrees of electricity coverage intensity). Additionally, trends were examined for the environmental concepts of climate change, peak oil and pollution, for the alternate emission control mechanisms of carbon tax and emissions trading scheme (ETS), and for certain economic concepts such as growth, balance, and money.

In particular, four case studies were selected for closer examination. These were not selected in advance, but were chosen after the study was well underway, once it became apparent which issues had arisen (in real time) that were particularly relevant in an electricity policy context. The four chosen case study topics were 1) the death of Folole Muliaga, 2) the dismissal by the Energy Minister of Electricity Commissioner Roy Hemmingway, 3) the construction of a high voltage upgrade to the transmission line running between Whakamaru and Otahuhu (the main power supply to Auckland, traversing Waikato), and 4) a public discussion about possible partial privatisation of the three remaining government-owned large generating companies (nick-named "gentailers" as allowable vertical integration permitted them to provide electricity retail services as well).

Media research can be approached from a number of differing (and overlapping) perspectives, and these are described further in section 2.2.5. The stance taken within this study could be described broadly as a critical political economy approach, which expects that commercial pressures and powerful interests cause the media to favour some groups and ideologies over others, to the detriment of society as a whole. Although my study's open exploratory approach was designed to minimise bias, the ultimate results did indeed lend support to that perspective.

The analysis tool was developed and constantly refined as part of this study but was not formally validated. That exercise would suit a future study.

1.3 Chapter Guide

Chapter two (literature review) provides a more thorough overview of the study's theoretical framework from a media influence perspective, and describes the 2006-2007 electricity policy context within which this study was undertaken, together with descriptions of related and comparable studies.

Chapter three (categorisation framework) constructs, in pictorial form, the reference category sets of players, issues and concepts which were used to underpin the analysis of the news media texts being studied. After the framework is introduced it is compared with policy frameworks from other studies.

Chapter four (research design) outlines the process which was undertaken in order to evaluate media coverage relating to electricity public policy during 2006-2007. The techniques employed by the customised text analysis tool are described, each with associated rationale, and comparisons with other tools are made. The newly derived online news media "exposure" indicators are explained.

Chapter five (data) describes the results obtained when 6341 news media articles from 2006-2007 about energy, electricity, and electricity public policy in New Zealand were studied using the automated text analysis utility that was specifically designed for the purpose. A series of graphs present the comparative measurements which were calculated for the new media exposure indicators within the areas of enquiry determined by the thesis questions (above), and according to the categorised framework described in chapter 3.

Chapter six (discussion) analyses the results which were presented in the previous data chapter. The thesis questions are revisited and the feasibility of answering them using the technique employed is examined. The case studies are discussed, limitations are acknowledged, and further areas for study are recommended.

Chapter seven (conclusion) summarises the findings of this study, giving attention to their significance.

Chapter 2 – Literature Review

2.1 Introduction

This chapter includes background information as well as a literature review in order to set the scene and provide context for the study. The main sections are media context (which discusses theories of media influence), political economy (which describes the New Zealand electricity sector), and comparable studies. Each has been divided into a number of sub-sections which will be introduced at the start of the relevant section.

2.2 Media Context

> *Public sentiment is everything. With public sentiment nothing can fail. Without it nothing can succeed. He who molds opinion is greater than he who enacts laws.[12]*

2.2.1 Introduction

Any study of the media carries with it an assumption that the media have a certain significance, so this section begins with a brief discussion of the important role that the media play in society. That is followed by a selection of socio-political models that have at various times been used to explain the behaviour of the media, and a mention of some of the practical commercial challenges that the media face. If the media do have real power, as is alleged, then some discussion about theories of media influence and the effect upon the recipient is also required, leading to observations about the psychological importance of repetition. Repetition is a characteristic (of entities within texts) that clearly lends itself to measurement by quantitative content analysis, and is significant in this case as frequency counts provided a core component of my study. While politics is often studied in relation to the media, influences of media upon public policy are examined less often, and the section closes by summarising recent research in that area.

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[12] Abraham Lincoln quoted in Kerr & Littlewood (1974:246).

2.2.2 The Importance of the Media

Somebody … called journalism the fourth estate. That was true at the time no doubt. But at the present moment it is the only estate. It has eaten up the other three. The Lords Temporal say nothing, the Lords Spiritual have nothing to say, and the House of Commons has nothing to say and says it. We are dominated by Journalism[13].

The media have long been referred to as the "fourth estate"[14] since beside the three primary branches of government (the legislative, the judicial, and the executive), "in the Reporters' Gallery yonder, there [sits] a Fourth Estate more important far than they all"[15]. There is little doubt that media perform the vital role of information dissemination. According to John Fiske, news is "factual information that its viewers need in order to be able to participate in their society"[16]. For many, once they have left school various forms of media are effectively their (subtle or overt) trusted sources of life-long education, alongside the other people in their lives. This gives the main stream media (MSM) tremendous power and huge responsibility. Les Cleveland states that –

> The press … has a responsibility not only to convey useful service information to its mass audience, but also to act in their interests as a watchdog and critical analyst of public affairs. In this way it supplies an important functional service to the political system because it is a major source of the kind of feedback information which political decision-makers require for the more precise and sensitive regulation of their conduct of affairs. … [This] assumes that the news media, and particularly the press, have a form of responsibility which can properly be called political, because of its importance for the political process in a democratic society. [17]

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[13] Wilde (1891).

[14] According to Shultz (1998), the Oxford English Dictionary notes that Thomas Carlyle in 1841 (see next note) attributed the first use of this phrase to Edmund Bourke in the British parliament in 1787. The three "Estates of the Realm" at that time referred firstly to the Lords Spiritual (the clergy), secondly to the Lords Temporal (the nobility), together forming the House of Lords, and thirdly to the House of Commons (the commoners). Modern usage more usually relates this term to the three branches of government in the American Constitution: the legislative, the judicial, and the executive. New Zealand equivalents are the parliament, the judiciary, and the executive. Jasanoff (1990) and Salleh (2008) have further suggested a hidden fifth branch of government consisting of elite scientific advisors.

[15] Carlyle (1840).

[16] Fiske (1987:281).

[17] Cleveland (1970:ii).

This sentiment that a free and responsible news media is essential to a well-functioning democracy has been emphatically echoed by many media scholars. For example, according to Nichols and McChesney –

> An informed public democracy means rule of the people. A media system is absolutely essential to that process, if people are going to be political equals, they have to have the information and tools so they can actually be participants. [18]

Another assenting voice is that of Onora O'Neill –

> Democracy requires not merely that the media be free to express views, but that they actually and accurately inform citizens. If we are to have democracy, the media must not only express views and opinions but aim to communicate and inform.[19]

Taking it further, Robin Campbell quotes Cass Sunstein to indicate the importance of presenting a range of views that people "would not have sought out in advance" because "democracy does not benefit from echo chambers or information cocoons"[20].

Yet this role is by no means straightforward and commentators take differing approaches. Sarah Oates hints at the complexity in her brief comparison of the approaches of Robert Dahl, Jürgen Habermas and Samuel Huntington –

> While Dahl perceives democracy as an ideal rather than an actual type of governance, he sees freedom of expression, media freedom, and the right to expression as key components of civil society. Habermas argues that the media provide a critical 'sphere' in which the public can debate and discuss policy as they continually forge a better society. Huntington perceives the media as important in an educative role – and the more educated the citizens, the better chance there is for democracy. There are different definitions however, in terms of what constitutes 'education' and what is really just 'propaganda', definitions that vary not only from regime type to regime type, but even among countries with relatively similar political ideologies[21].

Alongside the informing and watchdog roles sits a filtering (or "gatekeeping") role. Not all information is able to be presented, so by necessity news selection is

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[18] Nichols & McChesney (2010).
[19] O'Neill (2004:7).
[20] Sunstein (2007:218) in Campbell (2012:6).
[21] Oates (2008:11-12), citing Dahl (1989), Habermas (1989), and Huntington (1991).

conducted according to various criteria for "newsworthiness". Media organisations have the power to choose the topics for the daily conversations which take place in households and workplaces across the land. This ability to "[focus] the public's attention on a small number of issues"[22] is described by McCombs and others[23] as the "agenda-setting" role, allowing the media to "establish both what is newsworthy and how newsworthy it is"[24]. In this sense, the media has played, and continues to play, a culture-forming role as well as a culture-reflecting role. Oates provides a glimpse of this complex relationship –

> As societies, we communicate, share, and attempt to come to terms with political events through the mass media. At the same time, most people are aware that there is a range of filters in place that shape this relationship between politics and the mass media. … Much of the time, viewers, listeners, and readers are fairly complacent about what they learn from the mass media. Yet, at times of change and crisis – ranging from elections, acts of terrorism, war, to the collapse of a regime – citizens find themselves in great need of comfort, information, and even direction from their mass media.[25]

A number of theoretical models attempt to explain the variations in media style or content preferences, and some of these are described in the next section.

2.2.3 Media Models

The notion that journalism can regularly produce a product that violates the fundamental interests of media owners and advertisers … is absurd[26].

In 1963 Siebert, Peterson and Shramm proposed three main media styles or models –

1. Authoritarian – a press completely subservient to the state.

2. Libertarian – supporting the notion that opinions should be aired freely.

3. Social responsibility – media work proactively to include all segments of society in its coverage[27].

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[22] McCombs (2005:544-545).
[23] E.g. Lichtenberg (1990:9).
[24] Abel (2004:192).
[25] Oates (2008:1-2).
[26] McChesney (1997:60).

Suggested examples of these models were Burma for authoritarian, the U.S. for libertarian, and the U.K. for social responsibility (especially the BBC), though the U.S. model was arguably far from libertarian in actuality because of its U.S.-centric world view[28]. These models provide useful generalised classifications, but it is clearly problematic to attempt to classify media styles by country when (especially in the West) one country can harbour many different types of media, and media organisations can be globally owned. Instead, this model usefully provides a concise illustration of three different "ethical" functions that mass media can perform.

Hallin and Mancini recognised the "the limitations in trying to define models that usefully explain the relationship between media and politics in a comparative context", and their "more nuanced" version is shown in Table 2.2.3.1.

Table 2.2.3.1 – Hallin and Mancini's Media Models (2004)[29]

Model name	Definition	Countries on which it is based
Liberal	Relative dominance of market mechanisms and commercial media. Relatively small role of state.	Great Britain, Ireland, US
Democratic corporatist	Historical co-existence of commercial media and media tied to organized social and political groups. Relatively active, but legally limited role of the state.	Northern continental Europe
Polarized pluralist	Integration of media into party politics, weaker historical development of commercial media. Strong role of the state.	Mediterranean countries of southern Europe

In Table 2.2.3.1 it can be seen that while there are still three models, they have come slightly closer together in definition. Siebert's earlier authoritarian model has, under Hallin and Mancini, softened to become polarized pluralism in the southern Mediterranean, the U.K. has joined the U.S. in the liberal market model, and the social responsibility model has gained a mild commercial aspect to be called democratic corporatist, now found in northern Europe.

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[27] Oates (2008:5) citing Siebert et al (1963). The fourth "Soviet" style is omitted here due to its similarity to the authoritarian model.
[28] See Herman & Chomsky (1988).
[29] Hallin & Mancini (2004) cited in Oates (2008:12-13).

Theorist Doris Graber breaks away from the country-by-country perspective and instead categorises media organisations into four models "according to the manner in which they approach news coverage" –

1. Mirror model – news is a reflection of reality.

2. Organizational model – news emerges from pressures inherent in the organizational processes and goals of media organizations.

3. Political model – news reflects the ideological biases of individual journalists and their media organizations.

4. Professional model – news-making is an endeavour of highly skilled professionals, seeking to create news that attracts consumers and citizens[30].

However, the reality for many media organisations is likely to be a mix of "all of the above", albeit with various weightings. As well as separate institutional models these also represent a description of the conflicting pressures that come into play during news production, often within the one institution.

Sue Abel broadly summarises prevailing theory into two useful approaches for studying the mass media[31]. The first she describes as the "liberal pluralistic" perspective, which maintains that news media serve the public in a balanced, objective, free and fair manner. Market competition between media outlets provides appropriate checks and balances. News "happens" and the public are informed. This perspective implies acceptance of the general status quo and resembles similarly named categories within models described earlier.

The second is the "critical" perspective which acknowledges inherent problems, and asserts that the media are a conduit for dominant power structures in society. News is selected or constructed, and the ownership of the media outlet is an influencing factor. Within the critical perspective, Abel describes two further categories, or streams of thought, the "bureaucratic" and "political economy" models.

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[30] Oates (2008:10-11) citing Graber (2005).
[31] Abel (2004).

The more passive bureaucratic perspective considers that professional and organisational processes tend to, almost inadvertently, "tame" the news to support the dominant cultural status quo. This approach is less extreme or conspiratorial than the political economy approach, though it still acknowledges the underlying bias, imbalance, and hegemonic nature of mainstream news. While this assertion may be fiercely contested by professional news practitioners, as a perspective it has wide acceptance by critical media scholars[32]. This more benign critical approach has overlap with what is sometimes called the "cultural studies" theoretical approach[33].

On the other hand, the political economy perspective encompasses "active" theories such as "the manipulative model" which claims that media owners use their influence to promote their own interests[34], and the "structuralist" approach which asserts that it is the underlying capitalist commodity approach to news with its associated profit maximisation to shareholders which creates a power imbalance favouring advertisers over consumers[35].

This thesis approaches the topic from a critical perspective, examining hegemonic power structures as they may be discerned through the lens of a quantitative study of media texts. While bias may be plainly evident even within an inadvertent "bureaucratic" model, this thesis contends that the structuralist "political economy" model of active bias would appear to be more justified as a critique in this case, and that such problems are unsurprising for a media organisation (such as nzherald) which is constrained within a commercial market model.

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[32] E.g. Gitlin (1980).
[33] Baran & Davis (2012:212-218).
[34] E.g. Herman and Chomsky (1988).
[35] E.g. Nichols & McChesney (2009).

2.2.4 Ownership and Commercial Pressures

> *We do nothing controversial. We're not in the investigative business. Our only concern is giving editorial support for our ad projects – Houston Chronicle.*[36]

It is often assumed that ownership structures and commercial pressures will have an effect on news content, and this has been born out when examined. When Campbell compared the *New Zealand Herald* with the U.K.'s *Guardian* and the *Irish Times*, he attributed the clear differences in coverage styles to their respective ownership arrangements. The "trust" ownership style of both the *Guardian* and *Irish Times* meant that they had alternate forms of financial support and this allowed these papers to remain more committed to the core journalist values that were envisaged when they were set up[37]. On the other hand the more commercially-oriented *New Zealand Herald* was observed to have weaker environmental and social codes than the other papers, and a "low level of rightish partisanship" compared to the more left-leaning inclinations of the other two[38].

John Nichols and Robert McChesney, American campaigners for media reform, consider that commercial imperatives have tainted the news production process, leaving the public short-changed. As newspapers have increasingly struggled financially, first in competition with television and even more so in the digital age, the problem has been exacerbated –

> The economic collapse and Internet have greatly accentuated and accelerated a process that can be traced back to the 1970s, when corporate ownership and consolidation of newspapers took off. It was then that managers began to balance their books and to satisfy the demand from investors for ever-increasing returns by cutting journalists and shutting news bureaus.[39]

They see the result to be a lack of balance, a lack of quality and a lack of scrutiny –

> Politicians and administrators will work increasingly without independent scrutiny and without public accountability. … The collapse of journalism and the democratic infrastructure it sustains is not a development that anyone,

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[36] Liberty Quotes (2010).

[37] Former NZ Herald editor-in-chief Ellis (2011) cited in Campbell (2012:73).

[38] Campbell (2008:70-73).

[39] Nichols & McChesney (2009).

except perhaps corrupt politicians and the interests they serve, looks forward to.[40]

New Zealand's major newspapers all follow a commercial model, which means that advertising was, and continues to be, their primary source of revenue. A gradual decline in advertising income over the second half of the decade under observation placed them under increasing financial pressure.

2009 Advertising Share of Market by Medium

Legend: NEWSPAPERS, TELEVISION, RADIO, MAGAZINES, INTERACTIVE, OUTDOOR, UNADDRESSED MAIL, ADDRESSED MAIL, CINEMA
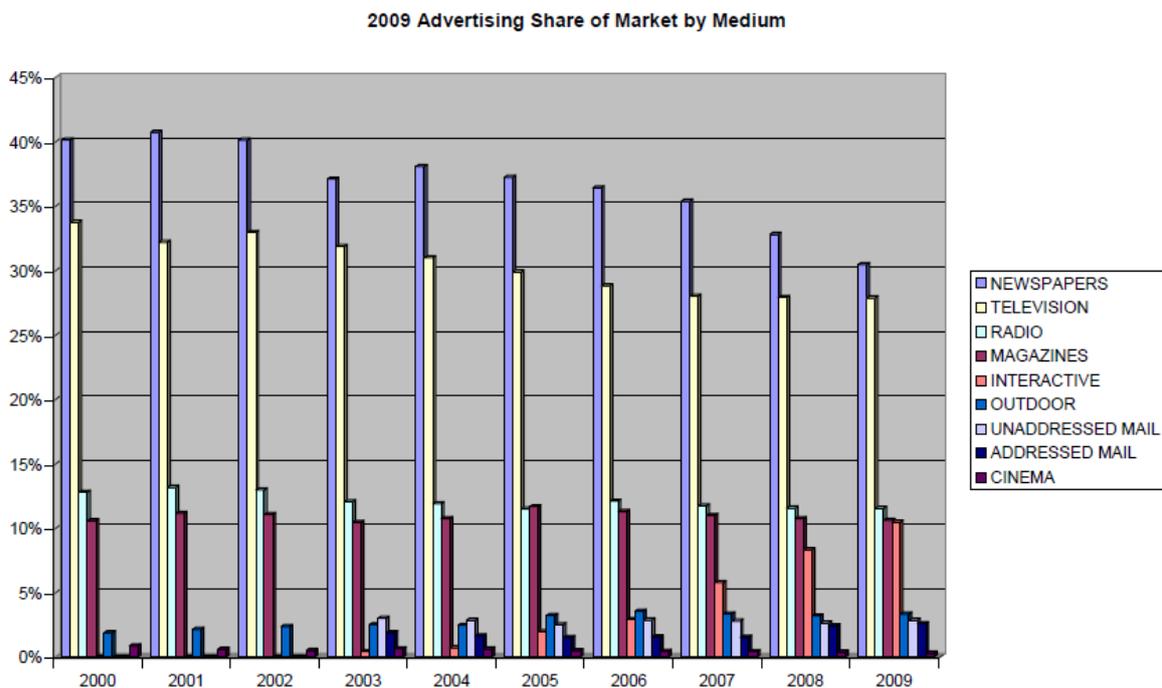
Figure 2.2.4.1 – 2000-2009 Advertising Share of Market by Medium[41]

It can be seen from the graph in Figure 2.2.4.1 that newspaper advertising market share (tallest light blue column), while still leading, had been consistently decreasing since 2004, mainly at the expense of "interactive" (orange) which was primarily the internet, while other media remained relatively constant. This trend was quite pronounced during the study period 2006-2007, when compared with the years on either side, 2005 and 2008.

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[40] Nichols & McChesney (2009).
[41] New Zealand Marketing Association (2010).

2009 New Zealand Advertising Spend by Medium
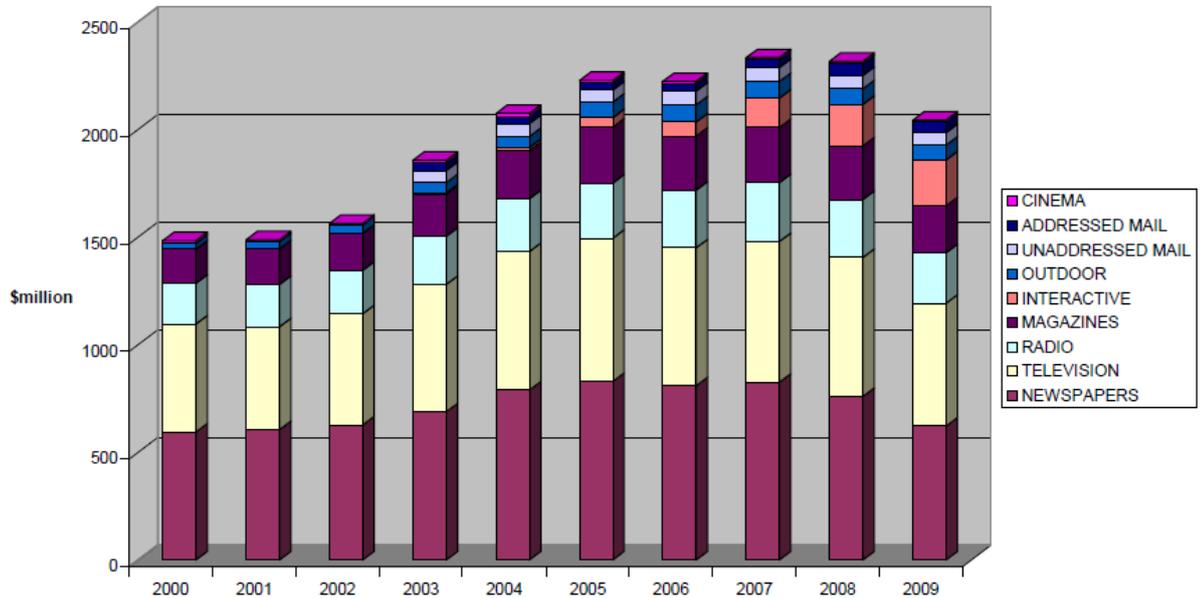
Figure 2.2.4.2 – 2000-2009 Advertising Spend by Medium

In dollar terms, newspaper advertising income stopped increasing and remained approximately static during the years of interest 2006-2007, then started to significantly decline in 2008, as can be seen in Figure 2.2.4.2 (bottom segment). Even a static income in dollar terms is equivalent to a decrease in real dollar terms when inflation is considered, so these figures were not good news for newspapers.

Reuters finance blogger Felix Salmon succinctly explains the situation –

> Media historically [has] been an advertising business. People think that the job of a newspaper is to sell news to readers. In fact the job of a newspaper is to sell readers to advertisers.[42]

Lack of capacity within the news media naturally leads to a rise in the effectiveness of lobbying, and its associated publication bias. In the fast developing internet age of the early 21st century (with its expectation of free news), media companies found themselves more and more stretched for money and resources, providing the

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[42] Salmon & Hill (2013). Also see McQuail (2005:100) for a similar description.

incentive to take the path of least resistance, and simply print material that was supplied to them (by people and organisations with resources), rather than seek alternative news from further afield[43]. Echoing concerns by Nichols and McChesney that "the ratio of PR flacks to working journalists has skyrocketed, as spin replaces news"[44], Margie Comrie observes that the –

> Demands of daily news production and newsroom cutbacks encourage journalists to turn to the growing number of public relations people as essential sources of news, information and access[45].

Michael Bassett agrees, adding that –

> The financial pressure applied to the media by demanding shareholders has pruned staff members. Wage structures make it difficult to retain good reporters when nearby PR companies offer double remuneration. As a result, overworked journalists easily succumb to spoon-feeding[46].

Consequently, while those in the media may strive to present themselves as defenders of the underdog and seekers after truth, considerable media "column inches" could still be claimed by those who already held significant positions of power, thus advantaging those who already held advantage. The question then arises – does this matter? What are the possible effects?

2.2.5 Theories of Media Influence

Mechanisms for media influence are not at all straightforward, but they demand our attention due to their potential importance. According to Maxwell Boykoff –

> Mass media have (vigorously) debatable limits in terms of potential conduits to attitudinal and behavioural change. Nonetheless, as unparalleled forms of communication to wide audiences, it remains vitally important to examine the ways in which media representations and symbols are produced, interpreted and consumed, thus influencing a spectrum of possibilities for governance and decision-making. From visceral influences such as 'Hey, that's me on television', to measured interrogations such as how corporate control of media potentially constrains dissent, the multifarious contributions that mass media make to public discourse deem it worthy of careful reflection and

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[43] Salleh (2008); Nichols & McChesney (2009); Nichols & McChesney (2010).
[44] Nichols & McChesney (2010).
[45] Comrie (2002).
[46] Bassett (2002).

scrutiny. Coverage certainly does not determine engagement; rather it shapes possibilities for engagement.[47]

Media influence has been studied extensively over several decades but answers are elusive due to the large number of factors involved, giving rise to measurement challenges. The apparent success of propaganda campaigns before and during World War II gave rise to suspicion of the mass media after the war (and attempts to utilise this power), but these fears were not borne out in early studies which endeavoured to measure direct media influence.

Research in the 1940s by Lazarsfeld, Katz and others resulted in the theory that friends, family and "opinion leaders" were more effective than the media at influencing the voting and purchasing decisions of members of the public[48]. The first stage of this "two-step model of communication" was the transmission of the media message to the opinion leader, who then filtered the message and passed it on to their friends and followers as the second stage. Ironically, suspicion about the power of the media was one reason that people gave as to why they preferred to trust their friends and mentors. Another reason was an understandable desire (conscious or otherwise) to maintain comfort and acceptance within their own social circle[49]. A third reason was a lack of desire to engage with new or complex ideas (many participants were described as "disengaged"), replaced by the preference to have issues explained and decided upon by a trusted third person. Although some observers felt reassured (for the sake of democracy) that inter-personal networks were revealed to be important[50], the discovery of the two-step model caused surprise and consternation to others, in two separate directions. On the one hand media owners seeking revenue were afraid that advertisers would be disappointed if the media appeared to be less influential than expected. Concerned alongside them were those who wished to harness the power of the media for virtuous, social, or manipulative purposes (Harold Lasswell was a devoted proponent of such

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[47] Boykoff (2011:2).
[48] Katz & Lazarsfeld (1955); Katz (1957); Balas (2007).
[49] Katz (1957:71-72,77).
[50] Katz (1957:61).

strategies)[51]. On the other hand propaganda-wary critics feared that media influence would thenceforth be underestimated, resulting in a loss of vigilance in that area[52]. In fact, some evidence of media influence was found in this experiment, just with a more targeted and more educated audience than previously imagined (being the opinion leaders rather than the public at large). There may also have been other forms of influence at play that were not being measured by these experiments, as various theorists have proposed, inviting further research in this area.

Although these and other studies clearly rejected the earlier "hypodermic syringe" model (of injecting messages directly into the audience in order to influence them), in favour of the "limited effects" theory, social scientists tend to agree that the media do somehow play an important role in shaping and maintaining cultural norms. Providing clear demarcations useful for a critical study, Lance Bennett applies the three dimensions of power postulated by Steven Lukes, namely decision-making power (overt), nondecision-making (gatekeeping), and ideological (sub-conscious), to the media –

> When assessing the impact of media on societies … Bennett derives three aspects of perceptions of political power from Lukes' … typology of power in society: People either accept political actions that affect them as legitimate; or they resist them; or they resign themselves to being powerless about these actions. The media can feed into these conceptions in three ways. First, media can frame coercive power within societies in ways that can 'encourage, discourage, hide, or expose it' ... . In addition, the media can be selective in their formal political coverage, reporting on some politicians and their activities while ignoring others. Finally, media are important for 'transmitting values, problem definitions and images of people in society that provide resources for people in thinking about their lives and their relations to government, politics and society'[53].

An exploration of Bennett's first dimension (the overt framing of power) would seem most suited to a qualitative approach, but the second (gatekeeping) and third (subtle transmission of values) dimensions are useful theoretical frames to apply to investigation using quantitative content analysis.

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[51] Baran & Davis (2012).

[52] Balas (2007).

[53] Oates (2008:8-9) discussing Bennett (2000:204:205) in relation to Lukes (1974).

Obtaining measurements from content presentation faces certain challenges, but measuring audience effects is also complex, albeit in a different way. McQuail divides audience research into three main types: studies about who is paying attention to the media, studies of individuals' behaviour in response to media messages, and studies about the various cultural understandings that appear to be received from the media (also see Gerbner further down). McQuail lists "six specific hurdles that a media message must cross in order to have a meaningful impact on a member of the audience: 1) the message must be created and offered; 2) it must be able to be received by the audience; 3) it must actually be received; 4) it must be registered by the audience member; 5) it must be internalized by the audience member … [and] 6) the message must then lead to some sort of political behaviour"[54].

However while not disagreeing, Kam & Zechmeister contend that some stages in this process may not be consciously registered, because there are additional "subconscious influences shap[ing] political decision-making"[55]. In their work testing the validity of name familiarity they discovered that repeated exposure to a person's name, using a subliminal priming technique under laboratory conditions, clearly gave rise to name recognition effects. In the absence of stronger cues such as incumbency (i.e. under low information conditions, or all other factors being equal), name recognition alone was sufficient to significantly sway votes in an election (as part of their experiment). Further investigation within the same study determined that the underlying psychological mechanism appeared to be the "bandwagon effect" (people preferring to back winners), in that a familiar name was seen as a more viable choice.

In a similar vein (where asserted influence is cumulative over time and primarily beyond awareness), "cultivation theory" was developed by George Gerbner as part of his Cultural Indicators project. Cultivation theory bears some resemblance to Bennett's third postulate above, the transmission of values. Gerbner studied the long

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[54] McQuail (1997) cited in Oates (2008:68). Alternatively see McQuail (2005:414) which, citing the original postulation in Clausse (1968:632), does not mention step 6.

term effect of television violence upon audiences and found correlations between hours of television watched and certain targeted behavioural traits (and attitudes) in individuals. Gerbner concluded that –

> What is most likely to cultivate stable and common conceptions of reality is, therefore, the overall pattern of programming to which total communities are regularly exposed over long periods of time.[56]

However, he also acknowledged that the dynamics are not simple, and that many factors are involved –

> The influences of a pervasive medium upon the composition and structure of the symbolic environment are subtle, complex, and intermingled with other influences. This perspective, therefore, assumes an interaction between the medium and its publics. Thus television neither simply 'creates' nor 'reflects' images, opinions, and beliefs. Rather, it is an integral aspect of a dynamic process.[57]

A core component of cultivation theory is the "mainstreaming" effect, arising from the observation that the views of otherwise disparate recipients have been found to trend towards a common outlook on the world when heavily exposed to repeated media messages of a consistent nature, where that common outlook reflects the dominant cultural current within society (the mainstream). This is augmented by the concept of "resonance", wherein the cultivation effect is magnified when television matches or reflects a reality already perceived by the viewer in real life (for example by a member of a victimised minority)[58].

Though early work was focused on television violence, researchers have since extended the thinking around cultivation theory to other topics and other types of media[59]. Looking at the larger picture, Gerbner's cultural indicators project as a whole highlighted three stages, or "three entities – institutions, messages, and publics" of which the observed effects of cultivation theory upon recipients (discussed above) is but the third stage. The three stages may be described this –

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[55] Kam & (Zechmeister 2011:ii).
[56] Gerbner (1998:179).
[57] Gerbner (1998:180).
[58] Gerbner (1998:183).

First, 'institutional process analysis' investigates the organizational forms, power relations, and decision-making pressures and processes of the institutions that produce mass-mediated messages. Second, 'message system analysis' investigates broad structures and consistent patterns in large bodies of those messages in the aggregate (as opposed to in any particular program or genre, and apart from issues of 'quality' or aesthetic value). The third area of analysis—cultivation analysis—was defined as the 'study of the relationships between institutional processes, message systems, and the public assumptions, images, and policies that they cultivate'. These relationships were framed as dynamic, with each component affecting (and affected by) the others.[60]

In summary, cultivation theory is –

The notion … that living in a symbolic environment in which certain types of institutions with certain types of objectives create certain types of messages, tends to cultivate (support, sustain, and nourish) certain types of collective consciousness.[61]

My study comprised of "message system analysis", bringing it within the ambit of the second stage of Gerbner's trilogy. Audience effects were not measured in my research, but what was sought was an effective mechanism for measuring patterns of coverage which would be likely to give rise to cultivation-style effects.

In other words, one hypothesis put forward by this study is that there are elements of cultivation theory at work in the presentations of newspapers and, by extension, their news webpages. This would mean that even if specific messages were not directly absorbed by readers, that constant repetition of concepts, even in the background, are likely to have a cultural "mainstreaming" effect on recipients. In this project I have undertaken to measure some of these recurring background themes in a uniquely comprehensive way.

On the other hand, even if cultivation effects were not found in recipients for this specific example (if they had been able to be measured), it is proposed that the steady stream of concepts as messages presented by the media in my sample (if

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[59] Morgan & Shanahan (2010).

[60] Gerbner (1970:71) cited in Morgan & Shanahan (2010:338).

[61] Morgan & Shanahan (2010:338-339).

taken to be representative of wider media behaviour) can still usefully tell a story about what is being presented for consumption, and what is being omitted.

2.2.6 Psychological Components

Looking more closely at audience effects, certain psychological processes have been associated with, and add validity to, the theories of media influence discussed above.

As highlighted in the previous section, research by Lazarsfeld & Katz, combined with points 3, 4 and 5 in McQuail's list above (that messages need to be received, registered, and internalised respectively), indicate that audiences do not always receive, or may be resistant to, messages from the media. In addition to the reasons briefly described earlier, one significant cognitive trait that gives rise to selective media receptivity (and supports the limited effects theory of media influence) is the human tendency towards confirmation bias[62].

When applied to media selection Charles Atkin discusses confirmation bias under the heading of "reinforcement-oriented selective exposure", indicating its close association with reinforcement theory. Reinforcement theory holds that there are three main stages at which intended messages can be interrupted (or mis-interpreted) by the recipient. These broadly match 3, 4 and 5 in McQuail's list and are described as 1. selective exposure, 2. selective perception, and 3. selective retention[63]. These three stages are shown as steps 4, 5, & 6 in Figure 2.2.7.1, later on.

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[62] "The human understanding when it has once adopted an opinion ... draws all things else to support and agree with it. And though there be a greater number and weight of instances to be found on the other side, yet these it either neglects and despises ... in order that by this great and pernicious predetermination the authority of its former conclusions may remain inviolate. --Francis Bacon, Novum Organum, 1620 ", from Shermer (2006). Shermer himself described confirmation bias as the experience " … whereby we seek and find confirmatory evidence in support of already existing beliefs and ignore or reinterpret disconfirmatory evidence". Shermer's 2006 Scientific American article referenced 2004 research by Westen et al. (2007) which explored "emotion-biased motivated reasoning" with strongly partisan participants, and found that confirmation bias used different parts of the brain from "cold reasoning". Atkin (1985:75) advanced a number of explanations for confirmation bias, one of which was as a mechanism for the avoidance of cognitive dissonance.
[63] Watts (1997:77).

Atkin also describes other explanations for variations in media receptivity[64]. This area of research is called the "uses and gratifications" theoretical approach, focusing upon what people "use the media for" rather than what the media does to them.

Alongside barriers to media influence, there are also psychological processes which reinforce the concept of media influence. Psychological studies have found that repetition is central to the learning process. This relationship has long been recognised as the "Law of Frequency". Other similar laws are the "Law of Recency" (most recent material encountered is more readily learned) and the "Law of Primacy" (first words in a list are more readily learned). According to William Bagley –

> The Law of Frequency asserts that those things that are the most often repeated are the best remembered. This law has been the one which has been recognized by schoolmasters of all times, and is the one most readily utilizable in the learning process[65].

Supporting evidence was provided in systematic memory research by Hermann Ebbinghaus[66]. Furthermore, names and phrases that are repeated frequently become part of the common lexicon, taken for granted without question, and embedded in the subconscious. In his paper entitled "Mere Exposure: A Gateway to the Subliminal" Robert Zajonc states –

> Vast literature on the mere-repeated-exposure effect shows it to be a robust phenomenon that cannot be explained by an appeal to recognition memory or perceptual fluency. … Empirical research shows that a benign experience of repetition can in and of itself enhance positive affect, and that such affect can become attached not only to stimuli that have been exposed but also to similar stimuli that have not been previously exposed ….[67].

In their voter research (discussed earlier), Kam and Zechmeister find the observed experimental effects arising from name familiarity to be consistent with Zajonc's "mere exposure effect"[68], where repetition "increases positive feelings toward that

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[64] Atkin (1985:74:76).
[65] Bagley (1911).
[66] Ebbinghaus (1913).
[67] Zajonc (2001).
[68] Kam & Zechmeister (2011:2,6,11,25,27).

name"[69]. Kam and Zechmeister's research involved subliminal priming, but they also refer to other studies which show that "supraliminal and subliminal presentations can have similar effects", and further that "the manner in which stimuli are presented (supraliminally or subliminally) is less important than how the stimuli are processed (consciously or subconsciously)"[70], but that even subconscious processing produces valid effects.

It is this realisation of the value of repetition, together with the importance of the emotional component, which has led to ongoing developments in advertising, marketing and public relations. For example, the marketing technique of name repetition within an emotionally positive context is based upon a cognitive bias called the "halo effect". Edward Thorndike[71] is said to be the first to empirically identify the "halo effect" phenomenon whereby one positive trait within an individual gives rise to exaggerated assessments in other areas. For example a beautiful person may be assessed as more smart, kind, or talented than they actually are. This preference-inducing observation has been extrapolated into marketing strategies such as that of associating a celebrity (or beautiful image) with a product or brand, in order to engender positive feelings about that product or brand. Similarly, it is also incorporated into the practice of sponsorship, which increases public awareness of a brand in the first instance, but at the same time associates the brand with a socially desirable activity (for example a sport or charity)[72]. In both of these scenarios positive public feelings towards the celebrity or the virtuous activity are expected to "rub off" on the brand, enhancing (and moving beyond) the mere exposure effect (where positive affect derives simply from repeated mention).

The opposite "e-Halo" effect was labelled the "pitchfork effect" by Jonathan Glennie[73] in a *Guardian* blog post, referring to the practice whereby politicians attempt to taint their opponents with exaggerated insults in the hope that the

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[69] Kam & Zechmeister (2011:2).

[70] Kam & Zechmeister (2011: 10, 27).

[71] Thorndike (1920).

[72] Salmon & Hill (2013) cites Red Bull sponsorship of extreme sports as an example of seeking the Halo effect.

negativity will stick. Interestingly, Kam and Zechmeister initially ran their name recognition experiment in three separate cohorts, by placing the name alongside positive, negative and neutral words respectively, but found no statistically significant differences between the three sets of results. A positive voting effect was found in every case, ostensibly providing support for the "all publicity is good publicity" hypothesis. However, this does not entirely negate the halo or pitchfork effects, as emotional tainting was not the primary focus of Kam and Zechmeister's research and therefore "these null findings could arise from experimental design issues (weak treatment, lack of power), or they might indicate that classical conditioning does not operate within this design"[74]. The halo effect is closely related to the "affect heuristic" whereby it has been shown that a person's positive (or other) emotions can unconsciously and instantaneously affect the way in which they process and judge information even before rational assessment comes into play[75].

This evidence adds support to the standard media (and marketing) practice of presenting content which is likely to elicit an emotional response in the audience, in order to attract and keep their attention. An evolutionary survival strategy (the instinctive response to "threat") theoretically supports the evidence that negative emotional triggers are found to be stronger than positive ones[76] (called "negativity bias"), thus explaining why the media often lead with bad news in order to attract attention. Interestingly, early theory by Harold Lasswell in the 1920s contends that constant negative messaging has a traumatising effect on audiences, causing them to be more open to propaganda in their search for reassurance[77]. This is also the underlying premise within Naomi Klein's book "The Shock Doctrine"[78].

A further psychological phenomenon which needs to be discussed in relation to repetition and media influence is the "availability heuristic" which has been put

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[73] Glennie (2011).

[74] Kam & Zechmeister (2011:12).

[75] Zajonc (1980).

[76] Baumeister et al. (2001); Hanson (2013).

[77] Baran & Davis (2012:83). Clausse (1968:637-640) also describes his observations of the psychologically destabilising effects of shock news on the public.

[78] Klein (2007).

forward as contributing to observed effects in cultivation theory[79], priming[80], and media agenda-setting[81]. It has been the subject of much research, and is accessibly described in a book by Daniel Kahneman called "Thinking Fast and Slow". Kahneman's findings were the result of many years research with Amos Tversky, where they explored conditions under which people by-pass considered rational processes in favour of assertions which happen to be "top of mind" but which may not in fact be true. They find this to be a common phenomenon particularly in relation to statistical estimations and issue salience, and it is explained as an "efficiency" mechanism that the mind employs when allocating its "limited budget of attention". Kahneman explains –

> Students of policy have noted that the availability heuristic helps explain why some issues are highly salient in the public's mind while others are neglected. People tend to assess the relative importance of issues by the ease with which they are retrieved from memory - and this is largely determined by the extent of coverage in the media. Frequently mentioned topics populate the mind even as others slip away from awareness. In turn, what the media choose to report corresponds to their view of what is currently on the public's mind. … Because public interest is most easily aroused by dramatic events and by celebrities, media feeding frenzies are common. For several weeks after Michael Jackson's death, for example, it was virtually impossible to find a television channel reporting on another topic. In contrast, there is little coverage of critical but unexciting issues that provide less drama, such as declining educational standards or over-investment of medical resources in the last year of life[82].

It may thus be concluded that there is reliable evidence to support the assertion that repetition within the media can have an effect on its audience via the mere exposure effect and availability heuristic, giving rise to cultivation and agenda setting effects, including issue salience[83]. In addition, intentional invoking of an emotional response is a common characteristic of media content (via classic sensationalism, including making use of the halo effect and negativity bias).

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[79] Morgan & Shanahan (2010:344,345,348).
[80] Hindmoor (2008:83) lists a number of authors on the subject of priming effects.
[81] Where agenda setting is a special media-oriented form of priming. See Weaver (2007:145).
[82] Kahneman (2011:8-9).
[83] In both senses of the word, i.e. importance and "top of mind", as per Weaver (2007:146).

2.2.7 Media Influence on Public Policy

> *Even though the media have become an important factor in politics, in particular during elections, their influence on political decision making has been largely ignored so far.[84]*

Ideally public policy will reflect the goals arising from public desires within a democratic society. It is therefore useful to investigate mechanisms by which the media can play a role in influencing those public desires and, by extension, policy outcomes.

Studies about media influence on public policy were researched by Sigrid Koch-Baumgarten and Katrin Voltmer, and a selection was presented in their book "Public Policy and Mass Media". They found that this topic had little available literature. Summarising the available research, the authors suggest that the mass media influences public policy in two closely related but subtly different ways[85].

A. By influencing public opinion, impelling politicians to respond.

B. By giving the impression that they represent public opinion, thus impelling politicians to respond.

Regardless of the motives behind the influence (including ownership factors), and whether deliberate or unconscious, it is proposed that one or other of these mechanisms are employed. In the first one, politicians respond to actual (media altered) public opinion, whereas in the second one politicians respond to the media agenda, believing it to be public opinion.

However, actual influence wielded in practice by the media is observed by scholars to generally be smaller than expected, and confined only to a restricted number of suitable policy areas. This is because the sensationalist nature of news reporting favours simple, colourful topics of short duration, whereas much policy development is slow, laborious, and not very exciting[86].

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[84] Koch-Baumgarten & Voltmer (2010:xviii).
[85] Koch-Baumgarten & Voltmer (2010:xvi,2).
[86] Brown (2010:133); Koch-Baumgarten & Voltmer (2010:xvii,2,4-5,9).

The two mechanisms of influence (Path A and Path B) described above are conceivably measurable by drawing time-lapse correlations between media content and policy responses, with the two paths likely indistinguishable other than by the additional evaluation of audience attunement. There is another more indirect (but significant), mechanism whereby the media affect policy simply by their presence, so that policy-makers feel pressured to adapt policy in preparation for the way in which it will ultimately be presented in the media (for anticipated acceptance or rejection by the public). This changing of priority by policy-makers to focus on media engagement rather than community social engagement is described by Baran and Davis as "media intrusion" theory[87]. To stay within the two options proposed above, this scenario is classified under Path B, because here the media are effectively acting as proxy for the public (this time in advance).
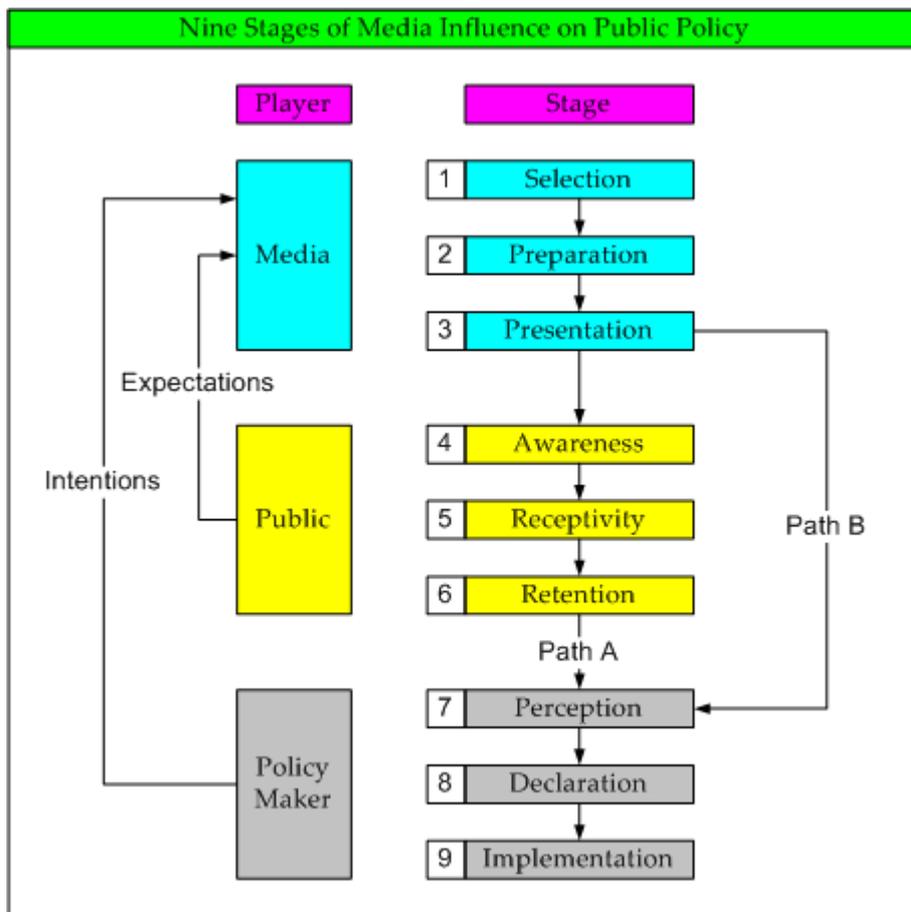
Figure 2.2.7.1 – Nine Stages of Media Influence on Public Policy

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[87] Baran & Davis (2012:307-310). Also described by Koch-Baumgarten & Voltmer (2010:4) and others as "mediatization".

Overall, the assessment of media influence upon public policy is enticingly difficult, and relatively unexplored, though a few different approaches have been attempted.

Based upon literature examined so far, I constructed a simple diagrammatic representation of media influence upon public policy which demonstrates the difference between Paths A and B, shown in Figure 2.2.7.1. The first three stages in Figure 2.2.7.1 together encompass the news production process, comprising of the various activities which result in the widely accepted "agenda-setting" effect. Stage 1 selection represents the media "gatekeeping" role, where items are selected for "newsworthiness" or alternatively, for convenience of source[88]. Stage 2 preparation is the (often concurrent) compilation of the paper or website accompanied by the writing and editing of articles. Stage 3 presentation represents the final product presented to the public, including its location and prominence. This third stage is where the focus of my research lies, in examining the final published text using frequency-based analysis. The remainder of the diagram provides important context, as content cannot meaningfully be studied in isolation[89].

The three "public" stages (4,5,6) of awareness, receptivity, and retention in Figure 2.2.7.1 acknowledge that members of the public may or may not receive the messages sent by the media. These steps reflect the three primary mechanisms of reinforcement theory discussed earlier, which are selective exposure, selective perception, and selective retention.

Stage 7 perception presents the crucial point of media influence upon the policy maker (if such influence exists) and here Paths A and B (described earlier) are illustrated. Either the public are on side with the policy argument as reflected in the media and the policy-maker is aware of this (Path A), or the policy-maker is persuaded directly and believes the media presentation to represent public opinion, regardless of actual public support (Path B). Alternatively policy can be prepared

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[88] The proliferation of lobbyists, and the easy publication of press releases, were mentioned earlier. Jones & Wolfe (2010:21) note the recognised importance for policy-makers of having a good relationship with the media, and of being easily accessible to them.
[89] Richardson (2006); Philo (2007).

with anticipated media presentation in mind (discussed above). Stage 8 <u>declaration</u> is the announcement of a policy (to the media, the public, or affected parties), and Stage 9 its eventual <u>implementation</u>, which may or may not actually occur.

On the left hand side of Figure 2.2.7.1, arrows depict the complicating reverse scenarios (and the recursive nature of the process) whereby the media is also influenced by each of the other two players, the policy-makers and the public. In the case of the former, it is certainly likely to be the policy-makers intention to influence the media (rather than the other way around), and at the very least it is in the policy maker's interest to inform the media of policy <u>intentions</u> and gain appropriate favourable media coverage[90]. In the case of the latter, the public have certain <u>expectations</u> that the media endeavour to fulfill, as well as (arguably) control.

Building upon the more general theories of media influence discussed earlier, a useful discussion of theoretical approaches to media influence upon public policy is provided by Jones and Wolfe. They list four possible applicable theories [91] –

1. Influence theory: The media tell the politicians what to think.

2. Agenda-setting theory: The media tell the politicians what to think *about*.

3. Indexing theory: The politicians tell the media what to *write* about.

4. Detection theory: Politicians and the media struggle to identify, characterize, and prioritize multiple complex streams of information.

Jones and Wolfe argue that the first three theories listed are too linear to usefully encompass the full range of influencing factors, and that the last in the list, their newly named "detection theory", is a more accurate description of the complex media-politician interaction. They describe detection theory as an "information processing" approach which encompasses aspects of the three earlier theories, but which acknowledges the reciprocity of the process and also incorporates additional messaging from elsewhere, such as experts and events.

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[90] Jones & Wolfe (2010:21); Koch-Baumgarten & Voltmer (2010:4).
[91] Jones & Wolfe (2010:17).

Reflecting upon their position, it is true that influences upon real world policy-makers are complex if one is attempting to model the whole picture, but I would also argue that the simpler stand-alone theories remain useful and can be shown to apply on a case-by-case basis when it is specifically media influence which is under the spotlight. It is generally agreed that media effects upon policy apply differently to different types of policy issues, leaving room for the development of a variety of theoretical approaches, depending on the circumstances. Furthermore, it is the identification and differentiation of these distinct policy-scenario characterisations that invite researcher attention.

Jones and Wolfe acknowledge the value (and validity) of the other theories as components of their own. Their discussion about indexing is instructive, and asks questions which fit well into a critical political economy approach –

> Who or what sets the news media agenda? Is it a question of *who* controls the media, or rather, *what* controls the media? Government officials are preferred as sources because they have power …, they lend legitimacy to news stories … and because the economy of information encourages journalists to establish relationships with elite sources … . These relationships are symbiotic in that all parties benefit. Government officials also 'go public' through the media in order to garner support for policies, to explain political actions, and to capitalize on 'free' publicity … – all actions that also fall in line with democratic accountability through increased transparency.[92]

A list of studies comparing indexing vs. agenda setting include sometimes contradictory findings that –

1. Government elites are overwhelmingly used as official sources, and news is indexed to the range of official debate.

2. A major driver of indexing is elite conflict, and the decline of issue coverage does not follow the resolution of a problem, or as an issue disappears from the formal agenda, but rather when elites stop discussing it.

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[92] Jones & Wolfe (2010:21).

3. News coverage of foreign affairs follows the spectrum of official debate and the media marginalize non-official voices when there appears to be official consensus on a policy topic.

4. Domestic elites are not the only or majority of official sources in news stories, journalists sometimes balance coverage by including foreign sources as opposition voices.

5. Contrary to 1 above, non-official viewpoints do occur in news coverage for selected issues (like police brutality) which officials would rather keep out of public discourse.

6. Journalists' propensity to index varies depending on ideological context, stage of conflict, and prior success of existing policies.

7. Policymakers lead on issues, such as national debt and deficit, which the public do not experience directly, but media has influence on more salient issues.

8. Media attention sometimes precedes and sometimes follows changes in attention by government agencies; each can affect the other, reinforcing the pattern of positive feedback and punctuated equilibrium[93].

In their work comparing the timing of New York Times policy articles with congressional hearings using high level aggregated policy issue data from the Policy Agendas project over several decades, Jones and Wolfe found significant support for indexing but no significant support for agenda-setting. They conclude that –

> Clearly, political leaders intend to influence the media, but it is less clear that the media intends to influence politics, once we get beyond the issue of corporate self-interest. It is even less clear that any one set of actors – be they from the media or political elites, or from business or from 'the public' – in any sense 'controls' policymaking.[94]

They also admit that, of course, "what policymakers do is *news*", thus explaining their results, and I contend that although their data shows Congress consistently

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[93] List compiled from Jones & Wolfe (2010:21,29,30).
[94] Jones & Wolfe (2010:30).

leading the New York Times in the aggregate data, there may have been more support for agenda setting if specific policy topics (or events) were separated out and examined more closely. They did in fact discuss a few selected high level policy topic studies (on climate change, economics, and crime) in relation to external events as a third factor (in support of their information processing approach), and found a mix of results, including apparent agenda setting effects from "tonal" media coverage over a period, ultimately leading to congressional attention with a lag time of about a year[95]. It appears that this description of ongoing "tonal" coverage bears some relation to Gerbner's cultivation effects, and Bennett's third dimension of media power – the transmission of values, including "problem definitions" (as discussed earlier). Steady ongoing background coverage of this nature was the kind of media messaging which my study sought to capture and analyse, including at more precise levels (of topic specificity) than was possible in the studies described by Jones and Wolfe.

Jones and Wolfe note that most indexing studies cover foreign policy crises and they call for more studies about domestic policy issues to "determine whether news coverage is largely a portrayal of power struggles within elite institutions … rather than critical discussion of societal conditions"[96]. My study of New Zealand electricity policy within the media responds to their call and occupies the gap in the literature that they identify.

2.2.8 Summary

The mass media are a prominent, necessary, and powerful force in society. They perform an informing, culture-reflecting and (arguably) culture-forming role. The media are expected to play "watchdog" and hold politicians to account, and it is important that researchers likewise hold the media to account.

Various models representing the complex relationship between mass media and society highlight tensions between ethical factors such as social responsibility,

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[95] Jones & Wolfe (2010:31-33).
[96] Jones & Wolfe (2010:21-22).

political or ideological allegiance, professionalism, balance, and the contestability of ideas. Commercial pressures are alleged to reduce the quality of journalism, increase publication bias, and give rise to incentives which privilege certain players and perspectives within the media, prompting the critical perspective of this thesis.

Measuring media influence is challenging but scholars agree that mass media play a "gatekeeping" role and an "agenda-setting" role. In this way, the media not only "tell the public what to think about", but they also guide issue salience within the public mind. Name familiarity has been shown to affect voter preferences, and it is also claimed that the media produce "mainstreaming" cultivation effects in audiences by repeated exposure to certain types of values-laden messaging.

Media-induced audience effects are supported by psychological studies which confirm observed phenomenon such as the mere exposure effect (for repetition) and the availability heuristic (for agenda setting), and these influences are effective at a subconscious level. Appeals to human negativity bias are made by attention-seeking headlines, and the halo effect transfers glamour and importance from celebrities and experts to the articles (and publications) that they appear in.

The public policy creation process is complex and involves many actors. Politicians (as policymakers) have mutually beneficial relationships with journalists and often see the media as representative of public opinion. Media influence upon policy-makers (and thus upon public policy) is considered to be more likely in some circumstances than others but often it appears to be the other way around, and more research is required. This thesis is a contribution to the literature in that area, and its focus on electricity policy is unique in this context.

2.3 Political Economy and Electricity

> *Modern civilisation has been built upon a prodigious consumption of energy; energy has become the ultimate raw material. To the consumer it is the commodity he buys as gasoline, natural gas and electricity. To engineers, it is the heat for industrial furnaces or the motive power for machinery. To the economist, it is the key ingredient to national prosperity. Without energy man would be at the mercy of his environment, his cities uninhabitable and many of the material benefits he now enjoys unavailable.[97]*

2.3.1 Introduction

This section discusses the vital economic role of electricity within the New Zealand political context, and outlines challenges faced by the sector. The four main sub-sections are electricity in New Zealand, the electricity reforms, Ministry of Economic Development (MED) reporting, and environmental implications.

2.3.2 Electricity in New Zealand

By the beginning of the twenty-first century, electricity was fully integrated into modern Western society as a ubiquitous source of energy, taken for granted by households and businesses every day, and New Zealand was no exception. Electricity (alongside oil) underpinned the economy by supplying power to society's vital enterprises. On another level, the large volume of financial market transactions within the electricity sector contributed to GDP and bolstered government revenue. Electricity was therefore a sensitive commodity, if in fact commodity was the right word. Any disruption to supply affected both society and the economy.

New Zealand was blessed with a large renewable energy base, with 60-70% of its electricity generated by hydro[98]. However by 2006-2007 environmental concerns meant additional large hydro schemes were unlikely. Kyoto commitments and a decline in the large Maui gas field meant that further gas-fired thermal generation investment looked risky. Coal remained a reasonably abundant local resource, but although mining provided welcome jobs in Huntly and on the West Coast, coal was

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[97] Kibblewhite (1974:13).
[98] Statistics NZ (2010). See Martin (1998) for a comprehensive history of electricity generation in New Zealand.

also recognised to be dirty, carbon-emitting, environmentally costly, and dangerous to extract. Its use for electricity generation (at the Huntly power station) was kept to a minimum and much of New Zealand's mined coal was instead exported to India and Japan[99]. Wind power had recently come into its own, and a number of new wind farms were under development around the country. The intermittent nature of wind, however, meant that it could only take New Zealand so far without an effective means of electricity storage and without affecting the overall stability of the grid. According to Redshaw & Dawber (1996), extending renewable power generation alternatives was an oft-stated and popular goal, but despite enthusiasm for solar, wave and tidal options, practical reality had not yet translated that enthusiasm into serious gigawatts in New Zealand.

Electricity consumption in New Zealand had been growing at approximately 2% per year (see Figures 2.3.4.3 and 3.4.4.2) for the previous two decades[100]. If oil and petrol prices continued to climb, the viability of electric public transport (especially rail) was expected to increase, as would the popularity of electric cars[101], thereby creating a likely increase in electricity consumption. However, investment in new electricity generation had slowed since the start of the market reforms[102] (see next section), in response to calls for increased efficiency[103]. Furthermore, New Zealand's transmission infrastructure was aging, and while grid operator Transpower was locked in a battle with the new Electricity Commission over costs and alternatives, the security of the power supply to New Zealand's largest and fastest growing

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[99] South Island coal was unsuitable for Huntly (MED 2008b), and about half of its coal for power generation was imported from Indonesia (Tichall 2008).

[100] Martin (1998:332); Statistics NZ (2010).

[101] Electric cars were not yet available in New Zealand but their popularity was increasing overseas, encouraged in places such as London by the metropolitan commuter benefits of cheap parking and congestion charge exemptions. Technical development focused on extending battery life to enable longer driving distances between re-charges. Petrol electric hybrids had been available in New Zealand for some time, but without plug-in re-charging.

[102] See Figure 2.3.4.4 (MED 2008b). Note the flat area on the graph after 1985 once Huntly had been fully commissioned.

[103] "The McLachlan report … in 1984 … concluded that the historical expenditure on power stations had led to large unnecessary costs because of inadequate planning, advice and management, and that this had affected the overall performance of the economy. More

population base in Auckland appeared to be in danger. The question thus arose – could New Zealand contain its future electricity demand, and if not, could generation rise to meet it?

The challenge for New Zealand (and the rest of the world) was how to maintain a stable political climate, a sound business environment, a steady economic outlook, a clean green image, and a comfortable standard of living, while looking directly into the threat of oil shortages, global warming, and possible environmental collapse. Could New Zealand realistically meet its future electricity needs without exacerbating any of those problems, and preferably by mitigating them? And if so, how?

1. Coal

In 2006, coal continued to be one of the most widely used and cheapest fuels to use for electricity generation world-wide. New coal generation plant was coming on stream regularly in countries such as the US and China[104]. Although highly polluting, carbon emitting, dangerous to obtain and environmentally destructive, its abundance, reasonable price and already entrenched position meant that coal was not an easy fuel to discard, and so every effort possible was being made to find a way that it could continue to be used for power generation. Investigations into "clean coal" and "geosequestration" (perceived as being the two main mechanisms for saving coal) were allocated high priority by those in the coal or electricity generation industries worldwide. Research dollars were being spent and predictions of ultimate success were consistently declared[105].

Despite the threat of climate change the state owned enterprise (SOE) Solid Energy continued to expand its coal mining operations and export market, for the benefit of its own profits and the New Zealand economy.

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widely, the Electricity Division was criticised for its excess generating capacity, non-commercial pricing and a lack of emphasis on cost and efficiency" (Martin 1998:286).

[104] Lin (2003).

[105] Diesendorf (2006)

2. Oil

Although it did not feature prominently in the electricity industry, transport and other use meant that oil continued to form the backbone of the modern energy-intensive hydrocarbon economy world-wide in 2006, taking its place at the most recent end of the historical human fuel source progression from carbohydrate, through coal and steam, finally to fossil fuels or "buried sunshine"[106]. Earlier in the twentieth century nuclear power had been predicted to displace oil as the primary modern energy source with "energy too cheap to meter"[107], but safety, cost, and radioactive waste issues meant that it had not yet been able to live up to the promise, and so, while the decades-long quest for usable nuclear fusion (instead of fission)[108] continued, oil remained king. Hydrogen was also in the pipeline, so to speak, as another possible successor to oil, but although almost[109] perfectly environmentally clean, it was more volatile than oil, and therefore, as a gas, required more careful handling. It also required a significant amount of energy to create, causing it to be classified as energy storage rather than an energy source, and it lacked many of oil's convenient features, such as ease of extraction and transport.

Oil, although relatively plentiful, had long been a fluctuating source of world friction, and the dual global oil crises of 1973 and 1979 provided a warning which was heeded by some. For example, Denmark's windmill proliferation and expertise was the direct result of that country's determination to reduce their reliance upon oil. Similarly, Brazil's response was to pursue wide scale production of ethanol.

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[106] Dukes (2003), cited in Byrne, Toly & Glover (2006:ix).

[107] Byrne & Toly (2006:2).

[108] Nuclear power had always been generated via nuclear "fission". This occurred when an atom, usually uranium or plutonium, was split, causing a reaction which was difficult, but manageable, to control and which produced radioactive waste products. By contrast, nuclear "fusion" would create power by combining two atoms (usually heavy water H_30) and would not produce radioactive by-products. While its theoretical feasibility had been accepted for decades, at time of writing practical reliable nuclear fusion remained elusive.

[109] When hydrogen is burned in pure oxygen (e.g. within a fuel cell) the by-products are water and heat (CHFCC 2009). However burning hydrogen in air can produce nitrogen oxides and nitric acid (Atomistry 2013). Wikipedia-based websites claimed that it also produced hydrogen cyanide gas (Wofsey 2009) but I was unable to verify this from other sources.

New Zealand's brand new Marsden B oil-fired electricity generation plant was never used because of the oil price shocks following the same 1970s oil crises. In 2006 the Whirinaki stand-by generation plant was the only remaining large oil-based power generation facility in New Zealand, and this was fueled by oil distillate. Private diesel generators were quite common however, making oil New Zealand's rather expensive back-up fuel for electricity generation, rather than a primary source.

In 2005 and 2006, world oil prices rose severely, causing concern that peak oil had arrived and that prices would continue to rise. In New Zealand petrol prices were of public concern and biofuels became a hot topic. However, oil prices dropped again towards the end of 2006, so much so that members of the OPEC oil-producing cartel considered cutting production in order to maintain profits and steady the price[110]. Major concerns were expressed by some about the social cost of oil, its ability to polarise wealth, divide communities, trigger wars, and cause environmental destruction. The actions of the United States in securing its oil supplies around the world were also questioned[111].

3. Natural Gas

Extensive hydro-electric projects early in New Zealand's history meant that the country was well supplied with power for decades from a reliable and renewable source. However, New Zealand's existing lakes had limited storage capacity, and popular opposition strengthened by environmental awareness meant that new large hydro schemes were no longer feasible[112]. The proliferation of thermal generation plant over the previous half century, made possible by the discovery of the Maui gas field, had therefore by 2006 comparatively reduced the hydro generation proportion

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[110] Reuters (2006a).

[111] Klare (2006).

[112]Although there was no legislated prohibition this was a widespread assumption. Following the abandonment of Meridian's Project Aqua Jeanette Fitzsimons said " … the end of large-scale hydro was signalled some time ago because all the easy, cheap, do-able sites have been taken. … The writing's been on the wall for large hydro schemes for a long time" (Cumming 2004). According to an international study "Like Norway, New Zealand is planning to move away from large hydro projects" (Meisen & Garzke 2008:15).

(see Figure 2.3.4.2), and increased New Zealand's vulnerability to the natural gas market. Oil and gas exploration continued on and off the shores of New Zealand, in the hope of finding a significantly large natural gas repository to replace the dwindling supply from Maui. Despite the costs and potentially volatile market exposure, the importation of LPG was discussed by some of the larger generating companies as a back-up plan, particularly those with large investments in thermal plant.

4. Nuclear

In 2006 the prospect of New Zealand giving consideration to the development of any kind of nuclear power generation capability was extremely remote, despite promotion by a small minority. Public support for New Zealand's non-nuclear stance was a matter of national identity and would not be discarded lightly. However, this did not take the nuclear power discussion off the agenda because New Zealand's closest neighbour, Australia, was inching closer to the possibility of developing nuclear power.

Australia was already a source of high grade uranium for export, and was facing the same concerns as the rest of the world with regards to security of future electricity supplies in the face of potential oil and climate crises. Despite Australia's delayed ratification of the Kyoto Protocol, global warming was nonetheless a looming threat to their coal-fired generation, and severe drought increasingly threatened their hydro generation systems. Despite perceived public opposition, Australian Prime Minister John Howard had been gently and consistently raising the issue of expanding the Australian uranium mining capability, and then announced an investigation into nuclear power generation for Australia[113].

While Australia's potential adoption of nuclear power was unlikely to significantly influence New Zealand's interest in doing the same, this was not a benign development from New Zealand's point of view. The implication for New Zealand from Australia's consideration of nuclear power was primarily one of physical

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[113] AAP (2007).

safety. A nuclear accident in Australia would almost certainly mean radioactive fallout for New Zealand. In addition, the slightly heightened possibility of a terrorist attack which unavoidably accompanied Australia's close ties to America at that time, meant that a nuclear facility on Australian soil would increase the probability for catastrophic damage from any such eventuality.

Concern for future electricity supplies arising from local political instability as much as from resource and climate factors, meant that similar considerations were being made in many other countries around the world at that time, and many were gearing up to increase their nuclear generation capacity (e.g. Britain, Germany, China, India, Iran)[114].

5. Geothermal

Like Iceland, New Zealand is blessed with a number of naturally occurring steam and hot water sites, and geothermal had provided a relatively steady 8% of power generation since 1990 (see Figures 2.3.4.1-2). New Zealand was an early adopter of geothermal electricity generation technology, subsequently exporting the expertise to other countries (e.g. Kenya). Geothermal power (harnessing steam from out of the ground) is usually considered to be a renewable resource, although even when managed sustainably it is likely to be depleted eventually. Its strength is its ability to provide constant "baseload power", and a number of new geothermal sites were being explored during the study period.

6. Other Renewable Energy Sources

Growing awareness of the implications of peak oil and global warming meant that the general public in 2006 was becoming more aware of the need for renewable energy solutions, both in New Zealand and around the world.

New Zealand electricity generation companies had been gradually gearing up towards producing more electricity from renewable sources, and this was evident in the number of new wind farms, both in production and in the planning stages[115].

[114] Bergeron & Zimmerman (2006).
[115] Elley (2003).

The proposed installation of New Zealand's first tidal generation plant at the mouth of the Kaipara Harbour was announced in November 2006[116], but it had yet to proceed through the required regulatory hurdles.

As a follow-up to their 2005 post-election co-operation agreement with the Green Party, the Government announced the finalisation of a solar hot water initiative in November 2006, designed to encourage the uptake of solar hot water panels on the country's roofs[117]. This was an energy efficiency initiative designed to save power and reduce residential power bills.

However, despite the rhetoric and increased enthusiasm for renewable energy, the evidence was plain that it would not be possible to make the transition to producing all of the electricity needs of a modern first world economy from renewable energy sources, under a "business as usual" scenario. Even if possible, it was unlikely to be achieved in time to ward off the serious climatic effects and resource shortages that were predicted if fossil fuel combustion was to continue at then current rates. This was one reason for the resurgence in world-wide enthusiasm for non-carbon emitting nuclear power.

Glover (2006) expressed concern that the widespread adoption of renewable energy sources by the global energy giants was transforming what was potentially a small scale people-power resource with self-sustainability potential, into yet another way to prop-up what was fundamentally an unsustainable energy regime, thereby postponing the real conversation that should be taking place about the need to transform lifestyles and reorient mindsets towards finding a radically new way of doing things.

New Zealand's Parliamentary Commissioner for the Environment reflected a similar view in a released Wind Power report[118], recommending that careful consideration

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[116] "Crest Energy Kaipara" planned 200 turbines in water 30m deep to supply 200MW, enough to power 250,000 homes. There would be two 30km undersea cables for connecting to the national grid (Thompson 2006).
[117] Fitzsimons (2006).
[118] PCE (2006).

be given to wind farm size and location. His concern was that preference should be given to smaller clusters of turbines close to demand and distributed for balance, rather than massive constructions on remote landscapes requiring long distance transmission.

2.3.3 Electricity Reforms

Electricity sector liberalisation spread globally during the 1980s and 1990s, as a logical extension of the neo-classical "Chicago School" market reforms of the Reagan and Thatcher era. The withdrawal of the state from the electricity sector, combined with a market-orientated competitive arrangement, was the standard structural model insisted upon by the World Bank, and it was still supported by that organisation at time of writing, albeit to a slightly lesser extent[119].

While many authors, especially those schooled in economics, supported the "new way" as being more logical, efficient, and productive[120], there were other voices who decried the changes as being socially detrimental, resulting in threats to employment, to residential pricing, and to supply security[121]. These voices became louder in the US following the infamous California blackout debacle in 2000 when electricity prices skyrocketed as a result of market manipulation by the secretly failing Enron Corporation[122].

World-wide enthusiasm for complete electricity reform slowed markedly in the first few years of the new millennium, as problems became more evident, and appropriate market regulation proved difficult[123]. Electricity restructuring was a complex and multi-facetted business, which varied in suitability, as well as in

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[119] Dubash & Williams (2006).
[120] E.g. Evans & Meade (2005).
[121] E.g. 'It is hard to avoid the conclusion that when we reformed the electricity industry we threw out the baby with the bathwater. … it was not necessary to choose an electricity market structure that does not co-ordinate generation and transmission or provide enough reserve capacity, and induces generators to maximise profits by keeping us on the edge of a shortage. Better options were available, but the decision-makers seemed to believe that if they called their proposed system a "market" it would behave like a real market. It is like calling a frog a bird and expecting it to fly' (Leyland 2006).
[122] Gibney (2005).

implementation, from country to country. There were some nations for whom the task proved very challenging, and some chose to only partially restructure[124].

Whenever the new model appeared to have failed, proponents tended to say that the reforms had not gone far enough and should be extended[125], whereas detractors said they should be unraveled, allowing the state to step back in and take a more interested role. An example of the latter took place in mid 2006 when both Bolivia and Ecuador re-nationalised their entire energy sectors. However this was not simply an electricity reform issue, it was also in response to the perceived "imperialism" of foreign powers, particularly the United States, in the oil and gas industries[126]. Other countries in South America such as Venezuela and Chile were also tending toward increased state control of energy in 2006.

Despite some teething problems, most major Western nations were still, in 2006, enamoured of the market-model for electricity, and New Zealand at that time officially remained one of its foremost proponents[127]. The challenge in 2006, according to market supporters, was to implement appropriate regulation and market incentives. The greater challenge, however, according to a growing number of others[128], was to derive incentives for greater energy efficiency, greater uptake of renewable energy sources, and reduced carbon emissions. If these goals could not be achieved satisfactorily within a formal independent market structure, then this would form a valid reason for the Government to become more involved.

A raft of new laws and regulations created a totally new public policy environment to accompany the restructuring of the electricity sector which took place in New Zealand during the 1980s and 1990s. These contentious electricity sector reforms and their effects have been described and analysed in a number of publications and

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[123] Dubash & Williams (2006).
[124] Hunt & Shuttleworth (1996).
[125] Evans & Meade (2005).
[126] Reuters (2006).
[127] The extent and nature of electricity restructuring in New Zealand was described in detail within my masters thesis, Elley (2003).
[128] E.g. EECA (2004); Fitzsimons (2006).

reviews[129]. Ideological points of view varied from one (neo-liberal pro-market) end of the continuum (i.e. the reforms were positive but did not go far enough) to the other (i.e. the reforms were destructive and achieved the opposite to what they intended, in the process damaging supply security, electricity pricing, and social well-being). Evans & Meade (2006) staunchly occupied the former position, while an impassioned example of the latter was able to be found in "Deceit of the Highest Order" Blakemore (2004). Others attempted to take a more moderate stance, but many had some concerns (Elley 2003).

The policy environment surrounding the electricity sector was still in a state of flux in 2006, as the Commerce Commission, the Electricity Commission and the government all vied with the generating companies, lines companies and Transpower, to try to find a working structure which would keep electricity prices reasonable, maintain security of supply, and encourage renewable generation, all while creating favourable business incentives.

Electricity was not an ordinary good and it presented unique challenges to the market model. For example, it did not come in discrete parcels which could be identified, it was delivered in real time, its storage was difficult and expensive, its provision was technically complex, its transportation caused wastage, and certain parts of the process were usually provided by monopolies. Furthermore, electricity demand was not particularly elastic because it had become an essential embedded part of modern life.

Nonetheless, by 2006 New Zealand had already adopted a market model for electricity, and continued to refine and improve that model. Here, competition was introduced into the electricity sector by splitting transmission from generation, and by distributing major generation assets between several large companies. There was, by 2006, a mix of government SOE ownership and private ownership throughout the sector, and a functioning wholesale spot electricity market.

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[129] E.g. Wolak (2006); Wolak (2009).

A certain amount of regulation was introduced into the transmission business in order to restrain the activities of Transpower and the local lines companies, who all had acknowledged monopolies. This aspect (particularly the pricing calculation) was overseen by the Commerce Commission.

One major drawback that appeared to have been a consequence of the competitive market model was a lack of forward planning and security of supply. In fact, it was acknowledged that in a market environment a reverse incentive may apply, in that scarcity of a product with inelastic demand can push up prices and benefit suppliers. For example, Gibney (2005) maintained that Enron used this as a deliberate desperate tactic in California, just prior to that company's collapse.

In an attempt to assuage concerns, and in order to bring a certain level of oversight and forward planning into the electricity arena, the Electricity Commission was created[130]. The Electricity Commission was mandated to regulate Transpower (alongside the Commerce Commission), contract out emergency generation capacity, and provide a level of guidance to the generating bodies, but without the ability to exert any actual directive power over them.

Following the major reforms of the 1990s, there were conflicting opinions as to whether the reforms had been successful or not. Those who had benefited from the reforms tended to be in favour. For example the major generating companies Genesis, Mighty River Power, Meridian, and Contact had all reported excellent profits, so they were unlikely to complain. The New Zealand Government, who received much of that profit in the form of dividends, was also happy. Many domestic consumers, however, saw their prices rise (see Figure 3.5.4.3), and there were groups who continued to be very angry about the loss of government control and regulation over what they considered to be a public good. Others were genuinely fearful for the country's security of supply[131].

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[130] MED (2003).
[131] E.g. Leyland (2006).

In 2006, electricity consumption was closely linked to the economy. Successive improvements in energy intensity notwithstanding[132], many global studies show close correlations between power consumption trends and GDP growth[133]. Hence a causative relationship between these two key indicators was often assumed. While the "economy" of a country was, in reality, much more than just the measurement of GDP, it had become an accepted global standard that growth of per capita GDP was heavily relied upon to give an indication of the health of an economy.

The relevance of politics to electricity may not appear to be immediately obvious, but it was a political reality that any embedded resource of such crucial importance to our standard of living as electricity, must by necessity come under political scrutiny. Globally, the significance of politics to energy was evident in the news every day, whether in deals or disputes regarding oil supplies, environmental disputes over large hydro projects, gas pipeline disruptions, or popular opposition to nuclear power plants.

2.3.4 Ministry of Economic Development Reporting

Energy existed as a Cabinet portfolio within the New Zealand government during the period under study in 2006-2007, but there was no Ministry of Energy, as it had earlier (on 1 January 1990) been amalgamated into the Ministry of Commerce by the then Labour-led government, and this was subsequently (in 2000, following the investiture of the next Labour-led government) renamed the "Ministry of Economic Development" (MED)[134]. The Minister of Energy was one of the ministers that the MED reported to, along with several others.

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[132] Energy intensity is expressed as unit of energy consumed per unit of GDP (Lin 2003:6). Changes in energy intensity can be interpreted as a measure of efficiency in the use of energy resources for "generating" growth in GDP. This means that the direct correlation between GDP and energy consumption will be modified if energy intensity is improved, for example, by the observation of increased GDP growth despite a comparatively lesser increase in the marginal energy consumed. The reverse could also happen, where, for example, increased energy consumption does not result in significantly increased GDP growth, indicating a reduced energy intensity. However, "it is a general accepted definition [that] electricity demand is mainly determined by two important factors, tariff and GDP" (Lin 2003:3).

[133] Lin (2003:3).

[134] Archives NZ (2010).

Following its inception MED provided regular energy reports based upon data compiled by Statistics New Zealand, augmented by information from other agencies such as the Commerce Commission. Relevant energy publications released by MED during (or covering) 2006-2007 are shown in Table 2.3.4.1.

Table 2.3.4.1 – MED Regular Energy Reports (covering 2006-2007)[135]

Report Name & Description	Reporting Period	Published	Pages
New Zealand Energy Indicators 2006	Fifteen years 1990-**2005**	August 2006	12
New Zealand Energy Indicators 2009	Seventeen years 1990-**2007**	May 2009	13
New Zealand Energy Domain Plan	Planning for **2006**-2016	18 Aug 2006	54
New Zealand Energy in Brief 2007	One calendar year **2006**	June 2007	44
New Zealand Energy in Brief 2008	One calendar year **2007**	August 2008	44
New Zealand Energy Quarterly	December quarter **2007**	18 Mar 2008	8
Energy Data File 2007	Mainly 2002-**2006** + history	June 2007	172
Energy Data File 2008	Mainly 2006-**2007** + history	June 2008	174

The "New Zealand Energy Quarterly: December quarter 2007" was described as providing "quarterly statistics and trend data on the supply of major fuel types, electricity generation, greenhouse gas emissions and fuel prices"[136]. This particular issue was the first of a new set of quarterly publications, replacing the publication called "Energy Statistics Hot Off the Press" by Statistics NZ. The intention was that MED would from then on "be the primary source for energy production and generation statistics, while Statistics New Zealand [would] be the primary source for energy end-use statistics"[137]. The new quarterly appears also to have replaced the more attractive and comprehensive New Zealand Energy in Brief annual report which was published only three times and, at the time of writing, had not been published again following the 2008 issue. Both of these publications provided useful "at a glance" summaries of (selected) extractions from the more detailed information in the annual "Energy Data File" publications.

Electricity generation statistics for the 8 quarters (2 year period) under study are listed in Table 2.3.4.2. Generation can be seen to vary by season, with a slight rise

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[135] Source: MED (2010).
[136] MED (2008a:1).

(~2%) in each quarter of the second year when compared with the first, except for the June quarter which experienced a small drop from 10,716 GWh to 10,707 GWh.

Table 2.3.4.2 – Quarterly NZ Electricity Generation 2006-2007[138]

QUARTERLY ELECTRICITY GENERATION (GWh)[8]

		Mar06	Jun06	Sep06	Dec06	Mar07	Jun07	Sep07	Dec07
Renewable Generation	Hydro	5,144	5,671	6,115	6,193	6,035	5,314	6,167	5,767
	Geothermal	728	782	888	802	805	809	812	865
	Wind	158	104	161	194	148	201	285	294
	Wood	137	125	102	137	133	135	120	140
	Biogas	44	55	50	51	55	50	48	45
	Total	6,211	6,737	7,317	7,376	7,176	6,509	7,431	7,112
Thermal Generation	Gas	2,444	2,579	2,442	1,722	1,983	3,204	3,311	2,703
	Coal	1,106	1,389	1,510	1,099	727	983	620	589
	Oil	20	1	0	0	0	0	0	0
	Waste Heat	11	11	11	11	10	11	12	11
	Total	3,581	3,979	3,962	2,832	2,720	4,198	3,944	3,303
Total Generation		9,792	10,716	11,280	10,208	9,896	10,707	11,375	10,415

[8] Excludes generation used on-site for auxiliary services (e.g. lighting, coal grinders) and internal losses.

Note:
The figures published previously by Statistics New Zealand in relation to quarterly generation differ from those published in the *New Zealand Energy Quarterly* due to a greater number of small generators being included in *New Zealand Energy Quarterly* data.

Figure 2.3.4.1 – NZ Electricity Generation December Quarter 2007[139]

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[137] MED (2008a:1).
[138] Source: MED (2008a:5).
[139] Source: MED (2008a:5).

Eight generation sources for the last quarter of 2007 are shown in Figure 2.3.4.1. Table 2.3.4.2 further divided these into "Renewable" and "Thermal". The latter name is not very precise, as geothermal is a type of thermal (heat-derived) generation, although not customarily described beneath that banner. A better name for the second category would be "Non-Renewable" or "Fossil-Fuels". The location of "Waste Heat"[140] in the table would surely depend on the origin of the waste heat, but is assumed here (probably for convenience) to be non-renewable in origin[141]. Furthermore, it is debatable whether geothermal is correctly described as renewable, because geothermal fields are known to run down, and can be polluting. However, geothermal generation does exhibit characteristics of (at least short term) renewability and is cleaner than fossil fuels, so once again it is a broad classification of convenience. Table 2.3.4.2 listed one extra generation type not shown in Figure 2.3.4.1 (making nine), and that was "Oil". According to this table, oil was a source of electricity generation in the first half of 2006 (20 GWh and 1 GWh for the first two quarters respectively), but is shown with a generation of 0 GWh for the remaining 18 months (six quarters).

The classifications used here by MED were the same broad categories (renewable vs. non-renewable) and the same source categories (hydro, geothermal, wind, wood, biogas, gas, coal, oil, waste heat) that were examined in my study of electricity media articles. A comparison could thus be made between the levels of coverage each generation type received in the media, and the actual proportion of electricity that was generated by each, as reported in Table 2.3.4.2.

"New Zealand Energy in Brief" was an annual MED report, which graphically summarised the "Energy Data File" statistics by year, up to the end of the year

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[140] Waste heat could be thought of as the "opposite" of (or complementary to) cogeneration. The former produces electricity using left-over heat from another process, the latter utilises the heat produced by electricity generation for another process. Occasionally these overlap and are used interchangeably, (e.g. MED 2008b:104-105). Customarily, waste heat is a type of fuel, and cogeneration a type of plant.

[141] "To better align with international reporting, the generation from industrial waste heat whose primary energy source is a fossil fuel is now entered under the primary energy source (principally coal). These revisions have been made back to 1974" (MED 2008b:100).

before publication. In many of the graphs comparative figures were also included for at least one, and sometimes several, decades back.

The second of these reports (listed in Table 2.3.4.1), "New Zealand Energy in Brief 2008" (MED 2008) described energy use up to December 2007 and included a graphical representation of the reduction over time in New Zealand's use of renewable energy, provided in Figure 2.3.4.2.

The renewable energy classifications used here are not quite the same as those used for the Energy Quarterly. Three are the same (hydro, geothermal, and wind), but "wood" and "biogas" listed in Table 2.3.4.2 and Figure 2.3.4.1 earlier, have here been combined into the one category called "bioenergy".

Percentage of Electricity Generation from Renewable Sources
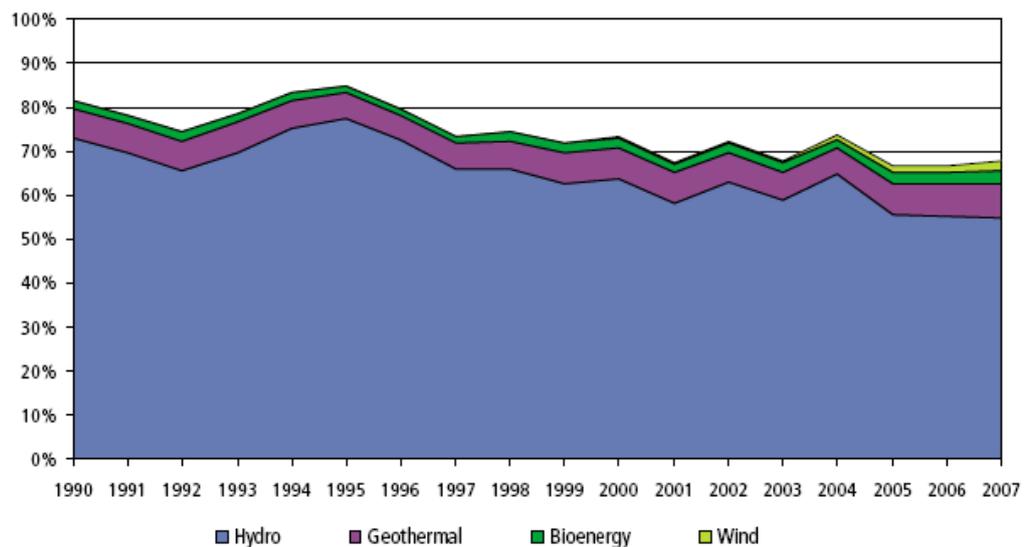
Figure 2.3.4.2 – Percentage of Renewable Generation[142]

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[142] Source: MED (2008:27). Also see MED (2008b:89) for extended version.

Net Electricity Generation by Fuel Type

¹ Includes wind, biogas, wood and waste heat.
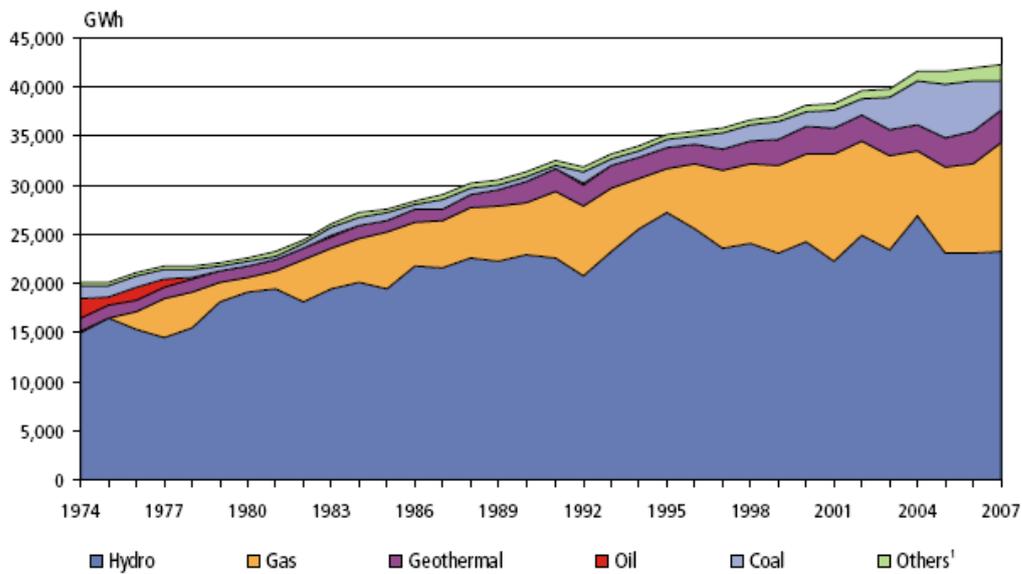
Figure 2.3.4.3 – Net Electricity Generation by Fuel Type[143]

In Figure 2.3.4.3, electricity generation by fuel type has been illustrated, and the source categories listed in an order which appears to be by volume. Renewable and non-renewable have not been clearly distinguished here, and the "other" category, although mostly renewable according to the Energy Quarterly (i.e. wind, biogas, and wood) also here includes "waste heat", which the Energy Quarterly had included with the non-renewable group. Therefore, while the categories in Figure 2.3.4.3 are useful pictorially, they were not helpful in providing accuracy or consistency of detailed classification, at least not for those which were smallest by volume. However this was only a minor issue, as the primary classifications were standard.

Although this is a "generation" graph, the "net" in the title indicates that not quite all generation was included here, in that generators' "own use"[144] (about 3% of gross) was excluded. Energy conversion losses were never included with generation. These happened during the generation process and were very large at just over

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[143] Source: MED (2008:28). Also MED (2008b:98).

50%[145]. However, transmission losses were included in these generation figures and could therefore be calculated. Total generation for the 2007 calendar year was 42,374 GWh[146] and total consumption over the same period was 38,545 GWh[147], a difference of 3,829 GWh or 9%. However, the MED tables routinely attributed 1-2% of this to "statistical differences"[148] and provided an estimated figure of 7.7% for 2007 (March year) transmission losses.

In addition to data for electricity generated, statistics were also provided for electricity capacity, which was "potential" generation ability, regardless of whether the power was used or not. Electricity capacity can be seen pictorially in Figure 2.3.4.4. The classifications here are not as distinct because they are by plant type, rather than by fuel type[149], and thus include some extras, such as cogeneration, diesel and oil, which are not included in Figure 2.3.4.3. The large pink gas/coal category represents the Huntly power station, which was able to use either fuel, and was definitely included in the generation statistics above, but the other oddities were smaller, and included back-up potential generation such as Whirinaki (this ran on diesel and was seldom used). The gas/oil contribution in 2006 was from Contact's New Plymouth power station, but this had been decommissioned by 2007[150].

Note that wood, biogas and waste heat are not mentioned in Figure 2.3.4.4 at all. This was partly because of the specified 10MW minimum (mainly affecting biogas), and also because most of these fuels came under the umbrella description of the "cogeneration" plant type[151]. If smaller plants (< 10MW) had been included in Figure 2.3.4.4, the culminating figure for 2007 would be slightly higher at 9,132.8 MW[152].

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[144] "Own Use is electricity used by the generator for auxiliary services (e.g. lighting, coal grinders) and internal losses" (MED 2008b:98).

[145] MED (2008b:172).

[146] MED (2008b:96).

[147] MED (2008b:97).

[148] Statistical differences exist between generation data (calculated consumption) and sales data (observed consumption), as a result of information coming from different sources (MED 2008b:98).

[149] MED (2008b:106).

[150] MED (2007a:108); NZPA (2007).

[151] See MED (2008b:106).

[152] According to MED (2008b:106).

Total Electricity Generation Capacity (>10 MW)
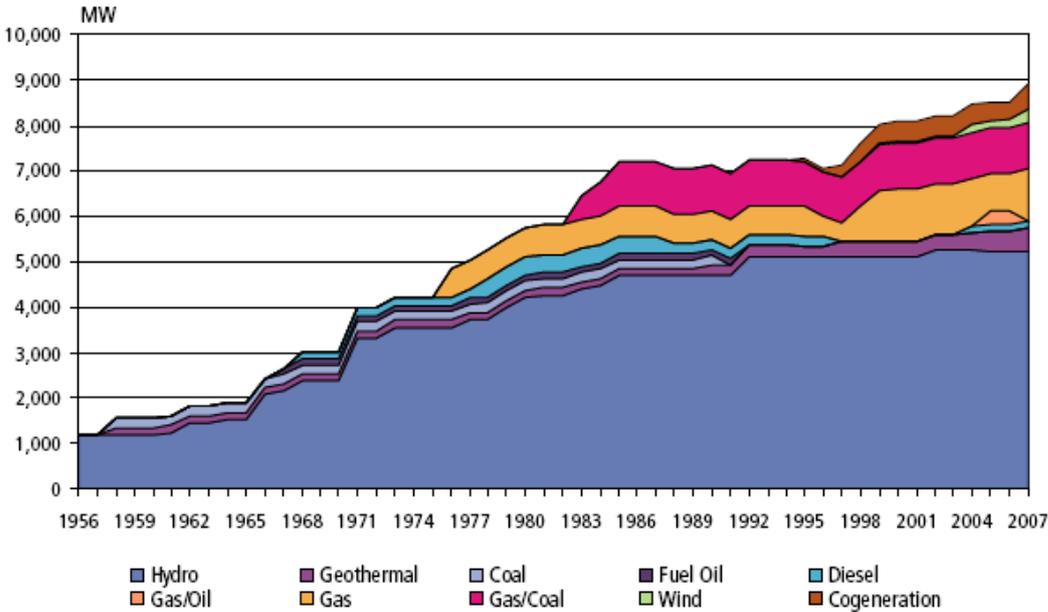
Figure 2.3.4.4 – Electricity Generation Capacity to 2007.[153]

The first New Zealand Energy Indicators document (MED 2006) reported on the fifteen year period 1990 to 2005, which was up to (but not including) the period under study 2006-2007. The second indicators report (MED 2009a) did include the study period. The latter document broadly covered the seventeen year period 1990-2007 and also included a small amount of information from the September quarter 2008. These two publications each presented a "core set of high-level indicators which collectively attempt[ed] to represent the national performance of New Zealand's energy sector"[154]. Some of these indicators covered energy as a whole (including electricity)[155], some excluded electricity[156], and others were exclusively electricity measures[157]. The 2009 indicators (up to 2007) are shown in Table 2.3.4.3.

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[153] Source: MED (2008:30) Also MED (2008b:103).

[154] MED (2010).

[155] "Electricity-inclusive" indicators are numbered 1, 6, 7, 8, 9, 10, 11, 13, 14, 15 in Table 2.1.3.3.

[156] "Non-electricity" indicators are numbered 2, 12, 16, 17 in Table 2.1.3.3.

[157] "Exclusively electricity" indicators are numbered 3, 4, 5 in Table 2.1.3.3.

Table 2.3.4.3 – MED Energy Indicators (1990-2007)[158]

Energy Indicator Name	Description
Security	
1. Net Energy Import Dependency[1]	Percentage of energy used that was imported.
2. Net Oil Import Dependency[2]	Percentage of oil used that was imported.
3. System Average Interruption Duration Index (SAIDI)[3]	Average length of time (in minutes) without electricity per year.
4. Customer Average Interruption Duration Index (CAIDI)[3]	Average duration (in minutes) of electricity outages per year.
5. System Average Interruption Frequency Index (SAIFI)[3]	Average number of electricity outages per year.
Environmental Effects	
6. Energy Related Greenhouse Gas Emissions ($ktCO_2$-e)	Estimated total kilo-tonnes of carbon dioxide equivalent energy sector emissions.
7. Ozone Precursor Gas Index	Estimated comparative total energy sector emissions of NOx, CO, and NMVOCs.
Energy Intensity	
8. Energy Demand vs. Economic Growth	Cumulative percentage change in GDP compared with total consumer energy.
9. Total Primary Energy Supply per Capita (TPES)	Total energy supply (in tonnes of oil equivalent) per capita.
Affordability	
10. Percentage of household expenditure spent on energy	
11. Percentage of household expenditure spent on domestic fuel & power by deciles	
12. Percentage of household expenditure spent on fuel for vehicles by deciles	
Pricing	
13. Real energy prices for industry	
14. Real energy prices for households	
15. International comparisons of electricity prices	
16. International comparisons of petrol prices	
17. International comparisons of gas prices	

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[158] Source: Compiled from MED (2009a).

Some observations about these indicators can be made. The oil dependency indicator (number 2 in Table 2.3.4.3) was a "net" percentage calculation. This figure is the result of subtracting exports from imports. Doing this subtraction is practical from a financial perspective (if export prices are similar to import prices) but may be misleading from a practical availability perspective. For example, the increase in exported oil from the Tui field (in 2006-2007 causing the dip at the end in Figure 2.3.4.5) may not have been useful to New Zealand in an oil shortage because it was of a higher quality than the standard type of oil used in the Marsden Point refinery[159].
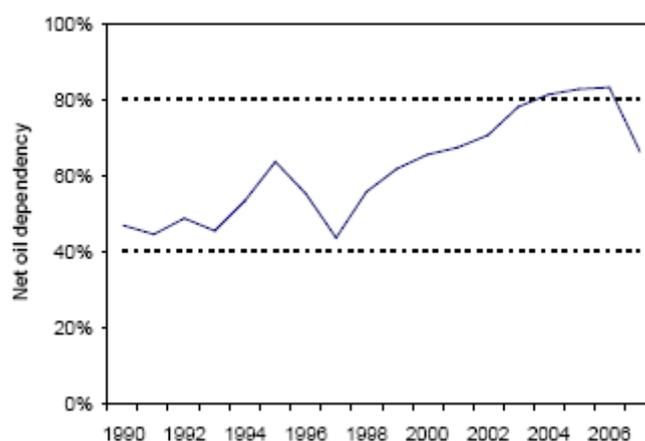
Figure 2.3.4.5 – Net Oil Import Dependency[160]

A similar issue arises for the net energy dependency indicator (number 1 in Table 2.3.4.3) because coal imports and exports were of different quality[161], and also because coal exports had been steadily increasing until in 2006 they were almost as large as domestic use by volume[162]. The 2006-2007 dip that is shown for this indicator in Figure 2.3.4.6 was partially caused by increased coal exports together with increased oil and gas production from Tui and Pohokura fields[163], but in reality these factors alone do not necessarily guarantee increased energy security for New Zealand.

[159] MED (2009b:5).
[160] Source: MED (2009a:4).
[161] MED (2009b:5).
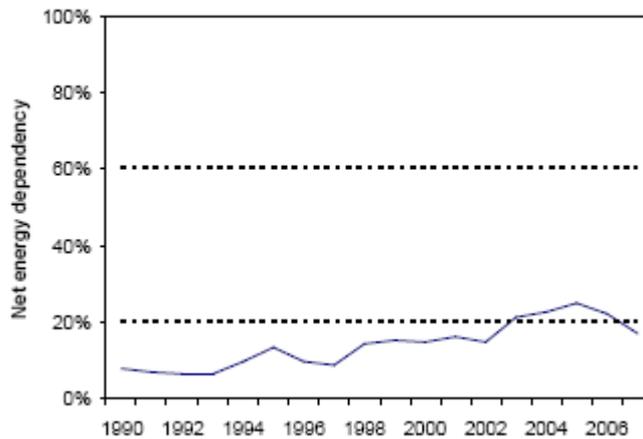
Figure 2.3.4.6 – Net Energy Import Dependency[164]

In my opinion a more "honest" dependency indicator would not subtract exports, and thus would reflect the level of New Zealand's actual practical current import dependency (or level of self-sufficiency). Unless an export could be relatively quickly and easily substituted for an import (this could be assessed using some sort of "liquidity" measure), then for both of these indicators these "net" figures are very misleading with regards to New Zealand's actual position. This would especially be the case if New Zealand continued to increase its coal exports while having no way, and no intention, of using that amount of coal domestically. These two "net" indicators (1 and 2 in Table 2.3.4.3) have provided net "production" measures (in energy terms) which are similar to net financial trading index figures (if measured in dollar terms), but these are not "dependency" figures so they have not been correctly named. True "dependency" figures would be closer to "gross", rather than "net", and should not subtract (non-substitutable) exports from imports.

Neither the 2009 energy indicators publication (MED 2009a) nor the supporting documentation (MED 2009b) listed all of the fuels or energy sources which were included in the primary energy dependency calculation, although MED (2009b:5) indicated that they were based upon the total primary energy supply (TPES) figure further down at number 9 in Table 2.3.4.3. When accounting for sun, wind, and

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[162] MED (2008:10).
[163] MED (2009a:4).

water based generation it is important to use actual GWh produced (converted to PJ or oil equivalent) rather than potential MW of installed generation because the latter would be incorrect and would exaggerate self-sufficiency. TPES does this in MED (2008b:89), so these figures are thus reasonably reliable.

The three "exclusively electricity" indicators (3, 4, 5 in Table 2.3.4.3) are all security measures relating to "outages" and were (interestingly) all obtained from the Commerce Commission, rather than Statistics NZ. This is an example of the dispersal of electricity information (since the reforms) that Wolak described in his evaluation of the NZ electricity market[165]. It also appears that the figures which comprised these indicators were all for the year ending in March (the standard financial year), rather than for the calendar year (MED 2009a:5), making them slightly out of sync with the other indicators. This shifted time period explains why the severe Auckland 8 hour outage in June 2006 (which caused both the SAIDI and CAIDI graphs below to end badly) appeared in the 2007 column rather than the 2006 column. See Figures 2.3.4.7 and 2.3.4.8.
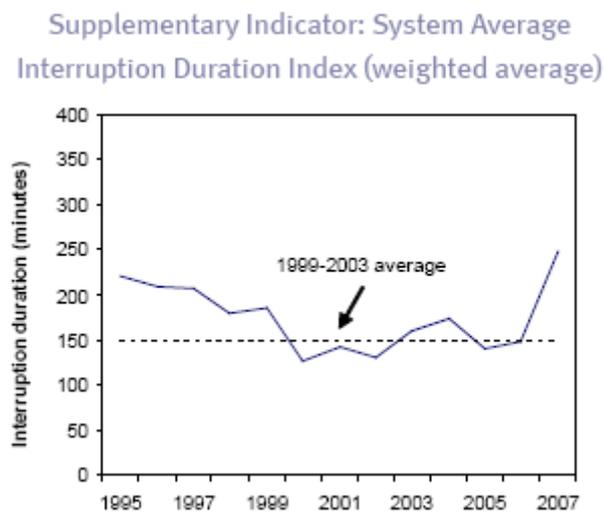
Figure 2.3.4.7 – SAIDI[166]

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[164] Source: MED (2009a:4).
[165] Wolak (2006).
[166] Source: MED (2009a:5).

Supplementary Indicator: Customer Average Interruption Duration Index (weighted average)
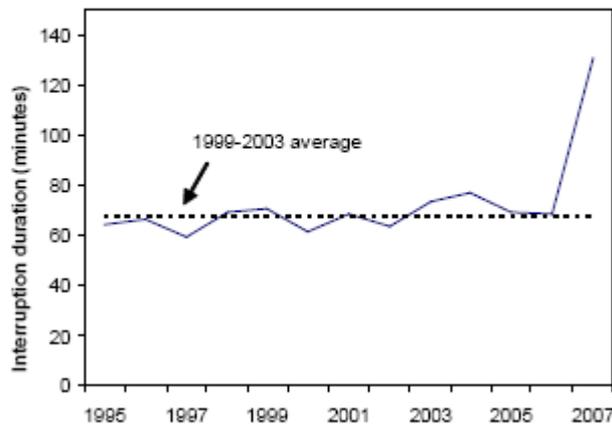
Figure 2.3.4.8 – CAIDI[167]

In contrast to the matching highs for the one long outage in June 2006, the 1995 phenomenon seen in Figures 2.3.4.7 and 2.3.4.8 where SAIDI was high while CAIDI was low was achieved by many outages of short duration, with the result that the average outage duration was short (CAIDI) but the cumulative duration was long (SAIDI). This pattern is able to be confirmed by the 1995 figures represented in Figure 2.3.4.9 for SAIFI, which shows the count rather than the duration.

Supplementary Indicator: System Average Interruption Frequency Index (weighted average)
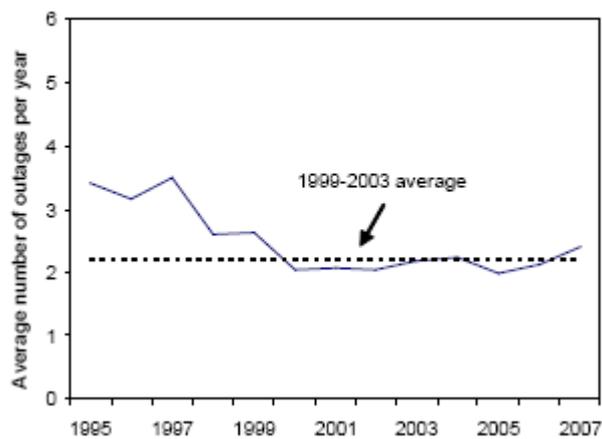
Figure 2.3.4.9 – SAIFI[168]

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[167] Source: MED (2009a:5).
[168] Source: MED (2009a:5).

Note that for all five of the graphs in Figures 2.3.4.5 to 2.3.4.9, the goal is for the curve to be decreasing if possible, i.e. smaller values are preferable.

2.3.5 Environmental Implications

In their 2006 book "Transforming Power", Byrne, Toly and Glover discuss the historically parallel evolution of energy and economic systems, and express concern at the technological enthusiasm and unquestioned inevitability that has driven much of the world to accept the ceaseless economic and technological "growth" imperative, despite its consequent social and environmental drawbacks.

Contrary to the promise of a future full of wealth, wonder, and endless leisure time, many parts of the world in 2006 were still burdened by inequality, poverty, illness, corruption and war. The irony was that the cost of "production" for the energy dense fuels that drove modern society was often these very problems. Oil leaks and spills caused environmental destruction and despoilation of livelihoods for millions of people. Political disputes and wars over oil destroyed societies and lives. Large hydro projects turned whole communities into homeless refugees. Coal mines endangered lives as they laid waste the land. The modern motor car, mighty symbol of status and freedom, annually killed and maimed more people than firearms[169].

New Zealanders may not have directly witnessed much of the devastation wrought by oil, but they were nonetheless active participants in the global market place, and unavoidably caught up in the cycle of progress that accompanied the energy race.

Byrne et al. did not totally decry modern progress, but they were concerned that the connection between energy and social wellbeing was being ignored. They maintained that the lack of access to modern energy systems by the poor was contributing to deforestation, health problems and lack of economic prosperity, and their analysis gave rise to a rather obvious question. For all the advances of modern technology, why was it not yet possible to harness the progress that had been made and turn the world into a clean and hospitable place to live, for everybody?

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[169] Matthewman (2007:346).

Instead, in 2006 the converse appeared to be true. With the world intent on maintaining and growing a modern standard of living despite blatant and pressing social and environmental consequences[170], countries and companies were pushing the boundaries even further than before in order to obtain electricity[171], oil, gas and coal, whether that be by war[172], strong arm tactics[173], or prospecting in areas that were previously protected or off-limits[174].

In a world where GDP growth had come to be accepted as the primary nation state performance measure, and where GDP was used as a benchmark for many other globally accepted performance measures, it was difficult for any country to take precautionary steps, or to change direction in any way that might adversely affect GDP.

Similarly, if profit remained the single primary goal of all competitive entities operating under market-oriented capitalism, then without specific financial incentives it was difficult for any private company to take actions on an ethical or environmental basis unless it could be demonstrated that such actions would have favourable financial outcomes.

Thus the world found itself, in 2006, in a situation where almost everyone, even the staunchest believer in "growth and progress", was becoming more aware of the looming environmental, climate, and energy threat, but most felt powerless to address it in any significant way because of constraints placed upon them by the accepted prevailing societal and economic structure.

In fact, the situation was proclaimed to be so dire that eminent scientist Stephen Hawking, author of "A Brief History of Time", declared[175] that the best course of human endeavour at that point would be to focus all efforts to secure a habitable

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[170] E.g. Nigerian environmental and social devastation as a result of oil exploration.
[171] E.g. China's controversial Three Gorges Dam hydro project.
[172] Many consider that the US-led Iraq war was primarily to secure access to oil reserves.
[173] E.g. The gas price stand-off between Russia and Belarus.
[174] E.g. Alaska, Antarctica, sea-bed mining, oil sands.
[175] Daily Mail (2006).

settlement on the moon, and then Mars, as the earth would shortly no longer be suitable for human habitation.

Hawking's forecast formed a disturbing counterpoint to the confident though controversial treatise by Francis Fukuyama following the fall of the Berlin Wall, in which he proposed that the "End of History" had arrived with the triumph of modern liberal democracy and technologically driven capitalism[176]. Although democracy was proving to be a popular form of government, the liberal capitalist aspect to Fukuyama's logic had long drawn cries of outrage from environmentalists as having ignored the devastating effects of the capitalist growth imperative on the earth's ecology, and the veracity of their criticism was becoming more evident with the growing awareness of climate change in 2006.

The irony of the situation was exacerbated by the Stern Review on climate change[177] which highlighted the economic consequences of doing nothing. Other authors outlined the likely catastrophic economic consequences of a continued reliance on oil under the Hubbert peaking scenario[178]. In a nutshell, countries and companies shied away from addressing the looming energy shocks in any way that would adversely affect GDP or profits, but if these problems were not addressed, then GDP and profits would ultimately both take a pounding (and worse) in the longer term. It was a dilemma[179].

2.3.6 Summary

It has been demonstrated above that in 2006-2007 New Zealand was buffered by a reasonably large renewable component in its electricity generation mix, but was heavily dependent on oil for transport fuels, and consequently faced energy challenges substantially similar to most other nations.

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[176] Fukuyama (2006).
[177] Stern (2006).
[178] E.g. Harrison (2006).
[179] Jackson (2010).

The New Zealand electricity sector had been restructured into a competitive market model, but concerns remained about the best way to ensure security of supply and energy efficiency, within a global marketplace where fossil fuels were acknowledged exacerbators of climate change and likely to become more scarce (thus more expensive), within a local economy heavily reliant upon growth, consumption, and ever-increasing GDP.

From an economic perspective, electricity provision provided a reliable source of revenue for the Government, but rising electricity prices were causing hardship for households, and questions were being raised about a lack of true competition in the sector[180].

Out of this background picture of the New Zealand electricity sector (within a broad economic and environmental context), certain important aspects were extracted for closer analysis within this study. One crucial point was the comparative media coverage of fossil fuels relative to renewables, and of the individual fuels under those headings. As shown in Figure 2.3.4.2, the renewable component of New Zealand's electricity supply dropped steadily between 1990 and 2007, though that trend started to reverse towards the end of that period. Informed by publications such as those by Stern, and by Byrne et al. discussed above, a progressive move to clean energy appeared to be essential if pollution and climate change effects were to be mitigated. Of concern in this study was the question of whether the media were giving renewable energy sources the attention one would expect under such a scenario.

A key issue in relation to the economic reforms was the fragmentation of the electricity industry, resulting in a variety of ownership models. Later chapters will examine the coverage of various players within the sector giving rise to consideration of matters such as whether the economic paradigm (in concert with the media commercial incentives discussed earlier) led to the allocation of significant

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[180] Wolak (2009).

extra media coverage for those privatised companies which were listed on the stockmarket, and the implications therein.

Security of supply was one aspect overseen by the MED in the past, but which in 2006-2007 had become the province of the Electricity Commission. Although difficult to prove, it is possible to hypothesise that a study of the media prominence granted to this organisation in relation to others within the electricity sector could shed some light on the relative power that it was able to wield in this arena. As a key player in the sector, the Electricity Commission featured prominently during the study, and appeared within the case studies that were chosen.

Now that the electricity context has been described, the next section will examine a selection of related studies, in order to provide a sense of the placement of this study in relation to others.

2.4 Comparable Studies

2.4.1 Introduction

Despite exhaustive searches through online journals, theses, and databases, very few studies were found which were closely related to the study being presented in this thesis, although a large number had certain aspects in common.

The studies listed in Table 2.4.1.1 provide a representative sample, each selected for discussion and comparison with this electricity study because they contain a number of relevant aspects.

Table 2.4.1.1 – List of Selected Comparable Studies

Author	Brief Name	Relevance
Blackwell (2009)	Electricity Conservation in Context: A Mixed Methods Study of Residential Conservation Behaviour During an Electricity Shortage in NZ.	NZ, media content, electricity, power saving, policy.
O'Sullivan et al. (2012)	Death by Disconnection: The Missing Public Health Voice in Newspaper Coverage of a Fuel Poverty-Related Death.	NZ, media content, electricity, Muliaga disconnection, policy.
Campbell (2012)	Someone Else's Problem: The Framing of Climate Change Politics in the Irish Times, The Guardian and The NZ Herald.	NZ, media content, climate change, policy, influence.
Roulston (2005)	Educational Policy Change, Newspapers and Public Opinion in NZ, 1988-1999.	NZ, media content, policy.
Hooks & Perera (2006)	The Evolution of Annual Reporting Practices of an Electricity Firm.	NZ, text content, electricity, policy.
McKenna et al. (2010)	Reporting of NZ Media – Content and case study analysis. (Suicide reporting in the media).	NZ,media content, policy, influence.
Context Analytics (2008)	Media Prominence: A Leading Indicator of Brand Value.	media content, influence.

This chapter section contains a brief examination of each study listed above.

2.4.2 Media Influence and Electricity Conservation

Blackwell (2009) undertook a nationwide survey to examine public electricity conservation attitudes and behaviour during the six week "Powersavers" campaign which was launched in response to the June/July 2008 power crisis. She also examined electricity usage data and found that actual household power savings

were not as great as they had been during shortages in earlier years. To provide context and a proposed explanation, she analysed the language used in the media over the same period, finding that "the issue was deeply political and debate was dominated by a focus on supply whilst conservation was predominantly portrayed as detrimental to households and the economy". Her results suggested that "a relationship did exist between the socio-political context and individual behaviour during the shortage" leading to the recommendation of "a truly interdisciplinary approach to managing residential energy demand which takes into account the personal and social context within which energy consumption occurs and the multi-faceted social drivers of demand"[181].

Blackwell described her news media study as a "thematic analysis of media reports relating to the electricity shortage" which undertook to "analyse how electricity conservation was portrayed in the media and political discourse during the shortage period"[182]. "Print media was selected because the scope of the study did not allow for an analysis of all available media sources (i.e. television, radio, online sources)". The search criteria were "electricity AND (shortage OR crisis) AND hydro[183] for articles between 1st May 2008 and 31st August 2008"[184], which was a period approximately twice as long as the six week savings campaign, to allow for discussion either side.

Firstly, the media texts were categorised by source (i.e. publisher), and then they were analysed according to Braun and Clarke's (2006) six-phase process for thematic analysis. As part of this analysis a coding mechanism was manually applied to the data with two high level themes, each with two or three sub-themes, as can be seen in Table 2.4.2.1.

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[181] Blackwell (2009:iii).

[182] Blackwell (2009:15).

[183] The selection of hydro as a required search term was an intriguing choice, possibly justified by the fact that the power crisis was caused by low lake levels, but also perhaps intended to keep the article selection manageable. However this restriction is also likely to have caused the article selection to omit a number of relevant articles about saving power.

[184] Blackwell(2009:36).

Table 2.4.2.1 – Electricity Study Categories assigned by Blackwell (2009)[185]

Theme	Sub-theme	Sources	References
Electricity Supply as political debate	Crisis	112	233
	Energy policy	103	219
	Well-managed event	51	92
Electricity use	Powersavers campaign	65	107
	Concern with demand	36	46

Blackwell found that "the government was portrayed as naïve and patronising compared with the business community that was portrayed as serious and responding appropriately in the circumstances"[186]. While she acknowledged that it was an election year and referred to the views of Labour and National in her discussion, relative counts of references to opposition players and government players within the media articles were not provided.

Blackwell also found that "criticism of the government and its policies predominated", and noted the importance of repetition, for example "National's spokesperson [was] <u>repeatedly</u> quoted on the issue of infrastructure", and that "Opposition energy spokesman Gerry Brownlee <u>repeatedly</u> laid the blame for lack of capacity with the government" (underlines added). Blackwell pointed out that the Opposition's critical view fitted neatly with the "Crisis" sub-theme and commented that "the juxtaposition of these two perspectives on generating capacity suggests the significant role framing can play in handling an issue so that it meets the priorities of the party or individual in question"[187].

Articles categorised under "Well Managed Event" spoke about a coordinated response between government and the "industry", used neutral language especially the word "prudent", and projected a concerned but responsible image.

Relating to "Electricity Use", the "Powersavers" campaign was promoted by a wide variety of players and included savings tips, praise for savers, and admonishment

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[185] Source: Blackwell (2009:39).
[186] Blackwell (2009:42).
[187] Blackwell (2009:43,46,47).

for laggards. There was also criticism for the late start and lack of a target, both blamed on the fact that it was an election year. Given that the study was examining the reduced savings in comparison to shortages in earlier years, it is pertinent to note (although she did not bring attention to this) that savings were apparently expected to be lower anyway (5% mentioned here by Energy Minister David Parker vs. 8% (from a target of 10%) in 2001)[188].

"Concern for Demand" was essentially the same topic (demand-side measures rather than supply) but without explicit mention of the Powersavers campaign. This sub-theme had the lowest frequency count and was notable in that there was no mention of any long term benefits for the country from reducing demand. While it is not entirely beyond the realms of possibility that the explicit inclusion of "hydro" into the selection criteria might have excluded some articles about this topic, its complete absence in this sample is still significant.

Key points in Blackwell's summing up were "the dominant message in the media about ways to solve supply concerns was that it was necessary to increase supply rather than reduce demand" and that energy conservation was "acceptable in the context of the supply shortage … [because] …. this promotion of conservation behaviour at a time of shortage supported and promoted social norms around electricity conservation thereby encouraging conservation behaviour"[189].

2.4.3 Death by Disconnection

O'Sullivan et al. (2012) studied the media's depiction of the death of Fololo Muliaga from a public health perspective. With reference to a number of scholars, they asserted the importance of media messaging and the media's ability to instigate social change, noting that media can influence policy decisions because policy makers and politicians see the media as reflecting public opinion. In addition, "misperceptions of public opinion provided by the media may cause inappropriate policy decisions to be taken in response to perceived public support for these

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[188] Blackwell (2009:51).
[189] Blackwell (2009:54).

policies and, furthermore, biased media coverage privileging certain views can manipulate policy decisions"[190].

O'Sullivan saw the media's focus upon individuals as being problematic (and often unethical) from a public health perspective, with the resultant privileging of the notion of "individual responsibility". Nevertheless it was recognised that personal stories can provide evidence and add "newsworthiness" to highlight important issues. There was therefore room for social advocates to better utilise such stories once they are already in the media.

Their focus was fuel poverty[191], and the authors regretted that this serious social problem in New Zealand (exacerbated by low quality housing) did not receive more emphasis in the media. They would have liked to have seen more mention of the wider social determinants of this problem and its health implications within the coverage of the Muliaga story. Their assessment was that in this particular case the media attention "did lead to" some policy change (in the reworking of disconnection rules), but felt that this response was insufficient and "a missed opportunity", specifically on the part of public health advocates.

The study included analysis of media articles obtained from the Factiva database, where selection criteria was inclusion of the word "Muliaga" and exclusion of "recurring pricing data", within articles from "major New Zealand papers" published between 1 May 2007 and 31 Dec 2008. The long time span was designed to include coverage of the Coroner's report released in Sep 2008. A total of 368 articles (including letters to the editor) were extracted.

Thematic analysis was undertaken using NVivo, and articles were coded for the four main themes of personal tragedy, conflicting evidence, institutionalised racism, and responsibility. Sub-themes within these four high level themes were, respectively, a) personal tragedy: descriptions of the death, grief, Mrs Muliaga's

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[190] Thompsett et al. (2003) cited in O'Sullivan et al. (2012:52).
[191] "Fuel poverty is defined as the situation in which a household needs to spend more than 10% of its income on household energy services, including adequate heating" (O'Sullivan et al. 2012:53).

personal attributes, attributes of the family; b) conflicting evidence: police investigation, company investigation, Coroner's inquiry, family account, medical information about Mrs Muliaga, medical information about home oxygen use; c) institutionalised racism: immigration, cultural sensitivity of police, Samoan cultural obligations; d) responsibility: personal responsibility, corporate responsibility, social or community, responsibility, political responsibility, conflicting legislation, health service provider.

Findings included a key theme of personal tragedy, and a positive perception of Mrs Muliaga's personal attributes, considered unusual in the media depiction of Pacific Islanders, according to other studies. This positive angle was assumed to accentuate the "David & Goliath" framing of the story. Discrepancies between witness accounts were thought to have heightened public interest, resulting in high engagement through letters to the editor and opinion pieces. Concern was expressed about the ethics of divulging so much detail about Mrs Muliaga's medical history, and it was noted that this led to a certain amount of "victim-blaming". Furthermore, despite the positive framing mentioned earlier, certain racist attitudes were discerned in relation to police sensitivity, obesity, and Samoan culture (including church tithing), resulting in some discussion around immigration rules, particularly within letters and opinion pieces. Responsibility was attributed according to Figure 2.4.3.1, where it may be noted that the Privacy Act was specifically implicated in preventing Mr Muliaga access to the electricity account which was in his wife's name.
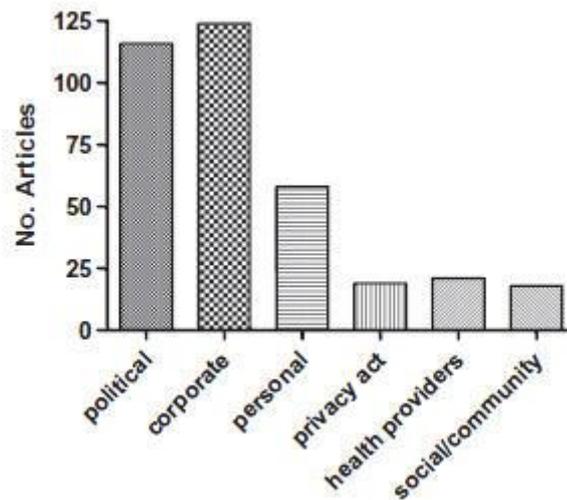
Figure 2.4.3.1 – Attribution of Responsibility for Mrs Muliaga's Death[192]

The research concluded that "the portrayal of the Muliaga case in the media was a public health 'success' as it provoked a reworking of the rules around electricity disconnections. However, public policy changes did not address the deep underlying issue of fuel poverty and its many outcomes, of which disconnection causing medical distress is only one. … the dominant discourse was that the corporation was within its rights to discipline those who do not pay bills, and that this right, except in strictly specified medical circumstances, overrides the corporation's responsibility to provide an essential service, even to those who cannot afford to pay"[193]. Despite their criticism of this perspective, the authors observed that there was a clear rise in the use of the phrases "fuel poverty" and "energy poverty" in major NZ newspapers between 2007 and 2008, indicating that the Muliaga event may have had at least some effect in raising public awareness of this specific public health concern[194]. The concluding message was that policy changes may have been stronger if public health advocates had taken better advantage of this prominent media story, and that they must do so in future when such opportunities arise.

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[192] Source: O'Sullivan et al. (2012:57).

[193] O'Sullivan et al. (2012:58).

[194] Corroborated by Laugesen (2011) cited in O'Sullivan et al. (2012:59).

2.4.4 Climate Change Political Framing in Three Newspapers

Campbell (2012) compared climate change political coverage in *The Irish Times*, *The Guardian*, and *The New Zealand Herald* at the time of the Cancun COP16 UNFCCC meeting in late 2010, and found that "a neoliberal economic paradigm dominates the three newspapers, wherein action on climate change is justified, or not, in the language of economics"[195]. In *The New Zealand Herald* specifically, Campbell found that –

> Climate change action is usually framed as costly, and the problem of climate change subsequently becomes subservient to other economic concerns. The New Zealand Herald frames domestic climate change policy as both evidence that New Zealand is taking appropriate steps to combat climate change and as a dangerous burden on the domestic economy; in doing so it paints a contradictory picture of the diplomatic importance of New Zealand as a principled and independent nation state that is also relatively powerless in the international system and economically at the mercy of other global agents[196].

Furthermore, "as in many other countries, the New Zealand media often reports climate change simplistically and explains scientific questions only briefly, potentially leaving audiences bewildered"[197].

Campbell chose to study newspapers because of "the political significance of the media in democracies: to investigate, interrogate, critique, and most of all, to take the problem seriously". His study addressed how climate change was framed in the media as a political problem, defining framing as "a cognitive process by which people understand phenomena; news texts contain frames that select or highlight some aspects and agents in a news story so as to tacitly or openly endorse a particular definition of the problem and therefore define the scope for possible solutions"[198].

He argued that "in general, a focus on macroeconomics and conflict-ridden elite spheres of global politics, together with the absence of discussion of the 'close to

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[195] Campbell (2012:2).
[196] Campbell 2012:iii-iv).
[197] Campbell 2012:44).

home' impacts of climate change, lead the newspapers to frame climate change as someone else's problem". The importance of climate change as a metaphor and a signal was noted. Campbell said climate change could be seen as "shorthand for the environmental consequences of modernity" while asserting that "the politics of climate change call into question dominant political-economic systems of production and ways of being"[199]. He considered that –

> Media portrayals possess great potential to influence reader perceptions and concern. In turn, these can feed into public awareness and engagement, as well as politics and policy. In other words, the ways in which 'climate change' and 'global warming' are discussed in media representations – as a 'threat', 'problem' or 'opportunity' – impact considerations of possible responses, as well as policy priorities[200].

He apportioned some blame to the media for the huge discrepancy between the near consensus of the scientific community and the widespread skepticism within the population, pointing out that this gulf "may reflect the influence of intermediary forces, of which the mass media is among the most evident because of its reach and power"[201].

While recognising the underlying neoliberal capitalist hegemony, his argument was based upon the view that people behave rationally in response to arguments presented in the media, and emotionally in response to identifiable concerns, thus leading to action, so those were the framings that he was seeking to identify. This is the "cognition, affect, and behaviour" definition of "engagement"[202] (in other words he was not specifically considering sub-conscious or long term cultural effects).

Campbell recognised that simple presentation of information within the media does not necessarily mean that it will be accepted by its audience, especially when "scientific knowledge conflicts with existing knowledge" or when new information

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[198] Campbell (2012:1).
[199] Campbell (2012:2).
[200] Boykoff (2011:12) cited in Campbell (2012:7-8).
[201] Campbell (2012:8).
[202] Campbell (2013:9,45).

"requires revision of previously held mental models or attitudes"[203]. Nonetheless, within the context of climate change policy, his perspective echoed the claims of Koch-Baumgarten and Voltmer, and O'Sullivan, in that –

> Elected officials, … policy negotiators and rank-and-file policy actors view amplified media attention … as a proxy for public attention … (and pressure for action) …. Conversely, a diminished amount of coverage can be seen as detrimental to putting forward strong … policies[204].

Campbell noted that language forms an important aspect of an applied "frame", as does the selection of dominant players, which is not always a conscious process on the part of the journalist, likely already enmeshed within a network strongly featuring elite participants. He observed that "The framing of politics in mainstream media thus often speaks to, and reinforces, dominant ways of looking at things"[205].

While studying the effects of journalism on readers was out of scope for his thesis, Campbell nonetheless considered that "studying the framing of important political events and phenomena … helps to shed light on the competing discourses and agents, and helps to reveal patterns in their communication with the public" as well as to "illuminate power relations at play"[206].

He discussed the difficulties of scientific reporting, noting that "the caution and uncertainty that is often at the core of new scientific theories and findings …[may come] across to/in the media as 'scientific confusion and incompetence'", also highlighting the problem of "balance as bias" (particularly in the US, though less so in NZ) where "well established conclusions [may be] given equal weight in a story with speculative ones"[207]. Furthermore the polarising sensationalism of journalism often does not sit well with the consensus-seeking peer-review style of scientific discourse. He also pointed out that –

> Considerations of morality and social justice are important to inspire behaviour change, but in the absence of total rethinking of the dominant

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[203] Campbell (2012:21).
[204] Boykoff (2011:28) cited in Campbell (2012:22).
[205] Campbell (2012:31).
[206] Campbell (2012:35).
[207] Campbell (2012:40-41).

neoliberal paradigm and the economic base of global economies, publicising the economic and financial benefits of [combating] climate change is an equally important behaviour change motivator[208].

He compared "alarming" with "alarmist" coverage, noting that approached cautiously the former could encourage engagement, while the scare tactics of the latter may cause a distancing effect, a sense of helplessness and a turning away[209].

Campbell obtained 87 articles from the Proquest online database by searching for articles containing the phrase "climate change" over the 26 day period 22 Nov - 17 Dec 2010, 7 days either side of the Cancun conference. He manually coded for Nisbet's eight "common frames that appear consistently across science policy debates", namely: social progress, economic competitiveness, ethics, scientific uncertainty, frankenscience, public accountability, middle way, and conflict/strategy as well as for 19 additional selected topics, including economics, natural science, energy, global politics, framing of conference outcomes, unusual weather, etc. He also counted the appearance of 19 different types of players, here called "agents".

Campbell found that a "community of elite policy agents dominates the items analysed … [such that the] journalistic focus on elite political processes and agents outweighs the reporting of the current and potential human impacts of climate change" and also that "the problem of climate change is defined in two different ways depending on geographical location and industrial development, as either a lived climatic problem [for the global south] or an abstract political-economic problem [for the global north]". Furthermore "The New Zealand Herald stands out from the other two newspapers as having a very low proportion of items that mention the potential or current human costs of climate change" and "all three newspapers more commonly frame climate change as a problem that will affect the future than as a problem that is already having impacts"[210]. Representative results are shown in Figures 2.4.4.1-3.

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[208] Campbell (2012:42-43).
[209] Campbell (2012:49).
[210] Campbell (2012:108-109).
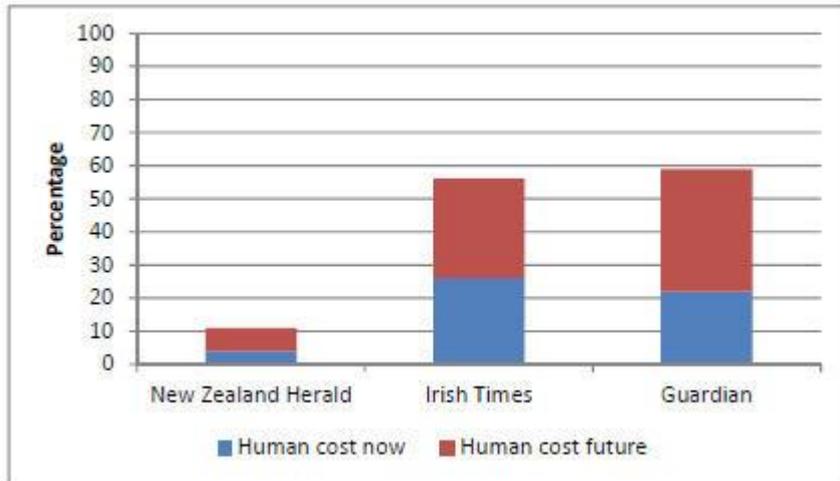
Figure 2.4.4.1 – Temporal Framing of Human Cost[211]
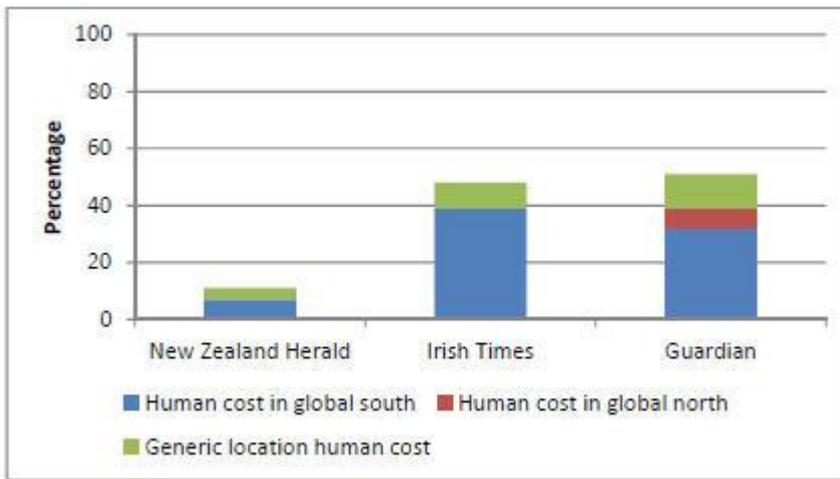
Figure 2.4.4.2 – Locational Framing of Human Cost[212]
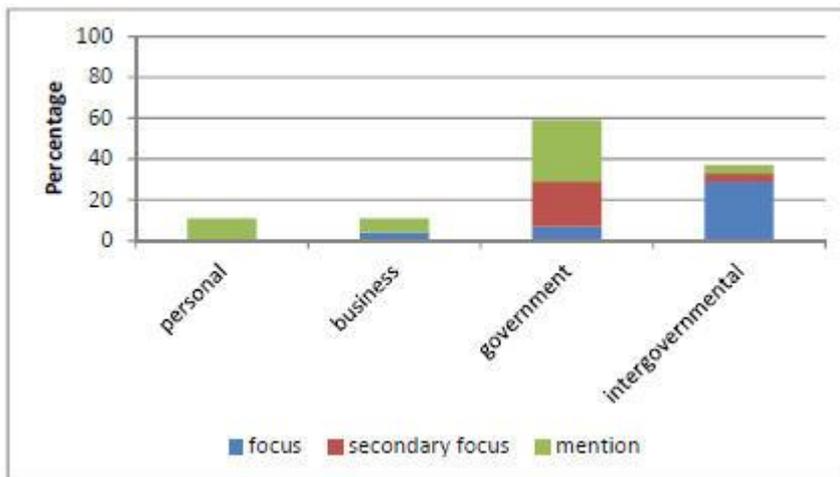
Figure 2.4.4.3 – Solution Framing in The New Zealand Herald[213]

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[211] Source: Campbell. (2012:109).

[212] Source: Campbell. (2012:110).

Overall, Campbell's research found that the major framings of climate change push the topic into "existing cognitive spheres that are removed from individual action. As a lived problem, climate change affects people far away who are 'not like me'. As a political policy issue, climate change is to be dealt with by elite policy agents who operate in opaque and conflict-ridden spaces of global governance, spaces in which newspaper readers do not have any place"[214]. Campbell's conclusion is that the media are not fulfilling their responsibility in this area. The news media could and should do much more to make climate change relevant to their readers in a way which is more likely to promote engagement and initiate behavioural change.

2.4.5 Educational Policy Reforms and New Zealand News Media 1988-1999

Though not energy-related, an important example of a New Zealand study of media and public policy was the comprehensive analysis and critique by Roulston (2005) which utilised the Budd (1964) score (see section 4.5.2). This ambitious study covered a 12 year period from 1988 to 1999[215] (a period of significant educational policy reform), with a focus on the media reporting of education in five major NZ daily newspapers. As with most other studies examined here, hers was a manually coded study, in this case based upon paper copies of newspapers.

Roulston compared the observed education media coverage with academic and policy papers published over the same period in order to identify discrepancies and draw conclusions about the "gate-keeping" influences which were evident in the media content selection process.

Roulston deduced that important educational issues were ignored because they were too complex and thus did not fit with media story requirements. Her strongly worded conclusion suggested that the media had completely failed in their watchdog role, noting that the observed education coverage with its "focus on the

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[213] Source: Campbell. (2012:113).

[214] Campbell (2012:112).

[215] Although a lengthy study, the reasonably sparse sampling process provided a manageable sample size of 1680 newspapers. While 6166 relevant articles were found, only 136 of them had a Budd score of 4 or 5, and only these were examined in detail.

commodification of information" was "superficial, narrow, unquestioning and given low priority", causing it to be "arguably anti-social, anti-Māori, anti-feminist, anti-competitive and therefore, anti-democratic"[216]. Her findings also revealed an unexpected focus on local educational issues (74%), to the detriment of national issues (23%), and the almost non-existent international issues (3%).

Roulston's study demonstrated good use of mixed method media content analysis within a policy context, and raised important concerns about the role of the New Zealand media.

2.4.6 New Zealand Research Relating Language and Electricity Policy

Though not a media study, one example was found where a simple keyword search was used to study the relationship between language and policy for the New Zealand Electricity Sector.

In a longitudinal study of annual accounting practices for a New Zealand electricity distribution firm Hooks & Perera (2006) found "evidence to suggest that accounting was used to influence the regulatory environment and as rhetoric in supporting a new ideology, which is market-oriented and profit driven". In this study, the researchers chose a set of key words, namely *commercial*, *customer*, *efficient/efficiency*, *competitor/competitiveness*, and *performance*. Occurrences of these words were counted in the organisation's annual report and differences compared over the length of the study from 1985 to 2001. These years were divided into three distinct periods, namely pre-privatisation (1985-1991), privatisation (1992-1996) and post-privatisation (1997-2001). The authors observed a distinct change from 0 at the start of the period, increasing sharply during the period of privatisation to a high of 33, and then decreasing again in the post-privatisation period, once the required changes had been implemented. This small set of quantitative data was not the only focus of the study, but rather was used to augment other observations such as annual report structural changes and accounting practices, as well as a set of

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216 Roulston (2005:i).

accountant informant interviews which described an intention for organisational culture change, in which choice of language was a deliberate strategy.

The authors concluded that the various strategies involved, including the use of these key words, were not simply chosen in response to the changing political and regulatory environment, but were also chosen as a deliberate marketing strategy, in order to influence events and to mediate audience reception of the message.

2.4.7 Suicide Media Monitoring Project

McKenna et al. (2010) undertook a study of suicide reporting in the New Zealand media which was an adapted replication of the first of a set of Australian studies within the "Media Monitoring Project"[217].

The main aims of the study were firstly to determine the extent and nature of suicide reporting in New Zealand, and secondly to assess (from a random sample of 10% of articles) whether media reports of suicide were conforming to the published (evidence-based standards of best practice) media guidelines for suicide reporting, as set out in the 1999 Ministry of Health guidelines and the Coroners Act 2006[218].

Contracted by the Ministry of Health as part of the implementation of the New Zealand Suicide Prevention Action Plan 2008-2012, it "provided the first comprehensive baseline picture of the extent and nature of the reporting of suicide by the New Zealand media". It also stated that it had been able to clarify "the differences between the professional culture of journalism and the health sector"[219].

The New Zealand study was divided into two parts, firstly a quantitative content analysis (aimed at achieving both goals set out above) and secondly a qualitative analysis consisting of five case studies (to complement the content analysis). The case study topics were Online media, Celebrities, Murder-suicide, Economic crisis, and Mental health services. A method of discourse analysis called "framing

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[217] Pirkis et al. 2001, Pirkis et al. (2009).
[218] McKenna et al. (2010:ii).
[219] McKenna et al. (2010:v).

analysis" was used within the selected case studies to identify "framing devices that lead a reader to formulate particular interpretations about suicide, such as the structure of the media report, patterns of story-telling and the use of rhetoric to provide an overall theme to the report"[220].

The study examined news media items collected from all mainstream English language New Zealand media news outlets over a twelve month period from 1st August 2008. including television, radio, print and online news articles. A company called Media Monitors collected the data and included all relevant media items within the period, not just a sample.

The study found that suicide was extensively reported and that internet articles were more likely to report suicides from overseas, especially from the United States. In most cases suicide was reported well, and in alignment with the guidelines. In other words, the media did not normalise it, highlight celebrity status, describe the method in detail, use the word suicide in the heading, or include footage of the scene, and the articles were located appropriately[221].

Media reports were also compared with official statistics, and the results roughly aligned (i.e. paralleled "official reality") for gender and age (mostly males 25-44), but not ethnicity (i.e. reporting did not reflect the fact that Māori are more likely to commit suicide than non-Māori). There was also an over-emphasis on murder-suicides and firearms, whereas most NZ suicides were by hanging[222]. Attempted suicides were less likely to be reported, even though they were more common. The overall discrepancies were understood to "reflect journalistic emphasis on reporting 'newsworthy' events"[223].

Recommendations from the study were for more interaction between the media and mental health services (to provide context for the guidelines), more media articles about people overcoming their difficulties, and more prominent information about

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[220] McKenna et al. (2010:v).
[221] McKenna et al. (2010:vi).
[222] Ministry of Health (2006b) cited in McKenna et al. (2010:vi).
[223] McKenna et al. (2010:vi).

available support services. The report concluded that the existing Ministry of Health guidelines should be updated to be more understandable, especially for different types of media, and to encourage the media to play a more educative role.

The New Zealand suicide study report clearly acknowledged the influential role of the media when it stated –

> International research has suggested that media reporting can impact, both negatively and positively, on suicidal behaviour. Research that has focused on the potentially negative consequences of media reporting on suicidal behaviour has highlighted the use of sensationalism and specific reporting methods as leading to 'copycat' behaviour … . This kind of reporting can impact on those in the community who are struggling with suicidal ideation moving them towards acting upon their thoughts[224].

This conclusion was significant and contrasted with some of the other studies examined, where media influence was played down and coverage was assumed to be "reflecting" society[225] rather than specifically influencing its audience. The suicide study did not attempt to verify the influential role of the media, and was careful to ascribe media influence to certain media behaviours, but nonetheless it did take the influential role of media as read, based upon a list of other studies.

2.4.8 Media Prominence and Brand Value

When ContextAnalytics (2008) studied the correlation of unpaid (non-advertising) media prominence with (retail sector focused) brand value and advertising spend[226], they were careful not to definitively ascribe causative properties (influence) to the media coverage. However, a "bi-directional" link was assumed, and the purpose of the study was to financially quantify the value of paid public relations. Their conclusion was that (on average) media prominence "accounted for" 27% of brand value.

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[224] McKenna et al. (2010:1).
[225] E.g. Blackwell (2009), GMMP (2010).
[226] Brand value was sourced from Interbrand 2008, and advertising spend from publicly available documents (only retrievable for half of the companies in the sample).

Their 2006 media article data was taken from the "Dow Jones' Factiva database of over 20,000 global print and online publications ... searching for mentions of each brand in English, Spanish, Japanese, German, French, Italian, and Chinese"[227]. Actual media article sample size was not provided and may have consisted of all search results. They found a range of correlations between media prominence and brand value, from low for impulse purchases (luxury and personal care), to high for items which were more likely to be researched by the consumer (automotive and computing). Their correlation result for food was surprisingly high but this was described as "skewed" because of the presence of Coca Cola and McDonalds, both of which demonstrated a very high brand value uncharacteristic of other food brands in the study. They noted that the correlation between advertising and brand value displayed the reverse trend (high for impulsive purchases and low for researched purchases).

The media prominence indicator was specified somewhat vaguely as a "weighted composite of headline, lead paragraph, and article body mentions for each company" with no weighting details provided, suggesting that was proprietary information. Headline was also used alone for regression analysis when predicting how many headlines were required to increase brand value (or vice versa). This was not an academic study and certain details were not provided, but the methodology and results together provide a clear and useful attempt to calculate and understand the influence of media coverage.

2.5 Conclusion

What do we know about the power that media have to influence attitudes and behaviour? Who and what do they promote, and does it work? This chapter has covered some of the available research in this area but much more remains unknown. It is a field which cries out for more investigation, especially in the complex realm of public policy decision-making.

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[227] ContextAnalytics (2008:7).

Policy issues vary widely in their attractiveness to the media, depending on how well they fit the pattern of desirable attributes for a "good story". Electricity public policy is a relatively unusual choice for a media study, but energy use vitally underpins modern society, and future environmental challenges such as climate change and peak oil are likely to have a significant implications for policy in this area.

Electricity-related concepts in the media may be examined in a number of different ways, such as in terms of message "framing", but another method is to comprehensively examine pertinent themes over an extended period, in a manner akin to Gerbner's cultivation analysis. This approach seeks a more sub-conscious cultural flavour, disregarding the attractiveness (or otherwise) of the rational arguments presented, and instead focusing on what people and concepts are emphasised overall (and which ones are missing).

Chapter 3 – Categorisation Framework

> *Models are always wrong, but many of them are useful[228].*

3.1 Introduction

It is important to seek balance and consistency when deriving a categorisation strategy. Shoemaker and Reese lament that –

> Standardization of content analysis lags behind standardization in survey or experimental research. Consequently, content analysis results are often not comparable and the measurement schemes from one study may not be valid in others. The development of more theoretical bases for the study of content may help us develop consistent and valid operational definitions[229].

This chapter describes the systematic process by which the political economy surrounding the New Zealand electricity sector (as discussed in the previous chapter) was examined and codified into a model, so that the resulting categorisation framework could be used as the basis for the media article text analysis. The way in which this constructed model was utilised for this purpose will be described in more detail in the next research methods chapter.

Although electricity was the starting point for the categorisation structure, it proved to be an all-encompassing subject. Consequently, the deep thought that went into broadening and balancing the design allowed it to grow and be transformed from what was initially an inter-player influence-oriented electricity-based model into a very generic final categorisation model which would also be applicable for studies on other topics.

This chapter is firstly a story about the decision-making that guided the building of the high-level categories, followed later in the chapter by a few short comparisons of the categorisation framework with other models.

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[228] Gurteen (2007).
[229] Shoemaker & Reece (1990:652).

3.2 Constructing the Categorisation Framework

3.2.1 Government Separation from the Electricity Sector

Prior to the electricity reforms of the 1990s, the New Zealand electricity sector was almost entirely publicly[230] owned and operated. By the end of the 20th century, and after the comprehensive restructuring initiated by former National Party Minister Max Bradford[231], the role of the State in electricity had been transformed. The Government had become theoretically separated from the machinations of the electricity sector and was on the outside looking in, as illustrated in Figure 3.2.1.1.
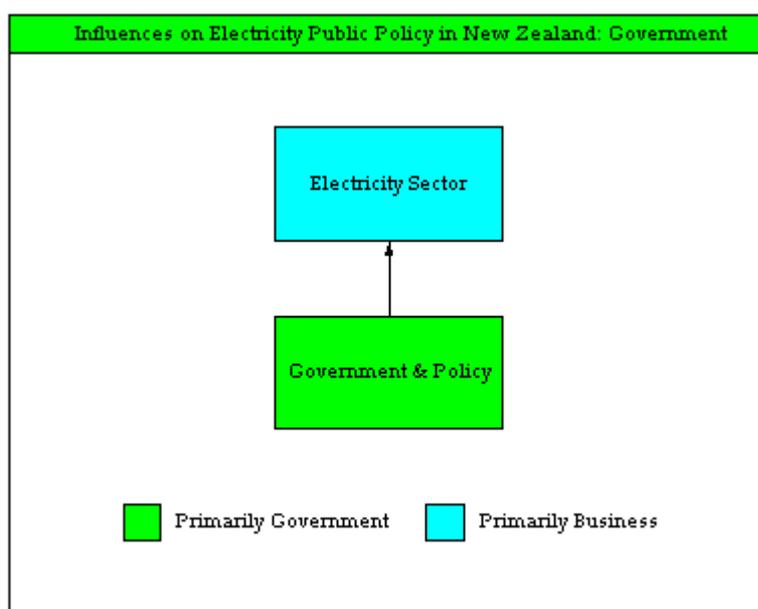
Figure 3.2.1.1 – The New Zealand Government and the Electricity Sector

The Government retained high level ownership of some key players, and retained the power to enact laws[232] affecting entities within the electricity arena, but the new

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[230]Prior to the reforms, national electricity generation and transmission was the responsibility of the government Electricity Department in conjunction with the Public Works Department, while local distribution was performed either by local councils or local public utilities.

[231] Max Bradford was the Minister for Enterprise and Commerce in the National-led government of 1996-1999. He was largely responsible for providing the impetus for the wholesale restructuring of the New Zealand electricity sector.

[232] Existing laws which impinged upon the Electricity Sector in 2006 included the Commerce Act 1986 (for regulating monopoly participants), Electricity Act 1992, Electricity Reform Act 1998 (EIRA), Energy Efficiency and Conservation Act 2000 (EECA), Fair Trading Act 1986 (for electricity pricing), Local Government Act 1974, Public Works Act 1981 (for land

business structures and rules were deliberately constructed so as to be out of the direct reach of day-to-day Government control. The arrow in the diagram provides recognition that there remained some influence on the Electricity Sector from the Government. The rectangles in this diagram will now be expanded.

3.2.2 Components of the New Zealand Electricity Sector

For the purposes of this study, the electricity sector is considered to encompass all aspects of demand and supply, consumption and generation, national transmission, local transmission, wholesale markets and retail contracts. Figure 3.2.2.1 provides a simple schematic overview of the New Zealand Electricity Sector during the period in question.
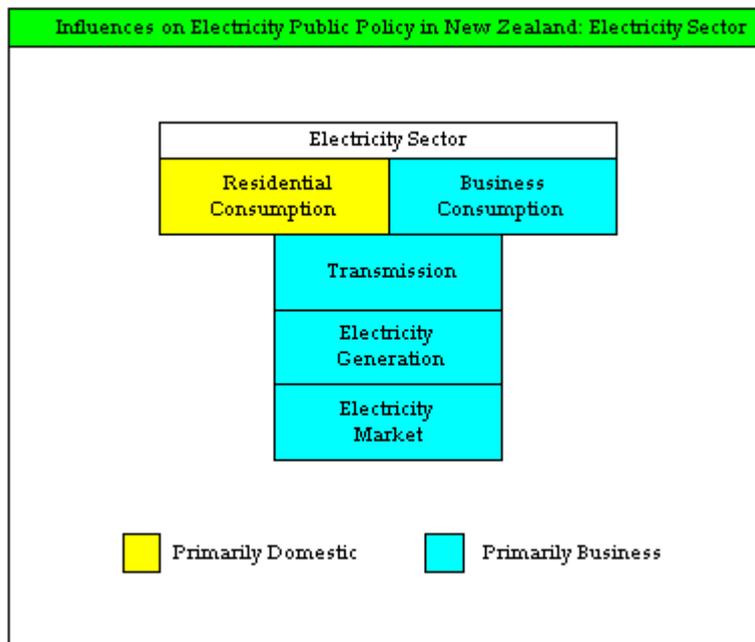
Figure 3.2.2.1 – The New Zealand Electricity Sector (schematic, not to scale)

In this diagram, which is an expansion of the upper half of the diagram in Figure 3.2.1.1, two colours have been chosen to illustrate the division between primarily domestic functions and primarily business functions. The components of the electricity sector listed above have been categorised within the diagram into five

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appropriation), Resource Management Act 1991 (RMA, for consenting the construction of generating or transmission plant), and the State Owned Enterprises Act 1986.

boxes: residential consumption (yellow), business consumption (blue), transmission (blue), electricity generation (blue), and the electricity market (blue).

The individual rectangles in all of the diagrams in this section are not designed to indicate size proportionality. Their purpose is primarily one of functional differentiation. In this particular case it may be interesting to gain an independent appreciation of the relative weighting for the two consumption rectangles. For many years prior to 2007, domestic residential consumption had consistently made up approximately 30% of electricity demand in New Zealand[233]. The remaining 70% was classified as business consumption in one form or another. Business consumption included heavy industry, light industry, commercial, and transport, as well as transmission losses[234].

At that time several State Owned Enterprises (SOEs)[235] were the owners of the monopoly national transmission grid, the majority of the generating assets and many electricity retail bodies. Although the Government was the sole shareholder[236] in each case, these SOEs were operating in a market which also (in the case of generation, wholesale and retail) consisted of private company players, and SOEs were mandated under the State Owned Enterprises Act 1986 to operate on a commercial basis under a profit motive. Therefore, for the purposes of colour allocation throughout this set of diagrams, SOEs are considered to provide primarily business functions (blue), rather than Government functions (green).

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[233] Statistics NZ (2006).

[234] Transmission losses are included under business consumption because the post-reform market structure of the electricity sector clearly defined the process of transmission as a business activity.

[235] The five State Owned Enterprises involved in the New Zealand electricity sector at that time were the monopoly national transmission company Transpower, three major generation companies Meridian Energy, Mighty River Power, and Genesis Energy, as well as the coal company Solid Energy.

[236] Note that the SOE Act engendered much discussion during 2006, as proposals to modify the rules to allow some private equity were raised.

3.2.3 Electricity Sector Regulation

The core components of the electricity sector have been defined in Figure 3.2.2.1, but there is also a need to recognise that the activities which take place in the electricity arena do not operate in a vacuum. There are rules and regulations in place which moderate and channel proceedings to a certain extent. Some of these limiting factors arose as a result of the divesting of the electricity assets from Government control in the 1990s, others evolved during the construction of the wholesale electricity market, and yet others continued to be debated as the Government and its arms-length regulators, the Electricity Commission and Commerce Commission, continued to take a greater interest in electricity monitoring and oversight during this period.
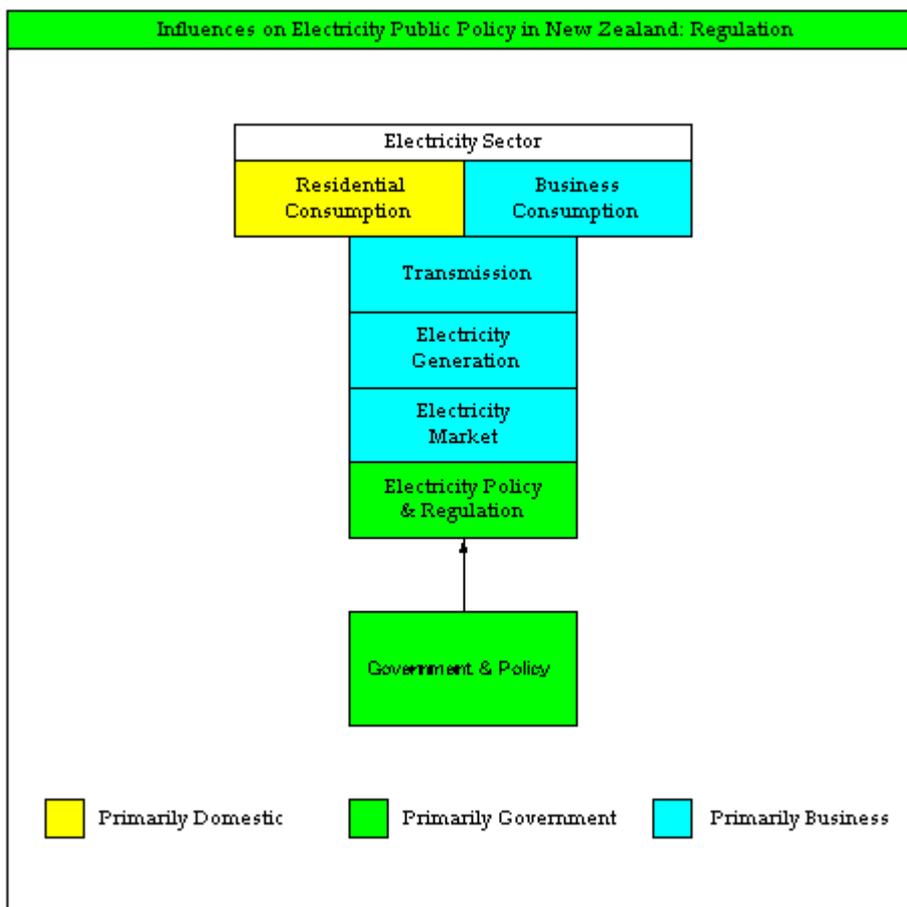
Figure 3.2.3.1 – NZ Government and Electricity Sector Regulation

In order to represent this dynamic pictorially, I have chosen to add the "regulation" component to the "Electricity Sector", and to represent the ongoing vital interest that the Government is obliged to take as a separate, but obviously related, entity. In

Figure 3.2.3.1 it is possible to see that Government policy has an effect on the Electricity Sector by way of certain regulatory controls.

3.2.4 Government Influence

Three primary activities of government were selected as representative components for the ways in which Government influenced electricity policy. Illustrated in Figure 3.2.4.1, these are Government Strategy, Education (especially Tertiary), and Scientific Research.
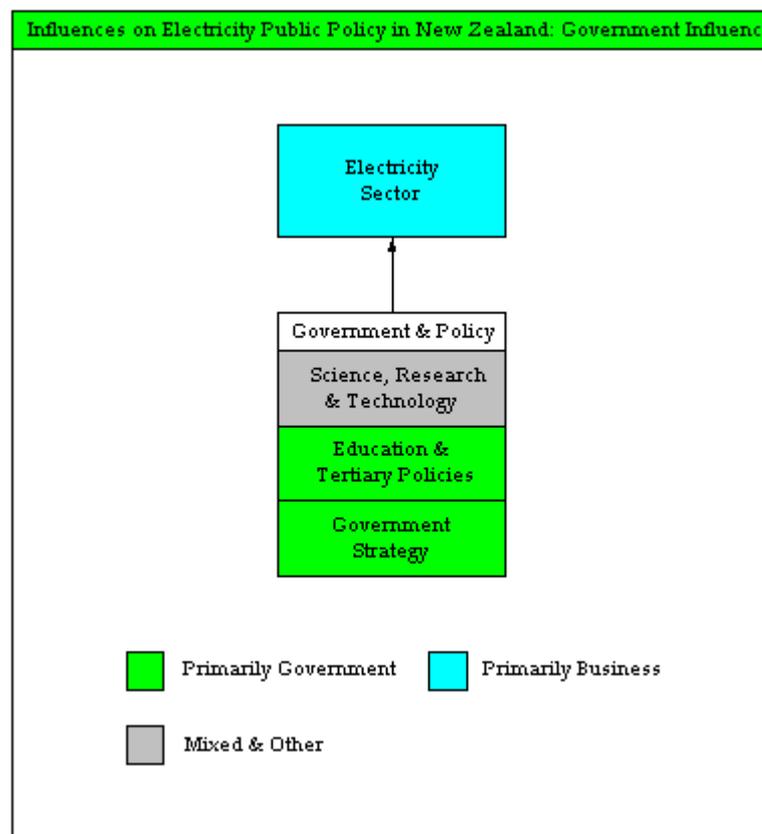
Figure 3.2.4.1 – NZ Government Influences and the Electricity Sector

The base component in Figure 3.2.4.1, "Government Strategy", continued in 2006-2007 to provide an overarching direction for the country. This indicated some government influence on the evolution of the "strategic" electricity sector, regardless of theoretical arms-length provisions, as the goal of government strategy was to provide maximum benefit to New Zealand as a whole. It was therefore coloured green in Figure 3.2.4.1.

Electricity was and is a technically challenging field, therefore "Science, Research and Technology" was the category considered to be the most closely aligned with electricity sector developments, as shown in Figure 3.2.4.1. Although ground breaking research and development in this field was seen as largely taking place overseas, New Zealand at that time was able to claim a respectable share of entrepreneurs, researchers and patents[237]. Scientific research within New Zealand used to have a strong Government base in the Department of Scientific and Industrial Research (DSIR) but, as part of the New Zealand market reforms of the 1980s and 1990s, this research department was restructured to take place at arms length from the government, within new entities called Crown Research Institutes (CRIs)[238]. Research also took place within universities, business incubators such as the Icehouse, think-tanks such as the New Zealand Institute, lobby groups such as the Greenhouse Policy Coalition, and within business itself. Because the Government still maintained a certain amount of control over research funding and regulation, I have chosen to include scientific research under the umbrella of "Government & Policy", but I have coloured it gray to indicate that other parties have significant interest and influence in this area.

Related to the pursuit of scientific research in New Zealand were Education and Tertiary Government policies. Tertiary policies influenced research funding and the promotion of scientific qualifications among the population. Employees within the Electricity sector were, by necessity, required to be highly skilled as it was a complex area in which to work. Education policies also had an influence on sustainability awareness, energy conservation, and energy consumption patterns within the public arena. This component in the diagram is coloured green because, despite the

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[237] For example Geoff Henderson of Windflow Technologies patented his unique wind turbine technology, at the same time undertaking to use "primarily New Zealand sourced labour, expertise and materials" (Henderson and Roding 2003:2).
[238] The Association of Crown Research Institutes website (ACRI 2006) provided the following list of nine CRIs in 2006: AgResearch Ltd, NZ Institute for Crop & Food Research, Institute of Environmental Science and Research Limited (ESR), New Zealand Forest Research Institute (now called Scion), Institute of Geological and Nuclear Sciences (GNS), Horticulture and Food Research Institute (HortResearch), Industrial Research Limited, Landcare Research

proliferation of private education providers, the Government retained a high degree of influence over policies in the education and tertiary sectors. The diagram in Figure 3.2.4.1 provides an expansion of the lower half of the diagram in Figure 3.2.1.1.

3.2.5 Wider Influences on the Electricity Sector

Moving away from Figure 3.2.1.1 and its focus on the Government's relationship with the electricity sector, a wider mapping of relationships between the electricity sector and other sectors of society are shown in Figure 3.2.5.1 which provides an overview of relationships with three other groups, namely "Business Interests", Non-Business Interests (divided into "Household" and "Other"), and "Media, Publicity & Lobbying".
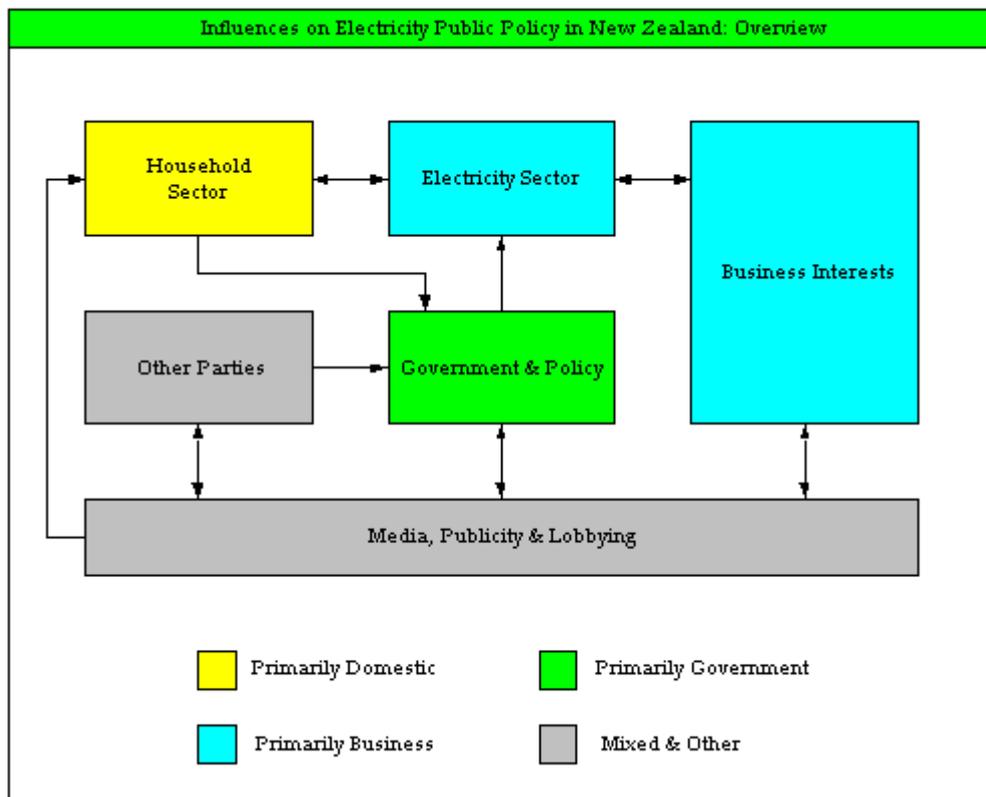
Figure 3.2.5.1 – Influences on the Electricity Sector

Figure 3.2.5.1 has been designed to facilitate exploration of the level of importance of the media when discussing influences on all Government policy, including those which are applicable to the electricity sector. The arrows in this diagram are intended to provide an indication of the primary direction of the influential relationships between the various sectors. What is postulated here is that the electricity sector is influenced by Government (as previously discussed), by business (most obviously via business consumption but also because business-based entities own and operate electricity assets), and by the household sector (via domestic consumption).

Also illustrated is the influence in the reverse direction of the electricity sector on the business and household sectors, shown by the arrow heads on each end of these relationships. These converse relationships can be envisaged theoretically by the supposition that the price and availability of electricity had an unavoidable effect on the health and wellbeing of individuals, as well as the location and viability of businesses.

The members of all four of these "player" functional groupings (government, business, household and other) were consistently fed information from media, publicity and lobbying, shown by the arrows from the gray box to the yellow, green and blue boxes. However, in the reverse direction I have shown arrows only from government, business, and other to media, not from household. This does not mean that residents and householders were never in the news, but is intended to represent the fact that, on the whole, the household sector was more of a consumer of information than a creator of information[239]. Where householders combined to lobby for or against a particular policy, any such resulting lobby group was included within the "Other Parties" sector.

Visible in Figure 3.2.5.1 is a departure from the tendency to make all rectangles the same size, and an exception has been made for the business interests category. This box has been drawn larger primarily to make the diagram appear more balanced to

the eye, but this variation also, conveniently, provides an impression of the assumed relative size of the power, influence and weight of that sector[240].

What is also evident in this new diagram is the direct relationship between households and the government, a relationship not drawn on the other business side. This relationship represents voting. While business interests have power and influence over the government through lobbying and the media, individuals gain their power, not through the media or marketing, but through the force of numbers, by their vote. Business does not have the power of the vote, because, despite a reasonably high rate of self-employed and small or medium enterprises (SMEs) in New Zealand, the number of employed is far greater than the number of business owners, so "business" simply does not have the numbers[241]. Business (like an NGO or any other organisation) generally attempted to influence individuals using media and marketing techniques.

Each of the newly added entities and relationships illustrated in Figure 3.2.5.1 will now be examined.

3.2.6 Business and the Electricity Sector

Businesses were dependent upon the electricity sector because almost all business entities, large and small, consumed electricity. Therefore electricity pricing and availability affected the whole of the business sector.

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[239] Gavin (2007; 2010) disagreed with this assumption. His diagram is depicted in Figure 3.4.1.1 under "Comparison with Other Models" at the end of this chapter.

[240] Unlike Gavin (2007; 2010) who rejected the theory of excessive business influence on media when he studied economic policy in the British broadcast media.

[241] According to the Ministry of Economic Development (MED 2008c:8), in Feb 2007 there were 463,380 enterprises in New Zealand employing 1,923,220 people. Of these, 1% (3,336) were government enterprises, and 18% (348,180) were government employees. Private sector SMEs (enterprises with 19 or fewer employees) comprised 97 percent (448,161) of all enterprises, and 30 percent (581,000) of all employees. Within this group, 68% (314,733) of all enterprises had no employees, and this included the self-employed who accounted for 11% (approx. 233,100) of the labour force (ibid:4,36). Larger private enterprises made up 3% (11883) of all enterprises, and employed 52% (994,040) of all employees (ibid:8).

Figure 3.2.6.1 is an expansion of the right hand side of Figure 3.2.5.1, in order to bring attention to certain areas of interest. Certain sectors have been highlighted here in order to illustrate their important status.
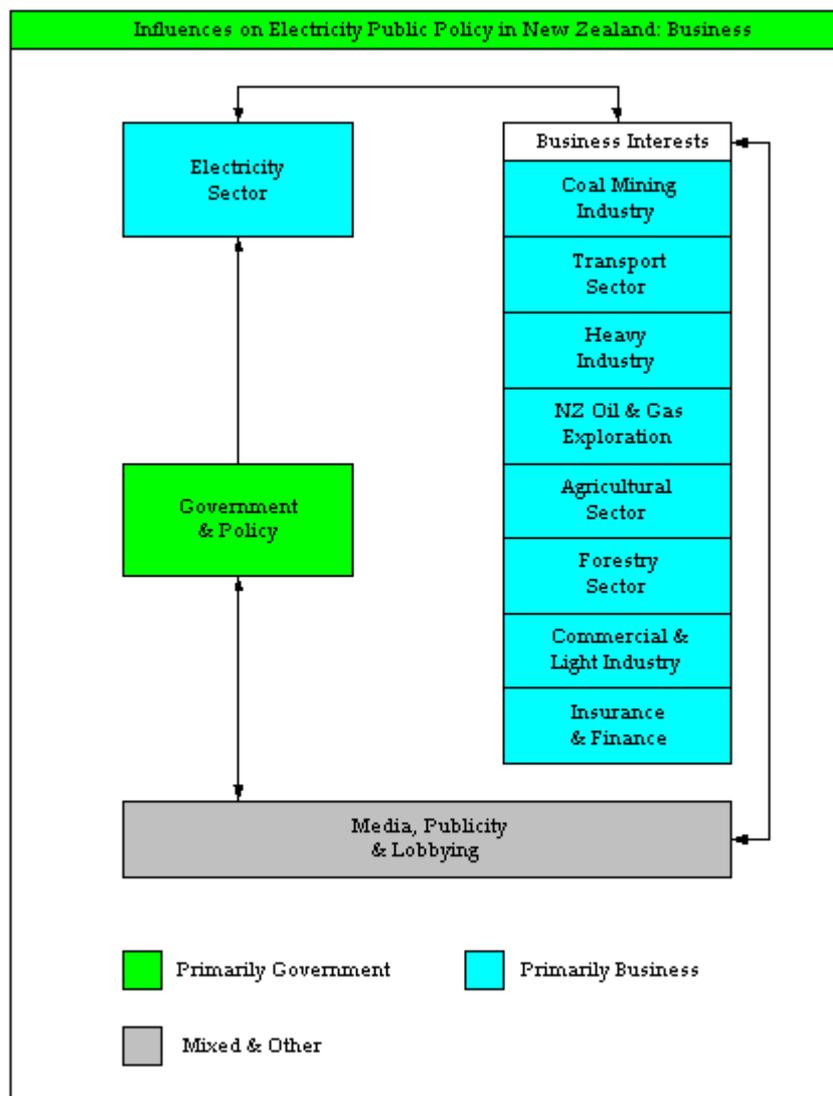
Figure 3.2.6.1 – Business and the Electricity Sector

The coal mining industry had an ongoing interest in the combustion of coal for the purposes of making electricity, whether in New Zealand or overseas. The profitability, viability, and growth of the coal industry were all dependent to a certain extent upon coal-fired power generation[242].

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[242] Internationally, electricity generation used about two thirds of coal production, and steel making about 12% (Fitzsimons 2008). New Zealand exported about half of its coal (MED

Trains and trolley buses in the transport sector used electricity directly, while in 2006-2007 electric cars were on the horizon. The envisaged hydrogen economy, if it ever came to pass, was likely to require electricity for the production of hydrogen. While most of the sector consumed oil directly at that time, there was discussion about an increased role of electricity in transport, in order to reduce reliance on fossil fuels.

Heavy industry relied hugely on electricity and some plants, such as the Comalco aluminium smelter, had long term contracts in place for supply[243].

Oil and gas exploration in New Zealand was consistently in the news in 2006-2007. Electricity generation was threatened by the expected demise of the Maui gas field which had been relied upon as a source of cheap gas for the thermal electricity generation which burgeoned in the wake of that gas field's discovery. With Maui depleting, the search for additional gas was becoming vital to keep the now entrenched thermal generation plant running. With volatile petrol prices providing an indication that peak oil and a global oil crisis may be threatening, it was also in New Zealand's interests to find additional oil reserves close by, if possible.

As the historical backbone of the New Zealand economy, agriculture cannot be omitted from any discussion of economy or electricity. The remoteness of farms meant that they were often the most likely of all businesses to have available stand-by generation in the form of portable diesel generators. They also had other unique connections to the electricity sector. For example, during 2006-2007 there was an increasing proliferation of arrangements with farmers for the siting of wind turbines on their land. On the other hand, farmers were also some of the most stridently opposed to the siting of new transmission pylons on or near their holdings and the

2008), and the large coal-fired generation plant at Huntly imported about half of its coal from Indonesia, where sub-bituminous coal was cleaner than New Zealand was able to produce (Tichall 2008). The proposal to convert the old oil-fired Marsden B generator to coal had obtained Resource Consent in 2005, but was meeting resistance from environmental groups (Greenpeace 2006).

[243] The Manapouri hydro scheme was constructed primarily to supply electricity to Comalco which, since then, had consistently utilised approximately 15% of the total electricity consumption in New Zealand (Statistics NZ 2010).

possible appropriation of land for this purpose. Milking sheds were large consumers of electricity as dairy farming was expanding rapidly, and surplus whey and animal tallow were both potential bio-fuel sources.

Where the underline forestry sector received publicity during 2006-2007, it was normally in relation to the awarding (or otherwise) of carbon credits. There was heated debate over who would receive the benefit for the carbon sequestration properties of trees, forest owners or the Government[244]. Wood waste was also promoted as a potential source of bio-fuels and was used by some wood related businesses to generate electricity on site[245].

Finance institutions were providers of the required capital for expenditure on future generating assets, while the insurance industry was involved by necessity wherever there was the possibility of climate catastrophe, or where business viability was threatened. Both of these factors increasingly impinged upon any discussion about electricity generation in 2006-2007. The banking industry was involved in financing new ventures and was thus required to take a close interest in the rules and regulations which applied in the electricity sector, specifically issues of regulation consistency, subsidisations such as carbon credits, and pricing mechanisms such as a possible carbon tax.

The commercial and light industry category included smaller businesses to which electricity supply was vital. This sector claimed about 25% of New Zealand's electricity demand in 2006[246] (see Figure 3.4.4.2).

[244] Pre-1990 forests and post-1990 forests were treated differently under Kyoto. After much consultation, the government eventually instigated a regime whereby some credits were able to be offered to both sides to ease deforestation penalties. This was embedded within the rules for the ETS as part of the Government Energy Strategy. A good discussion of the issue was provided in MfE (2007).

[245] For example, Carter Holt Harvey's Kinleith Pulp and Paper Mill at Tokoroa had a 40MW cogeneration plant that produced steam and electricity from wood waste, sometimes supplemented by gas or coal. The plant was owned and operated by Genesis Energy (EECA 2005:3, Genesis Energy 2006).

[246] Statistics (NZ 2010).

3.2.7 Non-Business and the Electricity Sector

"Non-business" was split into two main categories, the <u>household sector</u>, and <u>other parties</u>. Figure 3.2.7.1 is an expansion of the left hand side of Figure 3.2.5.1, and illustrates the components assigned to these two groupings.
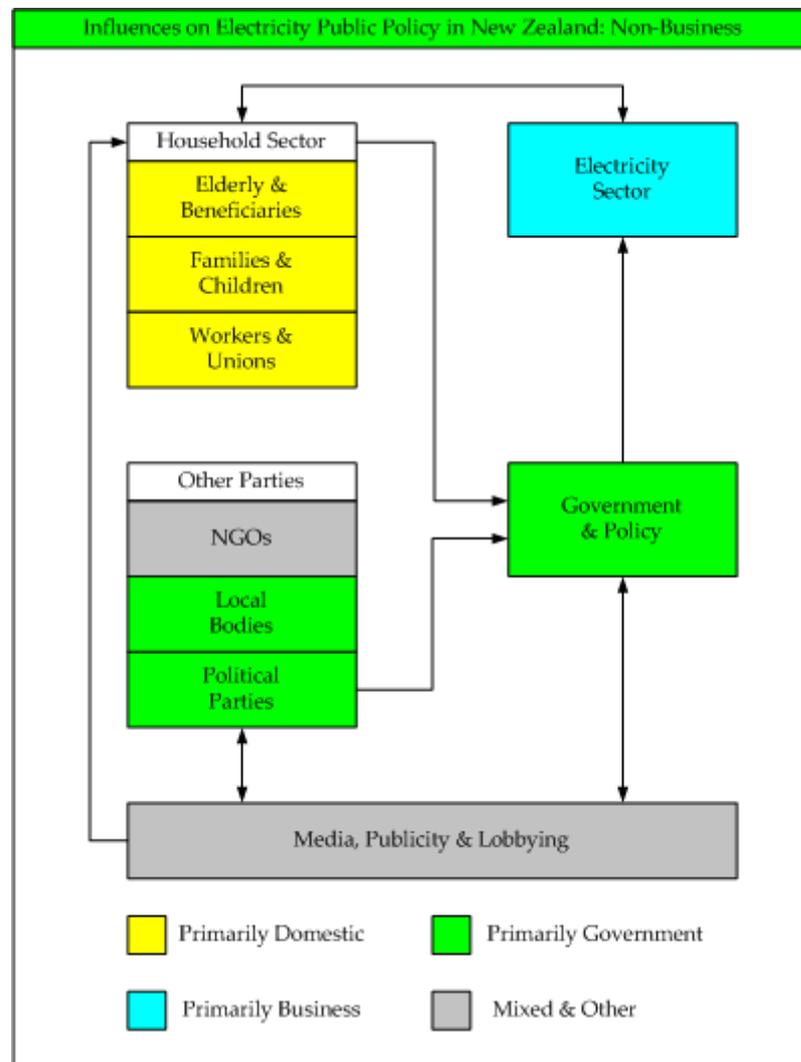
Figure 3.2.7.1 – Non-Business and the Electricity Sector

Within the household sector, <u>elderly and beneficiaries</u> are combined into one category, representing those on modest incomes who generally had limited choice and limited voice (especially beneficiaries). The cost of electricity was likely to be of prime importance to the health and welfare of this group. Organisations such as Grey Power (which also falls into the NGO category) tended to advocate on behalf of the elderly regarding matters of electricity.

Families and children form the second household grouping. Although a separate functional category in the diagram, the needs of the members of this group are similar in many ways to those of the elderly, in that price and availability of electricity are important. Membership also overlaps the first category because many beneficiaries are families with children.

The third component under the household heading is workers and unions. Unions represent workers and (like Grey Power) also fall into the NGO category. Employees are affected by electricity policy both as residential consumers and also at their place of work. Matters of working environment and personal safety can be assumed to affect those in this category.

The other parties category has been divided into three groups, namely NGOs (non-governmental organisations such as Greenpeace, New Era Energy, most lobby groups, and voluntary organisations), local bodies (municipal and regional councils), and political parties. Political parties have a unique direct relationship with the government within parliament (represented by the arrow between political parties and government). NGOs are restricted in their influence to the more circuitous route of standard publicity and lobbying mechanisms. For the purposes of this study I am interested only in those political parties which were represented in Parliament in 2006-2007[247].

3.2.8 Media and the Electricity Sector

The media, publicity and lobbying have been combined into a category intended to encompass not only the behaviour of media organisations but also any activity related to publicity and lobbying. Figure 3.2.8.1 is similar to Figure 3.2.5.1, but with the Media category expanded.

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[247] The eight political parties in parliament in 2006 were the Labour, National, New Zealand First, United Future, Green, Act, Maori and Progressive parties. Political parties not represented in Parliament at that time (for example the Alliance and Destiny parties) were not considered to have enough visibility to be relevant to this discussion.
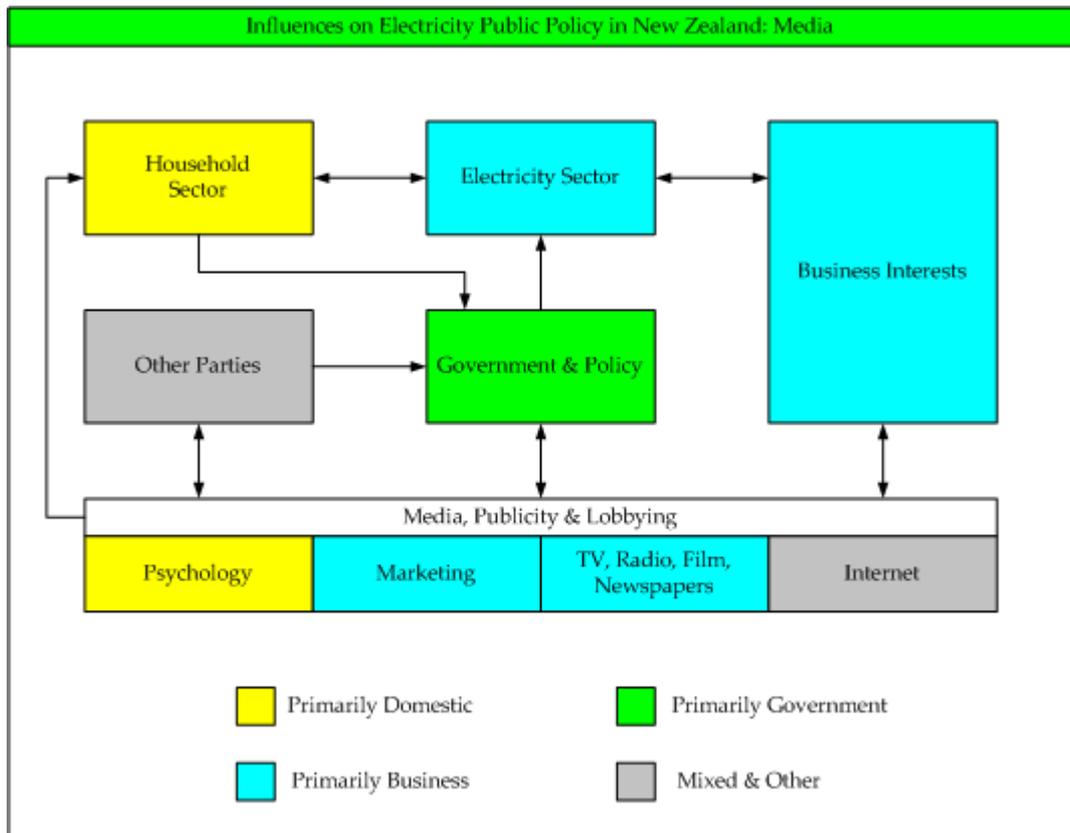
Figure 3.2.8.1 – Media and the Electricity Sector

Four areas of interest have been placed beneath the broad media heading. Firstly internet, the growth of which had an extraordinary effect on the propagation of information in the years leading up to my study period. The second category covers more conventional media outlets such as TV, radio, newspaper, and film. Thirdly marketing and advertising, which differ from the previous category in that bias and intent are more blatantly proclaimed. Lastly a box for psychology has been added, highlighting its importance within communication processes.

Figure 3.2.8.1 indicates again the two-way relationship between the media and business, government, and other non-business groups, in contrast with the depicted one-way relationship between the media and the household sector, representing "ordinary" people.

3.2.9 Global Influences

In 2006 New Zealand may well have been an island at the bottom of the world, but it was not insulated from ideas or events in other places. Decades of increasing air

traffic world-wide (with no carbon or pollution charge yet applied) and the relatively more recent but hugely influential proliferation of email and internet use, meant that globalisation was a reality which effectively had seen the world "shrinking" on a daily basis.

International treaties, trade agreements, and overseeing organisations such as the IMF and World Bank effectively restricted the autonomy of co-operating nation states, as countries were increasingly expected to conform to various standardised sets of agreed rules. Every aspect of a country's performance was monitored by international agencies[248] which regularly ranked countries on a number of different criteria, providing a proliferation of differing incentives for improvement, together with regularly alternating reasons for national pride or embarrassment.

Influences on Electricity Public Policy in New Zealand: Global Influences						
Global Influences						
Global Media	Global Politics	Global Research & Technology	Global Energy Policies	Global Oil Industry	Nuclear Industry	Global Business

Primarily Government   Primarily Business   Mixed & Other
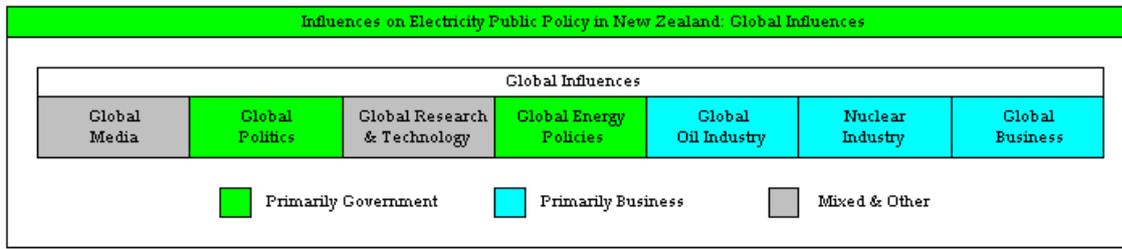
Figure 3.2.9.1 – Global Influences on the Electricity Sector

Under the heading of global influences, the seven relevant categories selected for Figure 3.2.9.1 were global media, global politics, global research and technology, global energy policies, the global oil industry, the nuclear industry, and global business. Each of these groupings would have had some influence over policy decision-making world-wide, and were also expected to have in some way affected New Zealand's energy environment in 2006-2007.

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[248] For example OECD, IEA, and various UN bodies.

3.3 Issues Affecting the Electricity Sector

3.3.1 Overview

Now that primary actors in the electricity arena have been categorised into functional groupings, the scenario will be augmented by introducing a number of key issues, to add specificity to the questions being addressed.

Red boxes are the chosen representation for four keys areas of interest in Figure 3.3.1.1. Another rectangle has been included along the bottom of this growing diagram to indicate the global influences discussed above.
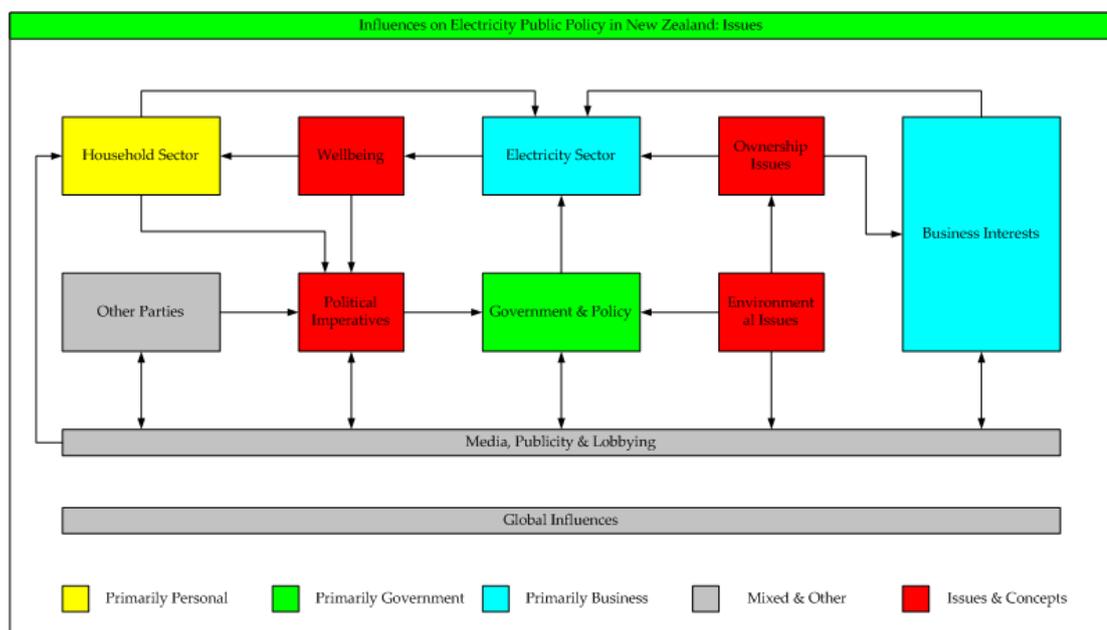
Figure 3.3.1.1 – Influencing Issues and the Electricity Sector

Global influences are considered to be so pervasive that they have been drawn simply as a line across the bottom of the diagram. To draw arrows in this case would clutter the picture unnecessarily. Connections can be assumed to exist from this category to all of the others in the diagram. Its close proximity to the media category is intended to indicate that much global influence arrives by way of the media.

Each of the four key issue categories will now be examined.

3.3.2 Political Imperatives

While the Government retained a certain amount of influence over the electricity sector, despite being constrained by arms-length provisions introduced by the sector restructuring of the 1990s, it was also bound in its decision-making by a number of factors which I have described as political imperatives. These forces contributed to the complex environment within which Government policy was created. The political imperatives highlighted here are progress (typically measured by GDP), social equity, and electioneering. These sub-categories are shown in Figure 3.3.2.1, which is an extract from Figure 3.3.1.1 with the political imperatives grouping expanded.
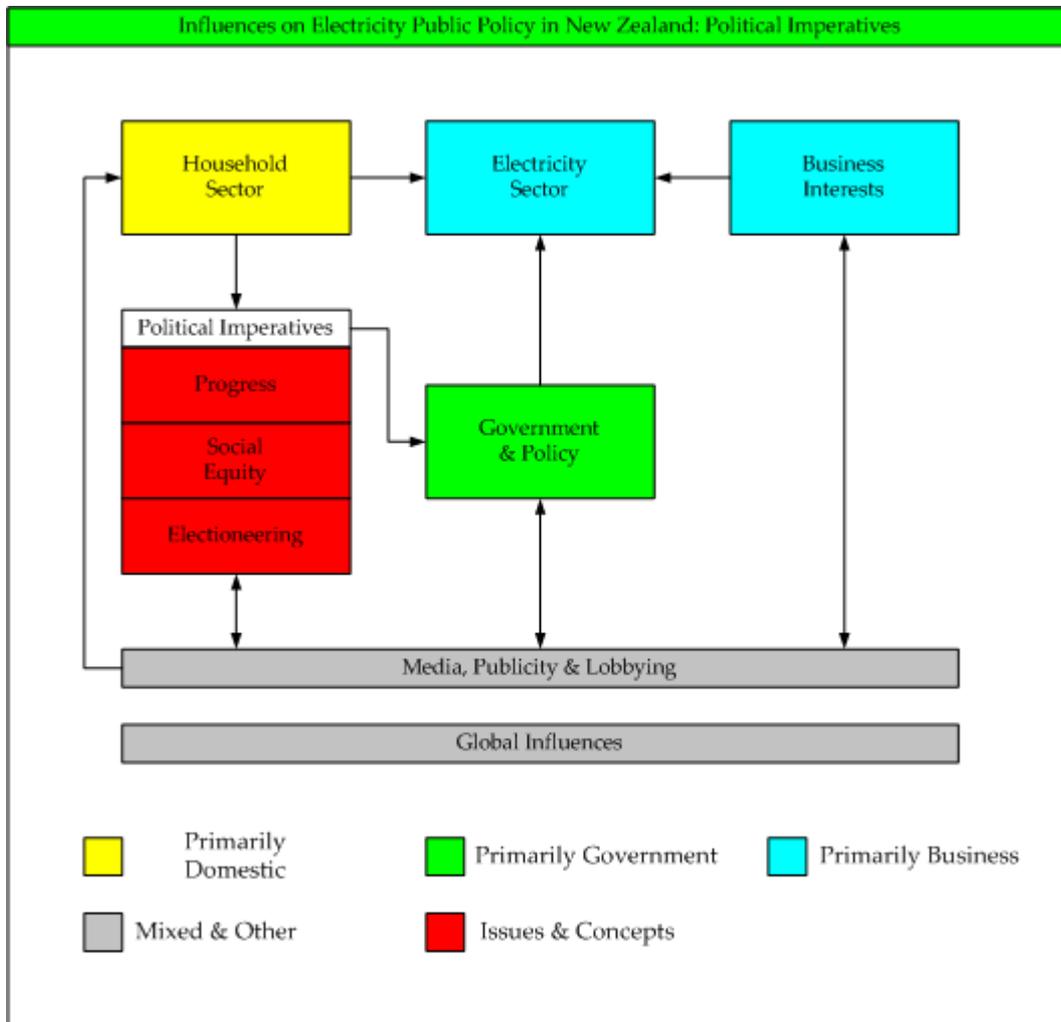
Figure 3.3.2.1 – Political Imperatives and the Electricity Sector

All three of these components were expected to be of interest to members of the general public, thus the arrow from the household sector. Economic prosperity

(perceived to be related to GDP) was balanced against the need for a "fair go for all" and an equitable compassionate civilised society, as they weighed up the performance of the Government and the comparative attributes of the various political players soliciting their votes.

Business influence on political imperatives has been illustrated in this set of diagrams as being primarily via media, publicity and lobbying.

3.3.3 Wellbeing

From the point of view of the household sector, electricity was a fundamental requirement for modern living. Most houses in New Zealand used electric power for their lighting, cooking (alongside gas), washing clothes and dishes, heating (alongside gas and wood burners), ventilation, electrical entertainment devices (TVs and computers), and hot water heating. Some also used it for cooling (air conditioning) and luxury items such as heated towel rails and exercise equipment.

Residential electricity contracts normally consisted of a daily charge combined with a usage charge. Households on a fixed budget would often take care to minimise their electricity usage in order to save money. More affluent households tended to be less careful with their usage and considerable electrical wastage was likely to have been occurring. It was commonly cited[249] that hot water comprised approximately one third of a household's electricity bill. Household stand-by power (for electrical appliances that were not being used) made up approximately another one tenth of that bill[250].

Power to one household could be deliberately cut off by an electricity retailer for non-payment of electricity bills and power to larger groups was occasionally lost due to accidents or weather events. If poverty meant that electricity was expensive or unaffordable, then a household could be severely disadvantaged in terms of health and shelter.

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[249] E.g. Fitzsimons (2006).
[250] Flinte (2003:66).

Figure 3.3.3.1 is an extract from Figure 3.3.1.1 with the <u>wellbeing</u> category expanded, and illustrates three chosen aspects of wellbeing.
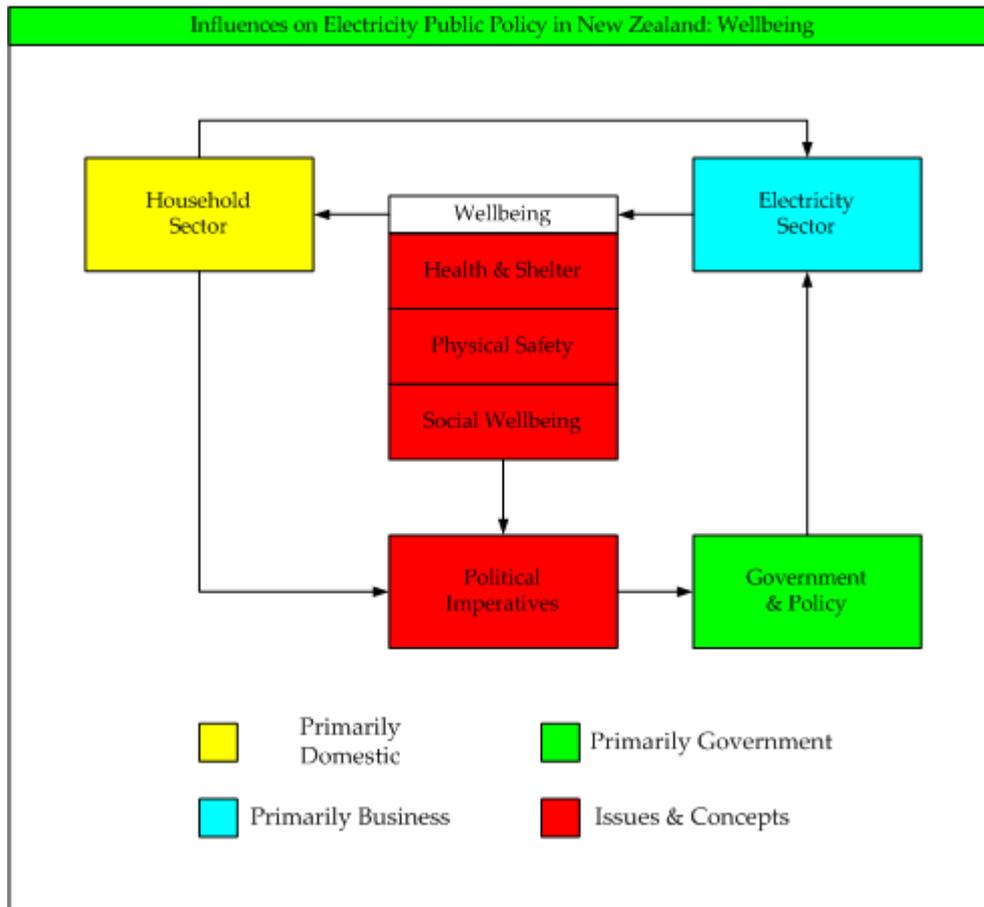
Figure 3.3.3.1 – Wellbeing and the Electricity Sector

<u>Health and shelter</u> are obviously affected by electricity consumption, providing the first of the three wellbeing categories illustrated in Figure 3.3.3.1. The second category, <u>physical safety</u>, can be applied to workplaces (coal mines being some of the most dangerous) and to the dangers of exposed electric cables, among others. Looking at the wider picture, the third category beneath this heading is <u>social wellbeing</u> and includes crime and violence on the negative side, and community support on the positive side.

3.3.4 Environmental Issues

Three significant environmental issues were particularly relevant to the electricity sector during the study period and all were growing in urgency, without any global

consensus on how to deal with them. These are illustrated in Figure 3.3.4.1, which is an extract from Figure 3.3.1.1 with the <u>environmental issues</u> grouping expanded.
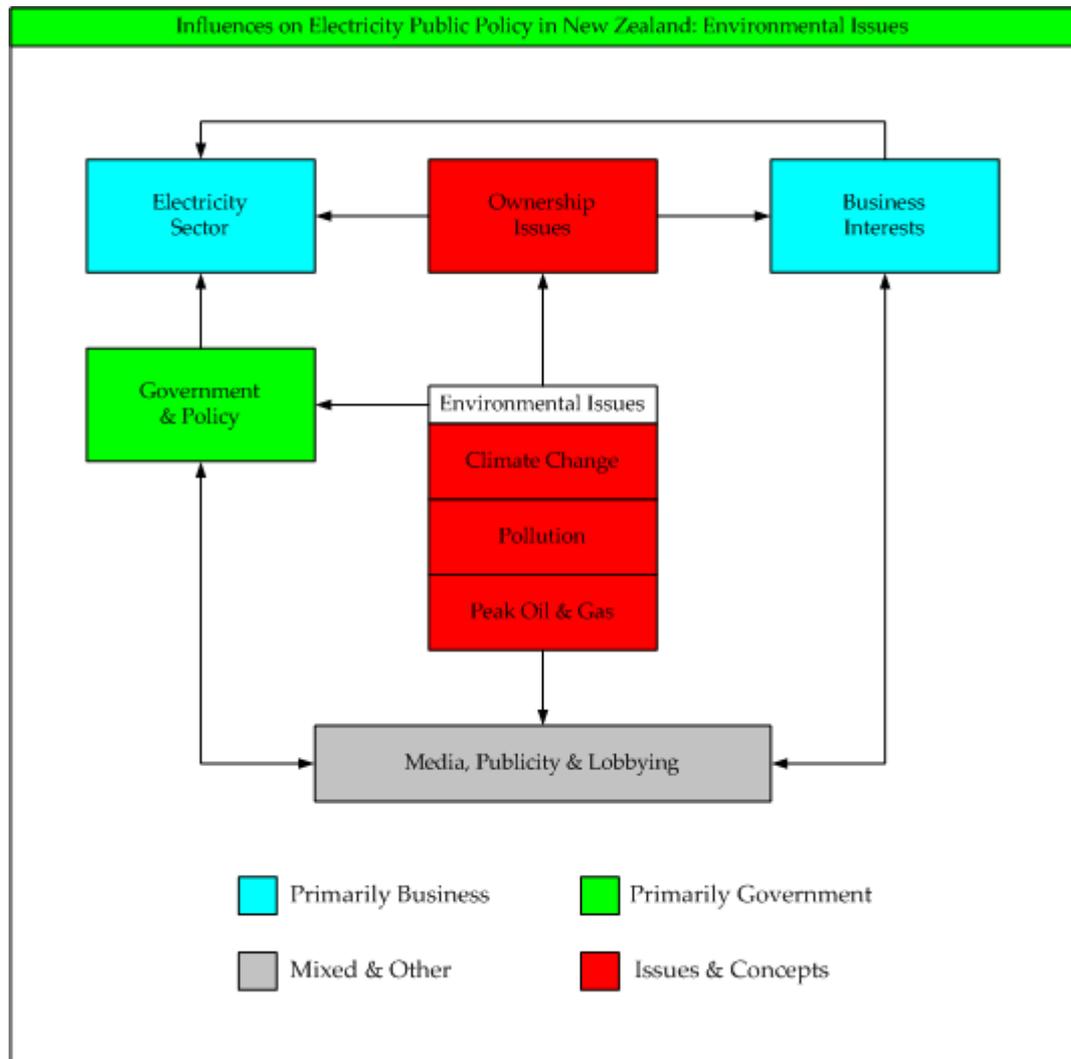
Figure 3.3.4.1 – Environmental Issues and the Electricity Sector

Firstly, there was the issue of anthropogenic <u>climate change</u>, suggesting that carbon levels in the atmosphere were increasing as a result of human activity and were likely to cause disruptions to the planetary climate[251]. New Zealand had ratified the Kyoto Protocol but was struggling to meet its commitments and was likely to face a significant financial penalty in 2012 if Kyoto targets were not met. A national carbon tax had recently been rejected, ostensibly due to lack of support in Parliament, and

[251] Stern (2006).

other economic instruments such as carbon trading were being discussed in order to establish the best mechanism for world-wide mitigation of this problem.

Fossil fuels such as gas and coal were widely used to generate electricity, and fossil fuel combustion produced other pollutants besides carbon[252]. Coal was one of the worst offenders in this regard. <u>Pollution</u>, particularly of the air, is therefore the second selected category beneath the environmental issues heading. Ironically it had been shown that the global accumulation of particulate matter in the atmosphere had for some time been mitigating the warming effect of climate change by having a mildly cooling effect on the earth, an effect known as "Global Dimming" (Goodell 2007). Some scientists, such as Lowell Wood, proposed deliberately increasing this effect[253] in order to combat global warming in the short term, to buy time while the world decided on a more permanent and sustainable solution.

Resource peaking and subsequent decline is the third selected environmental threat category. <u>Peak oil</u> was an increasingly well publicised concern at that time, but less discussed was the potential for any resource to eventually be exhausted, especially if chosen as a fuel for electricity generation on a large scale. Gas, coal and uranium all fell into this category[254].

3.3.5 Ownership Issues

Some level of media coverage for certain <u>ownership issues</u> within the electricity sector was to be expected. The privatisation of electricity assets and functions was the first and most obvious area of ownership contention relating to electricity. Another issue which was expected to arise was that of water rights for hydro generation vs. irrigation and recreational needs. Farmers desiring compensation for

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[252] In addition to carbon dioxide (CO_2) and carbon monoxide (CO), common pollutants also included nitrous oxide (NO) and sulphur dioxide (SO_2).

[253] At an "Energy Modeling Forum" conference in 2006, Wood proposed releasing sulphur particles into the atmosphere to imitate a volcanic eruption, thus shading and cooling the earth (Goodell 2007). The US proposed something similar to divert the IPCC from proposing an emissions targets agreement (Barnett 2007).

[254] Wild (2010) researched these fuels and predicted that global oil output would peak around 2012, global coal between 2010-2048 and global gas by 2027. Global uranium (at then rates of demand) was expected to be exhausted within 30 years.

pylon construction or maintenance was yet another. All of these issues were classified as property rights, which is the first ownership category shown in Figure 3.3.5.1. This diagram is an extract from Figure 3.3.1.1 with the ownership issues grouping expanded.

Figure 3.3.5.1 – Ownership Issues and the Electricity Sector

The siting of coal mines in public reserves where wildlife was endangered was an issue related to electricity generation which impinged upon the use of commons and public reserves, the second category. Air and water pollution were also issues relating to the "commons" ownership of air and water. This category thus included some overlap with the environmental issues already discussed.

When discussing river ownership, <u>tangata whenua</u>[255] consultation may be required (e.g. over permit renewal for Genesis to take water from the Whanganui river). This issue forms the third category in Figure 3.3.5.1.

Ownership was one area which was expected to affect business, as rules and regulations around ownership tended to have a strong bearing on the viability of businesses. That is why a relationship arrow has been drawn from this issue to business interests. Environmental factors may play a part in policy decisions around ownership and this is why a relationship arrow has been drawn from environmental issues to ownership issues.

3.4 Combined Influences on Electricity Sector Policy

3.4.1 Summary

Each selected functional category has now been identified and broken down into its constituent parts, so a final all encompassing diagram may be drawn which illustrates the sum total of the discussion so far.

The diagram in Figure 3.4.1.1 represents the culmination of my initial contemplations upon the topic of influences on electricity policy, and was used as a guide to frame the data collection and discussion which subsequently took place over the course of the study. In this picture, all of the categories examined so far are listed in their appropriate colour and indications of primary relationships between them are also provided.

This final diagram contains a few idiosyncrasies which were not evident in the introductory examinations of individual groupings. In Figure 3.4.1.1 most arrows have been drawn between headings to indicate influential relationships. However some arrows have also been drawn between specific components rather than between the headings. For example, because the direct influence of the <u>household</u>

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[255] "Tangata whenua" is a New Zealand Maori phrase which literally means "people of the land". It is an expression which confers upon Maori their status as the indigenous people of New Zealand.

sector on the electricity sector is primarily limited to <u>residential consumption</u>, the "arrow of influence" has been drawn to that component only, rather than to the electricity sector header.
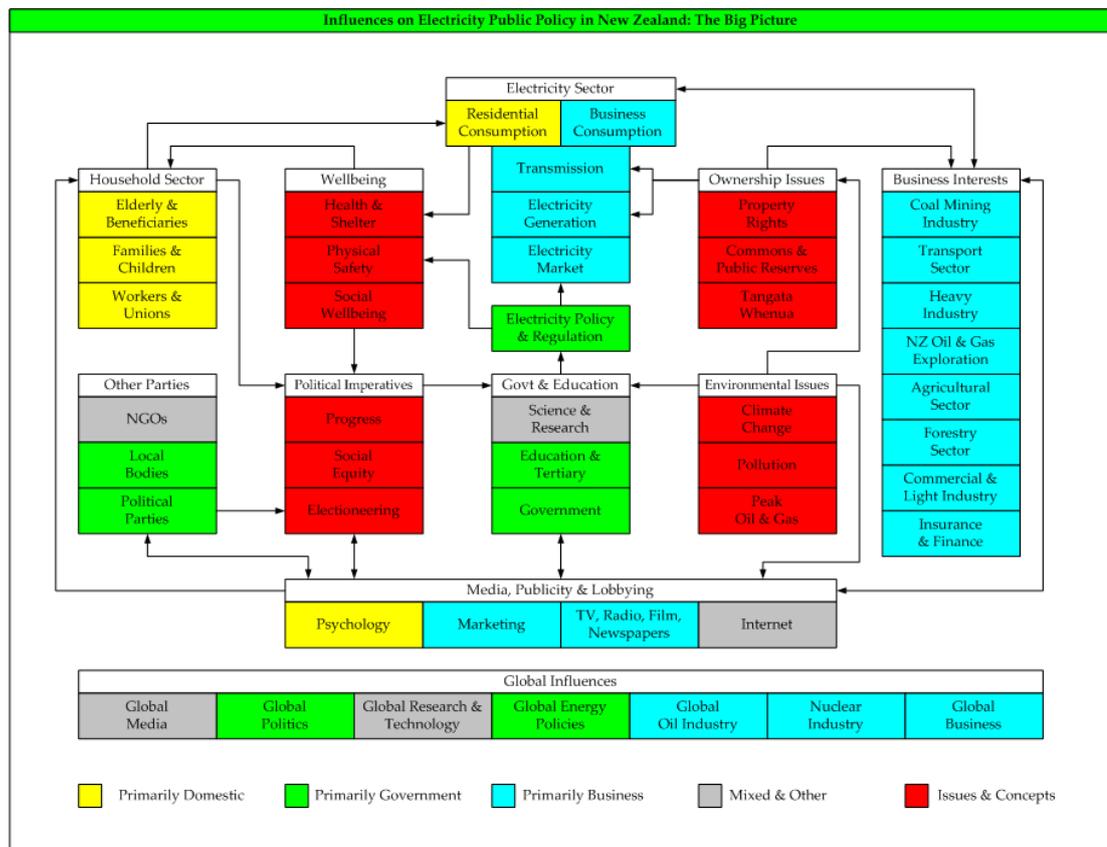
Figure 3.4.1.1 – Influences on the Electricity Sector

The influence of the electricity sector on <u>wellbeing</u> has been split into two arrows, one from <u>residential consumption</u> to <u>health and shelter</u>, and the other from <u>electricity regulation</u> to <u>physical safety</u>, to indicate specific relevance.

Within the electricity sector, <u>ownership issues</u> generally arose over <u>transmission</u> and <u>generation</u>, therefore the relationship arrows have been drawn directly to those two categories.

This diagram has placed the electricity sector within a context consisting of broad categories of players and large issues of general interest within society. Specific issues relating to <u>electricity policy</u> (the green box in the centre of the diagram), such as supply security, markets, and prices are categorised later in Table 4.4.5.3.

3.5 Comparisons with Other Models

3.5.1 Players and Processes

Neil Gavin (2010) undertook a case study examining political spin in relation to economic reporting on the BBC and ITN TV channels in Britain, thus contributing a partial response to his observation that "the direct role of the media in policy development is under-explored, as various contributors … attest"[256]. He concluded that the British Labour Government of the day, although oft described as having an effective "spin machine", and despite their best efforts, did not appear to have any significant influence over the tenor of media coverage of unemployment. Improving unemployment figures should have been to the government's advantage, but the news painted a downwards (negative) trending picture for "tenor" in their coverage.

Gavin's model in Figure 3.5.1.1 depicts influential relationships between the media, politicians, the public, and other organised interests, where each relationship was represented by a letter. It is noticeable that Gavin's model is symmetrical, indicating two way influence between all of the players, whereas for some relationships in my model arrows are drawn in only one direction, to indicate perceived power imbalances.

Another point of differentiation is Gavin's depiction of public influence on the media (relationship B in Figure 3.5.1.1). In my model I assume the public (meaning "ordinary people" and represented primarily by the household sector) to be effectively mute, in that ordinary people rarely feature in the news, certainly when compared with celebrities, experts, and chief executives. Therefore I did not draw an arrow from the household sector to the media, indicating that I see most people as recipients of news rather than makers of news. Gavin's interpretation is slightly different. As explained by Figure 3.5.1.1, he sees the media as pandering to public tastes in news selection, thereby attributing a great deal of influence to the public.

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[256] Gavin (2010:65).
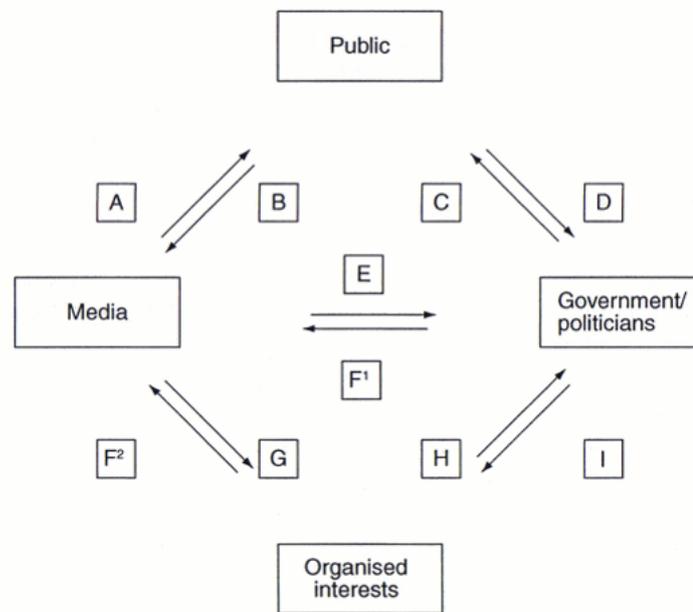
Players and processes.

Notes
A: content delivery; attitude formation.
B: audience/readership demand; citizen access; news values.
C: policy implementation/delivery.
D: polling; anticipated reaction; voting.
E: opinion 're-expression'; third person effect; anticipated reaction.
F: political marketing; spin; image management.
G: reinforcement of mobilisation.
H: lobbying; anticipated reaction.
I: policy network encouragement.

Figure 3.5.1.1 – Players and Processes[257]

Furthermore, Gavin gives credence to "vox pops" (a common feature of the short television news snippets in his study), claiming these to be representative of public opinion. I would counter that vox pops presented by the media are surely so few (comparatively) and so unlikely to be forming a valid random sample, as to be statistically unrepresentative of public opinion. Additionally, they would almost certainly have been filtered by the media organisation for "news value".

A further significant point of difference with my model is the fact that Gavin combines all political players together and collects most non-political players into one group called "organised interests", with the public separated from them. In his diagram, he includes business with other organised interests, even though large companies and their stakeholders are likely to have the means to wield considerably

more influence upon the media than, for example, unions or environmental activist groups. By contrast, my framework separates political parties and local bodies away from government but groups universities (and education) alongside government, includes unions with workers under the household sector (while recognising that they are also NGOs), and separates business interests into another group. In other words, my model contains more detail and differentiation than Gavin's model, and I see business interests as being an altogether separate, and presumably powerful, influencing group.

Not only does Gavin fail to separate businesses from NGOs in his model, but he also claims that upon closer examination he does not perceive business to have any undue influence worthy of report[258]. My assumptions and observations are altogether different. However when it came time to differentiate business interests for the purposes of measurement the task proved far from easy, as will be described in the next chapter under categorisation challenges.

3.5.2 ECNZ Social & Political Pressures & Issues

In their book "The Power to Manage", Spicer et al. (1991) discussed various challenges facing the newly formed ECNZ, and represented them within a diagram which bears a striking resemblance to my framework.

In Figure 3.5.2.1 the layout is similar to the categorisation framework designed for my study (see Figure 3.4.1.1), with players around the outside, and issues in the centre. Here, ECNZ (representing the newly corporatised SoE portion of the electricity sector as at 1991) occupies a central spot as the focus for the various challenges (similar to the electricity sector focus of my diagram). Although this was drawn 15 years earlier, and despite my not discovering this diagram until well after mine was complete, significant overlap in the selected categories may be observed.

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[257] Source: Gavin (2010:66). This diagram contained no attribution in Gavin (2010:66), and did not appear in Gavin (2007), so I assume that this was the first time it was published.
[258] Gavin (2010:74).

This diagram thus provides a certain level of reassurance to the relevance of my selected influences upon the electricity sector, as well as my style of presentation.
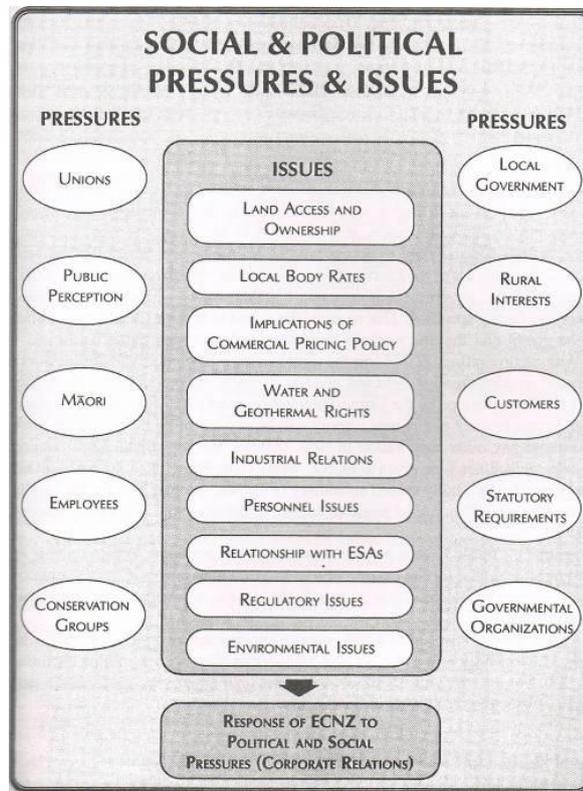
Figure 3.5.2.1 – Social & Political Pressures & Issues[259]

When compared with my framework (see Figure 3.4.1.1), it can be seen that matching categories (mine in brackets where differently named) include unions & industrial relations (workers & unions), public perception (political imperatives, psychology, & marketing), Māori (tangata whenua), employees & personnel issues (workers & physical safety), conservation groups (NGOs), local government & local body rates (local bodies), rural interests (agriculture), customers (households), statutory requirements, commercial pricing policy, relationship with ESAs, & regulatory issues (electricity policy & regulation), governmental organisations (government), land access & ownership (property rights), water (commons), and environmental issues.

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[259] Source: Spicer et al (1991:95).

Furthermore, although there are no arrows drawn in Figure 3.5.2.1 (as there are in my Figure 3.4.1.1), Spicer did describe relationships within the text, especially between selected player and issue categories[260]. Examples include local government with local body rates, unions with industrial relations, employees with personnel issues including safety, conservation groups with environmental issues and water rights, public perception with the implications of commercial pricing policy (as well as the broader category of corporate relations not listed above, but which matches well with my media & publicity categories).

This diagram was intended to serve a different purpose from mine, in that it was provided at the start of a book chapter primarily to illustrate and guide a discussion of how ECNZ tackled each of these challenges in turn. Nevertheless Figure 3.5.2.1 provides a useful comparison which visibly supports the style of categorisation framework used in my study. Furthermore, although the media was not explicitly mentioned within the diagram, the resulting discussion within the book frequently centred around the broader concern of corporate relations, which by definition included the media.

3.5.3 Comparative Policy Agendas Project

The comparative policy agendas project (CAP)[261] is an ongoing global longitudinal content analysis study by policy topic involving a large number of universities in 15 countries. It systematically (by year) collects and categorises a number of different printed (and more recently online) materials, such as bills, parliamentary questions, and randomised samples of newspaper stories, based upon a common set of topic and sub-topic codes[262]. It does not analyse coverage implications, but simply compiles lists of policy areas, measures how often each is referenced (by source), then makes this data available for other studies[263]. New York Times (NYT) policy references are sampled as part of this project.

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[260] Spicer (1991:94-95).

[261] http://www.policyagendas.org/ and http://www.comparativeagendas.org/.

[262] Baumgartner et al. (2006).

[263] For example Jones & Wolfe (2010) used data provided by the CAP project.

The NYT coding schedule includes the twenty major topic headings of Agriculture, Banking & Commerce, Civil Rights/Liberties, Defense, Education, Energy, Environment, Foreign Trade, Government Operations, Health, Housing & Community Development, International Affairs & Aid, Labor, Employment & Immigration, Law Crime & Family, Macroeconomics, Public Lands, Science & Technology, Social Welfare, Transportation, and Additional Topics. Each major topic contains between 6 and 20 sub-topics. For example, the "Energy" topic (code 8) is divided into General, Nuclear, Electricity, Gas & Oil, Coal, Renewables, Energy Conservation, R&D, and Other. The "Environment" topic (code 7) covers General, Drinking Water Safety, Waste Disposal, Hazardous Waste and Toxics, Air Pollution, Recycling, Indoor Environmental Hazards, Species and Forest Protection, Waterways Pollution, Conservation, R&D, and Other[264].

Comparing these categories with those in my model, it can be seen that the categories are rather differently structured and named. My study focused on the electricity sector and so topics relating to electricity formed the starting point. However as the study progressed I encountered electricity within articles about all kinds of other topics, and so, for completeness, my categories were expanded to include many wider policy concerns. These grew to encompass many of the topics listed above, but on a more multi-dimensional scale and with only minor adjustments to my original model (discussed further in the categorisation section of the research design chapter).

Amid calls for standardisation of categorisation frameworks to improve study comparability[265], the global CAP project admirably responds to that need. However, there is also (arguably) an ongoing requirement for refinement and expansion of the categories, and once older categories have become entrenched this can be difficult to progress. It is important to remain open to improvement in category definitions and relationships, and to assign them in such a way as to allow maximum flexibility for future studies. The examination of, and search for, suitably appropriate generic

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[264] Baumgartner et al. (2006).
[265] E.g. Shoemaker & Reece (1990:652).

categorisation structures has been a key component of my study and there is scope for my work to contribute to future categorisation decisions for projects such as CAP, as well as to contribute New Zealand data to that project.

3.5.4 Statistics New Zealand and MED

Statistics NZ electricity figures (compiled by MED) included sector differentiation when presenting different types of measurements, e.g. for consumption and pricing.

The simplest division arose within the pricing statistics for International Energy Association (IEA) figures which were split only between industrial and residential, see Figure 3.5.4.1. My model reflected this division by separating residential consumption and business consumption, and alternatively by selecting appropriate player categories when required.
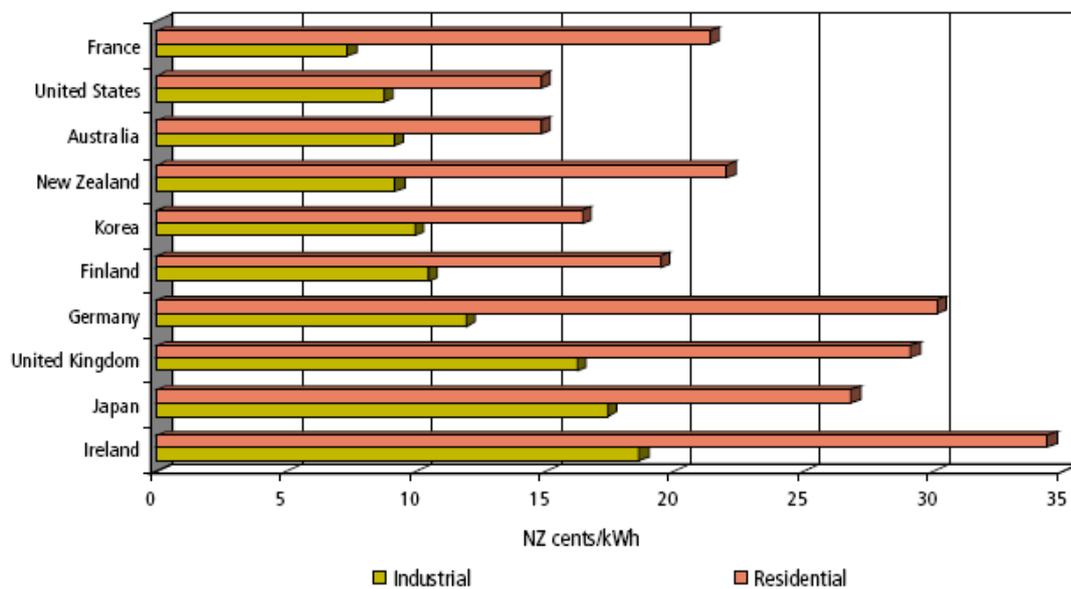
Figure 3.5.4.1 – International Electricity Prices Compared (IEA)[266]

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[266] Source: MED (2008:37).

Electricity Consumption by Sector[1]
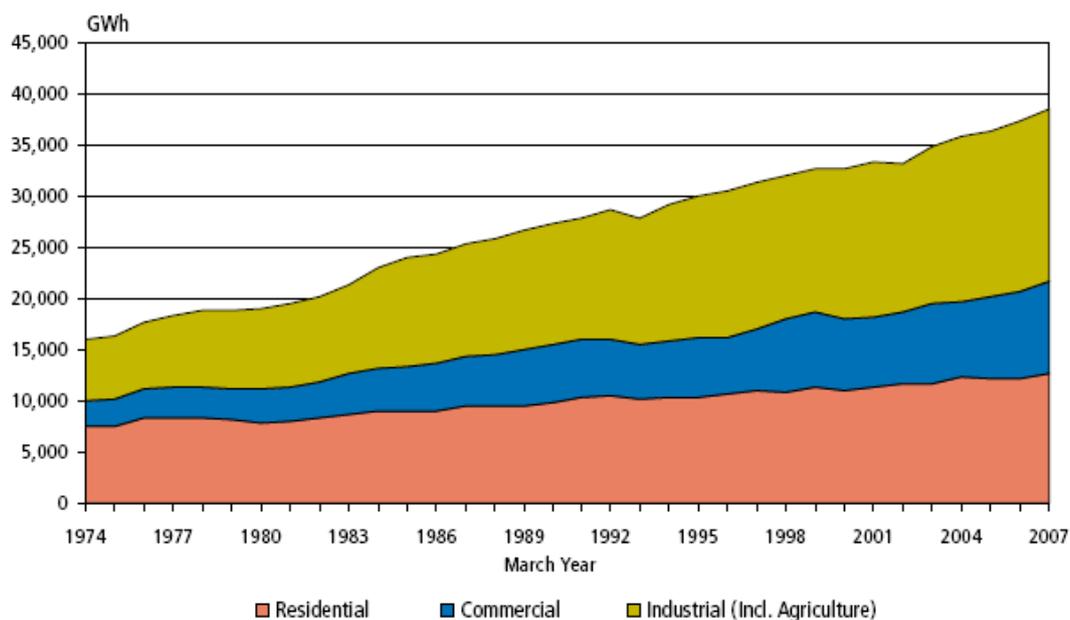
Figure 3.5.4.2 – Electricity Consumption by Sector[267]

Electricity Consumer Prices (Real)
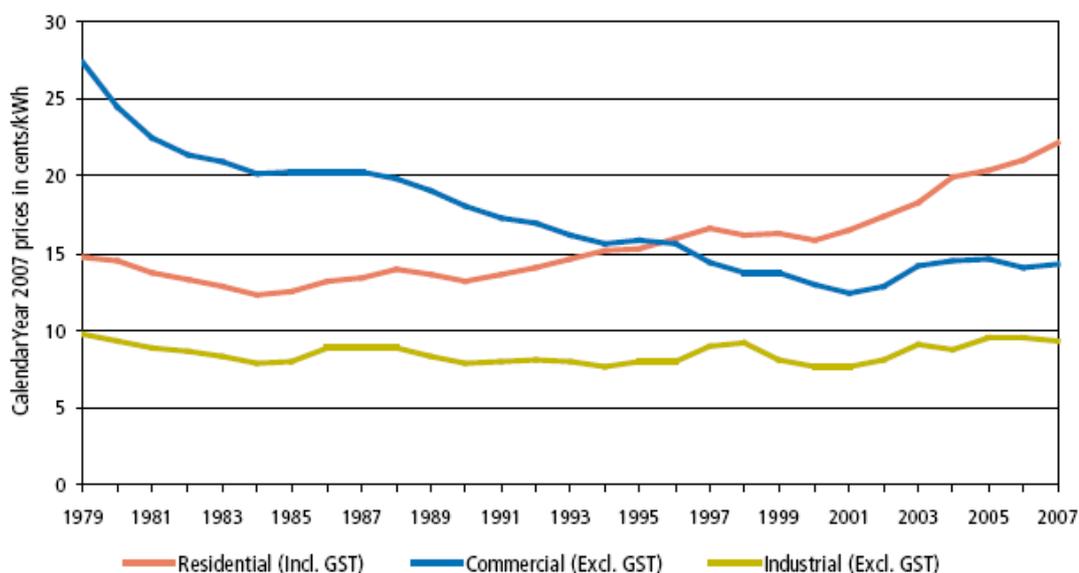
Figure 3.5.4.3 – Electricity Consumer Prices (Real)[268]

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[267] Source: MED (2008:29). Also MED (2008b:113).
[268] Source: MED (2008:31).

The most frequently reported sector differentiation was a division into residential, commercial and industrial, see Figures 3.5.4.2 and 3.5.4.3. In my model, this third commercial category broadly aligns with light industry and commercial.

The three categories illustrated in the previous examples were the most commonly used by MED when describing comparative statistics for the electricity sector, but when discussing the energy sector as a whole additional classifications were employed, as shown in Figure 3.5.4.4.

Total Energy Consumption by Sector
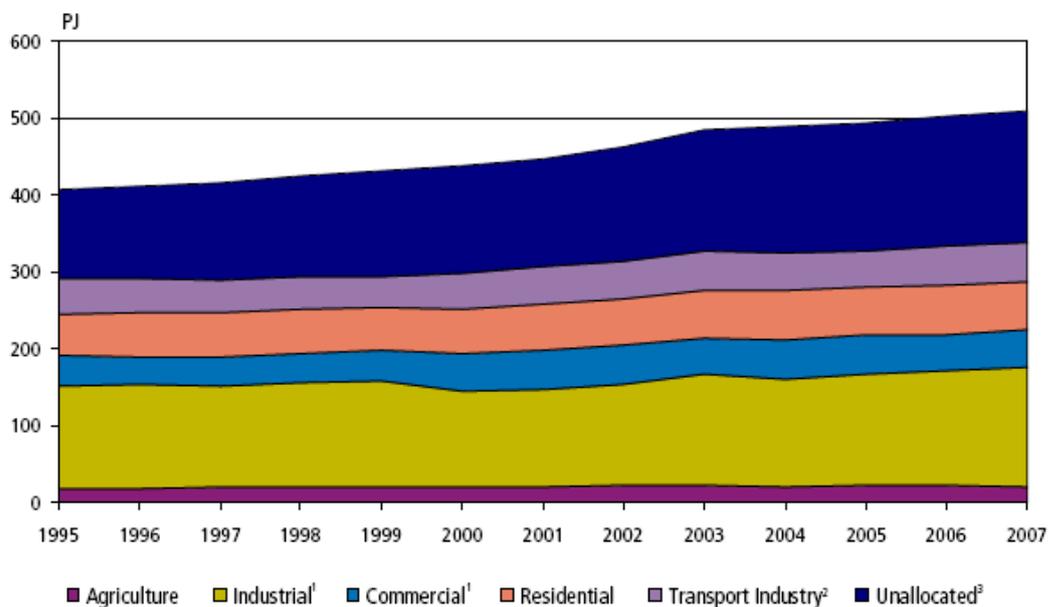
1 Excludes fuel used for cogeneration.
2 Refers to fuel sold to freight and transportation companies.
3 This is assumed to be principally transport and refers to fuel sold through all service stations and other independent delivery services (e.g. marina refuelling facilities and farm delivery services).

Figure 3.5.4.4 – Total Energy Consumption by Sector[269]

Here MED has divided business into the four categories of agriculture, industrial, commercial and transport. Unallocated is also mainly transport (see note 3 in Figure 3.5.4.4). These categories are similar to those in my model (Figure 3.4.1.1), except that I have added four more, forestry (subset of agriculture), coal mining (subset of

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[269] Source: MED (2008:9).

industrial), oil & gas (subset of industrial), and finance & insurance (subset of commercial).

Within the Energy Data File[270], additional electricity consumer classifications were specified using the new ANZSIC classification system. In Table 3.5.4.1, the industrial and commercial classifications for electricity consumption are split further into 45 separate lower level sector classifications. "Industrial" dominates with 30 detail lines (on this page), and "Commercial" has 15 detail lines (on the next page).

Table 3.5.4.1 – Electricity End Use for the year to March 2007[271]

	ANZSIC	Consumption MWh
Industrial of which:		16,824,644
Agriculture, agricultural services and hunting	A01-A02	1,491,804
Forestry and logging	A03	95,000
Commercial fishing	A04	127,048
Coal mining	B11	47,467
Oil and gas extraction	B12	14,705
Other mining and quarrying, and services to mining	B13-B15	261,473
Meat and meat products	C211	742,194
Dairy products	C212	794,160
Other food processing; beverages, malt and tobacco products	C213-C219	618,464
Textile, clothing, footwear and leather	C22	164,698
Log sawmilling and timber dressing, and other wood products	C231-C232	2,077,800
Paper and paper products	C233	1,378,852
Printing, publishing and recorded media	C24	192,394
Petroleum refining	C251	269,041
Petroleum and coal products	C252	4,186
Chemicals and chemical products	C253-C254	160,125
Rubber and plastic products	C255-C256	356,316
Non-metallic mineral products	C26	242,132
Iron and steel	C271	1,353,112
Basic non-ferrous metals[4]	C272	5,172,741
Basic non-ferrous metal products	C273	18,671
Metal products (other)	C274-C276	131,398
Transport equipment	C281-C282	32,689
Photographic and scientific equipment	C283	22,946
Electronic, electrical and industrial equipment and appliances	C284-C286	203,609
Other manufacturing	C29	304,960
Electricity supply	D361	99,662
Gas supply (including LPG and CNG)	D362	10,640
Water supply, sewerage and drainage services	D37	210,799
Construction	E	225,558

	ANZSIC	Consumption MWh
Commercial of which:		8,989,634
Wholesale and retail trade	F-G	2,587,702
Accommodation, cafes and restaurants	H	1,042,263
Road freight	I611	55,434
Road passenger	I612	19,998
Rail	I62	88,902
Water	I63	20,522
Air	I64	91,248
Other transport, and services to transport	I65-I66	240,561
Storage	I67	181,052
Communication services	J	417,086
Finance, insurance, property and business services	K-L	1,451,884
Government (including foreign), administration and defence	M	837,234
Education	N	652,893
Health and community services	O	593,438
Cultural, recreational, personal and other services	P-Q	709,417
Non-Residential[5]:		25,814,278
Residential:		12,731,218
Total Retail Sales:		38,545,496

Notes:
[1] Cost figures provided here may not be totally accurate for reasons outlined on page 3 of the *Energy Data File*. While absolute values for these factors are at least indicative, inter-year movements in such factors that can be obtained from comparison of Tables G.5a-G.5d should be viewed with caution.
[2] Note that on-site cogeneration is not included in this end use summary.
[3] Some financial information has been estimated based on the given average March year charge for the relevant industry (by ANZSIC classification).
[4] Note that some energy costs are estimates.
[5] "Non-Residential" includes commercial and industrial sectors.
Inter-year comparisons of individual sectors by ANZSIC code require caution due to the method used to collect the information, which relies on retailers to provide best estimates on what their customers main activities relate to, meaning figures by sector can vary considerably year on year.

It is evident from Table 3.5.4.1 that the largest consuming industrial and commercial sub-sectors in the financial year to March 2007 were, in order of reducing consumption, non-ferrous metals[272] at 5,712 GWh (13% of the total), wholesale and retail trade at 2,588 GWh (7%), timber processing at 2,078 GWh (5%), agriculture at 1,492 GWh (4%), finance at 1,452 GWh (4%), paper production at 1,379 GWh (4%), steel at 1,353 GWh (4%), and hospitality at 1, 042 GWh (3%). Note that the category "dairy products" described processing plants (dairy factories), but dairy farms were included under agriculture. Dairy farming was a reasonably high user of electricity (for milking sheds), so as New Zealand continued to intensify dairy production over this period it would have been interesting to see the dairy component of agriculture separated out within this coding system.

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[270] MED (2008).
[271] Source: MED (2008:114-115).
[272] Rio Tinto's Comalco aluminium smelter at Tiwai Point.

For comparison, the categories for gas end use in 2007 are listed in Table 3.5.4.2. In 2007 commercial gas use of 5,208 GJ and residential gas use of 5,611 GJ were almost insignificant when compared with industrial gas use of 151,666 GJ. It is also evident that the use of gas for electricity (strangely combined here with gas and water) was the largest single line figure at 95,377 GJ, comprising more than half the industrial total, and more than half of the grand total of 162,485 GJ (almost all industrial).

Table 3.5.4.2 – Gas End Use for the calendar year 2007[273]

	ANZSIC	Observed consumption GJ (000)
INDUSTRIAL of which:		151,666
Agriculture, forestry and fishing	A	1,805
Mining	B	221
Food, textile, footware and leather	C21 - C22	11,395
Wood & paper products, printing and publishing	C23 - C24	6,231
Petroleum, coal and chemical products[2]	C25	31,091
Metal, non-metallic, machinery products and other manufacturing	C26 - C29	5,420
Electricity, gas and water[R]	D	95,377
Construction	E	126
COMMERCIAL of which:		**5,208**
Wholesale and retail trade	F, G, H	1,397
Transport and storage	I	248
Communication services	J, K, L	355
Government (including foreign), admininstration and defence	M	340
Education, cultural, recreational and personal services	N, P, Q	1,569
Health and community services	O	1,299
NON-RESIDENTIAL		**156,874**
RESIDENTIAL		**5,611**
TOTAL SALES[3]		162,485

[1] Residential average prices include GST. Industrial and commercial average prices do no include GST.

[2] The ANZSIC category C25 includes non-energy uses as well as energy sources for petroleum refining and the production of petroleum and coal products, fertiliser, industrial gases and synthetic resin, organic industrial chemicals, and inorganic industrial chemicals.

[3] Total market natural gas prices are a weighted average price, based on information provided by the retailers of natural gas. The average price includes GST for the residential sector and excludes GST for the commercial and industrial sectors.

[R] = Revised figures.

The number (14 in all) of singular classifications (listed beneath industrial and commercial) for gas consumption in Table 3.5.4.2 is only approximately one third of the number (45 in all) that were listed for electricity consumption in Table 3.5.4.1 further up.

[273] Source: MED (2008b:86).

Gas was unique among NZ fossil fuels in that it was not imported or exported, and because it was primarily transported by pipeline it was only available in the North Island (not the South Island). However, as the Maui gas field was declining, discussions were underway about importing LPG or CNG, both for electricity generation and for reticulated use. These options were raised within the media articles being studied.

The detailed Energy Data File classifications listed above are provided for information. These were not reflected in the initial framework model derived earlier in this chapter (which was at a higher level), but they did bear some similarities to the more detailed divisions which arose when further sub-categories for organisations were added, as described in the upcoming research design chapter.

One clear difference between my categories and those of the MED reports was the way classifications were assigned. For the MED reports, organisations assigned the category themselves and could only assign one. Within my categories I manually assigned one or more classifications to each organisation, based upon information provided in media articles, augmented by further brief research if necessary. In other words, in my data the assignations were external rather than internal, and multiple assignations were permitted.

3.6 Conclusion

The categorisation framework progressively constructed in this chapter was designed to illustrate the existence of a multiplicity of practical and theoretical influences surrounding and acting upon the electricity sector, as well as to crucially provide a starting point for investigating the way that the various components were portrayed within a set of media articles.

The model described here includes a number of <u>players</u> (people and organisations) and <u>issues of concern</u> (events and concepts). Analysis of the former group will provide an answer to the first thesis question[274] by finding the players which feature

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[274] See section 1.2.

most prominently in the media, and analysis of the latter group will assist with answering part of the second thesis question by identifying which issues received the most media coverage.

This thesis has an electricity focus, but all categories were deliberately drawn broadly and inclusively to allow parallel application to other fields, such as the comparable studies which were examined in the last two chapters. Comparisons with categorisations used for other models and in related applications showed my constructs to be reasonable and useful for this purpose, as well as potentially useful for others.

While not itemised in detail within this model, policy (represented in Figure 3.4.1.1 by just one rectangle) was the third perspective under study, and communication (represented by the media group) was the fourth.

Electricity public policy acted upon the electricity sector portion of the diagram, according to influence from the other participants in the diagram. Therefore, alongside an examination of the players and issues already introduced, an examination of a number of electricity-related policy concepts was also undertaken. These policy items will be described further in the next chapter.

Chapter 4 – Research Design

> *So difficult it is to show the various meanings and imperfections of words when we have nothing else but words to do it with. - John Locke, philosopher (1632-1704).*[275]

4.1 Introduction

This chapter describes the methodological process which was undertaken for this study and which directed the examination of nzherald media coverage relating to electricity public policy during 2006-2007. It is divided into 6 main sections. After the introduction the first section provides a methodology overview and the second a description of the research process that was followed.

In the third section, the newly derived key indicators are explained, and some examples given. These new mechanisms for measuring online news media coverage provided the theoretical basis for the sets of data that were ultimately counted and compared in this study, the results of which will be presented in the next chapter.

The fourth section describes the very laborious categorisation process which was undertaken in order to derive a comprehensive hierarchical set of search phrases capable of spanning all areas of interest (as thoroughly as was reasonably possible) for the selected set of articles. In the fifth section, certain features of the processing algorithms that were used for phrase recognition and data extraction are described. These searching and counting techniques were implemented in practice by the newly developed text analysis tool. Finally, in the sixth section of this chapter, article selection is covered, and then the conclusion brings this chapter to a close.

Unique methodological features of this study included –

1. A newly devised method for measuring media "exposure" of entities (players or concepts) within online media articles, based on a derived set of key indicators. These indicators identified different types of "intensity" with regards to the

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[275] Wordsmith.org. Original source unknown.

placement of the target phrase within the article, and also distinguished between explicit (actual), literal (bonus), and implicit (hidden) "coverage".

2. A customised technique for categorising and extracting the targeted phrases, to enable a simplified "reading" of the article in a fashion not dissimilar to very rudimentary artificial intelligence (but only to the extent of interpreting words and short phrases for correct classification). Unique to this method was the handling of "nick names" to enable the recognition of extended coverage of a search target over multiple sentences (in the absence of proper names).

3. Comprehensive exception handling to handle phrases (and nick names) with multiple different meanings.

4. Carefully structured hierarchical relationships between entities, including degrees of relevance, so that scores could be actively differentiated by inclusion or exclusion of closer or more distantly related entities.

5. A unique scoring mechanism for articles to practically implement the features described here. Sentence counts by entity were used to calculate quantity rankings which were added to the new prominence rankings to assign intensity scores by entity. The constructed hierarchies enabled scores to be assessed at differing "implicit" levels. The scores also enabled the determination of article "main subject", as well as article "winners" from pairs of complementary entities.

6. A new prototype text analysis tool, hereafter called ETAT[276], to implement the new measuring method, search algorithms, scoring mechanism, and data extraction technique.

These unique features will be discussed in more detail within this chapter.

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[276] Elley Text Analysis Tool.

4.2 Methodology

4.2.1 Introduction

As signaled in earlier chapters, the experimental core of this study consisted of computer-aided quantitative content analysis, undertaken upon a set of news media texts, while incorporating a critical perspective both in the design of the study and in the examination of the results. One aim of the study was to use content analysis in an innovative way to examine certain underlying features of text that are difficult to extract, and thus seldom studied. This innovative approach provides a partial response to Fürsich who, on the subject of textual analysis, expressed concern that "media scholars in the cultural paradigm are rarely involved in methodological reflection … [whereas] methodological inquiry should be on the forefront"[277].

This chapter section is divided into five main sub-sections and examines selected characteristics of the content analysis methodology, especially in relation to this study. The first three sub-sections, content analysis, computerised semantic analysis and media analysis, discuss different aspects of text analysis. The next sub-section compares this study with a typical example of media content analysis, the Global Media Monitoring Project (GMMP). The last main sub-section, limitations, acknowledges some of the difficulties inherent in this type of study.

4.2.2 Content Analysis

Content analysis[278] is the name of a social sciences methodology which normally refers to an examination of the words (semantics) or structure (syntax) of textual passages, but also includes the study of other broader (e.g. pictorial and audio) channels of communication. According to Bernard Berelson –

> In the classic sentence identifying the process of communication – "*who* says *what* to *whom*, *how*, with *what effect*" – communication content is the *what*.[279]

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[277] Fürsich (2009:239).

[278] Also called textual analysis or text analytics. Textual interpretation may also be referred to as exegesis or hermeneutics, particularly when undertaken within a historical context.

[279] Berelson (1952:13).

Klaus Krippendorff shares an early definition of content analysis –

> Webster's Dictionary of the English Language included the term [for the first time] in its 1961 edition, defining [content analysis] as "analysis of the manifest and latent content of a body of communicated material (as a book or film) through classification, tabulation, and evaluation of its key symbols and themes in order to ascertain its meaning and probable effect"[280] .

Content analysis takes many forms, from superficial examination of the literal words used, to the more subtle interpretation of meaning in the subtext. A content analysis study may collate large numbers of texts for comparison, or it may cover just one for an in-depth study. The material studied might be one of a number of types, such as an academic work, an advertisement, or a political speech. The content analysis label therefore implies the study of some sort of communication, but does not provide any further information about the type of study, which could be quantitative or qualitative, or a combination of both.

Krippendorff describes content analysis as –

1. An empirically grounded method, exploratory in process, and predictive or inferential in intent …

2. Which transcends traditional notions of symbols, contents, and intents, because, especially in an online world, "content" has moved beyond the "container" metaphor to encompass huge networks of data archives which capture and reflect entire social systems, and …

3. Which has been forced to develop a methodology of its own, as increasing data volumes, complexity of contexts, and utilisation within multiple disciplines has required creative and innovative research designs[281].

As a guide (rather than a definition), Krippendorff's model indicating the stages that make up a standard content analysis process is shown in Figure 4.2.2.1.

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[280] Krippendorff (2004:xvii).
[281] Krippendorff (2004:xvii-xxii).
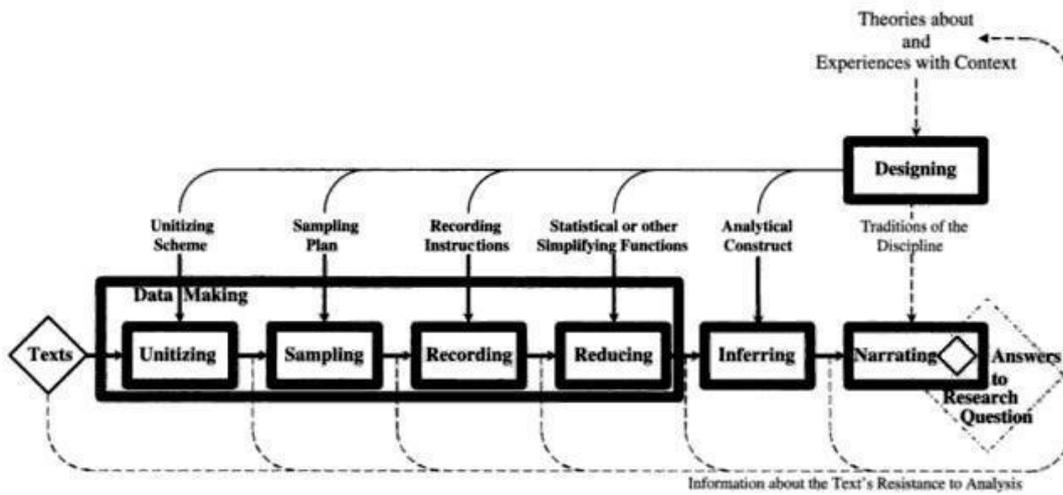
Figure 4.2.2.1 – Components of Content Analysis[282]

The stages shown in Figure 4.2.2.1 are expected to occur broadly (but not strictly) consecutively in time (moving from left to right) and all are likely to include several iterations and refinement during the course of the study[283]. Within my study, the stages shown in Figure 4.2.2.1 were applied as follows. The unitising stage involved the careful allocation of appropriate status[284] to "article", "sentence", "phrase" and "word", and a plan for how these would be counted. Once those were settled, the act of building and refining the large set of hierarchical data categories (for comparability) was able to continue over the full length of the study (due to the flexibility of the computer tool). The sampling decision was for the inclusion of all nzherald articles (which mentioned electricity) over a two year period. The recording phase was undertaken primarily with the prototype ETAT analysis tool by counting the mapped data categories as required. Some manual intervention was required during processing to handle ambiguities and assist with the determination of additional categories. The reducing (output) of the data was also performed by ETAT but was accompanied by a manual selection of the graphs and figures that would be most useful. During this simplifying stage, it is important to acknowledge

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[282] Krippendorff (2004:86).

[283] Early confirmation of study design is essential for a manually coded study involving many people, but a computer-aided study involving fewer people is likely to have more flexibility, allowing for changes and re-work later in the process.

[284] Words were the primary unit for interrogation, but the avoidance of a strict NLP "n-gram" model allowed for phrases of variable lengths to be included as "tokens".

that information is lost, but the goal of this exercise is to "reduce the diversity of text [down] to what matters"[285]. The <u>inferring</u> stage is of ultimate importance, and this is covered in full by the discussion and conclusion chapters of this thesis, the entirety of which forms the <u>narrating</u> stage.

According to Krippendorff, content analysis involves the drawing of conclusions from the available text via abductive reasoning, which means aiming to find the best possible explanation from the information provided[286]. The results must be understandable to the researcher, to their scientific peers, and to the beneficiaries of the research. It also must be rigorous, and be designed to answer designated research questions about "particular unobserved phenomena"[287].

4.2.3 Computational Semantic Analysis

In 1986 Richard Frisbie set out to improve reliability and validity in the coding of long answers to evaluation survey questions, and found that statistically verifiable advantages could be obtained by using "powerful microcomputer-implemented techniques"[288]. He found that computers were able to assist by identifying key words and by sorting responses appropriately, which improved operator coding consistency. Of course the "powerful" computers of 1986 have since been exponentially superseded. Krippendorff observes that –

> The increasingly widespread availability of electronic, and hence computer-readable, texts concerning virtually everything that matters to society and its members has moved content analysis, particularly computer-aided text analysis, into the centre of how society examines itself[289].

However, within social science research a move from manual coding to mostly or fully computer-based coding changes the paradigm. Because a computer's operations are perfectly reproducible, but it is extremely difficult to program a computer to "read" the text in the same that a human would, it follows that "the use

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285 Krippendorff (2004:85).
286 Krippendorff (2004:259).
287 Krippendorff (2004:260).
288 Frisbie (1986:2).
289 Krippendorff (2004:xiii-iv).

of computers in content analysis invokes a shift in methodological emphasis, from solving the human problem of achieving reliable coding for large volumes of text at a reasonable rate to solving the computational problem of preserving relevant readings of the text". In other words "the use of computers in content analysis is limited by the difficulty of achieving semantic validity". Two suggested mechanisms to minimise this obstacle are to use computer aids within "highly specialized contexts", and within "small intermediate steps"[290]. My study incorporated both of these mechanisms: firstly by selecting a set of matched-format media articles, and secondly by carefully selecting the particular types of assistance provided by the automation and allowing repeated manual process refinement at all stages, accompanied by frequent manual checking.

Within the field of artificial intelligence, "computational linguistics" and "natural language processing" (NLP) are both terms that are used to describe the study of processes which seek to automatically interpret, or determine meaning from, human text. Computational lexicology emphasises the dictionary categorisation aspect[291], and most NLP processes are described as either "lexicon" based or "learning" based, while a combination of the two has the potential for optimal effectiveness. ETAT incorporated aspects of both of these approaches: firstly by depending upon a large corpus of hierarchically related words and phrases for each required category, and secondly by incrementally adding to this customised lexicon (or taxonomy) by using carefully constructed search routines which could recognise and automatically classify words and phrases in a (limited) number of different ways, based upon their context. This included named entity recognition (NER). Grouping related language structures by meaning in this way is a form of semantic analysis.

Denotation is the literal explicit meaning of a word or phrase, and connotation is the cultural or emotional "baggage" that may accompany that word or phrase. Ways in which my study sought to refine traditional methods of identifying explicit denoted meaning were by a) the handling of nick names (such as he, she, "the company" and

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[290] Krippendorff (2004:260).
[291] An excellent example is WordNet - http://wordnet.princeton.edu/

it, also called co-reference resolution or computational anaphora[292]), and b) the handling of exceptions by context (described as linguistic pragmatics or word sense disambiguation). Ways in which my study sought to seek additional connotative and latent (as well as invisible and implicit), meanings from the text were by a) linking related entities together in relational hierarchies (such as companies with their owners and spokespeople), b) the identification (where possible) of the emotional overtones of words (called sentiment analysis), and c) emphasis arising from placement within the article. Other common NLP techniques which ETAT was able to incorporate were sentence breaking, word segmentation, topic segmentation, and automatic relationship extraction (to a certain extent). All of these techniques will be further described later in the chapter.

NLP has many extremely complicated aspects, especially when applied to the broad understanding and production of human-style conversation. However, when NLP is applied to the task of enhancing codified quantitative content analysis, only a subset of NLP techniques are required. The advantage of the categorisation approach (for this type of research) is that a full interpretation of each sentence is not necessary, thus avoiding many of the deeper challenges inherent in NLP.

In classical categorisation, the categories are clearly defined, mutually exclusive and collectively exhaustive. On the other hand, fuzzy set theory allows objects to belong to one or more groups, in varying degrees of fitness. My study incorporated conceptual clustering which is a simplified form of fuzzy set theory, allowing entities to belong to multiple categories, but in my case degrees of fitness were not incorporated at entity level. Instead, a simpler device was operationalised by the inclusion or otherwise of hierarchically related entity levels at reporting time.

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[292] According to Botley & McEnery (2000:3) "anaphora has been of great interest to computational linguists, because of the immense challenges that anaphora presents for natural language processing. Identifying the correct or most probable antecedent of an anaphoric proform is difficult for a computer to achieve, and many complex algorithms have been proposed and implemented, …. However, for now, a computer system that can resolve all anaphors is effectively some way off".

4.2.4 Media Analysis

When studying the media, content analysis is particularly appropriate because "content analysis can provide some of the most convincing data for the study of media and politics"[293]. Furthermore, the distinctive structural and formatting characteristics of traditional news articles (see section 4.6.3) make them particularly suitable for high-volume computer-aided quantitative analysis.

As already discussed in chapter 2, media articles have long been a popular data source for content analysis research of various types[294]. Internationally, media analysis research has traversed a variety of topics, and most are motivated by a search for media influence (or conversely, influence upon media)[295]. This large body of work presents a widespread acknowledgement of the suspected powerful role that media has played, and still plays, in shaping public opinion[296].

Sometimes the target of media research is a particular media organisation or genre (judged by their published media content), and conclusions naturally incorporate implications for the perceived impact or influence on the audience. For example, critical discourse analysis (CDA) has been used to critique British journalistic practice from the perspective of unbalanced coverage of the Israeli-Palestinian conflict[297], and to accuse the Sun newspaper of racism[298]. Television violence has been an oft examined phenomenon, where various studies have attempted to link broadcast violence with violent episodes or trends within society at large[299].

Other media studies have used content analysis or CDA to assert or to suspect media bias by examining the text of media articles. In some studies seeking evidence of racial or political prejudice, it has been possible to perform superficial quantitative analysis of textual content by counting selected stereotypical words

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[293] Oates (2008:210).
[294] Goode & Zuberi (2004).
[295] E.g. Pirkis et al. (2001); GMMP (2010).
[296] McCombs & Laidlaw (2008).
[297] Philo (2007).
[298] Van Dijk (2000).
[299] E.g. King et al. (2003); Gerbner (1970), (1998).

and/or changes in such counts over time[300]. A good example of critical media content analysis is provided by the longitudinal GMMP project.

4.2.5 Global Media Monitoring Project

The Global Media Monitoring Project (GMMP) has been assessing gender balance in the media in many countries[301] across the globe for one whole day every five years since its commencement in 1995[302]. Although gender is not a main focus of my study, gender did arise as a parameter of incidental interest, and gender results are reported in chapter 5, where they are compared with GMMP results.

GMMP is a large quantitative study seeking signs of media influence, with some similarities and differences to my study.

As the GMMP project was coded entirely by hand, a large number of people were involved and a huge amount of monitor training was required in an attempt to obtain consistent results for all countries and across the different news media (TV, radio, newspaper, online). By comparison, my electricity study was performed entirely electronically, by one person, in one country, for one publisher, on one medium, and covered a two year period rather than one day. However my study used a methodology which could be extended to conditions similar to those of the GMMP study. It is possible that GMMP researchers could consider the adoption of an electronic solution, at least for their subset of online articles, in future studies.

In the GMMP study, all radio and television bulletins for the day were recorded, but for newspapers only the 12 to 14 most important stories were coded. Similarly, for the internet pilot only 12 to 14 stories from the home page and news section were chosen. Stories were not chosen if they were more than 2 mouse clicks away from the home page[303]. Such filtering was not applied to my electricity study, which used

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[300] E.g. Hooks & Perera (2006).
[301] 108 participating countries in 2010, up from 71 in 1995.
[302] E.g. GMMP (2005); GMMP (2010).
[303] GMMP (2010:59).

the webpage "find" function to attempt to select every single article (for one publisher) which mentioned electricity.

GMMP noted three types of characteristics. They were a) the story, b) the journalist, and c) the people in the story (while also noting some secondary sources). My study had similar demarcations, with many category variations (e.g. source as well as reporter, organisations and other entities as well as people).

The "online" (internet) medium was a new GMMP category in 2010 and was described as a pilot study, so results for this medium were reported separately. Invitations to participate in the online study were extended to only 25 countries known to have high internet uptake[304], of which 16 took part. A total of 84 websites (8 international and 76 national) yielded 1061 news items containing 2710 subjects and 1044 reporters[305]. These totals included 6 websites from New Zealand.

The number of people found in the GMMP online study (nearly 4000)[306] was close to the number in my electricity study, even though the number of articles (about 1000) was only about a sixth the size of mine. This difference may be explained by the frequent re-appearance of prominent people in my study, which was monitoring only one country and was recording actual person names. By contrast, GMMP ignored personal identity (and thus person repetition) completely, so high profile people would have been counted several times.

GMMP findings deduced that "24% of the people … in [the] news are female"[307] and that "In New Zealand, with 32% female politicians and a female Prime Minister, only 18% of political news subjects were women"[308]. When comparing the GMMP measurement parameters used to deduce those findings with those used in my electricity study, a few points stand out. For example GMMP measured appearance and focus, with a simple binary (yes or no) score. Each person did or did not appear

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[304] According to UNDP (2009), cited in GMMP (2010:40)
[305] GMMP (2010:4).
[306] The full GMMP report was much larger.
[307] GMMP (2010:vii).
[308] GMMP (2005:37).

(in this case only appearance was relevant) and was or was not the focus of the article (as assessed by the monitor). There was no measure of "column inches" as per the Budd score (see section 4.5.2), and no alternate "frequency" or "intensity" measure available. By comparison, my electricity study used sentence counts to indicate the level of focus on each individual. My new "coverage" measure is described in sections 4.5.4 and 4.5.5. Comparisons are made between these two coverage measurement methods in section 5.4.1.

The GMMP study was undertaken by volunteers from a variety of interested organisations, but this was not seen as a negative factor because "MMA's 17 years of media monitoring experience has shown that these diverse groups do not detract from the accuracy and reliability of the data, but rather, because they have new skills to develop and their own information to gain they tend to demonstrate greater levels of commitment to the project"[309]. Four levels of consistency checks were performed and incorrectly coded results (less than 0.5%) were omitted from the study. Careful weightings were performed to determine a balanced selection of GMMP results by assigned "media band" to avoid domination by large countries. A duplicated researcher coding exercise took place in one country (South Africa), yielding a 97.7% accuracy rate[310], but GMMP acknowledged that accurate confidence limits were not available due to resourcing constraints.

Clearly the GMMP studies were undertaken because of concern about the influence of the media. The report maintained that "news media remain the major and most influential source of information, ideas and opinion for most people around the world", and that "in many countries, the cultural underpinnings of gender inequality and discrimination against women are reinforced through the media"[311].

In the report commentary the first perspective taken was one of "voice", in that the voice of women was being denied by lack of representation in the media. The second perspective arose from the understanding that the media provided a picture

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[309] GMMP (2010:60).
[310] GMMP (2010:61).
[311] GMMP (2010:iv).

of the world, in this case a skewed picture in which women were largely invisible outside the home. The consequences of this lack of voice, and this skewed picture, were claimed to be negative, for example "a lack of resources from which people must build their account of themselves", perpetuating "the tendency to ignore women or – at best – to talk about, rather than to or through women" as "normative cultural practices", and a restriction of women's "right to freedom of expression and information" by "under-representation, insufficient media coverage, and the prevalence of stereotypical information"[312].

GMMP acknowledged that the observed media behaviour was not necessarily the cause of gender inequality, but even if it was only reflecting (starkly) the existing level of power that women (as a group) held in society, the assertion was that the media was nonetheless strongly reinforcing these undesirable attitudes.

The stated purpose of GMMP was not only to report, but also to effect change, by "bringing media accountability into the struggle for gender equality"[313]. The project provided the opportunity to remind "media professionals and decision makers of policy commitments, obligations to their audiences, or statements of support for gender equality". However, the report also acknowledged that it was "immensely difficult to change either policy or practice"[314]. The first stage towards change is awareness and GMMP successfully provided this necessary illumination, thus informing and empowering the many groups taking part to be vigilant and to spread the message by for example incorporating the results into media training exercises.

My electricity study adopted a similar aim, to illuminate the picture of the world that was presented by the media; one which featured significant coverage imbalances in the realm of electricity policy, and more broadly as well.

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[312] GMMP (2010:iii).
[313] GMMP (2010:iv).
[314] GMMP (2010:iii).

4.2.6 Limitations of Quantitative Content Analysis

> *Not every thing that counts can be counted, and not everything that can be counted counts.*[315]

Concerns about the validity of quantitative content analysis studies fall broadly into three categories. Firstly, there are concerns about studying stand-alone pieces of text taken out of context (this caution applies to both qualitative and quantitative textual studies). While researchers may derive intellectual satisfaction from the act of dissecting passages of text, and from the multiplicity of interpretations gleaned therein, it has been argued that any ensuing hypotheses which are deduced from the text alone are likely to suffer from certain shortcomings[316]. In order to gain additional analytical depth relating to competing ideologies and audience perception, it is necessary to accompany media text analysis with a study (or at least an awareness) of "the social structures from which competing ideological explanations develop"[317]. In other words, it makes sense to place each text within a real world context, and to study other contributing factors such as the political climate, historical background, related events, organisational relationships, vested interests and "processes of production". Some of these factors may be constantly in a state of flux, which is why they are important, and why they may lend a more in-depth interpretation to perceived embedded meanings. In this study the contextual concerns expressed above were addressed by choosing the search phrases and keywords carefully in order to provide a direct link with the wider societal context and political climate, and by interpreting the results within the context of the electricity sector background described in chapters 2 and 3.

Secondly there are concerns about the ability of categorised extracts from the text to be able to provide meaningful semantic representations of the whole text (computer-aided analysis and manual coding validity can both face this accusation, where meaningful category selection is crucial), and to be very careful to avoid making assumptions about audience effects. Frisbie points out –

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[315] Albert Einstein quote from Calaprice (2011:482).
[316] Richardson (2006); Philo (2007).

> While computers can aid in the analysis of large bodies of narrative information like [books, films and reports], it is not a substitute for the critical, insightful, and sometimes colourful analyses and syntheses done by human experts[318].

To get around this limitation, it is important to choose research questions carefully so that they can be answered by the method chosen, and to take care with interpretations. For example, Krippendorff is clear that an inference must be justified by a suitable "warrant", meaning argument, justification, or available evidence. Conclusions for content analyses are likely to require qualification (e.g. "most likely") to indicate that they arose from abductive and not deductive reasoning[319].

Thirdly there are concerns about lack of rigour in the sampling and undertaking of the research (researcher bias comes in here). Ole Holsti notes that content analysis is "a tool which may be used badly or well, foolishly or thoughtfully, on problems ranging from trivial to important" and that one can be "struck by the number of studies which have apparently been guided by a sheer fascination with counting"[320].

Oates notes that "researchers need to tailor their projects to perform content analysis on a sample that is neither too large nor too hard to find in archives"[321], and sampling challenges can be further compounded online. Sarah McMillan closely examined many of the unique challenges of conducting different types of wide ranging content analysis on (proliferating and constantly changing) web-pages and observed that the "requirement for rigor in drawing a sample may be one of the most difficult aspects of content analysis on the Web"[322].

Fortuitously many of McMillan's online difficulties did not apply in my case because of the very specialised nature of my study. By choosing only web pages of a very standardised format, each consisting of one news article which closely

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[317] Philo (2007:175).
[318] Frisbie (1986:2).
[319] Krippendorff (2004:259).
[320] Holsti (1969:i).
[321] Oates (2008:210).

resembled a newspaper in presentation, and all from the same website, the challenges of sample selection, and of comparing a wide variety of website presentations (changing in real time) was almost completely mitigated. There were some small changes in nzherald page layouts over the period of the study but these were catered for within the analysis tool (by programming additional handling when encountered), and mostly only applied to the stripping out of advertising ("cleaning the data"), or header layouts. As this was a news site, there were minimal changes to the textual content of any page once it had been posted. Occasionally a news article was corrected or updated retrospectively but this was the exception rather than the rule, and the effect of a minor wording change was expected to be insignificant within the large sample size, and in relation to the subject matter being studied.

On computer coding Krippendorff states that "although the use of computers allows content analysts to circumvent the tedium involved in manual data handling and virtually eliminates the problem of unreliable coding, computer applications [face] other kinds of limits …"[323]. My thesis acknowledges these limitations at various places within this chapter, and the challenges of NLP have already been discussed in an earlier section.

There is one last point about the danger of skewed results. Social science research (as distinct from physical science) is sometimes attributed with "reflexivity", because researchers are unavoidably enmeshed within the social system being studied. One of the benefits of content analysis as a methodology is that it reduces (though does not eliminate) the observer effect that can be an obstacle in "real-life" social research (as well as in the physical sciences). In content analysis the original message may continue unimpeded by the act of research, whether taking place retrospectively or indeed concurrently (especially in the case of written or electronic data). However, whereas a researcher may well be completely removed from any influence over the original message, the observer effect comes into play at a later stage, in the

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[322] McMillan (2000:81).
[323] Krippendorff (2004:257).

categorisation and interpretation of results, which involves the careful placing of texts within appropriate syntactical interpretations (see section 4.4.3 for a discussion of researcher bias in relation to this study).

4.2.7 Summary

This thesis is partly descriptive, partly analytical, and partly political. Within my study of electricity public policy media coverage, there was a specific search for lack of balance, favoured players, or bias away from serious preparations for future energy shocks. Evidence such as the minimisation of environmental issues, or the underplaying of fossil fuel alternatives and energy efficiency, were considered to be of concern. To that extent, this study is critical research, and when the aim is to search for consistencies of themes and memes over time, and for the prominence (or otherwise) of people or sectors, quantitative content analysis is clearly the most suitable approach.

Frequency-based content analysis studies are relatively common[324], but there have been calls for more precise measures of content so that we can tell what people are actually being exposed to[325]. This study is a response to that call, and care has been taken to stretch the boundaries of traditional content analysis by the implementation of certain computerised NLP techniques while remaining cognisant of the limitations of the method and the rigour that is required.

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[324] Riffe & Freitag (1997) analysed 25 years of content anlysis studies within one journal.
[325] Shoemaker & Reese (1990).

4.3 Research Process

4.3.1 Introduction

This chapter section describes the research process that was followed over the course of the study. It is divided into four main sub-sections, each of which describes a different aspect of the study method.

Following this introduction, an overview of the whole research process is provided, followed by a demonstration of the process using article examples. A description of the data collection follows, covering the mechanics of day to day data retrieval. Finally the information technology sub-section introduces the way in which the collected data was processed. Data processing and data collection are touched upon only briefly in this section as they will be described more thoroughly later in the chapter, within the process algorithms and article selection sections.

After this research process section, the two sections in the middle of the chapter delve more deeply into the categorisation process and the derivation of the key indicators.

4.3.2 Overview

The dataset for this study was a collection of nzherald media articles relating to the New Zealand electricity sector, and published during 2006-2007. Each article was analysed individually, certain characteristics noted, and key phrases of interest were counted electronically using ETAT. The electronic nature of the procedure allowed for a much larger number of entities and concepts to be examined than would have been possible using a manual categorisation process, although the iterative category development process and the data checking were extremely time consuming.

Data collection was also a sizable task, as the number of articles relating to electricity was surprisingly large (see Appendix A11 for totals by month). Although the original intention had been to collect and compare articles from a number of different publishers, prohibitive volumes meant that the final study focused only on nzherald.

Nevertheless, this limitation may not have been as restrictive as it at first seemed. When Roulston canvassed 5 major New Zealand newspapers for educational policy content she found very little difference between them. It appeared they "kept one another in check" resulting in "considerable homogeneity of consensual newspaper articles bordering on 'pack journalism'"[326]. This may have been a consequence of the papers using many of the same sources (e.g. NZPA, Reuters) for their news.
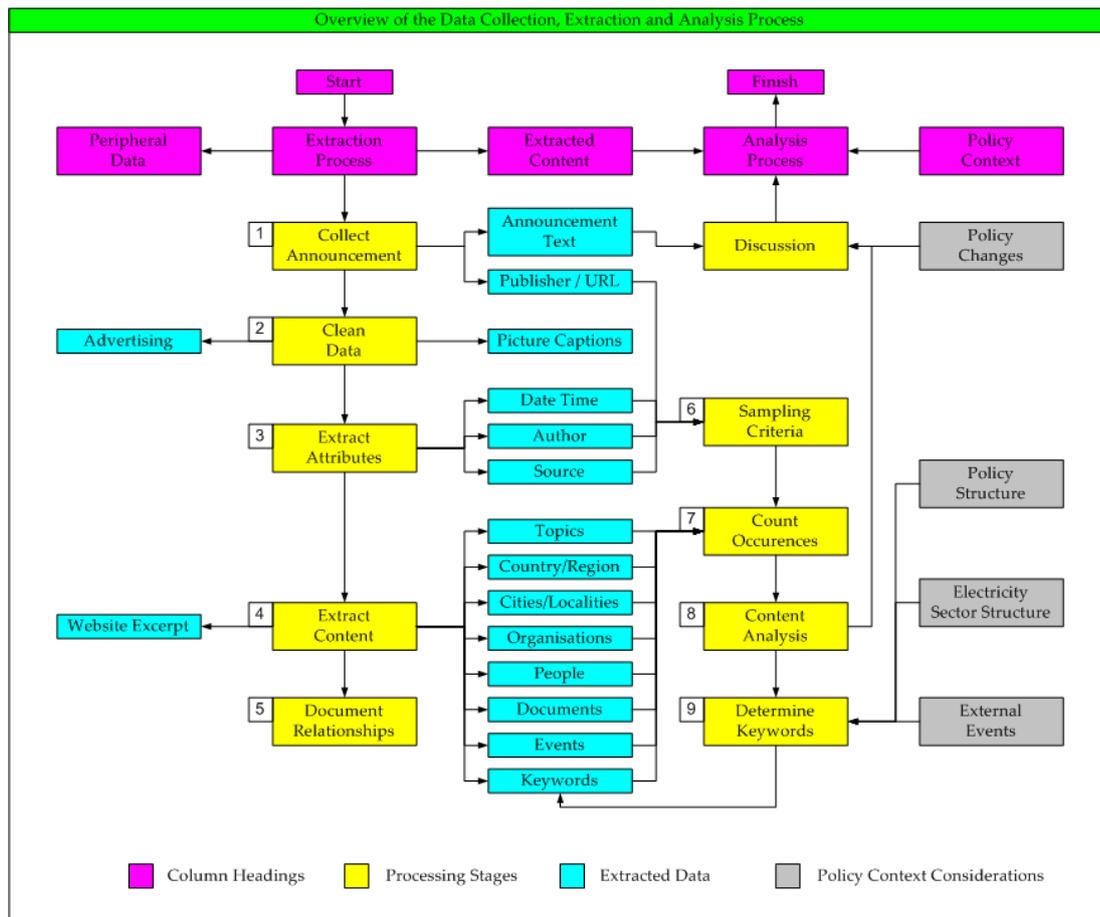
Figure 4.3.2.1 – Research Process

A diagrammatic representation of the research process is illustrated in Figure 4.3.2.1. Starting at the box called "Start", and moving down the yellow column on the left hand side, the sequence of data extraction procedures has been described by the boxes numbered 1 to 5. The blue column in the centre indicates the data elements that were extracted for each media article, during each of the extraction procedures just mentioned. Once the data had been extracted, the yellow rectangles on the right

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[326] Roulston (2005:226).

hand side illustrate the procedural steps that were followed to perform the data analysis. There was an element of iteration in this process, as keywords (and the required categories) were developed and refined, in order to produce meaningful results. The grey boxes further to the right indicate the electricity policy frames of reference, which provided guidelines for the subject matter.

4.3.3 Article Examples

To clarify what was involved in the research process, three example articles will be provided, each demonstrating various aspects of the procedure. In every case, the first stage was to copy the online article from the nzherald webpage and paste it into an Excel spreadsheet by hand. Automated "screen scraping" routines were not used to retrieve the articles for this study, but they are recommended for future studies.

The amount of "cleaning" (removal of advertising and extraneous links) an article required generally depended upon the article length (longer articles tended to contain more advertising), and date retrieved. The nzherald website underwent several formatting changes over the data collection period, which meant that its advertising layouts changed. Thus ETAT automated cleaning routines were revised and updated as needed to cater for articles which were retrospectively collected.

The first two examples both demonstrate aspects of the first three steps (yellow boxes numbered 1, 2 and 3). These are called <u>collect announcement</u>, <u>clean data</u> and <u>extract attributes</u>, in Figure 4.3.2.1. The third example demonstrates the next two descending steps (yellow boxes numbered 4 and 5) from the same diagram, called <u>extract content</u> and <u>document relationships</u>. Because the processing was largely performed by ETAT, more detail is supplied here than would have been the case for an off-the-shelf product.

Although these examples demonstrate phrase allocation into simple, well defined categories, the derivation of these categories was actually a laborious iterative process, illustrated by the circular arrows to and from the lower three yellow boxes (numbered 7, 8, 9) on the right hand side of Figure 4.3.2.1. This categorisation process will be more fully described in section 4.4.

Example 1 :

Here is an example of the processing for a short article. First the text of the article was copied from a web page and pasted into an Excel spreadsheet.

Low hydro lake levels mean higher profits

By Chris Daniels 5:00 AM Tuesday Feb 21, 2006 Share Email Print

Amid the bombshell news of the Origin-Contact merger, Contact also reported a big jump in profits for the past half year, with low hydro lake levels helping swell the coffers.

Higher wholesale electricity revenue came from better thermal generation levels and higher prices earned from the wholesale electricity market. These high prices were caused by low inflows in the hydro storage lakes during the last six months of 2005.

Contact generated 11 per cent more power during the six months than the year before and was paid an average price of $81.70 per megawatt hour - a jump of nearly 150 per cent from the same time in 2004.

Generating more power from a gas-fired station means spending more money on the fuel needed to keep them spinning, so Contact's gas bill went up from $58.6 million to $98.2 million in the six months.

But it was not just high wholesale prices that helped Contact's balance sheet last year. Recent price rises for retail electricity and gas helped push revenue from $626 million to $660 million.

Hydro storage lake levels have risen recently but levels in the principle [sic] reservoirs are still below the mean.

Example 4.3.3.1 Lower hydro lake levels mean higher profits – Chris Daniels[327]

The retrieval date was recorded into another cell on the same row, and the URL was also copied into a separate cell on the same row.

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http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=10369318

For nzherald articles, the number following "objectid=" at the end of the URL was able to be used as a unique identifier for the article.

ETAT then "cleaned" the data by removing any extraneous advertising or tags, so that recognisable attributes could be extracted. In this case the text "Share Email Print" (after the date) was automatically removed and stored in another cell (to simplify any reprocessing). Some adjustments were then automatically made (by ETAT) to assist with readability. For example, author line, date line and picture caption sometimes needed to be separated into different lines. This example had no

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[327] Source: New Zealand Herald ObjectId=10369318.

picture caption, but the author and date lines did require separation. The cleaned article is below. Note that the first three lines have changed.

Low hydro lake levels mean higher profits

5:00 AM Tuesday Feb 21, 2006

By Chris Daniels

Amid the bombshell news of the Origin-Contact merger, Contact also reported a big jump in profits for the past half year, with low hydro lake levels helping swell the coffers.

Higher wholesale electricity revenue came from better thermal generation levels and higher prices earned from the wholesale electricity market. These high prices were caused by low inflows in the hydro storage lakes during the last six months of 2005.

Contact generated 11 per cent more power during the six months than the year before and was paid an average price of $81.70 per megawatt hour - a jump of nearly 150 per cent from the same time in 2004.

Generating more power from a gas-fired station means spending more money on the fuel needed to keep them spinning, so Contact's gas bill went up from $58.6 million to $98.2 million in the six months.

But it was not just high wholesale prices that helped Contact's balance sheet last year. Recent price rises for retail electricity and gas helped push revenue from $626 million to $660 million.

Hydro storage lake levels have risen recently but levels in the principle reservoirs are still below the mean.

Once the article was in a standardised format, various "header" attributes were automatically extracted, such as publisher, date, author, source, picture caption, document link (very occasionally), and heading. This first example article had no attributed source, picture caption or document link, but the other four items were able to be recognised, extracted, and stored as follows.

Publisher : 2 NZ Herald

Article Date: 21-Feb-2006 05:00

Author: 529 Chris Daniels

Source:

Picture Caption:

Document Link:

Heading: Low hydro lake levels mean higher profits

In this example, "2" was the assigned organisation id for NZ Herald, and "529" was the assigned person id for Chris Daniels.

The article was then split into numbered sentences to prepare for keyword processing. In this study "sentence" was chosen to be the primary unit of measurement, (rather than word, phrase, occurrence, or web page line). Thus "sentence" assumed a key level of importance (see section 4.5.5).

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1. Amid the bombshell news of the Origin-Contact merger, Contact also reported a big jump in profits for the past half year, with low hydro lake levels helping swell the coffers.

2. Higher wholesale electricity revenue came from better thermal generation levels and higher prices earned from the wholesale electricity market.

3. These high prices were caused by low inflows in the hydro storage lakes during the last six months of 2005.

4. Contact generated 11 per cent more power during the six months than the year before and was paid an average price of $81.70 per megawatt hour - a jump of nearly 150 per cent from the same time in 2004.

5. Generating more power from a gas-fired station means spending more money on the fuel needed to keep them spinning, so Contact's gas bill went up from $58.6 million to $98.2 million in the six months.

6. But it was not just high wholesale prices that helped Contact's balance sheet last year.

7. Recent price rises for retail electricity and gas helped push revenue from $626 million to $660 million.

8. Hydro storage lake levels have risen recently but levels in the principle reservoirs are still below the mean.

9. Low hydro lake levels mean higher profits By Chris Daniels

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The sentence numbers were used mainly for identification and had no weighting significance, but the sentence order was important for nick name processing. The header attributes obtained earlier were added into extra sentences at the end (as can be seen above in sentence 9). These header sentences also needed to be processed for keywords, and when this happened it was helpful to process them (especially the heading) last, in order to assist with the identification of any contained nick names. The numbers of important sentences were noted in another cell, as follows.

Sentence Count: 9
Heading Sentence: 9
Lead Line Sentences: 1
Picture Caption Sentences:
Document Link Sentences:

Example 2 :

This second example contains additional header fields. In this case a picture caption at the beginning ("Roy Hemmingway") and a source reference at the end ("-Additional reporting NZPA"), as well as two authors. Articles with picture captions tended to be longer, so this example has been shortened for demonstration purposes, by removing a number of lines from the middle.

$500m Waikato power line may face delay or veto

5:00AM Friday Mar 24, 2006

By Brian Fallow and Anne Beston

Roy Hemmingway

The head of the Electricity Commission has strongly hinted it may veto or delay Transpower's planned $500 million power line from Waikato to Auckland.

Chairman Roy Hemmingway criticised the national grid operator for not looking carefully enough at alternatives.
[...]
"There's no question something must be done, we think before 2008. And if no generation is built in Auckland or north of Auckland there will need to be additional major investment," Mr Hemmingway said.

The commission will have another round of public consultation on its draft finding before issuing its final decision in July.

- Additional reporting NZPA

Example 4.3.3.2 $500m Waikato power line may face delay or veto[328]

No cleaning was required for this article and all important information was already recognisable so no line adjustments were needed. The line containing just the name "Roy Hemmingway" was able to be automatically identified by ETAT as a picture caption in this case because it was a name on its own with no terminator. Here are the extracted header attributes for this example.

Publisher : 2 NZ Herald

Article Date: 24-Mar-2006 05:00

Author: 4 Brian Fallow, 87 Anne Beston

Source: 7 NZPA

Picture Caption: Roy Hemmingway

Heading: $500m Waikato power line may face delay or veto

In the example above, 4 was the assigned person id for Brian Fallow, and 87 was the assigned person id for Anne Beston.

ETAT then separated out the sentences ready for processing, as follows.

1. The head of the Electricity Commission has strongly hinted it may veto or delay Transpower's planned $500 million power line from Waikato to Auckland.

2. Chairman Roy Hemmingway criticised the national grid operator for not looking carefully enough at alternatives.

[...]

17. "There's no question something must be done, we think before 2008.

18. And if no generation is built in Auckland or north of Auckland there will need to be additional major investment," Mr Hemmingway said.

19. The commission will have another round of public consultation on its draft finding before issuing its final decision in July.

20. Roy Hemmingway.

21. $500m Waikato power line may face delay or veto By Brian Fallow and Anne Beston - Additional reporting NZPA

Prominence information was then noted as follows.

Sentence Count: 21
Heading Sentence: 21
Lead Line Sentences: 1
Picture Caption Sentences: 20
Document Link Sentences:

It can be seen in this second example that the picture caption has its own sentence (number 20), but that the heading, author(s), and source(s) have all been combined into one sentence at the end (number 21), and this is simply called the "Heading Sentence". There were two main reasons for this. The first reason was that sentences, when recorded against the authors and sources, would be easier to check if they contained each other and the heading. The second reason was that because there was unlikely to be any overlap between these data fields, it would simplify the (later) prominence processing to group them together like this and grant each of them equivalent prominence scores within the article.

---

[328] Source: New Zealand Herald ObjectId=10374192.

Example 3 :

This third example demonstrates content extraction and relationship documentation (the yellow boxes numbered 4 and 5 in Figure 4.3.2.1).

A very short article has been selected here to keep the list of categories simple for demonstration purposes.

Mercury raises prices in Auckland region

6:00AM Tuesday Jan 10, 2006

Mercury Energy is putting up its charges from next month for 210,000 residential customers in Auckland, Manukau and Papakura by an average of 5 per cent.

Mercury says the increase will average about $4 a month.

Spokesman Mark Carter yesterday said the increase was the result of a review of the company's "competitive market position".

Example 4.3.3.3 Mercury raises prices in Auckland region[329]

ETAT split the article above into the four sentences below. This article has no attributed author or source, and no picture caption or document link.

1. Mercury Energy is putting up its charges from next month for 210,000 residential customers in Auckland, Manukau and Papakura by an average of 5 per cent.

2. Mercury says the increase will average about $4 a month.

3. Spokesman Mark Carter yesterday said the increase was the result of a review of the company's "competitive market position".

4. Mercury raises prices in Auckland region

ETAT then searched for each entity class in turn, and the results for this article are listed (and numbered) below in the following order – city, country, person, organisation, event, document, keyword, topic.

Each of the eight sets of entity search results will be accompanied by explanations, and some additional processing steps will then be described.

---

[329] Source: New Zealand Herald ObjectId=10363038.

1. City. A search for entity class <u>city</u> found the following full sentences.

NOTES for <u>Auckland</u> (City 3). Mercury Energy is putting up its charges from next month for 210,000 residential customers in **Auckland**, Manukau and Papakura by an average of 5 per cent. ... Mercury raises prices in **Auckland** region

NOTES for <u>Manukau</u> (City 44). Mercury Energy is putting up its charges from next month for 210,000 residential customers in Auckland, **Manukau** and Papakura by an average of 5 per cent.

NOTES for <u>Papakura</u> (City 45). Mercury Energy is putting up its charges from next month for 210,000 residential customers in Auckland, Manukau and **Papakura** by an average of 5 per cent.

These notes were translated into sentence numbers, which are listed below. The "C" item at the end of each line is the sentence count, and "P" item is the percentage of sentences.

SENTENCES for <u>Auckland</u> (City 3). 1^4^C2^P50

SENTENCES for <u>Manukau</u> (City 44). 1^C1^P25

SENTENCES for <u>Papakura</u> (City 45). 1^C1^P25

It can be seen from the list of cities above that "Auckland" appeared in the first sentence (1), and in the heading (sentence 4), while Manukau and Papakura each appeared in sentence 1 only. This means that Auckland was counted in 2 sentences (the "C" value), making up 50% of the article's sentences (the "P" value at the end of the line), and Manukau and Papakura were each counted in 1 sentence, representing 25% of the article's sentences.

It is at this point that the documented relationships (stage 5 in Figure 4.3.2.1) become evident. As entities (city, in this case) were found within articles, relationships between them were recorded, so that the results could be expanded to include, or grouped within, related entities when appropriate.

The "parents" of the cities (see section 4.5.4) were thus able to be calculated, giving two sentences (1 and 4, shown as "1^4") below. For practical purposes entity classifications were fairly loose descriptions, and wider localities were also included within the <u>city</u> classification (in this case "North Island").

SENTENCES for <u>North Island</u> (City 16). 1^4^C2^P50

2. Country. A search for entity class <u>country</u> found no direct notes, but country relationships with cities gave the following sentence numbers.

> SENTENCES for New Zealand (Country 1). 1^4^C2^P50

3. Person. A search for entity class person found the following notes.

> NOTES for Mark Carter (Person 2707). Spokesman **Mark Carter** yesterday said the increase was the result of a review of the company's "competitive market position".

Related sentence numbers are listed below. The "G" item indicates gender.

> SENTENCES for Mark Carter (Person 2707). 3^GM^C1^P25

4. Organisation. A search for entity class organisation found the following notes. For practical purposes wider sector groupings were also included within the organisation classification (e.g. companies and customers).

> NOTES for Mercury Energy (Organisation 1020). **Mercury Energy** is putting up its charges from next month for 210,000 residential customers in Auckland, Manukau and Papakura by an average of 5 per cent. **Mercury** says the increase will average about $4 a month. Spokesman Mark Carter yesterday said the increase was the result of a review of the **company**'s "competitive market position". **Mercury** raises prices in Auckland region
>
> NOTES for residents (Organisation 316). Mercury Energy is putting up its charges from next month for 210,000 **residential** customers in Auckland, Manukau and Papakura by an average of 5 per cent.
>
> NOTES for domestic customers (Organisation 2886). Mercury Energy is putting up its charges from next month for 210,000 **residential customers** in Auckland, Manukau and Papakura by an average of 5 per cent.
>
> NOTES for customers (Organisation 421). Mercury Energy is putting up its charges from next month for 210,000 residential **customers** in Auckland, Manukau and Papakura by an average of 5 per cent.
>
> NOTES for markets (Organisation 305). Spokesman Mark Carter yesterday said the increase was the result of a review of the company's "competitive **market** position".
>
> NOTES for companies (Organisation 419). Spokesman Mark Carter yesterday said the increase was the result of a review of the **company**'s "competitive market position".
>
> NOTES for public relations (Organisation 3384). **Spokesman** Mark Carter yesterday said the increase was the result of a review of the company's "competitive market position".

Note that public relations (Organisation 3384), in the last line above, was selected on the basis of the word spokesman[330].

A closer look at Mercury Energy is now warranted. If the notes for Mercury had been extracted only by literal name, the following notes and sentences would have been recorded, and the third sentence would have been omitted.

---

[330] Sample lists of alternate names for some entity ids are listed in Appendices A1-A8.

NOTES for Mercury Energy (Organisation 1020). **Mercury Energy** is putting up its charges from next month for 210,000 residential customers in Auckland, Manukau and Papakura by an average of 5 per cent. **Mercury** says the increase will average about $4 a month. ... **Mercury** raises prices in Auckland region

SENTENCES for Mercury Energy (Organisation 1020). 1^2^4^C3^P75

But the nick name company is used in sentence number 3 to refer to Mercury Energy. As there are no other companies in the previous sentence, this word company can safely be assumed to refer to Mercury Energy, thus increasing the sentence count for Mercury Energy[331]. Mercury's full notes thus become –

NOTES for Mercury Energy (Organisation 1020). **Mercury** Energy is putting up its charges from next month for 210,000 residential customers in Auckland, Manukau and Papakura by an average of 5 per cent. **Mercury** says the increase will average about $4 a month. Spokesman Mark Carter yesterday said the increase was the result of a review of the **company**'s "competitive market position". **Mercury** raises prices in Auckland region

The notes for all organisations (listed further above) were translated into sentence numbers, listed below. It can be seen that the "P" value (at the end of the line) for Mercury Energy is 100%, indicating that this article strongly features that company. Each of the other organisation classifications listed here were mentioned in only one sentence each.

SENTENCES for Mercury Energy (Organisation 1020). 1^2^3^4^C4^P100

SENTENCES for residents (Organisation 316). 1^C1^P25

SENTENCES for domestic customers (Organisation 2886). 1^C1^P25

SENTENCES for markets (Organisation 305). 3^C1^P25

SENTENCES for companies (Organisation 419). 3^C1^P25

SENTENCES for customers (Organisation 421). 1^C1^P25

SENTENCES for public relations (Organisation 3384). 3^C1^P25

The "parents" of each of the entities listed above were calculated, and the implicit sentences (not explicitly mentioned in the article) are listed below, in logical groupings so that the parental hierarchies are able to be followed.

---

[331] The word spokesman was another nickname for Mercury Energy so in this example either word could be used to include this sentence into Mercury's sentence count.

```
SENTENCES for Mighty River Power (Organisation 56). 1^2^3^4^C4^P100

SENTENCES for electricity generators (Organisation 475). 1^2^3^4^C4^P100

SENTENCES for electricity industry (Organisation 391). 1^2^3^4^C4^P100

SENTENCES for utilities (Organisation 2347). 1^2^3^4^C4^P100

SENTENCES for infrastructure industry (Organisation 3368). 1^2^3^4^C4^P100


SENTENCES for SOEs (Organisation 1548). 1^2^3^4^C4^P100

SENTENCES for NZ government (Organisation 11). 1^2^3^4^C4^P100

SENTENCES for governments (Organisation 310). 1^2^3^4^C4^P100


SENTENCES for electricity retailers (Organisation 476). 1^2^3^4^C4^P100

SENTENCES for retailers (Organisation 1109). 1^2^3^4^C4^P100

SENTENCES for commerce (Organisation 433). 1^2^3^4^C3^P100

SENTENCES for business (Organisation 311). 1^2^3^4^C4^P100

SENTENCES for money (Organisation 3601). 1^2^3^4^C4^P100


SENTENCES for households (Organisation 422). 1^C1^P25
```

For example, Mercury Energy (which featured in the article) was owned by Mighty River Power (above top), which was a state owned enterprise (SOE) owned by the NZ Government. That is why those organisations feature above with the same P value (100%) as Mercury had in the previous list.

Towards the bottom of the list, households is included because it was documented as a parent of residents. Similarly, the generally inclusive term money is here listed as a parent of business.

Interestingly, the word electricity did not feature in this article at all. However both electricity retailers and electricity industry were defined parents of Mercury Energy, and so they appeared in the sentence list above, providing a visible link to the topic of electricity.

While "parent" category groupings (such as electricity industry) were often reasonably self-evident, "parent" organisations were more difficult to pin down. For the purposes of this study a "parent" organisation was loosely defined as an

organisation which either owned (even in part), or received benefit from (usually financial), another organisation on an ongoing basis.

Note that these "parent" scores were not always relevant, but were available to be used for certain types of scoring, where appropriate. The parental hierarchies (implicit sentences) will be further discussed in section 4.5.4.

5. Document. A search on entity class <u>document</u> found the notes below (by full sentence). The document class was a loose classification which included items such as goals, policy themes, programmes, measures, and indicators, as well as reports, books, music, and films.

NOTES for <u>$</u> (Document 1327). Mercury says the increase will average about **$**4 a month.

NOTES for <u>prices</u> (Document 711). Mercury raises **prices** in Auckland region

NOTES for <u>charges</u> (Document 941). Mercury Energy is putting up its **charges** from next month for 210,000 residential customers in Auckland, Manukau and Papakura by an average of 5 per cent.

NOTES for <u>results</u> (Document 1289). Spokesman Mark Carter yesterday said the increase was the **result** of a review of the company's "competitive market position".

NOTES for <u>average</u> (Document 756). Mercury Energy is putting up its charges from next month for 210,000 residential customers in Auckland, Manukau and Papakura by an **average** of 5 per cent. Mercury says the increase will **average** about $4 a month.

NOTES for <u>per cent</u> (Document 1337). Mercury Energy is putting up its charges from next month for 210,000 residential customers in Auckland, Manukau and Papakura by an average of 5 **per cent**.

NOTES for <u>competition</u> (Document 782). Spokesman Mark Carter yesterday said the increase was the result of a review of the company's "**competitive** market position".

The notes list above shows that <u>prices</u> were found, but not <u>electricity prices</u>. Similarly <u>charges</u> were found, but not <u>electricity charges</u>. This article was so brief that this level of specificity was not made explicit, so even though the reader was easily able to infer it from the name of the company involved, it was more difficult for an automated routine to do the same (but note that a link with <u>electricity</u> was established earlier). Here are the sentence lists with their scores.

SENTENCES for <u>$</u> (Document 1327). 2^C1^P25

SENTENCES for <u>prices</u> (Document 711). 4^C1^P25

SENTENCES for <u>charges</u> (Document 941). 1^C1^P25

SENTENCES for <u>results</u> (Document 1289). 3^C1^P25

SENTENCES for average (Document 756). 1^2^C2^P50

SENTENCES for per cent (Document 1337). 1^C1^P25

SENTENCES for competition (Document 782). 3^C1^P25

The additional associated parent sentences below have combined explicit and implicit sentences, so the sentence list for prices now includes charges. Associated phrases are shown alongside for clarity.

SENTENCES for money (Document 1175). {'$', 'charges', 'prices'} 1^2^4^C3^P75

SENTENCES for prices (Document 711). {'charges', 'prices'} 1^4^C2^P50

SENTENCES for data (Document 1036). {'average', 'per cent', 'result'} 1^2^3^C3^P75

From prices, ETAT has assigned the same sentence lists (and scores) to money (terminology)[332], which was a parent of prices and of the dollar sign "$". Although not shown here, data was further assigned the parents information and studies, which themselves had parents investigations and reports respectively. The word competition was noted in the original list, but had no parents documented.

6. Event. A search on entity class event found the notes below (by full sentence). As can be seen in this example, the event class included some more generalised classifications such as time periods (and others, like emotions), alongside more standard events such as wars, meetings and conferences.

NOTES for increase (Keyword 29). Mercury says the **increase** will average about $4 a month. Spokesman Mark Carter yesterday said the **increase** was the result of a review of the company's "competitive market position".

NOTES for high cost (Event 736). Mercury Energy is **putting up its charges** from next month for 210,000 residential customers in Auckland, Manukau and Papakura by an average of 5 per cent. ... Mercury **raises prices** in Auckland region

NOTES for intentions (Event 611). Mercury says the increase **will** average about $4 a month.

NOTES for future (Event 286). Mercury Energy is putting up its charges from **next month** for 210,000 residential customers in Auckland, Manukau and Papakura by an average of 5 per cent.

NOTES for past (Event 287). Spokesman Mark Carter **yesterday** said the increase was the result of a review of the company's "competitive market position".

---

[332] A specific version of money (terminology) was an item in the document class, and a more inclusive version of money (including business) was an item in the organisation class.

Here are the lists of associated sentences with their scores.

SENTENCES for <u>increase</u> (Event 707). 2^3^C2^P50

SENTENCES for <u>high cost</u> (Event 736). 1^4^C2^P50

SENTENCES for <u>intentions</u> (Event 611). 2^C1^P25

SENTENCES for <u>future</u> (Event 286). 1^C1^P25

SENTENCES for <u>past</u> (Event 287). 3^C1^P25

The parents were also calculated. Displayed below are the full versions (implicit plus explicit) with associated phrases alongside for clarity, this time also with a number of extra indicators displayed along the line.

SENTENCES for <u>emotions</u> (Event 480). {'increase', 'putting up its charges', 'raises prices', 'will'} 1^2^3^4^C4^P100^R3^H1^E1^U0^D0^M2^I5

SENTENCES for <u>positive</u> (Event 557). {'increase'}
2^3^C2^P50^R3^H0^E0^U0^D0^M0^I3

SENTENCES for <u>negative</u> (Event 556). {'putting up its charges', 'raises prices'}
1^4^C2^P50^R3^H1^E1^U0^D0^M2^I5

SENTENCES for <u>future</u> (Event 286). {'next month', 'will'}
1^2^C2^P50^R3^H0^E1^U0^D0^M1^I4

SENTENCES for <u>past</u> (Event 287). {'yesterday'}
3^C1^P25^R2^H0^E0^U0^D0^M0^I2

It can be seen above, that <u>will</u> has been included with <u>future</u>, and that <u>increase</u> is considered to have a <u>positive</u> inclination.

On the other hand, <u>negative</u> has been assigned as a parent of <u>high cost</u> (which included the phrases <u>putting up its charges</u> and <u>raises prices)</u>. Thus, with two sentences each, positive and negative are equivalent for sentence count (C), percentage (P), and quantity ranking (R). However the negative phrases appear in the heading (H) and lead-line (E), giving <u>negative</u> some prominence (M), and thus a higher overall intensity (I) score of I5, compared with I3 for <u>positive</u>. <u>Negative</u>, <u>positive</u>, and <u>intentions</u> ("will") also all have <u>emotions</u> as a parent.

Explicit and implicit coverage, along with these additional indicators, will be discussed further in section 4.5.

7. Keyword. A search on entity class <u>keyword</u> found the notes below (by full sentence). The keyword entity class was used for words or phrases which did not fit neatly under the other headings. For example it was used for processes, for precise subsets of other entities, and for straight word searches.

> NOTES for <u>energy</u> (Keyword 12). Mercury **Energy** is putting up its charges from next month for 210,000 residential customers in Auckland, Manukau and Papakura by an average of 5 per cent.

The associated sentence lists, counts and percentages are shown below.

> SENTENCES for <u>energy</u> (Keyword 12). 1^C1^P25

In this case, the keyword <u>energy</u> had no direct <u>keyword</u> parent but was associated with the related <u>organisation</u> energy industry instead. Placing it in the keyword class allowed for specific exception handling in one place (for phrases such as "energy drinks") which could then be applied generically to other classes where appropriate.

8. Topic. Topics[333] were not literally searched for by phrase in the same way as city, country, person, document, event, and keyword. Instead, topic lists behaved like a master set of pre-determined (explicit) "parents" which were identified by pre-assigning one or more topics to each of those other entities.

Topics were accumulated automatically in a reverse process. First the relevant sentence lists were combined for all entities belonging to the same topic, and then the sentences were converted back into notes (to allow checking). Topic sentence lists and scores for this example are shown below.

> SENTENCES for <u>electricity</u> (Topic 5). {e.g. 'Mercury Energy'} 1^2^3^4^L0^C4^P100
>
>   SENTENCES for <u>policies</u> (Topic 11). 1^2^3^4^L2^C4^P100
>   SENTENCES for <u>energy sources</u> (Topic 26). {'Energy'} 1^2^3^4^L2^C4^P100
>
>   SENTENCES for <u>issues of concern</u> (Topic 76). 1^3^4^L1^C3^P75
>   SENTENCES for <u>political imperatives</u> (Topic 88). 1^3^4^L2^C3^P75
>   SENTENCES for <u>progress</u> (Topic 90). 1^2^4^L3^C3^P75
>   SENTENCES for <u>economics</u> (Topic 1). {'$', 'charges', 'prices'} 1^2^4^L4^C3^P75
>
>   SENTENCES for <u>players</u> (Topic 103). 1^2^3^4^L1^C4^P100
>   SENTENCES for <u>electricity sector</u> (Topic 104). 1^2^3^4^L2^C4^P100
>   SENTENCES for <u>residential consumption</u> (Topic 105). 1^L3^C1^P25

[333] Topic headings were derived from Figure 3.3.1.1. See section 4.3.3 for more detail.

```
    SENTENCES for electricity suppliers (Topic 108). 1^2^3^4^L2^C4^P100
   SENTENCES for business interests (Topic 33). {e.g. 'company'} 1^3^L2^C2^P50
   SENTENCES for household sector (Topic 113). {'residential'} 1^L2^C1^P25

 SENTENCES for communication (Topic 130). 1^2^3^4^L1^C4^P100
  SENTENCES for psychology (Topic 44). 1^2^3^4^L2^C4^P100
   SENTENCES for tone (Topic 84). 1^2^3^4^L3^C4^P100
    SENTENCES for positive (Topic 87). {'increase'} 2^3^L4^C2^P50
    SENTENCES for neutral (Topic 86). {'will'} 2^L4^C1^P25
    SENTENCES for negative (Topic 85). {e.g. 'raises prices'} 1^4^L4^C2^P50
   SENTENCES for angle (Topic 136). {'Spokesman'} 3^L3^C1^P25
  SENTENCES for mechanism (Topic 122). 3^L2^C1^P25
   SENTENCES for messaging (Topic 71). 3^L3^C1^P25
    SENTENCES for marketing (Topic 138). {'Spokesman'} 3^L4^C1^P25
```

The topics listed above are grouped into their sub-hierarchies beneath each master category name. The "L" value in each list indicates the level in the hierarchy, and each line is indented accordingly. Only topics which were found are listed so there may be gaps in the hierarchies. A few phrases have been inserted to indicate where the sentence counts came from. Topics higher in the hierarchy accumulate phrases from below, adding to any of their own.

The tone of this article was neutral by sentence count but was considered to be slightly negative once prominence indicators were taken into account, as discussed earlier under the event heading for this article example. More information about these hierarchies and scoring methods will be provided sections 4.4 and 4.5.

9. New Entity Extraction

Where possible, new entities were extracted automatically (based upon sets of pre-determined recognisable keywords appearing in proper case[334]), and assigned any

---

[334]The set of assumed person names (iteratively built by ETAT from found names) was too long (5172 names altogether) to be usefully presented within this document. It was divided into ambiguous names (such as Banks) and unambiguous names (such as Margaret), where ambiguous names made up about 5% of all names. Unambiguous names always triggered an "automatic person add" if located within a pair of proper case words (thus enabling the capture of the other name), but ambiguous names would only trigger an "automatic person add" if accompanied by another recognised name. Each individual name was defined as forename, surname, either, or unknown; and as male, female, either, or unknown. Honorifics assisted with gender determination and gender assisted with nick-name determination (he, his, she, hers, etc.). Names and their attributes were able to be assigned manually or automatically as the lists grew over the course of the study. Sets of keywords for each of the other entity classes are listed in Appendix A10. These behaved slightly differently in that

known attributes. In this example, the following new person entity was able to be added automatically.

> MESSAGE: At least one word was recognised as a name so Mark Carter was added as a Person.
>
> MESSAGE: Gender set to M from First Name for Mark Carter.

Within ETAT, the search for new entities occurred in the first pass after all known entities had already been extracted, but prior to the assigning of sentences (described earlier), so as to allow processing to continue as normal for the new entity.

10. Other Relationships

Where possible, inter-entity relationships (such as person to organisation, document to person etc.) were extracted and documented. This information was sometimes difficult to extract automatically using ETAT, and was augmented manually where necessary.

In the example above it can be seen that person "Mark Carter" was a "spokesman" for "Mercury Energy". This information was extracted automatically and recorded with the following message.

> MESSAGE: Description 'Spokesman.' for Mark Carter (Person 2707) extracted from - **Spokesman** Mark Carter yesterday said the increase was the result of a review of the company's "competitive market position".

In this case "Mercury Energy" was not extracted automatically because it did not appear in the sentence close to the person name, but in another article Mark Carter was described as "Mercury Energy consumer markets general manager". This designation was automatically added to his description when that article was processed, making manual adjustment of his description unnecessary, and demonstrating the usefulness of a large sample size.

> Mark Carter (Person 2707). Mercury Energy consumer markets general manager. Spokesman.

---

they would trigger a suggested add within ETAT (requiring manual confirmation) if they were part of a proper case phrase (of any length).

With this extra information, a number of attributes and relationships were able to be automatically extracted for Mark Carter. In addition, because the organisation Mercury Energy had already been (manually) associated with the country "NZ", it was able to be noted (against Mark Carter) that he worked for a New Zealand company. When such assumed relationships were assigned automatically, they were accompanied by messages such as the ones below, to allow user checking for reasonableness.

```
MESSAGE: New org_id list extracted for Person 'Mark Carter'.
3384^1020^305^585^418
Spokesman^Mercury Energy^markets^manager^consumer

MESSAGE: New org_country_id list extracted from description for Mark Carter. 1 NZ
```

A list of person designations (such as "spokesman") that were searched for within sentences (to use for describing people) was created for use by ETAT, but not all of these were associated with classifications in the organisations list. In this particular case Mark's description had a number of associations with organisations (or organisational groupings), as can be seen above.

11. Leftovers. Once all words of interest had been extracted from the text, the leftovers were made available for checking, to make sure that no words of interest had been overlooked. The leftovers for this article looked like this.

```
         is            from        for 210,000              in        ,
and       by an    of 5         .
    says the               about $4 a month.

                 the         the    of a review of the      's "
position".
          in
```

Certain statistical counts for this article were then calculated, as follows.

```
Line Count : 5
Sentence Count : 4
Word Count : 61
Character Count : 411
Leftover Count : 25 words
Leftover Percent : 40%
```

In this case the line count was one more than the sentence count. This was because the date line was counted in the line count but ignored for sentence counting, as these counts served different purposes within the processing. For most (longer) articles the reverse was true, and sentence count was greater than line count. This

was because it was common in online news articles for "lines" (actually paragraphs) to contain more than one sentence.

12. Scores. In addition to sentence counts and percentages for each entity class (including topics), a number of customised scores were calculated for each article. Some of these were mentioned briefly in this section but will be more fully described in section 4.5.

4.3.4 Data Collection

Throughout 2006 and 2007, news articles relating to electricity were collected directly from the nzherald website (via electronic copy and paste), in real time. After the end of this period, additional relevant articles dated from the same period were retrospectively sought, and added to the collection in order to provide as complete a sample as possible. Sample selection criteria will be described in more detail in the last section of this chapter.

Data sources at the beginning of the study were a combination of paper and online articles, but as data collection progressed, a transition to the collection of exclusively online articles took place, due to the superior ease of retrieval.

This re-focusing of the data collection method, to online only, mirrored a change in public news reading habits that was occurring at precisely the same time within New Zealand and throughout the Western world, as newspaper companies progressively lost (paid) physical paper readership, and gained (mostly unpaid) online readership instead[335].

Two more comments are important in relation to this transition. Firstly, it was noted in the early phase of the study that there appeared to be very little difference between the online and paper versions of each article. Therefore, at first, it did not seem to matter which method was used. Most were identical, though occasionally there were small headline differences. Furthermore, sometimes a paper article would not appear online, and sometimes an online article did not appear in the

paper, or was truncated. As time progressed and paper newspapers declined in physical size[336], it seemed logical that the number of articles falling into the latter two categories in that list (i.e. online articles missing, or truncated, in the paper) would have increased, so it may be assumed that the choice of the online method ultimately provided a larger and more comprehensive sample size.

Secondly, this study was undertaken at the beginning of a new era in news media analysis. As more news became available online, physical newspaper readership declined[337], thus affecting the methods required for meaningful news media analyses which recorded "prominence". How this study dealt with this coverage measurement conundrum will be discussed shortly in the key indicators section.

4.3.5 Information Technology

Relational databases such as Access, MySql and Oracle were investigated, but the data storage medium ultimately chosen was a set of Excel spreadsheets. This choice was made because of ease of use, portability, stability, visual clarity, independence (no internet or external server requirement), accessible embedded programming tools (Visual Basic and Excel macros), and the native provision of simple but attractive reporting layouts.

The disadvantages included reduced performance for large processing runs, cumbersome handling of data relationships, and the requirement to build a large number of the required processing functions from scratch.

All of the query tools for key string searches, data cleaning and data extraction were developed as part of the research. Thus there was a significant amount of computer programming involved. The development of ETAT as part of the study was feasible because I have many years experience as a professional software developer.

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[335] McCombs & Laidlaw (2008)
[336] McCombs & Laidlaw (2008)
[337] Nielsen (2008); NZMA (2010).

4.4 Categorisation

4.4.1 Introduction

This categorisation section of the research design chapter describes the iterative procedures that were followed to develop and refine the numerous hierarchical categories that ultimately provided the phrases for counting and analysing in this study. The primary categories (called <u>topics</u>) were based upon the socio-political model of electricity sector influences which was derived in chapter 3.

After this introduction, the first sub-section provides an overview of the categorisation process and the second discusses the problem of researcher bias. The next four sub-sections describe the definitions and hierarchies for the main <u>topic</u> category, followed by the other seven primary entity classes of <u>person</u>, <u>organisation</u>, <u>document</u>, <u>event</u>, <u>city</u>, <u>country</u> and <u>keyword</u>. A short discussion about categorisation challenges follows, prior to the conclusion for this section.

After this categorisation section, the three remaining sections of the research design chapter describe the key indicators, the process algorithms that were employed (using ETAT), and lastly, the article selection processes.

4.4.2 Categorisation Overview

Categorisation was at the very core of this study. Detailed categorisation was the method by which the required entities and concepts were selected and defined (by sets of key words or phrases) for frequency analysis.

Unlike conventional quantitative studies, the set of required categories was not fully defined at the start of this study, but was developed via a painstakingly detailed iterative process as the study progressed. In this respect the study more closely imitated qualitative analysis but in this case it spanned a very large sample size. These ongoing category adjustments were made possible by the static nature of the texts being studied and by the flexibility of the developing ETAT text analysis tool, because repetitive re-processing was required as category changes were made.

A large number of sub-categories were ultimately included, in order to meet the aim of the study, which was to attribute a certain level of "meaning" to the text, and to identify what the text was "about" as far as was practicable, and then to analyse the results in relation to a set of topics of interest. The intention was to move beyond simple word searches to the use of more complex phrase lists in order to instill a rudimentary level of intelligence into the processing. This task involved an element of learning, as various patterns emerged for the ways in which the English language was used in news media articles to represent the concepts under study. The refinement of the categories was a very important component of the study and was hugely time consuming. Much of the article selection process (described in the last section of this chapter), ultimately relied upon the finalised category definitions.

4.4.3 Researcher Bias

This is an appropriate moment to reflect upon researcher bias. Because the categories were developed and refined during the course of the study, there was an apparent opportunity to skew results by manipulation of the iteratively evolving category definitions. This danger was made more feasible by the fact that this was an "unblinded" study and many article-level results were visible to the researcher as the study progressed. While size constraints meant that presentation of the full phrase-library by entity within this thesis was not feasible, an attempt to minimise the suggestion of researcher bias has been made by including the full list of item names by topic in the Appendices.

Of course researcher bias did exist, as might be expected in a critical study such as this one (especially within the selection and arrangement of the categories), but the researcher's intent was, as faithfully as possible, to represent the meanings of the text as the original author appeared to intend, within the scope of the categories that were chosen for investigation. That part of the categorisation process which could be considered to be the most subjective was in the notoriously difficult allocation of "tone" (positive or negative) to phrases of interest. There too, objectivity was sought as much as possible.

4.4.4 Topic Hierarchies

The starting point for the categorisation process was the model that was derived in the chapter 3, and the full framework model from Figure 3.4.1.1 has been reproduced below as Figure 4.4.4.1. The sets of categories arising from this model have collectively been called topics, and they are the category sets that were primarily of interest for this study. Seven other entity classes (organisation, person, event, document, city country, and keyword) were also examined in order to provide data for the topics analysis, and these will be described later in this section.
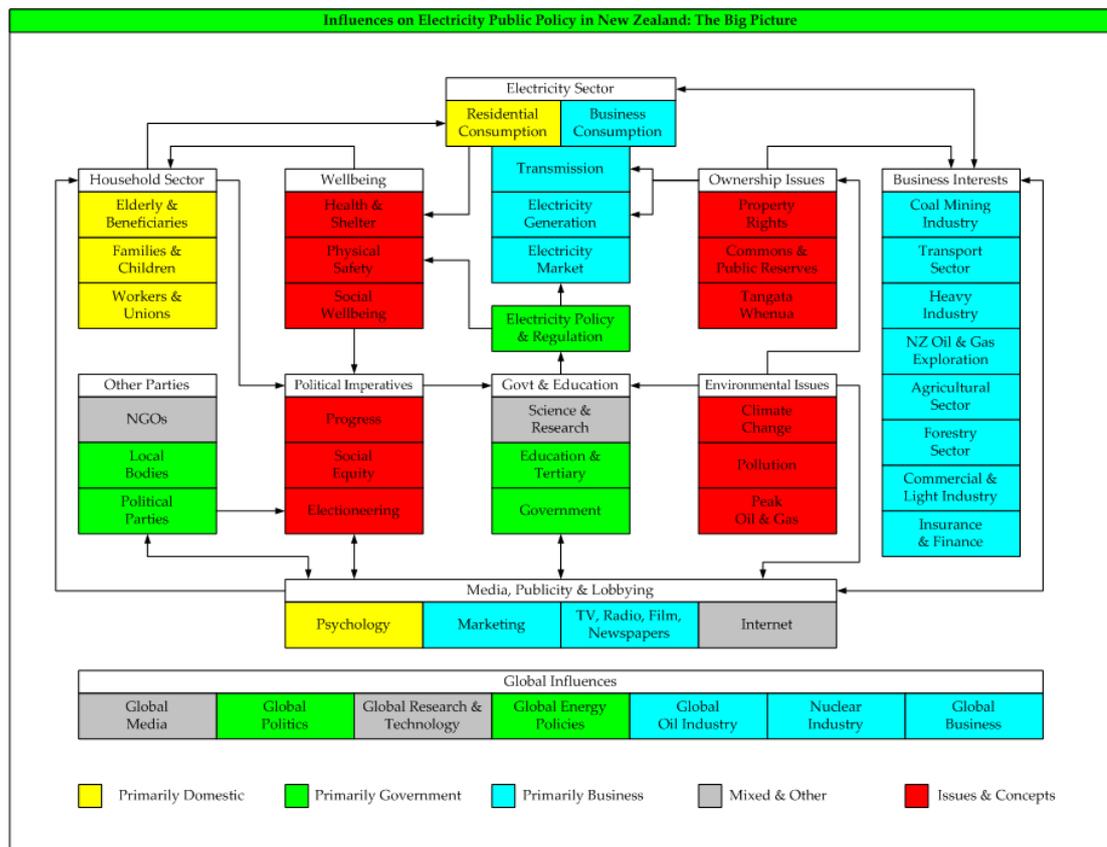
Figure 4.4.4.1 – Influences on the Electricity Sector

From a high level categorisation perspective, the model in Figure 4.4.4.1 may first be simply divided in two, into issues of concern (topic heading 1), representing the four red boxes in the middle, and organisational groupings or players (topic heading 2), representing most of the other coloured boxes around the outside, specifically electricity sector, business interests, government and education, household sector, and other parties.

No topic headings were created specifically to align with the boxes in the global influences bar which is shown along the bottom of Figure 4.4.4.1. These were not defined separately as drawn, but were instead included alongside their domestic counterparts within the matching player topic categories. Global influences were studied using an additional analysis by country instead. This will be described later in the data chapter.

For a public policy perspective, a third topic heading category was added to the first two (players and issues of concern), and this one was inclusively just called policies (topic heading 3). This additional high level topic category endeavoured to provide a policy overview for the whole diagram, and while it could be thought of as an expansion of the one small green box called electricity policy and regulation (shown at the bottom of the electricity sector group near the centre of Figure 4.4.4.1), in practice and by necessity it came to encompass a broader policy perspective beyond electricity, during the process of attempting to auto-extract meaning from the news articles.

A fourth topic heading of communication (topic heading 4) was later added to the three already described in order to provide analysis for some aspects arising from the group of boxes which are named in Figure 4.4.4.1 as media, publicity and lobbying.

In summary, level one of the topic hierarchy contained the four high-level topic categories called players, issues of concern, policies, and communication. Beneath these four level one topic categories, level two, three and four topic categories were constructed to aid the text analysis. An outline depiction of the hierarchical structure that was devised for the entity category called topic is shown in Figure 4.4.4.2.

Topics Hierarchical Structure

Highest Level 1	Topic Level 2	Sub-Topic Level 3	Detail Level 4

Issues of Concern			
All Concerns	Topic of Concern	Sub-Topic of Concern	Event or Prediction
	Topic of Concern	Sub-Topic of Concern	Event or Prediction
		Sub-Topic of Concern	Event or Prediction
			Event or Prediction

Players			
All Players	Sector Name	Sector Category	Sector Actor
	Sector Name	Sector Category	Sector Actor
		Sector Category	Sector Actor
			Sector Actor

Policies			
All Policies	Policy Topic	Policy Sub-Topic	Policy Point
	Policy Topic	Policy Sub-Topic	Policy Point
		Policy Sub-Topic	Policy Point
			Policy Point

Communication			
All Communication	Comms Topic	Comms Sub-Topic	Comms Detail
	Comms Topic	Comms Sub-Topic	Comms Detail
		Comms Sub-Topic	Comms Detail
			Comms Detail

Figure 4.4.4.2 – Topics Hierarchical Structure

4.4.5 Topic Definitions

Each of these four topic headings (or groupings) will now be explained in more detail. The 1-4 numbering assigned here is the order in which they were presented above, and is included only for the purpose of explanation. In other parts of this document these four topic headings may be presented in a different order.

1. The <u>issues of concern</u> topic heading category (represented by the four red boxes in Figure 4.4.4.1) has been presented hierarchically in Table 4.4.5.1. The phrases in italics in the first two columns (topics and sub-topics) have been taken directly from the red boxes in Figure 4.4.4.1, and for many of them an extra lower level of (usually two) sub-categories has been added here into the third and fourth (topic detail) columns.

Table 4.4.5.1 – Hierarchy for Topic Heading "Issues of Concern" (Level 1)

Topic (Level 2)	Sub-Topic (L3)	Topic Detail (Level 4)	
Wellbeing	*Health & Shelter*	Illness	Wellness
	Physical Safety	Accidents	Weather
	Social Wellbeing	Community Support	Crime & Violence
Political Imperatives	*Social Equity*	The Poor	Disadvantaged Groups
	Progress	Economics	Indicators
	Electioneering		
Environmental Issues	*Climate Change*	Greenhouse Emissions	Climate Impacts
	Pollution	Air Pollution	Water Pollution
	Peak Oil & Gas	Oil Reserves	Alternative Fuels
Ownership Issues	*Property Rights*	Enterprise Ownership	Pylon Property Issues
	Commons	Public Land	Water Use
	Tangata Whenua		

Each phrase listed in Table 4.4.5.1 is a topic category name, and each has a further list of search phrases[338] associated with it. These lower level phrase lists will be described in more detail later in the chapter.

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[338] The phrase lists were built by linking with other entity definitions which will be described shortly.

While a topic category name at any level (in Table 4.4.5.1) was designed to be a subset of the higher level phrase to the left (its "parent"), in practice there was some overlapping of categories, and there were also some anomalies. For example, weather and pylon property issues were primarily level 4 "children" of wellbeing (via physical safety) and ownership issues (via property rights) respectively, but both were also indirectly assigned environmental issues as a parent. In other words there were cases where multiple parent relationships existed. Although these overlapping associations are not visible in Table 4.4.5.1, the full list of topics with their parents and associated entities is available in Appendix A1.

The purpose of building a hierarchy like this (where each topic was divided into lower level sub-topics) was to assist with determining phrases for finding text which applied to the topic, and to attempt to make each list of appropriate phrases a manageable size. In practice, when attempting to extract from news articles certain lists of phrases which implied each of these concepts, it was often difficult to be precise. More examples of overlaps and exceptions will be provided beneath the other topic headings below.

2. The players topic heading category (represented in Figure 4.4.4.1 by most of the multi-coloured boxes which surround the red boxes) has been presented hierarchically in Table 4.4.5.2. The phrases in italics in the first two columns (topics and sub-topics) have been taken directly from the multi-coloured boxes in Figure 4.4.4.1. In this case no further "topic detail" sub-categories have been added within the topic hierarchy, but more levels are provided beneath the person and organisation entity hierarchies instead. These will be described further below.

Table 4.4.5.2 – Hierarchy for Topic Heading 2 "Players" (Level 1)

Topic (Level 2)	Sub-Topic (Level 3)	Topic Detail (Level 4)
Electricity Sector	*Residential Consumption*	(In organisation & person classes).
	Business Consumption	
	Transmission Players	
	Generation Players	
	Electricity Market Players	
	Electricity Regulators	
Business Interests	*Coal Mining Industry*	
	Transport Sector	
	Heavy Industry	
	Agricultural Sector	
	Forestry Sector	
	Oil & Gas Industry	
	Light Industry & Commercial	
	Finance & Insurance	
Household Sector	*Elderly & Beneficiaries*	
	Families & Children	
	Workers & Unions	
Other Parties	*NGOs*	
	Local Bodies	
	Political Parties	
Government & Education	*Science & Research*	
	Education	
	Government Players	

3. The policies topic heading category is represented in Figure 4.4.4.1 by the one green box in the centre called electricity policy and regulation. This has been expanded into a full policy hierarchy, shown in Table 4.4.5.3. In this case there are sometimes up to three topic sub-categories at the fourth level down (in the right hand column).

Table 4.4.5.3 – Hierarchy for Topic Heading "Policies" (Level 1)

Topic (Level 2)	Sub-Topic (L3)	Topic Detail (Level 4)
Supply Security	System Capacity	System Oversight / System Reliability
	Transmission	National Transmission / Local Distribution
	Configuration Alternatives	Isolated Supply / Connected Alternatives
Demand Management	Green Buildings	Insulation / Building Rating Systems / Water Heating
	Household Behaviour	Metering / Household Power Saving / Consumer Education
	Industry Behaviour	Industry Power Saving / Electric Transport / Location of Generation
Energy Sources	Fossil Fuels	Gas-fired / Coal-fired / Oil-fired
	Renewables	Biomass / Hydro / Geothermal / Wind Power/ Solar / Marine-based Electricity Generation
	Other Energy Sources	Nuclear / Electricity Storage
Structure & Regulations	Trading & Markets	Wholesale Electricity Market / Sharemarkets / Carbon Trading / Oil & Gas Markets
	Acts & Bills	RMA / Carbon Tax / Energy Strategy
	Pricing & Regulation	Standards / Electricity Charges / Electricity Penalties

Although these topics were deliberately constructed to represent electricity policy, they ultimately (by necessity) included broader policy concepts as well. It was often difficult to make clear distinctions between categories as there was considerable overlap. For example, many subsets of the alternative fuels category mentioned earlier, although not used to generate electricity, would also fall under the biomass and renewables policy categories above. Therefore if a question was to be asked about how much the media mentioned renewable energy sources, it was thought to be prudent (and easier) to broaden the category to include all mentions of renewables. Similarly, gas was mentioned in the context of electricity generation, and also in its own right, and it was most straightforward to include all mentions of gas beneath the fossil fuels category, and leave the electricity distinction to be made (if required) by matching against other topic or entity references.

Each of the sub-topics beneath the <u>structure and regulations</u> topic (near the bottom of Table 4.4.5.3) provide examples of even more broad topic categories, where <u>markets</u> includes mentions of most types of markets, and <u>acts and bills</u> includes all kinds of laws, not just electricity legislation.

4. The <u>communication</u> topic heading category (represented in Figure 4.4.4.1 by the row of boxes lower centre, above <u>global influences</u>) has been presented hierarchically in Table 4.4.5.4. The phrases in italics have been taken directly from the multi-coloured boxes in Figure 4.4.4.1, and the others have been added to augment the model.

Table 4.4.5.4 – Hierarchy for Topic Heading "Communication" (Level 1)

Topic (Level 2)	Sub-Topic (Level 3)	Detail Split (Level 4)
Psychology	Tone	Negative / Neutral / Positive
	Angle	News / Entertainment
Mechanism	Messaging	*Media / Marketing / Lobbying*
	Channel	Phones / *Internet / Radio / TV / Newspapers / Film /* Books

The categories in Table 4.4.5.4 were added as a kind of recursive meta-layered experiment, to see whether any information could be gleaned about the way that the media presented itself and other forms of communication, as well as to allow some rudimentary psychological analysis of the communication itself.

4.4.6 Entity Definitions

Now that the topic categories which provided the platform for the study have been defined, the other relevant entity classes will be described. In order to facilitate the interpretation of the relevant text from each of the news articles, it was necessary to be able to recognise certain different entity types, and where possible extract them automatically by their known descriptive attributes. The relationship between these entities and the topics already discussed has been represented as a cross-tab in Figure 4.4.6.1. This diagram illustrates the broad difference between topics and other entities, in that phrases which were found for each entity listed on the vertical axis

were also (where possible) subsequently allocated to one or more of the topic categories on the horizontal axis, by pre-assigning topic codes to each entity.

Figure 4.4.6.1 – Grid showing Cross-Tab of Topics with Other Entities

The seven primary entity classifications (or classes) of interest were person, organisation, country (or region), city (or locality), document, event, and keyword. These were all briefly mentioned earlier in this chapter when discussing example articles to illustrate the research process.

If a relational database had been used for this study, each of the entity classes described above could have been a "table" in the database. In this case each of them had an Excel worksheet assigned instead. The (Visual Basic) Excel-based ETAT analysis tool mimicked the functions of a relational database when handling the elements within the worksheets for these different entity classes.

For the full cross-tab containing all entity names and topic names, see Appendix A1. Note that the axes have been reversed for the full list in that location. It can be seen in Appendix A1 that most (but not all) of the player (topic) phrases were sourced from within the person and organisation entity classes. Most (but not all) of the policy (topic) phrases were located within the document class, while phrases for the issues of concern and communication (topics) were more likely to be from the event class, or spread across several entity classes.

Items within the <u>topic</u> category did not have any search phrases directly assigned to them. They were all assigned indirectly through the names and alternate names of items within the seven other linked entity categories.

When preparing information ready for text searching, each entity item was assigned a numerical identifier (id), an identifying name, a set of alternate names including an acronym (if applicable), a set of nick names (if applicable), a set of exception phrases (if applicable), a set of parents (if applicable), and one or more topic codes. The name, alternate names and nick names were the set of phrases that would enable the recognition of this item within the text, while the set of exception phrases would explicitly prevent this item from being mistakenly identified in the text. All of this information was listed on a row within an entity worksheet, and all of it was constantly being iteratively refined during the course of the study.

Example 1. Listed below are key attributes for the <u>organisation</u> called Meridian[339]. Each of these names or nick names was found (or expected) to refer to Meridian at some point within the news articles under study.

> **Id**: 55, **Name**: Meridian
>
> **Alternate Names** : Meridian Energy Ltd^Meridian Energy
>
> **Nick Names**: company^electricity company^generator^gentailer^government electricity company^it^its^power company^power producer^soe^state power company^state-owned enterprise^Turner, whose company
>
> **Exceptions**: Meridian Planning^Meridian Mall
>
> **Parents**: NZ government^electricity generators^electricity retailers^SOEs
>
> **Organisation Type:** SOE
>
> **Topic:** electricity suppliers

The list formed from name plus alternate names provided the primary phrases required for entity recognition, and if found they "turned on" the nick names for

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[339] Although the full name of the company was Meridian Energy Limited, it was referred to frequently enough in news articles as "Meridian" to be able to assume that as a rule "Meridian" was referring to this company. Therefore, for processing purposes, "Meridian" was chosen as the primary entity name, for brevity and convenience.

subsequent sentences, until such time as another entity with (any) matching nick names was found, at which point the nick names were "turned off" again.

The two "exception" organisation names listed above, Meridian Planning and Meridian Mall, both provided literal (i.e. subtle branding) publicity for Meridian Energy (discussed further in the next key indicators section), even though an article which mentioned them was not actually "about" Meridian Energy. Thus they were logically excluded from the entity explicit (topic) coverage counts, but were available for literal (or nominal) coverage counts. Organisation type was primarily an aid for assigning parents and topics.

Example 2. Listed below are key attributes for the <u>organisation</u> called TrustPower. Although a similar type of organisation (an electricity generator), the nick names listed here are slightly different from those for Meridian, as TrustPower was a public company and appeared in media sharemarket analysis columns.

Id: 79, **Name**: TrustPower

Alternate Names : TrustPower Limited^TrustPower Ltd^Trust Power

Nick Names: board^company^electricity company^electricity retailer^generator^gentailer^group^it^its^listed company^New Zealand company^power company^retailer^stock

Exceptions: a group of^on board^stock exchange^stock market^TrustPower rescue^TrustPower TECT^TrustPower Tect^TrustPower Trust TECT

Parents: Infratil^Alliant Energy^Tauranga Energy Consumer Trust^electricity generators^electricity retailers^New Zealand stock exchange

Organisation Type: Public Company

Topic: electricity suppliers

For companies which were listed on the sharemarket, the associated stock exchange was listed as a parent for this study, because the exchange would have benefited indirectly from publicity that the company was given. Any known shareholders were also listed as parents (in recognition of their ownership). Shareholder names were not actively sought from other sources, but were linked as "parents" when they were mentioned in news articles. As this study was for a fixed period of time

(two years), it was not deemed necessary to include stop and start dates for shareholder parents as shares were bought and sold[340]. In this example, it can be seen that both Alliant Energy and Infratil have been listed as parents for the duration of the study, even though Alliant Energy sold its TrustPower shares in September 2006 to Infratil (an existing shareholder), granting it majority control.

Several of the exceptions listed for TrustPower above were shorthand for the TrustPower TECT Rescue Helicopter. It was not necessary to include the full helicopter name, as the phrases "rescue" and "helicopter" were both captured elsewhere in the model, and it was found (after much iterative trial and error) that the phrases listed (TrustPower rescue, TrustPower TECT, TrustPower Tect, TrustPower Trust TECT) were sufficient for recognition in the text. Although sponsored by TrustPower, the rescue helicopter itself was not the same as the TrustPower entity, and so it appeared in the exceptions list. However, it was allocated a parent-child relationship with TrustPower, due to the sponsorship, and was also a deliberate (in this case) example of the literal branding benefit mentioned earlier for Meridian (which was accidental in that case).

Example 3. For an illustration from the <u>person</u> entity, key attributes for the person called Jeanette Fitzsimons are listed below.

Id: 10, **Name**: Jeanette Fitzsimons

Alternate Names : Jeannette Fitzsimons

Nick Names: Fitzsimons^her^hers^Jeanette^Ms Fitzsimons^Ms Jeanette^Ms Jeanette Fitzsimons^she

Exceptions: [none]

Gender: F, **Honorific**: Ms

Description: Party leader. Government spokeswoman on solar power and energy efficiency. Government spokeswoman on energy efficiency and conservation. Government energy efficiency spokeswoman. Government spokeswoman Greens co-leader. Partner Harry Parke. Green Party co-leader. Government's spokesperson for energy efficiency. Green co-leader. NZ.

---

[340] If a similar study was made over a longer period of time using a standard relational database, such date handling would be desirable, even though that would add another layer of complexity.

> **Associated Organisations:** spokesperson^spokeswoman^Green Party^power^energy efficiency^solar
>
> **Associated Country:** NZ
>
> **Topic:** political parties

Gender and honorific were recorded for the person entity only, and were calculated automatically[341] where possible, although they could also be set manually if necessary. Also unique to the person entity was the automated extraction of description from article sentences, although these descriptions sometimes needed to be adjusted manually as well.

For most of the seven entity classes, the name and description fields were automatically scanned for organisations, cities or countries, and these were then linked to the entity concerned (see the "Associated Organisations" listed above). Sometimes (for non-person entities) an associated person was also linked. This meant that the information that was manually (for all entities except person for which this was mostly automated) set into the description field, needed to be selected with care.

Where no (or very limited) information about an extracted entity was available from any of the study articles, external sources were sometimes referenced for more information to help with the allocation of basic links, parents, or topics. Any additional information thus obtained was placed into the description field, so that most required links could be generated automatically.

It can be seen in the person example above that one alternate name is a spelling mistake of the correct name. Occasionally spelling mistakes were stored as alternate names like this, but mostly (when noticed) spelling mistakes were just corrected in the article by the researcher, before the final processing.

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[341] Gender was recognised automatically from either the first name, the honorific, or a gender specific pronoun such as "she" (which had not already been matched to any other person) in a subsequent sentence. Honorific was retrieved automatically if it was recognised from a list of possible honorifics, and if it directly preceded the person name in any sentence.

Example 4. To demonstrate another type of entity, key attributes for the <u>document</u> entity called "electrical capacity" are given below.

Id: 264, **Name**: electrical capacity

Alternate Names : capacity of the lines^gigawatt^gigawatts^gw^kilowatt^kilowatts ^kw^megawatt^megawatts^mw^substation capacity

Nick Names: capacity

Exceptions: gigawatt hours^megawatt hours^kilowatt hours^gigawatt hour^megawatt hour^kilowatt hour

Description: [none], **Parents:** [none]

Associated Organisations: electricity industry (auto-assigned from electrical)

Document Type: Measure

Topic: electricity^system capacity (manually assigned)

In the "electrical capacity" example above, all the exceptions have the word "hour" on the end, because these phrases tend to indicate the volume of electricity consumed rather than electrical capacity.

Although no description was recorded for the entity in example 4, it can be seen that an associated organisation was able to be extracted from the entity name because "electrical" was in the list of alternate name phrases for the organisation called "electricity industry".

The <u>keyword</u> entity class was set up to contain any words or phrases of interest which did not fall neatly within any of the other entity classes, but the boundaries between entity classes were not rigid and there was some flux and some overlap as entity items developed and were refined over time.

Sometimes an entity started as a keyword, but was then moved to another (usually document or event) sheet if it was subsequently deemed to be closely related to one or more of the entities already on that sheet, or if it needed to be expanded to include extra keywords. For example "infrastructure" started as a keyword, but when it was found that an "infrastructure industry" entity was needed in the organisation list in order to claim a specific usage of the nick name "industry" away from other industries also using that nick name within the text of a particular article,

the keyword was simply moved over to the organisation sheet instead, and appropriate alternate and nick names added.

Another fairly major move was the eventual transition of the phrase "environment" away from the document list (it had been loosely classified as a policy), into the organisation list. This was a difficult decision to make, but two advantages were that 1) it then provided a "parent" for environmental organisations, and 2) it could from there more easily be compared with the two other realms from the "triple bottom line" approach, namely "social" and "financial".

An even more radical decision was made shortly afterwards, which was to create a new organisation entity called "ecosystems", and to split that off from environment (becoming one of its "child" entities instead). The reasoning here was that though the word "environment" (along with its derivatives) was bandied about frequently, it almost seemed to be a token mention in many instances, and so I thought it would be interesting to see whether there was much explicit mention of the actual underlying organisms which form our natural world. I therefore decided to classify them as if they were an organisation-type entity effectively competing for publicity in the media.

This differentiation of was an example of the very flexible nature of the classification system. Some entity definitions were very broad and all encompassing, including long lists of only vaguely related phrases (for example "religion", or the company(ies) called AMP). This was sufficient for anything which was only peripheral to the study, but which needed to be identified to avoid confusion with other entities.

However, sometimes it was more useful to split entities up into quite specific separate entities. Reasons for doing this included the necessity to use different nick names (for example "company" vs. "fund"), or the necessity to assign different topic codes (for example "water permits" vs. "mining permits"). Overall, the entity lists evolved and grew over time as need was perceived for differentiation in the text.

The available hierarchical "parenting" structure within each entity list made it easier to split off sub-entities, while still retaining a link to their parent in case inclusive counting was required. These entity hierarchies will be discussed further below.

Note that modifications to entity names and structures were possible right up to the end of the study because the data set was able to be fully reprocessed after any changes.

Other secondary (reference) entity tables that were helpful in building definitions and hierarchies for the seven primary entity classes discussed above were person name, person designation, organisation type (Appendix A9a), and document type (Appendix A9b).

4.4.7 Entity Hierarchies

Within each entity class, it was difficult to keep the item lists tidy and classified correctly as their numbers grew, and so groupings and hierarchies were developed within each entity sheet, to simplify the various matching processes that were required, and to assist with the consistency of applying parent and topic relationships.

Colour coding of "parent" rows in the Excel sheets, along with a procedure of physically sorting the entities into rough groupings of similar types (where possible) assisted with keeping track. A single entity row did not have a colour assigned until it had been allocated a topic code, but a parent classification was coloured dark blue in that case. Once a topic code had been assigned, the row was generally coloured light blue if it was a parent classification, and light yellow if it was a single entity. This rule was very flexible in the document, event, and keyword sheets, but worked reasonably well overall, especially for organisations, countries and cities. Another colour that was applied from time to time was light green for parent classifications with no children (such as "superpowers" and "candidates" on the organisation sheet), and this colour was also used for waterways in the country and city sheets. Once logic for "exception entities" had been included, to enable the collection of counts for exception phrases in some cases (instead of ignoring them altogether),

additional colour coding was added to help keep track of these. An exception entity (one whose phrase list provided an exception list for another entity) was coloured dark orange until a topic was assigned, at which point it changed to a red brick colour. Examples of the uses of all of these colours may be seen in the entity lists in Appendices A1-A8.

Setting hierarchies within the city/locality and country/region entity classes was mostly straightforward. Countries were grouped together within region as far as was possible, and cities or localities were grouped within a province or state if they were within New Zealand or Australia, and sometimes also for USA and Canada. Most other countries did not receive enough mentions of their cities or provinces to make it worthwhile grouping beneath a parent province. In those cases it seemed sufficient to group by country. Furthermore, provinces and cities or locations which were rarely mentioned but which were geographically near each other were often combined into alternate names for one entity, for convenience.

The generic terms "developed countries" and "developing countries" were placed into the country/region class, but they were not defined as parents of other countries, although in theory an attempt to do so could have been made. The same practice was applied for the entities "global" meaning all countries, and "foreign" meaning all other countries except the one being reported.

Similarly, the generic terms "urban" and "rural" were placed into the city/location class, but no attempt was made to assign them as parents of other cities or locations. They simply collected direct references to phrases which implied urban or rural, to allow later comparison at that semantic level only (not geographically).

An interesting situation arose for the Netherlands where one alternate phrase was "Dutch", and so every mention of "Royal Dutch Shell" gave a count to the Netherlands. Although superficially valid, I felt that this made it difficult to see how much the Netherlands was actually being mentioned in its own right, so I made a separate entity within the country sheet for Royal Dutch Shell (even though Shell was already an organisation entity) and assigned the Netherlands (alongside England) as its parent on the country sheet. This arrangement allowed the flexibility

of being able to choose inclusive or exclusive counts for the Netherlands within the county sheet, if required.

Similarly, a separate entity was created on the country sheet for the frequently mentioned special case "global warming", as an exceptional child of "global", even though there already was an event called "global warming".

While all entities were (mostly manually) assigned <u>topic</u> codes where possible, to use for later analysis, it also became evident that it would be interesting to make comparisons between certain entity groupings as well (where not already neatly differentiated by topic). Therefore some of these were also selected for separate analysis, for example past vs. future (events), male vs. female (persons), urban vs. rural (cities/localities). These comparisons will be presented in chapter 5.

Once underway with the article processing and entity extraction, it was found that certain extracted entities did not fit neatly into the defined topics, and so sometimes decisions had to be made whether to a) not assign a topic at all in some cases, b) find the topic which most closely approximated a match, or c) adjust the topic definitions to be more inclusive. Each of these three solutions was employed at different times.

One example of a problematic phrase was "appliances". I started by assigning this as a <u>keyword</u> entity, and allocated it under the topic <u>demand management</u>, because the first occurrences I came across were referring to energy saving appliances. However it soon became apparent that most references to appliances (such as fridges, washing machines, TVs, or the company called F&P Appliances) were not related to demand management, and were simply incidental mentions of devices which consumed electricity. In other words the topic should have been "demand" or "consumption", rather than "demand management", and there was not a suitable topic which covered simple everyday demand like this. Ultimately the decision was made to include such items beneath <u>residential consumption</u>.

Another constant difficulty was the vital word <u>energy</u>. The primary aim of the study was to extract phrases relating to electricity, but sometimes energy meant electricity, and sometimes it did not. Sometimes it meant gas, sometimes oil, occasionally coal,

and sometimes it was referring collectively to all four (electricity, gas, oil, and coal) with other energy sources such as renewables also implied from time to time.

After much trial and error, the resolution to this dilemma involved allowing the word <u>energy</u> as a nick name for both the <u>electricity industry</u> and the <u>oil and gas industry</u>, as well as setting up a separate and over-arching (parent) <u>energy industry</u> item, so as to be sure that all energy references were extracted and able to be checked. Each of the words <u>electricity</u>, <u>power</u>, and <u>energy</u> were also set up as keywords so as to monitor the way in which they were being allocated, and to allow the careful construction of exception handling where appropriate.

Because of other ambiguities similar to this one, the topic which had been previously called <u>electricity sources</u> was renamed <u>energy sources</u>, and <u>electricity</u> was removed as the topic parent (which thenceforth needed to be additionally explicitly specified if applicable). This broadened the topic definition sufficiently to allow all references to any kind of energy to have an applicable topic assigned.

Although the research goal was primarily to study electricity in the media (rather than transport, oil, gas, or water), in practice all of these other energy-related topics needed to be extracted and carefully distinguished as different, where possible.

4.4.8 Other Categorisation Challenges

Throughout this study there was a constant tension between simplicity and accuracy. As with many statistical studies, the challenge was to identify the most useful information that could be condensed into an understandable format, from a complex array of factors. On one hand there was the temptation to oversimplify and lose precision in order to have tidy classifications. On the other there was the danger that, by aiming for accuracy, excessive detail might render results unfathomable and conclusions unattainable.

Categorisation was an arduous and repetitive task. There is not space in this document to discuss every decision made, but four typical examples of the type of challenge that was regularly encountered are provided here, for <u>government</u>, <u>advocates</u>, <u>business</u>, and the <u>environment</u>.

1. Government Category Inclusion

When measuring comparative media coverage of players in his study of aid organisations, governments and the media, Ecker-Ehrhardt (2010) made a differentiation between "government" and "parliament", where government indicated only the party in power, as opposed to parliament which included all other represented parties, primarily the opposition. This was a differentiation that was not made clear in the design of my topic framework, but which did need to be handled once categorisation was underway.

It was tempting to include parliamentary opposition parties within the government category (as they did contribute to law formation within select committees), but I decided to categorise them completely separately, simply as political parties. The rationale for this decision was firstly that opposition parties officially did not have the power to implement their own policies, and secondly that their media profile was most likely to be publicly challenging the government. Thus it did not make sense to include them within the government category for this study.

This situation was muddied considerably by the presence within the New Zealand Government of ministers (outside cabinet) from smaller parties who were not in coalition, but who had agreed to support the government on votes of confidence and supply in return for some policy concessions and prestigious positions. This complication applied specifically to the United Future leader Peter Dunne as Revenue Minister[342], and the NZ First leader Winston Peters as Foreign Minister[343]. In practice these individuals were categorised within their political parties, but their positions (when mentioned) within government. However, by nature of their linked designations, their personal coverage also registered as a type of second tier "implicit" coverage for the government (further explained in the next key indicators section).

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[342] Clark & Dunne (2005).
[343] Clark & Peters (2005).

A slightly different situation applied to the Green Party but it gave rise to similar categorisation issues (which were handled in the same way). Two Green MPs (Sue Bradford and co-leader Jeanette Fitzsimons) had been allocated government spokesperson roles (on "Buy Kiwi Made" and "Energy Efficiency" respectively) in return for abstaining on votes of confidence and supply[344]. This meant that the Greens remained an opposition party, but not as strongly as the National and Act parties, which had no support agreement with the government of any kind. The dilemma was more acute in this case because the Green Party featured significantly within the media (and within this study) on matters relating to electricity and energy efficiency (one of their portfolios), unlike the United Future and NZ First parties, whose presence within this study was mostly incidental.

Another dilemma was the decision about where to place the chief executives and high ranking staff of government ministries. Ultimately they were included alongside other distinguished "state" staff (such as the governor general, commissioners, ambassadors, diplomats, and "officials") within the broad government category (based on the assumption that they would be "government friendly" or neutral in the media.

Judges provided another challenge and, although they were in theory strictly independent, they were also brought in beneath the government umbrella, (effectively acting for the Ministry of Justice). Lawyers were not. They were mostly considered to be commercial businesses.

2. Classifying Activists

Classifying NGOs, lobby groups, associations and think tanks was particularly difficult because these came in many varied shapes, sizes, and purposes. Even assigning the topic player classification (e.g. NGO, research, government, or business) to these organisations in a consistent manner was quite difficult, so I developed an intricate hierarchy within the organisation class to group them and aid with the standardisation of their classifications.

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[344] Clark, Donald & Fitzsimons (2005).

I decided to call these groups "advocates" and (aiming for simplicity) split them into three types, <u>business advocates</u> (e.g. the Motor Trade Association or right wing think tanks), <u>social advocates</u> (e.g. worker unions or some UN organisations) and <u>environmental advocates</u> (e.g. Greenpeace or conservation groups), once again guided by the "triple bottom line" approach.

The arrangement I came up with is illustrated pictorially in Figure 4.4.8.1.
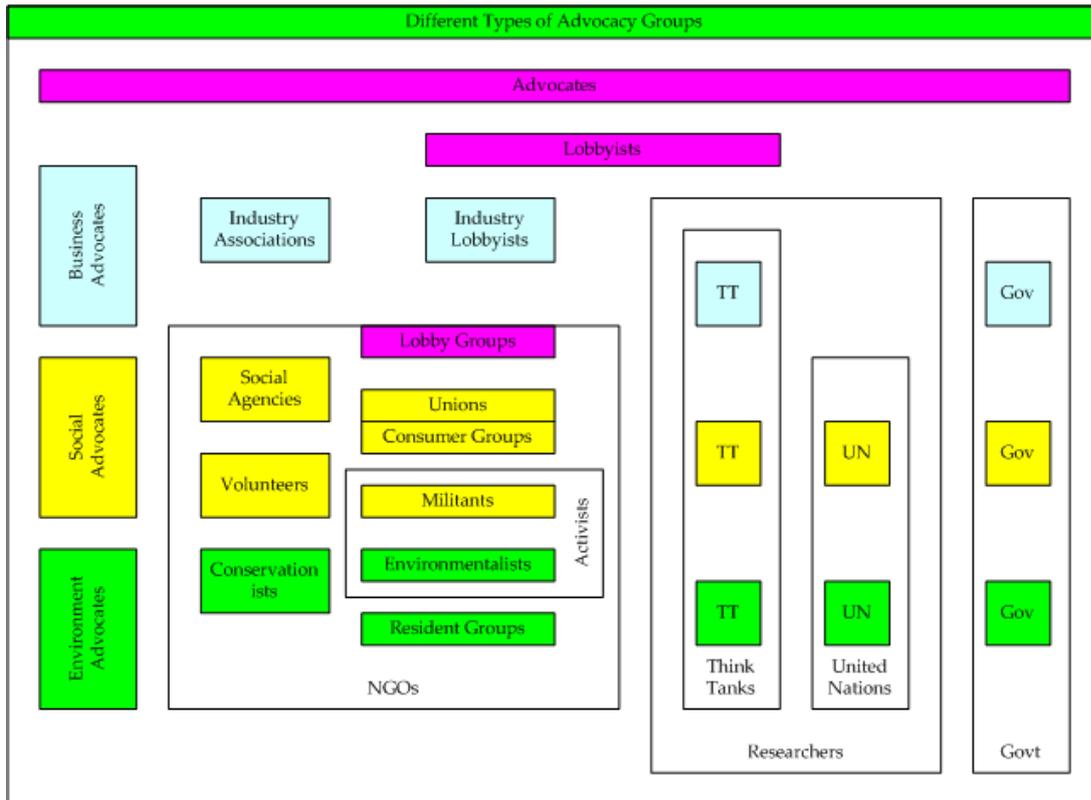
Figure 4.4.8.1 – Different Types of Advocacy Groups

It was not always easy to decide which of these three groups an organisation should fall into, and there was some overlap, especially between social and environmental. Small one-issue residential groups were sometimes a challenge. For example "New Era Energy" represented (mostly) farmers and landowners opposed to Transpower's large pylon plan through the Waikato and Hunua areas. Residents like these who had banded together to oppose development of some type were classified as environmental advocates, even though there may well have been monetary (property values) or social (community health) factors involved as well. For each organisation an attempt was made to identify what seemed to be their main

purpose (by visiting their website if not enough information was provided in the extracted articles).

Occasionally an organisation was assigned two of these advocate categories. For example, those clearly promoting green commerce (such as "Renewable Energy NZ") were classified as both business and environmental advocates. Where a so-called think tank seemed genuinely impartial with no lobbying focus (such as Panorama), it was removed from think tanks (which were considered to be a lobbyist[345] subset of researchers) and just categorised beneath research instead.

Each of these three advocate classifications was an umbrella term intended to cover both (quiet) support organisations (e.g. Salvation Army) as well as (more noisy) lobbying organisations (e.g. Global Peace and Justice). These were then able to be further identified into their various (sometimes multiple) player, issue, and communication types where possible. For example, social agencies were NGOs for households, unions were lobbying NGOs for workers, some UN organisations were researchers, think tanks were lobbying researchers, and industry associations (lobbying or otherwise) were simply classified as belonging to their specific industry. This extra "brand" of advocacy that had been applied (although not explicitly appearing in the original framework) was thereafter available within the organisation hierarchy for additional comparative analysis if required.

The classification lobby groups also had a further subset called activists (using the more extremist sense of the word), comprising militants and environmentalists among others (shown in the centre of Figure 4.4.8.1). Note that this illustrated classification configuration was built mainly as a result of apparent usage in media articles (or by the organisations themselves), not necessarily by following referenced definitions.

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[345] A distinction was made between "lobbyist" and "lobby group", where lobbyists were considered to be more organised and better funded than lobby groups. Thus industry advocates and think tanks were classified as lobbyists, while NGOs (where appropriate) were called lobby groups, as indicated in Figure 4.3.4. The term NGO was not applied to business advocate organisations, instead these were categorised beneath their industries.

Describing this process in more general terms, where there was an apparent weakness or ambiguity in the player topic categories, additional hierarchy layers and groupings were added within the organisation class in order to help with consistency of the topic categorisation and to provide more fine grained classifications in case they proved useful. The down side of doing this was that the larger the multiplicity of possible categories, the more decisions that needed to be made when classifying.

In his study of a globalisation protest event, Gavin (2007) noted that activists and protesters formed disparate groups of many different types. Although his study showed conclusively that the media covered them mostly in a simplistic and fairly derogatory manner, he asserted that it was more their own overall disorganisation and lack of a clear cohesive message which led to their "bad press", rather than any fault on the part of the media.

The challenge I experienced when forming my classifications seemed to add validity to Gavin's assertion of apparent ad hoc variability, but while his deduction (of no clear message) may have had some credence for the specific protest in his study, I do not agree that the media should be excused in the more general sense for trivialising, and not examining more closely, the issues that such NGO groups are concerned about.

3. What is Business?

It became evident fairly early on in the study that (as a corollary of the market reforms of the 80s and 90s) the language, structure, culture, and practice of business had (by 2006) permeated almost all aspects of our lives, certainly those aspects which were visible in the media articles under study. Universities were creating "Institutes" and "Centres" for the express purpose of collaborating with business, or commercialising the products of their research. Governments were funding business ventures, government ministries (such as Crown Minerals, MAF, and MED) were not restricted to oversight but were actively promoted industries, and government research centres (CRIs) were encouraged to commercialise wherever possible.

Furthermore, market analysts were often described as researchers[346] (e.g. MacQuarie Research Equities). In my model (developed in chapter 3) government and research were clearly separate from business, but at classification time the significant level of intertwining became evident, so great care was taken to assign justifiable lines of demarcation.

This overlap had particular ramifications for the electricity industry. Having constructed a separate section in my model for the electricity industry (but acknowledging the relationship by colouring it blue), at which points did it overlap with the business sector? Knowing that aspects of electricity provision had previously been (and were still in some overseas jurisdictions) provided directly by government or local government, and that in New Zealand some components were still owned by community trusts (e.g. some lines companies) and by the Government (as SOEs), I was hesitant at first to categorise them all as businesses. This gave rise to the question, what exactly did "business" mean in my model?

In the end, I concluded that ownership was irrelevant to the question of whether an organisation was a business or not, and tended towards the Inland Revenue Department (IRD) perspective instead. If an organisation was structured as a commercial entity, and undertook commercial activity intending to make a profit, then it was a business. This meant that SOEs were businesses (because they were called "companies" and profit was their mandate[347]), but District Health Boards (DHBs) and Crown Research Institutes (CRIs), despite tending in that direction, were not. It also meant that lines companies were businesses, even if they were owned by a community trust. As a result, most of the electricity sector did indeed come under the business umbrella. However, mentions of self-sufficiency in

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[346] It soon became obvious that the word research was used more often in relation to stocks and financial investment, than in relation to science. This caused difficulties for the science and research topic phrase classification. The situation was ameliorated by using the term "analysts" to cover business oriented research (including "financial research" and "market research", to distinguish these from more scientific researchers.

[347] Section 4, Part 1 of the State Owned Enterprises Act 1986 states "The principal objective of every State enterprise shall be to operate as a successful business and, to this end, to be—(a) as profitable and efficient as comparable businesses that are not owned by the Crown; … ".

electricity and some types of demand management needed to be carefully excluded[348].

Furthermore, what type of business? While markets were mainly financial mechanisms, and retailers came under the commercial category, most types of generation and transmission actually involved large metal work construction (and maintenance) projects, which would surely be regarded as heavy industry[349]. Here a feedback loop appeared. Electricity generators provided electricity to smelters which provided metal to manufacture turbines and construct pylons. Everything was indeed inter-related.

The grey area extended still further. I began by categorising words such as "CEO", "director" and "board" under the general topic of business interests, until I realised that many non-commercial organisations also used these designations, thereby copying the business model and using business language even though they were not businesses.

These allocations therefore created a false positives problem as I did not want non-business organisation sentences being counted incorrectly against business, although where they used the language of business it could be called "bonus" coverage (this term will be described further in the next key indicators section). To address this problem, I pulled out many non-business exceptions using contextual markers (e.g. "CEO of the", "association executive director", etc.). Unfortunately this added exception handling was not quite comprehensive enough, so the phrases in question were removed from the business classification altogether. In order to capture them (when appropriate) beneath the topic of business, they were instead assigned as nick names for the actual organisations concerned. Although it was a challenge to capture them all, this configuration provided a successful solution.

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[348] Exclusion was required much less often than expected. Ultimately, usage of the phrase "energy efficiency" was found to be related to innovative business products or practices in most cases, and was therefore assigned to the "energy efficiency industry".

[349] "Heavy industry" was found to mean very large or "capital intensive" industry. House construction was not considered to be heavy industry, but high-rise construction was.

4. What are Environmental Issues?

> *When we try to pick out anything by itself, we find it hitched to everything else in the universe. - John Muir, naturalist, explorer, and writer (1838-1914)[350].*

For the next major dilemma, the question arose as to when to relate an article entity or concept to the topic underlined environmental issues, or (as I came to use this topic header) to the environment in general. A precedent had already been set by underlined alternative fuels when it was classified as a sub-topic beneath underlined peak oil, which was defined as an environmental issue (see section 4.4.5). The question then arose, if alternative fuel references were (via peak oil) adding to topic sentence counts for environmental issues, should renewable energy in general also add to these same environmental sentence counts? Certainly renewable electricity generation was addressing these issues (peak oil and climate change) in a similar way, and this was a subset of the broader renewable energy category, just like alternative fuels.

One distinction here (when deciding whether renewables as a whole were specifically an environmental topic or not) was the issue of "newness". Alternate fuels were relatively new, and were being considered precisely and primarily because of peak oil (with additional benefits for climate change). Wind, solar, and marine energy could perhaps make a similar claim (although the more short term issue of security of supply was clearly another factor), so it initially seemed reasonable to include them beneath climate change and (less obviously) peak oil as well. However, hydro generation was a different story. This was an established generation source, built at a time when such issues were not on the radar. Furthermore, it was unlikely that New Zealand would build any significant new hydro dams[351]. To add to the complexity, hydro seemed mostly to be discussed in relation to security of supply (lake levels) which was a short term weather issue, but not so much discussed in relation to climate change. Geothermal energy was caught in between. Established geothermal was mostly unrelated to such issues, but new geothermal developments were supported by climate change concerns.

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[350] Wordsmith.org.
[351] Cumming (2004); Meisen & Garzke (2008:15).

The second consideration was one of predominant and consistent context, and this was what validated my decision to leave other renewables (and the renewables topic as a whole) out of the explicit environmental issues "family", while retaining alternative fuels inside. If the environment or any environmental issue was mentioned alongside a renewable energy phrase in a sentence, it would be counted anyway, so there was not an issue there. However if no direct parent (inclusive) topic relationship was constructed, then false positives would be avoided for those cases where the main issue was (for example) system capacity or security of supply. This decision did not preclude an acknowledgement of the <u>implicit</u> relationship between renewables and the environment, which was still able to be successfully accommodated (as discussed in the next key indicators section). The concern here was purely about counts for explicit <u>environmental issues</u> <u>topic</u> coverage.

A similar issue arose with the <u>environmental issue</u> of <u>pollution</u>. Should all mentions of fossil fuels give rise to counts for pollution? If so (and if the previous renewables had also been included), then all energy use would have given coverage counts to the environment, renewables on the positive side, and fossil fuels on the negative side. In other words, demonstrating that all of them affect the environment (but not very useful when trying to assess comparative levels of media coverage)!

However, fossil fuel generation was once again an established conventional fuel source, so talking about it in the media did not necessarily mean one was talking about environmental effects. In fact one premise of this thesis is an assertion that such effects are not given enough media recognition. Pollution (as a topic) was thus counted only when discussed directly, and pollution counts were not accumulated when fossil fuels were mentioned. Furthermore, an <u>implicit</u> relationship between fossil fuels and pollution was not assigned in the data map because to do so would have meant relating <u>all</u> industry to pollution, which was not practical or necessary for this study.

5. Economics

Another difficulty arose when deciding when to classify an item beneath <u>economics</u> (a political imperative) rather than the <u>finance industry</u> (a player).

When classifying <u>organisations</u> this distinction was relatively clear. <u>Finance companies</u> dealt primarily with money. The <u>economics</u> category only arose occasionally for organisations, when classifying <u>economists</u> for example. However, it was within the <u>documents</u> class that this dilemma became more acute. <u>Economics</u> was a word used in many different contexts within the modern English language, with some subtleties of meaning. What did I mean when I used that word as the name of a classification? And how freely could I use it as a classification?

The term <u>economy</u> was slightly easier to manage. Treated as a subset of the concept economics (in the hierarchy of entities), economy simply referred to the "big picture", for example, government expenditure, inflation, and other such indicators. Economics on the other hand could often mean, quite simply, anything to do with money, or to be slightly more specific, any assessment of the value of something. For example, could the entity <u>electricity price</u> be classified as <u>economics</u>? Ultimately, the decision made was that it could.

What was required in this type of classification dilemma was not so much an exact definition, but rather a more general term which would provide a rough set of boundaries within which groups of phrases could be comfortably accommodated, specifically where there was not any other more appropriate category available. Right up until the end of the study, topic names were still able to be adjusted slightly (as were entity item names) in an attempt to more comfortably fit the concepts that were underlying the framework designed in chapter 3.

6. Overlap and Nesting

One challenge encountered during the construction of categories was the issue of nesting. This issue occurred within almost all entity classes, even occasionally for persons (e.g. for married couples), but was most easily observed for organisations. For example, should a subsidiary be included as an alternate name for its parent, or have its own separate item id?

Alongside the nesting/overlap dilemma was the question, did it really matter? If not, why not, and what was the avoidance strategy? And if so, then which handling mechanism would provide a method of greatest usefulness?

The level of significance appeared to be related to position in the hierarchy. In other words, the more times an entity or concept was split into its detailed components for closer inspection, the greater the requirement for overlap handling, because of the greater chance of double counts. Counter to that was the combining of minor entities together. Care needed to be taken that this did not reduce counts for that topic. One important factor was the golden rule of categorisation, i.e. as much as possible "compare like with like". However, when examining selected words belonging to the English language, this proved to be more difficult than it had at first appeared.

Ultimately, because the ETAT counting routines merged sentence numbers, it transpired that the risk of double counts was low, and so the nesting consideration was only an issue when comparing specific entities of interest.

4.4.9 Summary

This categorisation section of the research design chapter described the process that was followed to develop and refine the numerous hierarchical categories that provided the data for counting and analysing in this study. It discussed the importance of the categorisation process, touched upon researcher bias, and provided an overview of the construction of the topic categories that were applied to the study. It also provided a description of the way that the other entity classes (person, organisation, document, event, city, country, and keyword) related to their assigned topics and to each other.

Categorisation was a laborious and exacting process but it was in no way all encompassing. While attempting to do this in a logical and intuitive manner, even at best the resulting model was only a very rudimentary approximation of reality. Boundaries between categories were not necessarily hard and fast in the real world. Some overlaps and some omissions were unavoidable.

Categorisation is useful but it can be dangerously arbitrary, and one must be aware of the tendency to over-simplify in order to allow a conclusion to be reached. In this study I met the categorisation challenge head on, gave it in-depth consideration, and provided some straightforward tools and rules for handling a complex area.

4.5 Key Indicators

> *Measure to manage.*[352]

4.5.1 Introduction

There are many ways to measure media exposure. In this key indicators section of the research design chapter, some of these are discussed, and the unique methods which have been chosen for this study are presented.

Measuring media coverage or prominence for online news articles was found to be different from measuring coverage or prominence for newspaper articles, because traditional yardsticks such as "column inches", "page number" and "location on page" ceased to be relevant online.

As the research progressed, the methods outlined here were developed in response to the need to find effective ways to measure and compare media exposure for the different entities and concepts in this study.

After careful consideration, tools were developed specifically to match what was required. The intent was to deliberately avoid being drawn only to what was easiest to measure, a common pitfall in data collection where the easiest indicators are not necessarily the most important indicators.

This section is divided into seven main sub-sections: media exposure, indicator development, coverage indicators, intensity indicators, article scoring, article ranking, and selecting winners.

The remaining two chapter sections after this one describe process algorithms and article selection.

4.5.2 Measuring News Media Exposure

At the core of this study is a distinctive new way of measuring media coverage, which has been developed specifically for online media news articles rather than

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[352] This is a common mantra in business circles, exact origin unknown.

newspaper-based articles. This new method attempts to improve upon traditional content analysis methods by applying an increased level of carefully considered precision to the measuring process. At the basis of the new method is a set of key indicators which will be described shortly.

Past newspaper analyses[353] measured "prominence" using scales such as the Budd score[354], which assigned a ranking according to page number, size of headline, length of article and location on page. For a study (such as this one) of online articles which had no equivalent "page layout" around them, such measurements no longer held the same relevance. While an argument could be made for equating the layout of a media organisation's home page with a newspaper layout, I considered that substitution to be tenuous, as search engines easily enabled readers to pull out articles by keywords and news sites directed readers to whole topics at a time via a single mouse click. Furthermore, it was standard practice for lists of headlines on a media website to rotate throughout the day, making it much more difficult to pin down a "webpage location" in any way which paralleled a location in a static daily newspaper, as the latter traditionally remained the same for a full 24 hours, and was easily retrievable and visible later in a copy of a past issue. Another possible substitute for the page "location" reference could have been the (free) daily automated news headline email service that some media companies provided to subscribed recipients, but most such services offered user choice (removing the "static" nature). In addition, while the emailed headlines no doubt gained some prominence, once the user had linked to the website to read the article they were subject to the other distractions and features already described.

For the purposes of this study, I therefore developed my own prominence scoring method. However, this prominence scoring mechanism had a slightly different focus. It was not attempting to measure the article (or topic) prominence in relation

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[353] E.g. Cleveland (1970); Roulston (2005).

[354] The Budd (1964) score was a 1-5 "attention" scale which assigned one point each for the following four criteria. 1. A headline two columns or more in width, 2. A first line above the fold (or midpoint) of the page, 3. Occupation of ¾ or more of a column (including pictures),

to an external reference (the whole paper or media site), but instead measured the comparative prominence of entities or concepts within the articles themselves, and accumulated the score for multiple articles. In other words I chose to measure the relative prominence of entities or concepts within electricity articles, rather than measuring the relative prominence of electricity as a topic (or any related concepts or players) within the whole set of news articles.

4.5.3 Indicator Development

Once the required entities and concepts of interest had been identified, named, defined, categorised, related to each other, and nick-named in a multiplicity of ways (described briefly in the previous section and further in the next section) it became evident that there were many possible ways in which these items, and their signifying phrases, could be counted. Consequently, there were further decisions to be made about which key indicators would give the best information to enable accurate measurement of comparative media exposure.

While undertaking the development and selection of key indicators to measure exposure, two main perspectives became evident, namely, "what to count" (which words, phrases and relationships were important) and "where to count" (the phrase location within the article).

Consideration of the first perspective ("what") gave rise to the key concept of coverage (with indicators literal/bonus, explicit/actual, and implicit/hidden), and consideration of the second ("where") gave rise to the key concept of intensity (with indicators appearance, substance and prominence).

Classifications within each of these two perspectives gave rise to a number of constructed key indicators, each of which were able to be cross tabulated with the indicators from the other perspective, to make a larger set of combined indicators. Thus the two highest level key indicators (one from each perspective) could be combined to arrive at a final total measure of exposure, but each of the other

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4. Appearance on page 1, the editorial page or the sports page. A bonus fifth point was

indicators was also able to be examined separately, where more appropriate, to break that final measure down into its component parts. This separate component examination was useful for the subsequent investigation into whether one of the lesser measures might be a better measure of exposure than the all-encompassing final total. Each of these two perspectives, the <u>coverage</u> ("what") and the <u>intensity</u> ("where") will be described in the next two sub sections.

4.5.4 Coverage Indicators

The <u>coverage</u> indicators arose from a consideration of "what" to count. These are most easily explained using organisations as examples, as this was where the choice (or dilemma) was most acute.

Three distinct ways of looking at coverage were identified. These were named <u>literal</u> coverage (words), <u>explicit</u> coverage (entities), and <u>implicit</u> coverage ("children" or subsidiaries). <u>Explicit</u> coverage of an entity by meaning (the yellow box in Figure 4.4.3.1) was considered to be the primary indicator for coverage, and the others were extras in two opposite directions, such that <u>literal</u> mention of the same words (with a different meaning) gave rise to "bonus" coverage, and <u>implicit</u> mention of related (or owned) entities gave rise to "hidden" coverage, as described further below.

1. <u>Literal coverage</u> was the simplest to count, as it included any mention of the key identifying label or brand for this participant. For example "Genesis" was the brand name for Genesis Energy, and so Genesis Energy gained a small amount of bonus coverage whenever Genesis Research, the rock band Genesis, or the biblical book of Genesis were mentioned. While some reader confusion may have arisen from words with multiple meanings, such repetition is alleged to increase sub-conscious familiarity with the term in question, thus providing a small amount of extra exposure[355] for the brand of the organisation under study (see section 2.2.6). This assumption is based upon the same logic as that which motivates companies to purchase sponsorship deals (of which several were observed in this study).

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allocated if the headline occupied more than half the width of the page (Roulston 2006).
[355] Where "mere exposure" leads to increased "positive affect" (Zajonc 2001).

Probably the most extensive example of extra bonus coverage observed during the study was the frequent use of the word "green" providing a quiet boost for the Green Party brand. This was followed closely by the word "national", which added subliminal heft to National Party coverage.

Literal coverage could include every use of the brand name (including lower case), or it could be just the extra counts from other entities (or deliberate sponsorship). Meridian Mall and the TrustPower TECT Rescue Helicopter were examples of bonus coverage that were set as entity exceptions in the previous categorisation section.

2. Explicit coverage comprised the bulk of the coverage for most entities. This indicator was a genuine attempt to count entities or concepts by meaning, where the participant under consideration may have been described in a number of different ways, including nick names. This indicator provided the closest measure of deliberate "actual" coverage, and was the primary method of measurement for this study, although counting was more complicated than for literal coverage, because of the logic required to handle nick names and exceptions.

This indicator came closest to the traditional "column inches" measure, with the added advantage that computer counting could add a more precise level of relative coverage detail for the individual elements that made up each sentence. In other words, rather than simply measuring the size (or column inches) of a whole article (about a subject), the measure here was of the exact number of (in this case) sentences which mentioned the item of interest, whether it was a major or minor subject within the article.

3. Implicit coverage was the most contentious, required the most manual input, and was difficult to define precisely although every effort was made to provide a reasonable approximation. This indicator counted the mentions of related or "owned" entities with a different name from the entity under study. For example Mercury Energy was a wholly-owned subsidiary of Mighty River Power, and so any mention of Mercury Energy provided extra "hidden" coverage for Mighty River Power (as its "parent"), but not necessarily visa-versa, as explained below. The

meaning of "related" or "owned" created a dilemma, and the structure eventually arrived at was a hierarchical (usually one-way) "parent-child" type of relationship.

The word "member" was originally tried, but this did not quite confer the ownership or directional relationship that was needed. A good example was OPEC. While the governments of Saudi Arabia and others may have been considered to be "members" of OPEC, it seemed that the direction of the hierarchy should actually be the other way around, using the following logic. When one talked about Saudi Arabia, one was not necessarily talking about OPEC, but when one talked about OPEC, one *was* talking about Saudi Arabia, along with the other 10 members[356]. So effectively OPEC was "owned" by its member states, and not the other way around. Furthermore OPEC itself did not exist in a vacuum apart from its members, so any coverage or exposure attributed to OPEC was also indirectly conferred upon its member states, even when they were not mentioned by name. Thus OPEC was defined as the "child", and the governments of the member states became the "parents" (or owners).
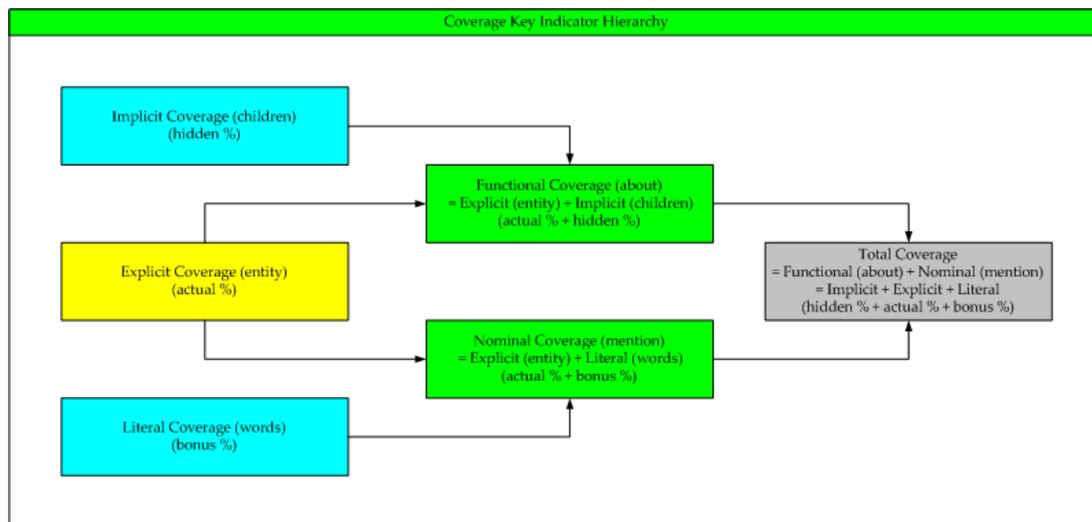
Figure 4.5.4.1 – Key Indicator Coverage Hierarchy

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[356] The eleven members of the oil exporting OPEC cartel over the period of study were the governments of Algeria, Indonesia, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, Venezuela, and UAE. Dominant non-OPEC countries were Norway, Canada and Mexico.

The same logic was applied to business lobby groups such as the Greenhouse Policy Coalition and the Major Electricity Users Group (MEUG)[357]. In each of these cases the members were considered to be the "parents" of the group, so any media coverage of the group gave extra "hidden" coverage to the views of the members.

Once the three primary ways of examining coverage had been isolated, three other possibilities arose, as may be seen in Figure 4.5.4.1. "Functional" coverage was described as a combination of explicit and implicit coverage, and the more superficial "Nominal" coverage was described as a combination of explicit with literal coverage. Finally the term "Total" coverage was considered to contain all of the others combined. These combinations are presented here as if they were straightforward additions, but the diagram is indicative only and does not preclude the use of a weighting mechanism to diminish the effect of adding the hidden and bonus counts under some circumstances.

Various permutations were explored in this study, and the results are presented in chapter 5. Overall, it was found that the most useful indicators were the explicit and functional measures, sometimes depending on the type of entity being measured. Literal coverage was briefly noted for certain selected entities.

4.5.5 Intensity Indicators

When deciding "which locations" (where in the article and how often) to count, three main types of intensity indicator were considered to be relevant. These were named appearance, substance, and prominence, and were defined as follows –

1. Appearance – the item of interest was (or was not) mentioned at least once, anywhere in the article. This is a binary (yes/no) indicator at the article level, and when accumulated, gave rise to a total count of the number of articles (from within a given sample) in which the item of interest appeared. This was by far the most straightforward intensity indicator to measure, and when used for comparison, it

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[357] See section 6.3.2 for further information about these two organisations.

provided information about breadth of exposure (over time) while giving little information about depth.

2. <u>Substance</u> – the number (or proportion) of sentences[358] in which the item of interest was mentioned. This gave rise to a count (and/or percentage) indicator at the single article level, and also (like appearance) was able to be accumulated to form totals over a period.

3. <u>Prominence</u> – an indication as to whether the item of interest appeared in a prominent position (rather than embedded) in the article. In order to calculate this indicator four distinct groups were constructed such that the heading, author line and source line (trailer) made up one group, all sentences in the lead line made up the second group, all picture captions made up the third group, and all labels for any attached documents, videos, or links made up the fourth group. A prominence score (or ranking) of 0 to 3 was then assigned, where 0 indicated no appearance in any group, 1 implied appearance in just one group, 2 implied appearance in two groups, and 3 implied three or more. It was observed that proper names generally did not appear in headings. Instead nick names often appeared as "teasers" to invite the reader to dive in and find out what was being referred to. The opposite was true of photos, which nearly always included full names, and almost never included nick

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[358] An alternative measure of "substance" would be a count of "instances" rather than sentences, but this can be arbitrary if nick names are included in the count. For example if "he" is counted as a nick name for John Smith, then in a sentence such as "John Smith decided that he would change to Meridian because it was a carbon neutral electricity retailer", does an instance count for John Smith give a value of 1 or 2? Similarly if "electricity retailer" and "it" are both counted as nick names for Meridian, then an instance count could give a value of 3, while intuitively this feels like a single mention. Because ETAT incorporated a complex nick name/proxy name system in the phrase extraction functionality to allow the counting of multiple related sentences, it was considered to be more meaningful to count sentences rather than instances. Note that if only primary entity names (and not nick names) were counted, then an instance count would normally give a similar count to a sentence count anyway, as it is unusual for a name or word to be repeated in the same sentence. The drawback of not counting nick names is that a proper name may only be mentioned once, but then be followed by many sentences on the same topic which are referenced relatively rather than directly, and which would not be counted at all. While straightforward for person or company names, an instance count would also be more difficult for ideas or concepts (like "oil price") which may have many permutations, and where the difference between primary name and nick name may be unclear or overlapping.

names. After some contemplation upon this issue, it was considered not necessary for the final scoring method to have to distinguish between the use of a proper name and the use of an assigned nick name.
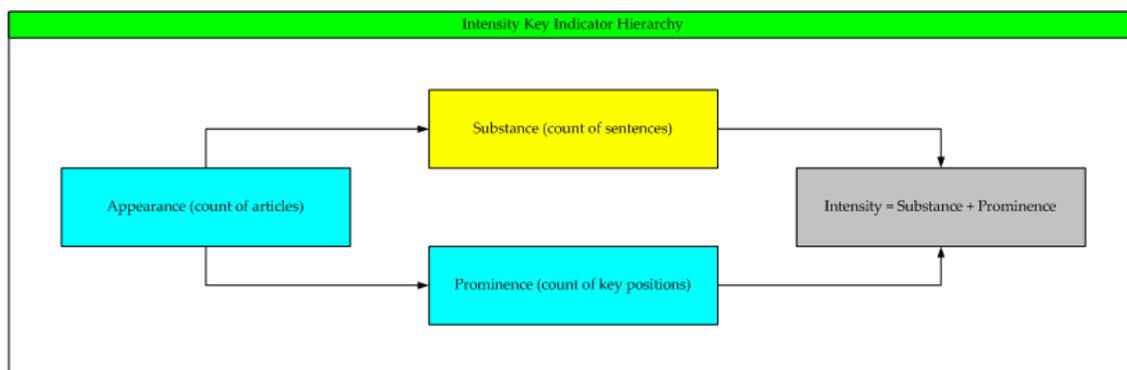
Figure 4.5.5.1 – Key Indicator Intensity Hierarchy

Each of the three intensity indicators shown in Figure 4.5.5.1 were measured and made available for comparison, and a fourth "total" intensity indicator was also constructed by combining substance and prominence scores together. This last indicator was considered to give the best overall indication of the intensity of the coverage (when compared with other entities).

4.5.6 Article Scoring

As each article was processed, coverage and intensity indicators (described above) were calculated by ETAT for every entity item (i.e. each individual player, concept, or high level topic).

Appearance was the easiest to measure, as this simply recorded whether or not an entity item was referenced at all in an article. This measure was the one most used in other studies[359].

However, in this study if the item was found then substance was also measured, by counting the number of applicable sentences. This measure was stored both as a sentence count, as a percentage of the total number of sentences in the article, and as a quantity ranking (see next section). Sentence counts of explicit coverage were

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[359] E.g. GMMP (2010); Gavin (2010).

recorded for all entities, of <u>implicit</u> coverage as far as was practicable, and of <u>nominal</u> coverage for just a few selected entities of interest.

<u>Prominence</u> (0-3) was also scored, and combined with each of the <u>substance</u> rankings (0-3) described below to provide a set of scores for <u>intensity</u> (0-6).

These different measures may seem confusing, but their variability highlighted different approaches that could be taken to the measurement of coverage. It was not possible within the scope of this thesis to analyse and discuss all of the different measures for all of the different entity items in the study (although most were measured). Therefore only selected examples of interest will be examined in the data and discussion chapters. This study primarily involved the counting of articles (a commonly used mechanism), and of sentences containing phrases of interest (a mechanism customised for this study). Once this had been done, the entity item counts and rankings were aggregated over sets of related articles, then compared with each other as totals and as trends over time.

4.5.7 Substance Ranking

The availability of numerous indicator counts for every article also gave rise to other ways of ranking articles for comparison, as well as for article selection (described further in the last section of this chapter). Furthermore, in order to combine the <u>prominence</u> score (0-3) with the <u>substance</u> score it was preferable to convert the substance sentence count (and percentage) also into a ranking (0-3).

For example, within each article the proportion of sentences relating to electricity (topic id=5) was used to determine whether electricity was a major subject, a minor subject, an incidental mention, or missing altogether. Thus the <u>substance</u> (sentence count proportion) measure of <u>explicit coverage</u> (by meaning) for the topic of electricity allowed an individual article to be ranked into one of those four categories. After some experimentation, reasonable category boundaries for these four quantitative rankings (<u>zero</u>, <u>incidental</u>, <u>minor</u>, and <u>major</u>) were determined to be sentence proportions of 0%, 1-19%, 20-39%, and 40-100% respectively. Weighting by article length would further improve this measure, as discussed below. These

ranges were each assigned a number (0-3), allowing them to be examined in aggregate or compared over time, in the same way that counts were. These substance scores (or rankings) were also used to filter or select articles of interest, and (when compared for selected high level categories) allowed rudimentary auto determination of what the article was about. Each assigned value was effectively a simplified representation of a sentence percentage range, see Table 4.5.7.1.

Table 4.5.7.1 – Substance Ranking Boundaries (by sentence percentage)

Ranking	Meaning this entity item is …	Low Boundary	High Boundary
0	missing from the article (no mention)	0%	0%
1	an incidental mention within the article	1%	19%
2	a minor subject within the article	20%	39%
3	a major subject within the article	40%	100%

4.5.8 Article Length

The median article length was reasonably steady by month, at 21 sentences. The minimum was 3, and the maximum varied between 115 and 332, depending on which articles were included, thus forming an obviously skewed distribution. The standard deviation was approximately the same size as the median.

Table 4.5.8.1 – Substance Ranking Implications for Article Length

Sentences	Incidental (1)	Minor (2)	Major (3)
3	N/A	1 = 33%	2 = 66%
4	N/A	1 = 25%	2 = 50%
5	**N/A**	**1 = 20%**	**2 = 40%**
6	1 = 16%	2 = 33%	3 = 49%
7	1 = 14%	2 = 28%	3 = 42%
8	1 = 12 %	2 = 25%, 3 = 37%	**4 = 50%**
9	1 = 11%	2 = 22%, 3 = 33%	4 = 44%
10	**1 = 10%**	**2 = 20%, 3 = 30%**	**4 = 40%**
11	1 = 9%, 2 = 18%	3 = 27%, 4 = 36%	5 = 45%
12	1 = 8%, 2 = 16%	3 = 25%, 4 = 33%	5 = 41%
13	1= 7%, 2 = 15%	3 = 23%, 5 = 38%	6 = 46%

Some problems were anticipated with this substance ranking method for very short or very long articles. For example, in a three line article (heading plus two sentences), every single item which was mentioned in the lead line automatically obtained an intensity of 3 (33% substance = S2, plus prominence M1 = I3), and any feature appearing in only one sentence was still considered to be at least a minor feature. At the other end of the scale, for an article containing 40 sentences, a topic which appeared in 7 sentences (but not the prominence groups) was considered to be only incidental (17% => S1 + M0 = I1), whereas logically it should at least be minor. This problem could be overcome (for future studies) either by adjusting the boundary values for (arbitrarily defined) very short or very long articles, or by deliberately excluding such articles altogether from the analysis.

Another complication (for verification) was the number of other topics. If the article was about many distinct topics, each mentioned only briefly, and none of which appeared in more than one sentence, then the dilemma arose as to whether the article was about none of the items, or all of them. In this case it could be said that the article was really more about the higher level conglomerated subject which was the common factor among all of them, rather than about any of the individual items themselves. The beauty of examining media releases was that most of them were about one main topic, and so this dilemma arose only at the lower levels of dissection, or for the longer (often opinion piece) articles.

4.5.9 Article Winners

Another way that entity item comparisons were approached for individual articles was to select winners according to the entity item which received the most exposure within a single article, each time selecting between a small set of competing related entities. This made use of the scoring methods described above, while providing a slightly different vantage point. It compared substance (sentence count), prominence, or intensity (substance ranking plus prominence ranking), selecting just one single winning item for the article from each related group of items, and ignoring losers altogether. Numbers of each type of winner were then aggregated across articles (rather than sentence scores), allowing measurement of, for example,

the number of articles with an overall positive tone, or the number of articles which mentioned women more than men. This mechanism provided a microcosm at single article level for some of the same item comparisons that were performed at the aggregated article level, allowing the effect to be magnified when winners were accumulated instead of the raw scores. This was operationalised for the selected entity sets listed in Table 4.5.9.1 (pairs) and Table 4.5.9.2 (groups of three or more).

Table 4.5.9.1 – Customised Winner Comparisons (Pairs)

Name	Competitors
Named Gender	Male / Female
Unnamed Gender	Male / Female
Merged Gender	Male / Female
Tone	Positive / Negative
Perspective	Past / Future
Domestic	NZ / Foreign
NZ Island	North Island / South Island
Carbon Pricing Tool	Carbon Tax / Emissions Trading

Table 4.5.9.2 – Customised Winner Comparisons (Groups of three or more)

Name	Competitors	Members
Players Level 7 – Electricity Supplier	Contact / Trustpower / Meridian / MRP / Genesis / KCE	6
Players Level 7 – Political Party	Labour / National / Greens / NZ First / Act / United	6
Energy Source	Fossil fuels / Renewables / Nuclear / Demand Management	4
Fuel	Oil / Gas / Coal / Hydro / Wind / Solar / Biomass / Other	7
Region	Australasia / America / Europe / Asia / Scandinavia / Eastern Bloc	6
Country	NZ / Australia / USA / UK / Russia / China / India / Iran etc.	many

This type of measurement was also available for each of the topic groupings by level. Some examples are shown in Table 4.5.9.3.

<div align="center">**Table 4.5.9.3 – Topic Standard Winner Comparisons**</div>

Name	Competitors	Members
Subject Topic Level 0 –	Electricity / Oil / Gas / Water	4
Players Topic Level 1 – Broad Sector	Business / Government & Education / Household / Other Parties	4
Players Topic Level 2 – Sector Category	Coal / Transport / Heavy / Agriculture / Forestry / Oil / Light / Finance / Science / Education / Government / Beneficiaries / Families / Workers / NGOs / Local Bodies / Political Parties	18

Photographs, radio and TV contain visual or aural <u>influencing</u> factors such as facial expression, background, intonation, and music which are not applicable to text. Nonetheless, in this study levels of <u>emphasis</u> were able to be gleaned by analysing coverage and intensity characteristics within the text, and picture captions were able to be included (rather than actual pictures). Some estimates of tone (and emotion) were also able to be interpreted from the words used.

4.5.10 Summary

There are a surprising number of ways to measure media exposure within news articles, even when only examining the words in the text. For this study a careful logical approach was taken to key indicator selection, which eventually arrived at a flexible hierarchy of 6 (coverage) x 4 (intensity) = 24 key indicators. Within this set, the top level total indicator provided one measure of influence, but selected component indicators (e.g. functional coverage or explicit coverage) were often examined instead, where they were considered to be more appropriate, for reasons which will be discussed in the data chapter. This core set of indicators allowed compound ranking measures to be derived, and the selection of "winner" entity items by article. The set of exposure indicators developed for this study differed from traditional newspaper prominence indicators such as Budd (1964) in that they measured the comparative exposure (and prominence) accorded to entity items within an article or set of articles. They did not attempt to measure whole article prominence arising from positioning, timing, or decoration on the webpage. That type of analysis for online articles offers fertile ground for future studies.

4.6 Processing Features

> *"Words differently arranged have different meanings, and meanings differently arranged have a different effect." - Blaise Pascal, philosopher and mathematician (1623-1662)[360].*

4.6.1 Introduction

Sections 4.3-5 have introduced the customised ETAT text analysis method. This section describes further algorithmic features of this method. Also discussed are the rationale for, and some of the challenges inherent in, attempting to automate the (usually manual) text coding process.

The ETAT software was developed in parallel with the two processes of categorisation and key indicator identification discussed earlier in the chapter, so that the required capabilities would be able to be implemented as specified.

Following this introduction, the subjects covered in this section are research coding, article characteristics, product comparisons, software advantages, developmental challenges, and search techniques. The section will conclude with a brief summary.

4.6.2 Research Coding

In 1970 Cleveland noted that detailed "news flow" media studies were rare, at least partly because "the quantitative analysis of newspaper content presents methodological difficulties and is enormously time consuming"[361]. Cleveland proceeded to laboriously devise unique methods for his New Zealand newspaper analysis, including his own code lists (to be scored by a large number of coders), and a customised prominence scoring method which was his variation on Budd's score.

The advance of computer technology has since made the task somewhat less daunting. Nevertheless at the time of my study (over 35 years later than Cleveland's), surprisingly similar challenges remain.

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[360] Wordsmith.org.
[361] Cleveland (1970:iii).

In fact, all prior news media content analysis studies that were examined, including large global projects such as the policy agendas project[362], and the later global gender project[363] involved manual coding to a set of categories, according to each reader's interpretation of the article. Where the number of categories was large (for example in the ongoing policy agendas project), this would be a daunting task for the coder, and at times considerable reader discretion would be unavoidable, especially if the allocation of topic proportionalities within one article was required.

Even well-trained coders will vary in their scoring of complex passages of text, and so studies which involve the participation of many different people must expect a certain level of inconsistency.

Double coding (by two different people for the same piece of text) is one way to attempt to overcome this anomaly. This "moderation" technique is extremely effective for data entry validation where correct answers are able to be accurately verified if discrepancies arise, and is also useful for text passage interpretation, providing assistance with the identification of obvious outliers (within the checked sample), and an indication of the margin of error. However it may be beyond the resources of many projects for any more than a small subset of the study[364].

The clear solution to this problem is to develop a computer program capable of interpreting the text, and able to automatically allocate scores according to predetermined categories. While errors of categorisation may not disappear completely under such a scenario, anomalies would be expected to be of a consistent variety, having been performed by one machine using one clear set of rules, almost as if the text had been coded by one person – namely the computer programmer. Such a scenario is the one presented in this thesis.

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[362] Baumgartner et al. (2006).

[363] GMMP (2010).

[364] For example, the GMMP project undertook one double coding exercise in South Africa with three pairs of coders producing a 97.7% accuracy result but stated that "logical constraints prevented further tests so no overall figure is available" (GMMP 2010:61). In another study, Maeseele & Schuurman (2010) assessed a 20 percent sample, asserting that a Kappa range of 0.72 to 0.94 was a good match for their two coders.

Even if the latest artificial intelligence software, or interpretative language translation software had been available, the challenge would still have been to train it to categorise as required. Therefore a flexible categorising computer program (ETAT) was written by the researcher from scratch instead, to fulfill this purpose.

4.6.3 Article Characteristics

Because their journalistic style contains certain standardised features, news articles are particularly suited to the development of a simple customised text analysis routine. Some of these features are listed below.

1. News articles are usually short, concise, stylistically conformist, and linguistically straightforward.

2. They are mostly about one subject. Longer articles, especially opinion pieces, sometimes broach several subjects and tie them together, but in general a pair of key phrases which appear within the same article can be assumed to have some kind of association.

3. The heading briefly indicates the article subject. This location was considered to provide the highest level of exposure for players or concepts of interest.

4. The lead line also indicates the article subject, this time in more detail. This location was considered to provide the second highest level of exposure for players or concepts of interest.

5. Photographs or pictures (represented in this study by isolating picture captions from the rest of the text) also provide higher (player or concept) exposure than the body of the article. This location was considered to be the third highest level of exposure, and the article body fourth.

6. The full name of an organisation is normally used in the body of the article prior to using its acronym or nick name[365].

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[365] Although Botley & McEnery (2000:10-11) warn against the use of gross heuristics in the handling of anaphora, there is a place for simple processing rules if the texts being examined are likely to conform to similar and relatively predictable syntactical structures. Furthermore, same sentence anaphora can be ignored when counting sentences rather than instances.

7. A person's full name is normally used in the body of the article prior to referring to them by surname (or nick name) only.

8. If the shortened version of a name appears in a heading or picture caption then the full name normally appears in the article somewhere.

9. Formulaic organisation and person descriptions are usually provided on introduction.

Features such as those listed above invited analytical automation. The question was whether any available products were sufficient to achieve the goals of this study.

4.6.4 Product Comparisons

The decision to develop a customised text analysis tool was reinforced by the examination of several available text analysis programs, none of which proved flexible enough for the needs of this study. Although many provided attractive features and extra functions (which were beyond my ability to develop within the time available), a simple customised search application was expected to be sufficiently powerful and flexible enough to make it the preferred choice in this case.

1. NVivo

For example, the popular and impressive NVivo application by QSR International[366] advanced through four different versions during the length of this study, starting with version 7 in 2006. By 2010, version 9 invited users to "use sophisticated text analysis tools to help you find meaning in unstructured data – look for specific words or words with similar meanings – search for tourist and also find traveler, holidaymaker, and sightseer. Automatically code what you find"[367]. In 2012, version 10 allowed for the manual capture of webpages into pdf files, and the subsequent manual coding of selected attributes within that page, but did not include any automatic categorisation. This type of manually built individual query model, although advanced, able to be saved for repetition, and similar in purpose to the key phrase searching of ETAT, was not suitable for searches for thousands of lists of key

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[366] http://www.qsrinternational.com/

phrases such as those which were undertaken for this study. NVivo was primarily a qualitative research tool rather than a quantitative one. My customised application not only allowed for auto standardisation of similarly structured searches, but also allowed a move beyond word searches into nick name handling[368], a feature not found in any other products examined. Furthermore, ETAT allowed for complex multi-level relational hierarchies between entities to cater for implicit (hidden) exposure, a feature not found anywhere else.

2. Leximancer

Leximancer[369] was another powerful text analysis tool designed for qualitative research. It very effectively used word co-location algorithms to achieve many of its impressive automated functions. Although not available at the start of my study[370], by 2013 Leximancer version 4.0 employed sophisticated sentiment analysis alongside very flexible thematic extraction capabilities. Furthermore, it offered web crawling functionality, but without customised web page cleaning and formatting, or media article header extraction. However, despite its newly incorporated boolean operators (applicable to "text segments") and its built-in thesaurus (avoiding the tedium of manually built phrase lists), its generic nature imposed limitations that my customised product was able to surpass. For example, Leximancer's automation was primarily based around single word or phrase recognition, whereas ETAT was able to handle long lists of customised phrases and automated permutations of full names. Once again nick name and hierarchical capabilities were absent, and exception handling existed but was limited.

NVivo and Leximancer were both powerful and generic research tools, though neither was customised for large numbers of news articles.

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[367] QSR 2010:6.

[368] Nick name handling was described in sections 4.3 and 4.4.

[369] https://www.leximancer.com/

[370] Leximancer was commercialised in 2007 after seven years of development by Dr Andrew Smith at the University of Queensland (Leximancer 2011).

3. Private Marketing Tools such as ContextAnalytics

A search within the Australia/New Zealand Reference Centre database using the search terms "media content analysis software" returned one reference from 2002 which gave a succinct summary of the state of play at that time. This article was from The Australian, and quoted Tim Dyson (later to become CEO of the public relations company Next Fifteen Communications Group) in predicting that intelligent media analysis software tools were just around the corner and would revolutionise the public relations industry. He cited examples of media content analysis software tools which would shortly be able to "drill down into which media outlets and journalists are writing about [a certain subject], which analysts they are quoting, [and] which issues those analysts typically respond to, and which they don't"[371]. The intent was to allow firms to raise their brand awareness by pitching to targeted journalists and analysts, based upon their personal interests and known underlying bias, all determined by auto-analysing their writing. At that time, Millward Brown Precis was already claiming to be able to measure the impact of individual journalists on brand awareness and sales.

Dyson predicted automated tools which would (for example) –

> Find what triggers contribute to a sudden rise in the issue of globalisation in the media: was it certain organisations or analysts who always put it back on the agenda, was it certain areas of the media that have a vested interest in it, or is it just a case of it coming around every six months because it gets put on the list in [editorial] planning? … Certainly within two or three years some of this will become commonplace[372].

Since that was written, there have indeed been advancements in automated media analysis, but in subsequent publications by related public relations firms the focus remained restricted to mentions of literal brand names and / or targeted messaging by keyword(s)[373].

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[371] McIntyre (2002).
[372] McIntyre (2002).
[373] Duncan (2010).

For example, ContextAnalytics (2008) made it clear that their automated media analysis was based purely upon literal brand name volumes, also noting the absence of any weighting due to (text-based) reputation. A follow up report (said to be due in 2009) was scheduled to address this lack by incorporating "tone" (sentiment), as well as venturing into "new media". While a proliferation of later reports were found on the latter subject (including google, facebook, and twitter measures), the tone aspect appeared to be sidelined by that particular company, perhaps because of the complexity inherent in sentiment analysis.

Public relations companies differentiated between what they described as "earned, owned, and paid" media coverage[374], where <u>earned</u> implies genuine news coverage, <u>owned</u> is self-explanatory, and <u>paid</u> means advertising. Another marketing firm promised a "scientific approach" to assessing the expected effect of advertising text upon the consumer brain. However, upon inspection the tool was found not to be automated, being instead a set of carefully crafted questions which were applied to the text and assessed manually by cognition professionals[375].

Even six years after the commencement of my study (a considerable length of time in information technology terms), the use of specialised automated media analysis tools was still mainly limited to proprietary in-house products, helping businesses measure the financial outcomes of their public relations spending, (also reaching into advertising and social media trends), rather than being made available for use in broader (academic) research, where coding for media analysis still primarily remained a manual task.

4. ToneCheck

Furthermore, while "tone", or "tenor" (known as sentiment analysis) was frequently mentioned in relation to both business-oriented and academic text-based research[376], mechanisms for the measurement of this attribute were consistently not provided, leaving one to assume that for most media research, article tone had been assessed

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[374] Ibanez (2010).
[375] Copymetrics (2011).
[376] E.g. Gavin (2007); Gavin (2010); Maeseele & Schuurman (2010); Duncan (2010).

entirely using the judgment of the coder, without the provision of any further guidance[377]. Although the science of sentiment analysis has existed for some time (as a sub-branch of the artificial intelligence field of computational linguistics), its automation is challenging.

As this thesis was being completed, a relatively new online product called "ToneCheck" became available, which was able to analyse outgoing emails, posts, and tweets for tone (by sentence), in order to avoid embarrassment or misinterpretation[378]. This application had used (and continued to use) voluntary "crowd sourcing" to build its library of coded phrases. In 2009 ToneCheck moved beyond simple polarity (positive, negative and neutral) to describe eight possible states for each sentence: friendliness, enjoyment, amusement, contentment, sadness, anger, fear, and humiliation. Two years later the company claimed to analyse "200+" emotions in its professional product[379]. Although news media text analysis was not a feature specifically promoted for ToneCheck, there is scope for such research to consider adapting the use of this tool. Furthermore, it appears to be a suitable tool for validating the rudimentary ETAT sentiment analysis as a future project.

5. LIWC

Alpers et al. (2005) studied transcripts from an internet support group of breast cancer patients, and analysed the text of the online conversations using a tool called LIWC (Linguistic Inquiry and Word Count). They evaluated their findings in order to assess the effectiveness and usefulness of the tool in this context. They chose this tool because it was "the most widely used program for analyzing text in clinical

[377] The explanation "Existing research on the impact of economic news on public opinion gave a convenient and useful way of categorising stories according to their overall tenor" (Gavin 2010:69), justified a method which was simply to grade the "polarity" of each short media piece (negative, neutral, or positive) according to the perceived tone (by the coder) of the first sentence. Maeseele's explanation was just as brief, "a three point scale (positive, neutral or negative) was used to assess the article's standpoint regarding the application" (Maeseele & Schuurman 2010:94). Oates experienced difficulties with sentiment coding saying "in my research we could never achieve reasonable inter-coder reliability as to whether a televised news item was 'positive' or 'negative' about a candidate or party in Russia. Eventually we dropped the category" (Oates 2008:209).
[378] Lymbix (2009).
[379] Lymbix (2011).

psychology". As it was intended for free writing and had not been specifically validated for conversations between individuals, they undertook to perform validation of the tool for this scenario. They noted that the tool performed word counts without taking context into account, and wondered whether this would limit its capabilities. They performed a set of validity tests for an online support group and found that the tool gave reasonable results. They concluded that "automated text analysis [tools] should be further developed for on-line discussions where they may serve as a useful tool for group moderators and researchers".

LIWC was a text analysis tool "designed to map several psychological and linguistic dimensions of written language". It counted occurrences within the text for a set of carefully selected and categorised words, and provided an assessment of the text (and by implication the psychological state of the author) by assigning values to a set of indicators according to the word frequencies associated with each related category. This mechanism was similar to that used in my study.

The output of the LIWC program was simply "the percentage of the total number of all recognized words that belong[ed] to each of the 64 pre-defined categories". Alpers focused on a subset of ten categories, namely Positive Emotions, Positive Feelings (subset of Positive Emotions), Optimism, Negative Emotions (all negative words), Anxiety, Anger, Sadness, Cognitive Mechanisms (words relating to thinking and reasoning), Social Issues, and Body. The remaining 25 LIWC dimensions describing psychological processes that Alpers did not measure or validate were Affect, Causation, Insight, Discrepancy, Inhibition, Tentativeness, Certainty, Sensation, Seeing, Hearing, Touching, Communication, References to Others, Friends, Family, and Humans. Many of these categories were captured by ETAT.

LIWC2007 was the latest release of this text analysis tool examined. This version worked with a dictionary of 4500 words and word stems[380]. The previous version,

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[380] Pennebaker (2007:4). Unlike LIWC, ETAT sought only whole words, not word stems. LIWC only tested for single words whereas ETAT captured whole phrases. ETAT also included nickname and exception handling and LIWC did not. LIWC counted words while ETAT counted sentences.

LIWC2001, was the version used by Alpers and this utilised a dictionary of 2290 words and word stems, which were intended to "match an average of 80% of words in normal texts"[381]. In this 2001 version there were 64 pre-defined categories and (as with ETAT) a word could belong to more than one category.

The validity tests performed by Alpers were designed to test three types of validity: "content validity, construct validity, and concurrent validity".

Content validity was "the degree of congruence between a measure and the content that it is intended to cover". It was measured by counting the number of words in the text that fell into the applicable categories, and were therefore able to be assessed by the text analysis tool. This "coverage" percentage was measured by the tool itself, and exceeded the claimed 80% for the sample provided, thus passing the test.

Construct validity was "a measure of the influence a relevant construct has on the scores". It was measured by comparing the LIWC scores from a newspaper article about the same topic and containing a similar degree of emotional content against the average scores for all of the online conversations. These were compared with the scores for a non-emotional article on a similar topic, to assess the tool's ability to differentiate. Similar comparisons were made with a set of average scores from "expert-derived" standard sample texts (emotional vs. non-emotional) provided by the LIWC tool (to provide "normative standards"). The range of observed patterns arising from the different texts provided evidence for the "specificity of this text analysis program" as similarities and differences were able to be explained. The results are shown in Fig 4.6.4.1.

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[381] The LIWC figure of 80% is a little misleading as many identified words were only classified grammatically, and not categorised for any other purpose. For example it appeared that most proper words would not have been assigned to a dimension. By contrast, ETAT coverage deliberately sought proper words for inclusion and classification. The parallel ETAT article average for content coverage at the end of the study was about 50%.
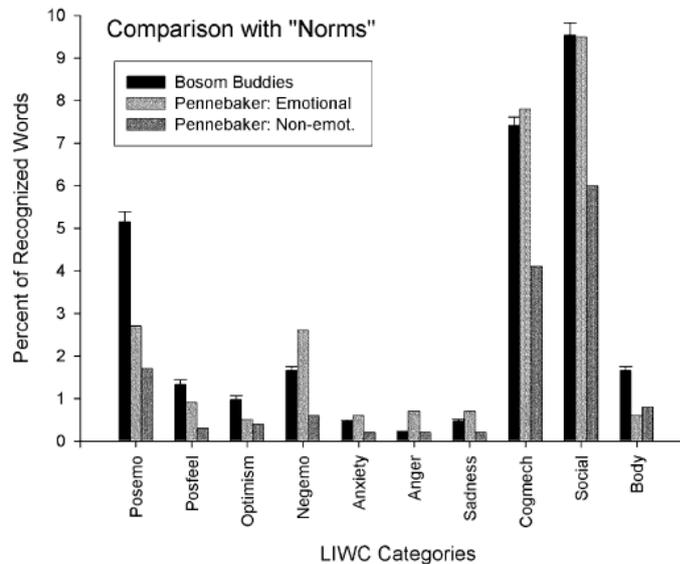
Figure 4.6.4.1 – Example LIWC Score Comparisons with Normative Standards[382]

The third validity type, "concurrent validity", was described as "the correlation with an independent measure of the same or closely related construct". This was measured by comparing the LIWC generated scores against scores derived manually by a "human rater" when assessing the same texts. One hundred of the 521 total messages were assessed and compared in this way. Coding rules were set up beforehand, and more than one human rater undertook the task to allow for consistency assessment. Pearson correlations were calculated and tested for significance. Some differences were observed between the LIWC scores and the human scores, as was expected. These differences were discussed and were able to be explained. It was noted that the broader categories had better correlation scores, whereas more discrepancies were found for the smaller sub-categories. A comparison between the tool-human (LIWC-rater) correlations and the human-human (inter-rater) correlation scores are shown in Figure 4.6.4.2.

Text from the moderator was excluded and only participant text was included. The text was also "de-identified" by the manual removal of names or identifying characteristics.

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[382] Source: Alpers et al. (2005:368).
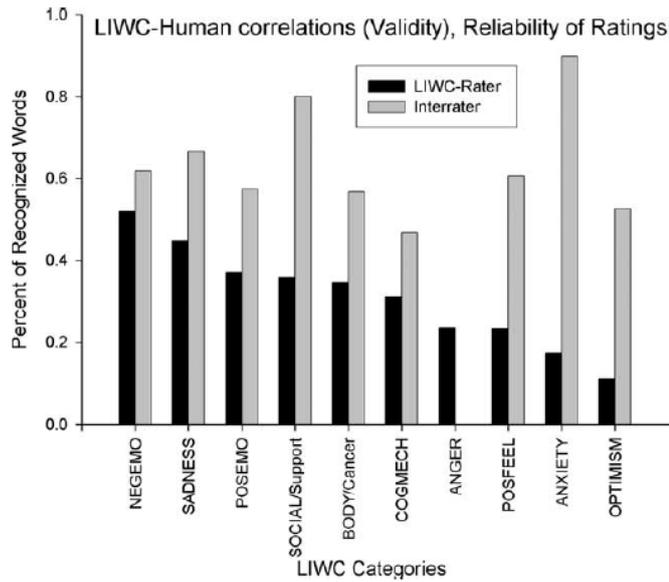
Figure 4.6.4.2 – Example LIWC –Human Correlation Scores[383]

Note that spelling was corrected manually before analysis (a procedure which I generally found simplest to do too, rather than try to automate a spelling corrector). Alpers used Microsoft spellchecker, whereas I corrected text manually, but only if the error was highlighted because it was causing a problem. Of course, spelling would be expected to be more of an issue for personal communication than for published media articles which in theory have already been edited professionally.

Alpers claimed that "text analysis programs have become widely used to analyze the content of written communication and to make predictions regarding psychological adaptation or other measures of health".

At his time of writing in 2005, Alpers observed that text analysis tools were mainly used for "the parsing of Web-site content … and keyword-indexing of texts for retrieval in databases"[384]. Since then there have been significant advances in the capabilities of text analysis programs, and thus in the broadening of their fields of use (see section 1.1.1). The LIWC text analysis tool was itself upgraded from the 2001 version to the 2007 version in this intervening period. However, this involved mainly the broadening of its dictionary, an upgrade to the software, and some

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[383] Source: Alpers et al. (2005:370).

adjustments to categories. It was not evident that any aspects of the concept, mechanism or methodology of the tool had changed.

LIWC inferred an ability to discern deeper meanings and intentions from text, as a result of simply examining the words. It produced a set of indicators based upon groups of word counts, which were intended to provide a psychological assessment of an individual from personally written texts. By contrast, in my study the indicators provided more of a topical (and sometimes ideological) measure of the content, in this case of online media articles.

While LIWC was an observational tool for assessing individuals who were expected to be sharing on a personal level, ETAT was designed to assess media articles which were published to a wide audience, and were intended to have an effect on the recipients of the message. This did not entirely negate the LIWC usage assumption that the indicators were a measure of the personal mindset of the author. It was in fact likely that the media articles would reflect this to some extent, but the author's own views would have also been tempered in this public forum by certain professional standards and expectations, along with an awareness on the author's part of the likely reception that their words would induce. This meant that the words written in a media article would not simply be a reflection of the personally held views of the author (which they may in fact not want to divulge). The views expressed and the people or issues given prominence (within the information imparted) in the media articles would be a combination of the views (and knowledge) of the author(s), the source(s), the sub-editor(s), the editor(s), and the paper owner(s), tempered by expectations about audience reception, including the reception by influential groups within society. There would also have been an awareness of the necessity to attract attention, driven by the financial imperatives of media organisations. This could be expected to give rise to "lowest common denominator" appeals to certain known human traits, and desires within the intended audience. Taken to the extreme, it could even be said that a media article would not so much reflect the mindset of the author (which is what the LIWC tool

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[384] Quotes in this section up to this point are all from Alpers et al. (2005:361-365).

intended to measure) but rather the mindset (or even the *intended* mindset) of the intended audience.

6. Appinions & Carbon Capture Report (CCR)

While ToneCheck appeared to be leading the way in readily available online sentiment analysis in 2011, two other sophisticated online media analysis reporting tools also incorporated sentiment (as well as player) analysis. The Carbon Capture Report[385] was the culmination of 10 years work at the University of Illinois, while the Appinions[386] marketing tool was the privatised result of 10 years work at Cornell University. While neither of these online products imparted detailed information about how their sentiment analysis actually worked, it was certainly automated. Furthermore, both reporting tools were very powerful, and in the case of Appinions, customisable as well. Appinions went further to combine authorship with content mentions in order to assert that they measured influence, as did another online social media measuring tool called Klout[387].

Although all of these impressive online media analysis tools were unavailable to me in 2006 when I started, they still would not quite have suited the purpose of this study, even if they had been. For example, the Carbon Capture Report measured some very similar concepts to those in my study, counting similar lists of relevant key phrases (for example "alternate energy" and "green energy"), but it was rigid in its categories, and not customisable, making it difficult to employ for a study. Appinions, on the other hand, was totally customisable, but did not have the ability to combine synonymous key phrases, for example listing separate counts for Tepco, Tokyo Electric Power, and Tokyo Electric Power Company, when these are all different names for the same company.

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[385] http://www.carboncapturereport.org/

[386] http://appinions.com/
The initially released 2011 version was described as the "Appinions Influencer Exchange" and was found at http://beta.ix.appinions.com/influencerweb/main

[387] Since 2008, Klout has used "data from Twitter, Facebook, LinkedIn, and Foursquare in order to measure how many people you influence (True Reach), how much you influence them (Amplification), [and] how influential they are (Network Score)" http://www.klout.com/.

7. Datumbox

Datumbox[388] was a brand new application which appeared mid way through 2013. It consisted of a set of programmable tools rather than a stand alone product, but it provided an accessible online example of the latest kinds of text analysis capabilities that were being offered just as this thesis was concluding. Datumbox did offer sentiment analysis, but this was limited to the three basic categories of positive, negative and neutral. It provided a number of useful functions such as document comparison and language determination, and had its own embedded lexicon which allowed it to detect such themes as education, spam, gender, commerce, and adult content. It could pick out highlights from passages of text, and was described as a "machine-learning" tool, but it also necessarily relied upon a significant amount of pre-prepared categorisation. It had the ability to pick out themes and keywords from pieces of text, where the latter would also seek phrases of pre-determined length ("n-gram" number of words), but without offering hierarchical sub-category facilities, nick names, or an exceptions capability.

8. AeroText

AeroText[389] was the product which came closest to being able to satisfy the automated content analysis requirements for this study, but it only came into the public domain once my data collection period was over. This very powerful and sophisticated natural language processing tool was developed by contractor Lockheed Martin for the intelligence arm of the United States Department of Defence and was purchased by Rocket Software[390] in 2008. It has been available as a commercial application since then, although it had been licensed for use by NetMap for international corporate customers since 2005[391]. AeroText appeared to incorporate almost all of the unique features that were developed as part of ETAT in order to operationalise the specialised method envisaged for this study, including exception handling, nick names, entity recognition, media header field extraction,

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[388] http://www.datumbox.com/

[389] http://www.rocketsoftware.com/products/rocket-aerotext

[390] Rocket Software was described by the "Database Trends and Applications" website in 2013 as one of the top global 100 "companies that matter most in data" (Wells 2013).

and the handling of large numbers of categories. However, it was discovered too late, and as a commercial product was likely to be expensive. Although customisable, I am not convinced that it would have handled the required hierarchies in this case, but there may be scope to work with this company to plan a method of using this product for social research in future, depending upon cost.

9. Product Comparison Summary

Table 4.5.4.1 – Summary of Comparable Product Features

ANALYSIS TOOL	ETAT	NVivo	Leximancer	Appinions	CCR	DatumBox	ToneCheck	LIWC	AeroText	Manual Coding
Required Features										
Designed for research	Y	Y	Y	Y	Y	Y	-	Y	-	Y
Quantitative focus	Y	-	Y	Y	Y	Y	-	Y	Y	Y
Sentiment analysis	Y	-	Y	Y	Y	Y	Y	Y	Y	Y
Flexible categorisation	Y	Y	Y	Y	-	-	-	-	Y	Y
Nick name handling	Y	-	-	-	-	-	-	-	Y	Y
Bulk processing	Y	-	Y	Y	Y	Y	-	Y	Y	d
Bulk categories	Y	-	Y	-	-	-	-	-	Y	-
Category hierarchies	Y	-	-	-	-	-	s	-	s	Y
Late category addition	Y	Y	Y	Y	-	Y	-	-	Y	-
Reproducibility	Y	Y	Y	Y	Y	Y	Y	Y	Y	-
Media focused	Y	-	-	Y	Y	-	-	-	Y	Y
Header field extraction	Y	-	-	Y	Y	-	-	-	Y	Y
Person recognition	Y	-	-	Y	Y	s	-	-	Y	Y
Gender recognition	Y	-	-	Y	-	Y	-	-	Y	Y
Document recognition	Y	-	-	-	-	-	-	-	Y	Y
Event recognition	Y	-	-	-	-	-	-	-	Y	Y
Org recognition	Y	-	-	Y	Y	-	-	-	Y	Y
Auto categorisation	Y	-	Y	-	Y	Y	Y	-	Y	-
Phrase handling	Y	Y	-	Y	-	-	Y	-	Y	Y
Exception handling	Y	-	Y	Y	-	-	-	-	Y	Y
Other Features										
Auto thesaurus	-	Y	Y	-	-	Y	-	Y	Y	-
Online	f	-	-	Y	Y	Y	Y	-	Y	-
Web crawling	f	-	Y	Y	Y	-	-	-	Y	-
Map link	-	-	-	-	Y	-	-	-	Y	-
Language flexibility	-	Y	Y	-	-	Y	-	Y	Y	Y

[391] Lockheed Martin (2005).

In Table 4.5.4.1 the various features that were required for my study are listed down the left hand side (with a few other optional features added at the bottom), and a selection of possible alternate content analysis research tools (or methods) are listed along to top. A "Y" placed in a cell indicates the availability of that feature for the product or method in question. A "d" indicates that the feature is possible but difficult. The "s" stands for "some", indicating limited capability. An "f" indicates an intention to incorporate the feature in the future.

It can be seen from Table 4.5.4.1 that ETAT (the first column on the left) offered all of the 20 required features listed, and that the newly discovered AeroText product came second with 18.5 out of 20, where its ability to effectively handle the required hierarchies and inter relationships have yet to be confirmed. Manual coding (the last column on the right) came third with 16 out of the 20. The four features not offered by manual coding were 1) Bulk categories, because it is not possible for manual coders to remember and code for large numbers of categories all at once, 2) Late category addition, because when coding manually the late addition of one or several categories may mean that the whole project has to start all over again, 3) Reproducibility, because people will not necessarily code text exactly the same way when the task is repeated, and 4) Auto-categorisation, which is limited when coding manually, and not feasible if many coders are employed (necessarily also requiring late category addition). Furthermore, a fifth feature was rated as "d" for difficult, where 5) Bulk processing, as in the processing of large volumes of articles, is only possible for manual coding if huge numbers of coders are identically trained[392] which is a difficult undertaking, or alternatively if a very long period of time is taken for the project.

The popular qualitative research tools Nvivo and Leximancer both offered some of the required features, but neither provided enough functionality for this study. Similarly each of the other products listed (Appinions, CCR, Datumbox, ToneCheck) were powerful in their own ways, but were not quite sufficient for purpose.

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[392] E.g. GMMP (2010).

For example, one feature incorporated into ETAT was the ability to auto-recognise, extract and classify (to a rudimentary level) previously un-identified proper names. This differed from most programs examined where the list of names to be searched for needed to be specified in advance (although social networking tools such as Klout were increasingly monitoring every person available, and global tools such as the Carbon Capture Report contained built in lists of all countries, for example).

In summary, the various text analysis software products examined, even when media focused, were primarily designed for purposes which differed from the purpose of this study. Text analysis software has been (and continues to be) developed for a number of different purposes which were outside the scope of this thesis, such as artificial intelligence, language translation, and public relations brand targeting. Media text analysis has been of particular interest in the latter, as discussed in some of the examples above. However, even in business-oriented media analysis, where resources have been invested over the past few years, there often continued to be a manual component, especially for sentiment analysis, although much work is underway to improve automation in this area. For media analysis studies conducted by academics, both category coding and sentiment analysis remain almost completely manual tasks, although article retrieval has been increasingly aided by powerful search engines and large databases.

4.6.5 Software Advantages

Whereas computer programs are very good at quickly pulling out <u>literal</u> words and phrases from text, the construction of an automated procedure which grouped together words and phrases according to their <u>meaning</u>, for extraction from a set of texts (as I did for this study), was a process which in many instances seemed to take much longer than undertaking the same task manually. By comparison, human recognition, interpretation and classification (while reading) can take place very quickly in the brain. At many stages throughout the project questions therefore arose as to whether the automation attempt was worthwhile.

Factors which justified the replacement of manual human assigned text categorisation with an automated procedure were –

1. <u>Thoroughness</u>. While the human brain is able to quickly interpret a text in detail much more easily than a computer program can, the human brain is also trained to take short cuts, skip words and jump to conclusions[393]. A computer program on the other hand will painstakingly examine every word and not miss a thing.

2. <u>Consistency</u>. Even when following a set of guidelines, a person may make slightly differing judgments based on their mood or level of tiredness, whereas a computer program works to a strict set of <u>rigid</u> rules. The result is that (as long as the rules are not modified) it will perform in <u>exactly</u> the same manner every single time.

3. <u>Perseverance</u>. While a person may get bored, tired or distracted over time, reducing accuracy and consistency, a computer program does not. There are limits to computer memory and processing capacity, but within those limits a computer will continue to perform without needing a break.

4. <u>Reproducibility</u>. Even if ETAT made errors in its interpretation of a text (due to an incomplete list of inclusion or exclusion criteria), then at least the failing was transparent and able to be exactly reproduced at any later stage for examination.

5. <u>Cross-checking</u>. For a person to have to continually be cross checking phrases against other lists is tedious in the extreme. For a computer, this is quick and painless by comparison.

6. <u>Scalability</u>. Although a person may be able to manually apply complex categorisation to a small number of texts much faster than the time it takes to write (and thoroughly test) a complete set of rules (computer program) which will do the same, once this is scaled up to a large number of texts, the automation comes into its own, and the time taken to develop the routine becomes less than the time that would have been taken to manually scan the large number of texts.

7. <u>Speed</u>. For large volumes, and when re-processing, a computer is much faster.

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[393] Reason (2001).

Within any computer system there remains a human fallibility component, in the three areas of programming, testing, and configuration. The last one (configuration) in my case includes categorisation, where consistency challenges were encountered between and within (the manually prescribed) categories (see section 4.4.8).

4.6.6 Developmental Challenges

Alongside its advantages, the decision to make software development a major part of the study brought with it an extra set of challenges. Significant hurdles encountered were –

1. Time, resources, and technical challenges.

2. Testing, validation, and regression.

3. Phrase selection and exception mechanisms.

Each of these will be discussed further below.

1. Time, Resources and Technical challenges

In order to provide the required functionality within the time available, the software needed to be developed using straightforward methods where possible, to maintain maximum transparency for ease of system testing, and to be able to provide sufficient validation (proof of acceptability).

Software development took a great deal of time, even while keeping things as simple as possible. Changes required regression testing. It was an exploratory exercise, and the developing functions sometimes required many permutations before they worked as intended. In addition, enhancements were continually added to handle new conditions as more articles were processed.

The vocabulary traversed within the media articles turned out to be much broader than expected, and many more articles were selected than expected, giving rise to capacity challenges within my chosen software environment, and technical difficulties which took time to overcome. In addition, my first laptop was prone to disc crashes and had to be rebuilt twice within the first three years of the study.

2. Testing and Validation

ETAT was developed in a very rudimentary form to start with, and was consistently improved upon as more articles were processed. The categories were extended and refined in parallel with the software development process, so that the software rules were continually being tested against real data, and at the same time the classification categories were consistently being challenged, and then reinforced or discarded as a consequence. The rules and the categories thus provided each other with mutually reinforcing validation processes.

Testing and double checking the meaning of each of the resultant selected phrases against the intended categorical concepts (and manually extracting exceptions) was a purely manual task and took huge amounts of time. A formal validation process was unable to be completed as part of this project, but such an exercise would suit a future study. Validation within this study consisted of extensive systematic manual checking, as well as automated consistency checks and warnings where feasible. Some examples of ETAT warning messages are shown below.

WARNING: Topic 1 economics found for Document 143 carbon prices. Should this have matching organisation 310,415,488 governments or economists or finance industry?

WARNING: Topic 33 business interests found for Document 143 carbon prices. Should this have matching organisation 311 business?

WARNING: Topic 87 positive found for Document 981 emissions reduction. Should this have matching event 557 positive?

3. Phrase selection and exclusion mechanisms

Development of an appropriate logical mechanism for the selection or exclusion of key phrases was the most important part of the process.

Various search engines were examined and some of the functions they did, and did not, provide are listed in Table 4.6.6.1. Though first examined in 2007 these characteristics were still applicable when revisited in 2010.

Table 4.6.6.1 – Comparative Search Engine Capabilities

Search Type	Attributes	Failings
1. Google Simple	Literal, case insensitive, whole words only, text search. Operators "and" and "or" available. Finds similar matches.	Not case sensitive. Exclusions affect whole articles, not phrases.
2. Google Advanced	As above, plus language, date, numeric ranges, phrase location, article type. Finds similar pages.	As above.
3. NZ Herald	Literal, case insensitive, whole words only, text search. Operators "and" and "or" available.	Not case sensitive. Exclusions affect whole articles, not phrases. Max limit.
4. MS Excel Native	Literal text search. Case sensitive option. Whole cell option.	Operators "and" and "or" not available. Not whole words only. No exclusions.

Public search engines such as Google and NZ Herald were helpful in selecting a "broad brush" group of articles to start with, and assisted with checking for any accidentally excluded articles, but were not fine grained enough for any detailed analysis, or for the exact selection of any sample sets other than for simple person or organisation names such as "Muliaga", "Roy Hemmingway", "Meridian", and "TrustPower".

Both for set selection, and for the data analysis, the mechanism I was seeking went much beyond what was provided by standard search engines, and more closely approached the kinds of logic used in software translation engines, and artificial intelligence logic, but without the extended functionality, complexity and resource intensity that such systems would necessarily incorporate.

Using a simple programming language as part of a simple text analysis tool, I attempted to push the limits of text interpretation within the bounds of the goals I had set while keeping it all as straightforward as possible.

4.6.7 Search Techniques

Because this study was partially focused on finding and identifying players in the text, proper names assumed a level of importance. Thus proper case words were

examined closely, especially those which did not start a sentence, or which appeared in consecutive groups. If such a proper case phrase was not already able to be matched against a known entity, then a new entity item would either be automatically added (with some provisos by entity[394]), or else highlighted in a note to allow the user to later verify and add it into the correct entity class. An example of an ETAT message for each scenario is shown in the box below.

MESSAGE: At least one word was recognised as a name so Chris Swasbrook was added as a Person.

MESSAGE: Gender set to M from First Name for Chris Swasbrook.

MESSAGE: New Honorific List Mr for Chris Swasbrook after 'Mr' added from text.

MESSAGE: Description 'Goldman Sach JBWere broker.' for Chris Swasbrook (Person 3711) extracted from - Goldman Sach JBWere broker Chris Swasbrook said yield chasers and cyclical buyers had helped Telecom's recovery today.
_____

WARNING: Unmatched proper words - Private

MESSAGE: Matched a remaining proper word or phrase 'Private'. Context: Private energy use jumps – NZPA

Microsoft Excel provided a native search function with a "Match Case" indicator which was able to be manually toggled on and off by the user. However, this level of precision was not considered to be sufficient for most of the matching required for this study[395], and so a more complicated matching formula was derived. The user specified a core list of phrases to be matched (for each entity item), and ETAT then expanded this list according to the rules below, to allow certain other case specific permutations.

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[394] For example organisations which contained a pre-specified keyword such as "Limited" were recognised as organisations, but user confirmation was requested before adding into the organisation sheet. The same applied to some documents and events. In a similar vein, pairs of known person names were able to be added directly into the person sheet, but in this case more certainty was assumed and no user verification was required. See Appendix A10 for the lists of keywords that were used for entity class recognition.

[395] The rigid "Match Case" style of matching was occasionally "turned on" where subsequent letter lower case matching was to be avoided, most strikingly for the organisation called 3M, in order to avoid accidental matching against 3m (3 meters), although alternative special number handling would also have worked in this case. See TrustPower example in point 2.

The case matching rules for the ETAT customised search engine were –

1. Words starting with a lower case letter could start with either a lower or upper case in the text, or be all upper case. In practice this meant that searching for words beginning with a lower case letter was not case sensitive at all (except for "Match Case" exceptions – see footnote).

2. An upper case letter in the middle of a word or phrase was permitted to be either upper or lower case in the text (Trust Power, TrustPower, Trustpower, TRUST POWER or TRUSTPOWER, but not trust power or trustpower). In practice this meant that unless the keyword was all upper case (point 4), the case of all letters after the first letter was disregarded.

3. Words starting with an upper case letter (but where the whole word was not upper case) had to begin with an upper case letter in the text, or be all upper case. In practice this meant that the case of all letters after the first letter of the phrase was disregarded.

4. Words which were listed in all upper case (i.e. acronyms) had to be all upper case in the text. While not an issue for acronyms which did not spell normal words, this rule was especially helpful for identifying organisations such as CAT, UN, ALP, AWE, WRAP, and WHO from within the text.

5. Certain minor words (and,at,de,for,in,ki,of,the) within a phrase were handled whether proper or lower case regardless of the case of the rest of the phrase.

Below is an example for the organisation called Trustpower.

Names Specification : Trust Power^TrustPower

Automatically Derived Case Sensitive Search Terms :

Trust Power^TRUST POWER^Trustpower^TrustPower^TRUSTPOWER

It was important to distinguish whole words from partial words, otherwise a search on "mw" (for megawatt) might have returned "Bramwell". Similarly a search on

"lines" might have returned "declines". Excel's native search function did not make this distinction, although most online search engines did. However, most online search engines did not provide case sensitivity. Any further refinement that was required for article selection was therefore provided by my own selection routines. In order to make my keyword selection more targeted and accurate, both in the primary selection, and all subsequent sub-selection searches, I employed the following techniques after the raw searches provided online –

1. <u>Whole words only</u>. This was done by placing a space on either side of the key phrase when searching, and by temporarily replacing all punctuation in the text by spaces for the purposes of the search. Almost all entity searching was restricted to whole words only ("$" was the exception).

2. <u>Possessives</u>. These were catered for by 1. above by the substitution of each apostrophe with a space.

3. <u>Hyphens</u>. Once again these were catered for by substitution with a space. For example "M-co" would be searched for and temporarily be replaced in the text as "M co".

4. <u>Plurals</u>. Automation of plurals was attempted but abandoned, so any plurals or other "word endings" needed to be manually specified. Thus each key phrase (for example "electrification") had a manually constructed list of permutations to try which included plurals (if relevant) and alternate declensions or tenses (for example a whole word search for any of "electrification, electrified, electrifies, electrify, electrifying").

5. <u>Misspellings</u>. If a misspelling was encountered, this was either manually corrected in my copy of the article, or (if likely to be common) manually added to the list of permutations for the key phrase.

6. <u>Part word option</u>. Towards the end of the study an option was added to cater for part word searches. This was added specifically for use with the dollar sign "$" (and the currency symbols for the British pound and the euro), and was thereafter also available for the recognition of other prefixes or suffixes.

Although not utilised any further for this study, this functionality would be available for future studies.

7. <u>Exceptions</u>. Where a limited number of known exceptions were identified, these were automatically removed from the article temporarily before searching for the associated key phrase, then reinstated again for subsequent searches. This exception-handling component provided the vital ability to distinguish between different usages for similar words. An example is provided below.

Name: electricity generators

Alternate names: atomic energy^**generate^generated^generates^generating^generation ^generator^generators**^gentailer^gentailers^geothermal^hot rocks energy^hydro ^hydroelectric^hydroelectricity^hydropower^nuclear energy^plutonium^power producer^power producers^power supply companies^power supply company^tidal power^wave power

Exceptions: a generation^baby boom generation^children's generation^computer-generated^educated generation^eighth-generation^excitement was generated^flying generated^generate interest^generate many emissions^generated a high level of willingness^generated these waves^generated within^generates as much as $45,000 ^generates prosperity^generates up to four times more carbon dioxide than conventional drilling^generating listings^generation X^generation Y^generation Z ^growth it generates^high level jobs^hydrocarbons are generated^ideas it generates^new generation of^next generation^our generation^our own generation ^returns generated^rising generation^starter generator^that generation^units generated^video generation^voyage generates^waste generated^young generation ^younger generation^money generation^cash generation^generate a unit of GDP ^generate cashflow^generate investment^generated an initial^generated good wealth ^generating high returns^generating income^generating most of its revenue ^generator of revenue^generators of revenue^sale, which is expected to generate

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For each entity (such as <u>electricity generators</u> above) where the core default phrases (in bold above) had alternate usages other than the one required, a choice had to be made as to whether to specify every possible occurrence of the desired meaning, or whether to incorporate the defaults (e.g. <u>generation</u> in this case) into the list, and subsequently add each exception to the list as it was encountered. That is the style shown above. Sometimes this approach proved unworkable and so the defaults would be removed, and/or set as nick names instead. For the case above a key phrase called <u>money generation</u> was set up in the keyword class, and this automatically provided many of the exceptions listed.

There were three main methods for handling this kind of scenario. One way, as above, was to use the desired simple default phrase (e.g. generation) in the core list

and specify a long list of exceptions. This method was also used for the National Party, so that every occurrence of the word "National" was counted unless incorporated into an exception phrase. Often this method resulted in a long list of exceptions (as above).

The second method (already mentioned briefly) was to remove the core defaults completely, and just list every encountered occurrence of the desired phrase. This generally led to a long list of alternate names, and very few exceptions. This method was used for money generation, for example –

<div style="border:1px solid;padding:10px">

Name: money generation

Alternate Names: cash generation^generate a unit of GDP^generate cashflow ^generate investment^generated an initial^generated good wealth^generating high returns^generating income^generating most of its revenue^generator of revenue ^generators of revenue^sale, which is expected to generate

Nick Names: [None]   **Exceptions**: [None]

</div>

The third method was to specify the default on its own first (so that all occurrences were collected and thus able to be examined), then to explicitly specify various lists of phrases for the alternate usages beneath, adding the core default words as nick names, thus catching generic usages which were difficult to explicitly specify.

This method was used for particularly difficult blanket phrases (such as supply, demand, prices, rates, votes, etc), where it transpired that specific usages were difficult to extract without excluding many other types of usage, but where, once one type of usage had been made explicit, other generic occurrences nearby were likely to mean something similar. Some examples are shown below for demand (with points of interest underlined).

Here also it can be seen that the "parent" style of hierarchy definition was able to assist with the recognition of increasing layers of specificity. For example demand for resources was a parent of energy demand, which was a parent of electricity demand.

Name: <u>demand</u>   **Alternate Names**: [None]   **Nick Names**: [None]

Exceptions: demand with a straight face^groups that demand^demand an apology^to demand that^demand total^key demand

───

Name: consumer demand

Alternate Names: dominated by domestic demand^demand for products^customer demand

Nick Names: <u>demand</u>   **Exceptions**: [None]   **Parent**: demand

───

Name: demand for shares

Alternate Names: demand for the shares^share demand

Nick Names: <u>demand</u>   **Exceptions**: [None]   **Parent**: demand

───

Name: demand for resources

Alternate Names: demand for oil and metals

Nick Names: <u>demand</u>   **Exceptions**: [None]   **Parent**: demand

───

Name: energy demand

Alternate Names: demands for energy^demand for energy^energy demands

Nick Names: <u>demand</u>   **Exceptions**: [None]   **Parent**: <u>demand for resources</u>

───

Name: electricity demand

Alternate Names: demand for a reliable supply of electricity^demand for electricity^demand for total electricity^demand from hot water^demand on the electricity^demand sees power^power to meet demand

Nick Names: <u>demand</u>   **Exceptions**: [None]   **Parent**: <u>energy demand</u>

4.6.8 Summary

The decision to develop a customised text analysis program was made deliberately, in order to allow maximum flexibility, convenience, and suitability for purpose.

In this chapter section, some of the features of the processing algorithms that were employed by the customised ETAT text analysis tool have been described, and the lack of certain required features in other software products was also discussed.

For this study it was necessary to carefully derive a set of searching tools which would be able to pick out phrases of interest, as faithfully as possible from the media article text. This meant careful case matching, as well as additional handling for various idiosyncrasies of the English language, such as hyphens and other punctuation.

The precision of the searching tool was refined over the length of the study, as more articles were processed, and more entity items collected. One requirement was to keep the logic as simple as possible, while enabling the extraction of a reasonable amount of identified meaning. The result was a process which could "read" each article in a rudimentary fashion, so that players and concepts of interest were able to be extracted and counted for analysis.

The last section of the research design chapter will discuss the way in which articles were selected for this study.

4.7 Article Selection

4.7.1 Introduction

Article selection for each of the data sets analysed was based upon criteria discussed earlier in the chapter. The main sub headings in this section cover study scope, daily article collection, retrospective article collection, final article selection, proportion collected, website upgrade effects, and sample selection.

4.7.2 Study Scope

At the commencement of a media content study, it is useful to be clear about the selection criteria for the media articles to be examined. Three crucial parameter sets, (a) time period(s), (b) article source(s), and (c) article subject recognition rules, need to be explicitly defined, certainly at some point. For this particular study, it transpired that these definitions were not as easy to arrive at as was initially expected, and some adjustments were made as the study progressed. Because this was an exploratory project, such refinement was able to be accommodated.

(a) The time period of collection was determined from the outset to cover the two years from 01-Jan-2006 to 31-Dec-2007. This was a reasonably long period, and rapidly accumulating article volumes in the first few months of 2006 quickly gave rise to the suggestion that the scope be trimmed back to just one year. However, large volumes can be useful within quantitative analysis, especially for trends, and two years' data would allow year by year comparison, so I decided to persevere with the two year period, even though this did have the consequence of considerably extending the total duration of the study. However, I felt reassured in my decision by the later observation that two years was the period of choice for other significantly similar studies[396], and by the knowledge that the data once collected would be available for further analysis after the completion of this study.

(b) Initially, five major online publishers were chosen for data collection. They were nzherald (introduced already), stuff.co.nz (hereafter referred to as stuff, which

included articles from the Christchurch's "The Press" and Wellington's "Dominion Post" among others), odt.co.nz (the independently owned Dunedin-based "Otago Daily Times" website, hereafter referred to as <u>odt</u>), radionz.co.nz (the website of state broadcaster "Radio New Zealand", hereafter referred to as <u>radionz</u>, which regularly posted brief online news segments), and scoop.co.nz (an online-only repository for New Zealand organisational media releases, hereafter referred to as <u>scoop</u>). However, due to time and volume constraints, the study sample was reduced to just <u>nzherald</u>. Future studies may extend to these other publishers.

The New Zealand Herald was the most widely read daily metropolitan newspaper in New Zealand, was published in the largest city (Auckland) where approximately one third of New Zealand's population resided[397], and was also read widely throughout the rest of country (by approximately 40% of Aucklanders, and 17% of the New Zealand population[398]). Thus I considered that it would provide a suitable, and sufficient, sampling pool. Online readership numbers were more difficult to ascertain[399], but the websites <u>nzherald</u> (majority owned by Tony O'Reilly's APN) and <u>stuff</u> (owned by Australian company Fairfax Media) were the two primary online newspaper sites in New Zealand at the time of the study.

(c) The subject[400] of this study is electricity public policy in New Zealand, but the rules required to arrive at media <u>article selection</u> for this particular subject were rather more difficult to define. Electricity was often referred to simply as <u>power</u>, a very useful word with a multiplicity of meanings but one which was difficult to search for by meaning without specifying additional contextual markers. Article

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[396] E.g. Gavin (2007, 2010); Ecker-Ehrhardt (2010).

[397] The March 2006 Census recorded the population of the Auckland region as just over 1.3 million, or 32.4% of the national population (ARC 2006).

[398] National newspaper readership survey for Jan to Dec 2007 (Nielsen 2008). By comparison, the Dominion Post (Wellington) and The Press (Christchurch) each scored a national readership of around 7%.

[399] Online readership measurement methodology was a new and more complex field (than the more established print readership measurement) at time of writing. Some issues were described in Wiggs (2006).

[400] The word "subject" is preferred here, as "topic" already has a specific meaning for this study.

selection by subject was ultimately performed by a series of consecutive selection methods, described further below.

It was tempting to broaden the analysis to all, or aspects, of the wider energy sector, especially the related subjects of transport, climate change, emissions trading and oil & gas exploration, but in order to keep the study to a manageable size it was necessary to limit the primary analysis to articles which had a direct relationship with, or an explicit mention of, electricity. Those broader energy related topics were therefore touched upon, but only in relation to electricity, not in their own right. Each of those related subjects would suit further study at a later date.

4.7.3 Daily Article Collection

All sampling was undertaken by the writer, and media article collection initially took place in real time over the specified period. This was followed by an extended period of retrospective "gap filling" article collection afterwards (described in the next section). Articles were downloaded from the internet on most evenings during the two year sampling period, initially from the websites of each of the chosen publishers, and later from just the one publisher (nzherald) once the practical decision had been made to narrow the scope. Each article was manually copied from the website, then pasted into an Excel spreadsheet together with the URL (web address) and collection date. When days were missed (due to conflicting time commitments), retrospective downloading took place a day or two later. Sometimes short periods were missed altogether (for example when I was moving house) and not recovered until the later retrospective collection.

Daily manual article collection from nzherald was performed using the website's own assigned category codes (tags[401]) as a guide. Once a routine was established, all

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[401] For example, the link to access all nzherald articles tagged as being related to energy was http://www.nzherald.co.nz/energy/news/headlines.cfm?c_id=37 , where the tag number is shown at the end of this link. Any individual online article could have just one, or several, tags. Inconsistencies in their application indicated that article tags were probably applied manually by a nzherald staff member (or the article author), but it is possible that some may have been applied automatically on the basis of article keywords. Most of the tags sought initially were secondary categories, so each article would be expected to have a main tag of

articles were taken from the categories called energy (tag 37), coal (152), electricity (187), and oil & gas (273). Selected articles were taken from the categories called environment (39), climate change (26), opinion (466), and business (3). Discretion for exclusion due to irrelevance was occasionally applied, either on the basis of the content of the heading line or the content of the complete article.

These early manually selected articles provided the first sample set for trialing the processing algorithms and were used to guide the development of more precise "electricity" selection rules.

4.7.4 Retrospective Article Collection

In order to ensure that the article set was as inclusive as possible, additional retrospective article collection was later undertaken (after the end of the sampling period) by means of keyword and key phrase online searches. This process retrieved additional articles which were inadvertently missed when using the original manual collection and discretion method. The additional articles were integrated into the first set and aspects of the analysis processing were tested again, to provide further interim results. This second stage article collection was possible for nzherald because (almost) all articles remained available online for the duration of the study and beyond.

A few nzherald articles were observed to have disappeared within a few months of collection (prior to the retrospective collection). These were mostly *Reuters* oil price reports and were not considered to have significantly affected the electricity results. Nevertheless, it is possible that other articles may have gradually disappeared over time and thus may have been lost to the latter stages of the retrospective collection which, being very labour intensive, continued for some time (in parallel with the text analysis algorithm development).

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national (1), world (2), and/or business (3) as well. Other primary tags included sport (4), technology (5), lifestyle (6), travel (7), and motoring (9). These primary tag numbers were not visible when the articles were listed on the secondary category pages, but all tags were visible on the search results page when the retrospective search was done at the end (see Appendix A12 for a list of relevant NZ Herald subject tag codes).

Google's more flexible search engine was briefly investigated for the retrospective article search, but it did not provide results in date order which was a major drawback. Therefore nzherald's own search engine was preferred, due to its very tidy search results presentation. One drawback of nzherald searching was that it was limited to whole words only. It was thus necessary to do more searches, e.g. for wind farms (plural), as well as wind farm, windfarms and windfarm. Multiple consecutive manual searches were performed, each including the year 2006 or 2007 within the search criteria, and making liberal use of the subtraction "-" sign to exclude previous search terms. The retrieved articles were checked against existing articles (sorted into date-time, objectid order), and new ones were added to the collection.

The development of the definition for an article relating to electricity was not as easy as it may seem. Not every article about electricity mentioned the word electricity. Some brief articles were on occasion, quite cryptic. It helped to split the topic of electricity into its various subsets and examine the keywords and key phrases for each. Thus the high level article selection phrase list used here was a simplified version of the detailed phrase selection which had been followed within the categorisation process when fine tuning the sets of key phrases for ETAT to use when selecting sentences about electricity. During that process, any observed omissions (articles considered relevant but which contained none of the defined keywords) caused the creation of new categories or keywords, in an iterative process until I was satisfied that the coverage was comprehensive. Furthermore, some electricity sector organisations such as Meridian Energy and M-co by definition were always electricity-related, so these could also be used as search terms by name.

Although this retrospective online search (second pass) was a deliberately inclusive collection, the words "contact", "energy", "lines", and "power" were considered to be too generic to be able to use within the search criteria definition on their own because the retrieved volumes would have been too large. Instead, they were each included as part of conjoint phrases (for example, contact+energy, contact+stock,

"energy efficiency", "power prices", "power station"), with the result that the search list was rather long.

The key words and phrases employed for the retrospective online searches (in order to retrieve all nzherald articles relating to electricity) were as follows, approximately in this order[402].

muliaga, "roy hemmingway", "electricity commission", transpower, pylons, trustpower, meridian, genesis, "mighty river", "mercury energy", contact+energy, contact+stock, empower, vector, powerco, windflow, geothermal, "wind farm", windfarm, windfarms, "wind farms", solar, hydro, electricity, "power prices", "power cut", "power lines", "power crisis", "atomic energy", "power station", "nuclear power", "nuclear energy", "wind power", "wind turbine", "wind turbines", "cogeneration", "wave power", "wave energy", "tidal power", "tidal energy", "marine energy", "photovoltaic", "electric", "energy efficiency", "energy efficient", "power outage", "power saving", "power pylon", "energy crisis", "lake levels", "without power".

Due to the deliberately inclusive nature of these online searches, this method still contained a manual component such that where the visible match onscreen was obviously not electricity-related, the article was skipped. These exclusions did not arise often but were mostly enacted for the word "electric" in sports articles[403]. However, four (non case sensitive) search terms with the same names as selected electricity companies (meridian, genesis, mighty river, and vector) were collected in this pass (even when obviously not electricity-related) so that literal brand names would be able to be counted in these cases, ("contact" was excluded for obvious reasons). The exceptions to this rule were seven formulaic article types (beauty tips, cartoons, food recipes, horoscopes, sports results, "What's On", and "Your Views") because they were not considered to be news articles. These were always excluded (even if they contained a relevant search term).

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[402] The reason that the search started with muliaga, roy hemmingway, transpower etc was to allow preliminary results for the case studies, followed by the generating companies for their comparisons. The reason that "electricity" was not searched for earlier was that nzherald had a limit of (50 pages x20 articles per page) 1000 search results, which was not sufficient without accurate date boundaries (which were not offered), so it was more practical to break the searching down into smaller groups, searching for other terms first and then later searching for electricity, excluding (using "-") the terms already searched for.

[403] These articles could have been collected, to be rejected later by the ETAT analysis tool instead, but for simplicity and in order to keep volumes down they were omitted at source.

Some unexpected article types arose, such as descriptions of properties for sale. It was decided that these should be included, and it was surprising how often electricity was mentioned in advertorials such as these. Articles belonging to other regular nzherald columns such as Sideswipe (amusing anecdotes), Movers and Shakers (career moves), concert reviews, technology columns, general sports coverage (except sports result lists), and travel guides were also collected if they contained the required search terms, in order that the article collection be as comprehensive as possible.

Some patterns were observed during this retrospective set of searches. For example, articles containing "atomic energy" were almost always referring to the International Atomic Energy Agency (IAEA) and its concern about Iran. Similarly most "nuclear energy" articles were about Iran. Other than "vector" (and its Vector Arena), the word "electric" gave rise to the largest number of peripheral topics, and while the word was mostly used in relation to General Electric (GE), electric cars and electric trains, it also returned electric guitars, toasters, fans, fences, wheelchairs, toothbrushes, frypans, blankets, saws, storms, and arc furnaces, as well as (more concerningly) the electric chair, electric shocks, tasers, and electric shock therapy (ECT).

4.7.5 Final Article Selection

The three collection methods which have been described up to this point, the category method (real time first pass), the online keyword search method (retrospective second pass), and the researcher-discretion method (used where necessary within both passes), were all broad brush methods which were not quite precise enough but were designed to provide more articles than were needed. In other words, the application of these preparatory selection rules was done generously to favour false positives, and to include many extra articles sometimes only peripherally related to the topic of electricity, but which did mention electricity somewhere in the article.

Once the first two passes were complete, the collection contained a large number of articles from one publisher relating to the topic of electricity, in preparation for

ETAT to analyse certain proportions within that set of articles. I cannot be sure that I obtained *all* relevant articles, although my collection methods were comprehensive enough to cause me to believe that I obtained the vast majority of them, largely due to the fact that nzherald permitted retrospective online access to historical articles.

From the rather too large sample set deliberately accumulated so far, a third and final pass was required in order to obtain a set of articles related to electricity which had been selected for that topic according to a rigorous set of rules. This final selection was performed by the ETAT analysis tool which had been customised for this purpose, rather than using the standard online search engines which were not able to be precise enough. This meant that articles which had been selected online during the first two passes, but which did not fit the more finely tuned criteria for final article selection were able to be deliberately excluded for the final analysis when electricity-only articles were required.

Using ETAT, levels of electricity (or electricity policy) relevance were able to be calculated for each article, allowing more finely grained article selection, for sub-samples, cross tabs, and comparative analysis. Furthermore, any of the individual retrospective selection criteria phrases (such as "vector") were able to be retained within samples if required, even if unrelated to electricity, to enable (for example) literal brand name counts for the electricity companies.

4.7.6 Proportion of Articles Collected

It was initially envisaged that it would be difficult to calculate the proportion of all online articles (by publisher) which were selected for this study, but eventually a mechanism was discovered which would allow a reasonable approximation. It was observed that as most articles had been posted online approximately in order and close to publishing date, and each had a unique "objectid" identifier, it was therefore possible to determine roughly how many articles were published online per month.

The "objectid" was thus used to find (manually by trial and error) each of the month boundaries, and thus the approximate total number of online nzherald articles by month (approximately 5000 per month or 200 per day), so that the total collected for

the study (about 5% of articles), and number of "electricity" articles (about 4.5% of articles) could be compared and these proportions calculated.

The full list of monthly nzherald article counts are listed in Appendix A11, and are assumed to be slightly high as they include pages such as "Your Views" horoscopes, cartoons, and sports results, which were deliberately omitted from this study, as well as some pages deliberately deleted by nzherald (not found on search by objectid). In addition (especially in 2006), some articles from 2005 were loaded online retrospectively by nzherald, so their objectid numbers were out of alignment, but these were the exception rather than the rule. A few articles were also posted early but published late (so their objectid was out of alignment with the article date), thus occasionally crossing month boundaries. However, these examples were also considered not to have affected the totals significantly.

4.7.7 Website Upgrade Effects

The nzherald website underwent several formatting changes during the length of the study. Initially (in 2006) some of the longer "opinion" articles by celebrated columnists were not fully available (only the first couple of lines were visible), requiring a subscription payment[404] to view them. When this occurred during the article collection, just the article header, available information and URL was collected at the time. A year or so later, when all of the articles became free, these were all revisited, the whole article was collected, and the new link was stored. These early "pay to view" articles, and a few others, did not initially have an objectid as part of the first URL that was saved for the study. Any of these articles that were missing the objectid were revisited later and the URL was retrieved again, so that all articles would have an accurate unique identifier. Fortunately, nzherald maintained the objectid as an underlying numbering system for all articles (even

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[404] Although I was a paying subscriber to the New Zealand Herald newspaper daily delivery into my letterbox at that time, this did not entitle me to view the "pay to view" articles on the nzherald website. I therefore initially only collected what was available (while looking for a work-around), as it seemed unreasonable to have to pay twice for the same information.

though alternate link addressing was offered in some of these early cases), and this objectid remained visible for all articles for the duration of the study.

Nzherald website formatting changes also gave rise to two specific date-time collection issues. Firstly, many articles from early 2006 were originally posted with a date but no "time" component visible. Later with subsequent searches, when the time did become visible for some of these articles, this information was added manually into the saved text, so that the article sort (into "posted online" order) would be as correct as possible.

Secondly, a shortcoming within the nzherald retrospective searching meant that a certain category of expert "opinion" article (once again from the first part of 2006) lost their date-time component when displayed in the later version of the website used for retrospective collection. In this case, the date and time (usually 5:00am) were estimated by comparing with the date-time on adjacent articles (by objectid) and were then typed manually into the correct location in the text.

It was observed that for most articles two separate date-time fields were stored. One was the date "loaded" (this appeared in the search results list) and the other was the date "published online" (this appeared in the header of the displayed article). For the purposes of this study I was interested only in the second date (the date-time visible to the reading public), but it was interesting to observe the size of the gap between the two, which was often quite large for the "travel" articles. When there was a gap, the eventual publishing time would almost always be 5:00am, presumably the time that most articles were bulk published. For articles published at any other time (in "real" time) both dates were the same or very close. It was noted that most articles by regular columnists were loaded the night before, for publishing in the morning.

4.7.8 Sample Selection

The selection process for this study retrieved a large number of articles, spanning a wide range of main subjects, and it was useful to be able to auto-classify these into sub-groups for comparative analysis.

All of them had already been categorised by nzherald (sometimes in many ways) using tags. This study did not retrieve the full list of tags for each article, so these were not all available to ETAT, even though each retrieved article did have one assigned nzherald tag as part of its URL. It was therefore necessary to calculate and assign a customised article subject, based on tags where possible, but assessed in other ways where necessary.

Article subject, article length, electricity intensity, opinion (or not), and NZ (or not) were the primary article attributes used for slicing and dicing the data[405], and these are listed in Table 4.7.8.1. Of these, only one (length) was straightforward to do automatically. The others required more complex calculations using a combination of tags (where known) and/or the key indicators discussed earlier in this chapter.

Table 4.7.8.1 – Primary Article Attributes

Name	Description
1. Article Subject	1-13 (Similar to tags - discussed further below).
2. Article Length	1-5 (Brief / Short / Medium / Long / Very Long)
3. Electricity Intensity	0-6 (see section 4.5 Key Indicators).
4. Opinion (Yes/No)	0-1 (tag 466 or editorial, guest, or known columnist).
5. NZ (Yes/No)	0-1 (predominant applicable country is NZ or not)

Article subject, though reasonably straightforward to determine at a glance by a human coder, proved to be rather more complex (though iteratively flexible) to ascertain automatically. Tags were able to assist but were not always definitive. For articles collected manually by tag in the first pass article selection, the tags in the URL were normally secondary tags such as energy (37), electricity (187) or climate change (26). For articles retrieved retrospectively by keyword search after the end of the sampling period, these were more often a primary tag, such as national (1), world (2), business (3), property (8), motoring (9) etc. Rather than use exact nzherald tags (of which there were a large number, often with multiple assignations per

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[405] Two other available attributes (not listed in Table 4.6.7.1) were author and source. These were each straightforward if unique, but slightly more complicated where more than one.

article) as the article subject, the tags were instead used as a rough guide where possible (or an exact match where applicable) to assign articles into just one subject from a smaller customised list of possibilities.

The article subjects listed in Table 4.7.8.2 were calculated in a specified order, starting with the ones which were easiest to recognise, so that the more difficult ones could (if necessary) be determined by a process of elimination.

Table 4.7.8.2 – Article Subject Determination

Name	Tag(s)	Other Identifier or Verifier
1. Sport	4	Primarily about sport. Usually positive.
2. Motoring	9	Primarily motor industry. Usually positive.
3. Entertainment	6,1502967	Primarily about entertainment. Usually positive.
4. Travel	7	Long length. Very positive. Usually overseas.
5. Property	8,1502988	Very positive. Usually NZ. Certain keywords.
6. Oil Report	273 and	"Oil:" prefix. Short. Usually Reuters. About oil.
7. Sharemarket	3 and	Known prefix, or primarily about the stockmarket.
8. Business	3 or	Other markets, economy or finance. [34,516]
9. Weather	10 or	Significant mention of weather events.
10. Environment	26,39 or	Other environment, including climate change.
11. Incidents	1or2 and	Significant mention of accidents, crime, or death.
12. Politics	1or2 and	Mostly political parties or governments.
13. Other	Any	Remaining articles.

Tags also provided a shortcut for determining whether the predominant country was NZ or not, although this was also able to be determined by key indicators alone if the required tags were not available, see Table 4.7.8.3.

Table 4.7.8.3 – NZ (or not) Determination

Name	Tag(s)	Other Identifier
NZ (1 = Yes)	1 or	No country mentioned, or mostly about NZ.
Not NZ (0 = No)	2 or	Another country leading the lead line, or mostly about countries other than NZ.

Any article which mentioned NZ was considered to be a NZ article and articles with no country mentioned at all were also considered to be NZ articles.

The "Opinion" indicator was relatively easy to determine for local authors (labeled guests, known columnists) and was also auto-assigned for selected article subjects (motoring, travel, and entertainment). However, it was slightly more difficult for overseas-sourced articles (*Independent*, *Guardian*, *The Age*, etc). For these sources the "Opinion" indicator was assigned manually (by author) upon inspection. It could also have been assigned automatically by size, but this was not implemented.

The classifications discussed above were assigned in order to allow additional fine grained comparisons of entity exposure characteristics within sub-groups of articles. As this study was examining media exposure for selected concepts and players, it was useful to be able to determine with some precision where such exposure was taking place. The players, events, policies, and concepts of interest that made up the primary study samples are listed in Table 4.7.8.4.

As mentioned in chapter 1, two significant events (the death of Folole Muliaga, and the dismissal of Electricity Commissioner Roy Hemmingway) and two specific issues (the upgrade of the "Waikato pylons" Whakamaru to Otahuhu transmission line into Auckland, and the possible privatisation of the state-owned SOE generators) were selected to provide four special case studies. These specially featured media topics were chosen towards the end of the data collection period, once it had become apparent whether any electricity policy issues had been given notable media attention. The case studies provided an opportunity for a close examination of specific policy-areas, to see whether any remarkable features arose in the way that they were handled by the media.

Table 4.7.8.4 – Article Sample Sets and Selection Criteria

1. Person/Event Sets	Selection Criteria
1.1 Muliaga Death	Person "Folole Muliaga".
1.2 Hemmingway Dismissal	Person "Roy Hemmingway".
2. Issue Sets	**Selection Criteria**
2.1 Waikato Pylons	Doc "Waikato pylons".
2.2 SOE Privatisation	Org class "SOE" & Doc ("privatise" or "listing").
3. Environmental Sets	**Selection Criteria**
3.1 Climate Change	Topic "climate change".
3.2 Pollution	Topic "pollution".
3.3 Peak Oil	Topic "peak oil".
4. Organisation Sets	**Selection Criteria**
4.1 Major Generators	Org "Meridian" or "Genesis" or "Mighty River" or "Contact" or "TrustPower".
4.2 Lines Companies	Org class "lines companies".
4.3 Grid Oversight	Org "Electricity Commission" or "Commerce Commission" or "Transpower".
5. Policy Sets	**Selection Criteria**
5.1 Generation Options	Topic "energy sources" & "demand management".
5.2 Carbon Pricing Tool	Doc "carbon tax" or "emissions trading".
5.3 Energy Prices	Doc "oil prices" or "electricity prices".

Acting upon and within the selected sample sets of articles listed in Table 4.7.8.4, certain other parameters (or sub-groupings) were identified purely for comparison (without the requirement for sub-sample extraction).

In addition to cross-tabulations of the selection criteria listed above (for example generation options were able to be compared within the climate change article set), certain other comparisons of interest are listed in Table 4.7.8.5. These are similar to the sets used for "winner" comparisons, described in Tables 4.5.9.1 and 4.5.9.2 of the earlier key indicators section.

As well as the selected parameters of interest listed below, comparisons were also made within standard topic groupings by level, as per Tables 4.4.5.1-4 in the categorisation section.

Table 4.7.8.5 – Article Parameter Sets and Selection Criteria

1. Gender Sets (Pairs)	Selection Criteria
1.1 Named gender	Person attributes "M" vs. "F".
1.2 Unnamed gender	Org class "males" vs. "females".
1.3 Merged gender	Merged results for the two previous comparisons.
2. Other Binary Sets (Pairs)	**Selection Criteria**
2.1 Tone	Topic "positive" vs. "negative". Also Event.
2.2 Perspective	Event "past" vs. "future".
2.3 NZ Island	City class "north island" vs. "south island".
3. Policy Sets (Pairs)	**Selection Criteria**
3.1 Equilibrium	Doc "growth" vs. "sustainability".
3.2 Money	Doc "money" vs. everything else. Also Org.
4. Ideology Sets (Triplets)	**Selection Criteria**
4.1 Political – left, right, green	Org "National" vs. "Labour" vs. "Green" parties.
4.2 Sectoral – market, govt community	Org class "markets" vs. "governments" vs. "households". Also parallel Topics comparison.
4.3 Triple Bottom Line – financial, social, environmental	Topic "economics" vs. "household sector" vs. "environmental issues". Also Org "business, social, environmental advocates".
5. Entity Sets (Multiples)	**Selection Criteria**
5.1 Regions	Country class level 5.
5.2 Countries	Country class level 6.
5.3 Governments	Org name like "% government".
5.4 Organisations	Org levels 6 and 7
5.5 People	Person level 8.

4.7.9 Summary

To summarise, several different layers of article selection took place during the course of this study. First there was the regular evening collection of articles during 2006-2007, mostly from the online <u>electricity</u>, <u>energy</u>, and <u>climate change</u> categories of the <u>nzherald</u> website. This process was expected to retrieve most of the required articles for the study, plus some extras. This first set of articles enabled the progressive development of processing algorithms, categories, and relationships to proceed (as described earlier in the chapter).

Later, towards the end of the study, there was a comprehensive website search using a long series of selected keywords, to make sure that all electricity articles really were included. This retrospective search retrieved an avalanche of extra articles, including a large number which were only peripherally related to electricity. The search deliberately included all (even unrelated) articles which mentioned electricity company brand names (such as meridian, genesis, mighty river and vector) to enable the literal/nominal coverage (described in the earlier key indicators section) for those companies to be measured, although the large number of <u>Vector Arena</u> references (especially once that venue opened in 2007) made the volume of unrelated data (and the requirement for many celebrity entities) extremely cumbersome. This decision was perhaps unwise from a time and volume perspective, although the application was able to handle them reassuringly well.

Finally, ETAT was used to filter all of the collected articles according to their level of electricity sector relevance (together with other criteria) and to pull out selected samples for further analysis. The results for each of these samples will be presented in the next chapter.

4.8 Conclusion

In order to undertake an examination of electricity public policy online media coverage in nzherald during 2006-2007, this research utilised a new style of qualitative analysis while adopting a critical political economy perspective.

In-depth consideration of the semantics and style of news presentation gave rise to a set of newly derived (online) news media exposure indicators which differentiated between literal, explicit, and implicit coverage, and which included a new prominence calculation. The ETAT text analysis tool was developed specifically to be able to measure these indicators, and to cater for a large library of search phrases which were derived via a laborious manual iterative categorisation process. Important unique features of this tool were nick name and exception handling, as well as differing types of relationships between entities to allow flexibility in "degrees of relevance" when reporting.

Software for literal content analysis (e.g. word counts) has been available for some time, but only after the bulk of this study was completed has available software become sophisticated enough to capably assist with sentiment analysis[406] and a steadily increasing number of natural language processing capabilities which in the past have been purely manual techniques in social science research. Even so, the study requirements were not fully catered for by any known external software at time of writing.

This thesis consists of a synthesis of ideas from multiple disciplines and the way that the research has been constructed could be said to place each of these disciplines into different roles. The topic of the study comes from electricity public policy, the motivation (or underlying hypothesis construction) from the psychology of repetition (via the mere exposure effect), the tools from information systems, and the methods from media text analysis.

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[406] E.g. Lymbix (2009).

Chapter 5 – Data

> *Trying to determine what is going on in the world by reading newspapers is like trying to tell the time by watching the second hand of a clock.*[407]

5.1 Overview

5.1.1 Introduction

News is steadily, unceasingly, produced, but variable, so a certain amount of accumulation is required in order to infer meaningful long term conclusions (or a bigger picture) from the voluminous minutiae of day-to-day mass media reporting[408]. Previous chapters have described the assigned method for performing such an accumulation in this case, and it is now time to present the results obtained when 6341 New Zealand news media articles relating to electricity, from the period 2006-2007, were examined using a text analysis tool which was specifically designed for this purpose.

The quantitative aspect of the undertaking involved measuring and comparing media exposure for each type of <u>topic</u> (player, issue, policy or communication technique) within the model outlined in the framework chapter. Values for each topic were obtained by accumulating coverage information for items of interest within each of the seven cross-tab entities (<u>person</u>, <u>organisation</u>, <u>city</u>, <u>country</u>, <u>document</u>, <u>event</u>, and <u>keyword</u>), as described in the categorisation section of the research design chapter. The flexibility of the developed ETAT processing tool, along with the eventual detail that was able to be compiled into the entity categorisation tables, meant that some core topics could also be examined in more detail by "drilling down" into their components if so desired. Other topics turned out to be more difficult to measure than envisaged, with ensuing results less precise than had been hoped for.

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[407] Hecht (1954:331), cited in Ehrlich (2004:26-27).
[408] E.g. Gerbner (1998:180).

This chapter is divided into a number of sections, each of which presents statistical results for a specific sample, related group of samples, or subset of related entity items. The list of selected samples with their selection criteria was provided in section 4.7.8. Here the presented quantitative results mostly stand on their own without significant analysis, but some explanatory notes are provided. Further analysis and interpretation will be provided in the discussion chapter.

5.1.2 Attribute Distributions

Tables 4.7.8.1-3 earlier described certain attributes which were available to assist with describing and analysing the data. As a prelude to the data analysis, the attribute distributions are given below. Note that the numbers on the left axes are always counts. Figure 5.1.2.1 illustrates one aspect of the standardisation of media news articles (length) that makes them particularly suitable for customised content analysis, as discussed in section 4.6.3. Length outliers were not excluded from this study, but future studies might consider that option to simplify the analysis, and/or arguably to improve validity.
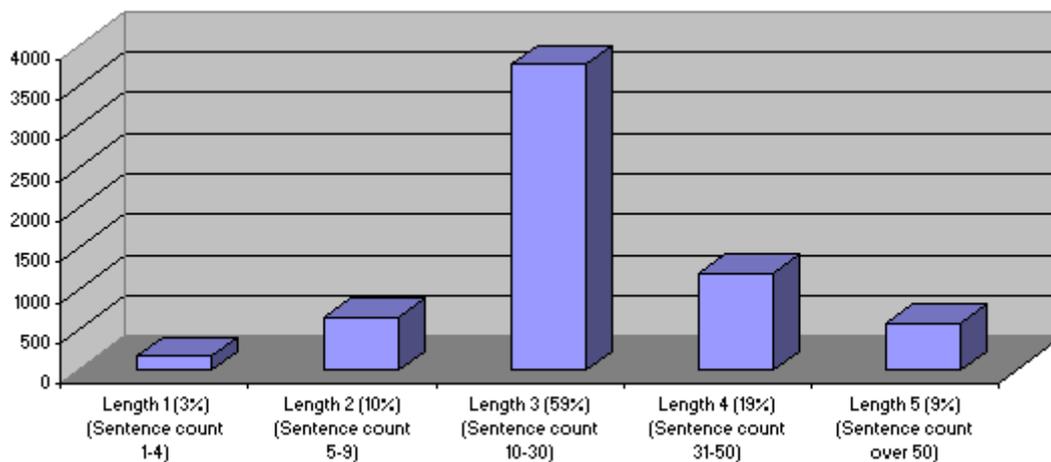
Figure 5.1.2.1 – Article length distribution for full sample

As discussed earlier (see Table 4.7.8.2), an estimate of the article subject was made automatically, based upon either the nzherald tag, or upon the scores for certain entities within the articles. This automated subject assignment was not always perfect, and the boundaries between some of the subjects (such as environment and weather, or weather and incidents, or business and politics) were not always easy to determine, but the spread of assigned article subjects is presented in Figure 5.1.2.2.
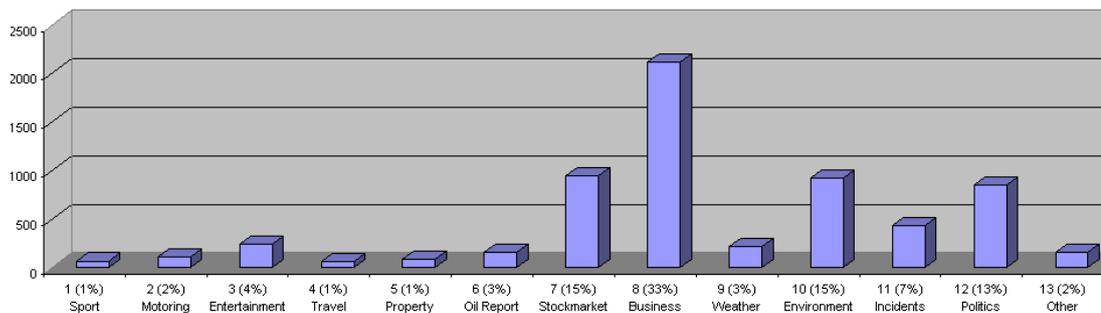
Figure 5.1.2.2 – Article subject distribution for full sample

Because sports results and "What's On" articles (consisting only of lists) were deliberately excluded, the <u>sport</u> and <u>entertainment</u> subjects above are likely to have scored lower than they would have if those categories had been included.

The focus of this thesis is electricity public policy, so the calculated electricity <u>intensity</u> measure was utilised to assist in separating the electricity-focused articles from the incidental (or, as sometimes occurred, no) mentions.

As discussed in the key indicators section of the research design chapter, articles were able to be ranked from 0-3 (based upon sentence count) to provide a broad indication of the level of coverage <u>(substance)</u> for any chosen subject. From an electricity perspective, this measure allowed comparisons between the four sets of articles containing zero, incidental, minor or major coverage of electricity. When <u>prominence</u> was added to substance, a further 0-3 points were able to be allocated (for appearance in one or more lines of the header or source line), resulting in a seven point scale (0-6) for <u>intensity</u>.

Figure 5.1.2.2 shows the electricity intensity distribution for the full sample set.

Article Count by Electricity Intensity
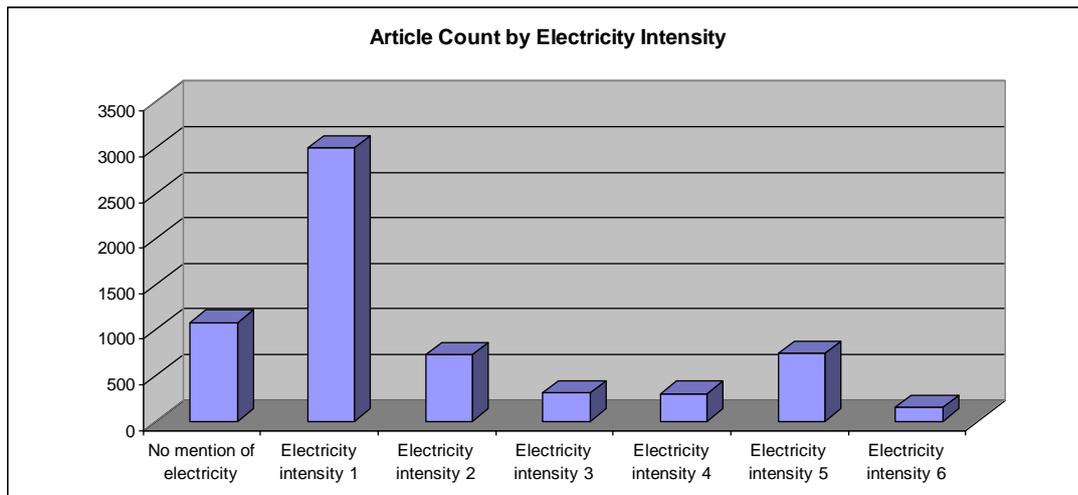
Figure 5.1.2.2 – Electricity intensity distribution for full sample

It can be seen here that by far the largest group were those with only an incidental mention of electricity, i.e. those with intensity 1 (47%), illustrating how very integrated electricity is to our way of life. Many of these lower scoring articles were collected during the second (keyword search) pass.

The reason that "no mention" (intensity 0) was large (17%) was because many articles which initially appeared to have an electricity reference, turned out not to have one, once the underlined exclusion criteria were activated. This was due to the ambiguity of many electricity-related words (such as "power" and "electric"), and also the deliberately collected electricity company sponsored (or literal) phrases (such as Vector Arena, and the biblical book of Genesis). In addition, during the initial collection a few articles were collected which contained relevant information despite lacking an explicit electricity mention (e.g. oil reports, climate change, or economics articles).

Although detailed analysis was possible at each of the seven intensity levels, that much detail proved too voluminous for this document. For simplicity, analysis has been (where meaningful) applied to the full sample and (where necessary) electricity-specific analysis has been provided for just that subset of articles with electricity intensity of 3 or more (the top 24% of articles).

Two other defined attributes were <u>Opinion</u> (yes/no), and <u>NZ</u> (yes/no). Their <u>article count</u> distributions are displayed in Figures 5.1.2.3 and 5.1.2.4.
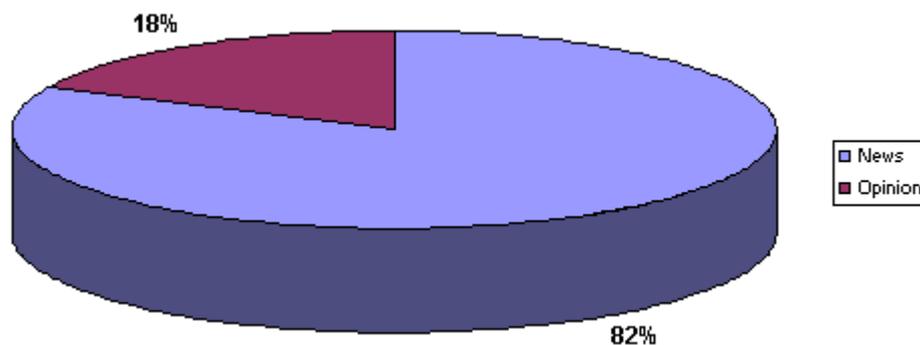

Figure 5.1.2.3 – News / Opinion distribution for full sample

"Opinion" was an article attribute that was included by obligation, but the accuracy of its classification was suspect. "Opinion" assignations were mostly performed manually (automation for this aspect within ETAT was not fully included), and although these "opinionated" columns and articles were often longer and more entertaining in tone than the others, it is at least debatable whether the NZPA and Reuters articles (for example) were not in fact also someone's opinion.
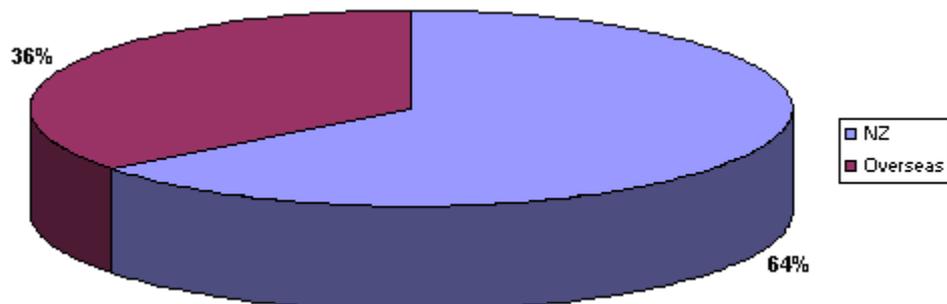
Figure 5.1.2.4 – NZ / Overseas distribution for full sample

It was good to see that most (64%) of the articles collected for Figure 5.1.2.4 were NZ <u>focused</u>, implying also that they were mostly NZ <u>sourced</u>.

This can be confirmed by analysis of the acknowledged source organisations, provided in Figure 5.1.2.5.

Article Count by Article Source
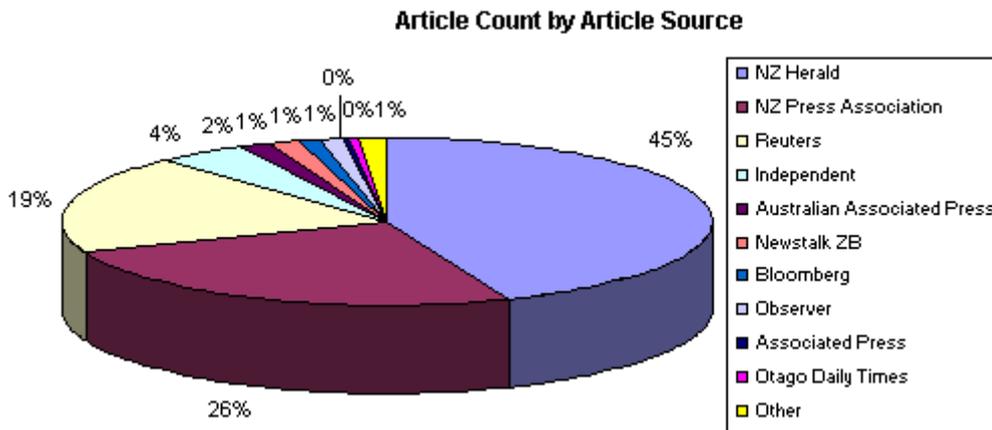
Figure 5.1.2.5 – Article source distribution for full sample

It can be seen here that within the top ten, overseas sources Reuters (20%), Independent (4%), AAP (2%), Bloomberg (1%), and Observer (1%), comprise just under 30% of the total. It is important to note that articles with no acknowledged source have been treated as nzherald articles for this comparison, but some of these may have had unacknowledged overseas sources. This is likely to explain some of the difference between this overseas result (30%) and the NZ/overseas result (36%) in Figure 5.1.2.4. Part of the difference may also have arisen from *NZPA* (for example) providing overseas news. These presumptions could have been confirmed by analysing the data more closely but that was deemed an unnecessary diversion.

Article counts for authors were analysed in a similar way, but as the spread was between hundreds of authors, there was not a lot to be gained by presenting these. Suffice to say that nzherald economics editor Brian Fallow authored the greatest number of articles at 137 (2%), followed by *NZPA* sharemarket commentator Melanie Carroll 108, nzherald transport commentator Mathew Dearnaley 99, and nzherald energy commentator Richard Inder 95. Many other authors came close to these numbers.

The next section will examine the results for the designated topics of interest.

5.2 Topic Set Results

5.2.1 Introduction to Topic Results

The topics for analysis were introduced in the framework and research design chapters (see Figure 3.3.1.1, Tables 4.4.5.1-4). A comparison of cumulative coverage for the level 1 topic categories players, issues, policies and communication, is shown in Figure 5.2.1.1, ranked by intensity.
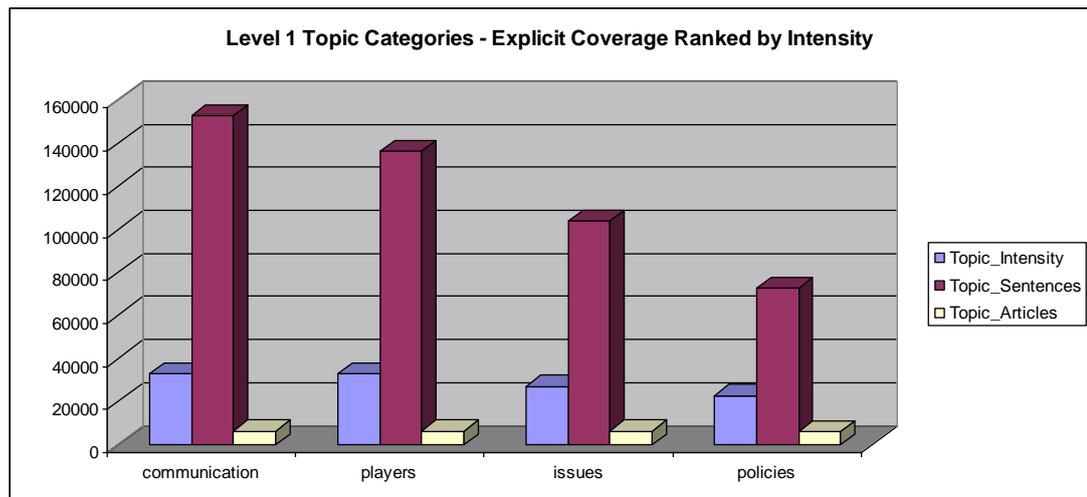

Figure 5.2.1.1 – Explicit coverage by level 1 topic for full sample

Article count is the third (smallest) measure in each column set above. Of 6341 articles sampled, 6340 mentioned a player phrase, and 6338 mentioned communication in one of the forms designated in this study, so these two categories achieved almost 100% coverage in terms of article count. By comparison selected issues appeared in 6314 (99.5%) of articles and selected policies in 6203 (97.8%) of articles. Thus all level 1 topic categories achieved close to universal coverage for appearance in articles.

Sentence count (substance) is the middle measure in each set above, and here more differentiation is evident. Of 163338 sentences sampled, 152830 (93.6%) contained communication, 136259 (83.4%) referred to players, 104076 (63.7%) covered issues, and 72448 (44.4%) mentioned policy topics.

5.2.2 Players by Sector

Scores for player level 2 topics (high level sector name) are shown in Figure 5.2.2.1. Level 1 (all) player scores are also included here beside the left axis for comparison (with label capitalised).
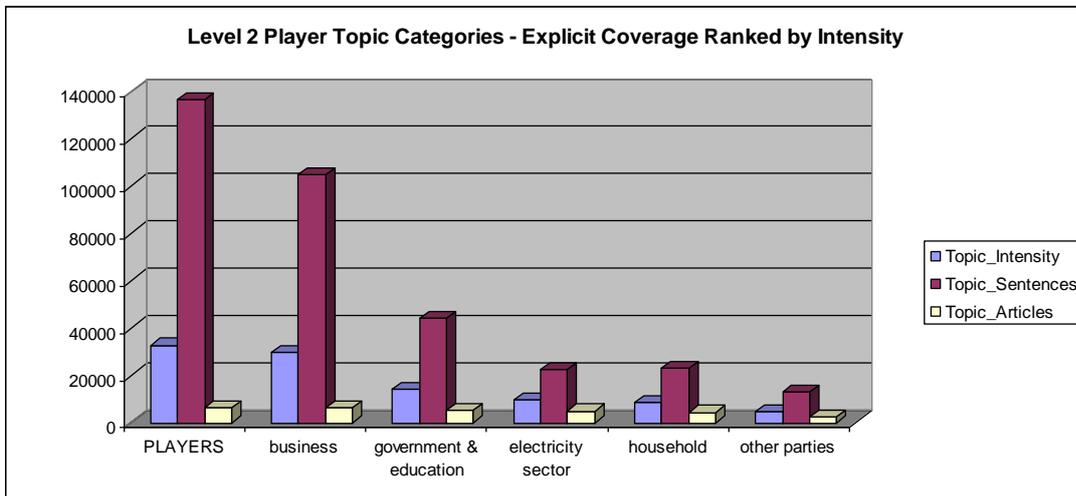

Figure 5.2.2.1 – Explicit player coverage by topic level 2 for full sample

When filtered for articles which mentioned electricity to an intensity of 3 or more, the comparative counts in Figure 5.2.2.2 were observed. The <u>ratios</u> here are almost identical to those between the scores above, except for the special <u>electricity sector</u> category, which can be seen to have moved up the rankings.
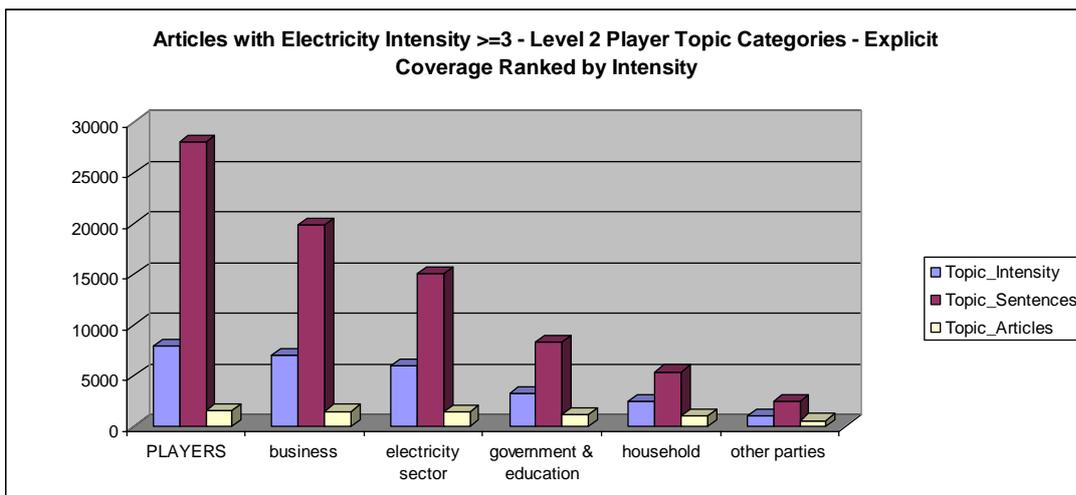
Figure 5.2.2.2 – Topic level 2 player coverage for electricity intensity >= 3

Each level 2 <u>sector name</u> was divided further into level 3 <u>sector categories</u>. Business was divided into the most sub-sectors (8), and these results are shown in Figure 5.2.2.3.
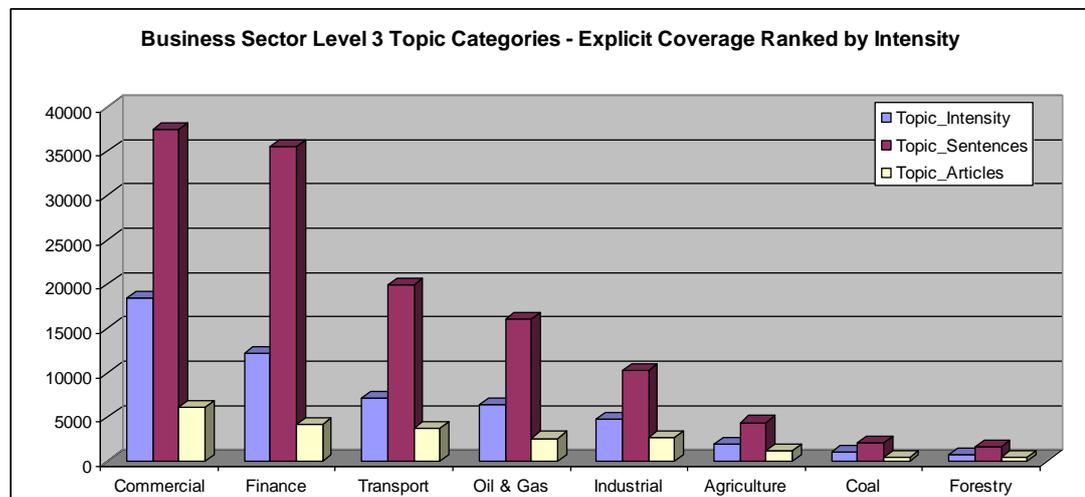

Figure 5.2.2.3 – Business sector coverage by player topic level 3

It can be seen here that the <u>light industry and commercial</u> category featured first, partly due to media organisations referring to themselves in almost every article. Second was <u>finance & insurance</u>, followed closely by <u>transport</u>, <u>oil & gas</u>, then <u>heavy industry</u>. <u>Agriculture</u> scores were small, despite the country's reliance upon primary produce. It can be seen that <u>forestry</u> scored lowest. Many of New Zealand's forests were sold off during the market reforms, and some of those that remained were being felled prior to the commencement of the Kyoto period, allegedly to avoid Kyoto deforestation penalties. The dairy boom was also contributing to the denuding of the land at this time.

Coal mining has traditionally been a very successful industry in New Zealand but it is apparent here that it did not warrant a particularly high level of media attention.

Non-business sectors have been grouped together for ranking by intensity in Figure 5.2.2.4, for ease of comparison. The <u>government</u> category is leading here by a large margin, and <u>science & research</u> is next, in this case acknowledged to be artificially high due to liberal use of the word "research" in business undertakings such as stockmarket analysis.

Non-Business Sectors Level 3 Topic Categories - Explicit Coverage Ranked by Intensity
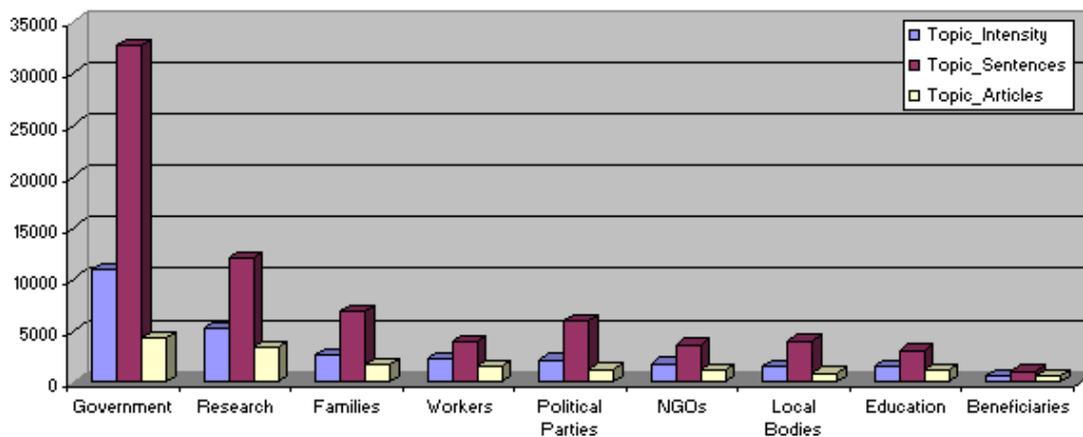

Figure 5.2.2.4 – Non-business sectors coverage by player topic level 3

In this graph <u>political parties</u> can be seen to be ranked behind <u>families</u> and <u>workers & unions</u> in calculated intensity and article count, despite surpassing workers in the sentence count. It was also interesting to see <u>local bodies</u> rank behind <u>NGOs</u> in intensity and article count, while marginally exceeding them on total sentences. The <u>education</u> sector can been seen to have rather low scores, and the <u>elderly & beneficiary</u> category was quite significantly lowest of all.

The graphs in this section covered the high level player results for <u>all</u> retrieved nzherald articles (except Figure 5.2.2.2). This sample, because of its large size and variety, was considered to be reasonably indicative for standard mainstream media coverage in New Zealand, so these trends are informative on their own, notwithstanding the electricity focus of this thesis.

Further detailed player analysis at an organisation and person level will be included later in the chapter.

5.2.3 Electricity Players

While still in the <u>player</u> topic section a closer look may be taken at the scores for the electricity sector on its own (within the full sample). In Figure 5.2.3.1 the level 3 categories (in lower case) are shown ranked in intensity order alongside their level 3 parent <u>electricity sector</u> (in caps), which in turn is shown alongside the full score for level 1 <u>electricity</u> (also in caps).
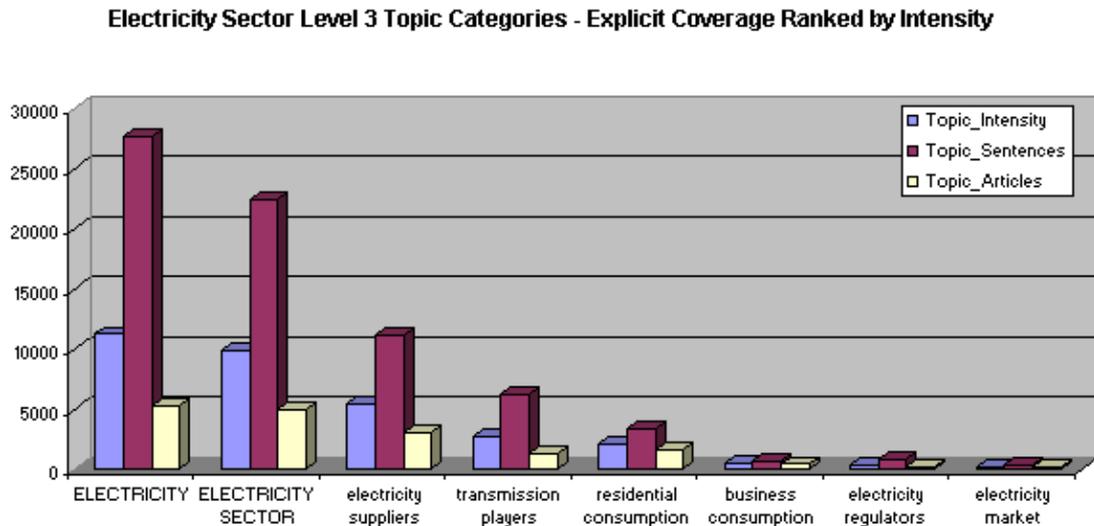
Figure 5.2.3.1 – Electricity sector coverage by player topic level 3

Here it can be seen that <u>electricity suppliers</u> received about half of the <u>electricity sector</u> coverage, and <u>transmission</u> about half of that. <u>Residential consumption</u> appears to be of significantly more interest to the media than <u>business consumption</u>, bearing in mind that both of these categories were difficult to measure accurately. This graph is for all articles, so some false positives from other energy sectors are likely to have boosted the scores slightly. <u>Electricity regulators</u> (e.g. the Electricity Commission) and the <u>electricity market</u> have received only a very small proportion of the coverage by comparison.

Note that only <u>explicit</u> (not implicit) coverage was measured for <u>topics</u>, although a parenting structure within the topic hierarchy meant that there was a certain amount of "inclusiveness" (see Appendices A1 -A1e).

Departing from the high level topic analysis for a moment and drilling down into actual entity counts closer examinations can be made for selected organisations of

interest. In three graphs on the next page a comparison is made between explicit coverage, functional coverage and literal coverage for the large NZ energy companies. Figure 5.2.3.2 shows clearly that <u>Contact</u> received the greatest explicit coverage overall, and that despite the salient Muliaga incident in June 2007 <u>Mighty River</u> ranked comparatively low.

Furthermore, it is clear that the three leading NZ energy companies in media exposure terms (<u>Contact</u>, <u>Vector</u>, and <u>Trustpower</u>), did not reflect company size or location (necessarily), but rather were the three that were listed on the stockmarket. The four that followed, in ranking order, were the government SOEs that NZX and the large investors were keen to obtain.

Figure 5.2.3.3 is similar to Figure 5.2.3.2 but this time shows functional coverage rather than explicit coverage, meaning that related person coverage was included, lifting the y-axis scores. It can be seen that <u>Trustpower</u> slipped a little, more closely aligning to its smaller size. <u>Vector</u> was notable for its higher sentence count, but without lifting the intensity or article counts, indicating the prevalence of long articles about the company and its people.

By contrast, Figure 5.2.3.4, reveals for the first time <u>literal</u> coverage (as defined in section 4.5.4) which was examined as an exercise. No attempt was made to combine literal scores with the explicit and implicit scores, but it can seen that when used in the broadest sense (allowing lower case and differing declensions for just the brand word – as indicated by the captions), the trends showed some similarities to the other graphs.
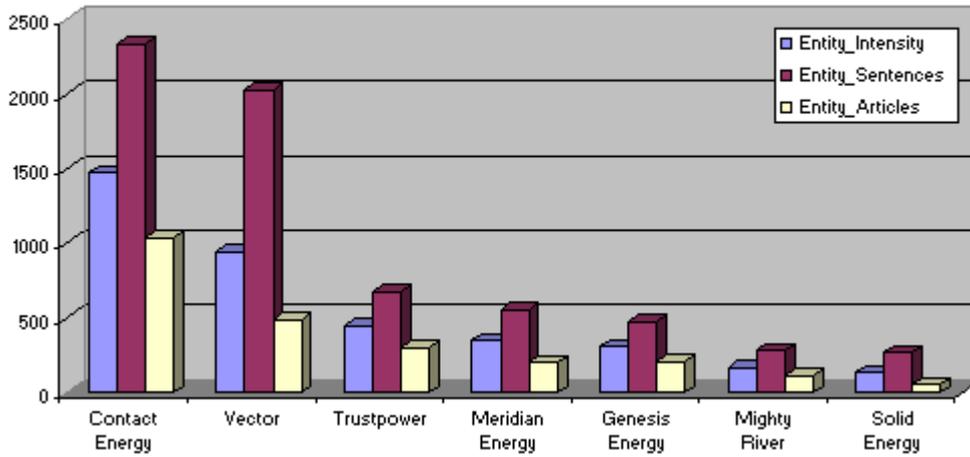
Figure 5.2.3.2 – Explicit coverage for major NZ energy companies

Figure 5.2.3.3 – Functional coverage for major NZ energy companies
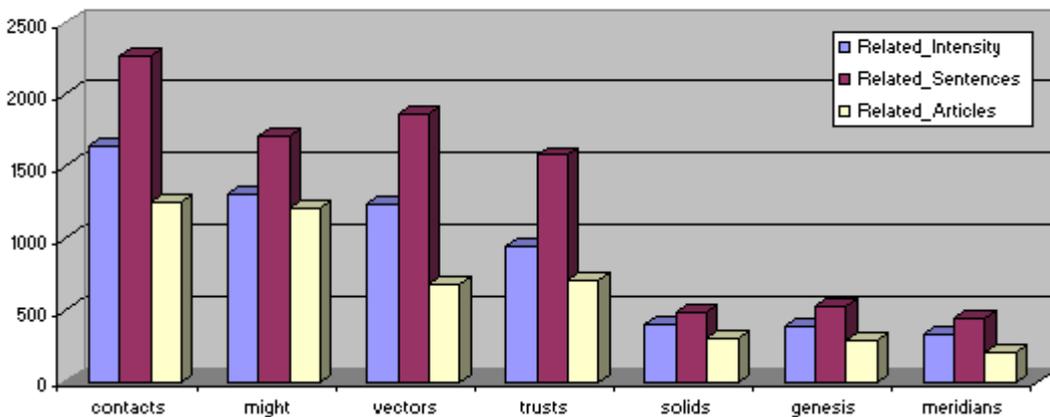

Figure 5.2.3.4 – Literal coverage for major NZ energy companies

An examination of functional (explicit plus implicit) coverage for NZ <u>lines companies</u> in Figure 5.2.3.5 shows clearly that Auckland's <u>Vector</u> (NZ's largest) was the lines company of most interest to nzherald. Contributing to that attention were a number of newsworthy conflicts during the study period.

NZ Lines Companies - All Articles - Functional Coverage Ranked by Intensity
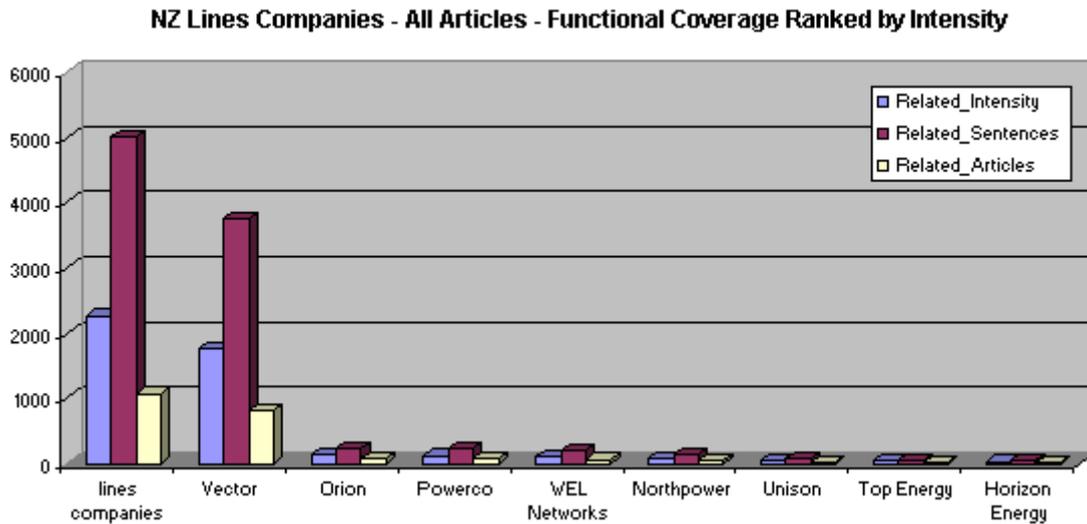
Figure 5.2.3.5 – Functional coverage for NZ lines companies

A brief look at the two main regulators alongside the organisations they oversaw is shown in Figure 5.2.3.6.

**Grid Regulation Players - All Articles - Functional Coverage Ranked by Intensity**
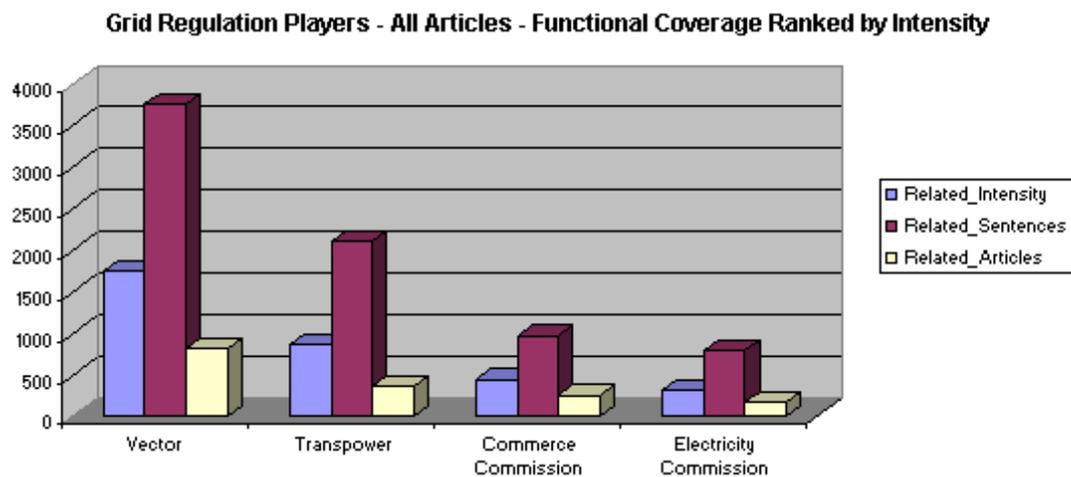
Figure 5.2.3.6 – Functional coverage for NZ electricity regulators

The Commerce Commission encountered challenges with both Vector and Transpower over the period but the Electricity Commission dealt with Transpower only, not Vector. This accounts for the higher coverage for the Commerce Commission overall.

5.2.4 Issues of Concern

In chapter 3, four level 2 topic names were specified beneath the <u>issues of concern</u> topic heading. These were <u>wellbeing</u>, <u>political imperatives</u>, <u>environmental issues</u>, and <u>ownership issues</u>. Figure 5.2.4.1 presents the explicit coverage that was deemed to have been given to each of these very broad level 2 topic categories, within the full sample.
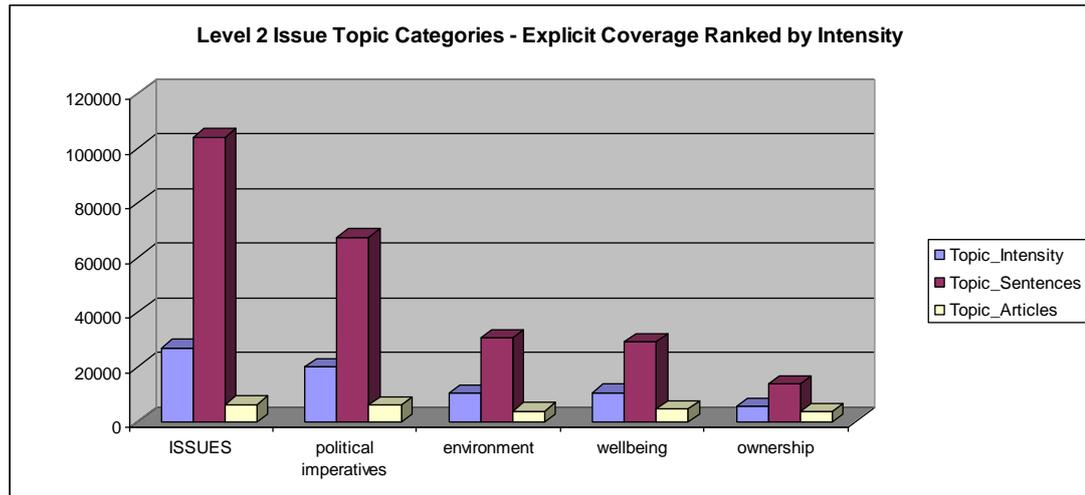

Figure 5.2.4.1 – Issues explicit coverage by topic level 2 for full sample

Of interest in the graph above is the indication that <u>political imperatives</u> are leading quite significantly, due to the fact that economics is a subset of this category. <u>Environment</u> and human <u>wellbeing</u> can be seen to be roughly equivalent here. Although it is difficult to see clearly, the article count for wellbeing is higher, although environment received higher sentence and intensity scores. <u>Ownership</u> can be seen to have been given a reasonable amount of coverage although only about half as much as environment and wellbeing, each of which received only about half as much coverage as political imperatives.

Each of these level 2 issue topics was allocated three level 3 sub-topics beneath them in the topic hierarchy. All nine of these have been integrated into a ranked list in Figure 5.2.4.2.

**Issues Level 3 Topic Categories - Explicit Coverage Ranked by Intensity**
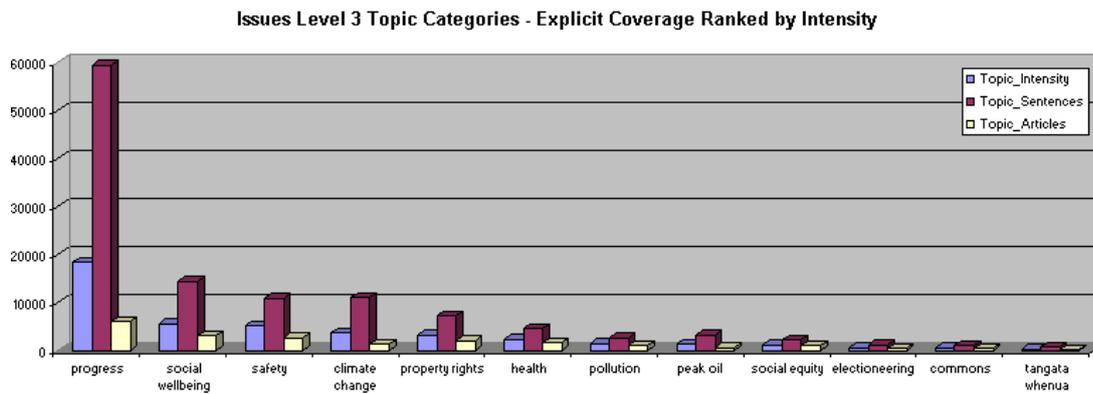
Figure 5.2.4.2 – Issues explicit coverage by topic level 3 for full sample

It can be seen here that progress, a sub-category beneath political imperatives, gained significantly more coverage than any of the other sub-categories, once again because it included economics. The other two sub-categories beneath political imperatives were social equity and electioneering, both of which appear to have received negligible explicit coverage by comparison (see also Figure 5.2.4.3). The second and third highest ranked categories shown here are social wellbeing (which included crime) and physical safety (which included accidents), both subsets of the wellness category (see also Figure 5.2.4.4.). The remaining wellness sub-category was health & shelter which is not much further down. Thus it can be seen that the coverage for the wellness category was fairly evenly spread among its sub-categories. The environmental sub-categories of climate change, pollution and peak oil, all appear near the middle, with climate change significantly ahead of the other two (see also Figure 5.2.4.5). Beneath the ownership category, property rights is close behind climate change, but commons and tangata whenua trail the field (see also Figure 5.2.4.6).

Most of the level 3 sub-categories above were divided again into two more detailed level 4 categories. The level 4 topic categories for <u>political imperatives</u>, <u>environmental issues</u>, <u>wellbeing</u> and <u>ownership issues</u> will now be examined in separate graphs, with level 3 in caps and level 4 in lower case, ranked by intensity scores within each level and sub-category.
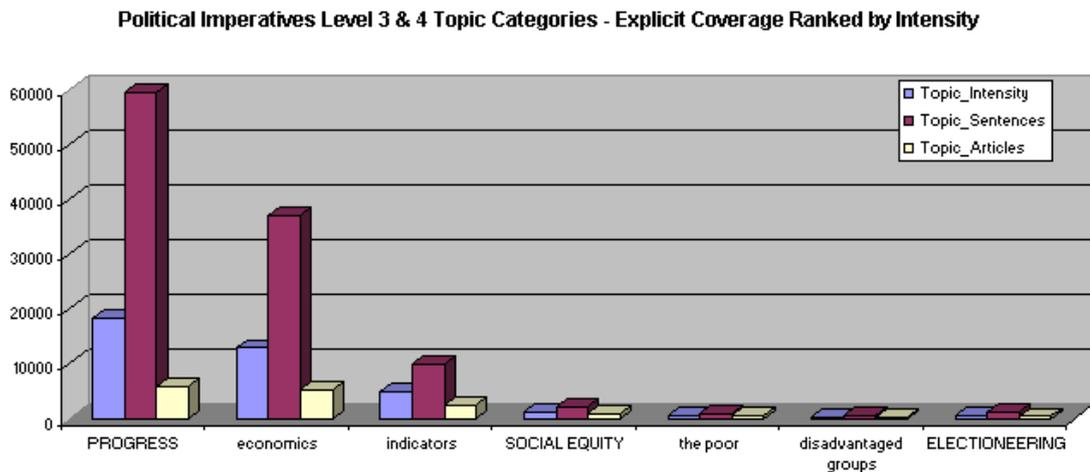
Figure 5.2.4.3 – Political imperatives coverage by topic levels 3&4

In Figure 5.2.4.3 the relative emphasis that was given by the media to <u>progress</u> and its sub-categories <u>economics</u> and <u>indicators</u> can be clearly seen in comparison with <u>social equity</u> and its sub-categories <u>the poor</u> and <u>disadvantaged groups</u>. <u>Electioneering</u> (which was not allocated any topic level 4 sub-categories) scored very low throughout, mainly due to what could be referred to as difficulties of retrieval.

While it would be reasonable to deduce that electioneering (a valid political imperative) was likely to have been an implicit motive underlying most politician coverage, it was not generally overt enough to be measured explicitly using phrase capture without making a lot of tenuous assumptions. Thus the scores presented here measured only <u>explicit</u> electioneering phrases such as "elections" and "voters".

After political imperatives, the next highest ranking level 2 issue topic category was wellbeing. Figure 5.2.4.4 shows the scores for the level 3 (in caps) and level 4 (in lower case) wellbeing sub-categories.
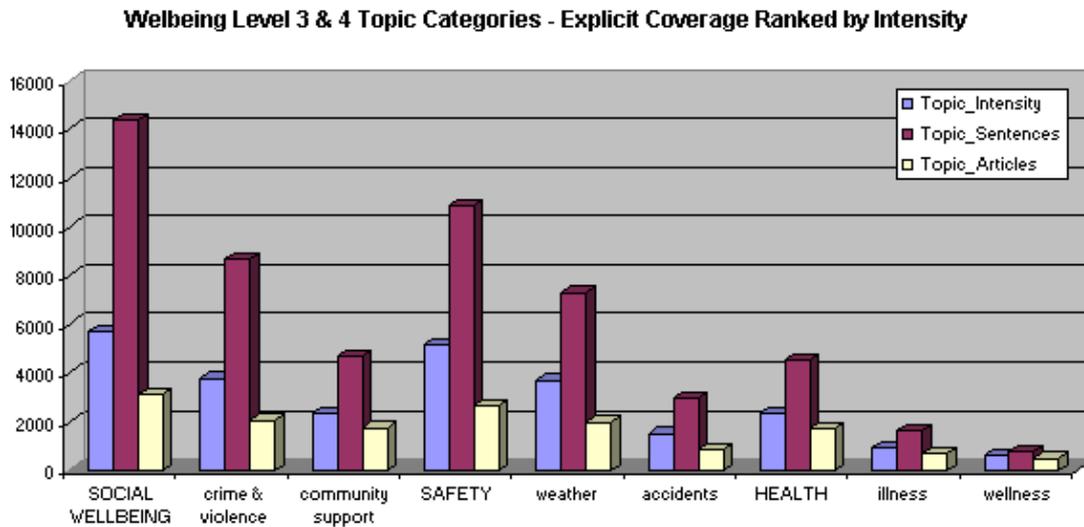
Figure 5.2.4.4 – Wellbeing coverage by topic levels 3&4

It can be seen here that wellness was not news, although health (not further defined) seems to have held its own, appearing here to be slightly more than the sum of its two parts. By contrast, crime & violence and weather certainly were news.

Whereas accidents and illness were expected to feature reasonably often in the news, the relatively high ranking for community support was a surprise.

When examining articles in detail the word "community" was observed to arise relatively frequently. Some of this high scoring will also have arisen from coverage of NGOs, pressure groups, and unions.

Moving on now to the third issue category, the environment. Figure 5.2.4.5 shows topic level 3 & 4 scores for all sub-categories beneath <u>environmental issues</u>.
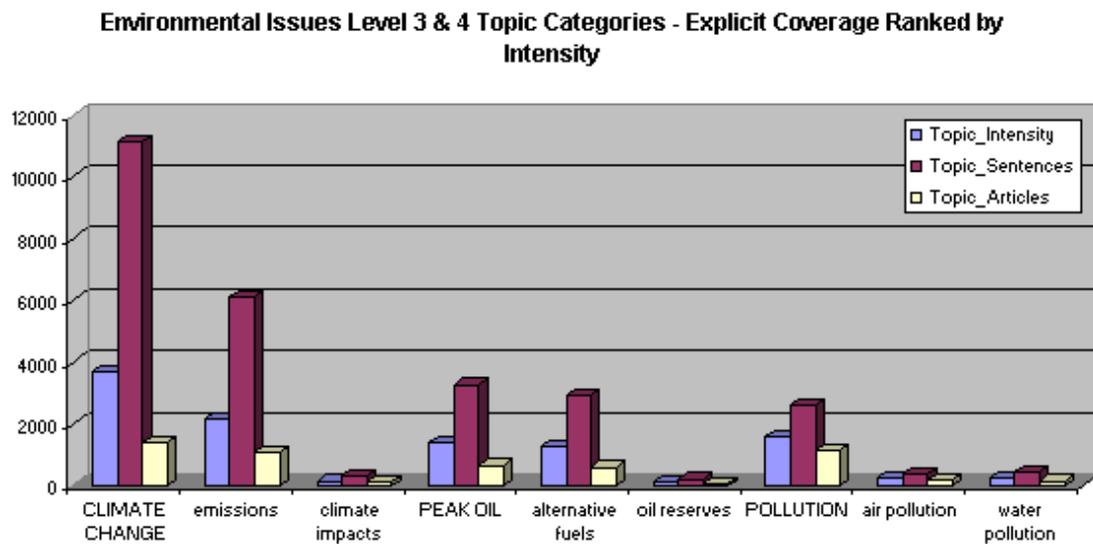
Figure 5.2.4.5 – Environmental issues coverage by topic levels 3&4

Within the collected articles, it can be seen that <u>climate change</u> received the most coverage of the level 3 environmental categories and that <u>greenhouse emissions</u> was the most mentioned issue at level 4. Potential <u>climate impacts</u> were barely mentioned and climate change (not further specified) seems to have received a lot of coverage in its own right because its scores are shown here to be significantly more than the sum of its two parts.

By contrast the scores for <u>peak oil & gas</u> can be seen to have arisen almost entirely from discussion about alternative fuels, and <u>oil reserves</u> were not explicitly considered a great deal. <u>Pollution</u> does not seem to have been given much further specificity within the text, as <u>air</u> and <u>water pollution</u> both have very low scores. However, some of the additional counts for pollution would have come from the phrase "carbon pollution". It can also be seen that while pollution was briefly mentioned in many <u>articles</u> (the third measure), its <u>sentence</u> count was relatively low by comparison, indicating only brief mentions.

Graphing trends proved illuminating. The results in Figure 5.2.4.6 show <u>climate change</u> coverage measures increasing steadily over the study period. Milestones during 2006-2007 included the Stern Review, the IPCC fourth assessment report and impacts statement, and Al Gore's movie "The Inconvenient Truth".

Climate Change Articles - Explicit Coverage By Month
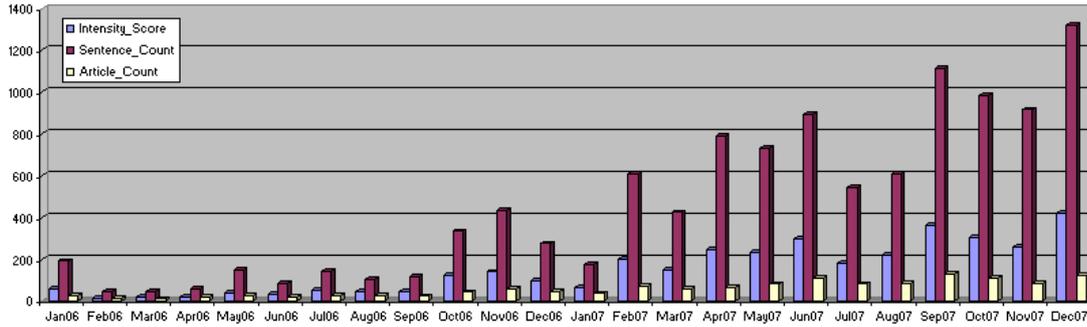
Figure 5.2.4.6 – Climate Change explicit coverage by month

When <u>pollution</u> was examined in Figure 5.2.4.7, the trend was not as stark but an increase is notable for 2007. The scale on the y axis of the graph (max 250 compared with 1400 for climate change) indicates that pollution, while consistently visible, was not a topic of major importance to the media.

Pollution Articles - Explicit Coverage By Month
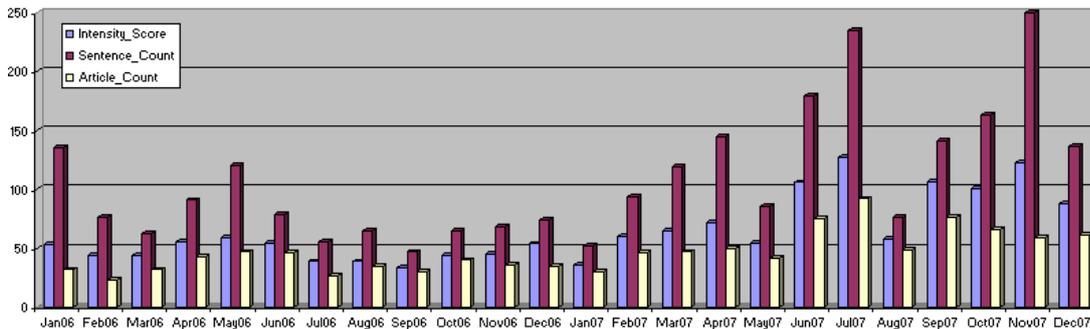
Figure 5.2.4.7 – Pollution explicit coverage by month

<u>Peak oil</u> fell between the two in coverage intensity, where the average level of coverage over the period came close to the maximum coverage for pollution, as can be seen in Figure 5.2.4.8.

Peak Oil Articles - Explicit Coverage By Month
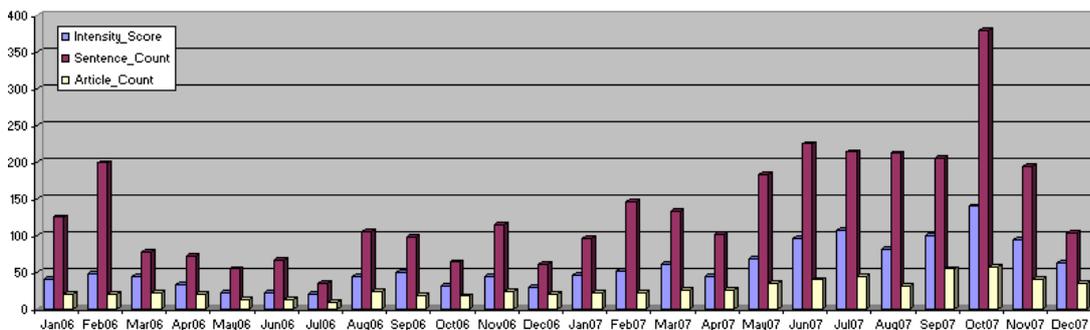
Figure 5.2.4.8 – Peak oil explicit coverage by month

It is clear that there was rising awareness in 2007, but (again comparing the y-axis max value) only to about a third of the level of coverage that there was for climate change. As previously discussed most of this coverage could be attributed to growing interest in alternative fuels (mainly biofuel). Environmental issues will be discussed further in section 6.4.1.

The fourth issue area was ownership. Figure 5.2.4.9 is presented in the same level 3 & 4 style as the graphs for the preceding three issue topic areas.
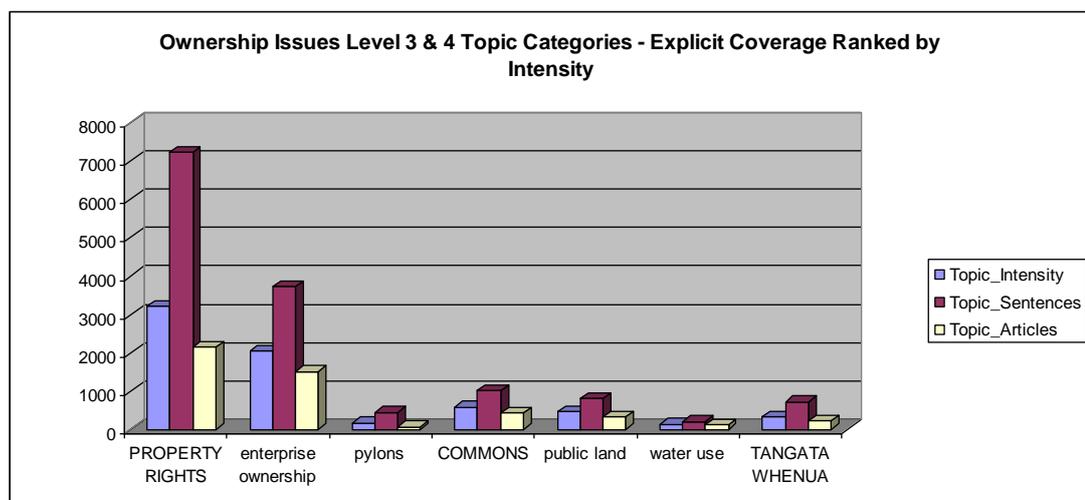

Figure 5.2.4.9 – Ownership issues coverage by topic levels 3&4

The scale of this graph is significant. The top value on the y axis here (8,000) is relatively low (compared with 60,000 for political imperatives, 16,000 for wellbeing, and 12,000 for environmental issues).

It can be seen here that property rights as a topic is given reasonable coverage in its own right, and that enterprise ownership makes up about half of that coverage in terms of sentences. Pylon issues do feature but only on a small scale by comparison.

The commons sub-topics public land and water use received a small amount of coverage, and tangata whenua (with no sub-topics defined) received little coverage overall.

5.2.5 Policy

The policy topics selected for this study were deliberately energy-related, because although the evolving analysis technique was deemed to have wider utility, electricity was the policy area of particular interest in this study.

Certain aspects of the policy results are therefore thought to be more relevant (and conceivably more accurate) for those articles with a higher electricity intensity rating, because phrase interpretation may have returned more ambiguous results within some of the less electricity-focused articles.

This section is therefore more complex than the previous two player and issue topic sections, both of which had very broad general applicability. Presentation within this section is slightly more customised.

The first graph in Figure 5.2.5.1 parallels similar charts in previous sections. The level 2 topics (in lower case) are here displayed alongside their level 1 parent policy (in caps) for ease of comparison.
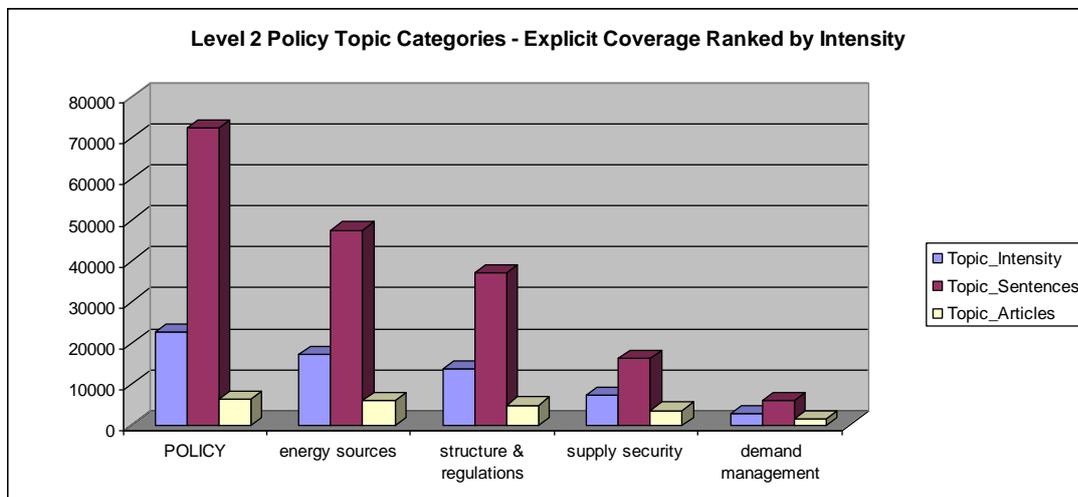
**Figure 5.2.5.1 – Policy coverage by level 2 topic**

It can be seen in the graph above that energy sources scored highly, and demand management very low by comparison. However, it was also more difficult to register demand management using phrase recognition. The general topic headings structure & regulations (which included markets), and supply security (which included transmission) fell in the middle.

From here onwards there will be a few departures from the strict topic level analysis to a more encompassing analytical basis where applicable, as the assigned topic levels were not always ideally structured for the required comparisons. Figure 5.2.5.2 presents a closer look at the major energy sources.
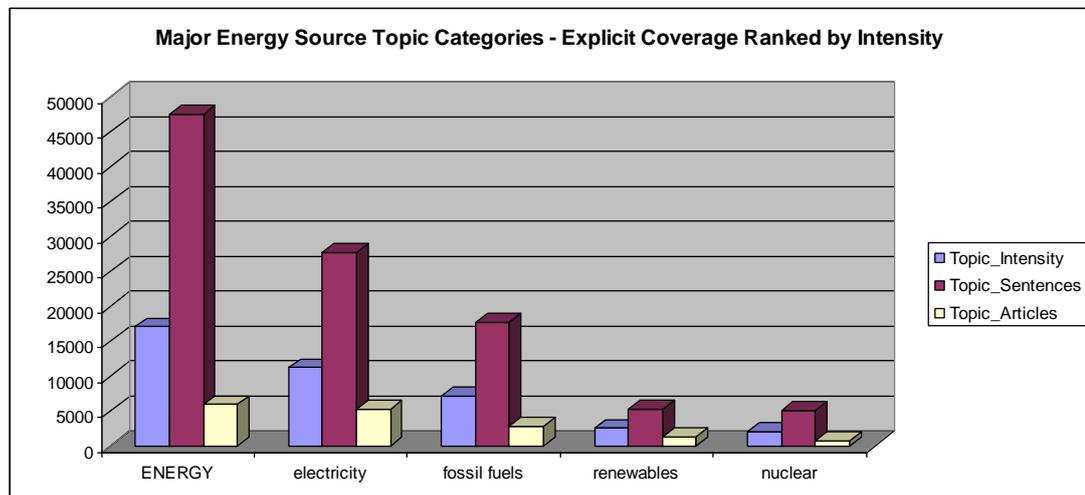
Figure 5.2.5.2 – Major energy source coverage by topic

In this graph energy (in caps) is the parent and the other displayed items (in lower case) are all separate components of that parent. There is also some overlap between electricity and each of the other three. While there are no specific phrase overlaps between the last three component groupings fossil fuels, renewables and nuclear (i.e. they are mutually exclusive) they may still have sentences in common. Thus parent scores are not (and are usually less than) the sum of component scores. Note that scores attributed to the energy parent will also include generic energy references not necessarily assigned to any of the components.

Here the ubiquitousness of electricity may be discerned, not so much in the high score (which is to be expected when electricity defined the article selection criteria), but more in the lower scores of the other major energy source groupings by comparison. Electricity of course is not (in this context) a primary energy source, but is rather an energy conduit. The true energy sources are to be found in the three groupings alongside, namely fossil fuels, renewables and nuclear.

Of particular note in the graph above is the fact that nuclear and renewables received similar levels of coverage. This outcome was found within the news articles

of a nuclear-free country (New Zealand) which has a 60% renewables base for its electricity, suggesting strong overseas influence within our media.

Figure 5.2.5.3 contains the same data, but with additional scores inserted (in intensity order) for the detailed components which made up the major energy source groupings.
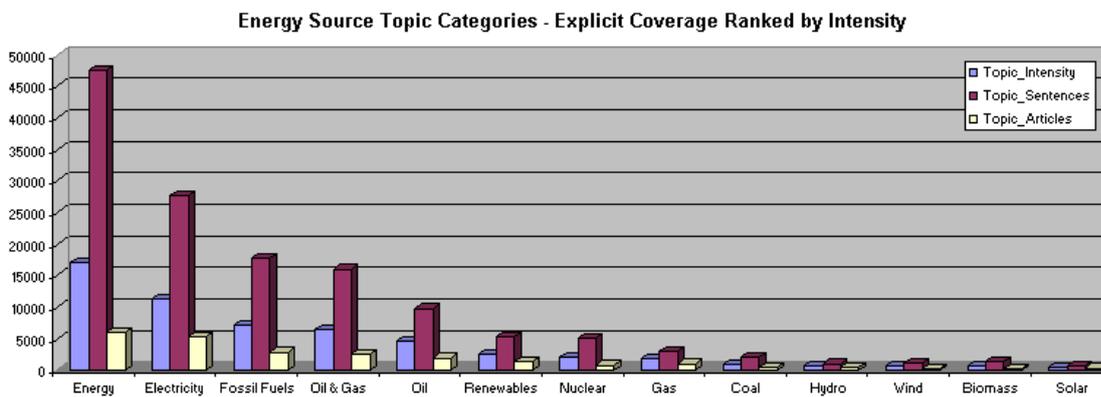
Figure 5.2.5.3 – Energy source coverage by topic

At this point it is important to remember that the full study sample included every nzherald article which explicitly referenced electricity (including nuclear power) over the two year period 2006-2007, but did not include every article which referenced certain other energy sources such as oil and coal. Therefore fossil fuel counts will be comparatively slightly lower in this sample than they would have been in the whole population of articles. On the other hand, as the many and varied terminologies for electricity turned out to be so very widely referenced (giving rise to a sample which was more than 5% of nzherald articles over the period, see Appendix A11), the cumulative energy-related results here are not expected to be widely different from results that would be achieved from the population as a whole. Furthermore, from the data presented here it may be clearly seen that fossil fuels already command a very dominant position in the hierarchy. Therefore this caveat is intended to emphasise the point that the comparative fossil fuel results obtained in this study are likely to be conservative (rather than exaggerated) if extrapolated to a wider energy study.

Another way in which these fossil fuel results are considered to be conservative arises from the explicit nature of the phrase reference reporting for topics as defined

here. The consequence is that although nearly all of our air and land-based <u>transport</u> is <u>oil</u>-fuelled, transport references in the text have not in themselves given rise to any points for oil whatsoever. The scores in these graphs were derived only from clearly <u>explicit</u> oil references such as "petrol", "crude", "refinery", "London Brent", "offshore drilling" etc.

The next highest ranking policy level 2 topic category (after energy sources) was <u>structure & regulations</u>. Figure 5.2.5.4 shows the relative importance given to each of the level 3 components beneath this level 2 heading, within the full sample of articles selected.
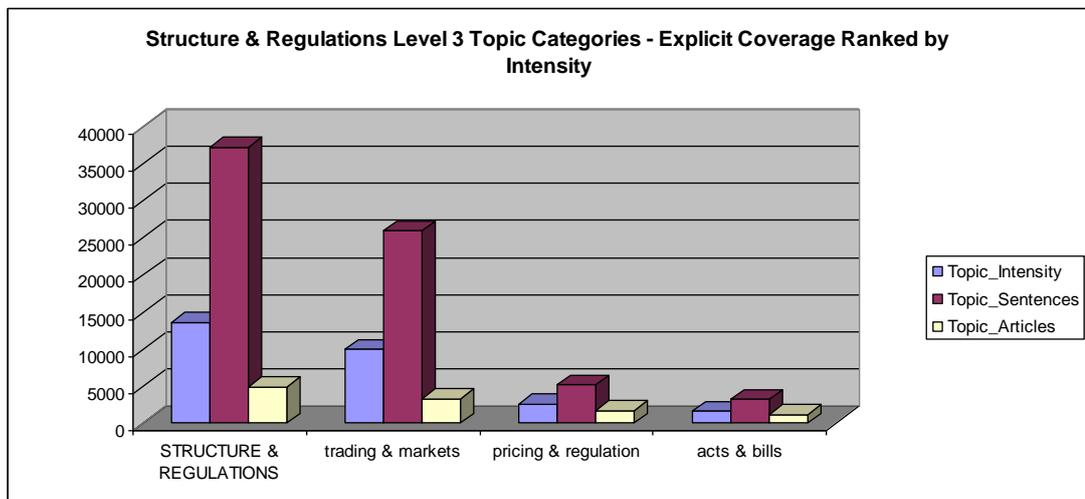
Figure 5.2.5.4 – Structure & regulations coverage by topic level 3

When all sample articles are included, the dominance of <u>markets</u> is seen very clearly both in the level 3 graph (Figure 5.2.5.4) and in Figure 5.2.5.5. The latter shows the level 4 components for each of the groups above, ranked by intensity <u>within their level 3</u> groups (of 4, 3, and 3 members each).
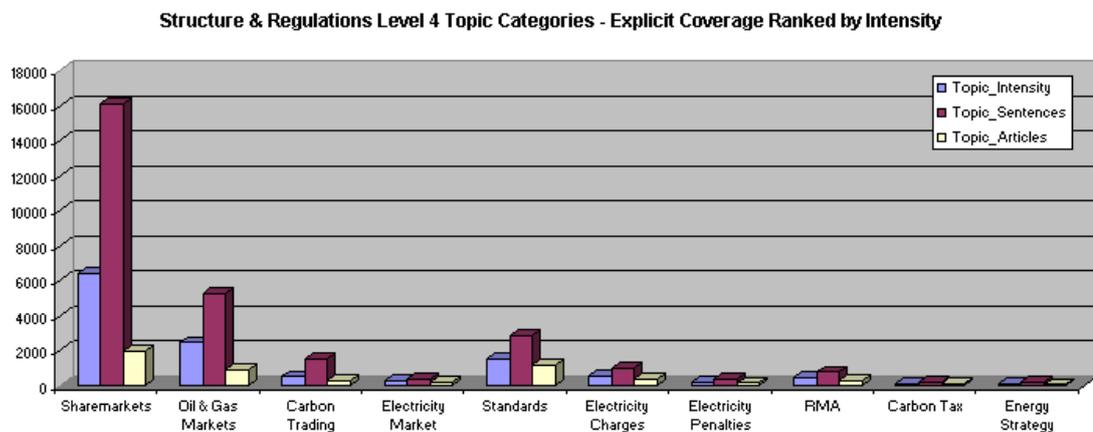
Figure 5.2.5.5 – Structure & regulations coverage by topic level 4

Within the first four market categories, <u>sharemarkets</u> are very prominent, followed closely by <u>oil & gas markets</u>. <u>Carbon trading</u> can also be seen to have received a reasonable amount of coverage overall when compared with the <u>electricity market</u>, which trails significantly. However, when this is compared with the same graph for the subset of articles with an electricity intensity of 3 or more, in Figure 5.2.5.6, the electricity market has moved up the relative rankings into second place behind sharemarkets, and ahead of the other two.

Articles with Electricity Intensity >=3 - Structure & Regulations Level 4 Topic Categories - Explicit Coverage Ranked by Intensity
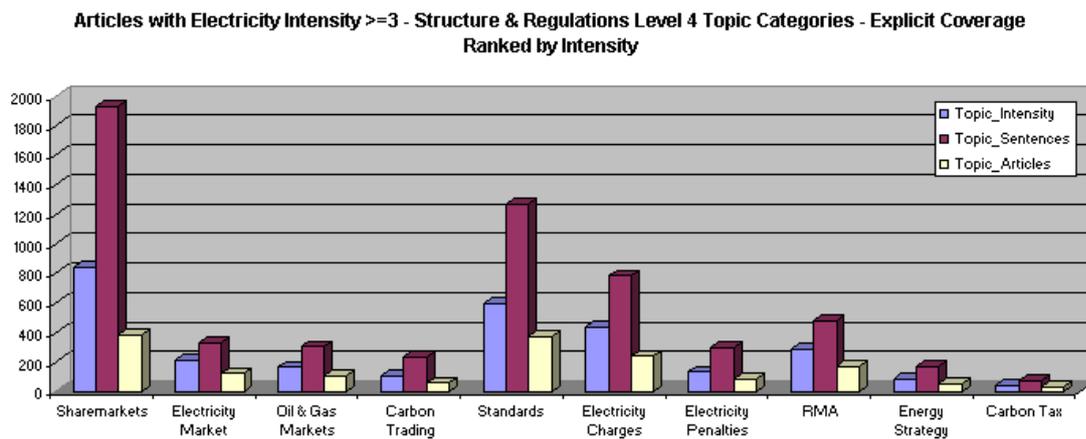
Figure 5.2.5.6 – Structure & regs by topic level 4 for electricity intensity>=3

What this implies is that much of the sharemarket, oil market, and carbon market coverage was found in articles that were not predominantly about electricity, whereas nearly all of the electricity market coverage was restricted to the distinctly electricity-oriented articles. The difference in the top y-axis value is also important (2000 here, compared with 18,000 in Figure 5.2.5.5), allowing a more close-up view of the other items in this graph, and implying that for the graph leader (sharemarkets), only about 1/9 of its coverage occurred in the 25% of articles where electricity was a primary subject. Another way of expressing this result would be to say that for most of the large number of <u>sharemarket</u> articles that were included in the study, electricity was only a peripheral subject (likely to have been a brief mention of one or more of the three publicly listed electricity companies Contact, Trustpower, or Vector).

Like the electricity market, the other item in the graph above which has changed places for the electricity-intensive set of articles in Figure 5.2.5.6 (when compared with Figure 5.2.5.5) is the <u>energy strategy</u>, which has moved ahead of the <u>carbon tax</u>

at the right hand end of the graph. This implies that the energy strategy was discussed more within articles which strongly featured electricity, whereas the carbon tax was proportionally more likely to have been discussed within the set of general articles not specifically about electricity.

It can be seen that the Resource Management Act (RMA) features reasonably strongly within the electricity articles in Figure 5.2.5.6, not far behind standards and electricity charges. Electricity penalties are a little further behind, probably due to that topic being less well defined, although its score would have been significantly boosted by the high profile accorded to the Muliaga disconnection (discussed later).

The third ranking policy area was supply security. As this level 2 topic is a little smaller than the previous two (energy sources, and structure & regulations), it has been possible to demonstrate most of the main features in Figure 5.2.5.7. The level 3 categories are in caps, and the level 4 components in lower case.
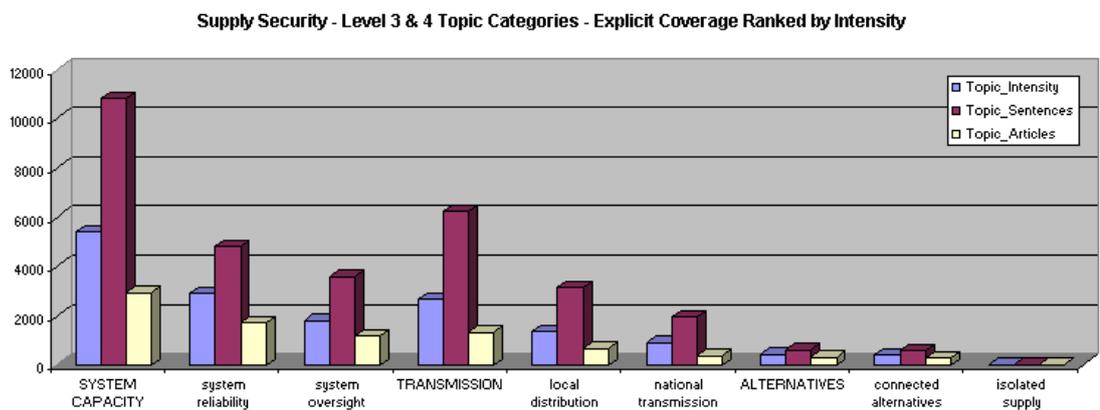
Figure 5.2.5.7 – System security coverage by topic levels 3&4

Because system oversight here includes all regulators, and system capacity phrases also tended to be used for fossil fuel supply lines, a slightly better picture of the electricity situation is achieved by producing the same graph for just the electricity-focused articles. This has been demonstrated in Figure 5.2.5.8.
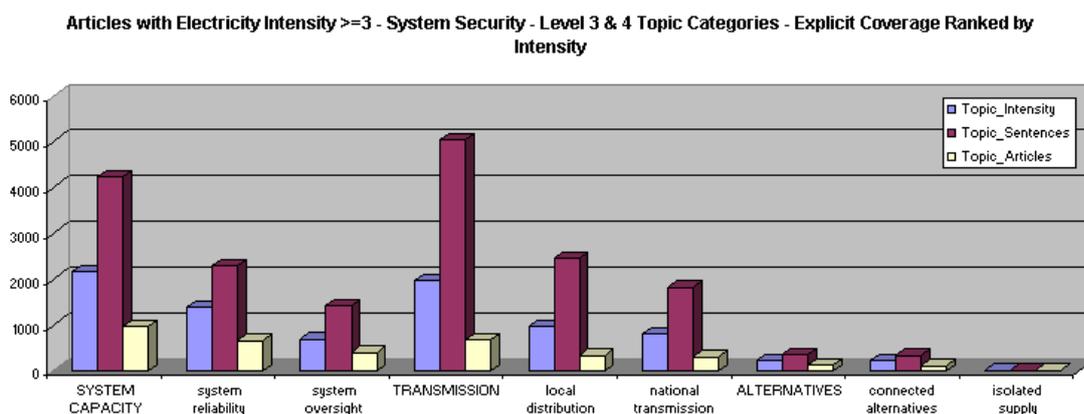
Figure 5.2.5.8 – System security by topic levels 3&4 for electricity intensity >=3

The main difference between this graph and Figure 5.2.5.7 is the reduction in scores for the first three items. The ratios of the remaining items stayed about the same. This finding reflects broader usage of phrases meaning <u>system capacity</u>, <u>system reliability</u> and <u>system oversight</u> within contexts other than electricity, but may also imply some use of passing references to electricity security even in articles not specifically about electricity (with the implication that this was less likely for the remaining items in the graph).

It can be seen here that <u>transmission</u> (business as usual) received significantly more coverage than <u>configuration alternatives</u>, which was admittedly harder to measure by phrase. For example, <u>connected alternatives</u> included such concepts as "distributed generation", "feed-in tariffs", and "solar power", while <u>isolated supply</u> included phrases like "off-the-grid". The main reason that <u>local distribution</u> achieved a higher overall profile in the media than <u>national transmission</u> was that local Auckland lines company Vector was a publicly listed company.

The fourth and lowest ranked of the level 2 policy topic categories was <u>demand management</u>. Figure 5.2.5.9 shows the coverage for this topic (in caps) alongside its three level 3 components (in lower case).
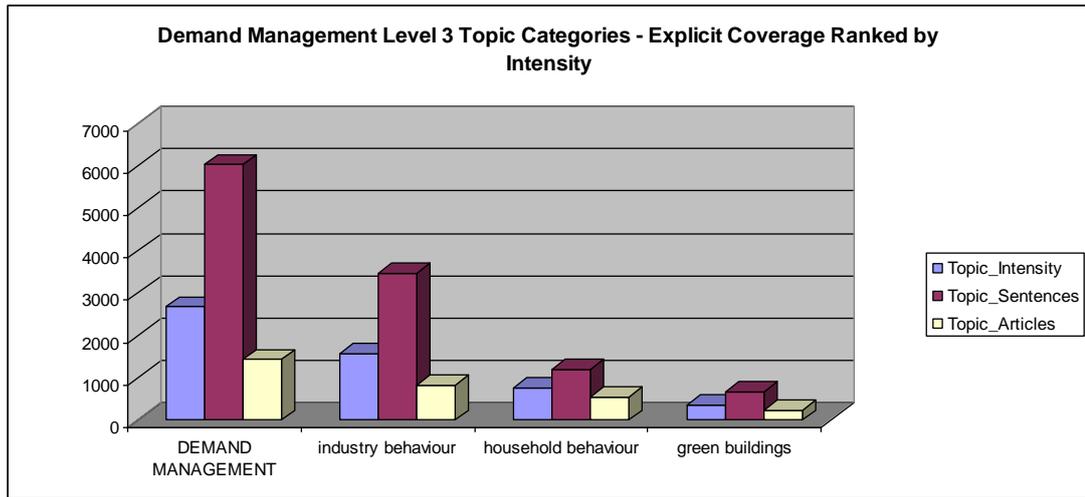
Figure 5.2.4.9 – Demand management coverage by topic level 3

The respective rankings in the graph above are clear, although somewhat skewed by the fact that <u>industry behaviour</u> includes electric cars. While electric cars certainly have an effect on demand, they are less likely to actually <u>reduce</u> demand, which is what demand management normally implies. While all types of electric cars (including hybrids) are clearly a way of managing demand for <u>oil</u>, from an <u>electricity</u> perspective plug-in electrics are more likely to <u>increase</u> the electrical load, which is the opposite of the desired goal. Taken one step further however, banks of charging electric cars may in the future also be able to serve a role in smoothing load by <u>providing</u> as well as <u>taking</u> power from the grid. Thus, after much consideration, this controversial inclusion remained in place. Figure 5.2.5.10 shows the level 4 sub-categories which contributed to each of the level 3 categories in the previous graph.
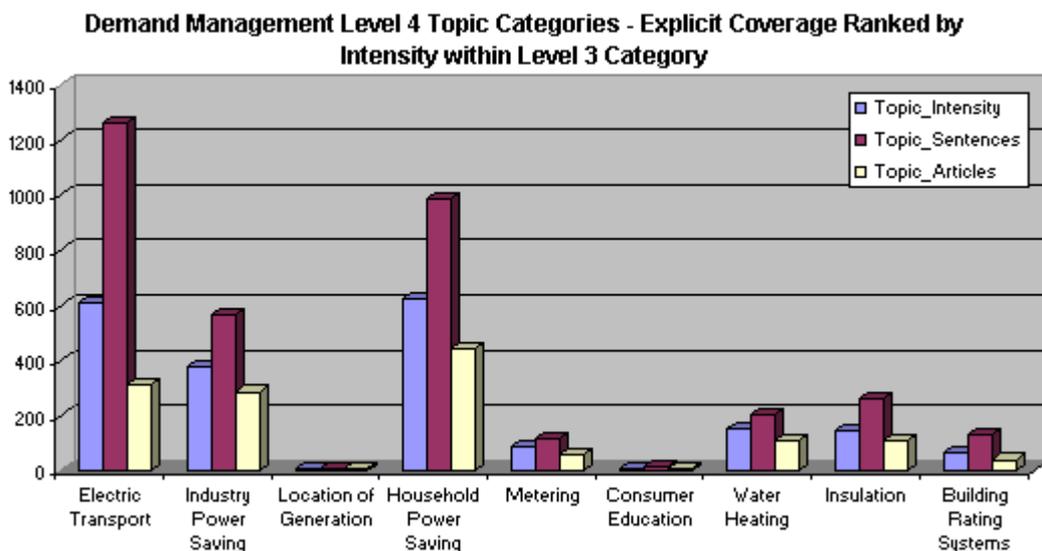
Figure 5.2.5.10 – Demand management coverage by topic level 4

It can be seen that once <u>electric transport</u> has been separated off, more emphasis has been placed on <u>household power saving</u> than <u>industry power saving</u>.

What can also be seen above are the rather low scores for the three <u>green building</u> components, <u>water heating</u>, <u>insulation</u> and <u>building rating systems</u>, all of which one would assume to be very important concepts that the public should know about. Likewise different <u>metering</u> (including "smart-grid") options received little mention. This graph seems to be showing an emphasis on individual responsibility, with less focus on more systemic solutions.

It is interesting that explicit <u>consumer education</u> (e.g. "power saving campaigns") received almost no discussion at all. While an active campaign would no doubt have featured in paid advertisements more than the news media, this score was much smaller than expected, especially given the otherwise much higher coverage of more general household power saving tips (such as light bulbs and turning off appliances).

As part of the policy analysis, selected related trends will also be examined. First energy efficiency, then the carbon tax, and lastly electricity prices.

A closer look at the coverage that (demand management subset) <u>energy efficiency</u> was given in relation to major energy sources is illustrated in Figure 5.2.5.11.
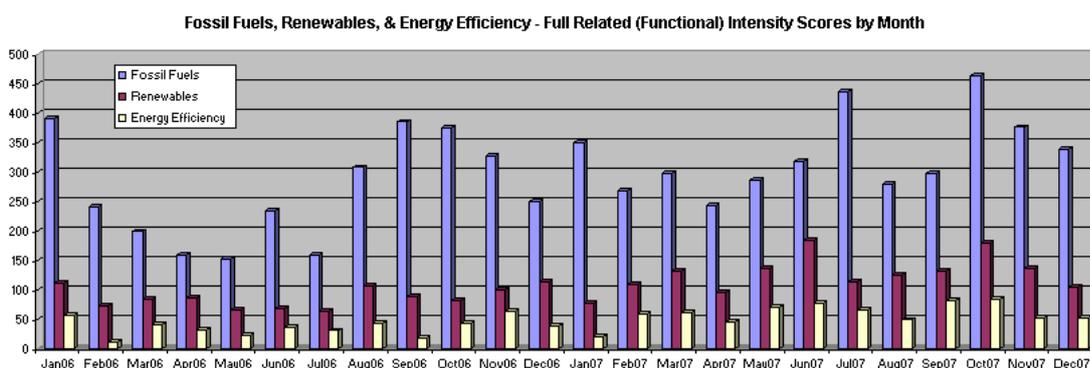
Figure 5.2.5.11 – Fossil fuels, renewables & energy efficiency by month

Here a gradual rise in <u>renewables</u> coverage (the middle measure) is visible, although no abatement of <u>fossil fuel</u> coverage (the left measure) is evident at all. On the right, <u>energy efficiency</u> coverage can be seen to have increased slightly in 2007, but still trailed significantly behind both of the others.

The next policy comparison undertaken was the carbon tax vs. emissions trading, and these results may be seen in Figure 5.2.1.12.
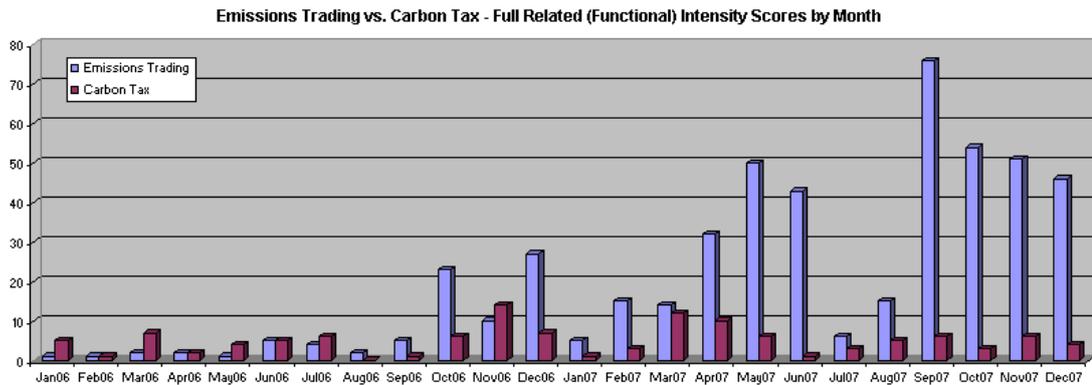
Figure 5.2.5.12 – Emissions trading & carbon tax by month

At the end of 2005 (shortly after winning the election) Labour's intended carbon tax had been officially discarded, ostensibly due to lack of votes in the house. Its intended replacement was revealed some months later (in Dec 2006) in the form of a proposed emissions trading scheme (ETS) which was outlined in the Government's draft energy strategy.

One conjecture at the start of the study was that favourable media coverage (by quantity) of emissions trading over a carbon tax may have influenced the public policy decision. However, in the months closest to the decision (the first few months of 2006) this was clearly shown not to be the case. While it would have been more appropriate to examine articles from 2005 to view the comparative trends which led up to this decision, the study sample only commenced in 2006, so this trailing data sample was deemed to be sufficient to test the principles involved. In this case the results were quite different from expected, in that the carbon tax consistently received more mentions in the media than emissions trading for the first seven months, as Labour's decision was analysed.

If specific mentions in the media could not be shown to have influenced the decision, what of the wider conversation, the cultural context? When markets as a whole were plotted against taxes as a whole the picture looked quite different, as illustrated in Figure 5.2.5.13, leaving no doubt about the dominance of markets over taxes in media coverage overall.
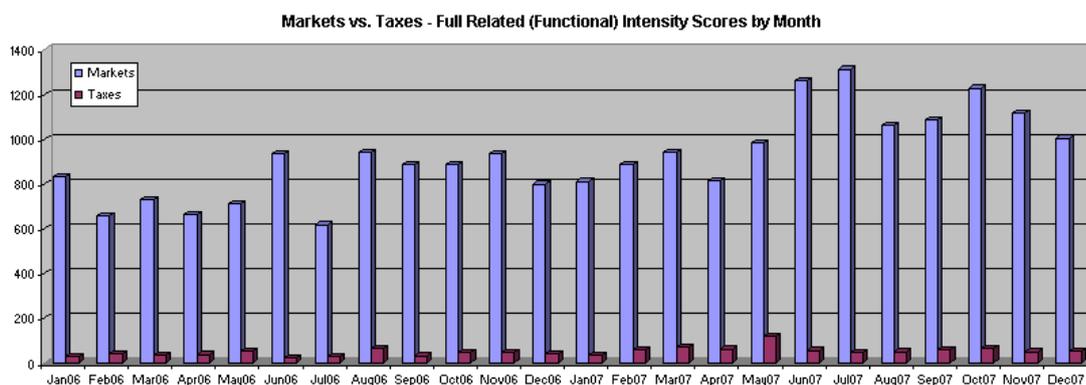
Figure 5.2.5.13 – Markets & taxes by month

Figure 5.2.5.14 shows the third policy comparison of oil prices vs. electricity prices. Coverage intensity for prices as a whole has also been provided for comparison.
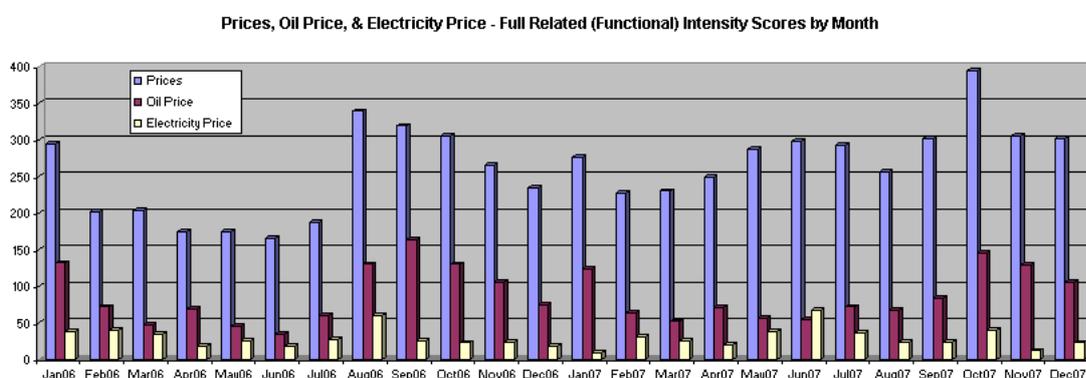
Figure 5.2.5.14 – Oil price and electricity price coverage by month

It can be seen here that prices in general (left) were of consistent media concern, that electricity prices (right) were mentioned frequently every month, and that oil prices[409] were discussed on a magnitude several times greater than electricity prices overall. The one month (June 2007) when electricity prices were discussed more than oil prices was the month following the Muliaga death.

That brings the policy results sub-section to a close. The next and last topic sub-section will present results for the topics which fell beneath the communication heading.

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[409] Oil prices gradually rose over the first half of 2006, from US$65.49 per barrel in January to a peak of US$74.41 (Cushing spot price) in July. Prices wavered and started to descend again in August, a month which surged in media coverage of both types of pricing as BP experienced pipeline difficulties in Alaska and the Commerce Commission investigated Vector's pricing. The low for this oil price cycle occurred in Jan 2007, at US$54.51. After that

5.2.6 Communication

The communication scoring mechanisms are acknowledged to have been experimental and thus somewhat less accurate, but they are presented nonetheless. In Figure 5.2.6.1, it can be seen that most of the 163,338 sentences examined contained at least one word (or phrase) which had been assigned a <u>tone</u> of some kind (level 3 in caps), whether that was <u>positive</u>, <u>neutral</u> or <u>negative</u> (level 4 in lower case). As the components add up to more than the whole, many sentences clearly contained more than one of these.
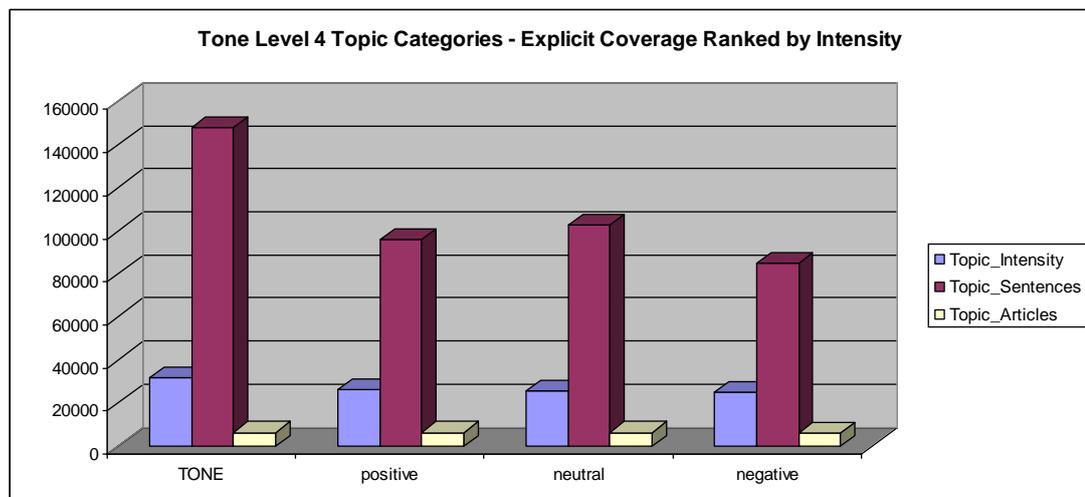
Figure 5.2.6.1 – Tone explicit coverage by topic level 4

It is intriguing that all three of the assigned tone categories gained about the same scores on all three measures. <u>Positive</u> was marginally ahead in intensity (implying a very slight advantage in headings and lead lines), while a <u>neutral</u> phrase was observed in the most number of sentences. However, these differences are not considered to be significant. As expected, all categories achieved very close to 100% for article count (within 6341 sample articles, 6335 had a least one <u>tone</u> phrase registered, 6282 contained a <u>positive</u> phrase, 6307 a <u>neutral</u> phrase, and 6221 a <u>negative</u> phrase).

oil prices rose fairly consistently for the remainder of the study period, reaching US$91.69 by December 2007 (EIA 2008).

<u>Neutral</u> flagged phrases at two ends of a continuum. At one end it included normalising (or trivialising) phrases such as "minimal", or "habitual", and at the other, emotional but neutral phrases such as "emphasising" or "huge".

The scores above do not provide any information about the <u>number</u> of each type of tone-registered phrase <u>per sentence</u> (which was beyond the capability of the ETAT tool and may have added strength to these scores), but <u>solely</u> positive or negative sentences were able to be counted, and even without reporting those "winner" counts here, the result can be inferred from this graph to be broadly neutral because positive and negative scores are similar.

These tone measures are likely to be more useful within more specific subsets of articles[410], as will be seen later on. The fact that the full sample is broadly neutral provides a convenient baseline for such comparisons.

Certain other aspects of communication were also measured. <u>Angle</u> was defined as a level 3 topic category which contained the two level 4 sub-categories <u>news</u> and <u>entertainment</u>. It was also considered logical for angle to be a parent to the level 3 topic <u>messaging</u>, which was split between media, lobbying and marketing. Figure 5.2.6.2 presents the scores that were achieved by these categories within the full set of sample articles.
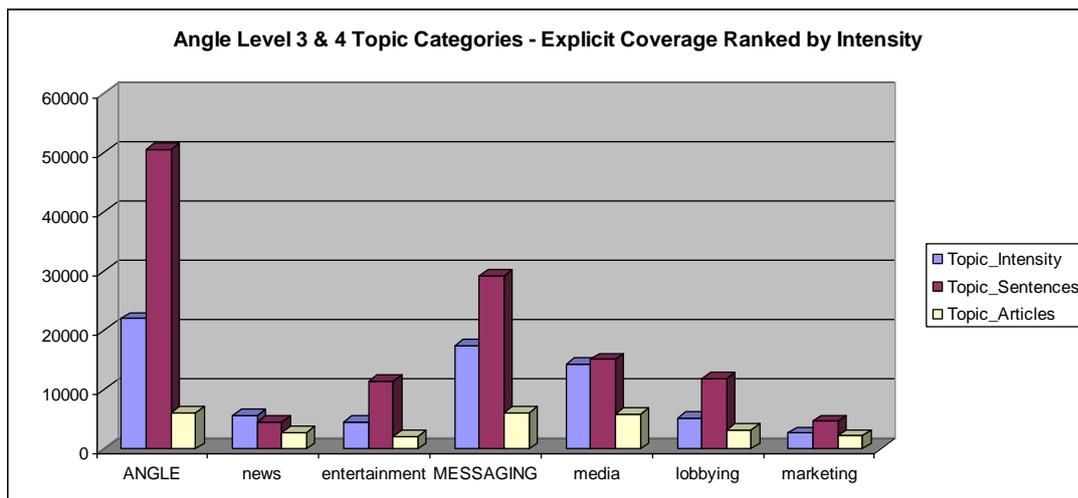
Figure 5.2.6.2 – Angle explicit coverage by topic levels 3 & 4

[410] They would be especially useful when analysed alongside other entities at sentence level. Although the collected data is comprehensive enough for this to have been possible, that level of analysis was not undertaken. This would be an interesting area for future research.

Within this graph, a glimpse is provided into how much the media was self-referential. <u>News</u> trumped <u>entertainment</u> in the <u>intensity</u> score (though not in the sentence count), probably because "Reuters" was considered to be synonymous with <u>news</u>. Thus it gained prominence points from its regular appearance in the <u>source line</u>. This explanation is further supported by the fact that the <u>intensity</u> score is (unusually) larger than <u>sentence</u> count. Other than that, the actual word "news" appears not to have been used very much.

Overt <u>entertainment</u> references (such as music, sport, arts, or celebrities) can be seen to have featured in over 10,000 sentences, or about one sixth of the total, which is reasonably high for what was originally envisaged to be a set of <u>news</u> articles. This finding can be partly explained by the large number of articles which referred to the sponsored <u>Vector</u> arena (deliberately included in the selection criteria), and also by the fact that <u>electric guitar</u> references pulled in a range of entertainment articles. All the same, the existence of some additional peripheral entertainment-focused articles was not the full story. This high entertainment sentence count also reflected the accepted understanding that entertainment references are drawcards likely to keep people interested, even within what could be considered formal news articles.

For the three publicity <u>messaging</u> mechanisms at the right hand end of the graph above, it can be seen that acknowledged <u>lobbying</u> (including lobby group names) was mentioned within the articles to about the same degree as entertainment, explicit <u>marketing</u> less than half as much as lobbying, and that <u>media</u> references were stronger than both of them, with significantly high <u>intensity</u> scores due to the extra prominence points gained from the author and source lines (header and footer).

Lastly in the communication section, more self-referencing by media is presented in Figure 5.2.6.3, this time analysing the various media <u>channels</u> as they were mentioned in the set of sample articles.
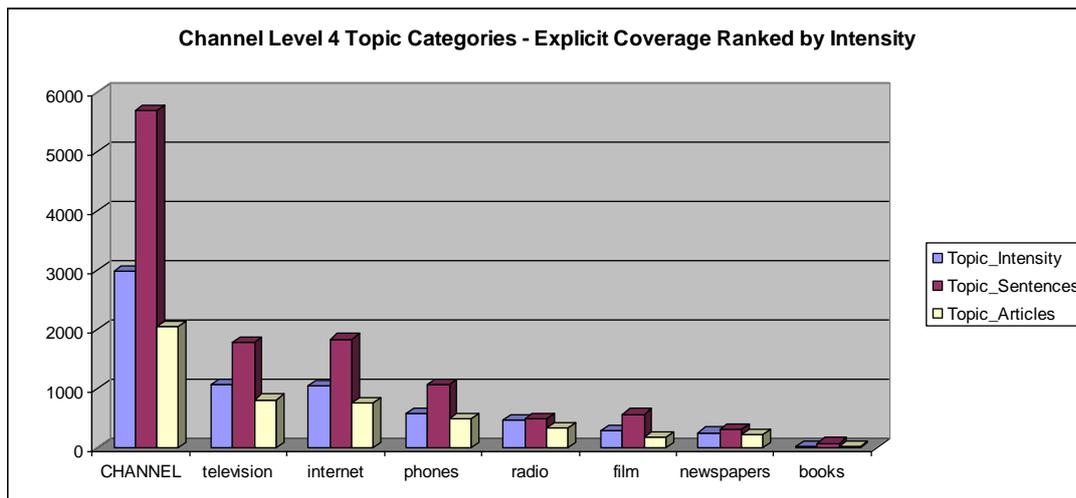
Figure 5.2.6.3 – Channel explicit coverage by topic level 4

Total media references to <u>television</u> just trumped the <u>internet</u> on the intensity score although not in the sentence count. As these results were for 2006-2007, the numbers were likely to change in ensuing years and a comparison between 2006 and 2007 might have been interesting. <u>Radio</u> did quite well, and this can be attributed once again to high source line appearance (e.g. for NewstalkZB), deduced from the closeness of the intensity and sentence count scores. <u>Phones</u>, <u>film</u> and <u>newspapers</u> all appeared reasonably often in the news articles, but the stand-out loser was <u>books</u>. This item was mentioned in only 25 articles out of 6341 (0.5%), and in 85 sentences from a possible 163,338 (less than 0.01%). If people do not seem to read books as often as they once did, perhaps the low profile of books within the news is a contributing factor. Note that the high ratio of <u>sentences</u> to <u>articles</u> for <u>film</u> indicates that most of the coverage came from a few dedicated columns like film reviews.

This communications overview brings the topic results section to a close. Results for selected article subsets and certain entities (as per Tables 4.7.8.4-5), will now be examined.

5.3 Case Study Results

5.3.1 Person/Event Sample - Muliaga Death

Folole Muliaga died within 2 hours following a retailer-directed contractor-implemented power disconnection at her home on 29 May 2007 (which disabled her oxygen machine), because her family's electricity payments had become slightly overdue. The 44-year-old Samoan mother of four from South Auckland became a cause célèbre as the media pressured electricity companies to introduce more compassion into the way they dealt with customers experiencing difficulties.

The sample selection included all articles for Person 382 Folole Muliaga (n = 88 over 6mths).
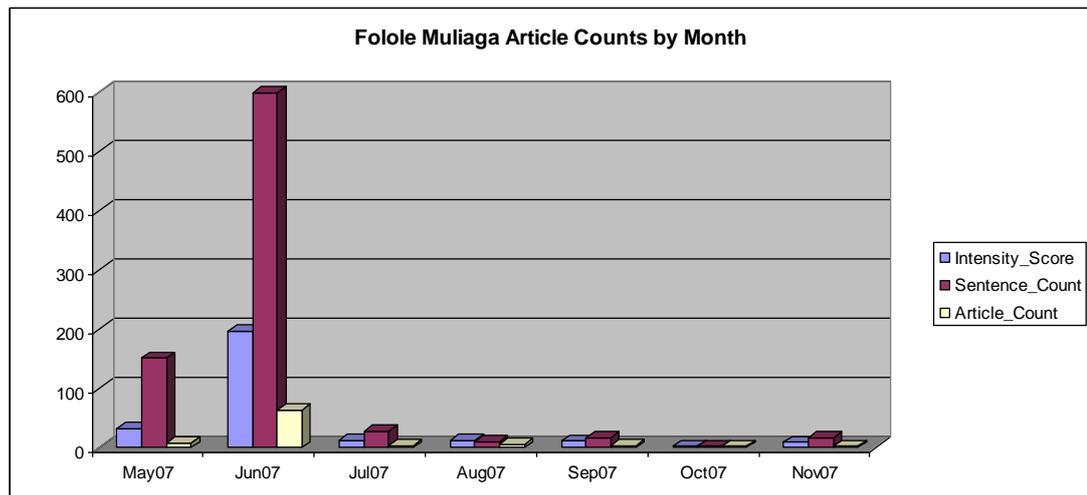
Figure 5.3.1.1 – Monthly scores for articles mentioning Folole Muliaga

Figure 5.3.1.1 shows the distribution of articles grouped by month. Because the counts for June are so high it is difficult to distinguish some of the lower scores in the later months. There were multiple articles within the days immediately following the event, sometimes several per day (up to 4).

A list of the people who featured in the Muliaga articles may be seen in Figure 5.3.1.2, ranked by coverage intensity.

Folole Muliaga Articles Person Explicit Coverage Ranked by Intensity (6 authors removed)
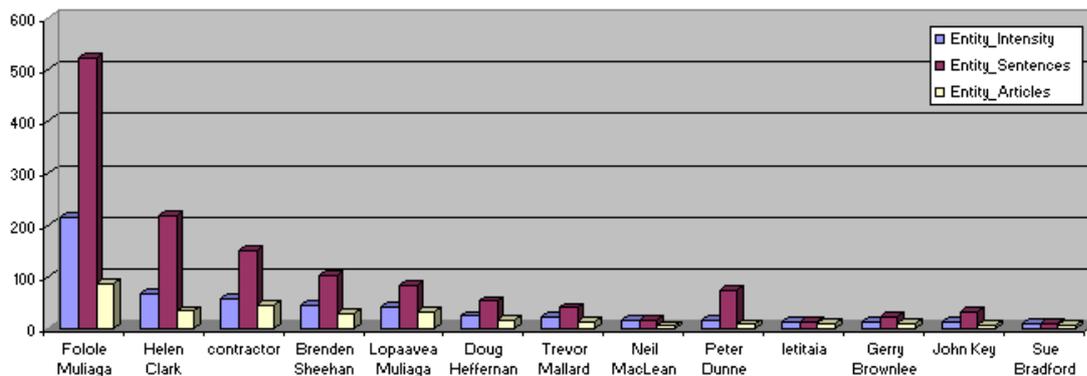
Figure 5.3.1.2 – Explicit scores by person for Muliaga articles

In the graph above, one salient feature is the predominance of politicians in the list of the top 13 people (excluding article authors), demonstrating the extent to which this became a political issue. Prime Minister Helen Clark and SOE Minister Trevor Mallard representing the Labour Government, Peter Dunne on behalf of Labour's confidence and supply partner United Future, Gerry Brownlee and John Key on behalf of the opposition National Party, and Sue Bradford representing the Greens.

Here some of the differences between the measurement indicators may be seen. For example Peter Dunne received a higher total sentence count (middle score) than Trevor Mallard, but Mr Mallard received higher intensity and article scores. The former was used to determine the ranking for this graph and includes prominence.

The other people given high profiles by the media were the unnamed contractor who disconnected the power, family spokesman Brenden Sheehan, Folole's husband Lopaavea Muliaga, Doug Heffernan (CEO of Mercury Energy's parent company, the SOE Mighty River Power), Chief Coroner Neil McLean, and Folole's eldest son Ietitaia.

It can be seen that although the contractor appeared in more articles (the third measure), Helen Clark received more total and prominent coverage within the articles that she appeared in.

Organisations were ranked by intensity in a similar way and the results are shown in Figure 5.3.1.3.
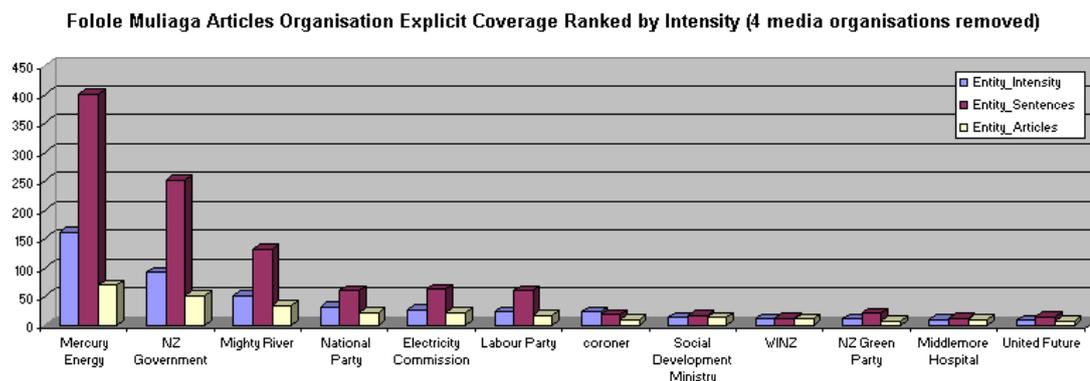
Figure 5.3.1.3 – Explicit scores by org (excl. media) for Muliaga articles

Here the disconnecting electricity retailer, <u>Mercury Energy</u>, received significant coverage and, in what became a regular pattern, the opposition <u>National Party</u> ranked above the governing <u>Labour Party</u> in explicit coverage mainly because the Labour Government was normally referred to as just the <u>NZ Government</u> (without its Labour branding). It can be seen that although Peter Dunne received more coverage than Sue Bradford in the person chart, his party <u>United Future</u> was slightly behind the <u>Greens</u> in the organisational rankings.
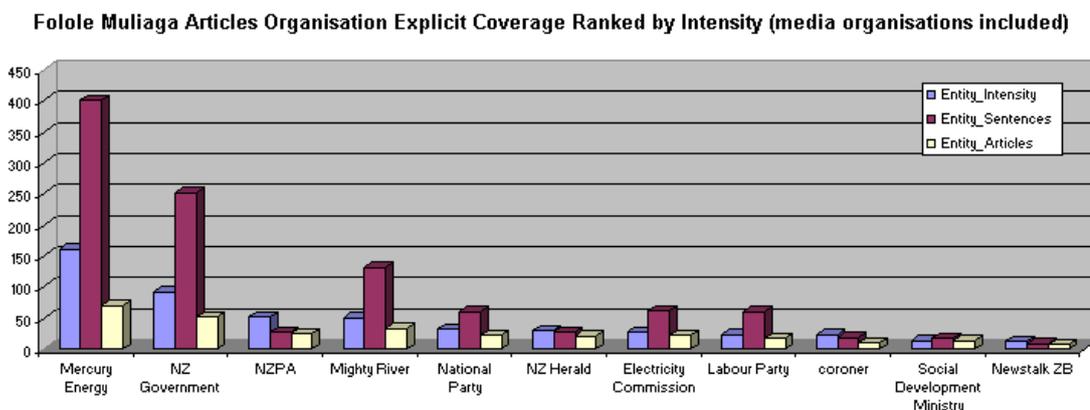
Figure 5.3.1.4 – Scores by organisation (incl. media) for Muliaga articles

In traditional media analyses, article authors and "source organisations" are often omitted (as they are in Figures 5.3.1.2 and 5.3.1.3). However, if a full picture is to be gained of the benefits which accrue from media coverage it seems logical to also acknowledge the exposure that the media gives to itself. Thus, Figure 5.3.1.4 includes the three highest media organisations in their ranked positions. A fourth, Radio NZ, was close behind - just off the chart to the right. As header and footer

positions are both granted <u>prominence</u> points, authors and sources can rank reasonably highly in the ETAT system, though they generally have low scores for <u>sentence counts</u>.

The results recorded so far have all been derived from <u>explicit</u> coverage, which means counts of sentences containing the named entity plus those containing appropriately assigned nick names such as <u>he</u>, <u>she</u>, <u>company</u>, or <u>it</u>. If these scores are accumulated to their parents (grouped hierarchically), such that <u>implicit</u> mentions are included, the graphs change somewhat. In Figure 5.3.1.5, full <u>functional</u> (explicit plus implicit) coverage is shown for selected key player entities (media and their owners excluded).
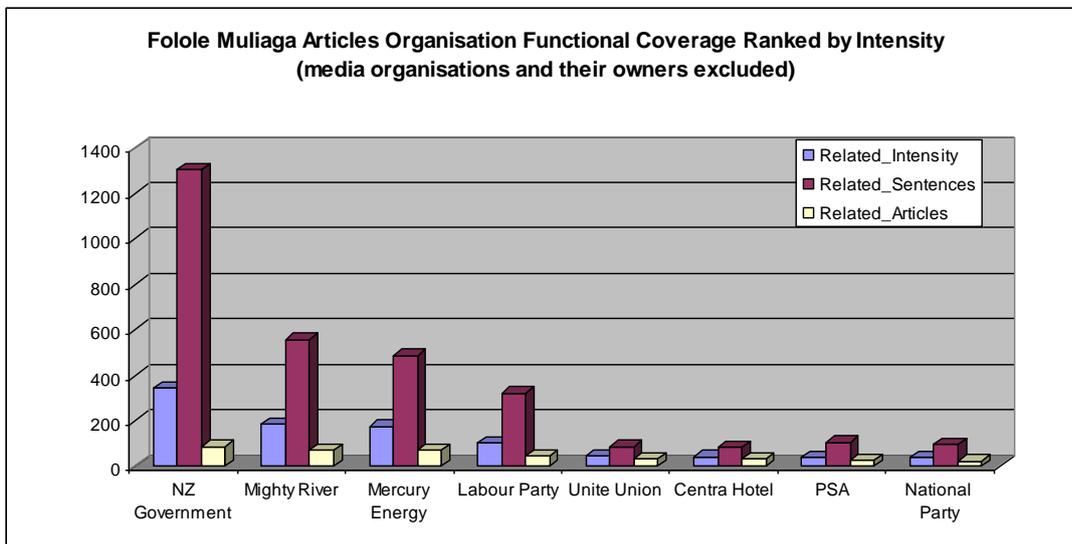
Figure 5.3.1.5 – Functional scores by org (excl. media) for Muliaga articles

It is worth noting that the criteria used to generate the scores above are <u>not necessarily mutually exclusive</u> (whereas they were for the explicit coverage discussed earlier). In other words, the score for <u>NZ Government</u> above includes the scores for <u>Mighty River</u> (which is a state owned enterprise). Similarly, the score for Mighty River includes the score for <u>Mercury Energy</u> (its retailer subsidiary). The scores above are also significantly larger than their explicit equivalents (in Figure 5.3.1.3) because these functional scores include related <u>person</u> coverage, causing some further overlap. For example any coverage for <u>Helen Clark</u> has been included into both the score for the NZ Government (as Prime Minister) and the <u>Labour Party</u>

(as leader). Thus in this graph, the Labour Party can be seen to have moved ahead of the National Party once this additional implicit coverage has been included.

Husband Lopaavea worked at the Centra Hotel and was a member of the Unite Union, while family spokesman Brenden Sheehan worked for the Public Service Association (PSA) union. Thus, in this graph, person scores have been directly transferred over to the organisations they were assumed to represent in some way.

Moving beyond specific organisations into organisational classifications, explicit groupings may be measured using the topic categories, shown in Figure 5.3.1.6 (author and media source are included here).

Folole Muliaga Articles Player Topics Explicit Coverage Ranked by Intensity
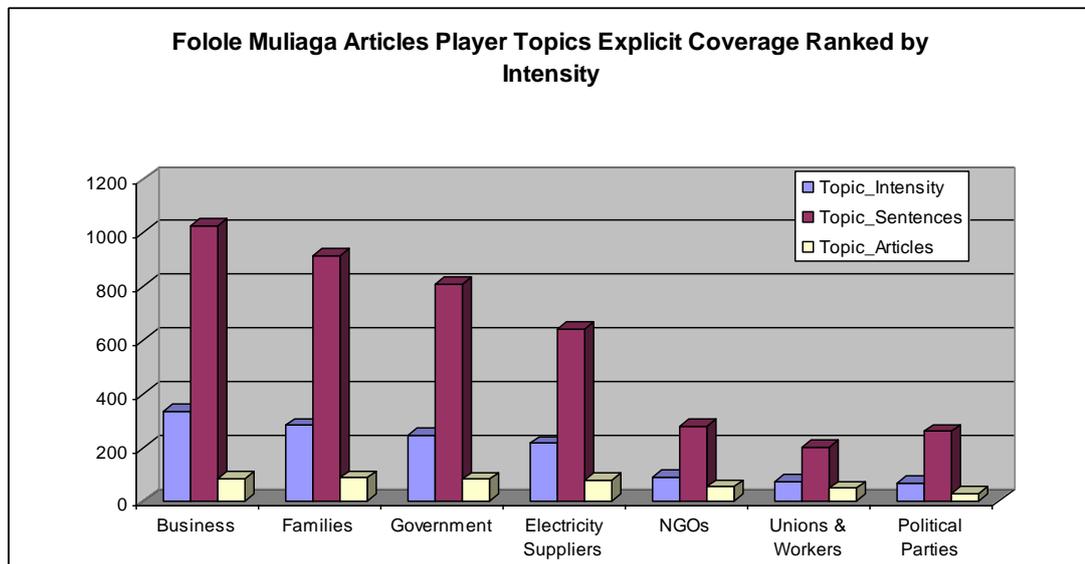
Figure 5.3.1.6 – Explicit scores by selected players for Muliaga articles

The main difference between this topic categories graph and the functional scores applied to specific organisations in the previous Figure 5.3.1.6 is that this time the scores include related words even if they were not applied to a specifically branded organisation. Thus families have moved up to a high ranking, and business-oriented phrases (such as "bills" or "retailers"), together with any explicit media company exposure (which is included this time), have apparently caused a high business profile overall. NGOs are introduced here, with a low to middle ranking. This category includes unions (so there is some overlap between those two columns) as well as the more generic "budget agencies" which were much discussed but tended not to be referred to by name.

Taking this a step further, selected <u>organisational</u> groupings have been ranked with their full <u>functional</u> or related (implicit as well as explicit) coverage, in Figure 5.3.1.7.
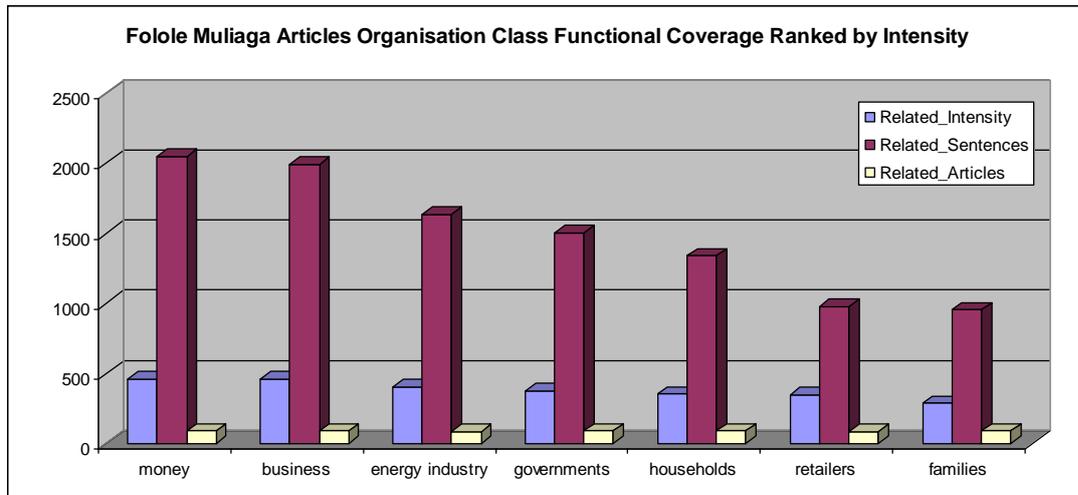
Figure 5.3.1.7 – Functional scores by selected org class for Muliaga articles

Here the <u>energy industry</u> has crept slightly ahead of the <u>government</u>, once all related concepts and entities have been included in the scoring. There is greater flexibility here than in the <u>explicit</u> <u>topic</u> categories (of Figure 5.3.1.6), allowing for more gradations, but also less accuracy as some of the designated inheritance relationships may be tenuous, or over-emphasised. Government scoring is higher here because it includes the SOE coverage whereas in the explicit topic scoring it did not.

As mentioned earlier in section 4.3.3 (example 3), <u>money</u> is a special type of player. Although not an organisational class as such, it (like environment) was eventually included within the organisation sheet as a catch-all, to allow accumulation of all money related terms from the document and event sheets into one place for ease of comparison. Under the <u>functional</u> (implicit plus explicit) scoring method used here, money fully includes the <u>business</u> category (which in turn fully includes <u>retailers</u>) so will always be larger than those. Similarly <u>households</u> here completely encompasses <u>families</u>. Note that (as defined in the phrase lists) energy industry and electricity suppliers are <u>not</u> subsets of business, although some of their components may be.

Moving away from players, let us now examine some of the other topic categories to see how they fared within this very specific group of articles. In Figure 5.3.1.8, level 3 scores have been compiled beneath two issues of concern topic categories, wellbeing and political imperatives.
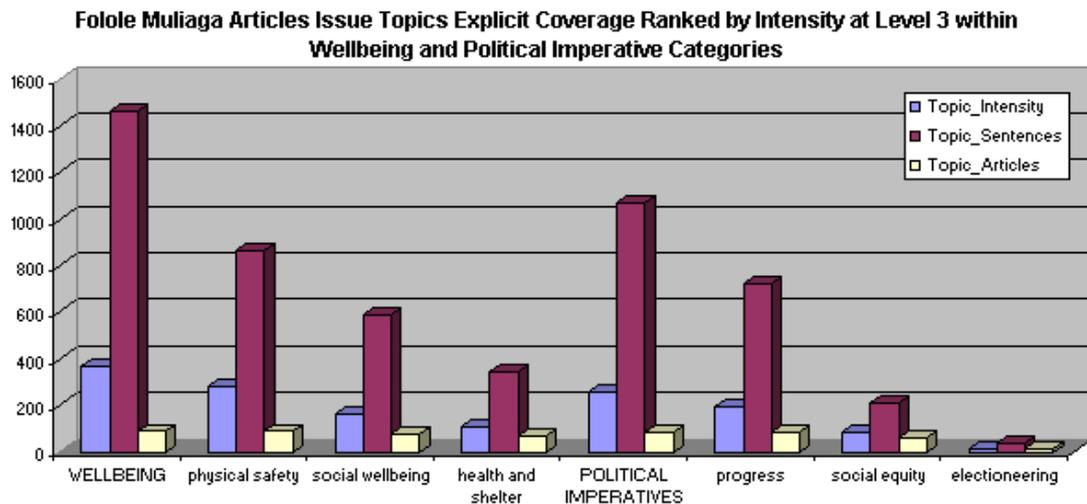
Figure 5.3.1.8 – Explicit level 3 scores beneath wellbeing and political imperative issue topics for Muliaga articles

It can be seen above that the level 2 category wellbeing scored slightly higher than the level 2 category political imperatives (reversing the order of Table 5.2.3.1), and that beneath the latter the score for the explicit level 3 electioneering category was very low, despite the obvious political sensitivity of this event, and notwithstanding earlier comments about the difficulty of measuring this topic.

When the lower level 4 categories were interrogated for this set of articles a closer view of the discussion was able to be gleaned, as illustrated in Figure 5.3.1.9 (lower scoring categories have been omitted to save space).
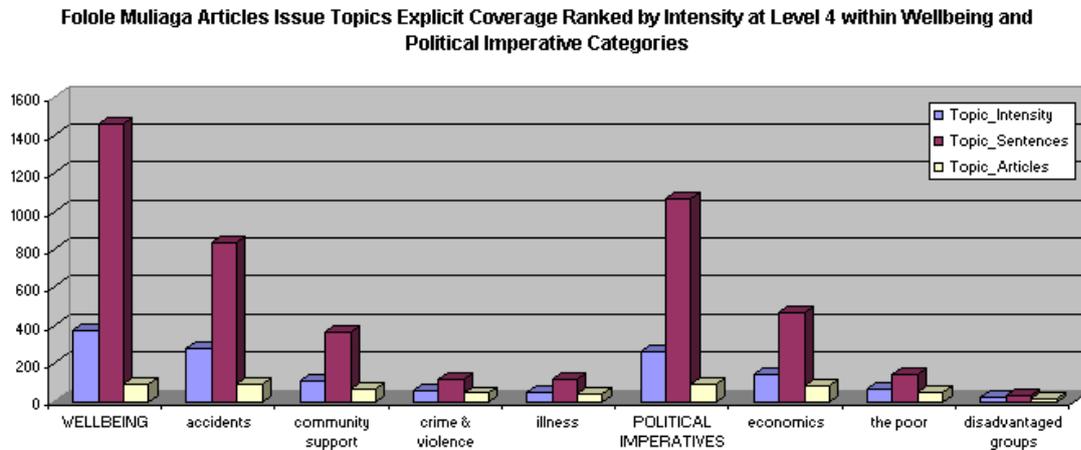
Figure 5.3.1.9 – Explicit level 4 scores beneath wellbeing and political imperative issue topics for Muliaga articles

When both graphs in Figures 5.3.1.8-9 are compared with the baseline scores for the full article set in Figures 5.2.4.1-4 (of the previous topics results section) the rearrangement of priorities within this subset of articles is clear. Economics still features, but without the earlier dominance. It has been overtaken by accidents, and the other level 4 categories shown have scored comparatively higher (compared with economics) than when all articles were measured, though here crime and violence is very low when compared with the larger set. It has been surpassed by community support (in the form of unions and budget agencies) which was discussed relatively frequently, but even in an extreme case such as this, the two social equity categories, the poor and disadvantaged groups continued to experience comparatively low coverage scores overall.

This case study will be discussed further in section 6.3.2 of the next chapter.

Like the LIWC psychological tool discussed in section 4.6.4, a rudimentary attempt was made to use ETAT to examine emotion and perspective. The ranked results are shown in Figures 5.3.1.10 and 5.3.1.11.

Folole Muliaga Articles Event Emotion - Functional Coverage Ranked by Intensity
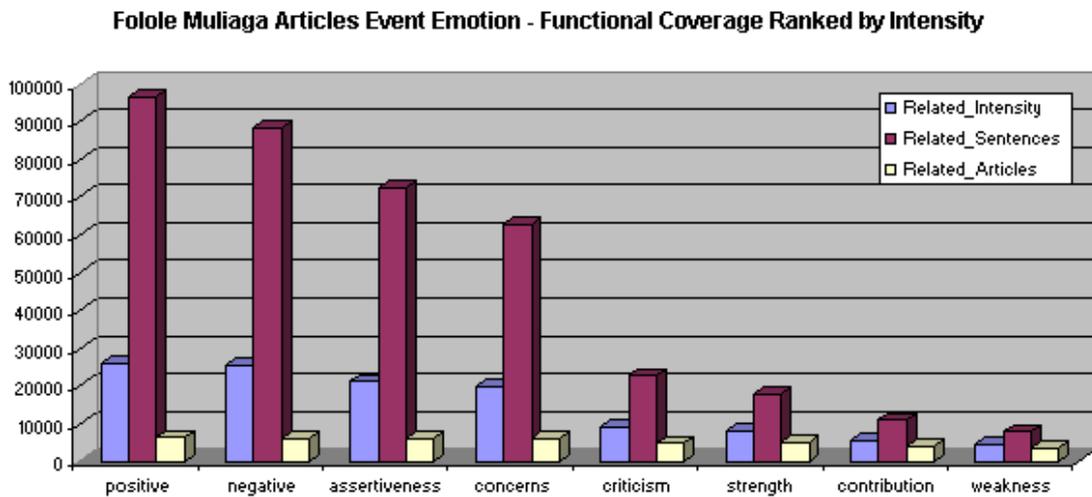
Figure 5.3.1.10 – Emotion for Muliaga articles

It was intriguing to see <u>positive</u> score higher than <u>negative</u> above, and <u>future</u> higher than <u>past</u>.

Folole Muliaga Articles Event Perspective - Functional Coverage Ranked by Intensity
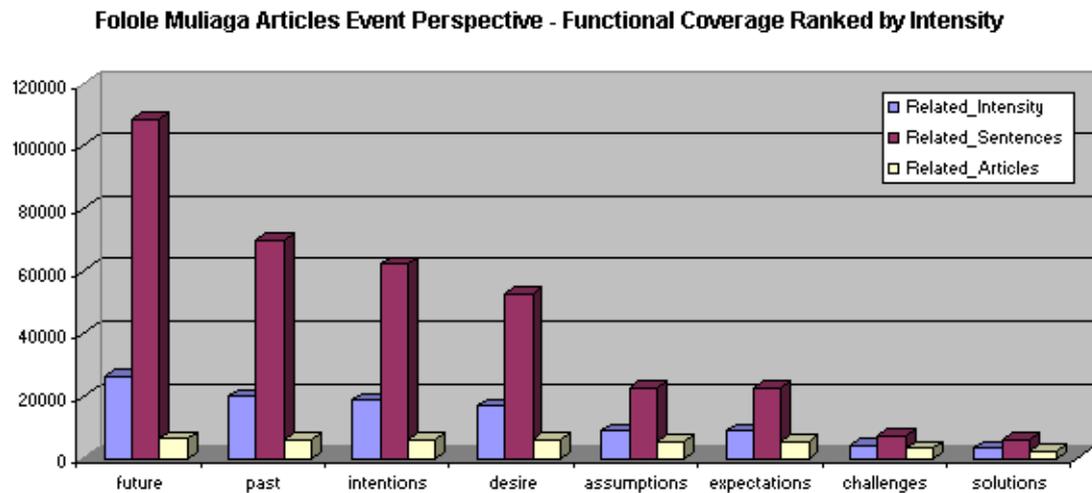
Figure 5.3.1.11 – Perspective for Muliaga articles

Although further refinement of the tool is required, these results are presented to demonstrate the potential usefulness of this capability[411].

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[411] Future comparisons against other samples or selected subsets would be of value, as would entity proximity analysis by sentence.

5.3.2 Person/Event Sample - Hemmingway Dismissal

The Electricity Commission was created in 2003 and Roy Hemmingway was appointed as the first Chief Electricity Commissioner. In September 2006 his three-year contract was not renewed, following ongoing unresolved negotiations with Transpower over the national grid upgrade into Auckland.

Sample selection included all articles for Person 134 Roy Hemmingway (n = 52).
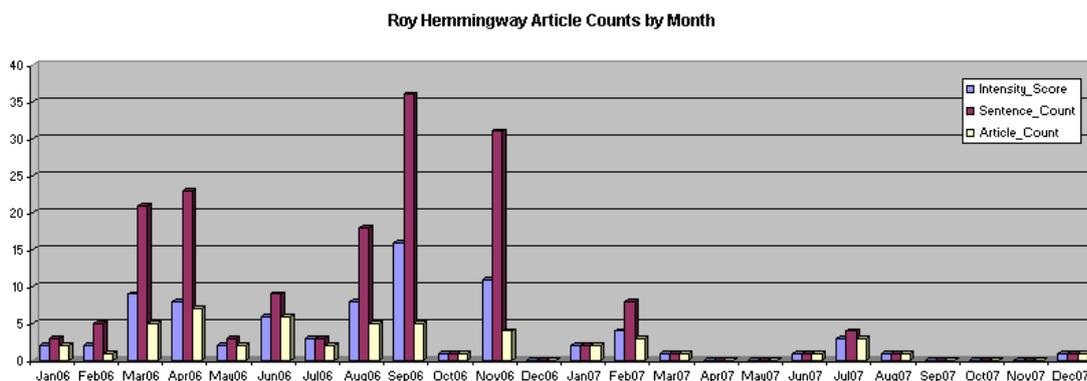
Figure 5.3.2.1 – Monthly count of articles mentioning Roy Hemmingway

Prior to September 2006, Roy Hemmingway was usually in the news for two main issues, either security of supply (hydro lake levels), or the Waikato pylons (see the next sub-section 5.3.3). After his dismissal, he protested government interference, and in Figure 5.3.2.1 it can be seen that the media continued to refer to the issue (using his name) for some months afterwards. There was a quiet month in October 2006, acting as a lull between September, when Hemmingway's dismissal was announced, and November when it actually took place.

In Figure 5.3.2.2, the other people who appeared in the same 52 articles as Roy Hemmingway have been ranked by intensity.

Fully six Labour Government Cabinet Ministers appear in this list, David Parker (the Energy Minister who "sacked" Roy Hemmingway), Michael Cullen (Finance Minister), Helen Clark (Prime Minister), Trevor Mallard (SOE Minister), Pete Hodgson (Health Minister), and David Benson-Pope (Environment Minister). Opposition National Party leader Don Brash appears near the end. The Electricity Commissioner who temporarily succeeded him (Peter Harris) has a reasonably high

comparative score, and the other three significant players are electricity SOE CEOs Keith Turner (Meridian), Ralph Craven (Transpower), and Murray Jackson (Genesis).

Roy Hemmingway Articles - Person Explicit Coverage Ranked by Intensity (8 authors removed)
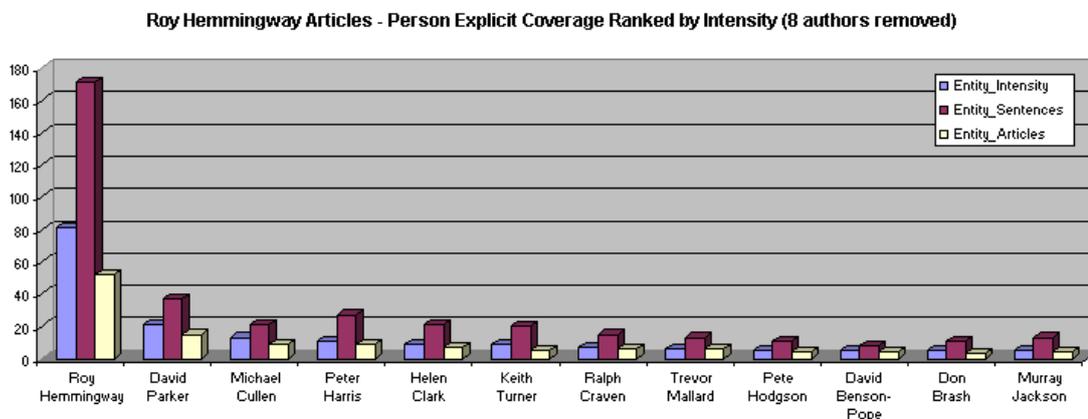
Figure 5.3.2.2 – Explicit coverage by person for Hemmingway articles

Not a great deal can be deduced from this graph other than the fact that this was a highly political issue, and that Hemmingway was a lone voice surrounded by very "big guns", so his road was a difficult one. Hemmingway's score is high here because his name was in the selection criteria, but suffice it to say that most (or all, bar perhaps Peter Harris) of the other players in this list were keen to see the new pylons proceed as fast as possible, and their cumulative coverage scores (though not obvious here) would have challenged his.

Those in the electricity sector were not keen to have an electricity commission at all, let alone one which appeared to obstruct their plans. More detailed information about coverage would perhaps have been able to be gleaned if this graph was divided into three parts, prior to Sep 2006, during the announcement period (Sep-Nov 2006), and the remainder.

The next graph in Figure 5.3.2.3 shows the parallel explicit organisational coverage.
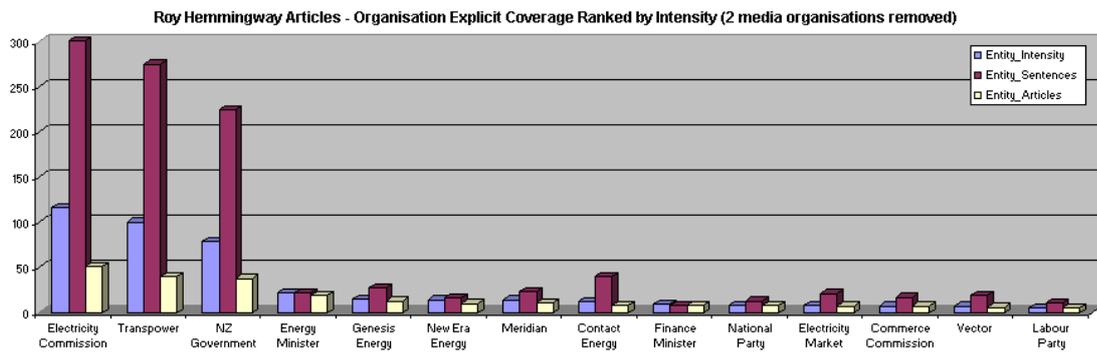
Figure 5.3.2.3 – Explicit coverage by organisation for Hemmingway articles

Here <u>Transpower</u>'s explicit coverage is almost equivalent to that of the <u>Electricity Commission</u> closely followed by the <u>NZ Government</u> with portfolios <u>Energy Minister</u> and <u>Finance Minister</u> also making an appearance. Major SOE gentailers <u>Genesis</u> and <u>Meridian</u> are visible alongside their publicly-listed privately-owned counterpart <u>Contact</u>. These players were said to be lobbying the government for more transmission to enable more generation[412], and saw Roy Hemmingway as an obstacle. His only "ally" in this picture could perhaps be said to be <u>New Era Energy</u>, the residents' group who opposed the pylons and who publicly supported Roy Hemmingway's fair and cautious approach, calling it a "breath of fresh air"[413].

By comparison, Lines company <u>Vector</u> and its intermittent combatant, regulator <u>Commerce Commission</u>[414], make an appearance near the end.

From a political perspective, it can be seen that once again the <u>National Party</u> was ahead of <u>Labour</u> in <u>explicit</u> coverage because Labour was referred to as "the Government" instead.

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[412] Hemmingway & Ryan (2006), Hemmingway & Plunkett (2006), Frykberg (2006).
[413] McQueen & Robinson (2005).
[414] Roy Hemmingway clearly envied the Commerce Commission's "legislated independence" Hemmingway & Ryan (2006).
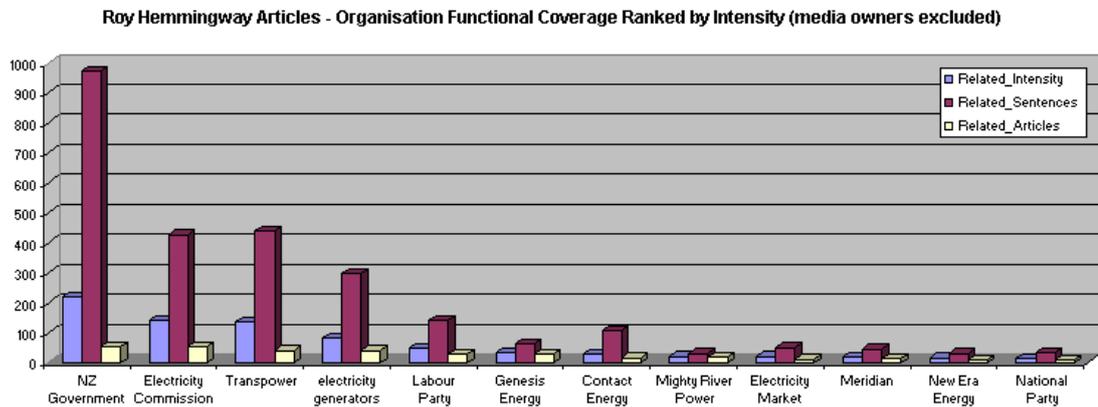
Figure 5.3.2.4 – Functional scores by org (excl. media), Hemmingway articles

When implicit coverage was merged with explicit coverage, and scores for related people and organisations were accumulated into their "parent" organisations, the resulting functional coverage produced Figure 5.3.2.4. Despite Roy Hemmingway's high personal scoring in Figure 5.3.2.2, here it can be seen that coverage for his organisation, the Electricity Commission, paled into insignificance alongside the Government, his "boss". His rivals Transpower and the electricity generators also scored comparatively well.

As was seen in the Muliaga example, the Labour Party score jumped ahead of National's once implicit person counts were included.
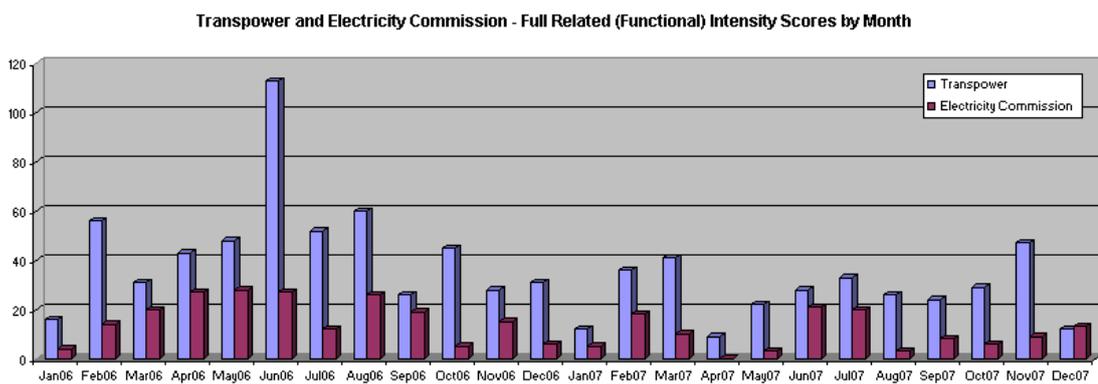
Figure 5.3.2.5 – Functional intensity, Transpower & Electricity Commission

In Figure 5.3.2.5, a comparison has been made between Transpower and its regulator, the Electricity Commission by month for all articles over the period (not just this sample). Hemmingway will be discussed further in section 6.3.3.

5.3.3 Issue Sample - Waikato Pylons

Transpower, NZ's monopoly SOE national grid operator, was planning a new line of high-capacity pylons from Whakamaru to Otahuhu, in order to strengthen electricity supply to the large and growing city of Auckland. Affected Waikato and Hunua land-owners formed groups to fight this proposal, the most high profile of those being "New Era Energy". The newly formed Electricity Commission had been granted statutory power of veto or approval for all of Transpower's investment plans, but only on the basis of cost efficiency and security of supply, not environmental factors. The Electricity Commission approval and consultation process was underway during the course of this study, and spanned the entire two year period.

Entity id 772 was created in the document sheet for the project <u>pylons through the Waikato</u>, and this was used for the sample selection (n= 58).
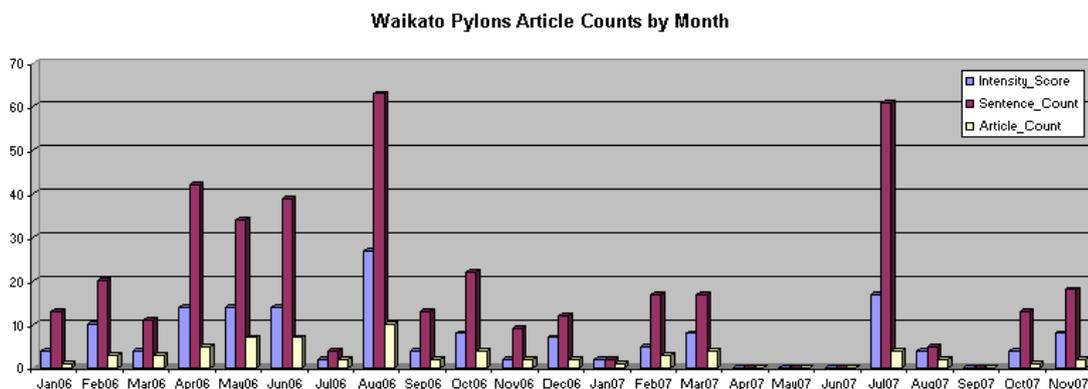
Figure 5.3.3.1 – Monthly scores for Waikato Pylon articles

Figure 5.3.3.1 shows the spread of articles that were identified as containing a phrase which pertained to the Waikato pylons project. It can be seen that the two tallest peaks roughly align with parallel increased coverage of Roy Hemmingway in Figure 5.3.2.1.

The main players who featured in these articles are shown in Figure 5.3.3.2.

Aside from three top government ministers, (Prime Minister <u>Helen Clark</u>, Energy Minister <u>David Parker</u>, and Finance Minister <u>Michael Cullen</u>), it can be seen that no opposition politicians have obtained (or sought?) any significant coverage over this

issue. Compare that with the Muliaga event where National, United Future and the Greens all featured, and the Hemmingway dismissal which the National Party co-opted to criticise the Government and gain political mileage.

Waikato Pylon Articles Person Explicit Coverage Ranked by Intensity (6 authors excluded)
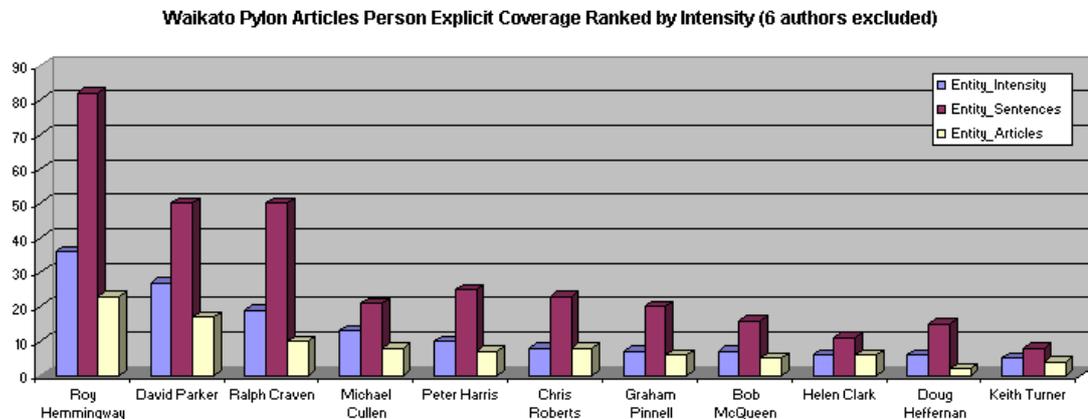
Figure 5.3.3.2 – Explicit coverage by person for Waikato Pylon articles

This issue presented a different situation, of course, being a slowly progressing on-going project rather than a single event, and politically very sensitive. Other than the three ministers, the remaining major players shown here are electricity industry professionals <u>Roy Hemmingway</u> (Electricity Commissioner), <u>Ralph Craven</u> (Transpower CEO), <u>Peter Harris</u> (Interim Electricity Commissioner), <u>Chris Roberts</u> (Transpower spokesman), <u>Graham Pinnell</u> (dissenting Electricity Commission board member), <u>Bob McQueen</u> (New Era Energy deputy chairman), <u>Doug Heffernan</u> (Mighty River CEO), and <u>Keith Turner</u> (Meridian CEO).

When explicit organisational coverage was examined in Figure 5.3.3.3, a similar picture emerged, although a few other peripheral players also appeared. Of interest in this graph is that <u>New Era Energy</u> achieved the ranking of fourth, a remarkable accomplishment for a residents' lobby group, although its scores were significantly lower than those of the major players alongside.
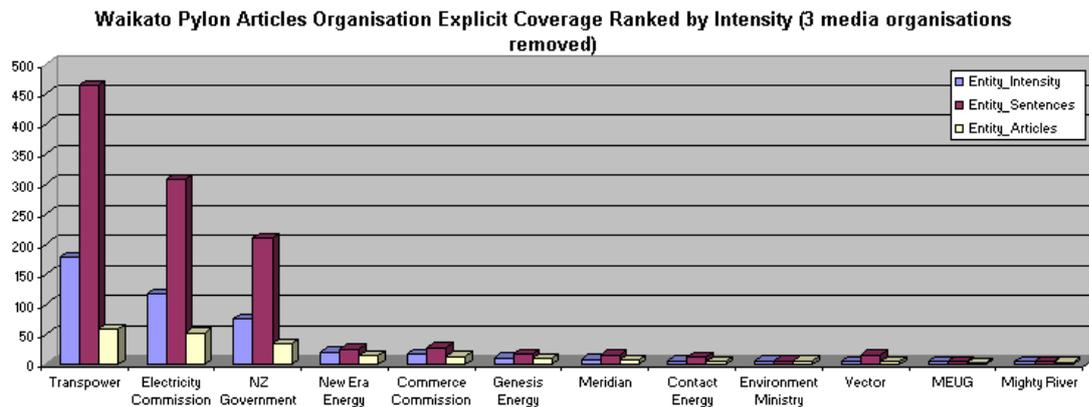
Figure 5.3.3.3 – Explicit coverage by organisation for Waikato Pylons

Of the players in this picture, <u>New Era Energy</u> was opposed to the pylons, the <u>Electricity Commission</u> was officially neutral, and all other electricity industry players were strongly in favour, including the one new entrant showing here, the <u>Major Electricity Users Group</u> (MEUG).
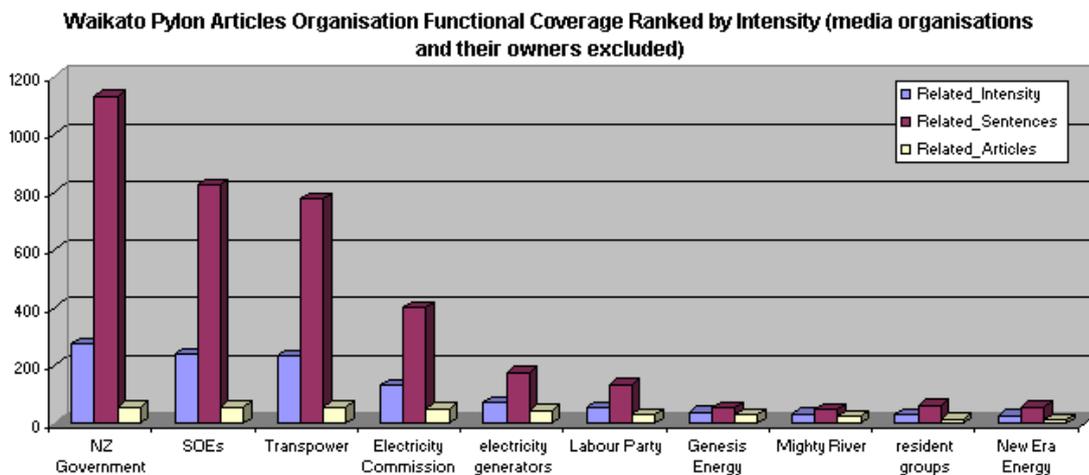
Figure 5.3.3.4 – Functional scores by organisation for Waikato Pylons

When functional coverage was compared in Figure 5.3.3.4, the <u>Labour Party</u> can be seen to have made its obligatory appearance due to the ministers' coverage, and <u>New Era Energy</u> has slipped further down the rankings, indicating in a more practical sense its real relative power in this situation.

This case study will be discussed further in section 6.3.4.

5.3.4 Issue Sample - SOE Privatisation

During the period under study, there was some public discussion about part-privatisation of some of the larger SOEs, specifically the electricity gentailers Genesis Energy, Meridian Energy and Mighty River Power, as well as the coal company Solid Energy.

It was difficult to accurately select the relevant articles for this sample with a broad brush tool, but an approximation was made by selecting document entity 608 or 296 ("privatise" or "listing") appearing together with organisation class 1548 ("SOEs") within the same article (n = 95).

Figure 5.3.4.1 shows the monthly intensity scores for each of the three entities in the selection. An article count view would probably present a similar pattern, but the intensity count is preferred because it incorporates a prominence weighting for each of the three comparable entities.
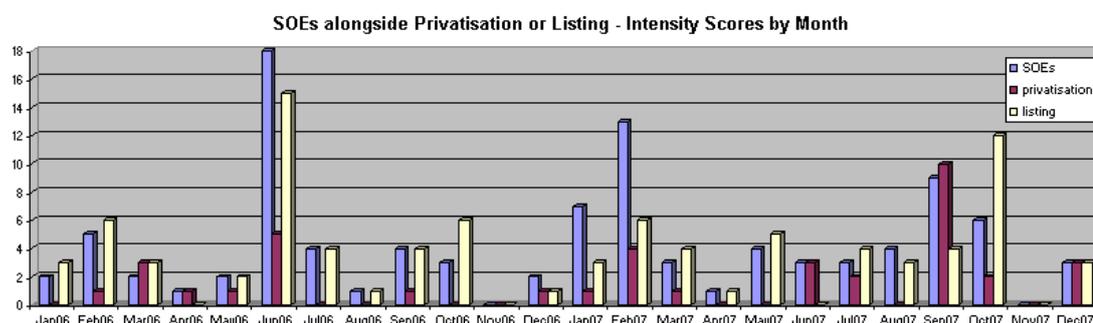
Figure 5.3.4.1 – Monthly intensity scores for SOEs and privatisation

There were no remarkable patterns visible in the data above, other than to note that there were three months with particularly high scores for the SOEs (Jun06, Feb07, and Sep07), and that of those, Sep07 had a significantly high score for privatisation.

When the influential voices were mapped for this set of articles in Figure 5.3.4.2, authors were deliberately included so that it would be possible to see who was discussing this issue. These were the nzherald sharemarket commentator Liam Dann, energy commentator Chris Daniels, and business commentators Bryan Gaynor and Fran O'Sullivan, followed not far behind by energy commentator Richard Inder.
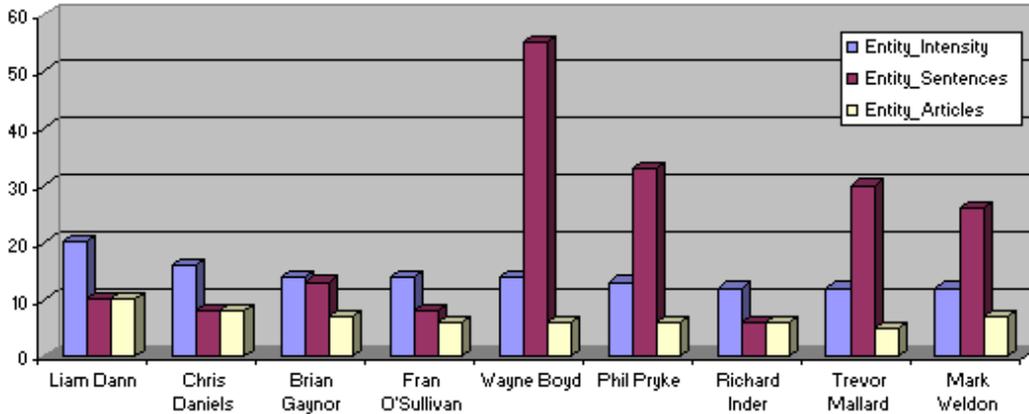
Figure 5.3.4.2 – Ranked person coverage for SOEs and privatisation

The two people in the middle, Meridian chairman (among multiple other roles) Wayne Boyd, and Contact director Phil Pryke were not central to this debate and arrived in the sample due to other company board news items within the same articles. SOE Minister Trevor Mallard and NZX chairman Mark Weldon on the other hand were two of the most vocal about the issue (of SOE privatisation) within the media.

Figure 5.3.4.3 – Organisation explicit coverage for SOEs and privatisation

In Figure 5.3.4.3, the organisations that were given explicit coverage within this sample have been ranked by intensity. Most of the names are those which appeared frequently within stockmarket reports. Note that the National Party has made an appearance towards the end of the list, as has Goldman Sachs JBWere, a frequent stockmarket commentator.
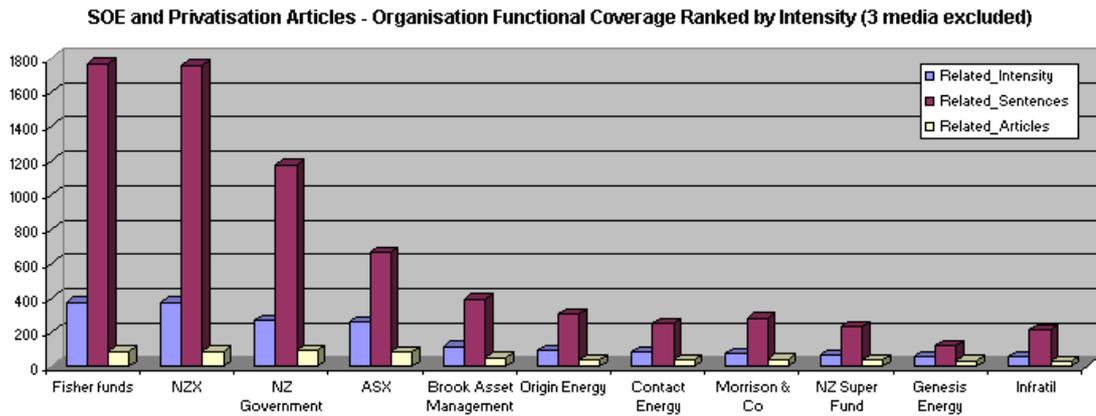
Figure 5.3.4.4 – Organisation functional coverage for SOEs & privatisation

The functional coverage equivalent for organisations is shown in Figure 5.3.4.4. As might be expected, large investors (e.g. <u>Fisher Funds</u>, <u>Brook Asset Management</u>, <u>Morrison&Co</u>, <u>NZ Super Fund</u>, <u>Infratil</u>) have taken some of the top spots here. These players are discussed further in section 5.4.5.
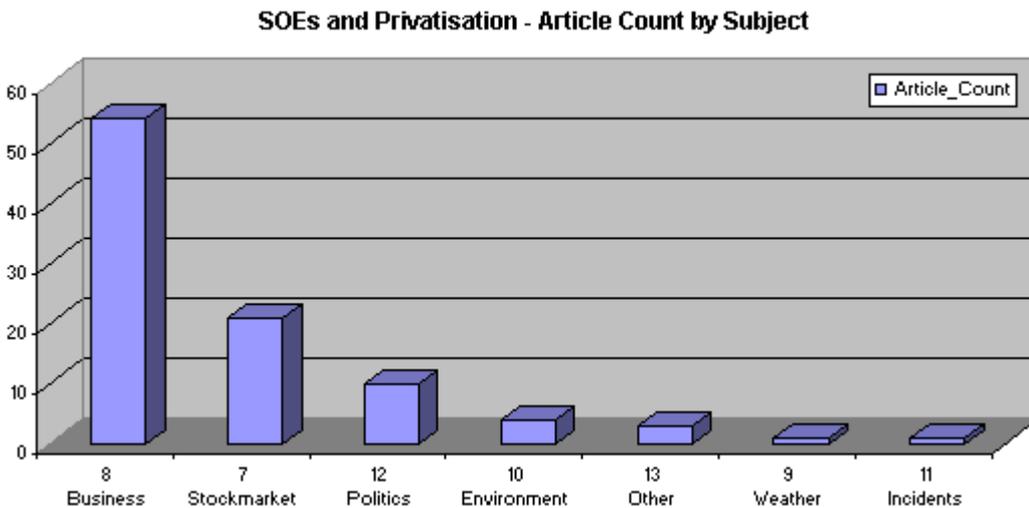
Figure 5.3.4.5 – Article count by subject for SOEs & privatisation

When analysed by subject, in Figure 5.3.4.5, it can be seen that business and stockmarket articles were the ones covering this story, closely followed by political articles.

This case study will be discussed further in section 6.3.5.

5.4 Parameter Set Results

5.4.1 Gender Parameter Results (Pairs)

The subject of gender may seem rather remote from the subject of electricity policy, but as the study progressed it became obvious that males received much more coverage than females. This observation held for nearly all articles, whether electricity related or not. Furthermore, ETAT lent itself well to this type of analysis, and so this short section on measuring gender balance has been included.

Gender coverage was able to be measured in several different ways, as already briefly described in sections 4.5.9 and 4.7.8, and it was interesting to find that most measures produced broadly similar results. Furthermore, they were not quite as extreme as expected. In fact they aligned reasonably well with the GMMP finding that "24% of the people … in [the] news are female"[415] as described in section 4.2.5.

Of the range of results achieved, the lowest female score of 18% was for named gender sentence counts (substance), shown in Figure 5.4.1.1, and the highest of 27% was for merged gender intensity percentages in Figure 5.4.1.2.
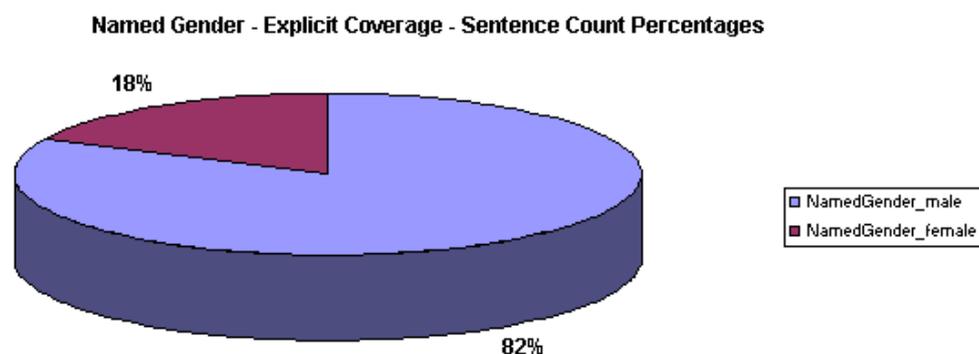
Figure 5.4.1.1 – Named gender sentence count percentages

The significant difference between these two scores may primarily be explained by the inclusion of female authors (such as Fran O'Sullivan) into the measurement, so when prominence was included, the intensity score rose considerably. Similarly, photographs of Prime Minister Helen Clark would have elevated this measure.

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[415] GMMP (2010:vii).

Merged Gender - Explicit Coverage - Intensity Percentages

27%

73%

- MergedGender_male
- MergedGender_female
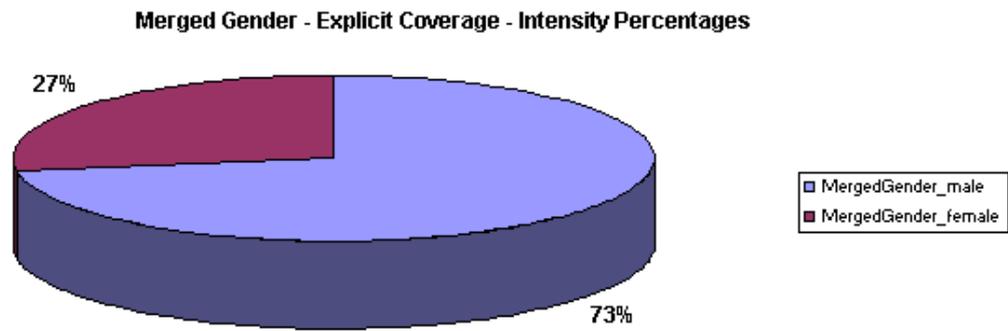
Figure 5.4.1.2 – Merged gender intensity percentages

Another implication from this difference was the contribution of unnamed gender (such as "spokeswoman") to the merged gender sentence counts. It therefore appeared that in "column inches" as such, named men were highly favoured and women were less visible, but once prominence was considered, a few high profile women authors and politicians addressed the balance somewhat.

Although not undertaken as a formal exercise, the fact that the ETAT gender findings aligned well with the GMMP findings provided a certain amount of "construct validity"[416] for the ETAT method.

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[416] As described by Alpers et al. (2005:363).

5.4.2 Other Binary Parameter Results

In section 5.2.6 tone was examined as an explicit topic. From a slightly different perspective, that of functional coverage from the events sheet, tone was also able to be measured in terms of winners for each article (as described in section 4.5.9), and the results are shown in Figure 5.4.1.3.

Article Winners for Positive vs. Negative - Functional Coverage Article Counts

47%

53%

- PositiveNegative_positive
- PositiveNegative_negative
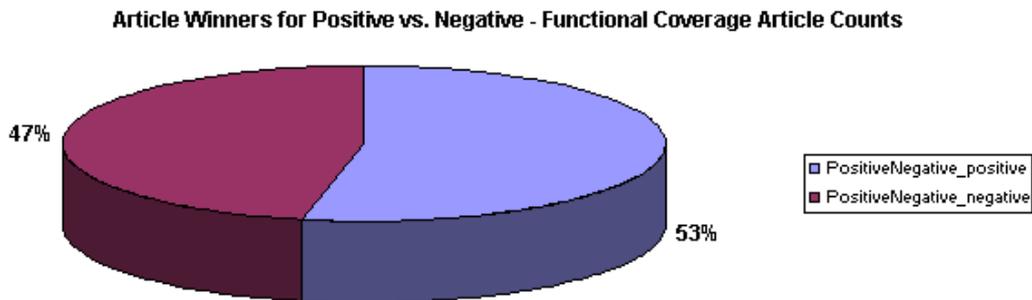
Figure 5.4.1.3 – Article winners for tone

It can be seen here that overall there were slightly more positive articles than negative ones, but the difference was not great.

It was interesting to find that when perspective was measured, future[417] came out comfortably ahead of past, as can be seen in Figure 5.4.1.4, which once again is measuring winners.

Article Winners for Future vs. Past - Functional Coverage Article Counts

39%

61%

- PastFuture_future
- PastFuture_past
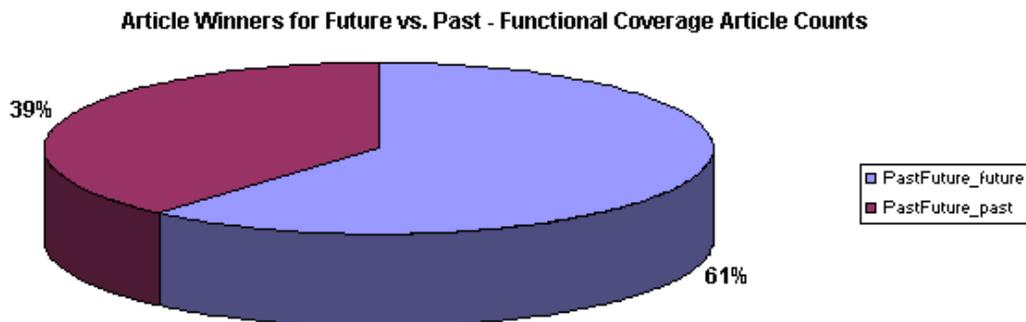
Figure 5.4.1.4 – Article winners for perspective

Measuring winners is expected to exaggerate differences but in this case when total sentences were compared, the proportion was exactly the same. When total

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[417] Note that phrases that were assigned a perspective of "future" included aspirational phrases such as progress, development and innovation.

intensities were compared however, they came a little closer and the proportions in that case were 57% for future and 43% for past.

Rather than examine winners for NZ <u>North Island</u> vs. <u>South Island</u>, a comparison of parental coverage for intensity, in Figure 5.4.1.5, gives a picture of the approximate ratio between them instead. When sentences were substituted for intensity the South Island substance share dropped to 16%.

North Island vs. South Island - Parental Coverage - Intensity Percentages
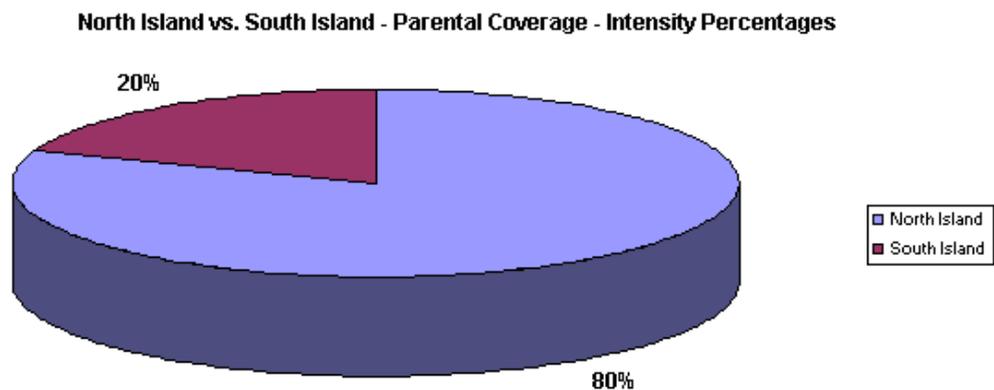
Figure 5.4.1.5 – Coverage Intensity for North Island vs. South Island

Winners results for <u>urban</u> / <u>rural</u> are shown in Figure 5.4.1.6. When proportions of sentences and intensity scores were compared, the results were similar. Rural scored 27% and 28% respectively in those cases.

Article Winners for Urban vs. Rural - Functional Coverage Article Counts
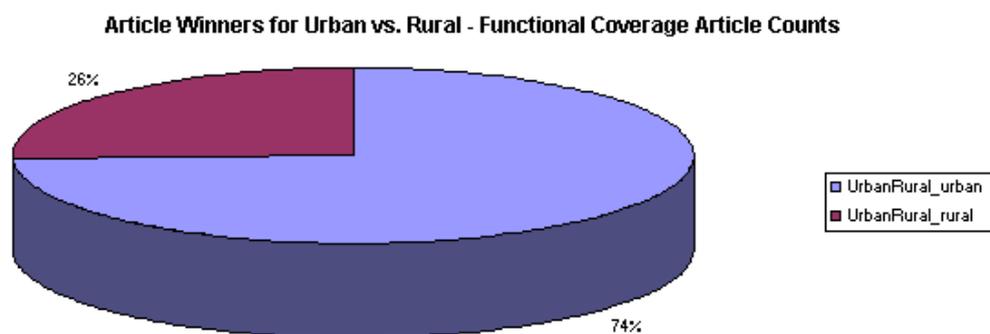
Figure 5.4.1.6 – Article winners for Urban vs. Rural

Although it was a nationally distributed newspaper, nzherald was based in Auckland so these North / South, urban / rural ratios seem reasonable.

5.4.3 Policy Parameter Results (Pairs)

When phrases implying <u>sustainability</u> were measured against those for <u>growth</u> (Figure 5.4.3.1) to give a result for "equilibrium", I had expected growth to dominate, but in fact sustainability won (although growth was mentioned in more articles). Furthermore, when related terms were examined, <u>balance</u> came out ahead of <u>profit</u> on the <u>intensity</u> measure, even though profit won on sentences (<u>substance</u>).
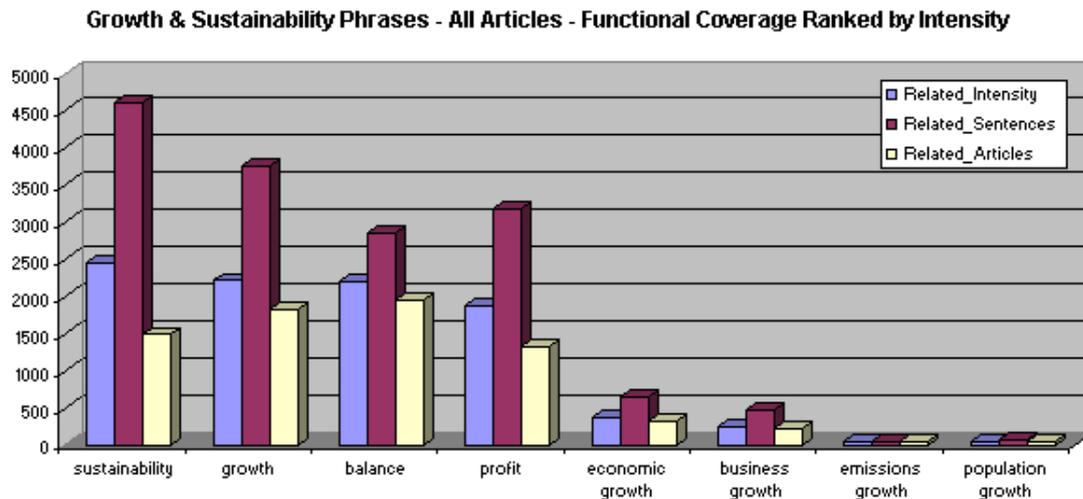
Figure 5.4.3.1 – Functional coverage for growth vs. sustainability

To investigate further, <u>growth</u> vs. <u>sustainability</u> by month was measured and Figure 5.4.3.2 indicates precisely where the transition took place.
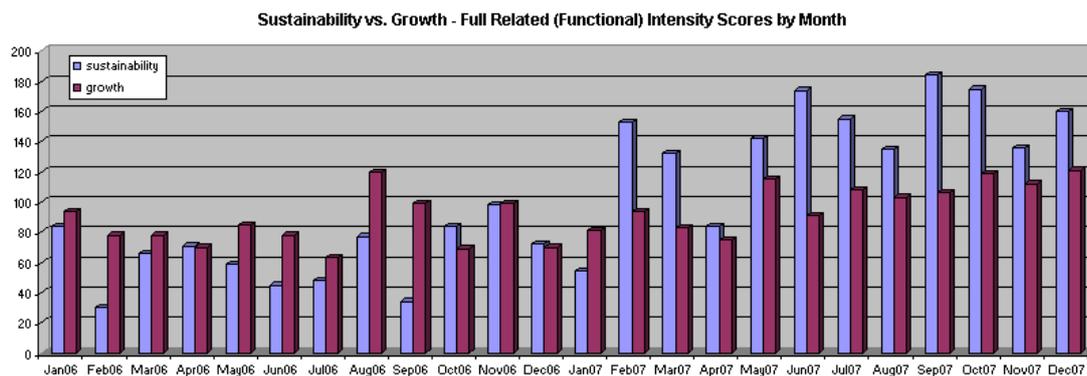
Figure 5.4.3.2 – Growth vs. sustainability functional coverage by month

In February 2007, New Zealand prime minister Helen Clark gave her annual "state of the nation" speech, within which she spoke of prioritising <u>sustainability</u>. After that, media commentators analysed this new emphasis, and (as can be seen above) spoke of it often. <u>Growth</u> had consistently scored more highly prior to that speech,

but at that point sustainability took the lead, providing an example of the power of one speech to slightly alter a media paradigm.

The next policy pair examination proposed in section 4.7.8 was money vs. "not money". Firstly, in Figure 5.4.3.3, money "terminology" has been compared with other high scoring aspirational phrases.

Aspirational Policy Phrases - All Articles - Functional Coverage Ranked by Intensity
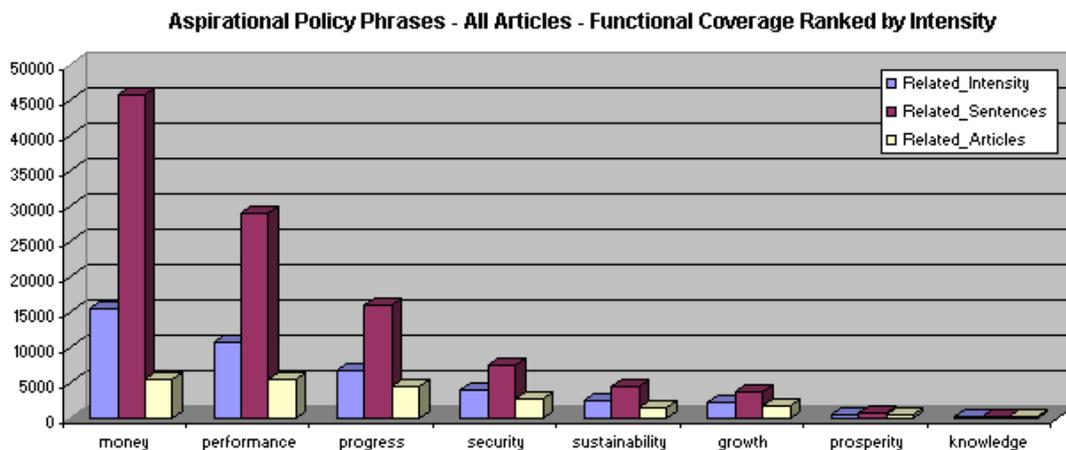
Figure 5.4.3.3 – Functional coverage for aspirational phrases

Growth and sustainability measures are put into perspective here, and it is made clear that money was a very dominant influence throughout.

Within ETAT two separate entries were labeled money. In the document sheet (as referenced in Figure 5.4.3.3) money referred to any type of monetary terminology such as "finances", "prices", "$", "purse strings", etc. However, another "catch all" money (including business) entry existed in the organisation sheet (as discussed in section 4.3.3 example 3, and also shown earlier in Figure 5.3.1.8). The latter item was a "parent" of all businesses and, when functional coverage was measured, it included monetary terminology as well.

The <u>document</u> version will be examined first. <u>Sentences</u> containing a phrase implying <u>money</u> (terminology) were compared with sentences which held <u>no monetary reference</u> of that type, and the resulting counts by month are displayed in Figure 5.4.3.4.
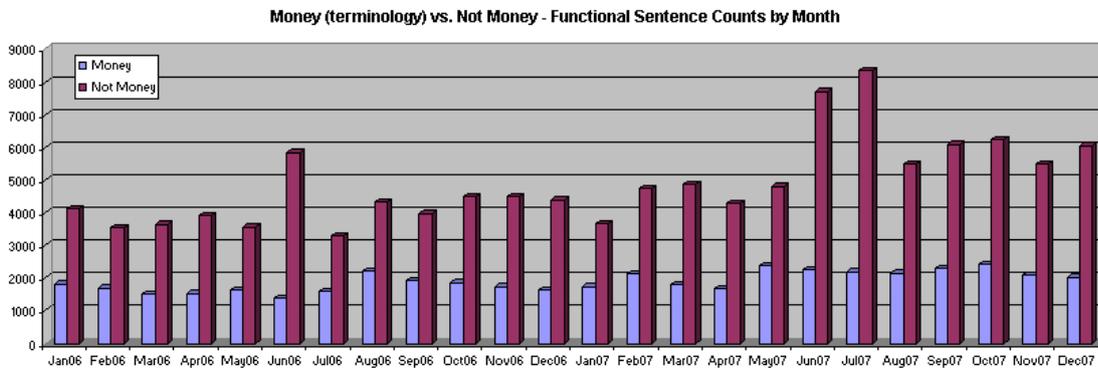
Figure 5.4.3.4 – Money (terminology) vs. not money functional coverage

Overall, the percentage of sentences containing an actual monetary reference was 28%. A slight trend is discernable over the 24 month period as that measure decreased from 31% in January 2006 to 25% in December 2007.

When the <u>organisation</u> version of <u>money (including business</u>) is examined, the results are almost exactly reversed. Sentences which included a reference to monetary terminology, or any aspect of business, made up 76% of all sentences in the full data set, as can be seen in Figure 5.4.3.5.
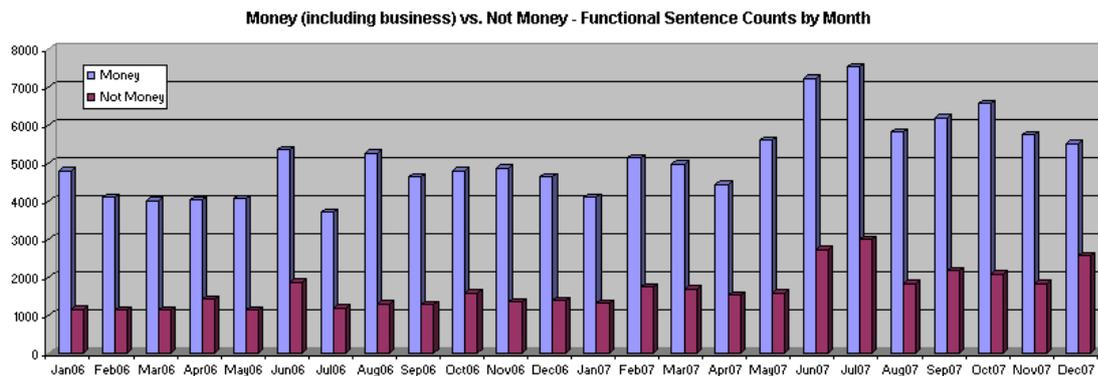
Figure 5.4.3.5 – Money (incl. business) vs. not money functional coverage

Once again a very slight trend can be observed away from monetary or business focus over the 24 months, from 78% (the average for the first four months) to 74% (the average for the last four months).

5.4.4 Ideology Parameter Results (Triplets)

The three NZ political parties of interest when measuring coverage were Labour (left), National (right) and Green (green), but the prepared graphs do show the other smaller parties as well, for interest. On the next page, three graphs illustrate explicit coverage (Figure 5.4.4.1), functional coverage, which includes related person coverage, (Figure 5.4.4.2), and literal coverage, in the broadest sense (Figure 5.4.4.3) for all of the main NZ political parties.

In Figure 5.4.4.1 it is clear, as has been discussed already, that the named National Party brand was presented more often in the media than the Labour Party brand, mainly because Labour was normally referred to as the Government instead. This became clear in the functional coverage (Figure 5.4.4.2), where Labour was well ahead once person coverage was included. When literal coverage (Figure 5.4.4.3) was interrogated, general usage of the term "labour" and its derivatives were seen to lag behind several of the other parties' brands, putting Labour at a slight disadvantage from the simple repetition perspective. By contrast various permutations of the word "national" are more frequently used.

The Green Party was quite close behind the larger two parties in both explicit and functional coverage but received a boost ahead of Labour (though still behind National) in the literal coverage, as the word "green" was observed to be quite widely used in a general sense.

Though coverage of all of the remaining parties was relatively low, the literal scores were interesting for NZ First and United Future, indicating good choice of party name. "First" (and its permutations) was the most widely scoring literal grouping, followed by "united" which was augmented hugely by "United States".
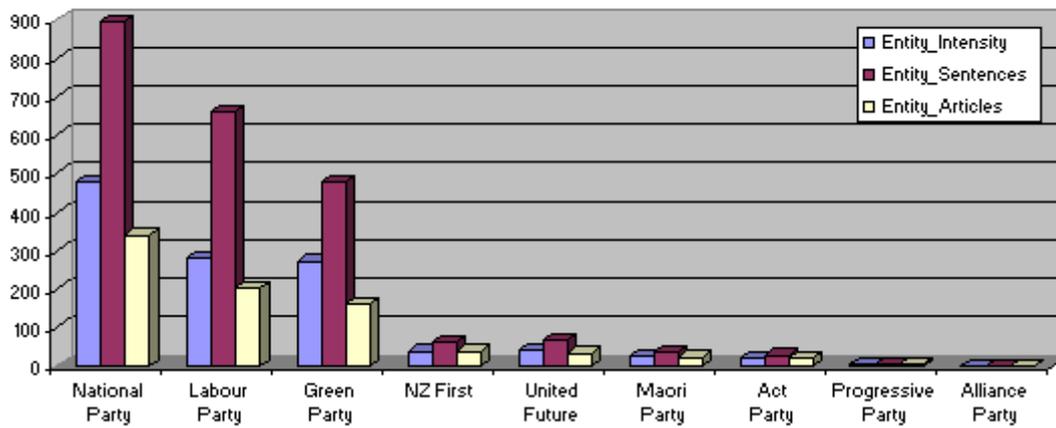
Figure 5.4.4.1 – Explicit coverage by NZ political party
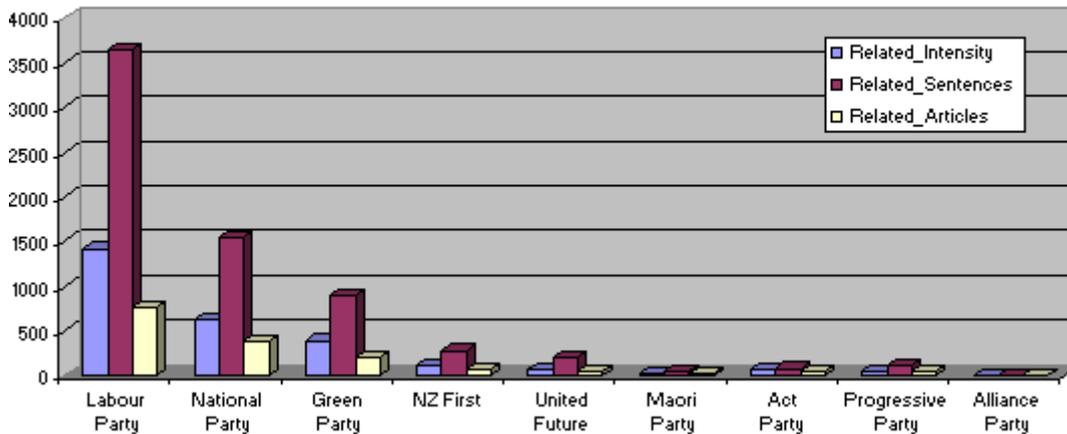
Figure 5.4.4.2 – Functional coverage by NZ political party
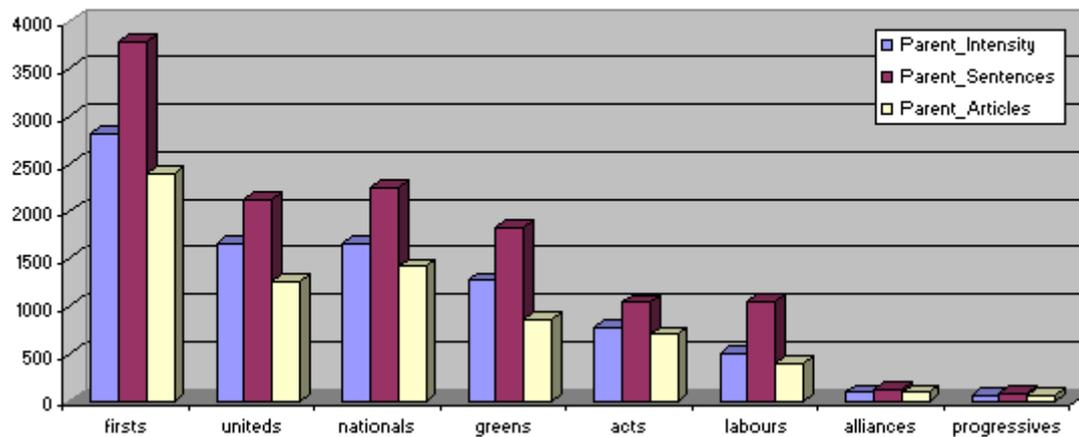
Figure 5.4.4.3 – Literal coverage by NZ political party

When overseas political party media coverage was examined, the results were similar.

On the next page, the first two graphs show the main overseas political parties that appeared in our media over the time period being studied. In Figure 5.4.4.4 the explicit coverage shows clearly that opposition parties in Australia (Labor), US (Democrats), and UK (Conservatives) received more brand coverage than governing parties (the Liberals, Republicans, and British Labour respectively). In Australia, even the Greens received more branded coverage than the Liberals. However, when functional coverage was reported in Figure 5.4.4.5 the trend reversed, and the governing parties received more actual coverage, once their people were brought into the mix (but without the branding).

Literal coverage was not attempted for overseas political parties, but instead the third graph on the next page (Figure 5.4.4.6) shows the collective functional coverage for all overseas political parties (including those not mentioned so far).

In this case it can be seen that governing parties clearly received much more coverage than opposition parties, and that as a result, ostensibly left wing parties received considerably more coverage than right wing parties, clearly because Labour was in power, both locally and in Britain.

Despite a reasonably good showing in the NZ comparisons, in can be seen in Figure 5.4.4.6 that green parties globally received only a fraction of the cumulative coverage of their larger counterparts.
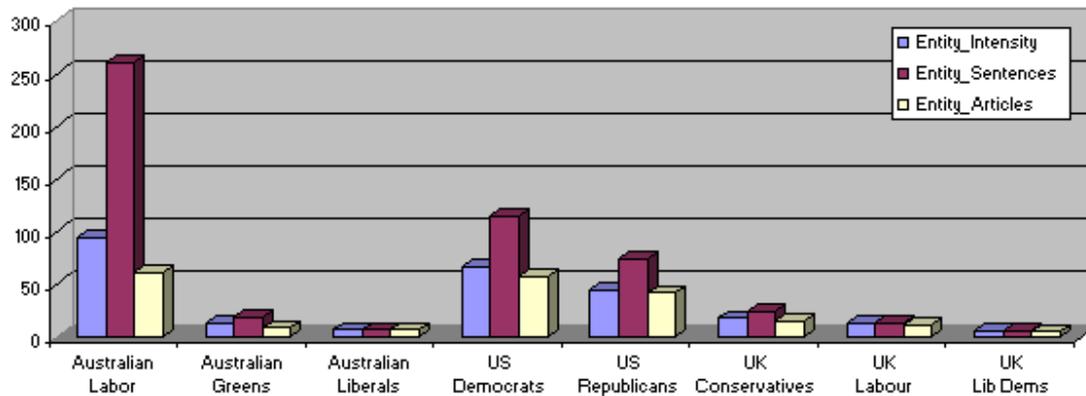
Figure 5.4.4.4 – Explicit coverage by overseas political party

Figure 5.4.4.5 – Functional coverage by overseas political party

Figure 5.4.4.6 – Functional coverage by party type

Following on from political parties, a little more ideological testing was performed along similar lines. Earlier in section 4.7.8, separate tests were proposed for triple bottom line (TBL) (business, social, environmental) and sectoral (market, government, community) comparisons. In practice it was found to be simpler if they were combined for reporting. For Figure 5.4.4.7, <u>functional</u> coverage was accumulated and reported from the <u>organisation</u> sheet, (as opposed to <u>topics</u> which were reported earlier in section 5.2.2, although the results are similar).
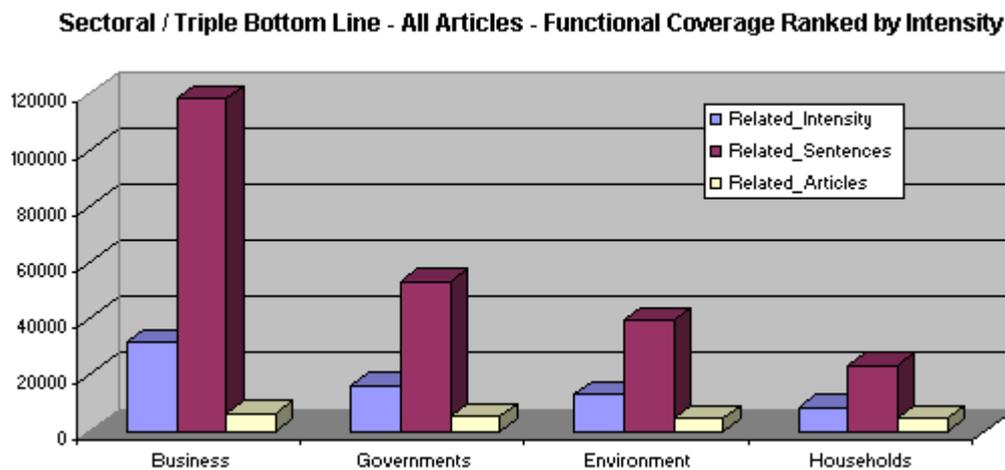
Figure 5.4.4.7 – Functional coverage by sector / TBL

In Figure 5.4.4.8 four extra sectors have been added into the lineup.
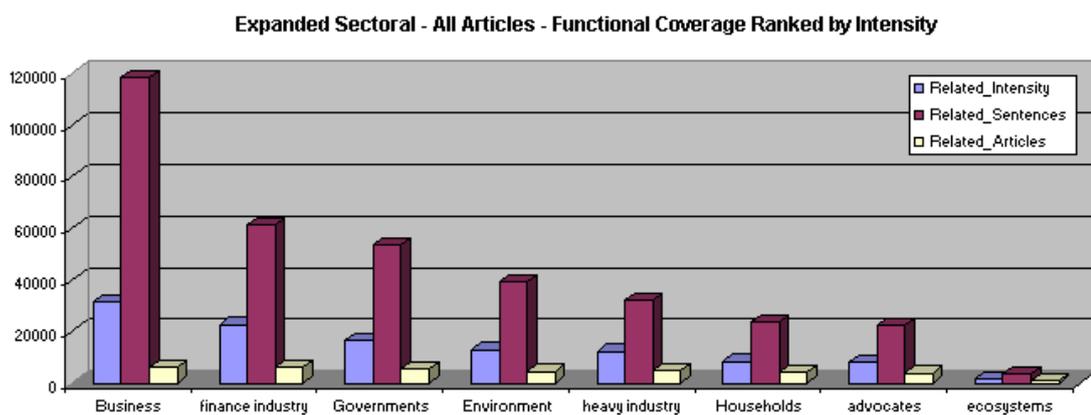
Figure 5.4.4.8 – Functional coverage by expanded sector

<u>Environment</u> scored remarkably highly in both of these tests, showing that a broad environmental awareness had permeated media coverage. However, in order to attempt to separate superficial environmental acknowledgement from a deeper concern, the category called <u>ecosystems</u> was also monitored, and here the numbers do not look as good. This category contained lists of nature and wildlife-related

phrases, rather than just the words "environment" or "green" which were easy for writers to insert anywhere.

To measure "community" or "social awareness", it was found that <u>households</u> turned out to be the most inclusive category, and the scores here were also better than expected, although still lower than the others. It was clear that there remained a <u>business</u> focus throughout.

In the last graph (Figure 5.4.4.9), an attempt was made to compare the coverage for advocates of different kinds, following on from the detailed study of these which occurred during categorisation (see Figure 4.4.8.1).

Advocates - All Articles - Functional Coverage Ranked by Intensity
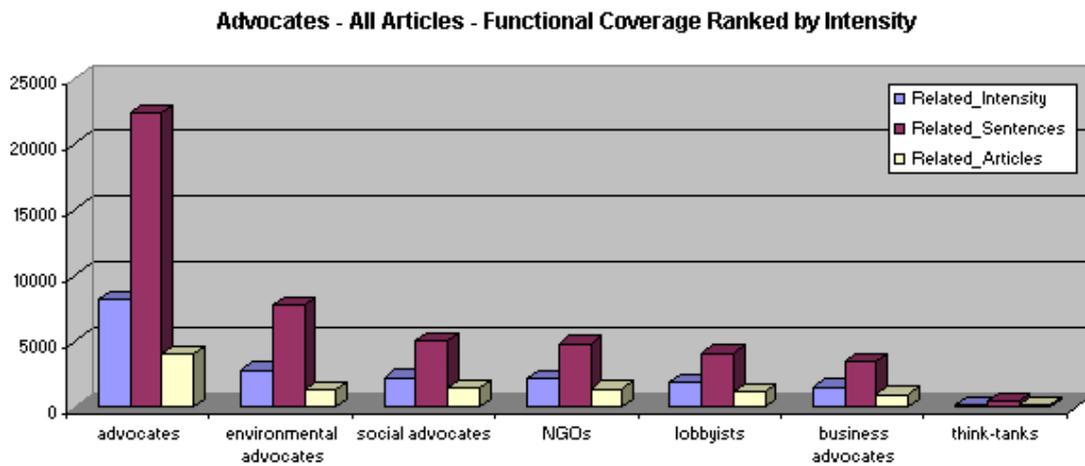
Figure 5.4.4.9 – Functional coverage for advocate categories

The results were not remarkable. <u>Environmental advocates</u> came out slightly ahead of <u>social advocates</u>, and <u>business advocates</u> came last. It must be presumed that this was because business coverage was already so large that additional advocates were not really needed, and also because businesses could be expected to provide their own advocacy.

After the challenges involved in categorising the various <u>think tanks</u> it was surprising to see how low they scored collectively.

5.4.5 Entity Parameter Results (Multiple)

This sub-section will briefly examine coverage rankings for regions, countries, governments, organisations and people. Results for regions will be presented first.
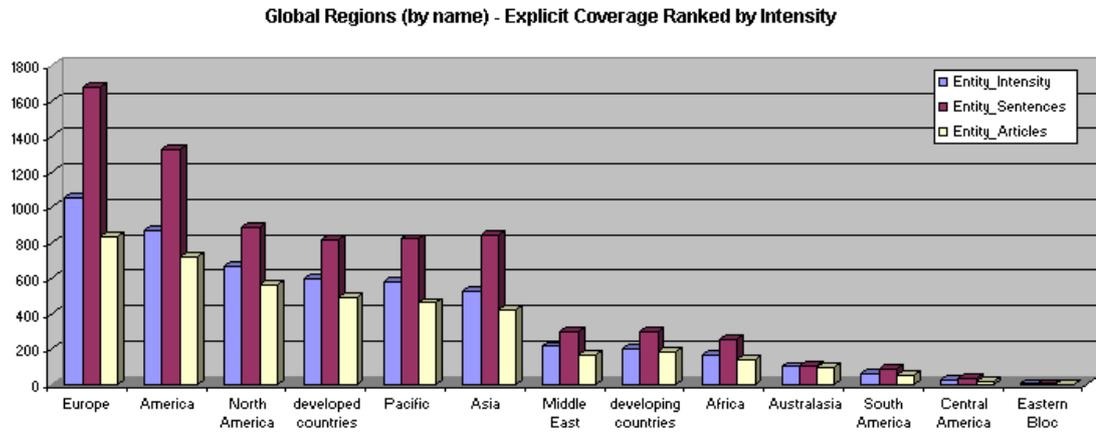
Figure 5.4.5.1 – Explicit coverage by region
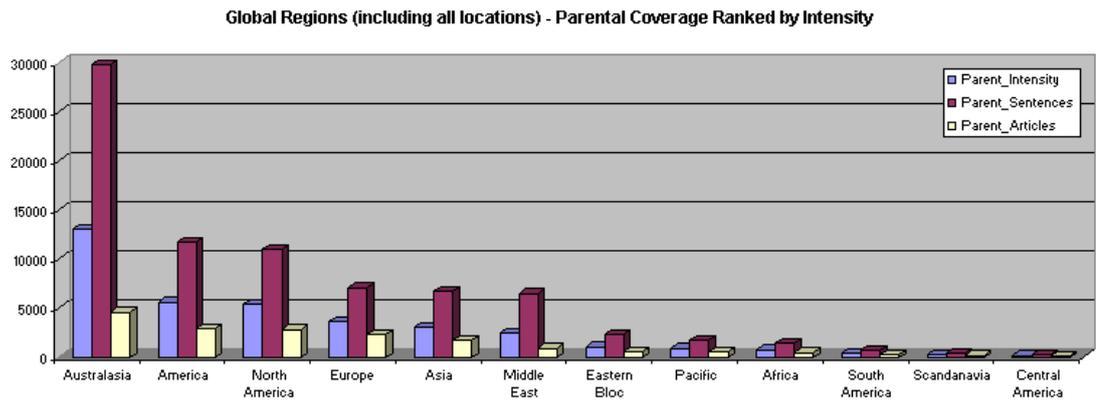
Figure 5.4.5.2 – Parental coverage by region
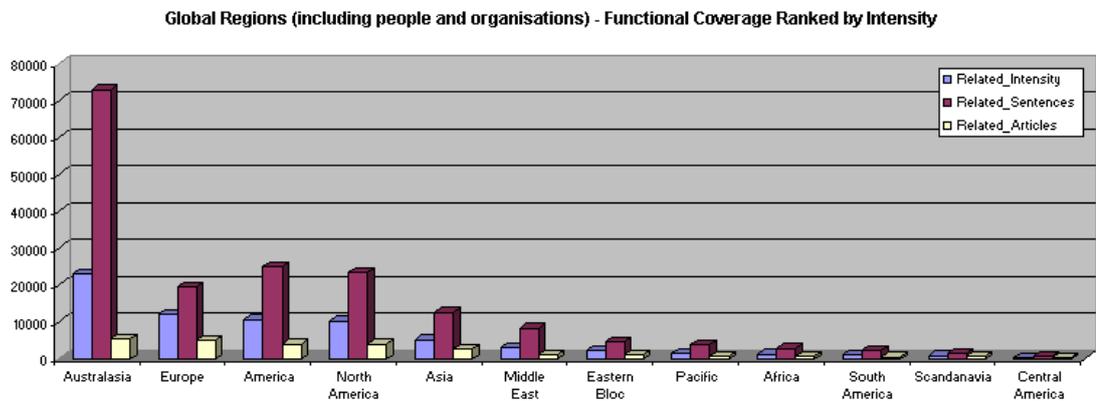
Figure 5.4.5.3 – Functional coverage by region

1. Regions

The three graphs on the previous page show the contrasting results when three slightly different measurement methods were applied to regional coverage. In the first (Figure 5.4.5.1) regional delineations were defined and counts were made for explicit references to the regions themselves. The fact that Australasia ranks so low indicates that it is a region seldom referred to explicitly by name. By contrast, Europe appears to have been referred to collectively more than any other region. Pacific gained a relatively high rating for the same reason.

In the second graph (Figure 5.4.5.2) regional parental coverage was fully inclusive of country, city, and location names, along with any explicit coverage belonging to them. Parental coverage was an intermediate concept between explicit coverage and full functional coverage, in that it included a certain amount of more closely aligned implicit coverage. This graph provides the most accurate representation of what would naturally be interpreted as the actual coverage by region, so this was the most appropriate measure in this case. As expected, once New Zealand and Australian locations were included, Australasia easily took first place, with America slipping in behind, relegating Europe now to third or fourth place, depending upon whether America and North America are considered to be one or two entries here. The other major mover here was Eastern Bloc, once Russia was able to be included by name.

The last graph (Figure 5.4.5.3) presented full functional coverage, implying the inclusion of further implicit coverage. For practical purposes, this mainly meant owned organisations, where that information was readily available.

Within NZ media, one would expect Australasia to retain its lead here, and most other regions kept their place, but the surprise change was the moving of Europe ahead of America at this point. Ownership was not able to be fully recorded within the categorisation as that would have been a monumental task, so the level of accuracy here could be challenged, but from the data that was readily available, this was the result. However, the high European intensity score would have been skewed by O'Reilly's APN (owner of nzherald), so if additional media sources had

been studied the pattern may have looked different. The size of this "Irish skew" became clearer once countries were examined.

2. Countries

Three graphs on the next page show what happened when the same coverage algorithms were applied at <u>country</u> level, and the results were not altogether surprising. <u>Iran</u> notably achieved a relatively high score on the explicit country measure (Figure 5.4.5.4) and dropped away slightly after that, implying that it was more often referred to by country name (rather than a city name, for example) than its immediate rivals. Its high position overall was due to Reuters ensuring that it remained constantly on the agenda, with several articles per month (like clockwork) repetitively making plain the US outrage that Iran intended to develop nuclear power. In fact, it was the sheer number of these articles more than any others that gave rise to the notion of classifying Reuters as an <u>opinion</u> source rather than a <u>news</u> source (mentioned alongside Figure 5.1.3.4).

As discussed for regions, the middle graph (Figure 5.4.5.5) showing <u>parental</u> coverage was the most suitable (and accurate) measure, and the last one (Figure 5.4.5.6) makes plain the high score for <u>Ireland</u> (from APN) once organisation owners were included into the functional coverage.

It was interesting that the <u>US</u> ranked more highly than <u>Australia</u> in all three of the country stakes, whereas <u>Britain</u> trailed both of them, and <u>China</u> was not far behind. Although not included here, a record of China's coverage by month might be expected to have shown an increasing trend.
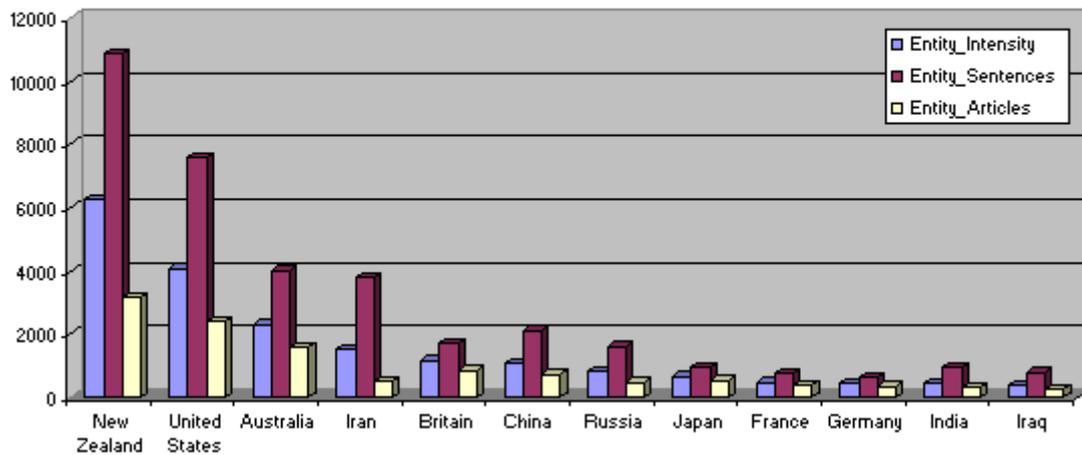
Figure 5.4.5.4 – Explicit coverage by country
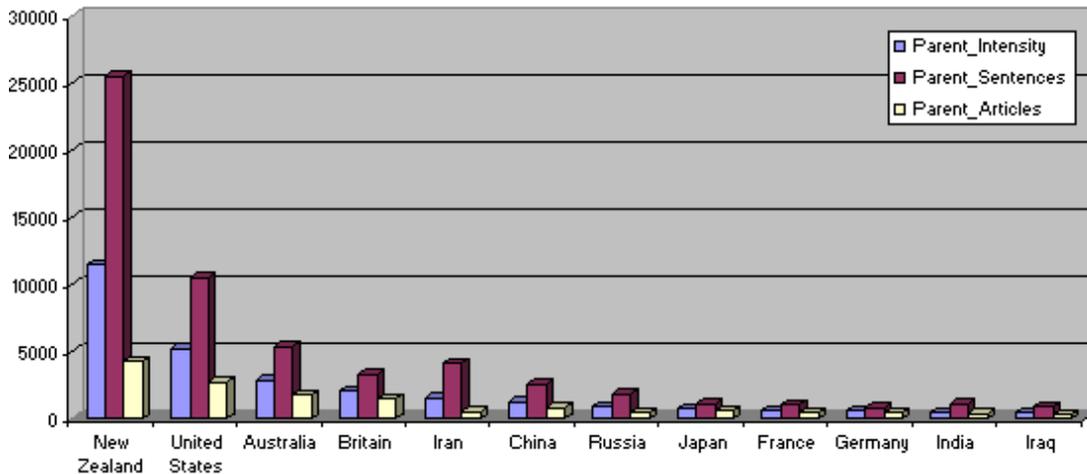
Figure 5.4.5.5 – Parental coverage by country
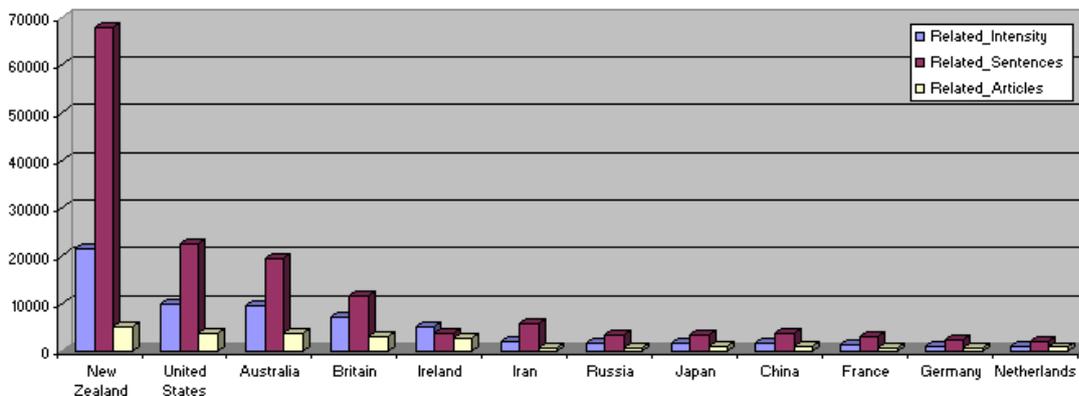
Figure 5.4.5.6 – Functional coverage by country

At this point it is worth noting that distribution by country / region has changed little since Cleveland's New Zealand newspaper content study of 1970, if regional content (this measure) and regional news source (his measure) are considered to be roughly equivalent. In his study of NZPA articles sourced from overseas for one week (57% of articles and 66% of word count), Cleveland (1970) found a regional ranking (with only one region per article) of (approximately), UK (20%), Australia (12%), America (11%) Europe (6%), Asia (6%), and Other (3%)[418]. He noted at the time that –

> These patterns of distribution may offer some support to the criticism of the Consumer Institute members who responded to a 1965 survey with the complaint that the New Zealand press had not realised that politically and geographically New Zealand was situated in South East Asia, and that events there were of vital interest. The press, it was argued, still reflected the older viewpoint that "Great Britain was closer to us than Indonesia or Vietnam"[419].

Although NZ may well acknowledge its Pacific and Asian connections more openly now than was the case in Cleveland's day, it can be seen from these results that the main difference is that America and Britain have changed places in terms of media coverage. Asia does feature but I suspect it will be some time before it displaces the European focus in the media.

3. Governments

The three graphs on the next page show these same three measures when applied specifically to governments rather than countries. Some large inter-governmental organisations were also included.

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[418] See Cleveland (1970:105) Table 4. The figures included above have been rounded and an approximate average taken between word count and article count, to give an indication only.
[419] Cleveland (1970:106).
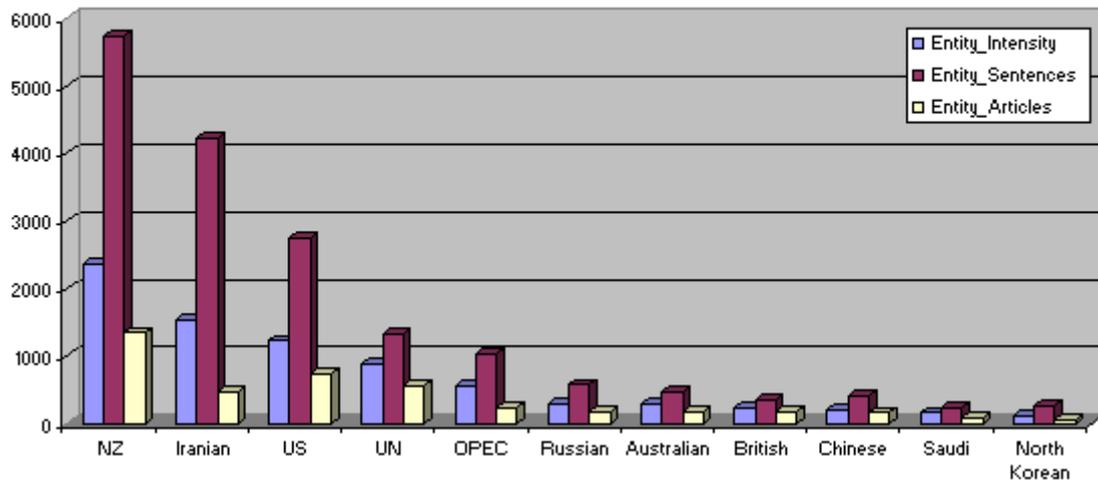
Figure 5.4.5.7 – Explicit coverage by government
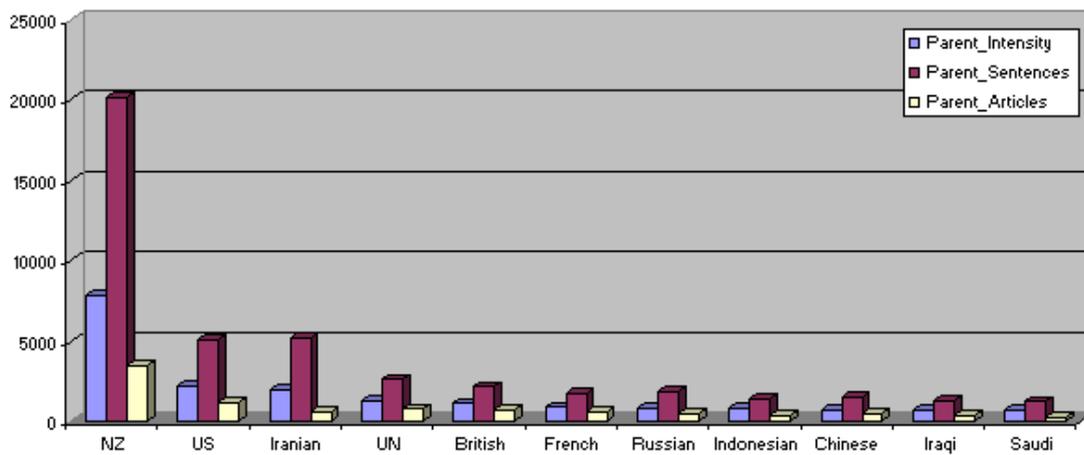
Figure 5.4.5.8 – Parental coverage by government
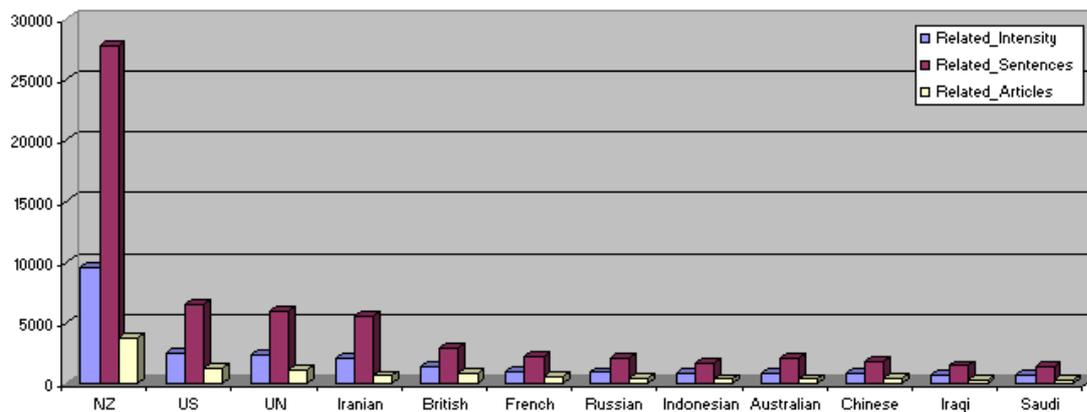
Figure 5.4.5.9 – Functional coverage by government

What is most intriguing here is that the Iranian and US governments received very similar quantities of coverage, in all three measures. In fact Iran actually surpassed the US when purely explicit governmental coverage was measured in Figure 5.4.5.7. This result may be explained by the strength of the UN scores, as the conflict was often portrayed in the media as one between Iran and the UN Security Council rather than the US itself. This imbalance was corrected within the next two parental and functional measurement graphs (Figures 5.4.5.8 and 5.4.5.9 respectively), once the US Government was able to be included as "implicit" in UN Security Council coverage.

The high scores for the Indonesian Government within the second and third graphs is also interesting. This was entirely unexpected and requires further research to explain, although its membership of both Opec and Apec would have helped boost its implicit scores. Although Australia scored well as a country, the Australian Government scored very low in these rankings, not even featuring in the top parental scorings (Figure 5.4.5.8).

4. Organisations

Following on from governments, a wider look at organisational exposure is in order. When finance, governments, and media were excluded, the organisations which received the highest explicit coverage scores are shown in Figure 5.4.5.10. It is clear that most were NZX participants.
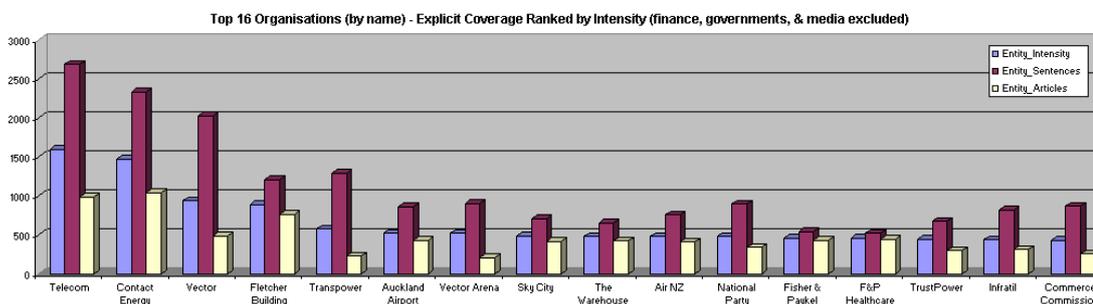
Figure 5.4.5.10 – Explicit coverage by organisation (with exclusions)

Non-sharemarket players of note here are Transpower, the National Party, and the Commerce Commission, all of which have been discussed already.

When finance, governments, and media were included, the organisation results produced the graphs in Figures 5.4.5.11 (explicit), 5.4.5.12 (parental) and 5.4.5.13 (functional), for the full sample of articles.
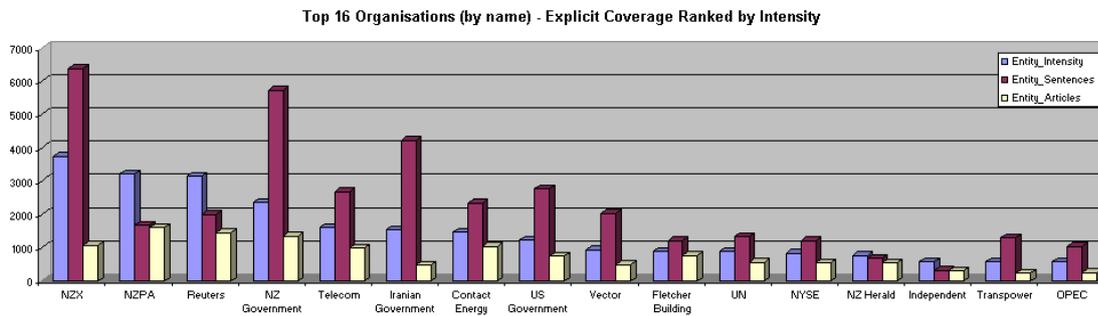
Figure 5.4.5.11 – Explicit coverage by organisation (no exclusions)
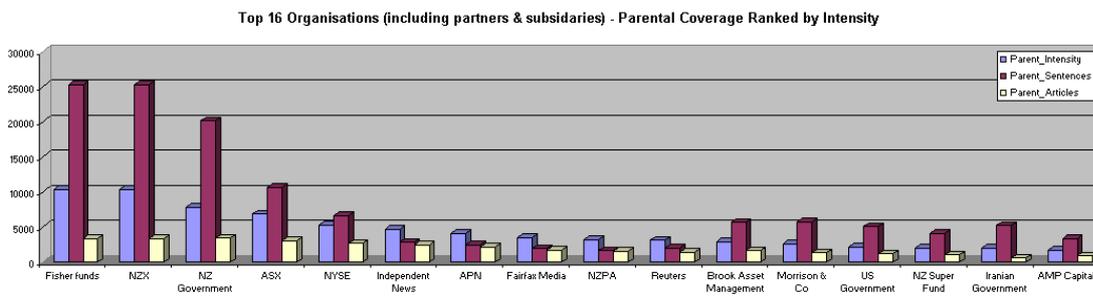
Figure 5.4.5.12 – Parental coverage by organisation
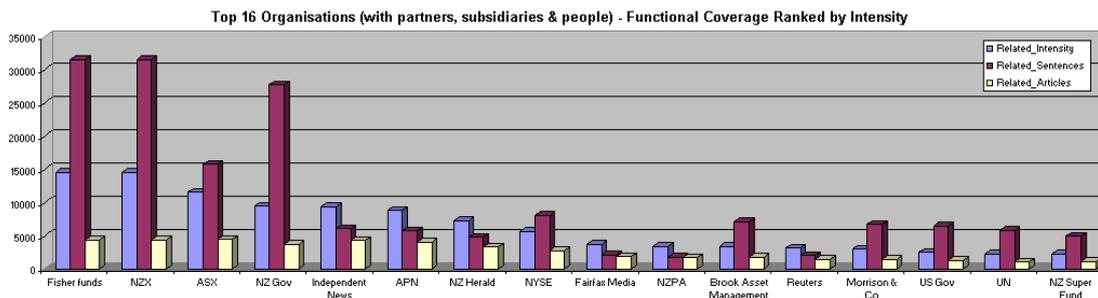
Figure 5.4.5.13 – Functional coverage by organisation

Because the ETAT categorisation system assigned NZX as a parent to all of its listed companies, a high result for its parental (Figure 5.4.5.12) and functional (Figure 5.4.5.13) coverage was expected but its high explicit scores (Figure 5.4.5.11) were not. The relatively low article count in that case indicated a prominence boost. Fisher Funds gained high implicit scores (in Figures 5.4.5.12-13) because of its shareholding in (part ownership of) NZX.

In conclusion, it appeared that the organisations benefitting most from implicit NZ media coverage were stockmarkets (NZX, ASX, NYSE), media companies (Independent News & Media, APN, NZ Herald, Fairfax, NZPA, Reuters), large investors (Fisher Funds, Brook Asset Management, Morrison & Co, NZ Super Fund, AMP Capital), and governments (NZ Government, US Government).

5. People

A similar analysis was done for the person sheet, and the results are shown on the next page. This time, parental coverage was not sufficiently different from explicit coverage (Figure 5.4.5.14) to warrant a separate graph but instead a variation excluding authors was constructed (Figure 5.4.5.15). Within those first two graphs it can be seen that Prime Minister Helen Clark received the most explicit coverage, followed by George W Bush, then Energy Minister David Parker. It was also clear that Folole Muliaga scored ahead of foreign leaders Mahmoud Ahmadinejad and John Howard. Authors Brian Fallow, Melanie Carroll, Mathew Dearnaley, Richard Inder, and Adam Bennett managed to complicate the findings by taking nearly half of the top spots in Figure 5.4.5.14. However, once authors were excluded in Figure 5.4.5.15, other featured politicians became visible such as Finance Minister Michael Cullen, Green Party Co-Leader Jeanette Fitzsimons, and SOE Minister Trevor Mallard. Taking the last three slots were high profile US climate change campaigner Al Gore, financial markets commentator Grant Williamson, and Vector chairman Michael Stiassny.

In the third and last graph (Figure 5.4.5.16), the scores for functional coverage were indicative only as they were totally reliant upon the (incomplete) entered information about owned shares by each participant. The four highest scoring (Peter Masfen, Carmel Fisher, Selwyn Cushing and David Cushing) were those known to own shares in NZX. These were followed by two media owners Tony O'Reilly and John Fairfax, and then a number of Government MPs with disclosed shareholdings, namely Ashraf Choudary (Labour), Jim Sutton (Labour), Jonathan Coleman (National), and Lynne Pillay (Labour). Several more politicians were listed after them but these figures were skewed in favour of politicians due to their required

public disclosure documents. The remaining two people in the list were high profile investors <u>Lloyd Morrison</u> and <u>Hugh Green</u>.
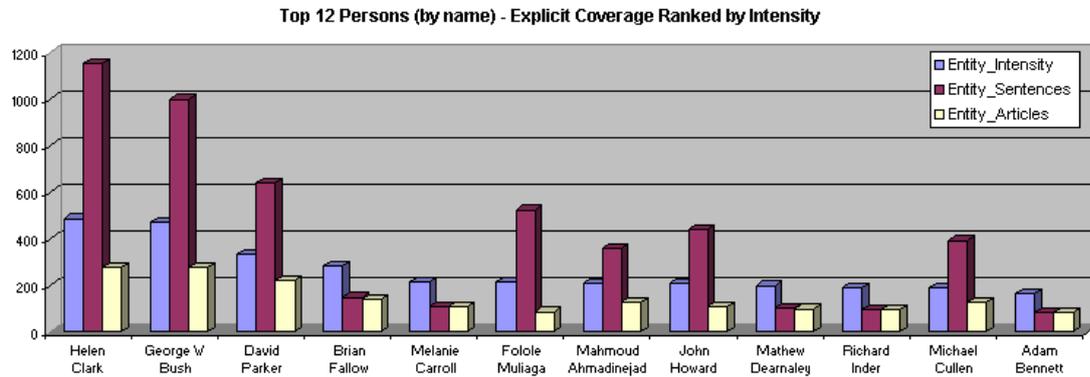
Figure 5.4.5.14 – Explicit coverage by person
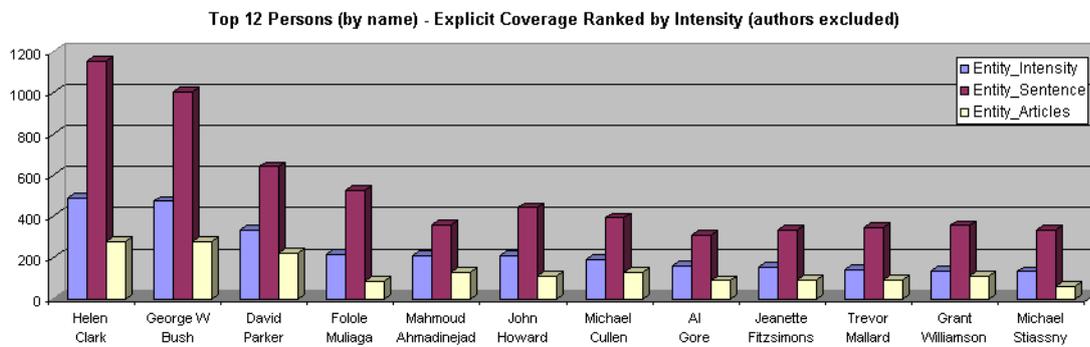
Figure 5.4.5.15 – Explicit coverage by person (without authors)
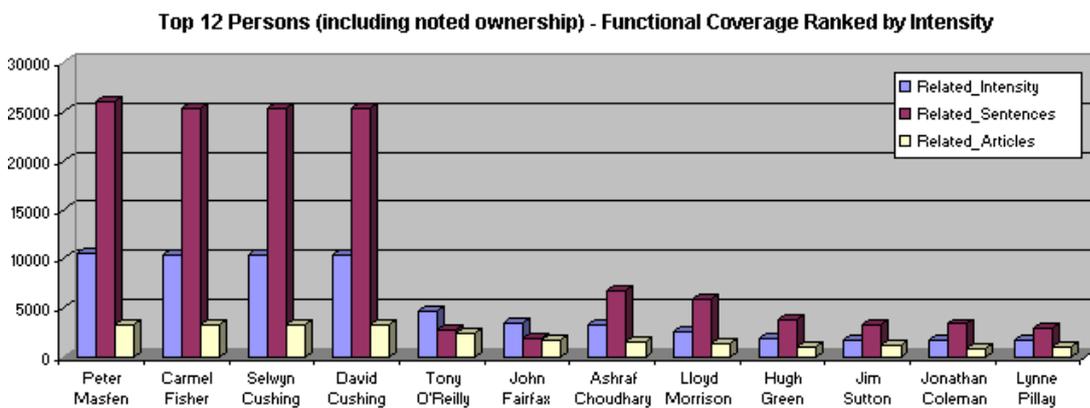
Figure 5.4.5.16 – Functional coverage by person

5.5 Conclusion

The data chapter has served two functions. One function was to demonstrate and explain the capabilities and implications of the newly derived ETAT method, and the other function was to present empirical findings to allow conclusions to be drawn (where possible) about electricity public policy and the news media.

In the case of the first (methodological) function of this chapter, a strong emphasis has been placed on the comparative method, in three different dimensions. The first dimension comprised of simple comparisons between selected entities, using an ordered ranking displayed laterally left to right for each group of entities. These relationships provided the most clearly delineated findings about the subject matter in question (more about the actual results further down), but they were not the only relativities under consideration.

Providing the second dimension were comparisons between indicators for the component entities (as per section 4.5.5), such that each individual item was displayed with three pillars, and the respective heights of those pillars told a story about the way that item had been presented in the news. The first pillar was a calculated intensity which assigned an overall weighting value to that entity within the media sample. The ordered item rankings within each standard graph were based upon this value alone. The second pillar was sentence count or substance, providing an indicator of overall volume of coverage, while the third pillar was a simple article count or appearance. Where substance was high compared to appearance, that implied that there were relatively few concentrated articles specifically on that topic. On the other hand, where substance came closer in value to appearance, this was more likely to mean a brief mention across many articles. Where intensity came close to substance (or rose above it) that indicated that almost every mention was assigned some special significance (this was particularly evident for media sources and authors).

The third dimension of comparison was the application (i.e. the inclusion or otherwise) of the relationship hierarchies (or "depth" of coverage) into the various measurements (as per section 4.5.4). Political party, country, and gender results in

particular were useful in demonstrating clearly how different outputs could be obtained with only slight adjustments to the counting mechanisms, allowing this understanding to be brought to bear on some of the other more esoteric entity measures. When selecting phrases to represent concepts there are always dilemmas around which phrases to include and which not to include, but even counting players is not always as simple as it may at first appear. Explicit coverage represented (as well as could be determined) the precise subject matter under scrutiny (including nick names). Functional coverage, on the other hand, added an additional level of perceived implicit coverage to the explicit coverage, resulting in higher scores when, for example, subsidiaries and spokespeople were added to counts for organisations. In the calculation of functional coverage a number of differing "degrees of separation" could be envisaged. The term parental coverage was used in this chapter to represent a constrained degree of functional coverage, limiting inclusion to child entities within the same class (for example subsidiary organisations but not people, or countries/cities within a region but not domiciled organisations or their owners). There is scope for additional work to further refine clear boundary rules to apply to each degree of separation for differing levels of functional coverage, especially for concepts (which were challenging) as well as players (which tended to have clearer natural boundaries). Pure literal coverage by word for key players (completely unrelated to meaning) was independently measured as well, but was not combined with the other indicators in this exercise. As with functional coverage, several gradations of literal coverage are conceivable but this was not explored further at this time.

It is customary in content analysis studies to pick one indicator and follow that through. By contrast in this study several indicators were followed and careful attention was paid not only to the comparative rankings between entities but also to how the different methods of measurement compared with each other for each entity. Where relationships between indicators ran in parallel (for comparable entities) this suggests broad equivalence in utility between the indicators, but where they varied lessons are able to be learnt, not only as a contribution to the interpretation of the results in this study, but also to assist with measurement choices for future studies.

The second important function served by this chapter was the presentation of empirical findings. It was not feasible to present all results for the large number of categories which were monitored as part of this study, so the few that were selected were chosen for the insight they could impart, either in relation to the thesis questions, or as an adjunct to provide an explanation of the method. Nonetheless, the very large number of categories being monitored added a thoroughness and greater precision to the study, both by handling exceptions and by ensuring that a high proportion of the total words and phrases were categorised.

In most cases the absolute counts were of most significance when assessed in relation to the counts for other entities, rather than standing on their own. The results will be further discussed in the next chapter but in order to conclude with a brief summary, the following patterns were seen to emerge.

Two thirds of the 6362 selected nzherald articles were New Zealand-oriented, half were primarily about business, and one quarter of the sample had a major (as opposed to minor) focus on electricity. In line with the primary subject dominance just mentioned, money, economics, business and the stockmarket featured prominently in both explicit and implicit coverage throughout, well ahead of other topics in most equivalent categories. One result of the stockmarket hegemony was the clear advantage in coverage that publicly listed electricity companies received over their government-owned counterparts.

While the opposition party received more explicit coverage (by name) that the governing party for every country examined, governments as a whole scored highly in functional coverage once all of their representatives were included, reflecting the common assertion that media mostly report on business and government[420]. Unions and community groups received some mention but notably lacking in coverage were beneficiaries, the elderly, the poor, the disadvantaged, tangata whenua, the commons, social equity, and Scandinavian countries (which have world-leading

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[420] Shoemaker & Reece (1990:652); Gavin 2010:73).

policies in some crucial areas). As predicted by GMMP, <u>men</u> received about three times as much coverage as <u>women</u>.

The broadly defined <u>environment</u> topic scored well though a more specific focus on <u>ecosystems</u> did not. Contributing to the environmental coverage was the increasing attention given to <u>climate change</u> over the period. Some <u>peak oil</u> awareness was evident in discussions of <u>alternative fuels</u> and <u>electric cars</u>, however despite the looming problems of climate change and peak oil, <u>fossil fuels</u> easily dominated the energy sources comparisons, where <u>nuclear</u> intriguingly gained as much coverage as the whole of the <u>renewables</u> topic. <u>Energy efficiency</u> was not well covered, and <u>alternatives</u> to the status quo, such as <u>solar power</u>, were hardly visible at all. Explorations of other policy topics, such as the <u>emissions trading system</u> and <u>sustainability</u>, appeared to tamely reflect the political discourse of the day. <u>Growth</u> was a prominent theme, and so was <u>balance</u>.

For the four selected case studies, the ETAT method was able to highlight some features of interest. The volume of articles about the Muliaga death indicated a high level of media attention and the nature of the controversy meant that it became a political issue, unlike the slower moving and ongoing Waikato pylons issue where politicians were largely absent. In the latter case a residents group fought valiantly but could not compete for coverage with the larger players. Similarly, player counts for coverage of the Hemmingway dismissal showed that he was outgunned by opponents on all sides, reflecting some of the difficulties that regulators face in this arena of powerful actors. In the last case study about SOE privatisation the sample selection was less precise but the interest shown by stockmarket players within articles touching upon this topic was very apparent.

In the next discussion chapter, these results will be further analysed and related to events, issues, and electricity public policy development within the real world.

Chapter 6 – Discussion

> *Since journalism has had such a privileged position as central institution for establishing what is to be considered as objective or true and even common sense, it is important for journalism scholars to analyze which spectrum of facts is permitted by this mediated reality and what is silenced.*[421]

6.1 Introduction

The aim of this study was to explore new ways of measuring media coverage by identifying the frequency with which entities and concepts were mentioned within the text of a set of media articles, to make inferences from those frequencies, and where possible, to relate the findings to events, issues, and electricity public policy development within the real world.

The contention is that by privileging certain players and concepts within the news, and silencing others, democracy is stifled and preparation for future energy and environmental challenges is held back. Although precise causes (of apparent media bias) and precise cultivation effects (upon readers) cannot be measured by a simple content analysis study, assertions that systemic structural issues have a significant part to play in the revealed hegemonic presentations place this thesis clearly within the critical political economy paradigm.

This chapter critically analyses the quantitative results presented in the previous chapter, augmented by pertinent article excerpts. First, the thesis questions are revisited and the feasibility of answering them using the technique employed is examined. As this was an exploratory study, certain peripheral points of note are also included. This is followed by two sections further discussing selected aspects of the results presented in the previous chapter (case studies, and other selected samples). These findings are related back to events and issues in the real world where possible. The chapter finishes by discussing limitations, recommendations, and opportunities for further research.

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[421] Fürsich (2009:246).

6.2 Addressing Thesis Questions

The question is not how accurately does the text reflect reality but what version of reality is normalized and as a consequence, how emancipatory or hegemonic is the text[422].

6.2.1 Question 1 – Which Voices?

Four thesis questions were proposed in the introductory chapter and the first was – which sectors of society, organisations, and/or individual persons, were the prominent voices within the selected media texts, and which were missing?

Broadly summarising the results by sector, the following trends were evident. In the topics section (where explicit total coverage across all articles was examined, not just primary subject), business players scored significantly ahead of the other three high level player categories (government, household and other) and the comparative ratios were almost identical whether the sample chosen was major electricity articles, or all articles in the study, indicating broad applicability for these results. Business players were covered more than twice as much as government & education (the next category), whether measured by sentence count or by calculated intensity. Within the business category, commercial (esp. media references), finance, transport, oil and heavy industry were all high scoring, while agriculture, coal and forestry received little mention by comparison.

In the non-business topic categories, the government sector was significant, almost scoring as high as the finance sector did in the business section. Families, workers, political parties, NGOs, local bodies and education each scored roughly between a fifth and a tenth as much as government, and the elderly and beneficiaries topic category hardly featured at all by comparison.

Coverage of the electricity sector was mostly about electricity suppliers (~50%) or transmission (~25%), with some focus on residential consumption (~10%). Business consumption, regulators and the electricity market received relatively little coverage. When individual organisations were compared, the companies which

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[422] Fürsich (2009:249).

were listed on the stockmarket (especially Contact and Vector) received significantly more coverage than the others, and regulators received significantly less coverage than the companies they were regulating.

In alignment with the thesis question, Fürsich says it is important to ask "which gender, class and ethnic identities the current cultural sensibilities (as expressed in this text) encourage and which ones they exclude"[423]. In response it can be said that the male gender received 75% of the gender-based coverage, the business class received 60% of the sector-based coverage (with government at 25%, and household at 12%), and although ethnicities were not examined specifically, it was clear that the tangata whenua topic category received negligible coverage overall (approximately 0.2% when compared with the sectors mentioned above). From Fürsich's reading of the results it would appear that wealthy share-owning business men and politicians are "encouraged", while women, the elderly, the poor, and tangata whenua are "excluded".

When considered within the context of the framing applied by GMMP, the dominant groups are firstly provided with a "voice" via the media, while others are silenced, and secondly dominant groups are given an opportunity to see themselves reflected as inordinately important within a skewed picture of the world, while those with significantly less coverage may see themselves within this picture as diminished, unvalidated and powerless.

If cultivation effects come into play and policy makers instinctively receive media content as a proxy for public opinion then the theoretical implications of this state of affairs from a policy perspective are that the concerns of the dominant groups will "naturally" be assumed to be of more ongoing importance than the concerns of others, when policy makers consider priorities. Within the arena of electricity policy specifically, this implication extends to a focus on electricity company profits, to the detriment of those who struggle to pay their power bills.

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[423] Fürsich (2009:247).

6.2.2 Question 2 – Which Concepts?

The second question raised at the start of the study was – which issues, political ideologies and electricity policy concepts were given the most media coverage, and which were missing?

When measuring explicit coverage for issues of concern, the economics topic scored significantly higher than all other concerns, and was the main contributor to the high score for the progress and political imperatives topics. By comparison, there was almost no mention of the social equity topic, which included the poor and disadvantaged groups. The environment as a whole gained about half of the amount of coverage as political imperatives, though there was very little coverage of the more focused ecosystems topic. About half of the environmental coverage came from climate change, and much of that coverage was about the problem of emissions. There was almost no mention of specific climate impacts (supporting the 2012 findings of Campbell). Peak oil received about a third of the coverage of climate change, almost all indirectly due to coverage of alternate fuels. Pollution received roughly the same coverage as peak oil. When trends were examined, climate change coverage was seen to increase significantly over the two year period while peak oil and pollution also showed some rise (see section 6.4.1 for further discussion of environmental issues). Scores for ownership issues almost exclusively comprised of property rights, and within that, enterprise ownership. By comparison there was very little mention of the commons, public land, water use, or anything related to tangata whenua.

Within the policy topics section, the energy sources comparison showed a heavy weighting towards fossil fuels, which appeared about three times as often as renewables or nuclear (the latter two scored roughly equal to each other). Although the general topic of renewables featured reasonably often, its component parts (hydro, wind, biomass, and solar) were relatively rare, especially when compared to the high explicit coverage of oil. Coverage in no way reflected actual electricity generation proportions (see section 2.3.4), as long-standing reliable hydro was (perhaps unsurprisingly) seldom mentioned, mainly only in the context of dry weather lake level concerns. More concerningly, however, was the lack of emphasis

upon renewable solutions for the future (especially solar), with fossil fuels and nuclear receiving highly skewed volumes of coverage in that respect.

Under structure and regulations, trading and markets appeared roughly five times as often as pricing and regulation, and the sharemarket featured very prominently. When all articles were considered the sharemarket eclipsed everything else by a wide margin, with oil markets receiving about a third as much coverage, and standards about half of that. However, within articles primarily about electricity, the electricity market and carbon trading also featured alongside oil markets with the three categories receiving roughly equal treatment, each between about a fifth and a tenth as much coverage as for sharemarkets. Also within this smaller electricity sample, the categories of standards, electricity charges, and the RMA were topics of some interest and each rose in importance to be between one and two thirds of the sharemarket coverage. Under system security, the categories of system reliability, system oversight, local transmission and national transmission all received reasonable coverage but alternatives to the status quo (whether off-the-grid or integrated/distributed like solar power) received almost no coverage.

Under demand management, the categories of electric transport, household power saving and industry power saving received more attention from the media than more systemic solutions like metering, insulation, water heating and building rating systems. Like distributed generation (e.g. solar panels) location of generation, though capable of saving significant power (through reduction of transmission losses) did not feature. Similarly, although coverage of household power saving tips in the media provide a form of consumer education, that function was hardly mentioned explicitly by name. Examined trends showed that fossil fuels were consistently of more interest to the media than renewables and energy efficiency combined, with the latter showing relatively poorly (supporting the 2009 findings by Blackwell).

The carbon tax was of more interest than the emissions trading scheme for the first 7 months of 2006 but after that the emissions trading scheme became a very popular topic (effectively echoing political decision making). However, at a higher more

generalised level it was found that markets were mentioned much more than taxes (and regulation), by many orders of magnitude throughout the whole period. Price volatility no doubt contributed to the fact that oil prices were a more popular topic than electricity prices for all months except the month immediately after the Muliaga incident.

Within the communications topics section, it was found that tone came out roughly even between positive, negative and neutral, that explicit entertainment references featured more than explicit news references, and that the media appeared self-referentially mostly in its source and author lines. Coverage of channels such as television and internet was slightly higher than the others, and books were seldom mentioned.

This is a large number of results, and significant among them is the dominance of oil and share markets, alongside the paucity of any concept of the commons. In terms of Lukes' second and third dimensions of media power, gatekeeping and transmission of values respectively, it can be seen that the consumption of electricity is being effectively promoted, while the conservation of electricity is downplayed or ignored. Polluting (entrenched, consumptive, commodity) industries take priority over clean (future-focused) ones and economic issues trump environmental and social issues. An individualistic celebrity-centric consumer society is celebrated, while those who are disadvantaged or who would put forward alternative ideologies are largely invisible.

From a critical political economy structural approach it is clear that the observed money, market, and property rights focus starkly reflects neo-liberal capitalist economic thinking, and also reflects the structural ownership and competitive working environment of the nzherald, itself a listed member (via owner APN) of both the New Zealand and Australian stock exchanges.

6.2.3 Question 3 – Adequacy of New Technique?

The third question was a methodological question and asked – was it possible and practical to develop a text analysis technique to systematically measure and

compare the relative cumulative coverage of a wide range of entities and concepts relating to electricity policy?

The technique undertaken here was an advance upon traditional media content analysis in a number of significant respects. Without attempting to move too far along the continuum towards natural language processing (NLP) in all its complexity, the ETAT method managed to maintain a level of simplicity in the important aspects required for a targeted research project, while adding another layer of depth to the analysis.

It automated some of the tasks that would normally be performed by a manual coder, and by so doing has allowed for the interrogation of a much larger number of categories and inter-entity relationships (than a human coder could cope with at one time), as well as including the ability to adjust categories at any time, even at a late stage in the research. Automation has improved some aspects of accuracy (reproducibility for example) but overall exactitude still contains a margin of error which is heavily dependent upon the thoroughness of the innovative categorisation processes.

For example, vehicle drivers and the weather[424] enjoyed high levels of coverage. The huge number of different related phrases which combined to provide the cumulative scores for each of these two concepts provided an example of the usefulness of the structured hierarchical approach delivered by the ETAT method. This data would have been difficult to gather manually in a consistent manner.

Krippendorff attests that "despite remarkable progress, content analysts can hardly claim to have met the challenges of the new era. The imagined analytical potential is far ahead of what can be done today, fuelling the work of many developers of new analytic tools"[425]. The new technique developed in my study has successfully opened fresh avenues for the exploration of improved content analysis techniques.

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[424] Described in Campbell (2012:36) as "news you can use", as it is experienced by everyone.
[425] Krippendorff (2004:iv).

6.2.4 Question 4 – Meaningful Indicators?

The fourth question was a further methodological question and asked – were meaningful indicators and rankings able to be derived to assist with such analysis?

It is clear from examining the data results that the distinctive indicators that were chosen for this study gave rise to shades of meaning which would not have been available using more traditional methods, so the question is able to be answered in the affirmative.

For example, when analysing the multiple parameter sets towards the end of the data chapter, key points were the differences between the closely related graphs within each set, demonstrating the importance of determining exactly what is being counted when performing content analysis. Often these category boundaries are not clear when reading about other studies, and this can bring results into question.

The gender results were able to be compared with the GMMP study, providing some construct validity for my study, as well as some explanations for the range of results that might be possible using slightly different techniques.

For the country comparisons, three different ways of measuring the results were supplied, indicating that even in the apparently simple area of geography, care must be taken to clarify exactly what is required, and what is being measured.

One clear finding was that although governments gained more coverage, opposition parties gained more explicit name exposure. Such an observation would not have been possible without the fine grained differences in coverage options provided by the unique set of indicators.

6.3 Case Study Analysis

> *If it bleeds, it leads (anon).*

6.3.1 Introduction

When this "real time" study commenced (in late 2005), most events which were to occur during the two year period of interest were as yet unknown. Once the study was underway and media articles were being progressively collected, various issues arose which appeared to be suitable for closer analysis, and four were chosen as case studies (Muliaga death, Hemmingway dismissal, Waikato pylons, and SOE privatisation). These selected issues were listed (along with other more generalised sample sets) in Table 4.7.8.4.

Other events occurring during the two year period of study but not chosen for closer study included multiple conflicts within boards of directors (Vector, Pike River Coal), potential takeovers (Origin of Contact, Auckland Airport by various suitors), threats by the Commerce Commission to take control (of Vector, of Transpower), the release of the government's energy strategy[426], and overseas issues (significantly Iran's nuclear ambitions). These events all provide fertile ground for later studies.

The discussions below are ordered approximately as the sample sets appeared in 4.7.8.4 and as their statistics were provided in section 5.3 of the data chapter.

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[426] The three consecutively released documents were the Draft Energy Strategy, the Energy Strategy, and the Energy Efficiency and Conservation Strategy.

6.3.2 Muliaga Death

> *… to recommend thrift to the poor is both grotesque and insulting. It is like advising a man who is starving to eat less.*[427]

The death of Folole Muliaga on 29th May 2007 (after a power disconnection at her home) was a sudden event which brought electricity policy to the front page. This event and its consequences scored third equal in the UMR "biggest news stories of the year" survey for 2007, where 72% of respondents reported that they followed this news item closely[428].

Mrs Muliaga had recently been released from Middlemore Hospital and had taken home an oxygen machine which she used intermittently when short of breath. The power bill (of $168.40) for the Muliaga home was overdue and Mr Muliaga had tried to pay some of the bill while his wife was in hospital, but his payment had been refused because the electricity account was in his wife's name. Because the bill went unpaid for a certain length of time (despite two small payments within the previous fortnight and even though the latest bill appeared to have a future due date of 13th June) an electricity disconnection was ordered . Mrs Muliaga was at home with two of her sons when the contractor arrived at about 2pm and disconnected the power, thus disabling her oxygen machine. Mrs Muliaga died within 2 hours. Even after she had died, the family had difficulty arranging for their power to be reconnected and had to wait until 8am the next morning.

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[427] Wilde (1891).

[428] UMR (2008:23). Eight of the 11 top news stories in 2007 were about individuals, and all of those involved crime or death. Two of the other three were about violence (the anti-smacking bill), or destruction (weather bomb). Only one of the 11 was positive, and that was about Team NZ winning the Louis Vutton Cup. The pattern in 2006 was similar, where four of the top 11 stories involved the death or dramatic rescue of individuals, three involved destruction (extreme weather), two conflict (Lebanon & Fiji), one was about policy (hospital waiting list problems), and one was positive (though controversial) about the upgrade of Eden Park vs. a stadium on the waterfront (UMR 2007:23-24). For this analysis of the 2006 survey I counted two stadium stories, and two Lebanon stories as one story in each case.

The family forgave the contractor but challenged the electricity sector -

> "The public interest is not served by a criminal investigation to blame any individual for this tragedy. What's required is an investigation into electricity companies and their procedures and practices." ... "If there were corporate manslaughter laws in this country it would be a different matter but we don't want this individual persecuted.

Example 6.3.2.1 PM praises family at Muliaga funeral – Maggie McNaughton[429]

The event was an embarrassment for Mercury Energy (the electricity retailer who commissioned the contracting company VirCom EMS), Mighty River Power (Mercury's parent gentailer SOE company), and also for the government as owner of the SOE. All moved into damage control mode immediately, part of which was an attempt to manage the media, and to be seen to be doing the right things.

Due to the high profile nature of the case and the danger of adverse international publicity, Prime Minister Helen Clark was involved from the outset.

> She told the power firm this morning that it should "stop digging" after it stood firm insisting it did nothing wrong when it cut Mr Muliaga's power. ... Helen Clark said Mercury needed to stop concentrating on defending its actions and be more open. ... She also hinted at a toughening of the rules under which power companies operate, saying every power supply firm should be made to consult the Ministry of Social Development before any customer's power was cut off. ... "We all feel not just embarrassed but devastated that this incident of heartlessness by a company and a contractor has gone around the world conveying an image of New Zealand that we don't like of ourselves," she said. ... Miss Clark said even if Mrs Muliaga's death was not directly related to the power cut, Mercury's actions to cut the family's power in the circumstances was wrong.

Example 6.3.2.2 Mercury executives, PM visit the Muliaga family to express sorrow and sympathy – Louisa Cleave[430]

From a media perspective this was a sensational news story. Death, drama, injustice, innocent victims, grief, bureaucracy gone mad, and a faceless uncaring large company (albeit government owned). As such, it remained a prominent news story for a considerable length of time (see Figure 5.3.1.1) and fuelled a media-driven campaign for changed company and public policy, which was ultimately successful (to a certain extent).

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[429] Source: nzherald 6 Jun 2007 ObjectId=10443867.
[430] Source: nzherald 1 Jun 2007 ObjectId=10443049.

> There was a time, under the old community-owned Auckland Electric Power Board, when the provision of electricity was a public service, electricity was seen as a necessity of life, and people mattered. It's been sickening to see National Party SOE spokesman Gerry Brownlee leaping into the fray, trying to make political capital out of this tragedy. It was his party that in the so-called reforms of 1992 and 1998, changed the focus of retail electricity from public service to profit first. He should be apologising too. That said, it is disheartening that eight years of Labour Government has failed to remedy the situation.

Example 6.3.2.2 Brian Rudman: Who's got the power? Certainly not the poor[431]

As far as media coverage of events relating to electricity public policy is concerned, this particular event generated the highest volume of related articles and the most apparently emotive language.

While difficult to measure directly, media influence upon public policy was asserted in this case by O'Sullivan et al. (2012), as discussed in Section 2.4.3. This assumption was based upon the circumstances, and upon what had been deduced from other studies about the way politicians and policy-makers tend to assume that media coverage reflects public opinion, and react accordingly[432].

The heightened media interest in this incident and subsequent public and political discussion backed up this assertion and certainly gave rise to the most visibly direct example of suggested media influence over electricity policy, within the time period being studied. In the days and weeks following the disconnection, questions were asked about existing policies and about proposed improvements to policies relating to electricity disconnection.

Apparently as a direct result of this incident, the Government introduced the "Electricity Disconnection and Low Fixed Charges Amendment Bill" to allow them more control over power companies' disconnection arrangements.

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[431] Source: nzherald 1 Jun 2007 ObjectId=10443039.
[432] O'Sullivan et al. (2012:58).

> Grey Power energy committee spokeswoman Molly Melhuish said the low fixed charge proposed as part of the Government's Electricity Disconnection and Low Fixed Charges Amendment Bill would not help elderly consumers, saving them on average only $2 a month. Instead, Grey Power would like to see the Government consider progressive pricing - a system that would give people an entitlement to a certain amount of power at a reasonable price. The bill, which passed its first reading in August, would give the Government greater powers to regulate power companies. It proposes raising the threshold for low fixed charge eligibility from 8000 kilowatt hours a year to 9000kWh for domestic consumers in Christchurch and south of the city. The legislation was hatched immediately after the death of Mangere mother of four Folole Muliaga in May after Mercury Energy cut power to her home, causing the oxygen machine she was using to shut down.

Example 6.3.2.3 Power plan 'would not help aged' - NZPA[433]

While it was true that something was "seen to be done", the projected effectiveness of the bill was not wholeheartedly endorsed (and the rules were later weakened in 2010 in response to corporate complaints[434]).

> United Future leader Peter Dunne said the bill did so little there was no reason to vote against it.

Example 6.3.2.4 Power control bill passes first stage - with doubts - NZPA[435]

This case, a sensational issue revolving around the death of an individual, allowed the news organisation to present itself as champion of the underdog, outraged on behalf of the public, demonising the uncaring large organisations, and campaigning for policy changes. This dramatic campaign was seen to be ultimately successful, despite having little effect on the underlying structure of the system and glossing over the underlying causes of inequality in society. While one end result was that more care was taken by electricity companies to encourage consumers to register medical device dependence, ultimately the ability to pay one's electricity bill remained the responsibility of the individual (now with additional support from budgeting agencies), regardless of steadily increasing residential electricity charges (see Figure 3.5.4.3).

This first case study incorporated all of the requirements for a sensational news story and significant media influence upon policy was able to be observed.

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[433] Source: nzherald 19 Oct 2007 ObjectId=10470815.
[434] O'Sullivan (2012:59).
[435] Source: nzherald 8 Aug 2007 ObjectId= 10456389.

Company policies were tightened and the Government introduced a Bill into Parliament. Although both of these areas of policy changes were publicly acknowledged to be a direct result of the <u>event</u> itself, media influence also appears to have been a significant factor. This assertion arises from the level of media coverage the event received and the fact that the public would not have been aware of the issue at all had it not been carried and sustained by the media (thereby exacerbating embarrassment for the companies concerned and the Government owner, and triggering the necessity to be seen to be addressing the issues raised). While other deaths caused by electricity also occurred during the two year period of the study (electrocutions), this death was the only one which received extended media attention.

This first sample provided a platform to explore the ETAT method, and the results were described in section 5.3.1. Features which were evident were the predominance of politicians within the articles, and the observation that opposition parties received more explicit coverage than governing parties (who carried the Government label instead). When all relevant phrases were included it transpired that even in the case of a personal tragedy such as this, business (and money) turned out to be the leading theme across the accumulation of all articles. Families, community support and personal safety all featured reasonably well (aligning with the personal positivity observed by O'Sullivan – see section 2.4.3), but the social equity angle continued to receive very little attention. This was an aspect also lamented by O'Sullivan, who saw it as a missed opportunity by social activists who should have leveraged the media frenzy and harnessed it more effectively for social change.

This one sample contained the right balance of newsworthy effects and provided an example of a situation highlighted by Jones and Wolfe, where –

> For whatever reason, the media can become preoccupied with an arena that may be ripe for policy action. By repeated muckraking and highlighting particular aspects of the information stream, the media may help to set the tone for subsequent policy action[436].

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[436] Jones & Wolfe (2010:31).

6.3.3 Hemmingway Dismissal

> *Who is given power in [journalistic] political discourses … and who is painted as victim, can have critical consequences[437].*

The dismissal of Chief Electricity Commissioner Roy Hemmingway by the Minister of Energy David Parker was announced on 13th September 2006. While commentators (and Hemmingway) described it as a dismissal, the Energy Minister preferred to call it a "contract non-renewal" instead.

Roy Hemmingway was appointed as the first Electricity Commission chairman in 2003 when the Electricity Commission was formed, following the failure of the newly reformed electricity sector to develop a workable voluntary regulatory regime[438].

The Electricity Commission was theoretically independent of the Government, but was limited in its powers and jurisdiction. Its role was primarily to regulate Transpower's grid investment while also attending to overall system capacity and security. A separate regulatory body, the Commerce Commission (led by Paula Rebstock), regulated Transpower's pricing, and there was a period during the study in early 2006 when the Commerce Commission threatened to take charge of Transpower due to irregular pricing.

Roy Hemmingway had been placed in an invidious position. As the head of an organisation set up to regulate New Zealand's monopoly transmission supplier, he was brought head to head with Transpower's CEO Ralph Craven. Their resulting rivalrous relationship was not reported on directly by nzherald (other than a brief mention in the article below), but was discussed in other media outlets once the sacking had been announced, being frequently described as a "dysfunctional relationship".

Roy Hemmingway did not have a chance of reining in Transpower or withstanding the "supply at all costs" mantra not only of Transpower, but also of business leaders

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[437] Campbell (2012:18).

and the other major power generators, backed by ministers ready to accede to their wishes.

The issues were described clearly in advance by columnist Richard Inder who, presumably oblivious to the approaching dismissal, suggested that Roy Hemmingway might even resign as a result of the treatment he experienced.

> At least the [Commerce] commission's independence is enshrined in law.
>
> Cabinet papers detailing Energy Minister David Parker's contribution to the aforementioned policy statement this week showed the Electricity Commission enjoys no such luxury.
>
> They disclose that Parker, frustrated over the delays to the 400kV line through the Waikato to Auckland, suggested the Cabinet take over planning of the national grid. They also disclose the Cabinet discussing how it could instruct the energy regulator to approve any power project the politicians deemed worthy.
>
> Frankly, it will be no surprise if the fiercely principled Electricity Commission chairman Roy Hemmingway decides to walk when his contract expires next month.
>
> In one stroke, Parker dispelled any illusions Hemmingway held over his independence and left him in an intolerable position.
>
> The commission was set up and Hemmingway appointed just over 2 years ago in an apparent attempt to impose on these critical decisions robust and dispassionate analysis.
>
> Now the very administration that created the beast is refusing to back it at the moment of its greatest need - hardly a response to inspire investor confidence.
>
> The 400kV line is the first major transmission upgrade in more than 10 years and is always going to be contentious.
>
> Over the approval process, Hemmingway appears to have acted within his mandate - and although government insinuations of relationship problems between him and Transpower cannot be ignored - he is, in some measure, taking the flak for the national grid's poor planning processes.
>
> Moreover, the Government admitted it had not given Hemmingway proper directions when, as part of the policy statement, it asked him to take greater account of its aim to boost the amount of energy generated from renewable resources.
>
> The Government should back Hemmingway.
>
> The alternative of taking control of the grid, which means the end of the electricity regulator, will certainly do little to foster enthusiasm for New Zealand as an investment destination.

Example 6.3.3.1 Richard Inder: Poverty of thought comes in many guises[439]

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[438] Bertram (2006).
[439] Source: nzherald 12 Aug 2006 ObjectId=10395826.

This second case study describes a situation in which the media played a different, more subtle, role. In contrast to the Muliaga case where a specific event triggered ongoing sensational media coverage which in turn led to actual policy change, in this case media coverage tended to simply reflect existing power structures, both before and after the dismissal event. It also reflected the observation that media "coverage gives priority to conflict that involves high profile actors"[440].

Coverage after the event did indeed raise questions about process, about personalities, about undue Government interference, and about the lack of legislated independence of the Electricity Commission, but no actual policy changes in any of those areas were observed as a result. While much of the action took place behind the scenes (asserted by Roy Hemmingway and others to have been effective lobbying by Transpower and the major generators), it was also evident within the measures of media exposure that the major electricity sector organisations received more extensive coverage within the media than the Electricity Commission.

The quantitative results for this sample were provided in section 5.3.2 and support the view of Roy Hemmingway as a lone voice among many other powerful interests. For example, in Figures 5.3.2.2-4 it was seen that most of the other people and organisations who featured in articles about Hemmingway were government or electricity generation representatives. All of these parties wanted the 400kV transmission line through the Waikato to be built as soon as possible, and saw the regulator as causing only unnecessary delay. The lone voice in Hemmingway's defence that was visible in the graphs was that of the residents' group New Era Energy, which welcomed the fact that the Commission was following due process, thereby taking the time to explore options and to challenge Transpower to find the best solution[441]. Furthermore, Figure 5.3.2.5 showed clearly that Transpower had a much higher profile in the media than the Electricity Commission, gaining an overall intensity score of 868 (73%), which was nearly three times as high as the 319 (27%) for the Electricity Commission.

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[440] Brown (2010:133).
[441] McQueen & Robinson (2005).

6.3.4 Waikato Pylons

> *Specific crises and conflicts often open a window of opportunity for the media, giving them access to the policy process and the chance to effect change in it[442].*

The third case study, the issue of the Waikato pylons, was in fact the main reason that Hemmingway's contract was terminated. The most significant difference between coverage of this issue and that of the previous case study is that politicians (notably the National opposition) featured in discussions about the dismissal but were notably absent from articles about this perennial underlying structural issue (see section 5.3.3). One explanation for the clear absence of the political opposition in this case is likely to be the difficulty of the decision. While inappropriate Government interference could safely be proclaimed in protest at Hemmingway's dismissal, politicians on the other hand would probably prefer to avoid being seen as being opposed to a strengthened national grid.

This was an extended conflict situation lasting the full length of the study period which received intermittent media interest at various salient points within the process. At risk was the power supply into Auckland, New Zealand's largest city, so the subject was of interest to many parties. The process was effectively a duel between Transpower and the objecting landowners, with the Electricity Commission as referee and ultimate decision maker (within the rules). The amount of coverage allotted to the various voices and perspectives was the focus. Here lobby groups were evident, with the consortium New Era Energy and its spokesman Bob McQueen on one side, and the Major Energy Users Group (MEUG) on the other.

In this case the media performed the role of public educator, primarily keeping people informed about the debate and about the tenor of the numerous public meetings that were held. The Electricity Commission featured quite strongly in articles, but their coverage was dwarfed by that of Transpower and the Government. While it was true that the major generators were able to lobby the Energy Minister behind closed doors, they also spoke out in the media.

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[442] Koch-Baumgarten & Voltmer, (2010:224).

Once again media coverage appeared to broadly indicate the level of power held by each of the players involved in the issue (see section 5.3.3). Ultimately a slightly modified version of the upgrade went ahead a few years later, indicating the (perhaps inevitable) successful dominance of the needs of the powerful players who had received by far the majority of the media coverage during this period.

This case study provided an example of both a crisis (possible shortage of power to Auckland), as well as a conflict (between Transpower the grid operator, and land owners who did not want large pylons across their community). Therefore, despite the fact that it was a long drawn out process, at times involving fairly esoteric technical details, the issue did attract a reasonable amount of intermittent media coverage.

Despite best efforts at genuine consultation with the affected landowners on the part of the Electricity Commission, there were suspicions from the very beginning that the upgrade was likely to go ahead regardless, and this was relayed in nzherald reporting.

> … Transpower is reiterating its intention to have the pylons up within five years.
>
> … Transpower spokesman Chris Roberts said the Government had now made it "pretty clear that there needs to be a line in to Auckland built and that the commission has to work with Transpower to have that approved".
>
> … Construction would take place between 2009 and 2011. Asked if he thought that would be acceptable to Waikato farmers, Mr Roberts said, "No, but I think it will be acceptable to 1.5 million other New Zealanders."
>
> … Meanwhile, a source told the Herald yesterday that Transpower had already appointed a Brisbane firm to vet tender applications for construction of the 400kV pylons. …

Example 6.3.4.1 Simon O'Rourke: Anti-pylon group accuses Government [443]

This perspective gained credence when the Electricity Commissioner was subsequently dismissed for apparently delaying progress unnecessarily. Clearly this case study provided an example of powerful (electricity and Government) players successfully utilising the media to project and justify their policy intentions.

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[443]Source: nzherald 9 Aug 2006 ObjectId= 10395306.

6.3.5 SOE Privatisation

> *My guess is we still have not got the structure of electricity generation right. Until we are sure it is, it would be suicidal to partially or fully privatise it. (Such common sense won't stop an ideological privatisation, though)[444].*

The generic state-owned enterprises (SOE) model seems to have provided a satisfactory governance structure for the many and various enterprises upon which it was subjected, but this "corporatisation" model was initially intended as a "half-way house", according to Roger Douglas[445], architect of the "Rogernomics" market reforms. Thus there was always the danger that to commentators, or to politicians with a privatisation predilection, any SOE was an attractive target.

During the period under study, there was public discussion about part-privatisation of some of the larger SOEs, specifically the three large electricity gentailers Genesis Energy, Meridian Energy and Mighty River Power, as well as the coal company Solid Energy. It was widely asserted that public sentiment was strongly against the further privatisation of state assets[446] following the "fire sale" of the 1980s and 90s (see below), so the proposal this time was to keep at least 50% in state ownership and to list the remainder on the NZ stock exchange (NZX).

> We first started selling assets cheaply in the late 1980s through the Government asset sale process. ... Telecom was sold for $4.25 billion in 1990 and, seven years later, it was worth more than $15 billion. In 1992, the Bank of New Zealand was sold to National Australia Bank for $1.5 billion and is now worth an estimated $8 billion. Tranz Rail was sold for $328 million in 1993 and the price was so low that the purchasers made a complete mess of the company and still walked away with vast profits. Subsequently, we have sold a large number of companies in the media, forestry, energy, food and beverage sectors. Most of these sales were at such low prices that the acquirers carried minimal risk and made huge profits from their investments.

Example 6.3.5.1 Brian Gaynor: Let's hear it for the Trade Me genius[447]

The framing of this issue in nzherald was reasonably balanced, with some hopeful voices for, and some strong voices against. It was noted that if a state owned enterprise was (even partially) sold to the private sector this would amount to a

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[444] Easton (2011).

[445] Douglas & Laidlaw (2006).

[446] E.g. Dann (2006); NZHerald (2007).

[447] Source: nzherald 11 Mar 2006 ObjectId= 10372075.

simple transfer of wealth from the country as a whole (a public asset) to specific individuals.

> No company that will not be allowed to fail should be privatised. The economy gains no benefit from an asset sale if the asset is protected from the consequences of its bad decisions. The only beneficiaries of a partial sale of such an asset are the private shareholders of the state-assured company.

Example 6.3.5.2 Editorial: Asset sales need sound justification[448]

While there would be one short term windfall for the government at the time of the sale, over the longer term any income generated by the divested asset (and these were well performing assets) would no longer accrue to the state sector, but would benefit private investors instead. Therefore, as well as losing "sovereignty" over vital strategic assets, the government would lose significant ongoing revenue.

There was an additional serious problem with the proposed 50% government ownership model, such that even if legislated into place it would be unlikely to stay that way, because the 50% share could later be legislated away just as easily. Over the course of the study, at least three clear examples arose of overseas governments relaxing legislated restrictions for previously state-owned companies.

One was the overturning of the "VW law" in Germany. The article below demonstrates the level of security that could be expected from such an arrangement.

> The European Court of Justice is expected to overturn Germany's so-called Volkswagen Law next week and allow Porsche to take control of Europe's biggest carmaker. The law dates from 1960, when VW was privatised. It was put in place to protect the company - a vital employer in northern Germany - from takeover. But, over the past few years, the court has criticised the law as a hindrance to free movement of capital. Porsche is almost certain to raise its 31 per cent holding in VW to a majority 51 per cent.

Example 6.3.5.3 The Good Oil: Porsche to leap VW law – Alastair Sloane[449]

Another was the Australian Government's "T3" share issue for Telstra. Until this point the Government had maintained an ownership of more than 50%.

> The expected float this year of the federal Government's remaining stake in Telstra, Australia's biggest telco, may affect the timing of IPOs, Audcent said.

Example 6.3.5.4 Telstra float won't hold back IPOs – Emma Ambler[450]

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[448] Source: nzherald 25 Sep 2007 ObjectId= 10465688.
[449] Source: nzherald 20 Oct 2007 ObjectId= 10470788.

Thirdly, the takeover of Endesa, Spain's largest utility eventually went ahead in February 2007, nullifying Spain's previous veto rights.

> The Spanish Government has been eager to see a powerful national energy company and analysts say it is nervous that a large part of its electricity industry, including 50 per cent of its nuclear power, could fall into foreign hands. Spain retains a "golden share" in Endesa, allowing it to veto a takeover until June 2007. But a spokesman for EU internal market commissioner Charlie McCreevy said in Brussels that his boss had reminded Spanish authorities not to use the golden share veto powers, outlawed by the EU's highest court in 2003, to halt the EON bid.

Example 6.3.5.5 Don't you dare, EU tells Spain – Reuters[451]

In New Zealand, Telecom's kiwi share obligation (KSO) was acknowledged to still be in place at the time of this study.

> The move was seen as unlikely, given kiwi share legislation requires government approval for any shareholder to own over 10 per cent and puts a 49.9 per cent cap on foreign ownership.

Example 6.3.5.6 NZ stocks: Rally continues this morning[452]

Although business circles felt constrained by the KSO limitations it was envisaged that they would be difficult to remove.

> "Even a resurgent right-wing coalition would probably think twice given the kind of public uproar it would create. The sense of ownership people feel for the lumbering telco is easy to underestimate - particularly from the outside looking in.

Example 6.3.5.7 Stock takes: Tell them they're dreaming – Liam Dann[453]

Nevertheless the KSO foreign ownership restrictions on Telecom were quietly and easily legislated away later in June 2011 by the incoming "centre-right" National Government when Telecom was split to create the new company Chorus. The justification was that Chorus would retain the KSO limitations instead[454]. Scoop reported - "One change in the SOP is to remove reference to the Kiwi share

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[450] Source: nzherald 1 Feb 2006 ObjectId= 10366232.
[451] Source: nzherald 24 Feb 2006 ObjectId= 10369755.
[452] Source: nzherald 5 Apr 2006 ObjectId= 10376168.
[453] Source: nzherald 6 Apr 2006 ObjectId= 10376383.
[454] Putt (2011).

obligation 'to reflect that the KSO will not be operative following the structural separation of Telecom'"[455].

Politically, the rationale behind selling state assets was as an incentive for "ordinary New Zealanders" to save, and invest.

> Mum-and-dad investors can be enticed from the housing market when offered the steady income and strong long-term returns of fully or partly privatised utility companies.

Example 6.3.5.8 Editorial: Time for lights out at trust[456]

However, in the business pages the discussion tended to focus more on attempting to bolster New Zealand's sharemarket by providing more large companies (capitalisation) as a draw for big players.

> The New Zealand Exchange (NZX) is the only publicly traded stock exchange whose share price fell last year, a decline which reflected the shrinking of its market. ... The Australian exchange, for one, has surged 55 per cent, beating a 16 per cent gain in the S&P/ASX 200 Index. ... The total value of stocks listed on New Zealand's market shrank 3.7 per cent to $57.38 billion last year, according to data compiled by Bloomberg. ... A total of $7.1 billion of shares were delisted from the exchange this year, exceeding the $2.4 billion of stock that commenced trading, according to exchange data. ... Weldon said Government policies would boost trading on the exchange. Finance Minister Michael Cullen wants to divert private investment into shares from residential property.

Example 6.3.5.9 Tina Morrison: NZX share-price drop reflects shrinking market[457]

Nonetheless the justification was usually couched in more rationalising terms.

> The largest state-owned enterprises are Meridian Energy ($2.9 billion value in the latest crown accounts), Genesis Power ($2 billion), New Zealand Post ($1.2 billion), Mighty River Power ($1 billion), Transpower ($0.7 billion) and Solid Energy ($0.6 billion). ... There are strong arguments to support the partial privatisation of Meridian, Genesis, Mighty River Power and Solid Energy. Partial privatisations would offer checks and balances, they would also subject these companies to the scrutiny of the market, improve their operating performance and give shareholders an opportunity to ensure they remain under domestic control. Bill English's proposal deserves serious and rational consideration as partial IPOs, with the majority of shares going to domestic investors, particularly KiwiSaver schemes, should ensure a far more positive outcome than the hopelessly flawed asset sales strategies of the 1980s and early 1990s.

Example 6.3.5.10 Bryan Gaynor: Privatisation not a dirty word if said the right way[458]

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[455] Scoop (2011).

[456] Source: nzherald 22 Jan 2007 ObjectId= 10420184.

[457] Source: nzherald 6 Jan 2006 ObjectId=10362560.

[458] Source: nzherald 29 Sep 2007 ObjectId= 10466634.

On this issue there was clearly lobbying within the media on behalf of the stockmarket and business interests, to attempt to put partial privatisation of the SOE electricity companies (amongst others) back onto the drawing board and to support any politicians who were leaning that way.

This case study also provided one of many examples of the less than subtle "normalisation" of the sharemarket as a prominent force within the media. Although sales of state assets were expected to be opposed by the majority of New Zealanders[459], this "story" of opportunity was regularly re-presented as if fresh, interesting, and desirable.

Sharemarkets (and their listed companies) appear to have received significant attention within the media. It was observed that there were normally between two and four formulaic stockmarket reports each day (two for NZ, one for Australia, and one for the US), as well as regular full feature articles devoted to presenting a publicly-listed company, on top of frequent mentions in other business and opinion articles. The quantitative results from this study align with these observations and show that high visibility was given to stockmarkets within the media articles studied (see Figures 5.3.4.3-4 and 5.4.5.11). As this study contained over 5% of all nzherald articles published over the study period, this repetition clearly served a normalising role within this publication. Furthermore, based upon observed coverage alignment in the NZ media[460], similar sharemarket prominence was expected to have been provided by the other NZ mainstream media outlets.

Extracting articles which explicitly mentioned the privatisation of SOEs, to form the fourth sample set, proved more difficult than the previous three, and the results indicated that this topic was often discussed within articles which were also discussing broader issues such as the sharemarket and business in general, so there was some "noise" from extraneous players. Large investors featured prominently in these articles.

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[459] Dann (2006); NZHerald (2007).
[460] Roulston (2005). Considerable topic alignment has also been observed between major US media publications, both traditional and online (McCombs 2005).

This issue discussion has been deliberately limited (mostly) to the period under study but it is worth noting that the part-privatisation of the four large energy SOEs discussed here (renamed the "mixed ownership model") became part of the planned policy program once the National Government gained their second term in 2011, and was a "hot topic" in New Zealand as this thesis was being completed.

6.3.6 Summary

The case studies described above provided four windows into the way in which nzherald (a mainstream media outlet) handled specific issues within the realm of electricity public policy.

In all four cases, multiple voices were heard as commentators presented various vantage points, so the media performed their role of providing differing points of view and informing the public about the issues. At the same time, opportunities for media influence upon policy were evident, especially in case studies one (relatively short term) and four (over the longer term). The first case (Muliaga death), triggered a high-profile media campaign against perceived injustice which resulted in actual policy changes. Comparative organisation scores for the last case (SOE privatisation) provided evidence for an aspect of coverage which could be described as "normalisation" (or cultivation), by demonstrating a high level of sharemarket dominance both within this sub-sample, as well as for the full set of articles.

For cases two and three (Hemmingway dismissal and Waikato pylons), there was an acknowledgement that while decision-making was likely to have taken place in back room conversations, the relative media prominence allocated to certain players nevertheless tended to reflect the actual power wielded by these same players in other forums. This was deduced from the large coverage scores obtained by the government, Transpower, and the generating companies, when compared with the lesser scores obtained by the Electricity Commission and the New Era Energy residents' group. While the first case study provided a clear example of media defence of the underdog, coverage volumes in the last three could be considered to demonstrate more of the alleged (and worrying) "cosy club" relationship between the media and those in power, with its likely entrenchment of "mainstream" views.

6.4 Other Selected Samples

> *Today, hard-core decision-making on global environmental problems requires an almost unprecedented degree of trust in experts and the political elite at the same time as this trust is continually undermined by scientific controversies and political indecision.*[461]

6.4.1 Environmental Issues

Environmental coverage comparisons were presented in the data chapter, and in section 5.4.4 environmental media exposure was compared with that given to business issues and social issues, reflecting the standard "triple bottom line" approach. There it was found that environment scored relatively well, indicating that as a general topic it had become a normal part of the conversation. However, the lower score for the set of ecosystems phrases sounded a note of caution about potential superficiality in this area[462].

As far as the three main environmental issues were concerned, there was some coverage of all of them, and there were some very good explanatory articles. However, while climate change clearly scored well, the volumes for the other two issues, pollution and peak oil, were not enough to gain critical mass or to change the conversation significantly (see below). Furthermore, the small number of fully informative articles would have been found by people looking for them, but may have passed unnoticed (or remained unread) by the general public.

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[461] Hajer (1995:11).

[462] While the defined environment topic appeared in 3918 of 6341 articles (62%) and 30668 of 163338 sentences (19%) (see Figure 5.2.4.1), fully inclusive references to the environment, environmental workers, or environmental issues (functional coverage) appeared in 4612 of 6341 articles (73%) and 39246 of 163338 sentences (24%) (see Figure 5.4.4.7). By comparison, explicit ecosystem phrases were mentioned in 611 of 6341 articles (10%) and 1811 of 163338 sentences (1%). When coverage for conservation organisations was included with ecosystems (functional coverage), these proportions rose to 16% of articles and 2% of sentences (see Figure 5.4.4.8).

1. Pollution

> *"The concerns about energy in the 1970's prompted experts, journalists and scientists to assure the American people that there was no reason to be concerned".*[463]

Pollution is a negative topic, and it is part of the media's role to entertain so as to attract readers. Thus, it is not surprising that pollution did not gain a lot of coverage[464] (see Figures 5.2.1.5 and 5.2.4.7). Nevertheless, a case can be made that people should be made aware of the environmental effects of modern technology.

The relevance of pollution to electricity was discussed in chapters 1 and 2. If New Zealand is to increase its use of clean energy, then the detrimental polluting effects of burning fossil fuels (with their downstream economic implications) need to be made clear to the public. While most people are aware of the air pollution resulting from combustion, less well known is the land and water pollution arising from toxic coal tailings and oil drilling residues[465]. This perspective is seldom touched by media and did not appear in any of the New Zealand articles in my sample. There were however a few specific articles about pollution occurring in other countries such as China and Europe (the Rhine), pipeline difficulties in Alaska, as well as some passing references to oil pollution in relation to Nigerian militants[466], effectively echoing Campbell's refrain that pollution is "someone-else's problem" (2012).

The conclusion that may be drawn from these results is that whereas media coverage tends to reflect the ubiquitous use of electricity, and promotes the untouchable idolisation of technology in general, the media do not do an adequate job of informing the public about adverse environmental (or social) effects which arise from that technology. The fact that our economic system relies on "confidence" implies a balancing act which tends to "play down" such issues of concern.

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[463] Bartlett (2002).

[464] Pollution by general topic appeared in 1119 of 6341 articles (18%) and 2616 of 163338 sentences (2%). Coverage increased in 2007, partly due to references to "climate pollution".

[465] Tsalik & Schiffrin (2005); Byrne et al. (2006).

[466] Oil spills appeared in 24 of 6341 articles (0.5%) and 58 of 163338 sentences (< 0.1%). Coal tailings did not appear at all. By comparison, the general topic called fossil fuels appeared in 2878 of 6341 articles (45%) and 17783 of 163338 sentences (11%).

2. Peak Oil

> *We are like tenant farmers chopping down the fence around our house for fuel when we should be using Nature's inexhaustible sources of energy -- sun, wind and tide. ... I'd put my money on the sun and solar energy. What a source of power! I hope we don't have to wait until oil and coal run out before we tackle that. -Thomas Edison, inventor (1847-1931)[467]*

Peak oil was in a similar position to pollution, gaining only low traction[468], though awareness was cautiously being raised by good news stories associated with alternative fuels. Figure 5.2.4.5 indicated that almost all of the <u>peak oil</u> coverage arose from <u>alternative fuels</u>. Figure 5.2.4.8 showed a trending increase in peak oil coverage (including alternate fuels) over the 24 months, such that 2007 coverage was almost exactly double that of 2006.

Dr M King Hubbert's 1956 prediction that US oil production would peak around 1970 was remarkably accurate, and the Hubbert "curve" predicted that world production would peak sometime between 2005 and 2010[469]. During the article study period of 2006-2007 peak oil was a contentious issue, but later on, the IEA acknowledged that production of conventional crude appeared to have peaked in 2006[470].

Subsequently The Economist (2012) warned that economic disruptions are likely to occur because "supply is inadequate to keep up with rising demand", noting that "crude output … has been flat since 2005".

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[467] Wordsmith.org.

[468] <u>Peak oil</u> by general <u>topic</u> (including alternate fuels) appeared in 668 of 6341 articles (11%) and 3274 of 163338 sentences (2%).

[469] Harrison (2006).

[470] Staniford (2010); IEA (2010).

Clear information about this concern was provided within only a few specialised articles[471], but how many people would have read them? For example -

> This was underlined by a 2005 report commissioned by the US Department of Energy (The Hirsch Report) which found that unless emergency efforts are begun more than a decade in advance of peaking, then the economic, social, and political costs will be unprecedented. In this context, even the department's claim that we have at least two decades before peak oil is far from reassuring - although Professor Heinberg is dismissive of such predictions. Whether you believe Professor Heinberg or the department it seems that tough times may be ahead. If peak oil is occurring right now, as he claims, we should be scared to death. And, even if peak oil isn't due for another two decades, we should probably still be terrified. * David Haywood is a science writer based in Christchurch.

Example 6.4.1.1 David Haywood: A terrifying prospect - sooner or later[472]

It must be acknowledged at this point that my study sample did not necessarily include all articles about oil, or about peak oil. It only included those with an electricity reference. However the extremely low score for this specific topic in an energy-related study was nonetheless of concern.

One or two articles was not enough. Constant repetition was required in order to raise awareness. This thesis is about a detailed search for that necessary repetition.

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[471] Explicit peak oil phrases* appeared in only 29 of 6341 articles (0.5%) and 131 of 163338 sentences (< 0.1%). They appeared in <u>four</u> headings, <u>one</u> picture caption, and <u>ten</u> lead lines altogether over the 24 month period. This was very low coverage.

*Phrases interpreted as explicitly meaning "peak oil" (i.e. the full set of alternate names for peak oil) were "peak oil^crash in oil production^days of cheap oil are over^declining oil^depletion of oil^endless oil is fantasy^energy crunch^energy demand will outstrip supply^energy is fast running out^expectations of oil supply and actual availability^insecurity over future oil^limits to oil^looming energy crisis^not enough oil^oil depletion^oil has peaked^oil is finite^oil is getting scarce^oil production would peak^oil runs out^oil supplies will not keep up with growing global demand^oil will peak^oil's increasing scarcity^peak in global daily oil^peak of oil production^production had peaked^run out of oil^sinking fossil fuel reserves^world without oil" (where "^" was the delimiter used by ETAT to separate phrases in the list).

[472] Source: New Zealand Herald 27 Oct 2007 ObjectId= 10471390.

3. Climate Change

> *However, it is clear that no matter how near-unanimous the scientific consensus is about climate change, public opinion is fragmented[473].*

Global warming was the third issue. This study is timely because "little scholarship exists on the reporting of climate change in the New Zealand media"[474]. The looming danger of anthropogenic climate change had been predicted for decades, and appeared to be gaining heightened media focus during the two year period of this study (see Figure 5.3.5.1), as scientific evidence mounted. The Kyoto protocol had been ratified by New Zealand in Dec 2002 and the first Kyoto commitment period of 2008-2012 was approaching.

The release of the Stern Review[475], closely followed by Al Gore's film "An Inconvenient Truth", meant that of the three issues under study, and despite the well publicised sceptics, this was the only one of the three environmental sub-topics which appeared to seriously gain traction in the media, eventually achieving sufficient volumes to be considered "normalised"[476]. This did not mean that the issue was being addressed to any great extent (see below) but it did mean that the media were meeting their obligation to let people know, and were including the issue frequently as part of the conversation.

> Six or seven years on, Tuvaluans concluded that the international community - particularly the big industrialised nations puffing vast quantities of carbon dioxide into the atmosphere - does not care. "They never listened when we asked for help," says Enate Evi, director of the Environment Department. "To be honest, I think they only care about themselves, and their economic advantage. That's how it feels, sitting here."

Example 6.4.1.2 Kathy Marks: Pocket of resistance to the rising tide[477]

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[473] Campbell (2012:4).

[474] Campbell (2012:43).

[475] Stern (2006).

[476] After steadily increasing coverage (see Figure 5.3.5.1), in December 2007, the last month of the study, <u>climate change</u> obtained a mention in 124 out of 308 articles (40%) and 1323 out of 8088 sentences (16%) for the month. These are notably high scores for a single issue. By comparison, in January, February, and March 2006 climate change appeared in 10%, 6%, and 5% of articles respectively. This was clearly a marked increase over the 24 month period.

[477] Source: New Zealand Herald 24 Jul 2007 ObjectId= 10452875.

Despite significant mention of climate change, the sub-topic called <u>climate impacts</u> received only a tiny proportion of that climate change coverage (see Figure 5.2.3.5), aligning (again) with observations by Campbell (2012) that climate change in "First World" media is often seen as "someone else's problem". According to Campbell the focus on emissions and instruments rather than effects led to the perception that mitigation was costly, rather than highlighting the dangers of climate change itself.

A Roy Morgan poll taken in Australia in November 2006 found "protecting the environment" to be the most important issue the public felt needed to be addressed by the leaders of the world. Gary Morgan noted that –

> Increased media attention and issues such as the ongoing threat of global warming has consequently made 'protecting the environment' the most important priority for the leaders of the world in the eyes of the Australian public with 22% saying it should be the top priority[478].

It is clear from Morgan's statement above that media are attributed with playing a significant role in this survey result, and that the issue of "global warming" had raised environmental awareness within the public. Though 22% is still a relatively small proportion, and is not a majority, it was the highest score in the table of issues offered in that survey, when each person could only choose one item in the list.

It is interesting to compare this result which is concerned with "what world leaders should do" (from among a list of very specific concerns) with the more regular "most important issues" public survey which maps scores by more simple general categories selected from "economy, environment, social, and political"[479]. In the latter case the economy consistently comes out the clear winner by a wide margin[480], although different research companies give different results depending on what was included under the heading "economics" (indicating the ease with which results can be skewed, and the desirability of a more standardised categorisation system)[481].

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[478] http://www.roymorgan.com/findings/finding-4100-201302270215
[479] E.g. http://www.roymorgan.com/findings/finding-4677-201302150135
[480] http://www.roymorgan.com/findings/5111-new-zealand-issues-august-2013-201308200005
[481] E.g. UMR (2008:22).

An earlier Roy Morgan survey in Australia in April 2006 also found high public concern about global warming –

Global warming continues to be a hot topic in Australia. More than seven-in-ten Australians (71%) think that if we don't act now it will be too late — up 4% from 67% in November 2005. Of some concern, 14% of Australians think it is already too late. Women are more worried about global warming than men, more women than men think that if we don't act now it will be too late (74% cf. 67%) and that it is already too late (15% cf. 14%), meanwhile more men (16%) than women (9%) think that concerns about global warming are exaggerated[482].

On the other hand, Campbell considered that nzherald was likely to downplay concerns because –

The New Zealand Herald generally has a low level of rightish partisanship. Analysis published on the New Zealand climate change blog Hot Topic shows that The New Zealand Herald's moderate conservatism often gives way to more extreme right viewpoints when climate change is concerned[483].

Campbell's concerns notwithstanding, Gary Morgan's direct attribution of increased public environmental concern to media coverage reflects the clear understanding that some commentators have about the power of the media to sway perceptions and priorities. Clearly this is one area in which Morgan feels that the media is able to lead.

While Campbell validly (and disturbingly) found the framing for climate change in nzherald to be generally unsatisfactory (from a rational perspective), my study found that quantitatively (and therefore more subliminally), the topic did at least steadily increase in prominence over the two year period, which can have been expected to have raised its salience in the public mind, in both senses of the word (importance and "top of mind").

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[482] http://www.roymorgan.com/findings/finding-4013-201302270310
[483] Campbell (2012:70).

6.4.2 Sample Sets for Organisations

> *There is only one thing in the world worse than being talked about, and that is not being talked about[484].*

When power companies were compared (see Figures 5.2.3.2-4), it was clear that publicly listed companies enjoyed a clear advantage from a publicity perspective. While balanced reporting was evident in many areas, the stockmarket appeared to be one inviolable area which was always highly promoted in the media and never challenged.

As nzherald was primarily an Auckland paper, it came as no surprise that Auckland distribution company Vector obtained the most media coverage of all lines companies (see Figure 5.2.3.5). However, another factor at play was that this was a controversial partially-listed lines company, and therefore the customary listed-company bias of the media was likely to have also played a part. In this particular case it was not possible to categorically attribute the extensive media coverage to the sharemarket bias because of the assumed regional perspective. However, the sharemarket report coverage was very large compared to other coverage and so it is reasonable to assume that this was a factor.

In the coverage competition between Transpower and its two regulators the Commerce Commission and the Electricity Commission (see Figure 5.2.3.6), it was clear that Transpower came out on top by a considerable margin (with Vector even further ahead). However, it would not be considered unusual for regulators to avoid the limelight. They were not profit making companies with a brand to protect or customers to attract. On the other hand, Transpower as a monopoly also had no need to attract customers and, as an SOE, it had no need to attract shareholders. Nevertheless, as every electricity customer in the country was paying a portion of their bill to Transpower, it remained within its interests to cultivate a positive public profile and to demonstrate to its Government shareholder that it was performing well.

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[484] Wilde (1890).

At the time of the study, the Greenhouse Policy Coalition (GPC)[485] and the Major Energy Users Group (MEUG)[486] had 8 overlapping members, which were Business NZ, Carter Holt Harvey, NZ Steel, Norske Skog, Pan Pac, Rio Tinto (NZAS), Solid Energy, and Winstone Pulp. In other words, more than half of the thirteen members of the GPC were members of both groups. Granted, the focus of each lobby group was slightly different, one being to lobby for climate change legislation which would be lenient to large emitters, and the other to lobby to keep electricity prices down for large users. However, both groups made frequent and multiple submissions, alongside submissions from many of their members, often on the same issues, effectively magnifying their influence upon the recipients of their reports.

Some time was spent researching these two organisations, but it was found that they received very little coverage in this sample[487], despite their considerable "behind-the-scenes" influence. The lack of specific coverage for these powerful groups may at first appear to imply that certain back-room players simply do not feature highly in media publicity. However, another approach would be to imagine the parental relationship structure functioning in the other direction, in which case cumulative measures of coverage for these two groups would have been significant, because some of the group members received considerable coverage. In future studies it will be useful to explore more exact circumstances under which different permutations

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[485] The 13 members of the Greenhouse Policy Coalition (representing large emitters) in April 2007 were Business NZ, Carter Holt Harvey, Coal Association, Fonterra, Holcim (cement), NZ Aluminium Smelters (NZAS), NZ Steel, Norske Skog, Pan Pac Forest Products, SCA Hygiene, Solid Energy, Vector and Winstone Pulp (Scoop 2007). By January 2011 this had reduced to 8 members and no longer included Holcim, Norske Skog, Pan Pac, SCA, Vector, or Winstone Pulp (and Methanex had joined) (GPC 2011).

[486] The 22 members of the Major Electricity Users Group (MEUG) in July 2007 were Auckland International Airport (AIAL), ANZCO Foods, Business NZ, Canterbury Meat Packers, Carter Holt Harvey, Dongwha Patinna (particle board), Fletcher Building, Heinz Watties, Holcim (cement), Lion Breweries, NZ Refining, NZ Steel, Norske Skog, Oceana Gold, Pan Pac Forest Products, Ports of Auckland, Ravensdown, Rio Tinto (NZAS), Solid Energy, Tegel, Telecom, Winstone Pulp, Wood Processors Association (MEUG 2007). By January 2011 this had reduced to 18 members and no longer included AIAL, Business NZ, Canterbury Meat Packers, Tegel, or Telecom (MEUG 2011).

[487] GPC appeared in 15 of 6341 articles (0.2%) and 38 of 163338 sentences (< 0.1%). MEUG appeared in 20 of 6341 articles (0.3%) and 40 of 163338 sentences (< 0.1%).

of the hierarchies are applicable. Note that this curiosity raises questions for very targeted queries but that higher level results would not have been affected in this case.

6.4.3 Sample Sets for Policy

> *The total annual solar radiation falling on the earth is more than 7,500 times the world's total annual primary energy consumption. If only 0.1% of this energy could be converted at an efficiency of only 10% it would be four times the world's total generating capacity.[488].*

Energy sources for electricity production are vitally important for New Zealand's future, and therefore the media perspective on the generation options was of considerable interest (see Figures 5.2.5.2-3 and 5.2.5.14). However, the overwhelming focus on fossil fuels in society and in the media was of concern in this age of peak oil awareness.

The fossil fuel focus in the Government's Energy Data File was also of concern. A review of the Energy Data File[489] revealed a very noticeable emphasis on oil and gas, in that renewables collectively occupied only 8% of the fuel-specific pages in the Energy Data File 2008 (compared with 92% for fossil fuels), despite the fact that renewables were acknowledged as supplying approximately 30% of New Zealand's total primary energy supply (TPES)[490].

Also, conspicuous by its absence in the Energy Data File 2008 was any significant mention of alternative energy sources or energy efficiency, other than a brief acknowledgement in the electricity overview that the Electricity Commission was expected to pay attention to "demand-side participation and promoting efficient use of electricity" in response to the Government Policy Statement (GPS)[491].

As MED did not emphasise or promote alternate sources of energy, here was an opportunity for the media to lead. However, in the area of alternative energy sources, as with the environmental discussion earlier, the media published a small

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[488] World Energy Council (2007) cited in ANZSES (2009).
[489] MED (2008b).
[490] MED (2008b:89).

selection of excellent articles[492], but overall the status quo remained dominant and non-standard options were effectively ignored.

While Matthew Simmons was concerned that oil demand may not be capable of slowing down[493], Kevin Cudby was convinced that New Zealand would be able to supply its future transport fuel needs using biomass to liquids (BTL) technology to produce synthetic diesel, rather than traditional biodiesel. He believed that the only way to get there in time would be to ban fossil fuels altogether[494].

However, articles like the one below indicated that responsible energy planning was not popular with the stock market.

> Third-ranked Contact Energy fell 9c to 786 after the release of the Government's draft energy strategy today, aimed at boosting clean energy and cutting greenhouse gases.

Example 6.4.3.1 NZ stocks: Sharemarket loses unconvincing early gains[495]

There were other notable omissions in the media coverage, such as <u>ripple control</u> which appeared in only one article.

Geoff Bertram suggested the reason –

> In the 1950s, when major new investments in generation plant struggled to keep pace with demand growth and blackouts were a common occurrence, most households were placed on ripple control to switch off water heaters at times of peak demand. … Ironically, this almost universal penetration of simple demand-management technology in the period of public-sector monopoly has been allowed to slide away in the era of 'market reforms' since 1987, as large commercially oriented firms on the supply side have welcomed demand-driven price spikes which they could take directly to their bottom lines[496].

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[491] MED (2008b:95).

[492] For example, <u>marine generation</u> appeared in 25 of 6341 articles (0.4%) and 58 of 163338 sentences (< 0.1%). <u>Solar power</u> appeared in 284 of 6341 articles (4%) and 542 of 163338 sentences (0.3%).

[493] Simmons (2006).

[494] Cudby (2010).

[495] Source: New Zealand Herald 11 Dec 2006 ObjectId=10414870.

[496] Bertram (2006:204).

Furthermore, there was almost no coverage of <u>distributed generation</u> and very little about energy <u>efficient appliances</u>[497].

Also already discussed, alongside Figure 5.2.5.11 and Figures 5.2.4.9-10 respectively, was the comparatively low scoring of the large categories for <u>energy efficiency</u> as a whole and <u>green buildings</u> in particular[498].

In fact Figure 5.2.4.10 showed that even the concept of price-driven household energy saving was not well promoted, as the long promised[499] "smart-grid" <u>metering</u> alternatives received little mention in the media, despite this being a current topic under investigation by most power companies, with trials and roll-outs underway. Perhaps this was because despite the hype, early benefits only accrued to power companies (by the provision of automated meter reading), not to consumers (to whom the data remained invisible). Overall, the media seemed to focus their energy efficiency attention upon individual responsibility, with less focus on more systemic solutions.

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[497] <u>Distributed generation</u> (including <u>feed-in tariffs</u> in just 2 articles) appeared in 11 of 6341 articles (0.2%) and 28 of 163338 sentences (< 0.1%), and <u>efficient appliances</u> (including <u>Green Star</u> in just 4 articles) appeared in 26 of 6341 articles (0.4%) and 35 of 163338 sentences (< 0.1%).

[498] <u>Energy efficiency</u> (inclusive functional coverage – see Figure 5.3.7.1) appeared in 717 of 6341 articles (11%) and 2473 of 163338 sentences (2%), and the <u>green buildings</u> <u>topic</u> (see Figure 5.2.4.9) appeared in 230 of 6341 articles (4%) and 697 of 163338 sentences (0.4%). By comparison, fossil fuels scored 45% for articles and 11% for sentences.

[499] Spicer (1991:100).

6.4.4 Electricity and the Profit Motive

> *On Sunday 17th October 2010, Phil Goff told the Labour party conference that "We will make the essentials more affordable. We will stop using the power companies as cash cows for the government"[500].*

Results for <u>profit</u> were presented in Figure 5.4.3.1. Some sharemarket and profit motive considerations from an electricity perspective are added here.

Enron was a giant US energy trading company which went spectacularly bankrupt in December 2001. The story of Enron arose from time to time in the set of nzherald media articles under study, because two top Enron executives, Kenneth Lay and Jeffrey Skilling, went to trial during 2006.

As seen in these example article excerpts, Enron acknowledged its use of market power to manipulate the electricity market –

> Enron agreed to settle charges for US$1.5 billion ($2.2 billion) that it manipulated power markets in California during the 2000-2001 energy crisis that caused rolling blackouts in the state.

Example 6.4.4.1 US judge limits testimony in Enron chiefs trial - REUTERS[501]

The consequences were theoretically severe -

> Financial scandals at Enron, WorldCom and Tyco led to tighter financial reporting disclosure standards for all US companies and increased accountability for top executives. Enron's demise as the largest US energy trader contributed to a severe contraction of the entire US electricity trading industry and accelerated a move away from competitive markets for electricity in several states.

Example 6.4.4.2 Another Enron executive imprisoned - REUTERS[502]

California, which experienced the blackouts referred to in the first example, was one state which had already been taking steps (since 1982, following the second oil shock) to separate power generation from the profit motive.

This was done via a two stage process designed by Art Rosenfeld. The first policy, called "decoupling" assigned a fixed revenue (based on set targets) to utilities to

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[500] Goff (2010).

[501] Source: New Zealand Herald 13 Jan 2006 4.00pm ObjectId=10363583.

[502] Source: New Zealand Herald 16 Nov 2006 ObjectId= 10411072.

remove the usage incentive, and the second, called "decoupling-plus" financially rewarded utilities for energy efficiency[503].

According to US energy consultant Matt Simmons, leaving energy to the free market with little regulation was "reckless behaviour". He also made the point that immediately following the California blackouts there was much consternation, but after only a short period "everyone forgot about it" [504].

Although California conscientiously did take increasing steps to de-couple profit from power use and emphasised energy efficiency, much of the US apparently did not heed the lesson. According to commentator Ronald Brownstein "At the time of the 1973 oil shock, California used about 17 percent less electricity per person than the country at large" but by 2009 "the average Californian … use[d] about 40 percent less electricity per year than the average American". While American per capita usage had risen by 50% over that period to about 12,000 kilowatt-hours per year, Californian use had remained absolutely flat at 7,000 kilowatt-hours[505].

Although a US company, Enron was included as an introductory example here in order to set the scene for an examination of some of the discourse around NZ gentailer Contact Energy in a selection of sharemarket articles from the period under study. For example –

> Contact Energy fell 6c to 655 as power prices continued to ease with heavy rain boosting the hydro lakes.

Example 6.4.4.3 NZ stocks: Telecom and Goodman underpin market - NZPA[506]

It can be seen above that although the country may have wanted security of supply and full hydro lakes, such a scenario was not celebrated by the sharemarket. Another example is below.

> Contact Energy fell 10c to 645, continuing its erratic path of late, possibly falling following heavy rainfall that has helped fill hydro lakes.

Example 6.4.4.4 NZ stocks: Telecom recovery helps market - NZPA[507]

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[503] Brownstein (2009).

[504] Simmons & Laidlaw (2006).

[505] Brownstein (2009).

[506] Source: New Zealand Herald 24 Jan 2006 ObjectId= 10365162.

In both examples above, Contact Energy's share price reportedly dropped in response to full hydro lakes, implying that the sharemarket would prefer electricity prices to rise due to scarcity, in order to improve Contact's revenue, and share price.

> Higher wholesale electricity revenue came from better thermal generation levels and higher prices earned from the wholesale electricity market. These high prices were caused by low inflows in the hydro storage lakes during the last six months of 2005. ... But it was not just high wholesale prices that helped Contact's balance sheet last year. Recent price rises for retail electricity and gas helped push revenue from $626 million to $660 million.

Example 6.4.4.5 Chris Daniels: Low hydro lake levels mean higher profits[508]

In the example above, dry lakes and higher power prices were seen as highly desirable. This sentiment was emphasised further in the excerpt below -

> But now - on top of the speculator effect - the prospect of a good old fashioned power shortage has started driving the price. Things aren't about to black out just yet but southern lake levels are low and this is always good news for Contact. The listed energy provider gets enough of its power from thermal sources that such low water levels don't constrain its supply. That leaves it in prime position to cash in on the higher wholesale prices.

Example 6.4.4.6 Liam Dann: Stock takes: Fat Prophets[509]

Away from the stockmarket columns, there was some concern expressed.

> The present industry structure is the handiwork of policymakers convinced that whatever the problem, the solution is a market. You want security of supply? You want efficient investment? Just build a market and they will come. But what we have ended up with is the risk of the third winter power crisis in six years, and the prospect of electricity prices driven by the world oil market and the exchange rate.

Example 6.4.4.7 Brian Fallow: Importing gas no small issue[510]

In the example above, Brian Fallow laments two separate though related issues. Firstly the dry lakes mentioned in the earlier examples, and secondly gas supply concerns, the latter raising prospects of LNG importation.

Clearly the importance placed on the sharemarket within the media appears to run completely at odds with logical attempts to move to clean energy, and even to a robust security of supply. The business-as-usual commodity market-driven imperative does not bode well for the future of New Zealand's electricity supply.

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[507] Source: New Zealand Herald 25 Jan 2006 ObjectId=10365332.
[508] Source: New Zealand Herald 21 Feb 2006 ObjectId=10369318.
[509] Source: New Zealand Herald 30 Mar 2006 ObjectId=10375259.
[510] Source: New Zealand Herald 30 Mar 2006 ObjectId=10375067.

6.5 Limitations

> *Text-only analysis provides a specific and unique contribution to media research as long as researchers are aware of the limitations and strengths of this type of methodology[511].*

6.5.1 Methodological Limitations

My study was limited by the choice of methodology (combined with the available technology – see next sub-section), but that was a deliberate choice and the thesis questions were carefully crafted appropriately (also see section 4.2.6).

Two drawbacks of using quantitative textual analysis are the inability to fully read the text and thus construct the full semantic context, combined with the challenge of building an appropriate categorisation taxonomy (and then using it correctly).

This categorisation dilemma also arises with manual qualitative analysis, as Campbell attests –

> In conducting framing analysis it can at times be difficult for those doing the coding and analysis to make confident judgments about all the possible received meanings of phrases, narratives and frames[512].

In my case a number of interesting categorisation challenges arose (such as the definition of business), and these were described in section 4.4.8

A potential problem with any multi-layered relationships model is that the aggregation of scores can amplify inaccuracy, meaning that a small error at a low level can have a large impact further up the hierarchy. The very detailed categorisation of ETAT endeavoured to minimise this issue.

Furthermore, when assessing the results of quantitative analysis, care must be taken to qualify any inferences appropriately. In my case, no specific measurements of media influence were possible, but some general propositions were able to be theoretically supported.

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[511] Fürsich (2009:250).
[512] Campbell (2012:163).

6.5.2 Tool Limitations

> *Computerized content analysis, as old as the General Inquirer [1966] and as new as free Web site programs, may signal continued growth [in the use of content analysis]. These new sources of content and alternatives to human coding, of course, raise new questions about data representativeness, reliability, and validity[513].*

ETAT performed remarkably well but nonetheless the text analysis contained a number of known limitations of performance. Some of these arose simply from English language idiosyncrasies. For example, the company name "Total" was difficult to reliably search for. One particularly intriguing situation was the anomaly that <u>public companies</u> (meaning <u>publicly-listed</u>) were actually in the <u>private sector</u>, not the <u>public sector</u>. <u>Private equity</u> meant not a <u>public company</u>, but both were <u>private sector</u>. Thus phrases containing the word <u>public</u> were very carefully assigned to one of a number of different categories.

Other limitations arose from the fact that ETAT was not yet completely adapted to idiosyncratic journalistic conventions. For example, quoted sentences of text with no person identifier were unable to be attributed, despite the fact that they would normally follow a sentence which was. Later versions of the tool will be adapted to handle these sentences. However, where sentences within an article would be difficult even for a reader to attribute, it is valid for the "machine" to err on the side of caution and avoid false positives.

Further limitations arose from occasionally casual treatment of company names (like Total mentioned earlier). For example "Greymouth" caused some difficulties when used as a nick name for Greymouth Petroleum, especially within articles where the location was relevant. Similarly, "Windfarms" was occasionally used as a nick name for NZ Windfarms. Sharemarket reports notoriously departed from the convention of including full entity names at all, meaning that nick names were sometimes difficult to decipher as company names in that context. As the study progressed, mechanisms were devised to handle as many of these as possible.

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[513] Riffe & Freitag (1997:521).

6.5.3 Use of an Unvalidated Prototype

The decision to develop a customised media analysis tool as part of the study was a limiting factor, because although it greatly enhanced the capabilities of the data analysis, the detailed precision required by constantly changing software development also monopolised a huge amount of time.

Although formal validation was not undertaken, some "construct validity" was evident where results were "as expected", such as for the gender balance results. Less precisely, alignment were also found with other studies in the low scores for energy efficiency, and the low scores for climate effects.

To enable a certain amount of checking by the reader, examples from the categorisation phrase library are provided in Appendices 1-8.

6.5.4 Sampling Limitations

As already discussed, the study was ultimately limited to just one publisher, nzherald, in order to keep volumes manageable. With a faster analysis tool and a longer time period, it would be interesting to run the same algorithms against media articles from other New Zealand publishers such as Stuff and Radio New Zealand, and to compare the results to see whether they align as well as some New Zealand researchers have attested.

Conversely, the generous inclusion of only peripherally related articles into my study allowed for an all-encompassing large sample, but more restrictive selection criteria would have simplified the processing time and complexity.

The study would also have been strengthened by extending it to include an examination of publication bias, which would have involved taking samples from source websites (or Scoop) and comparing them with published articles.

A third extension would be to compare the results with past and future years, canvassing a much longer time period. All of these extensions would have enhanced the results but were ultimately beyond scope and would suit future studies.

6.6 Recommendations

A great deal of intelligence can be invested in ignorance when the need for illusion is deep.[514]

6.6.1 Introduction

When searching for recommendations to make in response to the results of this study, I find that they basically fall into two broad categories, i.e. actions for outside, or inside, the media. The first question is therefore – given the known predilections, constraints and biases of the media, how can better environmental and social results be achieved while working within the status quo? The second question is – how could or should the media function differently? I'll touch upon each of these areas briefly in this section.

6.6.1 Recommendations for Non-Media

1. Utilise Newsworthiness Criteria

Politicians and marketers harness the power of the media by providing the media with newsworthy stories about triumph, crisis, conflict, drama, victims or celebrity. Though usually not as well resourced, this method can also be utilised (with practice) by academics, or seekers of environmental or social change. For example –

> There is ample scope for individual academics in both physical science and social science faculties and for universities collectively to take a much more prominent role in the public politics of climate change in New Zealand … , based on their relative absences from the pages of The New Zealand Herald[515].

Alternatively opportunities may arise to raise the profile of extenuating issues by piggy-backing on an existing story or crisis. For example, as a result of their research into the Muliaga incident, O'Sullivan concluded that there was unrealised potential for agents of social change to make better use of media-heightened incidents, in that case by speaking out clearly about the problem of fuel poverty[516].

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[514] Bellow (1977:261).
[515] Campbell (2012:151).
[516] O'Sullivan et al. (2012:59).

2. Language and Framing

Environmental and social problems are often framed in a boring or negative way. Expanding upon point 1, it may be possible and necessary to build excitement around vital topics that require discussion, and to reframe progress to include the necessary solutions (an approach which is succeeding for electric cars and alternative fuels to a certain extent), in order to gain the vital media attention required to raise public (and policy) profile.

This is a double edged sword, as while the incorporation of "business-speak" for example, may lend legitimacy and prestige to a non-profit, it can also further entrench the hegemony of that dominant frame. The monetising of ecosystem services also faces this challenge, to name another example, but the language of money is powerful and may sometimes be necessary to make the required point[517].

3. Indicators which Imitate the Sharemarket

When sharemarkets are so obviously dominant, as they were in my study, the question arises as to whether some sharemarket characteristics could be imitated for alternative purposes. Social and environmental indicators do not have the allure of sharemarket results for a number of reasons. For example, they do not involve money, they do not relate to individual people or companies, they do not seem as "exciting", "up" does not necessarily align with improvement, and they do not change every day.

However, when designing social[518] and environmental indicators, some of these aspects may be able to be incorporated to attempt to gain public (and policy) attention. A pollution index, for example, does change several times a day, so measures such as these could be announced every day, just like the sharemarket.

If they were publicised in the media, then they would gain prominence and raise awareness, just like the weather and the sharemarket.

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[517] E.g. Stern (2006) on the economic challenges of climate change.
[518] See Cotterell & Crothers (2011) for a discussion of social indicator challenges.

4. Triple Confidence Indicators

New Zealand consumer confidence is measured and publicised monthly by Roy Morgan[519]. The results are invariably reported in nzherald, often repeatedly, within many business articles. Surveys like this, and their reporting in the media, raise the salience of consumption, and of economics in the recipient's mind. In order to raise the salience of environmental and social issues in parallel with economic issues, it would make sense to run equivalent monthly social and environmental confidence surveys, and to pressure the media to publicise these to the same extent.

For example a socially-oriented "community confidence" indicator would be personally engaging, and could indicate how well people feel supported in their lives, households and communities, by measuring their future expectations in this area. The process of conducting the survey would have the added benefit of assuring recipients that these things matter, and that someone is interested. Similarly an "environmental confidence" indicator would assess people's perceptions of the ways in which they expect to interact with nature in future, and at the same time raise their awareness of the importance of a clean environment.

As with most suggestions of this type, sufficient resourcing is the main obstacle, so Government departments (who already work on social and environmental indicators) are the logical funders for projects such as these. Local government could also play a part.

6.6.2 Recommendations for Media

1. More State Support for Media

Nichols and McChesney are convinced that the commercial market model for media organisations is detrimental to democracy and a well informed citizenry. They lament the lack of state support for media in the United States, especially when compared with a number of other nations[520]. Campbell also observed that *The*

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[519] http://www.roymorgan.com/search-results?text=%22New+Zealand+Consumer+Confidence%22&searchcontext=Findings
[520] Nichols & McChesney (2010).

Guardian (for example) was apparently able to provide more balanced coverage than nzherald due to its trust-style ownership model, which did not require the paper to turn a profit[521].

New Zealand has one commercial-free state-owned radio provider (Radio New Zealand) and one almost fully state-sponsored television channel (Māori Television). The Government also owns TVNZ, but TV1 and TV2 as Crown Owned Companies are required to behave as fully commercial entities. Newspapers in New Zealand on the other hand are self-funded and fully de-regulated, which has allowed conglomerate ownership, mainly by just two large multi-nationals. New Zealand would do well to explore ways of diversifying media ownership and of providing additional state support to allow for more diverse and educational media content.

If such a path is not taken, then Salmon considers that the inevitable consequence will be for media organisations to effectively evolve into marketing companies, where news merges with paid advertisements to produce mostly high-quality advertorial content[522].

2. Journalist Awareness

Whenever analysis is performed upon media articles it shines a light on journalistic practice, providing opportunities for self-reflection, and raising new questions for journalists to consider.

Alongside suggestions to academics and activists must come suggestions to journalists to simply spend more column inches writing about social and environmental issues, and to help lead the way away from fossil fuels and towards clean, efficient, environmentally and socially friendly, energy use.

This is in the same vein as the GMMP study, which asks journalists to feature more women in the media, and in more diverse roles.

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[521] Campbell (2012).
[522] Salmon & Hill (2013).

6.7 Future Research

It is impossible for ideas to compete in the marketplace if no forum for their presentation is provided or available – Thomas Mann[523].

6.7.1 Extension

By taking a new approach, this study has opened up a large field of opportunity for further research along similar lines. While this particular study has necessarily focused on exploring and refining the developmental details of the method, much scope still remains for expansion into wider source and topic areas.

Now that a comprehensive method has been developed (within this study) for detailed topic extraction and analysis, there is scope for future similar studies (in electricity or other policy areas) to be extended to other New Zealand news media publishers, and also to a comparison between the published media articles and related (source) media releases by organisations.

A valuable repository of organisational media releases in New Zealand is the Scoop website, because it publishes verbatim all received media releases from a wide range of organisations. Additional sources of media releases are specific organisational websites, which can be checked against Scoop to verify that all releases of interest have been captured.

It would also be fruitful to broaden the analysis to all, or various aspects, of the wider energy sector, especially the related subjects of transport, climate change, emissions trading and oil & gas exploration. In order to keep my study to a manageable size it was necessary to limit the primary analysis to articles which had a direct relationship with, or an explicit mention of, electricity. Those broader energy related topics were touched upon, but only in relation to electricity, not in their own right. Each of those related subjects would suit further study.

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[523] Liberty Quotes (2010).

6.7.2 Procedures

To improve efficiency for future studies, it is recommended that the online retrieval be automated. This functionality would make data collection much less labour intensive, whether articles are retrieved retrospectively, in real time, or a mixture of both. Utilities which were able to automatically find and read articles on the web did exist at study commencement in 2006, but their integration into this particular project would have been difficult. However, such applications have improved significantly since then, alongside the exponential expansion of online capabilities. By the time this thesis was completed there were a number of tools and websites undertaking a similar type of automated article collection and analysis, some to an astonishing degree of complexity[524]. Even though publicly available tools do not yet provide the capability for users to add their own fine grained specificity to the extent that the ETAT tool has been able to provide for this study, an integrated automated retrieval system is expected to be feasible in future.

The prominence indicator developed for this study differed from traditional newspaper prominence indicators such as Budd (1964) in that it measured the comparative prominence which had been accorded to entity items within an article or set of articles. It did not attempt to measure whole article prominence arising from positioning, timing, or decoration on the webpage. That type of analysis for online articles offers fertile ground for future studies.

Embedded online advertising was ignored for the purposes of this study, as were page numbers (for the comparable paper versions of the articles), but these may hold useful information. This study was not able to encompass online blogs and public "viewpoints" or letters to the editor in addition to media articles, due to limited time and resources. These types of articles may be interesting for subsequent study.

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[524] E.g. http://www.carboncapturereport.org/

6.7.3 Media Influence

> *Research on the media-policy nexus is still in its infancy. … The interplay of mass communication and political decision making is emerging as an exciting area of academic investigation in which further work is clearly warranted.*[525]

According to Koch-Baumgarten and Voltmer there is a dearth of academic literature which moves beyond content analysis into the realm of media influence on the policy making process. One component of such influence is the media's direct effect on the public. In such analyses, problems of study design and measurement are encountered. Public surveys are considered to be one of the few mechanisms for measuring responses to media, but these are notoriously imprecise. Another component is the mapping of actual policy changes.

Within this study, just the one component of this approach has been explored, and that was an attempt to quantify (in a new way) aspects of known or assumed psychological triggers (such as prominence and repetition – inducing an agenda-setting effect) in relation to the presentation of people and pertinent policy concepts within the media content. In other words, rather than measuring actual influence externally, embedded influencing factors (deliberate or otherwise) were sought. Although the taking of a content analysis approach is not new, the increased level of precision and flexibility applied here was unique and significant. There is much scope to expand this type of analysis within policy studies which attempt to detect and measure media influence more comprehensively.

An example of actual policy change as an apparent result of media coverage was observed in my study, specifically in the case of the Muliaga death, and in that case new legislation was passed in response to the event. However, for the large part, my study was a frequency analysis without the necessary external evidence, such as audience surveys or measured electricity savings[526], that would be required to justify assertions of influence. This is an area with much potential for future study.

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[525] Koch-Baumgaten & Voltmer (2010).
[526] E.g. Blackwell (2009).

Chapter 7 – Conclusion

7.1 Significance of Findings

Talk matters, because language heard over and over changes brains.[527]

This study measured media coverage relating to electricity public policy from a number of exploratory perspectives, and was based on the premise that repetition over time in the media is likely to have mainstreaming enculturation effects, as well as a tendency to exaggerate and reinforce unequal power structures in society. Pivotal to the study was the development by the author of a unique method for measuring media coverage, which was successfully operationalised using a prototype text analysis tool.

Of interest was the question of identification within the media of privileged players and concepts, and whether that dominance was likely to affect electricity public policy, for example by obstructing (or playing down) important progress towards increased energy efficiency and the use of renewable energy within the electricity sector, both of which are clearly necessary to avoid future environmental shocks. Significantly, findings in that regard were not encouraging.

Recurring themes within the articles studied were money, business, and economics, as well as the more personal topics of vehicle drivers and the weather. Though the general environment term featured more highly than expected, most specific environmental issues were played down by comparison. Despite a smattering of excellent articles with full explanations of the social and environmental difficulties ahead, these were but a minor distraction from the underlying and overall focus on progress and markets, particularly the sharemarket.

Despite the knowledge that oil and gas supplies were finite and likely to be peaking soon, fossil fuels were a consistently prominent theme while very little emphasis was given to demand management as a whole, or power saving in particular. Green

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[527] Lakoff (2011).

commerce and renewables gained reasonable exposure over the period of study, but did not begin to approach the normalised ubiquity of hydrocarbons.

Climate change received significantly increased coverage in the second year of the study, as did the concept of sustainability. However, the topics of peak oil, alternative energy sources (e.g. marine and solar power), and distributed energy received very little coverage at all. On these topics, nzherald appeared to completely squander the opportunity to advance or nurture progressive ideas towards energy use, and remained predominantly mired in support of the commodified and polluting status quo.

Of the four cases studies examined, two of them exhibited opportunities for the media to have a significant effect on public policy, one directly and overtly in a campaigning manner (the personal tragedy of the Muliaga death), and the other more subtlely as a result of player and concept hegemony over a longer period (the SOE privatisation – which did go ahead later in 2011 after a change of Government). Results for the remaining two case studies (the Waikato pylons, and the dismissal of Roy Hemmingway) also demonstrated hegemony of the dominant players, but here the media was enmeshed within an (assumed) network of insiders, rather than exhibiting any clear role. Coverage in both cases did however reflect a worrying lack of independence or power on the part of the electricity regulator.

A clear finding which arose from the new method was that governing political parties lost explicit brand exposure (when compared with opposition parties) because they are usually referred to as "the Government". This phenomenon was observed for NZ, Australia, Britain and the US. That finding provides a unique perspective on political coverage, which until now has not been taken into account within studies examining political media bias.

Recommendations are that journalists, academics and clean energy proponents seek to raise awareness of the importance of clean energy by utilising techniques of media "newsworthiness", and that New Zealand explore ways of providing more state support for media outlets, to allow them to diversify away from a purely commercial path, and to provide more values-driven coverage.

7.2 Contribution to Knowledge

> *The issue of who is given space to speak in the media is an important one.*[528]

The contribution of this study has been in two specific areas. Firstly in the undertaking of quantitative media text analysis upon a subject seldom studied, that of electricity public policy, and secondly in the development of a unique method to do so. On the second point, this thesis has traversed uncharted territory by exploring a new method of computerised content analysis, and has paved the way for others to follow in the utilisation of selected automated NLP techniques for research purposes, as well as in the careful standardisation of categorisation techniques. I argue that there is significant scope to utilise computing power for content analysis in new ways, and to develop improved methods of measuring coverage which allow the extraction of information that is almost impossible for human coders to decipher or to handle. In doing so, a new depth of understanding and level of precision will become available to content analysis researchers.

Alongside the twin "manifest" (apparent) and "latent" (reading between the lines) aspects of content (as traditionally classified), there is additional "implicit" information (such as company ownership) that can be extracted and examined using textual analysis. Such data becomes available when relationships between entities are able to be thoroughly categorised alongside the entities themselves, allowing calibrated degrees of relevance to be selected and reported upon.

An important consequence of improved content analysis methods is the opportunity to study cultivation, enculturation, and agenda-setting effects with more precision and for a wider range of topics. When news articles present arguments for and against, it is assumed that rational people will weigh up the evidence and come to informed conclusions. However, psychologists advise that people's behaviour is not necessarily rational, but is often likely to be habitual and affected by emotion or subtle sub-conscious forces. The study of overt framing or specific argumentation within a text may be of limited use if there is incomprehension or resistance to the

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[528] Gavin (2010:73).

message on the part of the recipient. On the other hand, steady background repetition, and ubiquitous underlying themes have the opportunity to have an impact over time, even subliminally. That is why I chose to measure simple repetitive concepts rather than undertake a qualitative thematic or framing study.

The media arguably can hold a privileged role in the formation of public policy (at least within certain high profile areas), partly because of the reciprocal nature of the relationship between press gallery reporters and politicians. This can involve both the direct influence of journalists upon policymakers, and also the awareness (on the part of the policymaker) of the ability of the media to influence public opinion (accompanied by the belief that they actually do so), giving rise to media management on their part. Studying public policy in the media, and relating it to real world events, can help to build a better understanding of this process, in all its complexity, and can help to identify policy issues and arenas where media influence appears to play a part.

My critical study of media coverage of the electricity sector has highlighted structural problems which may be difficult to address unless the current market model for media ownership changes, but awareness of the issues is an important first step. Distinct lack of coverage of energy efficiency, and of renewable energy sources, especially solar, is of serious concern when society is threatened by the imminent environmental challenges of climate change and peak oil. Dominance of money, business and the sharemarket over other societal and environmental issues is also likely to provide a skewed world view which plays down other priorities.

While the media can sometimes be a driver for good policy when championing sensational causes on behalf of wronged individuals, this ability appears to more often be outweighed by the heavy dominance of a privileged elite within observed media coverage, reflecting and exacerbating a societal balance which is increasingly unequal.

This is an important work which has explored a new approach to media text analysis in the field of electricity public policy, and which has the potential to form the basis for many future studies.

Only after the last tree has been cut down,

Only after the last river has been poisoned,

Only after the last fish has been caught,

Only then will you see that money cannot be eaten.

    - Cree prophecy

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[Note that some obsolete online links remain available at the "Way Back Machine". See Internet Archive (2012) below.]

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Glossary

ACRI – Association of Crown Research Institutes

AI – Artificial Intelligence

ANZSES – Australia and New Zealand Solar Energy Society

ANZSIC – Australia New Zealand Standard Industrial Classification.

In MED publications covering this period 2006-2007, end uses of gas and electricity were identified by ANZSIC codes (MED 2008b:166), replacing the previously used NZSIC codes.

APN

One of the two major media owners in New Zealand (the other is Fairfax). Owner of the NZ Herald, the NZ Listener, BOP Times, Hawkes Bay Today, Rotorua Daily Post, and Northern Advocate, among others. Half owner of the Australian Radio Network, which owns NewstalkZB. Dual listed in Australia and New Zealand. A large shareholder is Irish company Independent News and Media (Tony O'Reilly).

ARC – Auckland Regional Council

CAIDI – Customer Average Interruption Duration Index

Carbon Credits

In countries signed up to the Kyoto Protocol, moves to reduce greenhouse gases are rewarded with the issue of carbon credits. These credits can then be used or sold (Shah 2006).

CAP – Comparative Agendas Project

An ongoing global longitudinal content analysis study by policy topic involving a large number of universities in 15 countries.

CCS – Carbon Capture and Storage

Also known as geosequestration. An experimental technique whereby carbon dioxide is extracted from emissions and stored in underground repositories such as old mines or depleted oil reservoirs.

CDA – Critical Discourse Analysis

An inter-disciplinary approach to the study of discourse which acknowledges that language and power are linked. Not necessarily restricted to a specific research method.

CDM – Clean Development Mechanism

One of the Kyoto mechanisms.

CEO – Chief Executive Officer

CFL – Compact Fluorescent Lamps

Cogeneration

"The simultaneous or sequential production of two or more forms of useful energy from a single primary energy source. In this publication, a cogenerator is an electricity generating facility that produces electricity and a form of useful thermal energy (such as heat or steam for industrial or commercial heating or cooling purposes). In the energy balances, only the electrical output is accounted for" (MED 2008b:166).

COP16 – 16th Conference of the Parties to the UNFCCC

Also the 6th meeting of the parties to the Kyoto Protocol. Held in Cancun, Mexico in 2010. See UNFCCC.

CRI – Crown Research Institute

DHB – District Health Board

DSIR – Department of Scientific and Industrial Research

A past New Zealand Government Department which devolved into a number of separate Crown Research Institutes (CRIs) during the market reforms of the 1980s.

ECNZ – Electricity Corporation of NZ

Also known as Electricorp, ECNZ took over from NZED in 1987 as the first permutation of the corporatised NZ electricity sector under the new SOE Act 1986. It comprised major generators and national transmission, but not local distribution. It was eventually split into the various component SOEs Transpower, Genesis Energy, Meridian Energy, & Mighty River Power, and the fully privatised Contact Energy.

EECA – Energy Efficiency and Conservation Authority

Established in New Zealand as a Crown Entity following the establishment of the Energy Efficiency and Conservation Act 2000.

EI – Energy Intensity

Expressed as unit of energy consumed per unit of GDP. Changes in energy intensity can be interpreted as a measure of efficiency in the use of energy resources for "generating" growth in GDP.

ETAT – Elley Text Analysis Tool

The prototype customised text analysis tool developed by the author as part of this study.

EROEI – Energy Return on Energy Invested

EROI – Energy Return on Investment

ESAs – Electricity Supply Authorities

The collective name previously given to local power boards and municipal electricity departments while they remained under local authority control up until 1992, at which point they were corporatised under the Energy Companies Act 1992,

and restructured into various new entities. Responsible for local electricity retailing and distribution, as well as some local power generation.

ETS – Emissions Trading Scheme.

The European Kyoto carbon trading ETS began its first phase in 2005, and second phase in 2008. The first phase was a preliminary "proof of concept" trial which was criticized for being too lenient on carbon emitters. The second phase had tighter emissions ceilings, and higher fines for non-compliance. Carbon emission quotas were allocated on a grandfathering basis, and then traded by the companies involved. The European scheme is run by the Climate Exchange, an AIM-listed company.

EU – European Union

Fairfax

Shortened name for Fairfax Media, an Australian-listed company founded by John B. Fairfax. One of the two major media owners in New Zealand (the other is APN). Owns Nelson Mail, Sunday Star Times, Southland Times, Waikato Times, Manawatu Standard, and Independent Financial Review, among others.

Geosequestration

Also known as "Carbon Capture and Storage (CCS)". An experimental technique whereby carbon dioxide is extracted from emissions and stored in underground repositories such as old mines or depleted oil reservoirs.

GMMP – Global Media Monitoring Project

Globally assesses news media by gender for one full day every five years.

GPC – Greenhouse Policy Coalition

IAEA – International Atomic Energy Agency

IEA – International Energy Association

Autonomous Paris-based intergovernmental organisation founded in response to the 1973 oil crisis to oversee world energy supplies. Most OECD nations are members of the IEA.

IPCC – Intergovernmental Panel on Climate Change

IRD – Inland Revenue Department

A New Zealand Government Department.

KSO – Kiwi Share Obligation (Telecom)

LED – Light Emitting Diodes

LIWC – Linguistic Inquiry and Word Count

A software package which uses an analysis of the individual words in a sample text to make assumptions about the psychological state of the author.

MAF – Ministry of Agriculture and Forestry

A New Zealand Government Ministry.

MED – Ministry of Economic Development

A New Zealand Government Ministry.

MEUG – Major Electricity Users Group

MfE – Ministry for the Environment

A New Zealand Government Ministry.

MRP – Mighty River Power Limited (SOE gentailer)

MSM – Mainstream media

NewstalkZB

Private New Zealand radio station. Owned by Australian Radio Network which is half owned by APN.

NER – Named Entity Recognition

A difficult but desirable capability for natural language processes to feature.

NGO – Non-Governmental Organisation

Includes non-government and non-business organisations, voluntary or otherwise, such as unions, lobby groups, church groups, etc.

NIWA – National Institute of Water and Atmospheric Research

A New Zealand Crown Research Institute (CRI).

NLP – Natural Language Processing

A field of computer science, artificial intelligence, and linguistics which studies mechanisms for enabling computers to interpret natural human speech. (Not to be confused with neuro-linguistic programming, a largely discredited psychotherapy practice from the 1970s which used the same acronym).

NYT – New York Times

NZEES – New Zealand Energy Efficiency and Conservation Strategy

NZED – New Zealand Electricity Division

A government department within the Ministry of Energy up until its assets were transferred to ECNZ in 1987 under the SOE Act 1986. The Ministry of Energy was abolished in 1989.

NZES – New Zealand Energy Strategy

Incorporated the revised NEECS.

NZPA – New Zealand Press Association

The long standing New Zealand national collective news-gathering service, jointly funded by rivals APN and Fairfax in 2006-2007 but disbanded a few years later.

NZSIC – New Zealand Standard Industrial Classification

Previously used in MED reports. Replaced by the ANZSIC system from Australia for the time period being studied 2006-2007 (MED 2008b:169).

ODT – Otago Daily Times

New Zealand's largest independent newspaper, not owned by APN or Fairfax. Published in Dunedin.

OECD – Organisation for Economic Co-operation and Development

Autonomous intergovernmental organisation whose members are often referred to as the developed countries. In 2006-2007 the OECD had 30 members, and by 2012 this had increased to 34 members.

PCE – Parliamentary Commissioner for the Environment

PSA – New Zealand Public Service Association

The union for all state sector employees. New Zealand's largest union.

QSR – QSR International

The name of the qualitative research software company which produced and sold the NVivo package.

RMA – Resource Management Act 1991

RNZ – Radio New Zealand

Government-funded independent broadcaster.

SAIDI – System Average Interruption Duration Index

SAIFI – System Average Interruption Frequency Index

Scoop

An independent New Zealand online news media site. Leading repository for New Zealand organisational media releases.

SME – Small or Medium Enterprise

In New Zealand this is defined as a business with fewer than 20 employees.

SOE – State Owned Entity

A company set up under the State Owned Enterprises Act 1986 to act as a business entity with a profit motive, but with the Government as the only shareholder.

TBL – Triple Bottom Line

Toe – Tons of Oil Equivalent

Equal to 42 gigajoules, a toe is the energy released by burning a metric ton of crude oil.

TPES – Total Primary Energy Supply

TOU – Time of Use

A term used in relation to "smart meters", where price or demand may vary with time of day.

UN – United Nations

UNFCCC – United Nations Framework Convention on Climate Change

A 1994 convention following the Rio Earth Summit in 1992. As at 2013 it had been ratified by 195 countries (called parties to the convention). Its ultimate objective is to stabilise greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropomorphic interference with the climate system.

Appendix A1 – Topic Hierarchy

A1.1 Policies

Id	Name	Level	Parent	Id	Name	Level	Parent
5	electricity	0	energy sources				
11	**policies**	1		11	**policies (cont.)**	1	
13	**supply security**	2	policies	15	**demand management**	2	policies
43	system capacity	3	supply security	40	green buildings	3	demand management
42	system oversight	4	system capacity	51	insulation	4	green buildings^health and shelter
14	system reliability	4	system capacity	52	building rating systems	4	green buildings^standards
25	transmission	3	electricity^supply security^transmission players	53	water heating	4	green buildings^water
45	national transmission	4	transmission^transmission players	41	household behaviour	3	demand management^residential consumption
27	local distribution	4	transmission^transmission players	57	metering	4	electricity^household behaviour^light industry and commercial
47	configuration alternatives	3	electricity^supply security	58	household power saving	4	electricity^household behaviour
48	isolated supply	4	configuration alternatives	55	consumer education	4	electricity^household behaviour
49	connected alternatives	4	configuration alternatives	50	industry behaviour	3	demand management
26	**energy sources**	2	policies	59	industry power saving	4	industry behaviour
60	fossil fuels	3	energy sources	128	electric transport	4	electricity^alternative fuels
23	gas-fired	4	gas^electricity suppliers	129	location of generation	4	electricity^industry behaviour
24	coal-fired	4	coal^electricity suppliers	66	**structure and regulations**	2	policies
8	oil-fired	4	oil^electricity suppliers	67	trading and markets	3	structure and regulations^business interests
61	renewables	3	energy sources	35	wholesale electricity market	4	electricity^finance and insurance^trading and markets
62	biomass	4	renewables	68	sharemarkets	4	finance and insurance^trading and markets
31	hydro	4	renewables^electricity suppliers^water	69	carbon trading	4	finance and insurance^greenhouse emissions^trading and markets
30	geothermal	4	renewables^electricity suppliers	92	oil and gas markets	4	finance and insurance^oil and gas industry^trading and markets
29	wind power	4	renewables^electricity suppliers	72	acts and bills	3	structure and regulations
63	solar	4	renewables	3	RMA	4	acts and bills
38	marine-based electricity generation	4	renewables^electricity suppliers^water	73	carbon tax	4	acts and bills
64	other energy sources	3	energy sources	6	energy strategy	4	acts and bills
37	nuclear	4	heavy industry^other energy sources	34	pricing and regulation	3	structure and regulations
65	electricity storage	4	electricity^other energy sources	70	standards	4	pricing and regulation
				74	electricity charges	4	electricity^economics^pricing and regulation
				75	electricity penalties	4	electricity^negative^pricing and regulation

A1.2 Communication

Id	Name	Level	Parent	Id	Name	Level	Parent
130	**communication**	1		130	**communication (cont.)**	1	
44	**psychology**	2	communication	122	**mechanism**	2	communication
84	tone	3	psychology	71	messaging	3	mechanism^angle
85	negative	4	tone	137	media	4	messaging
86	neutral	4	tone	138	marketing	4	messaging
87	positive	4	tone	139	lobbying	4	messaging
136	angle	3	Psychology	119	channel	3	mechanism
141	news	4	Angle	121	phones	4	channel^light industry and commercial
54	entertainment	4	Angle	140	internet	4	channel
				142	radio	4	channel^media
				143	TV	4	channel^media
				144	newspapers	4	channel^media
				145	film	4	channel^media
				146	books	4	channel

A1.3 Issues of Concern

Id	Name	Level	Parent	Id	Name	Level	Parent
76	issues of concern	1		76	issues of concern (cont.)	1	
77	wellbeing	2	issues of concern	2	environmental issues	2	issues of concern
78	health and shelter	3	wellbeing	4	climate change	3	environmental issues
79	illness	4	health and shelter	7	greenhouse emissions	4	climate change
134	wellness	4	health and shelter	10	climate impacts	4	climate change
81	physical safety	3	wellbeing	94	pollution	3	environmental issues
82	accidents	4	physical safety	95	air pollution	4	pollution
83	weather	4	environmental issues^physical safety	96	water pollution	4	water^pollution
131	social wellbeing	3	wellbeing	39	peak oil & gas	3	environmental issues
132	community support	4	social wellbeing^household sector	93	oil reserves	4	system reliability^peak oil & gas^oil
133	crime & violence	4	social wellbeing	36	alternative fuels	4	industry behaviour^peak oil & gas^transport sector
88	political imperatives	2	issues of concern	46	ownership issues	2	issues of concern
89	social equity	3	political imperatives^household sector	97	property rights	3	ownership issues
80	the poor	4	health and shelter^social equity	98	enterprise ownership	4	property rights
135	disadvantaged groups	4	social equity	99	pylon property issues	4	transmission^environmental issues^property rights
90	progress	3	political imperatives	56	commons	3	ownership issues
1	economics	4	progress	101	public land	4	commons
120	indicators	4	progress	100	water use	4	water^commons
91	electioneering	3	marketing^political parties^political imperatives	102	tangata whenua	3	ownership issues

A1.4 Players

Id	Name	Level	Parent	Id	Name	Level	Parent
103	players	1		103	players (cont.)	1	
104	electricity sector	2	electricity^players	33	business interests	2	players
105	residential consumption	3	household sector^energy sources	111	coal mining industry	3	business interests^coal^fossil fuels
106	business consumption	3	business interests^energy sources	28	transport sector	3	business interests
107	transmission players	3	electricity sector	32	heavy industry	3	business interests
108	electricity suppliers	3	electricity sector	19	agricultural sector	3	business interests
109	electricity market players	3	wholesale electricity market^electricity sector	18	forestry sector	3	business interests
110	electricity regulators	3	system oversight^standards^electricity sector	9	oil and gas industry	3	business interests^fossil fuels
113	household sector	2	players	12	light industry and commercial	3	business interests
114	elderly and beneficiaries	3	household sector	112	finance and insurance	3	business interests
22	families and children	3	household sector	123	government & education	2	players
21	workers and unions	3	household sector	124	science & research	3	government & education
20	other parties	2	players	125	education	3	government & education
17	NGOs	3	other parties	126	government players	3	government & education
127	local bodies	3	other parties				
16	political parties	3	political imperatives^other parties				
115	gas	0	oil and gas industry				
116	oil	0	oil and gas industry				
118	coal	0	coal mining industry				
117	water	0					

Appendix A1a – Topics by Matched Keyword

[FULL SET]

Id	Name	Level	Parent	Matched_Keyword_Name
5	electricity	0	energy sources	electricity^power^power after all^direct current^alternating current^power connection^appliances^refrigerators^TVs^gadgets^air-conditioning^lights^waste into energy^methane power^consumer electronics^lost hot water^back up power^electric heaters^turbines^electric fence
11	policies	1		
13	supply security	2	policies	
43	system capacity	3	supply security	
42	system oversight	4	system capacity	oversight
14	system reliability	4	system capacity	back-up^diesel generators^lost hot water^back up power
25	transmission	3	electricity^supply security^transmission players	power lines
45	national transmission	4	transmission^transmission players	grid^pylon^sub-stations^duplexing of the lines
27	local distribution	4	transmission^transmission players	
47	configuration alternatives	3	electricity^supply security	network alternatives^configuration alternatives
48	isolated supply	4	configuration alternatives	diesel generators^combined heat and power^electrical self sufficiency
49	connected alternatives	4	configuration alternatives	solar power^solar panels
15	demand management	2	policies	solar hot water^passive solar^greywater systems^grey water
40	green buildings	3	demand management	passive solar
51	insulation	4	green buildings^health and shelter	
52	building rating systems	4	green buildings^standards	
53	water heating	4	green buildings^water	water heating^solar hot water^wet back
41	household behaviour	3	demand management^residential consumption	household behaviour
57	metering	4	electricity^household behaviour^light industry and commercial	
58	household power saving	4	electricity^household behaviour	light bulbs^switching off^heated towel rails
55	consumer education	4	electricity^household behaviour	
50	industry behaviour	3	demand management	
59	industry power saving	4	industry behaviour	light bulbs
128	electric transport	4	electricity^alternative fuels	hybrid^electric cars^electric rail^regenerative brakes^hydrogen
129	location of generation	4	electricity^industry behaviour	location of generation^transmission losses
26	energy sources	2	policies	energy^fuels^fuel after all
60	fossil fuels	3	energy sources	thermal^fossil fuels
23	gas-fired	4	gas^electricity suppliers	gas-fired^combined heat and power
24	coal-fired	4	coal^electricity suppliers	coal-fired^clean coal^gasification
8	oil-fired	4	oil^electricity suppliers	diesel generators^oil-fired
61	renewables	3	energy sources	renewables^sustainable energy^clean energy
62	biomass	4	renewables	biomass^waste into energy^methane power^pyrolysis^biodegradable plastics^methanol^biofuel^ethanol^cellulose^biodiesel
31	hydro	4	renewables^electricity suppliers^water	hydro^dams
30	geothermal	4	renewables^electricity suppliers	steam
29	wind power	4	renewables^electricity suppliers	
63	solar	4	renewables	solar hot water^solar power^solar panels
38	marine-based electricity generation	4	renewables^electricity suppliers^water	marine-based electricity generation^tidal power^wave power

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Id	Name	Level	Parent	Matched_Keyword_Name
64	other energy sources	3	energy sources	
37	nuclear	4	heavy industry^other energy sources	nuclear sciences^radioactive material^nuclear submarines^nuclear weapons^reactor^nuclear waste
65	electricity storage	4	electricity^other energy sources	regenerative brakes^electricity storage^hydrogen^batteries^lithium
66	**structure and regulations**	**2**	policies	
67	trading and markets	3	structure and regulations^business interests	
35	wholesale electricity market	4	electricity^finance and insurance^trading and markets	
68	sharemarkets	4	finance and insurance^trading and markets	
69	carbon trading	4	finance and insurance^greenhouse emissions^trading and markets	
92	oil and gas markets	4	finance and insurance^oil and gas industry^trading and markets	heating oil
72	acts and bills	3	structure and regulations	
3	RMA	4	acts and bills	
73	carbon tax	4	acts and bills	
6	energy strategy	4	acts and bills	
34	pricing and regulation	3	structure and regulations	
70	standards	4	pricing and regulation	
74	electricity charges	4	electricity^economics^pricing and regulation	
75	electricity penalties	4	electricity^negative^pricing and regulation	unpaid power bill
130	**communication**	**1**		
44	**psychology**	**2**	**communication**	**psychology**
84	tone	3	psychology	
85	negative	4	tone	walking away^stranded^x stranded exceptions^lost hot water^dampness^unflued^nuclear weapons^weapons of mass destruction^gun^not self sufficient^human waste^nuclear waste^Smog Hog^grey water^germ warfare
86	neutral	4	tone	to fuel^connection between^driving factors
87	positive	4	tone	x power exceptions^powerful^high energy^economic health^hold firm^non financial assets^robots^money generation^wellbeing^warmth^heat pumps^double-glazing^x electricity exceptions^self-sufficiency^food self-sufficiency^technology^conservative approach^satellites^machines^compressed air^physical fitness
136	angle	3	psychology	
141	news	4	angle	
54	entertainment	4	angle	infotainment
122	**mechanism**	**2**	**communication**	
71	messaging	3	mechanism^angle	
137	media	4	messaging	
138	marketing	4	messaging	infotainment
139	lobbying	4	messaging	
119	channel	3	mechanism	
121	phones	4	channel^light industry and commercial	telephone lines^phones
140	internet	4	channel	internet^eftpos
142	radio	4	channel^media	
143	TV	4	channel^media	TVs
144	newspapers	4	channel^media	newspapers
145	film	4	channel^media	
146	books	4	channel	

Id	Name	Level	Parent	Matched_Keyword_Name
76	**issues of concern**	**1**		
77	**wellbeing**	**2**	**issues of concern**	**food self-sufficiency^health^welfare of^heating**
78	health and shelter	3	wellbeing	
79	illness	4	health and shelter	dampness^unflued
134	wellness	4	health and shelter	wellbeing^warmth^woodburners^heat pumps^double-glazing^physical fitness
81	physical safety	3	wellbeing	life jackets
82	accidents	4	physical safety	CPR
83	weather	4	environmental issues^physical safety	
131	social wellbeing	3	wellbeing	
132	community support	4	social wellbeing^household sector	
133	crime & violence	4	social wellbeing	nuclear weapons^weapons of mass destruction^gun^germ warfare
88	**political imperatives**	**2**	**issues of concern**	**political power**
89	social equity	3	political imperatives^household sector	
80	the poor	4	health and shelter^social equity	unpaid power bill
135	disadvantaged groups	4	social equity	
90	progress	3	political imperatives	technology^robots^compressed air^satellites^machines
1	economics	4	progress	economic power
120	indicators	4	progress	
91	electioneering	3	marketing^political parties^political imperatives	
2	**environmental issues**	**2**	**issues of concern**	**pyrolysis^biochar^clean diesel**
4	climate change	3	environmental issues	radiative forcing^icebergs
7	greenhouse emissions	4	climate change	
10	climate impacts	4	climate change	
94	pollution	3	environmental issues	human waste^nuclear waste
95	air pollution	4	pollution	Smog Hog
96	water pollution	4	water^pollution	grey water
39	peak oil & gas	3	environmental issues	
93	oil reserves	4	system reliability^peak oil & gas^oil	
36	alternative fuels	4	industry behaviour^peak oil & gas^transport sector	biofuel^ethanol^cellulose^biodiesel
46	**ownership issues**	**2**	**issues of concern**	
97	property rights	3	ownership issues	
98	enterprise ownership	4	property rights	assets
99	pylon property issues	4	transmission^environmental issues^property rights	
56	commons	3	ownership issues	
101	public land	4	commons	
100	water use	4	water^commons	irrigation^greywater systems^water pipeline^grey water
102	tangata whenua	3	ownership issues	

Id	Name	Level	Parent	Matched_Keyword_Name
103	players	1		
104	electricity sector	2	electricity^players	
105	residential consumption	3	household sector^energy sources	appliances^refrigerators^TVs^gadgets^consumer electronics^electric heaters^gas heaters^unflued
106	business consumption	3	business interests^energy sources	air-conditioning^lights
107	transmission players	3	electricity sector	
108	electricity suppliers	3	electricity sector	base load^nuclear waste
109	electricity market players	3	wholesale electricity market^electricity sector	
110	electricity regulators	3	system oversight^standards^electricity sector	
33	business interests	2	players	
111	coal mining industry	3	business interests^coal^fossil fuels	retreat mining
28	transport sector	3	business interests	vehicles^cars^gas guzzlers^petrol compression ignition^Powershift system^continuously variable transmission^automated manual transmissions^dual-clutch transmissions^powertrain^Integrated Starter Generator system^clean diesel^gas-to-liquid^coal-to-liquids^truck^ABS
32	heavy industry	3	business interests	
19	agricultural sector	3	business interests	biochar^fertiliser^BSE
18	forestry sector	3	business interests	
9	oil and gas industry	3	business interests^fossil fuels	oil self-sufficiency^pipeline
12	light industry and commercial	3	business interests	t-shirts^plastics
112	finance and insurance	3	business interests	eftpos
113	household sector	2	players	domestic chores
114	elderly and beneficiaries	3	household sector	
22	families and children	3	household sector	
21	workers and unions	3	household sector	
20	other parties	2	players	
17	NGOs	3	other parties	
127	local bodies	3	other parties	
16	political parties	3	political imperatives^other parties	
123	government & education	2	players	
124	science & research	3	government & education	pyrolysis^biochar^nuclear sciences^radioactive material^genetic engineering^biodegradable plastics^neurology^psychology
125	education	3	government & education	financial education
126	government players	3	government & education	nuclear submarines
115	gas	0	oil and gas industry	gas connection^liquefied natural gas^liquefied petroleum gas^gas heaters^unflued^gas^gas-to-liquid^CNG
116	oil	0	oil and gas industry	distillate^oil^crude^oil tankers^petrol^petroleum^diesel^clean diesel^horizontal directional drilling^floating production, storage and offtake vessel^oil sands^plastics
117	water	0		water^water tanks^desalination
118	coal	0	coal mining industry	coal^coal-to-liquids

Appendix A1a – Topics by Matched Event

[FULL SET]

Id	Name	Level	Parent	Matched_Event_Name
5	electricity	0	energy sources	electricity shortage^power cuts^blackouts^rolling blackouts^peak power demand^power crisis^electrical fault^electric shocks^electrocution^National Power New Zealand 2006^Nuclear Technology day
11	policies	1		
13	supply security	2	policies	major economies' meeting
43	system capacity	3	supply security	National Power New Zealand 2006
42	system oversight	4	system capacity	
14	system reliability	4	system capacity	water shortages^energy shortages^electricity shortage^power cuts^oil outage^blackouts^rolling blackouts^bottlenecks^pipeline bottlenecks^power crisis^energy crisis^oil shocks^dry weather
25	transmission	3	electricity^supply security^transmission players	bottlenecks^undergrounding
45	national transmission	4	transmission^transmission players	
27	local distribution	4	transmission^transmission players	
47	configuration alternatives	3	electricity^supply security	
48	isolated supply	4	configuration alternatives	
49	connected alternatives	4	configuration alternatives	
15	demand management	2	policies	peak power demand^Panasonic World Solar Challenge^EnergyWise awards
40	green buildings	3	demand management	
51	insulation	4	green buildings^health and shelter	
52	building rating systems	4	green buildings^standards	
53	water heating	4	green buildings^water	
41	household behaviour	3	demand management^residential consumption	
57	metering	4	electricity^household behaviour^light industry and commercial	
58	household power saving	4	electricity^household behaviour	Earth Hour
55	consumer education	4	electricity^household behaviour	
50	industry behaviour	3	demand management	
59	industry power saving	4	industry behaviour	Earth Hour
128	electric transport	4	electricity^alternative fuels	
129	location of generation	4	electricity^industry behaviour	
26	energy sources	2	policies	peak demand^energy crisis^oil shocks^International energy economists conference^Waikato Energy Forum^Energy Future Forum^Reuters Energy Summit^China energy conference^Conferenz 8th Annual New Zealand Energy summit^Round Table of Asian Energy Ministers
60	fossil fuels	3	energy sources	
23	gas-fired	4	gas^electricity suppliers	
24	coal-fired	4	coal^electricity suppliers	
8	oil-fired	4	oil^electricity suppliers	
61	renewables	3	energy sources	
62	biomass	4	renewables	Can Algae Save The World^bio-boom^Advanced Global Biofuel Summit^biofuels conference^NZBio^International Agroenergy and Biofuel Fair^Toyota Racing Series^New Zealand Grand Prix
31	hydro	4	renewables^electricity suppliers^water	hydro spillage
30	geothermal	4	renewables^electricity suppliers	
29	wind power	4	renewables^electricity suppliers	Wind Energy Conference
63	solar	4	renewables	Panasonic World Solar Challenge
38	marine-based electricity generation	4	renewables^electricity suppliers^water	
64	other energy sources	3	energy sources	
37	nuclear	4	heavy industry^other energy sources	nuclear age^Nuclear Energy for a Green Future^Nuclear Technology day^Chernobyl
65	electricity storage	4	electricity^other energy sources	Panasonic World Solar Challenge

Id	Name	Level	Parent	Matched_Event_Name
66	structure and regulations	2	policies	hearings
67	trading and markets	3	structure and regulations^business interests	bull market^bear market^market crash^bubbles^in-play^auctions
35	wholesale electricity market	4	electricity^finance and insurance^trading and markets	
68	sharemarkets	4	finance and insurance^trading and markets	IPO^delisted^profit taking^trading halt^tech wreck^Asian crisis of 1998^big crash of 1987^dot com bubble^bellwethers^insider trading^Business Herald Broker Picks
69	carbon trading	4	finance and insurance^greenhouse emissions^trading and markets	
92	oil and gas markets	4	finance and insurance^oil and gas industry^trading and markets	
72	acts and bills	3	structure and regulations	
3	RMA	4	acts and bills	Beyond the RMA
73	carbon tax	4	acts and bills	
6	energy strategy	4	acts and bills	
34	pricing and regulation	3	structure and regulations	
70	standards	4	pricing and regulation	
74	electricity charges	4	electricity^economics^pricing and regulation	
75	electricity penalties	4	electricity^negative^pricing and regulation	disconnection
130	communication	1		
44	psychology	2	communication	contemplation^revolutions
84	tone	3	psychology	
85	negative	4	tone	disruptions^shortages^energy shortages^electricity shortage^power cuts^blackouts^rolling blackouts^price spike^delisted^bottlenecks^pipeline bottlenecks^economic bottlenecks^congestion^traffic bottlenecks^shutdowns^death^death blow^post-mortems^crises^tech wreck^power crisis^energy crisis^shocks^oil shocks^electrical fault^electric shocks^electrocution^bad weather^frozen assets^rain^dust^natural disasters^drought^floods^fires^euphemistic storms^no choice^negative^secrecy^boredom^pain^resignation^avoidance^weakness^embarrassment^broken^selfishness^jealousy^greed^concerns^pressure^tensions^frustration^distress^trauma^suppression^threats^domination^resistance^discipline^criticism^waste of time^anger^derision^backlashes^deceit^complaints^unpopularity^uncooperative^hatred^neglect^pretentiousness^doubt^uncertainty^propaganda^controversy^knocking^disputes^conflicts^provocation^problems^inconvenience^damage^asbestos^errors^noise^confusion^danger^risks^leaky buildings^smells^halt^strikes^disaster strikes^receivership^dismissal^escape^confiscation^disaster^catastrophe^armageddon^societal collapse^end of the world^planetary emergency^environmental damage^deforestation^overfishing^extinctions^erosion^coral bleaching^acidification^rising sea levels^rising temperatures^wasteful^waste energy^waste money^scandals^Powdergate^bribes^Tampa^accusations^claimed lives^transgressions^skimming^extortion^tax evasion^drink driving^insider trading^blackmail^corruption^environmental crimes^war on the earth^economic downturn^recession^economic collapse^economic depression^Great Depression^stampede^blocking a coal train^x war exceptions^appeals^entreaties^worries^fear^warnings^urgency^distraction^Worst Transnational Corporation Operating in Aotearoa/New Zealand^decrease^fall^drop^failure^losing^insults^actual insults^fraud^free riders^cynicism^spin^greenwash^protests^unhealthy^illness^mental illness^occupational overuse syndrome^asthma^infections^HIV^Sars^accidents^whistleblowers^victims^militants^offenses^addiction^riots^violence^genocide^carnage^explosions^torture^weapons^coups^raids^Tongan riots^bombings^London underground bombings^wars^cold war^world war II^Holocaust^gulf war^Iraq war^Vietnam war^war on terrorism^Yom Kippur war^Spanish Civil war^nuclear war^battle of Passchendaele^world war I^murder^manslaughter^executions^electric chair^military strikes^9/11^economic crimes^Dump awards^Likely to be Littered^brickbats^bear market^cost increases^Erebus disaster^Sandoz fire^gas cuts^defamation^climate impacts^non-violent direct action^lightning^cyclone George^cyclone Clare^cyclone Favio^cyclone Gamede^cyclone Larry^hurricane Katrina^tropical storm Debby^tropical storm Ernesto^Tropical storm Florence^tropical storm Henriette^tropical storm Barry^tropical storm Ingrid^tropical storm Chris^tropical storm, Karen^Helene --^hurricane Felix^hurricane Mitch^hurricane Dean^hurricane Ivan^hurricane Rita^hurricane Lorenzo^hurricane Humberto^pollution^waste^salination^poisons^heavy metals^air pollution^acid rain^global dimming^emissions^carbon emissions^radiation emissions^water pollution^agricultural run-off^oil spills^didymo^algal blooms^ecological death^storms^earthquakes^tsunamis^volcanoes^dry weather^snow^winter^temperatures^psychiatry^electric convulsive therapy^Kashmir war^cannabis^axis of evil^Israel off the map^high cost^weather^hurricane Wilma^lawsuits^Tropical cyclone Wati^doubtful weather^other erosion^bird flu^damages
86	neutral	4	tone	decisions^choice^emotions^coping^belief^enclosed^relaxation^contentment^moderation^emphasis^surprise^seriousness^peak^assertiveness^debates^arbitration^closure^causation^compensation^allows^desire^challenges^precautions^intentions^advice^normal^approval^gas reconnections^remorse^power restored^rescues^endearing insults^signs^assumptions^expectations^habits^a certain^cheap^expensive^high prices^low prices^all weather^memories

Id	Name	Level	Parent	Matched_Event_Name
87	positive	4	tone	increase^Smales Farm Excellence in Environmental Management award^abundance^surplus^reconnection^booms^bubbles^good weather^positive^relief^hideaways^convenience ^softness^happiness^enthusiasm^excitement^humour^new^curiosity^novelty^strength ^courage^talent^leadership^bellwethers^popularity^privilege^luxury^compliments ^contribution^altruism^kindness^compassion^forgiveness^gratitude^respect^collaboration ^bypass^traffic bypass^importance^self-discipline^certainty^a certain appeal^solutions ^motivation^opportunities^adventures^emergence^potential^tradition^celebrations^Writers and Readers Festival^Mighty River Power Waterstock Festival at Jones Landing^Father's day^St Patrick's day^Valentine's day^weddings^film festivals^Cannes film festival^holidays ^public holidays^Easter^Christmas^Thanksgiving^New Year's day^awards^prizes^Emmy awards^Oscar awards^Brit awards^Golden Globe awards^Academy awards^Nobel prize ^Grammy^knighthood^New Year Honours^gold medals^Lifetime Achievement award^TV awards^Qantas Television awards^rise^jump^success^winning^clean^treasure^President's day^community^gardens^public parks^beaches^community support^bio-boom^economic boom^mining boom^credentials^treasure hunt^gold rush^Blossom festival^Adventure quest ^Leadership week^x reconnection exceptions^EnergyWise awards^EECA Supreme award ^Fujitsu General NZ Community award^Transpower Energy Supplier award^Meridian Energy Renewable Energy award^Honeywell Innovation award^Shell New Zealand Transport award^Genesis Energy Commercial/Services award^Energy for Industry Industrial/Manufacturing award^Contact Energy Manager award^Ministry for the Environment Public Sector award^Ramadan^Labor day^Labour day^Waitangi day^Auckland anniversary^Australia day^Anzac day^Martin Luther King Jr. day^May day^Queen's Birthday^Independence day^Fulton Gold Medal^Companion of the Queen's Service Order^fellow of the Royal Society^Weight Watchers Slimmer of the Year^Order of Australia^Winston Churchill Fellow^High Medallion of the Islamic Republic of Iran^Harkness Fellowship^EEO Trust Work and Life^Michelin stars^Herald New Zealander of the Year^Sir Peter Blake Trust Leadership awards^New Zealand Post Book awards for Children and Young Adults^Car of the Year^Fundsource Managed Funds Industry awards^Westpac Enterprise North Shore Business Excellence award^business awards^CEO of the Year^fund manager of the year^Business Leader of the Year^chairman of the year^Export Year's Business Champion^Business Herald Broker Picks^Fisher Funds prize^weekends^university degrees^science degree^arts degree^engineering degree^doctorate^commerce degree^Certificate in Continuing Education^computing degree^public policy degree^law degree^world record^Joseph W. Aidlin award^bull market^medical degree^convincing^public policy degree^economics degree^fieldays ^Loxene Golden Disc^New Zealand Entertainer of the Year^Tony award^summer ^confidentiality^World Class New Zealand awards^diploma of nautical science^Martin Luther King Jr day^low cost
136	angle	3	psychology	propaganda^communicating^spin^requests^speculation^probabilities
141	news	4	angle	
54	entertainment	4	angle	battle of Britain^gambling^trade shows^International Agroenergy and Biofuel Fair^Trenz ^Frankfurt Motorshow^Tokyo Motor Show^Detroit show^Shanghai Expo^Bio 2006^sporting events^Panasonic World Solar Challenge^World Fly Fishing Championships^Toyota Racing Series^New Zealand Grand Prix^Formula One^World Netball Champs^EnergyWise rally^2011 Rugby World Cup^Wimbledon^2007 Rugby World Cup^Soccer's World Cup ^Hockey World Cup^Olympics^A1 Grand Prix^Super Bowl^Commonwealth Games ^America's Cup^Tour de France^Paris Airshow^Tri-Nations^Secondary School Champs ^Ladies Ski week^Nokia Extreme^Corona Dragon Big Air^world rowing championships ^world championships in Gifu^Super 14^Tour Down Under^Tour of Wellington^End of the World Biennial^Live Aid^Live Earth^Aotearoa Live^Live8^Golden Green party^Global Green Pre-Oscar Party^Writers and Readers Festival^Climate Rescue Carnival^Glastonbury ^Confessions tour^Across the Great Divide tour^Woodstock^film festivals^Cannes film festival^Emmy awards^Oscar awards^Brit awards^Golden Globe awards^Academy awards ^Grammy^Fulton Gold Medal^world record^gold medals^Lifetime Achievement award^TV awards^Qantas Television awards^Amnesty International Conspiracy of Hope tour ^motorsport^sport events^lottery^betting^musical tours^concerts^International Wine Challenge^Ecoshow^celebrations^Lincoln University Schools Science and Technology Fair^Blossom festival^Adventure quest^Kiwifruit festival^Taste Bay of Islands^Mighty River Power Waterstock Festival at Jones Landing^Climate Change Festival^St Patrick's day^Valentine's day^weddings^World Environment day^Halloween^Captain's Choice Tour ^knighthood^Weight Watchers Slimmer of the Year^brickbats^Dump awards^Likely to be Littered^Worst Transnational Corporation Operating in Aotearoa/New Zealand^New Zealand Post Book awards for Children and Young Adults^business awards^Business Herald Broker Picks^Joseph W. Aidlin award^Sir Peter Blake Trust Leadership awards ^Herald New Zealander of the Year^High Medallion of the Islamic Republic of Iran ^Michelin stars^EEO Trust Work and Life^fieldays^Loxene Golden Disc^New Zealand Entertainer of the Year^Tony award^New Thinking 2006^Facilities Management trade show^World Class New Zealand awards^Festes de la Merce^Sweetwaters Festival ^Derby day^Auckland Cup^arts festival^A&P show^Commonwealth games^Miss South Pacific^Split Enz tour^Sweetwaters^Parihaka Peace Festival^Auckland International Film Festival^Auckland International film festival^National jazz festival
122	**mechanism**	**2**	**communication**	
71	messaging	3	mechanism^angle	
137	media	4	messaging	
138	marketing	4	messaging	business conferences^Intel developers' conference^biofuels conference^Tourism Industry Conference^NZBio^trade shows^Trenz^Frankfurt Motorshow^Tokyo Motor Show^Detroit show^euphemism^greenwash^State of the Union^Macquarie Bank's Australian Conference^International Agroenergy and Biofuel Fair^International Wine Challenge^Shanghai Expo^Bio 2006^Kiwifruit festival^Taste Bay of Islands^Father's day^Emmy awards^New Zealand Post Book awards for Children and Young Adults^Car of the Year^Fundsource Managed Funds Industry awards^Westpac Enterprise North Shore Business Excellence award^Oscar awards^Brit awards^Golden Globe awards^Academy awards^Weight Watchers Slimmer of the Year^Grammy^CEO of the Year^Smales Farm Excellence in Environmental Management award^fund manager of the year^Business Leader of the Year^chairman of the year^Export Year's Business Champion^Business Herald Broker Picks^Fisher Funds prize^Lifetime Achievement award^Climate Defence Tour^Facilities Management trade show^New Thinking 2006^World Class New Zealand awards^A&P show

Id	Name	Level	Parent	Matched_Event_Name
139	lobbying	4	messaging	talks^Beyond the RMA^Wellington Chamber of Commerce forum^Dalai Lama's Spirituality and Sustainability Forum^Auckland Chamber of Commerce Luncheon^campaigns^protests^smaller elections^World Environment day^Golden Green party^Global Green Pre-Oscar Party^International day for Biological Diversity^Nuclear Energy for a Green Future^Operation Smoky^Earth Hour^Live Aid^World Water day^Worst Transnational Corporation Operating in Aotearoa/New Zealand^Co-Existence^Make Poverty History^Live8^climate campaigns^International Polar Year^End of the World Biennial^Can Algae Save The World^International day of Action on Climate Change^Climate Change Festival^Climate Rescue Carnival^Camp for Climate Action^International Year of the Reef 2008^Cool Earth 50 initiative^Carbon Crusade^Live Earth^Aotearoa Live^Blog Action day^non-violent direct action^blocking a coal train^Cool Earth 50
119	channel	3	mechanism	
121	phones	4	channel^light industry and commercial	
140	internet	4	channel	
142	radio	4	channel^media	
143	TV	4	channel^media	
144	newspapers	4	channel^media	
145	film	4	channel^media	
146	books	4	channel	
76	**issues of concern**	**1**		**issues^concerns^campaigns^protests^non-violent direct action^blocking a coal train^revolutions**
77	**wellbeing**	**2**	**issues of concern**	**death^post-mortems^funeral^catastrophe^armageddon^societal collapse^end of the world^emergency**
78	health and shelter	3	wellbeing	
79	illness	4	health and shelter	unhealthy^illness^mental illness^occupational overuse syndrome^asthma^infections^HIV^Sars^addiction^psychiatry^electric convulsive therapy^Confidential forum^bird flu
134	wellness	4	health and shelter	
81	physical safety	3	wellbeing	electric shocks^radiation emissions^protective boom^safety boom
82	accidents	4	physical safety	accidents^rescues^electrical fault^electrocution^9/11^Erebus disaster^Sandoz fire^claimed lives^Chernobyl
83	weather	4	environmental issues^physical safety	lines down^weather^bad weather^snow^winter^rain^dust^natural disasters^drought^floods^fires^storms^lightning^cyclone George^cyclone Clare^cyclone Favio^cyclone Gamede^cyclone Larry^hurricane Katrina^tropical storm Debby^tropical storm Ernesto^Tropical storm Florence^tropical storm Henriette^tropical storm Barry^tropical storm Ingrid^tropical storm Chris^tropical storm, Karen^Helene --^hurricane Felix^hurricane Mitch^hurricane Dean^hurricane Ivan^hurricane Rita^hurricane Lorenzo^hurricane Humberto^El Nino^La Nina^dry weather^temperatures^earthquakes^tsunamis^volcanoes^natural disasters conference^benign weather^hurricane Wilma^Tropical cyclone Wati^doubtful weather
131	social wellbeing	3	wellbeing	National Inter-Faith Forum^Regional Interfaith Dialogue
132	community support	4	social wellbeing^household sector	community support
133	crime & violence	4	social wellbeing	murder^manslaughter^Operation Star^executions^electric chair^military strikes^offenses^economic crimes^violence^genocide^carnage^explosions^torture^weapons^coups^raids^riots^Tongan riots^bombings^London underground bombings^wars^cold war^world war II^Holocaust^gulf war^Iraq war^Vietnam war^war on terrorism^Yom Kippur war^Spanish Civil war^nuclear war^battle of Passchendaele^battle of Britain^New Zealand wars^world war I^9/11^Kashmir war^cannabis^hearings^tasers^lawsuits
88	**political imperatives**	**2**	**issues of concern**	
89	social equity	3	political imperatives^household sector	Co-Existence
80	the poor	4	health and shelter^social equity	Live Aid^Make Poverty History^Live8
135	disadvantaged groups	4	social equity	Martin Luther King Jr. day^EEO Trust Work and Life^Martin Luther King Jr day
90	progress	3	political imperatives	green revolution^Industrial revolution^industrial revolution
1	economics	4	progress	economic crimes^economic downturn^recession^economic collapse^economic depression^Great Depression^International energy economists conference^Apec^2nd World Islamic Economic Forum^G20^World Economic Forum^high prices^low prices^cheap^expensive^low cost
120	indicators	4	progress	
91	electioneering	3	marketing^political parties^political imperatives	elections^Orewa speech^state of the planet^Climate Defence Tour
2	**environmental issues**	**2**	**issues of concern**	**Smales Farm Excellence in Environmental Management award^planetary emergency^environmental damage^deforestation^overfishing^extinctions^erosion^environmental crimes^war on the earth^Beyond the RMA^New Zealand Marine Sciences Society conference^Dalai Lama's Spirituality and Sustainability Forum^state of the planet^Golden Green party^Ecoshow^World Environment day^Earth day^International day for Biological Diversity^Arbour day^gardens^greenwash^green revolution^Global Green Pre-Oscar Party**
4	climate change	3	environmental issues	climate crisis^climate change^global warming^global dimming^war against global warming^major economies' meeting^climate change conferences^Rio Earth Summit^Chapman Tripp symposium on climate change^Sydney climate talks^Climate Change Policy Symposium^UN Earth Summit^seminar on climate change at Holy Trinity^Climate Change Leadership Forum^Washington meeting^High-Level Event on Climate Change^Conference of the Parties^Nairobi talks^Bali talks^UN conference in Copenhagen^End of the World Biennial^Climate Defence Tour^International day of Action on Climate Change^Climate Change Festival^Camp for Climate Action^Cool Earth 50 initiative^Carbon Crusade^Live Earth^Aotearoa Live^Climate Rescue Carnival^climate campaigns^Can Algae Save The World^Cool Earth 50

Id	Name	Level	Parent	Matched_Event_Name
7	greenhouse emissions	4	climate change	carbon emissions^emissions
10	climate impacts	4	climate change	coral bleaching^acidification^rising sea levels^rising temperatures^natural disasters conference^International Year of the Reef 2008^climate impacts^International Polar Year
94	pollution	3	environmental issues	ecological death^pollution^waste^salination^poisons^heavy metals^Likely to be Littered^Dump awards
95	air pollution	4	pollution	air pollution^acid rain^global dimming^Operation Smoky
96	water pollution	4	water^pollution	water pollution^agricultural run-off^oil spills^didymo^algal blooms^International Commission for the Protection of the Rhine
39	peak oil & gas	3	environmental issues	Planning for Long-term Fuel Shortages
93	oil reserves	4	system reliability^peak oil & gas^oil	peak oil
36	alternative fuels	4	industry behaviour^peak oil & gas^transport sector	bio-boom^Advanced Global Biofuel Summit^biofuels conference^NZBio^International Agroenergy and Biofuel Fair^Toyota Racing Series^New Zealand Grand Prix
46	ownership issues	2	issues of concern	
97	property rights	3	ownership issues	
98	enterprise ownership	4	property rights	Worst Transnational Corporation Operating in Aotearoa/New Zealand
99	pylon property issues	4	transmission^environmental issues^property rights	
56	commons	3	ownership issues	
101	public land	4	commons	public parks^beaches
100	water use	4	water^commons	
102	tangata whenua	3	ownership issues	New Zealand wars^Hui Taumata^Waitangi day
103	players	1		
104	electricity sector	2	electricity^players	Conferenz 8th Annual New Zealand Energy summit
105	residential consumption	3	household sector^energy sources	
106	business consumption	3	business interests^energy sources	
107	transmission players	3	electricity sector	
108	electricity suppliers	3	electricity sector	
109	electricity market players	3	wholesale electricity market^electricity sector	
110	electricity regulators	3	system oversight^standards^electricity sector	
33	business interests	2	players	Industrial revolution^G20^World Economic Forum^Doha^Action Asia business summit^Wellington Chamber of Commerce forum^Mood of the Boardroom breakfast^Auckland Chamber of Commerce Luncheon^newthinking06 conference^business conferences^trade shows^Bio 2006^CEO of the Year^Westpac Enterprise North Shore Business Excellence award^Business Leader of the Year^chairman of the year^Export Year's Business Champion^Fisher Funds prize^industrial revolution^business awards^New Thinking 2006
111	coal mining industry	3	business interests^coal^fossil fuels	
28	transport sector	3	business interests	traffic bottlenecks^traffic bypass^Erebus disaster^powertrain technologies conference^Nikkei International Automotive Conference^Assembly of the International Civil Aviation Organisation^World Low Cost Airlines Congress^European Civil Aviation Conference^Tourism Industry Conference^Trenz^Frankfurt Motorshow^Tokyo Motor Show^Detroit show^Shanghai Expo^Panasonic World Solar Challenge^Formula One^EnergyWise rally^A1 Grand Prix^Paris Airshow^Operation Smoky^Car of the Year^motorsport
32	heavy industry	3	business interests	mining boom
19	agricultural sector	3	business interests	salination^agricultural run-off^Romeo Bragato conference^International Agroenergy and Biofuel Fair^International Wine Challenge^Kiwifruit festival^Taste Bay of Islands^fieldays^A&P show
18	forestry sector	3	business interests	deforestation
9	oil and gas industry	3	business interests^fossil fuels	spillage^pipeline bottlenecks^oil spills^Gas Summit conference^New Zealand Petroleum Conference
12	light industry and commercial	3	business interests	Sapphire'07^ICT Summit^Intel developers' conference^Trenz^Captain's Choice Tour^New Zealand Post Book awards for Children and Young Adults^Michelin stars^Golden Green party^Across the Great Divide tour^Amnesty International Conspiracy of Hope tour^Confessions tour^Father's day^Weight Watchers Slimmer of the Year^Emmy awards^Oscar awards^Brit awards^Golden Globe awards^Academy awards^Grammy^Lifetime Achievement award^TV awards^Qantas Television awards^Loxene Golden Disc^New Zealand Entertainer of the Year^Tony award^Facilities Management trade show^World Class New Zealand awards
112	finance and insurance	3	business interests	financial crisis^credit crisis^sub prime crisis^receivership^Asian Development Bank's annual meeting^Fed meeting^Fundsource Managed Funds Industry awards^Fund Manager of the Year^financial rescue^Macquarie Bank's Australian Conference^fund manager of the year^bubbles
113	household sector	2	players	
114	elderly and beneficiaries	3	household sector	
22	families and children	3	household sector	New Zealand Post Book awards for Children and Young Adults
21	workers and unions	3	household sector	Skill New Zealand

20	other parties	2	players	
17	NGOs	3	other parties	Dalai Lama's Spirituality and Sustainability Forum^National Inter-Faith Forum^Global Green Pre-Oscar Party^Worst Transnational Corporation Operating in Aotearoa/New Zealand
127	local bodies	3	other parties	
16	political parties	3	political imperatives^other parties	ALP National Conference in April
123	government & education	2	players	
124	science & research	3	government & education	Can Algae Save The World^bio-boom^Catching the Knowledge Wave^New Zealand Marine Sciences Society conference^NZBio^Lincoln University Schools Science and Technology Fair^Bio 2006^International Polar Year^Nobel prize^fellow of the Royal Society
125	education	3	government & education	21st Century learning conference^Harkness Fellowship^university degrees^science degree^arts degree^engineering degree^doctorate^commerce degree^Certificate in Continuing Education^computing degree^public policy degree^law degree^medical degree^public policy degree^economics degree^diploma of nautical science
126	government players	3	government & education	European Jewish Congress^Commonwealth Heads of Government Meeting^G8 summit in St Petersburg^2nd World Islamic Economic Forum^G20^East Asia Summit^World Economic Forum^State of the Union^Doha^G8 meeting in Heiligendamm^Gleneagles G8^China energy conference^meeting of G10^South Pacific Forum^Communist Party congress^Round Table of Asian Energy Ministers^national assembly^Fed meeting^Skill New Zealand^Sydney climate talks^Climate Change Policy Symposium^Washington meeting^High-Level Event on Climate Change^Conference of the Parties
115	gas	0	oil and gas industry	gas cuts
116	oil	0	oil and gas industry	oil outage^Australian Petroleum Production and Exploration Association conference^oil conference
117	water	0		water shortages^dry weather^salination^World Water day
118	coal	0	coal mining industry	

Appendix A1b – Topics by Matched Document

[FULL SET]

Id	Name	Level	Parent	Matched_Document
5	electricity	0	energy sources	reserve capacity^national policy statement on electricity^energy efficiency^electrical capacity^electricity policy^Government's 2004 policy statement on electricity^national infrastructure policy statement^security of supply^GWh^electricity usage^electricity, energy and the environment^The Nuclear Power Joint Fact-Finding^The Merchant of Power^Solar Revolution^project, Archimedes^Ministerial Inquiry into the Auckland power supply failure^national demand^electricity demand
11	policies	1		one-child policy^national policy statement on electricity^policies^public policy^foreign policy^climate change policy^Common Agricultural Policy^monetary policy^fiscal policy^no-new-mines policy^paid parental leave^energy policy^electricity policy^Japan's energy policy^national policy statement^national policy statement on biodiversity^national policy statement on landscape^Government's 2004 policy statement on electricity^national infrastructure policy statement
13	supply security	2	policies	safeguarding supply^Oxford University Taskforce report
43	system capacity	3	supply security	capacities^electrical capacity^supply^oil supply^barrels per day^gas supply^gas reserves^GWh^a report commissioned by the Canterbury Manufacturers' Association^national demand^electricity demand
42	system oversight	4	system capacity	enforcement^governance^stewardship^compliance order
14	system reliability	4	system capacity	reserve capacity^oil reduction^lake levels^supplies^inventories^water supply^food supply^fish stocks^energy supply^security of supply^Ministerial Inquiry into the Auckland power supply failure
25	transmission	3	electricity^supply security^transmission players	
45	national transmission	4	transmission^transmission players	Transmission Pricing Methodology^lines upgrades^grid investment test^grid upgrade plan
27	local distribution	4	transmission^transmission players	System Average Interruption Duration index
47	configuration alternatives	3	electricity^supply security	
48	isolated supply	4	configuration alternatives	
49	connected alternatives	4	configuration alternatives	distributed generation^feed-in tariffs^net metering
15	demand management	2	policies	load balancing^fuel efficiency^energy conservation^reduce demand^energy efficiency^energy efficiency fund^water saving^fuel saving^energy rating^demand management^energy audit^energy intensity^Greenfleet^corporate average fuel economy (Cafe)^improvements to Wellington rail^Northern Busway project^transport efficiency^SmartGrowth^corporate average fuel economy
40	green buildings	3	demand management	energy efficiency standards^Go for Green^household sustainability programme
51	insulation	4	green buildings^health and shelter	insulation^Contact Energy Healthy Homes programme^Energy Wise Home Grants scheme^Tauranga Healthy Homes project^Snug Homes project^"Healthy, wealthy and wise" report^energy-efficient homes package
52	building rating systems	4	green buildings^standards	efficient building^NOW Homes^Green Star system^home energy rating scheme^LEED
53	water heating	4	green buildings^water	solar water heating initiative
41	household behaviour	3	demand management^residential consumption	power usage^household sustainability programme^NZ lags behind in household energy efficiency, says report
57	metering	4	electricity^household behaviour^light industry and commercial	metering^Easymeter^time of use^progressive pricing^GridWise study^smart grids
58	household power saving	4	electricity^household behaviour	power saving^appliance efficiency^Energy Star^household power saving^the ampere strikes back
55	consumer education	4	electricity^household behaviour	power saving campaign^consumer education
50	industry behaviour	3	demand management	
59	industry power saving	4	industry behaviour	reduce production
128	electric transport	4	electricity^alternative fuels	Who Killed the Electric Car^Green Car Congress publication^Auckland rail electrification project
129	location of generation	4	electricity^industry behaviour	
26	energy sources	2	policies	energy efficiency fund^energy policy^Japan's energy policy^energy supply^energy prices^energy review^Energy and Environment^Energy Outlook to 2030^Energy act^poll of public attitudes towards energy and the environment^Oxford University Taskforce report^World Energy Outlook^energy intensity^energy demand
60	fossil fuels	3	energy sources	
23	gas-fired	4	gas^electricity suppliers	
24	coal-fired	4	coal^electricity suppliers	capture and storage
8	oil-fired	4	oil^electricity suppliers	
61	renewables	3	energy sources	national policy statement to promote renewable energy^fossil fuel free^gas ban^renewable energy certificates^renewable energy target scheme^report by consultants ACIL Tasman^Renewable Energy Cheaper Than Coal^2005 Clean Energy Guide^Advanced Energy Initiative^New Zealand Energy Revolution: How To Prevent Climate Chaos^Renewable Energy Cheaper Than
62	biomass	4	renewables	biodiesel usage^New Zealand Standard for biodiesel^ProAlcool^biofuel sales obligation^Australian Biofuel Projects 2007^Biofuel bill^Force 10
31	hydro	4	renewables^electricity suppliers^water	lake levels^inflows^Seepage and Uplift Pressures Under Hydraulic Structures
30	geothermal	4	renewables^electricity suppliers	Chemistry and Geothermal Systems

Id	Name	Level	Parent	Matched_Document_Name
29	wind power	4	renewables^electricity suppliers	standard for the assessment and measurement of sound from wind turbines
63	solar	4	renewables	California Solar Initiative^project, Archimedes^Solar Revolution^California Solar initiative
38	marine-based electricity generation	4	renewables^electricity suppliers^water	
64	other energy sources	3	energy sources	
37	nuclear	4	heavy industry^other energy sources	The Nuclear Power Joint Fact-Finding^Lombok Treaty^Atomic Energy act^Proliferation Security Initiative^IAEA report^Chernobyl - Catastrophe and Consequences
65	electricity storage	4	electricity^other energy sources	nickel metal
66	**structure and regulations**	**2**	**policies**	**compulsion^product stewardship^rules^regulations^laws^unbundling^Law of the Sea^poll commissioned by investment bank Goldman Sachs JBWere^quota^review of Commerce act^corporatisation^zoning^council zoning^school zoning**
67	trading and markets	3	structure and regulations^business interests	Monopoly game^bond prices^efficient markets^valuations^capital value^water trading^free market^tariff barriers^General Agreement on Tariffs and Trade^trade^trade agreements^P4 trade deal^free trade^free trade agreements^trade deficit^credit rating^market signals^commodities^price signals^energy prices^market reforms^Council of Australian Governments reform process^water market^single economic market^Bogor goals^Securities Markets act^The Great Turning^market share^Trade Practices act^coal price^TradeMe Success Secrets^hedges^liberalisation^sugar prices^deregulation
35	wholesale electricity market	4	electricity^finance and insurance^trading and markets	spot power prices^MWh^electricity reforms
68	sharemarkets	4	finance and insurance^trading and markets	share price index^Nasdaq^Hang Seng index^S&P 500^S&P/ASX 200 index^all ordinaries^NZSX-50^NZSX-15^NZSX-10^NZX Portfolio^NZX SmallCap^NZX MidCap^smart money index^NZSX All^FTSE 100^Dow Jones^Nikkei index^CSI-300^MSCI Barra index^index of semiconductors^WINZ world index^sensex index^Asia-Pacific index^Kospi^XAU^CRB index^shareholder votes^shareholder wealth^passive funds^active funds^takeovers code^compulsory acquisitions^listing^DLC^defensive stock^demand for shares^share prices^schemes of arrangements^Substantial Shareholder Notices^explanatory memorandum^entitled "Branch economy^2005 Global IPO activity report^global survey of IPOs^Institutional Investor magazine^Stock takes^NZ stocks:^Baron's Roundtable^Australian stocks:^US stocks:^P/E^enterprise multiple^A shares^blue chips^Sarbanes-Oxley law^EcoWin^Companies (Minority Buy-Out Rights) Amendment bill^shareholding democracy^Profit Distribution Plan and Associated Disclosure^reporting season^Companies Minority Buy-Out Rights Amendment bill
69	carbon trading	4	finance and insurance^greenhouse emissions^trading and markets	emissions trading^cap and trade^carbon credits^Projects to Reduce Emissions^emission reduction units^certified emissions reductions^assigned amount units^international standard for greenhouse gases^joint accreditation programme in New Zealand and Australia for a greenhouse gas emissions trading scheme^How To Play Carbon^Castalia report^grandparenting^global deforestation avoidance market^deforestation avoidance market^Design Options for a Tradeable Deforestation Permits Regime^reducing emissions from deforestation
92	oil and gas markets	4	finance and insurance^oil and gas industry^trading and markets	oil price^West Texas Intermediate crude^New York crude^US crude^London Brent crude^Malaysian Tapis crude^Dubai crude^petrol price^diesel price^gas price^US Henry Hub^Man Energy Daily report^Oil Market report^NZIER) undertook a study of LNG markets^Genesis-Contact statement^Reuters survey
72	acts and bills	3	structure and regulations	doctrine of prime necessity^constitutions^Commerce act^Biofuel bill^Climate Change bill^Energy act^Custom and Excise act 1996^Land Transport Management Amendment bill^Companies act^SOE act^Waste Minimisation bill^Public Transport Management bill^Consumer Guarantees act^Electricity act^Conservation act^Electricity Industry Reform act^Electricity Industry Reform Amendment bill^official information act^Overseas Investment act^Sentencing act^Customs act^bill before Congress^Private Investigators and Security Guards act^Crimes act^Privacy act^Corporate Manslaughter bill^Employment Relations act^Food act^Animal Products act^Agricultural Compounds and Veterinary Medicines act^Wine act 2004^Electricity (Disconnection and Low Fixed Charges) bill^Environment act^Residential Tenancies act^Residential Tenancies Amendment bill^Unit Titles act^Property act^Property Law bill^Building act^New Zealand bill of Rights act^Copyright act^Trademarks act^Defamation act^Waitakere Ranges Heritage bill^New Zealand Nuclear Free Zone, Disarmament and Arms Control act^Terrorism Suppression act^Terrorism Suppression Amendment bill^Credit Controls and Consumer Finance act^Fair Trading act^Freedom of Information act^Maritime Safety act^National Parks act^Telecommunications Amendment bill^Land Transport Management act^Telecommunications act^Births, Deaths and Marriages bill^Financial Service Providers bill^Reserve Bank Amendment bill^Health act^Public Health bill^Electoral Finance bill^Education (Tertiary Reforms) Amendment bill^Therapeutic Products and Medicines bill^immigration legislation^Mauao Historic Reserve Vesting bill^Dog Control Amendment bill No 2^Companies (Minority Buy-Out Rights) Amendment bill^Affordable Housing: Enabling Territorial Authorities bill^Waka Umanga (Maori Corporations) bill^Injury Prevention, Rehabilitation and Compensation Amendment bill (No 2^Maori Purposes bill (No 2^Customs and Excise Amendment bill (No 3^Real Estate Agents bill^Reserves act^Dairy Industry Restructuring act^bill going through the British Parliament^Trade Practices act^WorkChoices industrial laws^Sarbanes-Oxley law^Smoot Hawley act^Clean Air act^US Iran Sanctions act of 1999^Atomic Energy act^Alien Tort Statute^US Air Pollution Control act^Ryan White act^Patriot act^No Child Left Behind act^Volkswagen Law^regulatory impact statement^review of Commerce act^Public Works act^Local Government (Auckland) Amendment act^Electricity Disconnection and Low Fixed Charges Amendment bill^Education Tertiary Reforms Amendment bill^Companies Minority Buy-Out Rights Amendment bill^Waka Umanga Maori Corporations bill^Customs and Excise Amendment bill^Local Government Auckland Amendment act^West Coast Preservation act^Injury Prevention, Rehabilitation and Compensation Amendment bill^Maori Purposes bill
3	RMA	4	acts and bills	resource consents^call-in^Resource Management Amendment act^RMA^Resource Management act^resource management act
73	carbon tax	4	acts and bills	carbon tax^fart tax^negotiated greenhouse agreement
6	energy strategy	4	acts and bills	draft energy strategy^energy strategy^efficiency and conservation strategy

Id	Name	Level	Parent	Matched_Document_Name
34	pricing and regulation	3	structure and regulations	fuel tax^GST^VAT^legal bills^compliance costs^installation costs^Guidelines on Arrangements to Assist Low Income Domestic Consumers^financial costs
70	standards	4	pricing and regulation	building code^NoCO2 certification^NCEA^renewable energy certificates^IEC certification^standards^New Zealand Standard for biodiesel^corporate average fuel economy (Cafe)^international standard for greenhouse gases^joint accreditation programme in New Zealand and Australia for a greenhouse gas emissions trading scheme^accounting standards^prudential standards^standard for the assessment and measurement of sound from wind turbines^international financial reporting standards^eco-verification^Enviro-Mark programme^Green Seal^WOF^compliance document^energy audit^energy rating^ratings^CarboNZero^NoCO2^General Certificate of Secondary Education^corporate average fuel economy
74	electricity charges	4	electricity^economics^pricing and regulation	controlled tariffs^Transmission Pricing Methodology^progressive pricing^power bills^fixed charges^variable charges^electricity price^pricing plan^KWh^electricity price index^transmission prices^line charges^cost of electricity^weighted average cost of capital^Commerce Commission taking control^social agency pack
75	electricity penalties	4	electricity^negative^pricing and regulation	
130	communication	1		votes^reports
44	psychology	2	communication	rehabilitation
84	tone	3	psychology	
85	negative	4	tone	enforcement^taxes^mercenary^inaccuracy^ignorance^insecurity^unproductive^inefficiency^unsustainability^cuts^job cuts^absence of liquidity^attack targets^disposals^discouragement^restrictions^prohibitions^limits^coercion^penalties^sanctions^fines^boycotts^punishments^bans^levies^duties^steady decline^debt^deficits^discrimination^injustice^growing concern^accusatory charges^liabilities^price gouging^costs^transaction costs^externalising^social costs^environmental costs^tax system^tolls^Air Passenger Duty^carbon tax^fart tax^fuel tax^road user charges^tax losses^Trojan horse^The Skeptical Environmentalist^catch-22^Grapes of Wrath^Cool It^China's Water Crisis^Lord of the Flies^The Greenhouse Delusion^The Age of Turbulence^The Mess They Made: The Middle East After Iraq^The Party's Over^The Assault on Reason^nimby^isolationism^disadvantage^vested interests^dependency^Weimar inflation^crime rates^price-fixing^tax avoidance^blunt instrument^no confidence^unsafe^financial costs^compliance costs^installation costs^cost of electricity^cost-of-capital^weighted average cost of capital^Climate: Dangerous Games^revenge of Gaia^carbon prices^Greenhouse Gas Abatement programme^report exposing the CIA^Area Closed - Oil Spill, Hazardous Contaminants in Water^polluter-pays^greenhouse gases^sulphur^China Water Pollution Map^Health and Air Pollution in New Zealand^CFCs^political correctness^imbalance^compulsion^spending cuts
86	neutral	4	tone	mandatory^awareness^disclosure^security^balance^stability^maintenance^authority^investigations^discounts^sponsorship^permits^signals^responsibilities^ratification^strategies^spending time^offset^zero emissions^waste minimisation^accountability^agreements^money^Emperor's New Clothes^brave new world^moratoriums^justice^impacts
87	positive	4	tone	GE-free^back-to-basics^utilisation^insulation^efficient building^transparency^100 per cent Pure New Zealand^clean and green^accuracy^straightforward^goals^prosperity^knowledge^wealth^wisdom^reliability^confidence^productivity^achievements^progress^modernity^innovation^efficiency^steady growth^sustainability^sustainable growth^preservation^environmentally friendly^carbon neutrality^conservation^energy conservation^cash^liquidity^ethics^values^principles^saving^money saving^time saving^benefits^harvesting^encouragement^assistance^guarantees^grant consent^free^nuclear-free^freedom^no limits^bonuses^x bonus exceptions^independent^independence^work life balance^social responsibility^non-monetary credit^smoothing^growth^expansion^growing^stimulation^income growth^profit growth^plant growth^job growth^commitment^investor safety^credentials^NoCO2 certification^renewable energy certificates^QEII Trust^IEC certification^eco-verification^Enviro-Mark programme^Green Seal^agreement in principle^guidelines^Alice in Wonderland^savings culture^diversification^dispute resolutions^consensus^blue chips^advantage^cleverness^rationality^memorandum of understanding^tax free^bargains^stewardship^product stewardship^co-operation agreement^composting^Vector Life programme^KiwiSaver^Vodafone Handset Recycling Programme^recycling^Vodafone Handset Recycling programme^California Solar initiative^solar water heating initiative^SuperGold Card^eco-magination^Advanced Energy Initiative^American Competitiveness Initiative^energy-efficient homes package^Contact Energy Healthy Homes programme^Energy Wise Home Grants scheme^Tauranga Healthy Homes project^Snug Homes project^Guinness Book of World Records^Winning By Jack Welch^CarboNZero^NoCO2^fleet efficiency standards^National Business Review Rich List^Clean Green Profit Machine^Go for Green^Around the World in Eighty Days^20,000 Leagues under the Sea^Bright Star: Beatrice Hill Tinsley Astronomer^fossil fuel free^Helping America's Youth Initiative^free market^free trade^Lonely Planet Guide^NZAID^Philosophical Transactions of the Royal Society A^tax cut
136	angle	3	psychology	persuasion^influence^exemptions^temptation^encouragement^assistance^guarantees^incentives^bargains^carrots and sticks^sway
141	news	4	angle	news^Morning report^Tagata Pasifika^3 News^current affairs^Close Up^Campbell Live^60 Minutes^Sunday programme^Native Affairs^TV One's Breakfast^Agenda programme^NZ stocks:^Australian stocks:^US stocks:^Tangata Pasifika^Stock takes^Movers & Shakers^The Business^Weekend Review

Id	Name	Level	Parent	Matched_Document_Name
54	entertainment	4	angle	pac-man^Monopoly game^the Simpsons^thriller 24^Big Brother^Shortland Street^Pop Idol^Outrageous Fortune^Dancing with the Stars^Mr Magoo^Dr Who^ICE TV^Deal or No Deal^The Unauthorised History of New Zealand^Pulp Sport^broTown^Rude Awakenings^The Hothouse^Play It Strange^Lets Get Inventin^Westfield Style Pasifika 2007^Police Ten 7^NZ Idol^Intrepid Journeys^Fair Go^Downsize Me^Star Trek^Market Kitchen^X-Files^ABC's "Lost^drama Heroes^Scooby Doo^Adult Swim^Entourage^M*A*S*H^West Wing^ABC's Commander in Chief^NYPD Blue^Hell's Kitchen^music^Chrome Dreams II^song "Hey You^Irish National Anthem^Riders on the Storm^Age of Aquarius^God Defend New Zealand^Dumped^Good Life^movies^Crude Awakening^An Inconvenient Truth^Sicko^Darfur Now^Bowling for Columbine^Truman Show^Black Stallion^Reservoir Dogs^Kill bill^Roman Holiday^Die Hard^Syriana^Evan Almighty^Terminator^11th Hour^The Day After Tomorrow^Arctic Tale^Who Killed the Electric Car^Whale Rider^Sione's Wedding^Elizabeth: The Golden Age^Blood Diamond^Finding Nemo^perfect storm^seize the day^Five Ways to Save the World^band of brothers^The Fountain^films Pi^Requiem for a Dream^What Dreams May Come^Apocalypto II^2001: A Space Odyssey^The Matrix^A Constant Gardener^Solaris^Lord of The Rings^end of the golden weather^Raiders of the Lost Ark^Mad Max Beyond Thunderdome^Brokeback Mountain^Aviator^Capote^Walk the Line^Good Night, and Good Luck^Wallace & Gromit^Life and Death of Peter Sellers^Million Dollar Baby^Cinderella Man^King Kong^Tom Dowd & the Language of Music^movie industry^Green Seal^Wembley Stadium reconstruction^Green Event Guidelines^Sideswipe^Da Vinci Code^Winnie the Pooh^The Diana Chronicles^Guinness Book of World Records^Hitchhiker's Guide to the Galaxy^Alice in Wonderland^games^15 green actors^Sha La La La Lee^I Have Loved Me a Man^Games People Play^Don't Come Any Closer^Put Your Hand in the Hand^manchurian candidate^Everything is Illuminated^Glengarry Glen Ross^Enron: The Smartest Guys in the Room^film industry^The Spy Who Shagged Me^The Amazing Race^K-19: The Widowmaker^ring of fire^TimeOut^American Recordings^Folsom Prison Blues^I Walk The Line^Maddigan's Quest^Xena^Mercy Peak^Being Eve^Last Emperor^Harry Potter^Sheltering Sky^Teletubbies^Signspotting^Wild Hogs^Once Were Warriors^The Constant Gardener^Pride and Prejudice^Serenity^Tracey Ullman Show^Ice Age: The Meltdown^Eagle vs Shark^Across Ruled Lines^Swan Lake^Block Party^White Planet^Beijing Bubbles^Linda Linda Linda^in The New World^Thank You for Smoking^Blood of My Brother
122	mechanism	2	communication	
71	messaging	3	mechanism^angle	
137	media	4	messaging	TV program
138	marketing	4	messaging	mandate^brands^Brand New Zealand^Trademarks act^Australia Inc^kiwiana^European Union Visitor programme
139	lobbying	4	messaging	Green Car Congress publication^PetrolWatch bulletin^Largely Happy^bargaining^The Case for Auckland^Auckland's Contribution to the Government's Surplus in 2005^Castalia report^Carbusters^petitions^consultation
119	channel	3	mechanism	
121	phones	4	channel^light industry and commercial	termination rates^calling prices^unbundling^Telecommunications Amendment bill^Telecommunications act
140	internet	4	channel	unbundling^Telecommunications Amendment bill^Telecommunications act
142	radio	4	channel^media	Morning report
143	TV	4	channel^media	Tagata Pasifika^3 News^Close Up^Campbell Live^60 Minutes^Sunday programme^Native Affairs^TV One's Breakfast^Agenda programme^TV program^the Simpsons^Dumped^Good Life^thriller 24^Big Brother^Shortland Street^Pop Idol^Outrageous Fortune^Dancing with the Stars^Mr Magoo^Dr Who^ICE TV^Deal or No Deal^The Unauthorised History of New Zealand^Pulp Sport^broTown^Rude Awakenings^The Hothouse^Play It Strange^Lets Get Inventin^Westfield Style Pasifika 2007^Police Ten 7^NZ Idol^Intrepid Journeys^Fair Go^Downsize Me^Star Trek^Market Kitchen^X-Files^ABC's "Lost^drama Heroes^Scooby Doo^Adult Swim^Entourage^M*A*S*H^West Wing^ABC's Commander in Chief^NYPD Blue^Hell's Kitchen^Tangata Pasifika^The Amazing Race^Maddigan's Quest^Xena^Mercy Peak^Being Eve^Teletubbies^Tracey Ullman Show
144	newspapers	4	channel^media	
145	film	4	channel^media	movies^Crude Awakening^An Inconvenient Truth^Sicko^Darfur Now^Bowling for Columbine^Truman Show^Black Stallion^Reservoir Dogs^Kill bill^Roman Holiday^Die Hard^Syriana^Evan Almighty^Terminator^11th Hour^The Day After Tomorrow^Arctic Tale^Who Killed the Electric Car^Whale Rider^Sione's Wedding^Elizabeth: The Golden Age^Blood Diamond^Finding Nemo^perfect storm^seize the day^Five Ways to Save the World^band of brothers^The Fountain^films Pi^Requiem for a Dream^What Dreams May Come^Apocalypto II^2001: A Space Odyssey^The Matrix^A Constant Gardener^Solaris^Lord of The Rings^end of the golden weather^Raiders of the Lost Ark^Mad Max Beyond Thunderdome^Brokeback Mountain^Aviator^Capote^Walk the Line^Good Night, and Good Luck^Wallace & Gromit^Life and Death of Peter Sellers^Million Dollar Baby^Cinderella Man^King Kong^Tom Dowd & the Language of Music^movie industry^manchurian candidate^Everything is Illuminated^Glengarry Glen Ross^Enron: The Smartest Guys in the Room^film industry^The Spy Who Shagged Me^K-19: The Widowmaker^Last Emperor^Harry Potter^Sheltering Sky^Wild Hogs^Once Were Warriors^The Constant Gardener^Pride and Prejudice^Serenity^Ice Age: The Meltdown^Eagle vs Shark^Across Ruled Lines^Block Party^White Planet^Beijing Bubbles^Linda Linda Linda^in The New World^Thank You for Smoking^Blood of My Brother
146	books	4	channel	
76	issues of concern	1		
77	wellbeing	2	issues of concern	standard of living^food supply^doctor's certificate^Health act^Public Health bill^Therapeutic Products and Medicines bill^Injury Prevention, Rehabilitation and Compensation Amendment bill (No 2^Australian military's report on joint operations for the 21st century^Carbusters^Injury Prevention, Rehabilitation and Compensation Amendment bill
78	health and shelter	3	wellbeing	Primary Health Care strategy^health system
79	illness	4	health and shelter	Sicko^Medicare^Medicaid^project to provide treatment for HIV
134	wellness	4	health and shelter	smoke-free^GE-free^One Minute for Yourself^Fighting Globesity: A Practical Guide to Personal Health and Global Sustainability

Id	Name	Level	Parent	Matched_Document_Name
81	physical safety	3	wellbeing	nuclear-free^safety and security^safety^Walking School Bus programme^WOF^Maritime Safety act^unsafe^precautionary principle
82	accidents	4	physical safety	Southern Response Plan^Eastern Ruapehu Lahar Alarm and Warning System
83	weather	4	environmental issues^physical safety	Saffir-Simpson scale^power dissipation index^no-link theory
131	social wellbeing	3	wellbeing	work life balance^Vector Life programme^Alliance for Civilisations^Onward Christian Socialist
132	community support	4	social wellbeing^household sector	social services^social responsibility^Primary Health Care strategy^Largely Happy
133	crime & violence	4	social wellbeing	Darfur Now^Kill bill^Die Hard^Terminator^Blood Diamond^crime rates^START treaty^Nuclear Non-Proliferation Treaty^Defamation act^New Zealand Nuclear Free Zone, Disarmament and Arms Control act^Terrorism Suppression act^Terrorism Suppression Amendment bill^report exposing the CIA^Diary of Anne Frank^mutually assured destruction^Operation Emma^accusatory charges^Proliferation Security Initiative^Container Security Initiative
88	political imperatives	2	issues of concern	nonpartisan^justice^Australian military's report on joint operations for the 21st century
89	social equity	3	political imperatives^household sector	social equity^human rights^Working for Families^In Work Tax Credit^Family Support Tax Credit^social security^social costs^kiwi share^Send a Ray of Sunshine Down South^HK Corporate Social Responsibility Charter^Human Development report^Millennium Development Goals^technology transfer^National Statement on Religious Diversity^affordability^cost of living^affordable housing^Medicaid^medical bills^human development report^gender balance^Bowling for Columbine
80	the poor	4	health and shelter^social equity	affordable housing^shared equity scheme^social agency pack
135	disadvantaged groups	4	social equity	discrimination^Largely Happy^North-South divide^immigration legislation
90	progress	3	political imperatives	utilisation^goals^standard of living^performance^productivity^unproductive^achievements^progress^modernity^development^innovation^transitions^steady growth^sustainable growth^unsustainability^policy targets^growth^expansion^growing^stimulation^reforms^actions^employment^Guinness Book of World Records^technical devices^Millennium Development Goals^American Competitiveness Initiative^Think Big Project^Global Positioning System^26 point action Plan^SmartGrowth^to act^regional growth strategy
1	economics	4	progress	economy^economics^economies of scale^taxes^carbon prices^New Zealanders debt^government debt^SpendingPulse^money^economic cycle^finances^budgets^prudence^prosperity^wealth^balance sheets^balance of payments^cash^$^liquidity^absence of liquidity^payments^transaction fees^funds^value^valuations^value for money^money saving^Rogernomics^subsidies^revenues^tax revenue^royalties^capital gains^income^levies^duties^capital gains tax^tax cut^spending money^affordability^cost of living^economic growth^economic outlook^Auckland Regional Economic Development strategy^return on investment^exchange rate^currencies^NZ dollar^foreign currencies^sterling^US dollar^Australian dollar^euros^yen^yuan^credit supply^charges^legal bills^medical bills^prices^price signals^product prices^price gouging^property prices^internet prices^calling prices^energy prices^spot power prices^MWh^oil price^West Texas Intermediate crude^New York crude^US crude^London Brent crude^Malaysian Tapis crude^Dubai crude^petrol price^diesel price^gas price^US Henry Hub^coal price^free on board^compliance costs^installation costs^transaction costs^cost-of-capital^local body rates^tax system^tax losses^accounting standards^Focus Latin America^KiwiSaver^Metro Project^Personal Financial Education in Schools^market reforms^Government's Budget^Impact on the NZ economy of commitments for abatement of carbon dioxide emissions^Half Year Economic and Fiscal Update^Closer Economic Relations Agreement^policy targets agreement^single economic market^Trans-Pacific Strategic Economic Partnership Agreement^accounting^beige book^Twilight in the Desert: The Coming Saudi Oil Shock and the World Economy^The Undercover Economist^Grapes of Wrath^The Age of Turbulence^capital value^savings culture^capitalism^neoclassical^Stern Review^selling^trade deficit^Weimar inflation^deflation^interest rates^inflation^consumer price index^disbursements^redistribution^price-fixing^food prices^excise tax^income tax^euro^financial costs^The Case for Auckland^Auckland's Contribution to the Government's Surplus in 2005^Three billion New Capitalists - The great shift of wealth and power to Asia^primer, Globalisation^globalisation^energy intensity^quantitative easing^operating balance before revaluations and accounting changes^liberalisation^deregulation^federal budget^spending cuts^Bretton Woods
120	indicators	4	progress	Big Mac index^System Average Interruption Duration index^genuine progress index^gross national product^gross domestic product^indicators^consumption goods index^Transparency International Corruption Perceptions index^producers price index^footprint^Saffir-Simpson scale^power dissipation index^terms of trade index^electricity generation and supply index^timber framing index^wholesale trade index^meat product manufacturing index^petroleum products index^non-food manufactures index^mechanical machinery index^transport equipment index^food and beverages index^index of consumer sentiment^FT500^Amex airline index^current account^SpendingPulse^share price index^Nasdaq^Hang Seng index^S&P 500^S&P/ASX 200 index^all ordinaries^NZSX-50^NZSX-15^NZSX-10^NZX Portfolio^NZX SmallCap^NZX MidCap^smart money index^NZSX All^FTSE 100^Dow Jones^Nikkei index^CSI-300^MSCI Barra index^index of semiconductors^ANZ Business NZ performance of manufacturing index^WINZ world index^sensex index^Asia-Pacific index^Kospi^XAU^CRB index^consumer confidence^business confidence^national demand^rates^inflation^consumer price index^official cash rate^exchange rate^unemployment rate^commodity prices^metal prices^food prices^dairy prices^electricity price index^oil price^West Texas Intermediate crude^New York crude^US crude^London Brent crude^Malaysian Tapis crude^Dubai crude^petrol price^diesel price^gas price^US Henry Hub^coal price^interest rates^EcoWin^annual reports^energy intensity^sugar prices
91	electioneering	3	marketing^political parties^political imperatives	public votes^election law reform^Electoral Finance bill^election spending^May 18-20 survey of 1151 people^Morgan Poll^Morgan poll

Id	Name	Level	Parent	Matched_Document_Name
2	environmental issues	2	issues of concern	Good Life^The Day After Tomorrow^GE-free^green^ecological economics^sustainability^environmentally friendly^biodiversity^biosecurity^conservation^saving the planet^Gaia^product stewardship^waste minimisation^recycling^national policy statement on biodiversity^national policy statement on landscape^nitrogen^plant growth^deforestation rates^environmental costs^QEII Trust^eco-verification^Enviro-Mark programme^Green Seal^BlueGreen^Global Environment Outlook^OECD Environmental Performance Review^electricity, energy and the environment^State of the Environment report^Our Common Future^Green Event Guidelines^Environmental Environment index^British Antarctic Survey^Environmental Science and Technology^Energy and Environment^journal Nature^Current Biology^Environmental Friendliness Test^Omnivore's Dilemma^Australia's Mammal Extinctions: a 50,000 year history^2006 Environmental report^water supply^water permits^ozone^State of the Darling^Packaging Accord^Delta Primer: A Field Guide to the California Delta^Indonesian Island survey^Six Environmental Practices^Business Council survey^Waitakere Ranges Heritage bill^composting^Vodafone Handset Recycling Programme^Vodafone Handset Recycling programme^eco-magination^water allocation plan^Waitaki Catchment Water Allocation Regional Plan^Auckland Regional Coastal Plan^2005-06 Water Conservation and Recycling Implementation report^report by NZIER^report by Covec^Carbusters^Fighting Globesity: A Practical Guide to Personal Health and Global Sustainability^garden hedges^Love Food Hate Waste^Govt3^footprint^CFCs^Ramsar Convention on Wetlands^Chernobyl - Catastrophe and Consequences
4	climate change	3	environmental issues	An Inconvenient Truth^11th Hour^Five Ways to Save the World^sea-level^climate change policy^Kyoto obligation^Pacific Climate Change strategy^clean development mechanism^National Adaptation Programme of action for Samoa^carbon constrained^Stern Review^NZI Climate Change report^fourth assessment report^third assessment report^First National Climate Change Assessment^Turn Down the Heat^Sustainable Land Management and Climate Change Plan of action^council's position paper on climate change^Lincoln University reports^Kyoto protocol^Nairobi framework^Sydney Declaration^Lake Victoria Commonwealth Climate Change action Plan^United Nations framework to combat climate change^Bali roadmap^guidebook for global warming survivors^ShapeNZ online survey^March survey commissioned by the Climate Institute^Climate Change and Trace Gases^Climate Research^Towards a New Climate Treaty: Looking Beyond 2012^The Great Turning^The Skeptical Environmentalist^the Rough Guide to Climate Change^Cool It^The Greenhouse Delusion^Hot Topic: Global Warming and the Future of New Zealand^The Party's Over^Climate: Dangerous Games^revenge of Gaia^Cool Earth 50^pre-1990 forests^gas ban^climate change reports^no-link theory^geo-engineering^Permanent Forest Sinks initiative
7	greenhouse emissions	4	climate change	capping^capping emissions^carbon credits^emissions reduction^zero emissions^carbon sequestration^capture and storage^carbon offsets^food miles^air miles^greenhouse gases^carbon^methane^nitrous oxide^software called Overseer^nitrification inhibitors^tax on nitrogen^emissions growth^emissions standard^fleet efficiency standards^Euro 2^Euro 3^Euro 4^Euro 5^Euro 6^CarboNZero^Greenhouse Gas Abatement Programme^Greenhouse Friendly programme^Impact on the NZ economy of commitments for abatement of carbon dioxide emissions^reducing emissions from deforestation and degradation^Greenhouse Gas bulletin^Greenhouse Gas Inventory^Global Climate Project^nationwide survey of the fleets^carbon neutrality^Low Carbon Diet Masterplan^greenhouse gas inventory^Greenhouse Gas Abatement programme^NoCO2
10	climate impacts	4	climate change	Impacts, Adaptation, and Vulnerability^warming rate^New Zealand Energy Revolution: How To Prevent Climate Chaos^Human Development report^Summary Statement on Tropical Cyclones and Climate Change^Arctic report Card^human development report^Global Amphibian Assessment survey
94	pollution	3	environmental issues	Dumped^polluter-pays^Waste Minimisation bill
95	air pollution	4	pollution	sulphur^Land Transport Vehicle Exhaust Emissions Rule^Air Plan^Health and Air Pollution in New Zealand^Clean Air act
96	water pollution	4	water^pollution	Seine Normandy Water Agency is building a giant storage tunnel^Salmon 2000^China Water Pollution Map^Area Closed - Oil Spill, Hazardous Contaminants in Water
39	peak oil & gas	3	environmental issues	Crude Awakening^fossil fuel free^Oil Change^Why the Peak Oil Theory Falls Down: Myths, Legends, and the Future of Oil Resources^Facing the Hard Truths about Energy^oil depletion protocol^Twilight in the Desert: The Coming Saudi Oil Shock and the World Economy^The Last Oil Shock^energy dependency^gas ban
93	oil reserves	4	system reliability^peak oil & gas^oil	oil reserves
36	alternative fuels	4	industry behaviour^peak oil & gas^transport sector	biodiesel usage^New Zealand Standard for biodiesel^ProAlcool^biofuel sales obligation^Australian Biofuel Projects 2007^Biofuel bill^Force 10
46	ownership issues	2	issues of concern	control^any acquisitions^buying^procurement^Copyright act^intellectual property^copyright
97	property rights	3	ownership issues	property rights
98	enterprise ownership	4	property rights	due diligence^public private partnerships^privatisation^public ownership^SOE model^nationalisation^mergers^takeovers^right-of-first-refusal^business acquisitions^compulsory acquisitions^The trust commissioned a report by the New Zealand Institute of Economic Research^corporatisation
99	pylon property issues	4	transmission^environmental issues^property rights	farmer votes^land acquisitions^access orders^Big Pylon plan^Transpower's fact sheet for the upgrade proposal^Transpower's amended proposal route map^easements^pylons through the Waikato^Public Works act
56	commons	3	ownership issues	commons^tragedy of the commons
101	public land	4	commons	public access^Reserves act^National Parks act
100	water use	4	water^commons	water trading^water permits^water supply^State of the Darling^Lights! Water! Motion!^Waitaki Catchment Water Allocation Regional Plan^2005-06 Water Conservation and Recycling Implementation report^water market^water allocation plan
102	tangata whenua	3	ownership issues	Native Affairs^Treaty of Waitangi^Maori Purposes bill (No 2^Mauao Historic Reserve Vesting bill^Waka Umanga (Maori Corporations) bill^Once Were Warriors^Waka Umanga Maori Corporations bill^West Coast Preservation act^Maori Purposes bill

Id	Name	Level	Parent	Matched_Document_Name
103	players	1		annual reports
104	electricity sector	2	electricity^players	electricity system^Commerce Commission electricity review^The crisis that isn't - myths and truths about New Zealand's Electricity System
105	residential consumption	3	household sector^energy sources	power usage^progressive pricing^study by California's Berkeley University^Consumers' Institute's customer satisfaction survey
106	business consumption	3	business interests^energy sources	load growth^Power Agreement
107	transmission players	3	electricity sector	
108	electricity suppliers	3	electricity sector	electricity generation licence^Power Agreement^2005 Clean Energy Guide^Consumers' Institute's customer satisfaction survey
109	electricity market players	3	wholesale electricity market^electricity sector	
110	electricity regulators	3	system oversight^standards^electricity sector	electricity governance rule book
33	business interests	2	players	ANZ Business NZ performance of manufacturing index^100 per cent Pure New Zealand^clean and green^Brand New Zealand^business confidence^business targets^product stewardship^profit^ebit^net profit^bottom lines^company tax^profit growth^business growth^product prices^margins^Loss attributing qualifying companies^Limited Liability Partnerships^Australia Inc^Major Regional Initiative Fund^Metro Project^report by consultants ACIL Tasman^Castalia report^National Business Review Rich List^Westpac McDermott Miller quarterly survey^Grant Thornton International Business report^Mood of the Boardroom survey^National Bank Business Outlook^quarterly survey of business opinion^survey by ACNielsen^business models^Movers & Shakers^The Business^The Merchant of Power^I'll be Short^Winning By Jack Welch^research & development^Focus Latin America^turnover^intellectual property^copyright^statement of corporate intent^Customs act^Smoot Hawley act^Business Tax Review^poll commissioned by investment bank Goldman Sachs JBWere^Leadership Impact Surveys^Six Environmental Practices^Business Council survey^DHL Export Barometer^survey conducted by Cameron Partners^Fair Trading act^Major Regional Initiative fund^Quality Regulation Taskforce^The Case for Auckland^Auckland's Contribution to the Government's Surplus in 2005^Clean Green Profit Machine^WorkChoices industrial laws^Westpac McDermott Miller confidence survey
111	coal mining industry	3	business interests^coal^fossil fuels	
28	transport sector	3	business interests	fuel efficiency^transport efficiency^fuel saving^reduced carparking^food miles^air miles^tolls^Air Passenger Duty^fuel tax^road user charges^patronage growth^traffic growth^Land Transport Vehicle Exhaust Emissions Rule^Efficient Dynamics^improvements to Wellington rail^Northern Busway project^road projects^State Highway 20^Transmission Gully^East Taupo Arterial Highway^WOF^Jasons Holiday Parks and Campgrounds Accommodation Directory^AAA survey^Volkswagen Law^PetrolWatch bulletin^Dog & Lemon Guide^Lonely Planet Guide^Around the World in Eighty Days^Berlitz Guide to Cruising and Cruise Ships^integrated ticketing^Opus and Massey University study^nationwide survey of the fleets^report by Covec^report by NZIER^Greenfleet^corporate average fuel economy (Cafe)^Auckland motorway extension^Dart passage^gondola project^Queenstown monorail^corporate average fuel economy
32	heavy industry	3	business interests	mining permits^copper^nickel^nickel metal
19	agricultural sector	3	business interests	farmer votes^food supply^fish stocks^Situation and Outlook for New Zealand Agriculture and Forestry^quota management system^Omnivore's Dilemma^History of New Zealand Farming^dairy prices^fart tax^Dairy Industry Restructuring act^OECD-FAO Agricultural Outlook 2007-2016^Advanced Central Evaluation initiative, evaluating data on ram performance.^Advanced Central Evaluation
18	forestry sector	3	business interests	deforestation rates^Permanent Forest Sinks Initiative^Situation and Outlook for New Zealand Agriculture and Forestry^pre-1990 forests^Design Options for a Tradeable Deforestation Permits Regime^Permanent Forest Sinks initiative^deforestation avoidance market^reducing emissions from deforestation
9	oil and gas industry	3	business interests^fossil fuels	petroleum exploration permits^draft oil industry report^US-Ecuador investment treaty^Area Closed - Oil Spill, Hazardous Contaminants in Water^Project Kuwait^production-sharing agreements^MTBE^New Zealand's Lost Oilfields
12	light industry and commercial	3	business interests	Chrome Dreams II^song "Hey You^Riders on the Storm^Age of Aquarius^3 News^Close Up^Campbell Live^60 Minutes^Sunday programme^TV One's Breakfast^Agenda programme^the Simpsons^Dumped^Good Life^thriller 24^Big Brother^Shortland Street^Pop Idol^Outrageous Fortune^Dancing with the Stars^Mr Magoo^Dr Who^ICE TV^Deal or No Deal^The Unauthorised History of New Zealand^Pulp Sport^broTown^Lets Get Inventin^Play It Strange^Rude Awakenings^The Hothouse^Westfield Style Pasifika 2007^Police Ten 7^NZ Idol^Intrepid Journeys^Fair Go^Downsize Me^Star Trek^Market Kitchen^X-Files^ABC's "Lost^drama Heroes^Scooby Doo^Adult Swim^Entourage^M*A*S*H^West Wing^ABC's Commander in Chief^NYPD Blue^Hell's Kitchen^movie industry^SpendingPulse^consumer confidence^GST^VAT^consumer demand^New Zealand Tourism strategy^Buy Kiwi Made^Jasons Holiday Parks and Campgrounds Accommodation Directory^consumer spending^Telecommunications Amendment bill^Telecommunications act^digital content strategy^the ampere strikes back^15 green actors^Sha La La La Lee^I Have Loved Me a Man^Games People Play^Don't Come Any Closer^Put Your Hand in the Hand^manchurian candidate^Glengarry Glen Ross^film industry^Truman Show^Black Stallion^Reservoir Dogs^Kill bill^Roman Holiday^Die Hard^Evan Almighty^Terminator^Whale Rider^Sione's Wedding^Elizabeth: The Golden Age^Blood Diamond^Finding Nemo^perfect storm^seize the day^band of brothers^The Fountain^films Pi^Requiem for a Dream^What Dreams May Come^Apocalypto II^2001: A Space Odyssey^The Matrix^A Constant Gardener^Solaris^Lord of The Rings^end of the golden weather^Raiders of the Lost Ark^Mad Max Beyond Thunderdome^Brokeback Mountain^Aviator^Capote^Walk the Line^Good Night, and Good Luck^Wallace & Gromit^Life and Death of Peter Sellers^Million Dollar Baby^Cinderella Man^King Kong^Everything is Illuminated^The Amazing Race^Madrid Style^The Spy Who Shagged Me^K-19: The Widowmaker^ring of fire^TimeOut^American Recordings^Folsom Prison Blues^I Walk The Line^Maddigan's Quest^Last Emperor^Harry Potter^Sheltering Sky^Xena^Mercy Peak^Being Eve^Teletubbies^Wild Hogs^The Constant Gardener^Pride and Prejudice^Serenity^Tracey Ullman Show^Ice Age: The Meltdown

Id	Name	Level	Parent	Matched_Document_Name
112	finance and insurance	3	business interests	compulsory savings^Medicare^Medicaid^credit cards^New Zealanders debt^loan-to-value (LTV) ratio^dividends^underwriting^credit rating^collateralised debt obligations^loans^mortgages^securities^debentures^derivatives^bonds^US Treasury bonds^Perpetual Infratil Infrastructure Bonds^Maple bonds^carry-trade^investor safety^cost-of-capital^prudential standards^international financial reporting standards^PEP Fund III^Wembley Stadium reconstruction^Scene apartments^US-Ecuador investment treaty^Where to Live in Auckland^McEwen's Investment report^CreditWatch^Property Law, a New Zealand Investor's Guide^rich dad^Understanding Fixed Interest Rates^Before you Quit your Job^financial instruments^gearing^Equator Principles^credit^Securities Markets act^Financial Service Providers bill^bond prices^credit supply^policy targets agreement^Credit Controls and Consumer Finance act^Reserve Bank Amendment bill^Real Estate Agents bill^The Great Turning^Three billion New Capitalists - The great shift of wealth and power to Asia^hedges^single economic market^quantitative easing^sugar prices^Bretton Woods^loan-to-value ratio^fractional reserve^Precinct Apartments
113	**household sector**	**2**	**players**	**New Zealanders debt^project to provide treatment for HIV^community services card^Medicare^ShapeNZ online survey^poll of public attitudes towards energy and the environment^poll commissioned by investment bank Goldman Sachs JBWere^Morgan Poll^Colmar Brunton poll^census^Fair Trading act^Births, Deaths and Marriages bill^Morgan poll^folk stories**
114	elderly and beneficiaries	3	household sector	benefit reduction^social security^SuperGold Card^Work for the Dole^Personal Financial Education in Schools^retirement^work for the dole^unemployment rate^on benefits
22	families and children	3	household sector	paid parental leave^Walking School Bus programme^one laptop per child^SKIP programme^Personal Financial Education in Schools^No Child Left Behind act^work life balance^Vector Life programme^Gateway programme^Diary of Anne Frank^Helping America's Youth Initiative
21	workers and unions	3	household sector	worker votes^job cuts^wages^minimum wage^job growth^Modern Apprenticeship Scheme^Industry Training^Upskilling the Workforce^WorkChoices industrial laws^employment^work life balance^Vector Life programme
20	**other parties**	**2**	**players**	
17	NGOs	3	other parties	Carbusters
127	local bodies	3	other parties	councillor votes^Auckland Regional Economic Development strategy^local body rates^Metro Project^Wynyard Point^council spending^Affordable Housing: Enabling Territorial Authorities bill^LIM report^The Case for Auckland^Auckland's Contribution to the Government's Surplus in 2005^SmartGrowth^Local Government (Auckland) Amendment act^council zoning^Local Government Auckland Amendment act^regional growth strategy
16	political parties	3	political imperatives^other parties	Out of the Red^The Assault on Reason^MMP^Onward Christian Socialist
123	**government & education**	**2**	**players**	**Morning report^Tagata Pasifika^Native Affairs^Tangata Pasifika**
124	science & research	3	government & education	R&D^Our Common Future^Global Biotechnology report^studies^Global Climate Project^Environmental Environment index^survey^census^British Antarctic Survey^data^Environmental Science and Technology^Energy and Environment^journal Nature^the journal Science^Philosophical Transactions of the Royal Society A^Climate Change and Trace Gases^Current Biology^Proceedings of the Royal Society B^Proceedings of the National Academy of Sciences^Climate Research^Journal of Geophysical Research^Atmospheric Chemistry and Physics^Public Library of Science Biology^Bright Star: Beatrice Hill Tinsley Astronomer^20,000 Leagues under the Sea^Hot Topic: Global Warming and the Future of New Zealand^The Party's Over^Chemistry and Geothermal Systems^Australia's Mammal Extinctions: a 50,000 year history^research & development^Antarctic Treaty^study by California's Berkeley University^Indonesian Island survey^nationwide survey of the fleets^Global Amphibian Assessment survey^AAA survey^poll of public attitudes towards energy and the environment^ShapeNZ online survey^Advanced Energy Initiative^The Endurance^Landsat^March survey commissioned by the Climate Institute^graphical information systems^Advanced Central Evaluation initiative, evaluating data on ram performance.^Advanced Central Evaluation
125	education	3	government & education	education system^Tomorrow's Schools^student loans^NCEA^Walking School Bus programme^Modern Apprenticeship Scheme^Industry Training^Upskilling the Workforce^free early childhood^one laptop per child^Education (Tertiary Reforms) Amendment bill^No Child Left Behind act^Massey Magazine^I'll be Short^Gateway programme^school zoning^General Certificate of Secondary Education^Education Tertiary Reforms Amendment bill
126	government players	3	government & education	Primary Health Care strategy^government debt^parliamentary votes^UN votes^fiscal policy^confidence and supply^justice system^tax system^draft energy strategy^energy strategy^New Zealand Tourism strategy^efficiency and conservation strategy^Digital Content strategy^Focus Latin America^Permanent Forest Sinks Initiative^KiwiSaver^National Land Transport Fund^Consolidated Fund^shared equity scheme^biofuel sales obligation^Government's Budget^Half Year Economic and Fiscal Update^ministerial inquiry report^Prime Minister's Statement to Parliament^leaked intelligence report^Closer Economic Relations Agreement^single economic market^Trans-Pacific Strategic Economic Partnership Agreement^The Measures Of The Years^The Blair Years^The Mess They Made: The Middle East After Iraq^The Assault on Reason^state spending^Energy Outlook to 2030^START treaty^Medicaid^Sino-Russian strategic partnership^Nuclear Non-Proliferation Treaty^Agreed framework^Customs and Excise Amendment bill (No 3^digital content strategy^Permanent Forest Sinks initiative^National Land Transport fund^Consolidated fund^Government polls statement^Cabinet paper^Australian military's report on joint operations for the 21st century^ministerial inquiry^Govt3^Quadrennial Defence Review^federal budget^IAEA report^NZAID^royal commission^Bretton Woods^Customs and Excise Amendment bill^Proliferation Security Initiative^Container Security Initiative
115	**gas**	**0**	**oil and gas industry**	**gas demand^gas supply^Btu^gas reserves^gas price^US Henry Hub^petajoules^Industry report Card: Gas Prices Remain Achilles' Heel For New Zealand Utilities**
116	**oil**	**0**	**oil and gas industry**	**oil reduction^oil demand^oil supply^barrels per day^Petroleum Review^oil price^West Texas Intermediate crude^New York crude^US crude^London Brent crude^Malaysian Tapis crude^Dubai crude^petrol price^diesel price**
117	**water**	**0**		**water saving^International Journal of Water^China's Water Crisis**
118	**coal**	**0**	**coal mining industry**	**coal reserves^coal price^free on board**

Appendix A1c – Topics by Matched City/Location

[FULL SET]

Id	Name	Level	Parent	Matched_City / Location
5	electricity	0	energy sources	
11	policies	1		
13	supply security	2	policies	
43	system capacity	3	supply security	
42	system oversight	4	system capacity	
14	system reliability	4	system capacity	Whirinaki
25	transmission	3	electricity^supply security^transmission players	
45	national transmission	4	transmission^transmission players	Greerton^Cook Strait cable
27	local distribution	4	transmission^transmission players	
47	configuration alternatives	3	electricity^supply security	
48	isolated supply	4	configuration alternatives	
49	connected alternatives	4	configuration alternatives	Greenpeace Solar Panel Array^Greenmount^Rosedale^Kinleith^Awapuni Landfill^Silverstream plant^Redvale landfill^Whitford landfill^Atiamuri landfill
15	demand management	2	policies	
40	green buildings	3	demand management	
51	insulation	4	green buildings^health and shelter	
52	building rating systems	4	green buildings^standards	
53	water heating	4	green buildings^water	
41	household behaviour	3	demand management^residential consumption	
57	metering	4	electricity^household behaviour^light industry and commercial	
58	household power saving	4	electricity^household behaviour	
55	consumer education	4	electricity^household behaviour	
50	industry behaviour	3	demand management	
59	industry power saving	4	industry behaviour	
128	electric transport	4	electricity^alternative fuels	
129	location of generation	4	electricity^industry behaviour	
26	energy sources	2	policies	
60	fossil fuels	3	energy sources	
23	gas-fired	4	gas^electricity suppliers	Rodney plant^Otahuhu A^Otahuhu B^Otahuhu C^Southdown^Te Rapa^Huntly open cycle^Te Awamutu co-generation^New Plymouth power station^Taranaki CC^Stratford power station^Kapuni cogeneration^Windimurra^Darling Downs power station^Kwinana
24	coal-fired	4	coal^electricity suppliers	Marsden B^Huntly power station^Yallourn^Loy Yang^Drax power station
8	oil-fired	4	oil^electricity suppliers	Marsden A^Whirinaki^Lonsdale^Angaston
61	renewables	3	energy sources	
62	biomass	4	renewables	Greenmount^Rosedale^Kinleith^Silverstream plant^Awapuni Landfill^Motherwell^Mato Grosso^Redvale landfill^Whitford landfill^Atiamuri landfill
31	hydro	4	renewables^electricity suppliers^water	Mokau^Tongariro-Waikato system^Tongariro - Tokaanu^Tongariro - Rangipo^Wairehu canal^Whakamaru^Taupo gates^Aratiatia^Ohakuri^Atiamuri^Maraetai stations^Waipapa^Arapuni^Karapiro^Upper Kaituna^Matahina^Aniwhenua hydropower station^Waikaremoana - Kaitawa^Waikaremoana - Tuai^Waikaremoana - Piripaua^Patea^Kourarau^Wairau valley^Arnold river^Waitaki - Tekapo A^Waitaki - Tekapo B^Waitaki - Ohau A^Waitaki - Ohau B^Waitaki - Ohau C^Waitaki - Benmore^Waitaki - Aviemore^Waitaki power station^North Bank Tunnel^Project Aqua^Clyde dam^Roxburgh dam^Hawea^Waipori^Manapouri^Three Gorges^Gambsheim^Snowy mountains
30	geothermal	4	renewables^electricity suppliers	Ngawha^Tauhara^Ohaaki^Poihipi Road^Wairakei^Mokai^Rotokawa^Tokaanu^Poihipi^Te Mihi^Kawerau geothermal^Bonithon-1
29	wind power	4	renewables^electricity suppliers	Pouto project^Awhitu wind farm^Port Waikato^Te Anga^Awakino^Raglan^Te Waka^Unison/Hydro Tasmania Stage 1^Unison/Hydro Tasmania Stage 2^Titokura Saddle^Te Apiti wind farm^Tararua wind farm^Te Rere Hau^Turitea wind farm^Energreen wind farm^Brooklyn turbine^Project West Wind^Hau Nui wind farm^Gebbes Pass^Southbridge^Gebbies Pass^Lammermoor range^Mahinerangi wind farm^Project White hill^Kaiwera Downs^Bald hills^Emu Downs^Snowtown^Horse Hollow
63	solar	4	renewables	Greenpeace Solar Panel Array^Rangiora High School Solar
38	marine-based electricity generation	4	renewables^electricity suppliers^water	Kaipara harbour entrance^Hoteo river^D'Urville island^Wave Hub^Pelamis

Id	Name	Level	Parent	Matched_City / Location
64	other energy sources	3	energy sources	
37	nuclear	4	heavy industry^other energy sources	Valhalla^Dunmarra basin^Tennant creek^Port Pirie^Olympic dam mine^Beverley^Sellafield^Sizewell^Harwell^Yucca Mountain^Three Mile island^Cigar Lake^Kashiwazaki-Kariwa^Kyongju^Yongbyon^Yangjiang^Sanmen^Lingao nuclear power plant^Taishan nuclear power plant^Daya bay power plant^Chernobyl^Natanz^Bushehr nuclear reactor^Bushehr^Arak^Hiroshima
65	electricity storage	4	electricity^other energy sources	
66	structure and regulations	2	policies	
67	trading and markets	3	structure and regulations^business interests	
35	wholesale electricity market	4	electricity^finance and insurance^trading and markets	Haywards
68	sharemarkets	4	finance and insurance^trading and markets	
69	carbon trading	4	finance and insurance^greenhouse emissions^trading and markets	
92	oil and gas markets	4	finance and insurance^oil and gas industry^trading and markets	
72	acts and bills	3	structure and regulations	
3	RMA	4	acts and bills	
73	carbon tax	4	acts and bills	
6	energy strategy	4	acts and bills	
34	pricing and regulation	3	structure and regulations	
70	standards	4	pricing and regulation	
74	electricity charges	4	electricity^economics^pricing and regulation	
75	electricity penalties	4	electricity^negative^pricing and regulation	
130	communication	1		
44	psychology	2	communication	
84	tone	3	psychology	
85	negative	4	tone	
86	neutral	4	tone	
87	positive	4	tone	
136	angle	3	psychology	
141	news	4	angle	
54	entertainment	4	angle	Hollywood^Cannes
122	mechanism	2	communication	
71	messaging	3	mechanism^angle	
137	media	4	messaging	
138	marketing	4	messaging	
139	lobbying	4	messaging	
119	channel	3	mechanism	
121	phones	4	channel^light industry and commercial	
140	internet	4	channel	
142	radio	4	channel^media	
143	TV	4	channel^media	
144	newspapers	4	channel^media	
145	film	4	channel^media	
146	books	4	channel	
76	issues of concern	1		
77	wellbeing	2	issues of concern	
78	health and shelter	3	wellbeing	
79	illness	4	health and shelter	
134	wellness	4	health and shelter	
81	physical safety	3	wellbeing	
82	accidents	4	physical safety	
83	weather	4	environmental issues^physical safety	
131	social wellbeing	3	wellbeing	
132	community support	4	social wellbeing^household sector	
133	crime & violence	4	social wellbeing	
88	political imperatives	2	issues of concern	
89	social equity	3	political imperatives^household sector	
80	the poor	4	health and shelter^social equity	
135	disadvantaged groups	4	social equity	Anangu Pitjantjatjara Yankunytjatjara Aboriginal reserve
90	progress	3	political imperatives	
1	economics	4	progress	
120	indicators	4	progress	
91	electioneering	3	marketing^political parties^political imperatives	

Id	Name	Level	Parent	Matched_City / Location
2	environmental issues	2	issues of concern	Mt Maungatautari^Great Barrier Reef^Moondarra^Grampians^Arctic National Wildlife Refuge^Boreal forest^Zeppelin Mountain^Alps^Brijuni National park^Kilimanjaro^La Selva
4	climate change	3	environmental issues	
7	greenhouse emissions	4	climate change	
10	climate impacts	4	climate change	
94	pollution	3	environmental issues	
95	air pollution	4	pollution	
96	water pollution	4	water^pollution	
39	peak oil & gas	3	environmental issues	
93	oil reserves	4	system reliability^peak oil & gas^oil	
36	alternative fuels	4	industry behaviour^peak oil & gas^transport sector	Motherwell^Mato Grosso
46	ownership issues	2	issues of concern	
97	property rights	3	ownership issues	
98	enterprise ownership	4	property rights	
99	pylon property issues	4	transmission^environmental issues^property rights	
56	commons	3	ownership issues	
101	public land	4	commons	Great Barrier Reef^Moondarra^Grampians^Arctic National Wildlife Refuge^Boreal forest^Brijuni National park
100	water use	4	water^commons	
102	tangata whenua	3	ownership issues	Waitangi
103	players	1		
104	electricity sector	2	electricity^players	
105	residential consumption	3	household sector^energy sources	
106	business consumption	3	business interests^energy sources	
107	transmission players	3	electricity sector	
108	electricity suppliers	3	electricity sector	Tennant creek^Port Pirie^Sellafield^Sizewell^Three Mile island^Kashiwazaki-Kariwa^Yangjiang^Sanmen^Lingao nuclear power plant^Taishan nuclear power plant^Daya bay power plant^Chernobyl^Bushehr nuclear reactor^Bushehr^Yucca Mountain^Kyongju^Yongbyon^Arak
109	electricity market players	3	wholesale electricity market^electricity sector	
110	electricity regulators	3	system oversight^standards^electricity sector	
33	business interests	2	players	
111	coal mining industry	3	business interests^coal^fossil fuels	Huntly East mine^Rotowaro^Spring creek^Stockton mine^Brunner seam^Paparoa seam^Otira tunnel^Terrace on the West Coast^Cobden Rail Bridge^Ohai^Mataura mine^New Vale mine^Tahmoor mine^Mandalong mining^Newstan mine^Wandoan project^Dalrymple bay^Huntington, Utah^Xinglong mine^Ulyanovskaya^Yubileynaya^Coahuila
28	transport sector	3	business interests	Route 66^Yamanashi
32	heavy industry	3	business interests	Macraes project^Frasers mine^Ballarat^Rapid Growth project 2^Kimberley^Yarloop^Gove refinery^Samarco project^Taharoa^Mahara Royal prospect
19	agricultural sector	3	business interests	Hereford, Texas^Burgundy
18	forestry sector	3	business interests	Kinleith^Kaingaroa forest
9	oil and gas industry	3	business interests^fossil fuels	Northland basin^Pep 38349^East Coast basin^Pep 38348^Taranaki basin^Felix and Opito Updip permit area^Mt Messenger^Moki^Kupe^Momoho prospect^Kapuni^Motunui^Tieke prospect^Taranui prospect^Hector prospect^Urenui^Mangamingi-1^Ngatoro^Pep 38775^Kahili field^Moturoa field^Surrey oil field^Radnor area^Mt Taranaki^Windsor oil field^Maari oil field^Supplejack wells^Waikawau^Pep38751^Rimu production facility^Waihapa production station^Ahuroa^Tariki^Tawn^Kauri field^Manutahi^Bell Block base^Heaphy-1^Titihaoa-1^Westland basin^Fireball creek^Kotuku structure^Hokitika^Canterbury basin^Waiau basin^Te Anau basin^Waitutu basin^Western Southland basin^Sharpridge creek^West Southland^Eastern Bush prospect^Dean prospect^Solander basin^Great South basin^Toroa^Toroa well^Tara 1^Kawau 1^Mehrtens^Cullen prospect^Lomu prospect^Takapu-1^Hoiho-1C^Raikura-1^Moomba oil and gas field^Bass basin^BassGas project^Gippsland basin^Barrow island^Dampier port^Burrup^Pluto gas field^Browse gas field^Gorgon project^Snottygobble 1^Otway project^Cooper basin^Ocean Guardian platform^Piper Alpha^Lisburne oil field^Trans Alaska pipeline^Northstar oil field^Cabrillo Port^Port Arthur^Baytown, Texas^Big Spring^Corpus Christi^Seaway pipeline^Whiting^Pascagoula^Cushing^Baton Rouge, Louisiana^Atlantis South project^Neptune project^Athabasca^Sunrise field^Sangu gas field^Bombay High^Assam^Mangala^Surat^Krishna-Godavari^Orissa^Snorre A oilfield^Draugen oilfield^Orinoco^Norte de Paria^Jack field^Thunder Horse oil platform^Campeche Sound^Cayo Arcas^Coatzacoalcos^Dos Bocas^Sakhalin^Komi^East Java gas pipeline^Rub al-Khali^Haradh oilfield^Forcados oilfields^Bonny island^Brass export terminal^EA oilfield^Bonny Light^Benisede^Trans-Ramos pipeline^Lamu basin^Douglas-1^Magallanes basin^Brotula^Isla Magdalena^Provenir^Caupolican^Azadegan^BassGas
12	light industry and commercial	3	business interests	
112	finance and insurance	3	business interests	

Id	Name	Level	Parent	Matched_City / Location
113	**household sector**	**2**	**players**	
114	elderly and beneficiaries	3	household sector	
22	families and children	3	household sector	
21	workers and unions	3	household sector	
20	**other parties**	**2**	**players**	
17	NGOs	3	other parties	
127	local bodies	3	other parties	
16	political parties	3	political imperatives^other parties	
123	**government & education**	**2**	**players**	
124	science & research	3	government & education	Wave Hub^Zeppelin Mountain^La Selva
125	education	3	government & education	
126	government players	3	government & education	Diego Garcia
115	**gas**	**0**	**oil and gas industry**	**Cardiff gas field^Mangahewa^McKee gas field^Pohokura^Maui^Turangi field^Nabucco pipeline project^Kovykta^South Stream pipeline^Yamal^Shtokman^Pearl project**
116	**oil**	**0**	**oil and gas industry**	**Marsden Point refinery^Arakamu-1^Tui area oil fields^Amokura^Pateke^Cheal oil field^Ekofisk field^Brae Alpha oil platform^Tern Alpha platform^Schwedt^Leuna^Urals^Druzhba^Fos-Lavera^Kirkuk^Basra^Niger delta^Okono terminal^Bonga^Agbami**
117	**water**	**0**		**Hunter Downs^Lower Waitaki^Morven-Glenavy^North Otago irrigation project^Powlett river^Emu Downs**
118	**coal**	**0**	**coal mining industry**	

Appendix A1d – Topics by Matched Organisation

[EXAMPLES]

Id	Name	Level	Parent	Matched_Organisation
5	electricity	0	energy sources	Major Electricity Users Group^national winter group^nuclear energy industry^nuclear energy^Westinghouse^British Nuclear Group^Environmentalists for Nuclear Energy^Australian Nuclear Science and Technology Organisation^Nuclear Fuel Australia^Global Nuclear Energy Partnership^American Council on Global Nuclear Competitiveness^Atomic Energy Research Establishment^nuclear power^Ux Consulting^electricity users^domestic electricity users^business electricity users^residential electricity users^Atomic Energy Organisation^Rosatom
11	policies	1		Institute of Policy Studies
13	supply security	2	policies	Australian Strategic Studies Institute
43	system capacity	3	supply security	
42	system oversight	4	system capacity	regulators^European competition regulator^Securities Exchange commission^Office of Fair Trading^Australian Competition and Consumer commission^Biosecurity NZ^International Atomic Energy Agency^World Health Organization^Securities commission^Takeovers Panel^Returning Office^National Development and Reform commission^New Zealand Qualifications Authority^Nuclear Regulatory commission^US Minerals Management Service^St Lawrence Seaway Management Corporation^Maritime New Zealand^NSW Maritime^National Radiation Laboratory^International commission on Non-Ionizing Radiation Protection^Federal Office for Radiation Protection^Canadian Nuclear Safety commission^International Committee for Radiation Protection^Internet NZ^Power for Our Future^International Energy Agency^national winter group^International Grains Council^Green Building Council^NZ Green Building Council^Metrowater^Watercare Services^Waitaki Catchment Water Allocation Board^Department of Water Resources^Hong Kong's Telecommunications Authority^Telecommunications commissioner^EU internal market commissioner^Federal Trade commission
14	system reliability	4	system capacity	Electrical Contractors' association
25	transmission	3	electricity^supply security^transmission players	Unified Energy System^transmission
45	national transmission	4	transmission^transmission players	Transpower^Electrix^Power Grid Corp
27	local distribution	4	transmission^transmission players	Electrical Contractors' association^linesmen^power boards^Waitemata Power Board^Auckland Electric Power Board^Shoreline Power^Tonga Electricity Power Board^Stewart Island Electrical Supply Authority^lines companies^Energy Trusts New Zealand^Electricity Networks Association^MainPower^VirCom EMS^Orion^Orion Energy^Powerco^Auckland Energy Consumer Trust^Vector^Powerlynk^Just Power^United Networks^Hawke's Bay Power Consumers' Trust^Unison^King Country Energy Electric Power Trust^Waitomo Energy Services Trust^The Lines Company^Eastern Bay Energy Trust^Horizon Energy^Waipa Networks^Northpower^WEL Networks^Top Energy^Counties Power^PowerNet^Singapore Power^Southpower^Eastland Network^WestPower^Ergon Energy^Alpine Energy^Network Waitaki^ElectraNet^Energy Australia^Delta Utility Services
47	configuration alternatives	3	electricity^supply security	
48	isolated supply	4	configuration alternatives	
49	connected alternatives	4	configuration alternatives	Whispertech
15	demand management	2	policies	American Council for an Energy-Efficient Economy^Energy Foundation^Carbon Reduction Institute^energy efficiency industry^Eeca^EnergyPro^RAP^Schneider Electric Industries SA^Energy Saving Trust^Giraffe Innovation^Energy Management Association of New Zealand^mid-Wales Energy Agency^LED Dynamics^green building industry^Solar Industries Association^SunPower^Waste & Resources Action Programme^energy efficiency^eco technologies^public transport
40	green buildings	3	demand management	Negawatt^Centre for Housing Research^Beacon Pathway^The Dow Group^ECO Systems^Right House^Earthship^Australian and New Zealand Solar Energy Society^Warren and Mahoney^BBM sustainable design
51	insulation	4	green buildings^health and shelter	EnergySmart^Eco Insulation^Tasman Insulation
52	building rating systems	4	green buildings^standards	Green Building Council^NZ Green Building Council
53	water heating	4	green buildings^water	
41	household behaviour	3	demand management^residential consumption	
57	metering	4	electricity^household behaviour^light industry and commercial	Arc Innovations^Landis & Gyr
58	household power saving	4	electricity^household behaviour	
55	consumer education	4	electricity^household behaviour	
50	industry behaviour	3	demand management	
59	industry power saving	4	industry behaviour	
128	electric transport	4	electricity^alternative fuels	Wrightspeed^G-Wiz^HybridAuto^California Cars Initiative^Green Car Congress^Clean Green Car Company^California Fuel Cell Partnership^ITM Power^Rare Consulting
129	location of generation	4	electricity^industry behaviour	

Id	Name	Level	Parent	Matched_Organisation
26	energy sources	2	policies	National Development and Reform commission^national energy taskforce^International Energy Agency^Risoe National Laboratory^VIK industrial energy consumers' association^energy industry^US Energy Information Administration^Dialogue Consultants^ECCO Consulting^UK Energy Research Centre^Howard Weil^Concept Consulting^Pira Energy Consultancy^energy users^Worley Parsons^indigenous energy^EnergyQuest^Riverstone
60	fossil fuels	3	energy sources	Southern Company^National Thermal Power Corp
23	gas-fired	4	gas^electricity suppliers	Gasbridge^BG Group
24	coal-fired	4	coal^electricity suppliers	TXU^Drax
8	oil-fired	4	oil^electricity suppliers	
61	renewables	3	energy sources	Mali Folkecentre^Climate Care^Energy Foundation^TargetNeutral^Climate Friendly^SEANZ^Clean Energy Centre^mid-Wales Energy Agency^renewables industry^SEF^Centre for Alternative Technology^REN21^Chinese Renewable Energy Industries Association^Tsinghua-BP Clean Energy Research and Education Centre^New Energy Finance^Centre for Renewable Energy Development^National Renewable Energy Laboratory^Elemental Energy^Renewable Energy NZ^Iberdrola^renewables^Nature's Flame^Energy Developments^company Green Energy
62	biomass	4	renewables	Wastesaver New Zealand^Khosla Ventures^biofuels^Argent Energy^Global Green Solutions^Greenergy^APAC Biofuel Consultants^Diversa Corporation^Aqua Flow Bionomic Corporation^Ecotec^Dedini^BrasilAgro^Enerbio^LanzaTech^BioJoule^Renewable Energy Group^Rare Consulting^Solomon Tropical Products^Biodiesel New Zealand^Cleanstream Ltd^Range Fuels Inc^Anchor Ethanol^Bios Fuel^Panda Ethanol^Vertigro Energy^LiveFuels Inc^Greenfuel Technologies^Environ Fuels^Gordian Energy Partners^Envirocar^Earthrace^Bio Diesel Oils
31	hydro	4	renewables^electricity suppliers^water	hydro
30	geothermal	4	renewables^electricity suppliers	Wairakei Research Centre^Geotherm^Geothermal Energy NZ^US Geothermal Resources Council^International Geothermal Association^Torrens Energy^Ormat Technologies^Geothermal Resources^geothermal
29	wind power	4	renewables^electricity suppliers	wind industry^Wind Energy Association^Windflow^NZ Windfarms^Hawke's Bay Windfarm^Vestas^Alta Windpower Development Llc^Suzlon Energy^Allco Wind Energy Australia^Windpower Maungatua Ltd^Chinese Wind Energy Association^British Wind Energy Association^Ventus Energy^Wayang Windy^Renewable Devices Swift Turbines Ltd^Energreen Wind^Wind Farm Group^Challicum Hills
63	solar	4	renewables	solar industry^Australian and New Zealand Solar Energy Society^New Zealand Photovoltaic Association^Solar Industries Association^Solar Energy for Africa^Solar Electric Light fund^Nanosolar^Easy Being Green^Solar Electric Light Company^SunPower^Solar Power Solutions^SchoolGen^Sola60^Sensible Heat^G24 Innovations^Trans-Mediterranean Renewable Energy Corporation^Suntech Power
38	marine-based electricity generation	4	renewables^electricity suppliers^water	AWATEA^Crest Energy Kaipara^Manchester Bobber
64	other energy sources	3	energy sources	
37	nuclear	4	heavy industry^other energy sources	International Atomic Energy Agency^Nuclear Regulatory commission^Federal Office for Radiation Protection^Canadian Nuclear Safety commission^MDS Inc^American Museum of Science and Energy^Bulletin of the Atomic Scientists^Areva^AtomStroyExport^Atomic Energy of Canada Ltd^Energy Alberta^Teollisuuden Voima^nuclear industry^World Nuclear Association^Manhattan Project^French Atomic Energy commission^Ux Consulting^Westinghouse^British Nuclear Group^Environmentalists for Nuclear Energy^Australian Nuclear Science and Technology Organisation^Nuclear Fuel Australia^Global Nuclear Energy Partnership^American Council on Global Nuclear Competitiveness^Atomic Energy Research Establishment^Lucas Heights^New Zealand reactor^nuclear energy industry^uranium industry^Summit Resources^Uex Corp^Cameco Corp^Uranium One^UrAsia Energy^Paladin Resources^Australia Uranium Association^nuclear energy^nuclear science^nuclear power^Heritage Gold^AngloGold Ashanti Ltd^Atomic Energy Organisation^Khan Research Laboratories^Rosatom^General Atomics
65	electricity storage	4	electricity^other energy sources	A123 systems^California Fuel Cell Partnership^ITM Power^Exide Technologies
66	structure and regulations	2	policies	Occupational Safety and Health^Companies Office^Ombudsman^Environmental Risk Management Authority^Serious Fraud Office^Electoral commission^regulators^World Trade Organisation^European competition regulator^Australian Competition and Consumer commission^Biosecurity NZ^Standards New Zealand^International Atomic Energy Agency^World Health Organization^International Maritime Organisation^Norwegian Petroleum Safety Authority^Nuclear Regulatory commission^New Zealand Overseas Investment office^NSW Maritime^National Radiation Laboratory^Canadian Nuclear Safety commission^Internet NZ^Human Rights commission^Canadian Human Rights commission^US Environmental Protection Agency^San Francisco Bay Regional Water Quality Control Board^Environment Agency^State Environmental Protection Administration^WA Environmental Protection Authority^Rosprirodnadzor^California's State Lands commission^California Coastal commission^Municipal Bureau of Environmental Protection^French Agency for the Environment and Energy Management^Ibama^Seine Normandy Water Agency^New Zealand Institute for the Study of Competition and Regulation^Market Surveillance Committee^Fish and Game^Mine Safety and Health Administration^labour market^black market^US Federal Aviation Administration^Canadian Transportation Agency^International Civil Aviation Organisation^Vehicle Testing NZ^Department of Water Resources^Melbourne Magistrates' Court^Revolutionary Court^Hong Kong's Telecommunications Authority^Federal Aviation Administration^Federal Trade commission^high court^US appeals court

Id	Name	Level	Parent	Matched_Organisation
67	trading and markets	3	structure and regulations^business interests	Organisation for Economic Cooperation and Development^Securities Exchange commission^International Center for Settlement of Investment Disputes^Schork Report^Findata^Ichiyoshi Securities^Dealogic^AME^East Coast Options Inc^MarketWatch^J Ganes Consulting^TransGraph Consulting^Antaike^Cannex New Zealand^Federal Open Market Committee^Investment Research Group^Sotheby's^Optiver^water market^commodity markets^Commodity Futures Trading commission^US Global Investors^FCStone^CHR Metals^Heraeus^Sprott Asset Management^International Grains Council^Krom River commodity fund^rating agencies^Standard & Poors^Fitch Ratings^brokers^a broker^Goldman Sachs JBWere^Man Financial^ICAP Europe^Macquarie Futures USA^Spectron Group^Bansei Securities^Sucden Ltd^Direct Broking^broker Access^Jarden & Co^Eagle Capital^traders^dealers^Nukem Corp^CFC Seymour Ltd^Marubeni Corp^Access Futures and Options Trading^CMC Markets^Altavest Worldwide Trading^AGR Matthey^exchanges^Intercontinental Exchange^Chicago Board Options Exchange^London Metal Exchange^New York Board of Trade^foreign exchange^gas market^EnviroMarket^Pira Energy Consultancy^Enron Corporation^Ux Consulting^Barron's^Agri-Fax^Trade Me^US Henry Hub^Dutch spot market^EU internal market commissioner
35	wholesale electricity market	4	electricity^finance and insurance^trading and markets	electricity market
68	sharemarkets	4	finance and insurance^trading and markets	Securities commission^Takeovers Panel^Euronext^Joseph Palmer & Sons^Greenslades^Janney Montgomery Scott^shareholders^Shareholders Association^Institutional Shareholder Services^McDouall Stuart Securities^Forsyth Barr^Charles Stanley^Aequs Securities^Shaw Stockbroking^Hamilton Hindin Greene^FW Holst^Jarden's^Daysh Renouf^Patersons Securities^Charles Schwab^stockmarkets^stock-tipping industry^New Zealand stock exchange^Unlisted^Link Market Services^AXE ECN^Australian stock exchange^Sydney Futures Exchange^Hong Kong stock exchange^London stock exchange^New York stock exchange^Copenhagen stock exchange^AIM^Chinese stock exchange^Nikkei stock market^Nasdaq stock market^MSCI Barra^Inet electronic brokerage^NZX Discipline^Bombay stock exchange^Korean stock exchange^public companies
69	carbon trading	4	finance and insurance^greenhouse emissions^trading and markets	Gold Standard Foundation^TargetNeutral^Carbon Reduction Institute^Climate Friendly^Trading Rights Framework Group^carbon markets^Point Carbon^TZ1^European Carbon Exchange^Western Climate Initiative^Carbon Market Solutions Ltd^Climate Change Capital^Climate Cent Foundation^NZCX^Frazer Lindstrom^CantorCO2e^International Emissions Trading Association^M-co Registry^EcoSecurities Group^New Carbon Finance^MGM International
92	oil and gas markets	4	finance and insurance^oil and gas industry^trading and markets	Center for Global Energy Studies^Caprock Risk Management^Man Energy Daily Report^Cambridge Energy Research Associates^Societe Generale^BNP Paribas^Control Risks^Fuel First Consulting^Johnson Rice^A G Edwards^Wood MacKenzie^Petromatrix^PFC Energy^Fimat^Summit Energy^Purvin and Gertz^Ritterbusch and Associates^Simmons & Co^Energy Security Analysis^Cameron Hanover^Himawari CX^John Hall Associates^Platts^IFR Energy Services^Himiwari CX^oil market^NY Mercantile Exchange^Globex^Alaron Trading^Mitsui Bussan Futures Ltd^Excel Futures^Opec^non-Opec^OApec^Global Insight^TFS Energy
72	acts and bills	3	structure and regulations	courts^district court^supreme court^judges^Canadian Federal Court of Appeal^European Court of Justice^UK courts^Privy Council^UK high court^US courts^US district court^US supreme court^NZ courts^coroners^high court^Court of Appeal^Customs Appeal Authority^NZ district court^NZ supreme court^lawyers^Law commission^coroner^Melbourne Magistrates' Court^Revolutionary Court^High Court^US appeals court
3	RMA	4	acts and bills	environment court
73	carbon tax	4	acts and bills	
6	energy strategy	4	acts and bills	
34	pricing and regulation	3	structure and regulations	Commerce commission^Office of Fair Trading^National Development and Reform commission^Essential Services commission of South Australia^Parsons Brinckerhoff Associates^Waitaki Catchment Water Allocation Board
70	standards	4	pricing and regulation	New Zealand Qualifications Authority^International Organisation for Standardisation^Joint Accreditation System of Australia and New Zealand^US Minerals Management Service^St Lawrence Seaway Management Corporation^Maritime New Zealand^Electrical Contractors' association^International commission on Non-Ionizing Radiation Protection^Federal Office for Radiation Protection^International Committee for Radiation Protection^Real Estate Agents Licensing Board^Gold Standard Foundation^Carbon Reduction Institute^Det Norske Veritas^Green Tick^Tasmanian Gaming commission^New Zealand Racing Board^New Zealand Food Safety Authority^Energy Safety^Trans Tasman regulatory agency^Returning Office^Land Transport Safety Authority^International commission for the Protection of the Rhine^Great Barrier Reef Marine Park Authority^US Chemical Safety and Hazard Investigation Board
74	electricity charges	4	electricity^economics^pricing and regulation	Electricity and Gas Complaints commission
75	electricity penalties	4	electricity^negative^pricing and regulation	
130	communication	1		
44	psychology	2	communication	
84	tone	3	psychology	
85	negative	4	tone	
86	neutral	4	tone	beginners^broader management
87	positive	4	tone	presidents^vice-presidents^ethical investment^neighbours^relationships^teachers^other principals^academics^entrepreneurs^business leaders^chiefs^organisation chiefs^more chiefs^directors^organisation directors^chairmen^organisation chairmen^organisation managers^Green Tick
136	angle	3	psychology	
141	news	4	angle	Reuters^Associated Press^Bloomberg^Financial Mail^Scoop

Appendix A1e – Topics by Matched Person

[EXAMPLES]

Id	Name	Level	Parent	Matched_Person
5	electricity	0	energy sources	Ralph Mathes^Terrence Currie^Ralph Matthes^Ian Johns^Bruce Bathurst^Joseph Lawrence^Nicola Tesla^Bruno Comby^Gholam Reza Aghazadeh^Sergei Kiriyenko
11	policies	1		Jonathan Boston
13	supply security	2	policies	Kevin Patterson
43	system capacity	3	supply security	
42	system oversight	4	system capacity	Peter Kammler^Jane Diplock^Fatih Birol^David Hayes^Kevin Palmer^Shigeru Omi^Calvin Scovel^Claude Mandil^Jonathan Sinton^Chen Deming^David Fyfe^Jordan Carter^Patrick Fontein^Ed Willett^Ma Kai^Neil Patchett^Mohamed El Baradei^Philip Collins^Jane Henley^Nick Quinn^Maria Atkinson^Noe Van Hulst^John King^Gro Harlem Brundtland^Tina Nixon^Chen Shanru^Chris Oxenbould^Graeme Samuel^Linda Keen^Allan Fels^Peter Jenkins^Grigory Berdennikov^Rajmah Hussain^Ali Asghar Soltaniyeh^Gregory Schulte^Bernard Hill^Charlie McCreevy^Douglas Webb
14	system reliability	4	system capacity	Neville Simpson^Ian Johns^Bruce Bathurst
25	transmission	3	electricity^supply security^transmission players	
45	national transmission	4	transmission^transmission players	Ralph Craven^Chris Roberts^Howard Cattermole^Tim George^Rebecca Wilson^David Laurie^David Gascoigne^Patrick Strange^Kieran Devine^Cynthia Brophy^Rebecca Collerton^Stuart Low^Gavan Jackson
27	local distribution	4	transmission^transmission players	Warren Kyd^Shale Chambers^John Collinge^Michael Buczkowski^Karen Sherry^James Carmichael^Roger Sutton^Danny Gough^Peter Fredricson^Mark Franklin^Simon Mackenzie^Robert Thomson^Brian Gurney^Colin Holmes^Calvin Whaley^Rex Williams^Charlene White^Philippa White^Stephen Nicholls^Mark Gatland^Keith Fitzpatrick^Richard Krogh^Ross Dixon^Soane Ramanlal^Warren Moyes^Bob Thomson^John Wells^Robert Thompson^Brian Plimmer^Doug Dell^Donald McLaren^Paul Byrnes^Simon McKenzie^Graham Petrie^Duncan Head^Denise Bailey^Alan Jenkins^Roger de Bray^Steve Mutton^Clive Bull^Garth Galloway^Neville Simpson^Jodi Hayward^Michael Turner^Philip Blain^Nigel Barbour^Gary Pritchard^Neville Goodwin^Darren Mason^Alan Harrop^Derek Atkinson^Bill Hewitt^Tracey Bridges^Peter Thompson^linesman^Craig Shepherd^Peter Ellison^Malcolm Rhodes
47	configuration alternatives	3	electricity^supply security	
48	isolated supply	4	configuration alternatives	
49	connected alternatives	4	configuration alternatives	Bill Highet
15	demand management	2	policies	Hitesh Patel^Bruce Girdwood^Heather Staley^Murray Bell^Terry Collins^Andrew Pearce^Alastair Patrick^Chris Selwood^Steve Ryan^Hisahiro Yamamoto^Liz Goodwin^Toni Owen^Penny Hulse^Philip Sellwood^Eric Jansseune^Brian Cox^Rob Holdway^Jonathan Wish^Helen Taylor^John Taylor^Ray Cole
40	green buildings	3	demand management	Julien Lacave^Grant Dunford^Peter Dow^Ian McChesney^Nick Collins^Aaron Harvey^Rod Percival^John Scarry
51	insulation	4	green buildings^health and shelter	Julie Cupples^Graeme Baker^Greg Sweeney^Sue Sweeney
52	building rating systems	4	green buildings^standards	Patrick Fontein^Andrew Alcorn^Mike Donn^Jane Henley^Maria Atkinson
53	water heating	4	green buildings^water	
41	household behaviour	3	demand management^residential consumption	
57	metering	4	electricity^household behaviour^light industry and commercial	Helen Bremner
58	household power saving	4	electricity^household behaviour	
55	consumer education	4	electricity^household behaviour	Tone Wheeler
50	industry behaviour	3	demand management	
59	industry power saving	4	industry behaviour	
128	electric transport	4	electricity^alternative fuels	Stephen Pollard^Chris Borroni-Bird^Ian Wright^Martin Eberhard^Felix Kramer^Ulrich Schmid^Michael Milikin^Hisahiro Yamamoto^Chris Selwood^Mark McKenzie^Jim Heathcote
129	location of generation	4	electricity^industry behaviour	
26	energy sources	2	policies	John Noble^Chris Stone^Fatih Birol^Graeme Bethune^J.P. Painuly^Guy Caruso^John Loughhead^Sam Bodman^Claude Mandil^Murray Ellis^James Woolsey^Jonathan Sinton^Gene Gillespie^Gene Pisasale^Chen Deming^Ma Kai^Susan Krumdieck^Tony Owen^Noe Van Hulst^Agnes Reyes^Howard Gruenspecht^Chen Shanru^Jyoti Painuly^Parviz Fattah^Stuart Calman^Stephen Elder^Nigel Boielle^Philip Phillips^Kevin Patterson
60	fossil fuels	3	energy sources	Haley Barbour
23	gas-fired	4	gas^electricity suppliers	Bruce Beeren^Peter Hewett^Robert Wilson
24	coal-fired	4	coal^electricity suppliers	
8	oil-fired	4	oil^electricity suppliers	
61	renewables	3	energy sources	Russell Sturm^Li Junfeng^Jiang Ning^Ralph Sims^Ibrahim Togola^Ismail Diarra^Michael Buick^Wang Zhongying^Bruce Carswell

Id	Name	Level	Parent	Matched_Person
62	biomass	4	renewables	John Gifford^John Fistonich^Tommy Sandh^Peter Read^Elizabeth Yeaman^Jim Watson^Andy Hunter^Edward Shonsey^Barrie Leay^Andy Pag^Paulo Gaiad^Ronaldo Knack^Robert Kornfeld^Kerry Kirwan^Ben Wood^Jeff Stroburg^Vinod Khosla^Mark McKenzie^Sean Simpson^John Wolrath^Paul Quinn^Peter Bethune^Andrew Owens^Dickon Posnett^Mike Cochran^Craig Yencho^John Munford^Glen Kertz^Todd Carter^Dennis Denton^John Stansfield^Diomedes Christodoulou^Stephen Meller
31	hydro	4	renewables^electricity suppliers^water	
30	geothermal	4	renewables^electricity suppliers	Tony Mahon^Jim Ellis^Joe LaFleur^Jane Brotheridge^Lucien Bronicki^Chris Matthews^Joseph W. Aidlin^Alistair McLachlan
29	wind power	4	renewables^electricity suppliers	James Glennie^Chris Freear^Geoff Henderson^Fraser Clark^Bernhard Voll^Shi Pengfei^Glenn Starr^Ernest Hayes^Charles F Brush
63	solar	4	renewables	Julien Lacave^John M. Ssemanda^Mr. Achilles^Richard Kanyika^Chris Selwood^Steve Bayliss^Stephen Joll^Travis Bradford^Dave Catley^Lindsay Richards^Jesse Pichel^Murray Hogarth^Eric Jansseune^Brian Cox^Jeremy Leggett
38	marine-based electricity generation	4	renewables^electricity suppliers^water	Anthony Hopkins^Anthony Bellve^Andrew Laing
64	other energy sources	3	energy sources	
37	nuclear	4	heavy industry^other energy sources	Ziggy Switkowski^Ali Larijani^Thomas Neff^Alan Eggers^David Williams^Bruno Comby^John Borshoff^Michael Angwin^Mohamed El Baradei^Dick Raridon^Judd Brown^Ron Smith^Rajmah Hussain^Ali Asghar Soltaniyeh^Paul Dunn^Patrick Mutz^Charles Watson Munro^Linda Keen^Andrew Ross^Peter Atkinson^Ralph Stagg^Anneli Nikula^Gholam Reza Aghazadeh^Peter Jenkins^A Q Khan^Abdul Qadeer Khan^Grigory Berdennikov^Gregory Schulte^Javad Vaeedi^Sergei Kiriyenko^Aliasghar Soltaniyeh^Thomas Stelzer
65	electricity storage	4	electricity^other energy sources	Jim Heathcote^John Hawkins^Daniel Vieau
66	**structure and regulations**	**2**	**policies**	**Glenn Boyle^Lewis Evans^Richard Meade^Wil Bruhns^Bryce Johnson^David Hayes^Kevin Palmer^Shigeru Omi^Mike Walsh^Calvin Scovel^Thomas Barrett^Jordan Carter^Steve Smith^Ed Willett^Diane Feinstein^Stephen Johnson^Marion Blakey^Chris Oxenbould^Neil Patchett^Graeme Samuel^Zhou Shengxian^Mohamed El Baradei^Sergei Sai^Oleg Mitvol^Al Cross^Jay Graybill^Graeme Hughes^Gro Harlem Brundtland^Richard Stickler^Pascal Lamy^Linda Keen^Allan Fels^John Belgrave^Tina Nixon^Olivier Bommelaer^Alison Roberts^Felicity Broughton^Awad al Bander^Peter Jenkins^Grigory Berdennikov^Rajmah Hussain^Ali Asghar Soltaniyeh^Gregory Schulte^Bernard Hill^Nick Dibley^Ian Cole**
67	trading and markets	3	structure and regulations^business interests	Mike O'Donnell^Subodh Kumar^Alexander Zumpfe^Jeff Skilling^Ken Lay^Andrew Fastow^Bob Mitchell^Thomas Neff^Jean-Francois Tardif^Richard Causey^Mark Koenig^Michael Kopper^Bernard Doyle^Douglas Lau^Masanobu Takahashi^Simon Neal^Lorents Lorentsen^Chris Brodie^Vince Kaminski^Ben Glisan^Stephen Schork^Jonathon Poskitt^Jim Lennon^Simon Hayley^Simon Petley^Huw Roberts^Dan Smith^Bob Frye^Adam Smith^David Ricardo^Anthony Compagnino^Judy Ganes-Chase^Sam Tilley^M. Somasekhar^Mark Bringans^Steven Anderson^Neil Massa^Bill Bishop^Daniel Och^Antoine Halff^James Rollyson^Francisco Blanch^Angel Gurria^Greg Boland^Lance Jenkins^John Cobb^Clare Goldsworthy^Mark Benseman^Michael Carney^David Kostin^Harry Michas^Rick Meckler^Abhijit Chakrabortti^Richard Creed^Chris Cudsi^Mark Legge^Justin Davey^Kevin Lewis^Carolyn Martin^Robert Hurst^Daniel Petrocelli^Michael Ramsey^David Speight^George Secrest^Jim Fehrenbach^Charlie McCreevy^Wesley Colwell^Mathew Henry^Sam Morgan
35	wholesale electricity market	4	electricity^finance and insurance^trading and markets	
68	sharemarkets	4	finance and insurance^trading and markets	Chris Stone^Daniel Kieser^Paul Richardson^Mark Weldon^Greg Main^Jane Diplock^Jeremy Batstone^Wade Gardiner^Guy Elliffe^Dean Paatsch^Bruce Sheppard^James Lindsay^Craig Brown^Simon Botherway^Guy Eliffe^Geoff Brown^Brett Orsler^Andrew McDouall^Jason Lindsay^Sean Fenton^Ric Klusman^Arthur Lim^John Cairns^Guy Hallwright^Des Hunt^Rob Mercer^Mark Lister^Stephen Wright^Jason Teh^Paul Xiradis^John Colnan^Tim Barker^Denis Donohue^Rob Craigie^Bruce Cossill^Richard Burton^Grant Williamson^Richard Leggat^Paul Nicholson^Bryon Burke^Brett Wilkinson^Barry Lindsay^Joe Gallagher^Matt Willis^Neil Paviour-Smith^Chris Timms^Terry Tolich^John King^Steven Jurkovich^Jeremy Coe^Malcolm Davie^David Price^Rickey Ward^Nigel Scott^Peter Lynds^Andrew Mortimer^Matt Henry^Suzanne Kinnaird^Ian Waddell^Arjan van Veen^Rob Gwyther^Gregory Drahuschak^Carolyn Holmes^David McEwen^Phil Briggs^Kerry Porter^Jason Familton^Don Lewthwaite^Tom Bliss^Campbell Stuart^John Owen^Kar Yue Yeo^Andrew Kelleher^Rob Bode^Rodney Deacon^Rowan MacRae^Cameron Watson^Marcus Curley^Warren Doak^James Snell^Philip Hunter^Paul Valk^Andrew White^David Cassidy^James Smalley^Murray Rutherford^Nigel Pittaway^Meryl Witmer^Chris Swasbrook^Allan Furlong^James Miller^Robert Gee^Jason Wong^James Porteous^Liz Ann Sonders^Justin Cameron^Ian Wadell^Tim Howe^Stephen Hudson^Angus Geddes^Mark Storey^Mike O'Hare^David Land^Marc Pado^Doug Cote^Brian Williamson^Abby Joseph Cohen^Kathy Matsui^Peter Oppenheimer^Evan Olsen^Liam Dann
69	carbon trading	4	finance and insurance^greenhouse emissions^trading and markets	Joanna Silver^Terry Tamminen^James Cameron^Stuart Frazer^Murray Dyer^Karen Price^Mark Lewis^Craig McBurnie^Mark Woodall^Otto van der Wyck^Ross Garnaut

Id	Name	Level	Parent	Matched_Person
92	oil and gas markets	4	finance and insurance^oil and gas industry^trading and markets	Daniel Yergin^Edmund Daukoru^Mike Wittner^Frederic Lasserre^Jason Schenker^Tobin Gorey^Eoin O'Callaghan^Chip Hodge^Abdullah bin Hamad al-Attiyah^Keiichi Sano^Peter Davies^David Moore^Tony Nunan^Gerard Rigby^Mark Pervan^Matt Simmons^Rafael Ramirez^Ken Carroll^Jan Stuart^Eric Wittenauer^Ali al-Naimi^Lawrence Poole^Gholam-hossein Nozari^Michael Coleman^Shokri Ghanem^John Waterlow^Olivier Jakob^Kevin Blemkin^Tony Dolphin^Tim Evans^Bruce Evers^Bill O'Grady^Roger Diwan^Mohammed bin Dhaen al-Hamli^Carl Calabro^Chakib Khelil^Erik Simpson^Mike Fitzpatrick^Katherine Spector^Doug Leggate^Angus McPhail^Mark Waggoner^Tetsu Emori^Nauman Barakat^John Gretzinger^Andrew Harrington^Amanda Kurzendoerfer^Ali al-Jarrah al-Sabah^Christopher Bellew^Geoff Pyne^Adam Sieminski^Kazem Vaziri-Hamaneh^John Vautrain^Edward Meir^Tom Bentz^Jim Ritterbusch^Harry Tchilinguirian^Rob Laughlin^Peter Beutel^Makoto Takeda^Rick Mueller^Gerard Burg^Kevin Norrish^Addison Armstrong^Ken Hasegawa^Hasan Qabazard^David Fyfe^John Kilduff^John Hall^Paul Horsnell^Joseph Arsenio^Yaroslav Lissovolik^Christopher Jarvis^Evan Smith^Andrew Lebow^David Dugdale^Dariusz Kowalczyk^Hussain al-Shahristani^David Thurtell^Jeffrey Currie^Richard Hale^Kevin Rosser^Phil Flynn^Justin Smirk^Abdullah al-Badri^Kyle Cooper^Gary Ross^Simon Wardell^Tom Hartmann^Gordon Ramsay^Steve Bellino^Marshall Steeves^Maizar Rahman^Amanullah Khan Jadoon^James Gutman^Craig Pennington^Mark Keenan^Mark Mathias^Fathi Omar Bin Shatwan^Finlay MacDonald^Deborah White^Alexander Kervinio^Koo Cha-kwon^Alexandre Kervinio^Martin King^Mohammad Hadi Nejad-Hosseinian^Ahmad al-Fahd al-Sabah^Joe Arsenio^James Neale^Michael Lewis^Fred Fromm^Lawrence Eagles^Aaron Ford^Mohammed Barkindo^Hossein Kazempour Ardebili^Nader Habibi^Kate Dourian
72	acts and bills	3	structure and regulations	Bill Hodge^Michael Burton^Neil MacLean^Hugh Williams^Sim Lake^Simon France^John Paul Stevens^Antonin Scalia^John Roberts^Samuel Alito^Clarence Thomas^David Baragwanath^Graham Panckhurst^David Eady^Laurie Newhook^Lester Chisholm^Peter Salmon^John Wild^William Sessions^Stan Thorburn^Tony Randerson^Sam Alito^Sandra Day O'Connor^Alan MacKenzie^Lilia Vasilevici^Kelly Hennessy^Wayne McKean^Wendy Roberts^John Hueston^Sean Berkowitz^Martin Reid^Felicity Broughton^Raouf Abdel Rahman^Rizgar Amin^Jaafar al Musawi^Awad al Bander^Rodney Hansen^Paul Cogswell^Paul Hunter^Richard Maidment^Phillip Boulton^Lex Lasry^Anthony Whealy^Stanley Rosenblatt^Catriona MacLennan
3	RMA	4	acts and bills	
73	carbon tax	4	acts and bills	
6	energy strategy	4	acts and bills	
34	pricing and regulation	3	structure and regulations	Paula Rebstock^Chen Deming^Stephen Littlechild^Ma Kai^Philip Collins^Deborah Battell^Geoff Thorn^Chen Shanru^Jacqueline Martin
70	standards	4	pricing and regulation	Tony Craven^Julia Porter^Neville Simpson^Nick Quinn^Wayne Barnes^John Vorderbrueggen^Carolyn Merritt^Warren Larsen^Julie Crengle^Alan Jackson^Warren Bell^Ray O'Connor^Thayne Green^Alistair Sutherland^Don Holmstrom^Anne Schulte-Wulwer-Leidig
74	electricity charges	4	electricity^economics^pricing and regulation	Judi Jones
75	electricity penalties	4	electricity^negative^pricing and regulation	
130	communication	1		
44	psychology	2	communication	John McDowell
84	tone	3	psychology	
85	negative	4	tone	Achilles heel^Adolf Hitler^Ebenezer Scrooge^Pandora^Joseph Stalin^pandora^Judas Iscariot^Pinochet
86	neutral	4	tone	
87	positive	4	tone	Santa Claus^Pollyanna^Hercules^hercules
136	angle	3	psychology	Ivan Pavlov
141	news	4	angle	Brian Gaynor^Sean Plunkett^Philip Duncan^Anita McNaught^John Campbell^Kevin Milne^Mark Sainsbury^Christiane Amanpour^Peg Mackey^Neil Chatterjee^Ghaida Ghantous^Alex Lawler^Mariam Karouny^Anna Mudeva^Tom Ashby^Barbara Lewis^Simon Webb^John Wasik^Bruce Nichols^Matthew Robinson^Christopher Donville^Alister Doyle^Daniel Wallis^Parisa Hafezi^Hans Van Leeuwen^Maryelle Demongeot^Richard Valdmanis^Sinead Carew^Katherine Burton^Justin Baer^Osamu Tsukimori^Vivianne Rodrigues^Randy Fabi^Rob Taylor^Yaw Yan Chong^Cho Mee-Young^Janet McBride^Oliver Bullough^Matthew Lynn^Annika Breidthardt^Dmitry Solovyov^Jeffrey Heller^Sue Pleming^Erik Kirschbaum^Ed Cropley^George Nishiyama^Carol Giacomo [etc]
54	entertainment	4	angle	Santa Claus^Spencer Tunick^Gerard Daffy^Rod Emmerson^Peter Calder^Jim Hopkins^David James^Warren Larsen^Julie Crengle^Alan Jackson^Warren Bell^Ray O'Connor^Thayne Green^Alistair Sutherland^Brendan Hines^Peter Mochrie^Callum McKay^Katherine McRae^Leigh Hart^Cate Blanchett^Leonardo DiCaprio^Paul Henry^Anton Oliver^Brian Turner^Sheryl Crow^Madonna^Frankie Stevens^Megan Alatini^Basil Gelpke^Ray McCormack^Neil Young^Ainsley Harriott^Paul Merrett^Tom Aikens^Mark Hix^David Gower^Prunella Scales^Marco Pierre White^Barrie Thomlinson^Don Cheadle [etc]
122	mechanism	2	communication	
71	messaging	3	mechanism^angle	

Appendix A2 – Countries / Regions

[EXAMPLES]

Id	Name	Lev	Parent	Alt_Names	Nick Name	Acr	Exceptions	Ex From	Id
264	countries	4		continent ^continents ^country ^nation ^nations ^regime ^regimes ^region ^regions ^republic ^republics ^state ^states ^territories ^territory			a state of ^comfortable territory ^country and rock ^country club ^country folk ^country house ^country icon ^country mile ^country music ^country singer ^country singers ^cross-country skis ^Czech Republic ^do the country thing ^familiar territory ^hill-country ^King Country ^liquefied state ^living in the country ^marginal country ^medication regimes ^mixed state ^monitoring regime ^negative territory ^out in the country ^permits regime ^positive territory ^region of the solar ^regions of the brain ^regulatory regime ^resort region ^savings regime ^State Street ^state that the ^subject to a regime ^subsidy regime ^the state of ^United Nations ^United States		
267	a country	9	countries	any particular nation ^nation-states ^each country	country ^nation		a country better known ^a country known ^country mile		
1	New Zealand	6	Australasia	Aotearoa ^both sides of the Tasman ^Kiwi ^Kiwis ^mood of the nation ^nation like ours ^New Zealander ^New Zealanders ^New Zealandness ^New Zillun ^NewZealand ^Outer Roa ^Pakeha ^the Shaky Isles ^this country ^this side of the Tasman ^transTasman ^transtasman	country ^nation	NZ	This country is my country ^America, this country ^King Country ^country mile		
217	NZ domestic	6	New Zealand	domestic electricity ^domestic economy ^domestic stock	domestic				
23	world	4		internationally ^international ^worldwide ^globally ^global			a world away ^broadband world ^first world ^insignificant world ^Muslim world ^New World ^oil world ^third world ^Western world ^world of Pluto ^world-weariness ^world-weary	global warming	218
218	global warming	4	world						
172	overseas	4		foreigners ^Outsiders ^foreigner ^offshore ^foreign ^abroad			barrel-per-day offshore ^drilled offshore ^km is offshore ^offshore acreage ^Offshore are good beach ^offshore area ^offshore as ice ^offshore development ^offshore discovery ^offshore drilling ^offshore EA ^offshore exploration ^offshore field ^offshore finds ^offshore gas ^Offshore Ltd ^offshore Northland ^offshore oil ^offshore oilfield ^offshore oilfields ^offshore platform ^offshore platforms ^offshore Pohokura ^offshore sedimentary ^Offshore Services ^offshore Taranaki ^offshore terminal ^offshore Tui ^offshore well ^offshore wells ^offshore wind ^PTTEP Offshore		
103	northern hemisphere	5		northern Hemisphere					
63	arctic	6	northern hemisphere	Arctic Circle ^Eskimo ^Eskimos ^Hans Island ^Inuit ^Lomonosov ridge ^north east passage ^North Pole ^north west passage ^northeast passage ^northern Atlantic ^northwest passage ^permafrost ^Polar ^Polar bears ^polar bears ^the Pole ^tundra ^Ursus maritimus	Northwest route		Eskimo Joe		
74	North sea	6	northern hemisphere						
190	southern hemisphere	5							
62	Antarctica	6	southern hemisphere	antarctic ^Antarctic Circle ^Antarctic Peninsula ^Antarctic Territory ^Ross Sea ^South Pole ^sub Antarctic Islands ^West Antarctic ^West Antarctica ^Whillans and Mercer Ice Streams					
67	Southern ocean	6	southern hemisphere						

Appendix A3 – Cities / Localities

[EXAMPLES]

Id	Name	Lev	Alt_Names	Nick Name	Acr	Parent	Country	Topic	Exceptions
16	North island	7	Central North Island ^Island, while most of the load is in the North ^North and South Islands ^South and North Islands ^South Island than the North ^South Island to the North ^Upper North Island	North and	NI		NZ		
644	North island's west coast	7	North Island from the west coast ^North Island west coast ^Northland's west coast ^walkway access to the west coast ^west coast from Northland ^west coast of New Zealand's North Island ^west coast of Northland ^west coast of the North Island ^west coast off Northland	west coast		North island	NZ		
93	Northland	7	Auckland, Northern and Wellington ^Auckland and Northern ^Northern and Auckland ^Northland Regional ^Northern network ^Far North			North island	NZ		Northland Wellington ^Northland Suburb
92	Whangarei	8	Whangarei heads ^Langs Beach ^Hikurangi ^Waikaraka ^Tutukaka ^Waipu	Western Hills D ^Maunu Rd ^Kamo Rd		Northland	NZ		
218	Marsden A	8				Whangarei	NZ	oil-fired	
219	Marsden B	8	Marsden Point station ^Marsden, Otahuhu ^Marsden Point B	Marsden		Whangarei	NZ	coal-fired	Dr Marsden ^Ernest Marsden ^Marsden College ^Marsden Point oil refinery ^Marsden Point refinery ^Marsden Pt oil refinery ^Marsden Pt refinery ^Samuel Marsden ^terminal at Marsden Point
340	Ruakaka	8	Bream head ^Bream bay	Bream		Whangarei	NZ		
858	Marsden Point refinery	8	Marsden Point oil refinery ^Marsden Pt oil refinery ^Marsden Pt refinery ^Marsden Point ^Marsden Pt	hydrocracker ^Marsden Pt ^refinery		Whangarei	NZ	oil	[+Marsden B, 219]
146	Dargaville	8	Babylon coast ^Kai Iwi Lakes ^Kai Iwi Lakes Rd ^Kauri coast ^State Highway 12 ^Twin Coast Discovery ^Waipoua Forest	Promenade Point ^Normandy St ^Pine Beach	SH12	Northland	NZ		
278	Ngawha	8				Northland	NZ	geothermal	prison at Ngawha ^Ngawha prison
279	Kaikohe	8	Ngawha			Northland	NZ		
307	Mangonui	8	Karikari Peninsula ^Doubtless Bay ^Maitai Bay Rd ^Whatuwhiwhi ^Maitai Bay	Cable Bay	SH10	Northland	NZ		
308	Hokianga	8	Hokianga Harbour ^North Hokianga			Northland	NZ		
309	Fairburn	8				Northland	NZ		
310	Kaitaia	8	Awanui	Te Paki		Northland	NZ		
311	Taupo bay	8				Northland	NZ		
514	Kerikeri	8				Northland	NZ		
618	Ngunguru	8				Northland	NZ		
621	Takou bay	8				Northland	NZ		
628	Waitangi	8				Bay of Islands	NZ	tangata whenua	treaty of Waitangi ^Waitangi tribunal
674	Northland basin	8		basin		Northland	NZ	oil and gas industry	
774	Pouto project	8	Pouto forest			Northland	NZ	wind power	
813	Kaeo	8	Waikare Marae ^Totara North ^Whangaroa ^Kawakawa			Northland	NZ		
815	Mangakahia river	8	Titoki Bridge			Northland	NZ		
816	Wairoa river	8	Tangiteroria Bridge			Northland	NZ		

Appendix A4 – Keywords

[EXAMPLES]

Id	Name	Lev	Alt_Names	NickName	Acr	Exceptions	Parent	Topic	Ex From	Id
37	electricity	5	ampere ^amperes ^amps ^electric ^electrical ^electrician ^electricians ^electrified ^electrifies ^electrify ^electrifying ^hydroelectric ^hydroelectricity ^kiloVolt ^kv ^volt ^voltage ^volts	watts ^zap			energy	electricity	x electricity exceptions	27
27	x electricity exceptions	9	atmosphere was electric ^Electric Confectionaries ^electric eel ^electric eels ^Electric Light Orchestra ^electric pace ^electricity of excitement ^pace was electric					positive		
75	power	5	hydropower ^TrustPower ^powering ^powered ^Powerco ^powers			Merchant of Power ^Austin Powers ^Simon Power ^black power ^Grey Power	electricity	electricity	x power exceptions ^powerful ^political power ^economic power	89 ^211 ^219 ^223
89	x power exceptions	6	and power to ^biofuels to power ^cars powered by ^control powers ^ethanol to power ^fuel cell-powered ^give them more power ^given powers ^its power to ^lose power and is unlikely to reach ^lost power, becoming a tropical ^media power ^muscle power ^power and pressure ^power dissipation ^power in this volcano ^power oil ^power once the car ^power the vehicles ^power-nap ^power-napping ^power-naps ^powered by a twin ^powered by bio ^powering cars ^powers of access ^productive power ^redemptive power ^regulatory power ^scarcity power ^staying power ^that power ^the power to ^use its power ^voting power ^will-power ^your power					positive	power after all	114
211	powerful	6	extraordinary powers ^feel the power ^high-powered ^immense power ^incredible power ^more power ^police powers ^power ahead ^power and performance ^power goes to the front wheels ^power of imagination ^power of organisational ^power steering ^power up ^powered ahead ^powered up ^powering industry ^powering up ^powers ahead ^powers up ^rocket-powered ^star power ^their power to ^wealth and power					positive	power after all	114
219	political power	6	a great power ^a nuclear power ^armed power ^balance of power ^big powers ^biggest nuclear power ^burgeoning power ^came to power ^centralizing more power in ^clinging to power ^coercive powers ^coming into power ^contemplate life without power ^contemplate power ^corridors of power ^counterbalance the power ^Crown power ^disposition of power ^economic powers ^emerging powers ^EU powers ^European powers ^global power ^grip on power ^He is without power. ^hold on power ^holding powers ^in power ^international powers ^lack the power ^lobbying power ^major powers ^Middle East power ^negotiating power ^nuclear powers ^Opec power ^party in power ^permanent powers ^political power ^power centres ^power feud ^power feuds ^power for power's sake ^power it wields ^power of veto ^power play ^power plays ^power-sharing ^powerhouse ^powerhouses ^regional power ^rising power ^rose to power ^s power ^Security Council powers ^seize power ^seized power ^seizes power ^seizing power ^share power ^shift in power ^shift of power ^superpower ^superpowers ^swept from power ^the major power ^too much power ^took power ^tussle for power ^UN powers ^union powers ^US power ^veto power ^veto powers ^weapons power ^western powers ^wielding power ^with people and power ^world powers					political imperatives	power after all	114

Appendix A5 – Events

[EXAMPLES]

Id	Name	Alt_Names	NickName	Acr	Exceptions	Parent	Topic	Ex From
370	issues	circumstances ^issue ^saga ^scenario ^scenarios ^situation ^the matter ^those cases where			and issue ^bond issue ^bond issues ^issue a ^issue of debentures ^issue of new shares ^issue price ^issue prospectus ^prison-issue ^rights issue ^sometimes issue ^team issue gear ^team issue jackets ^to issue		issues of concern	
459	abundance	a wealth of ^abundant ^ample ^countless ^crowds spilling ^plenitude ^plentiful ^plenty ^plethora ^prolific ^rich ^richer ^richest ^richness ^spilling over ^spillover ^teeming ^vast			a bit rich ^Bay of Plenty ^Katherine Rich ^Miss Rich ^Mrs Rich ^Ms Rich ^rich and poor ^Rich said ^said Rich	positive	positive	
654	surplus	surpluses				abundance	positive	
585	disruptions	disconnect ^disconnects ^disrupt ^disrupted ^disrupting ^disruption ^disrupts ^outage ^outages				problems	negative	
117	shortages	customers short ^insufficient ^is at a premium ^running out ^scarce ^scarcer ^scarcest ^scarcity ^short of ^shortage ^shortfall ^shortfalls ^there not being enough			short of a Nobel ^stopped short	disruptions	negative	
161	water shortages	impossible to pump the water ^severed the waterpipe ^water shortage ^reduced water ^little rain	catchment		Board's catchment	shortages	system reliability ^water	
657	energy shortages	energy concerns ^energy shortage ^energy shortfall ^insecurity in the energy ^shortage of spare capacity ^supply concerns ^supply disruption ^supply disruptions ^supply problems ^supply uncertainty	shortfall			shortages	negative ^system reliability	
640	gas cuts	cut a pipeline supplying gas ^cut gas ^cut natural gas ^cut off gas ^cut off its gas ^cut off supplies of gas ^cut off to industrial users ^cutting gas ^gas cut ^gas prices that briefly cut ^gas shortfall ^turn off Ukraine's gas	cut ^cuts ^cutting ^interrupt ^interrupted ^interrupting ^interruption ^interruptions ^interrupts ^shortfall ^the switch-off			energy shortages	negative ^gas	
136	electricity shortage	struggled to generate enough power ^limit power production ^electricity shortges ^power shortages ^power shortage ^cold showers	power crunch			energy shortages	negative ^system reliability ^electricity	
105	power cuts	cut electricity ^cut water heating ^cuts power ^cutting power ^disrupted electricity ^electricity cut ^electricity is still cut ^electricity is still out ^no hot water ^no power ^off the power ^outage ^outages ^power can go out ^power cut ^power failure ^power going down ^power losses ^power outage ^power outages ^power shut down ^power supply interruption ^power supply interruptions ^power was cut ^powercut ^without electricity ^without heat or light ^without power	candle ^candlelight ^candles ^cut ^cuts ^fault ^faults ^interrupt ^interrupted ^interrupting ^interruption ^interruptions ^interrupts ^torch ^torches		contemplate life without power ^cut free ^cut off by water ^cut out of ^cut some ^He is without power. ^views will cut	shutdowns ^electricity shortage	negative ^system reliability ^electricity	oil outage
685	oil outage	disruption to supplies from Iran ^outage at Alaska ^outage would quickly erode ^outages from militant ^production outages ^prolonged outage ^supply outage				energy shortages	oil ^system reliability	
89	blackouts	black out ^black-outs ^blackout ^brown out ^brown outs ^brownout ^brownouts ^hot water issues ^knocked out electricity ^lights go out ^lights out ^lost hot water ^lost power ^power failure ^power failures ^power supply failure ^power was lost ^system failure ^system failures ^without hot water			blackout period is a bit too much ^lost power, becoming a tropical ^outage from Nigeria	power cuts	system reliability ^electricity ^negative	

Appendix A6 – Documents

[EXAMPLES]

Id	Name	Lev	Alt_Names	Nick Name	Acr	Exceptions	Parent	Topic
1041	goals	5	aspirations^aspiration^visioning^vision^goal			aspiration pneumonitis^apocalyptic vision^peripheral vision^City Vision^own goal		positive^progress
194	prosperity	5	prosperous^prospering^prospered^prospers^prosper				money	positive^economics
426	standard of living	6	better life^lifestyle^lifestyler^lifestylers^lifestyles^living standards^quality living^quality of life^raise all ships^standards of living^way of life				performance	progress^wellbeing
438	knowledge	5	Knowledge Economy^Knowledge wave^know-how			[+1387 ignorance]	awareness	positive
1387	ignorance	8	hadn't a clue^hasn't a clue^ignorant^ignorantly^illiterate^no clue^no idea^no knowledge^no one has a clue^no one really has a clue^not know^not knowing^t know^unknowingly^unsure					negative
917	wealth	6	affluence^affluent^fortune^have enriched^rich^richer^riches^richest^wealthy			a bit rich^a wealth of^good fortune^Katherine Rich^methane rich^Ms Rich^nutrient-rich^rich compost^rich feeding ground^rich fuel^rich in biodiversity^rich in variety^rich scientific^rich vein	prosperity	positive^economics
1342	shareholder wealth	7					wealth	sharemarkets
1031	wisdom	5	wising^wisely^wised^wiser^wises^wise			price-wise	knowledge	positive
1202	security	5	securely^securing^secured^secures^secure			[+1329 insecurity]	responsibilities	neutral
1329	insecurity	7	lack of security^no security^not secured^not secure^unsecured^insecure					negative
1389	reliability	7	dependable^ensure^ensured^ensuring^protect^protected^protecting^protection^protective^protectively^protectiveness^protects^reliable^reliance^shield^shielded^shielding^shields^trusted^trusting^trustworthiness^trustworthy			Reliance	security	positive
645	confidence	6				[+394 no confidence]	goals	positive
394	no confidence	7	blow to investor confidence^confidence drop^confidence goes^confidence has been sapped^confidence has taken a hit^confidence slump^confidence takes a knock^crisis of confidence^dismal business confidence^drop in confidence^falling business confidence^heavily on business confidence^hit consumer confidence^hit the confidence^knocks confidence^lack of confidence^lacked confidence^lacking confidence^lose confidence^losing confidence^lost confidence^low confidence^low investor confidence^lower confidence^plummeting business confidence^questions about the confidence^shaken confidence^shaky confidence^shook confidence^undermine confidence^undermined confidence^weak confidence^weak consumer confidence					negative
805	consumer confidence	7					confidence^indicators	light industry and commercial^indicators
1181	business confidence	7	confidence within the business^investor confidence^retail confidence				confidence^indicators	business interests^indicators
1237	justice	5	fair^fairly^fairness^fairtrade^impartiality^neutrality^unbiased			a fairly^at the fair^biofuel fair^fair city^fair dash^fair to say^fairly firm^fairly flat^fairly hefty^fairly high^fairly limited^fairly robust^fairly solid^fairly unknown^fairly weak^sounds fairly ^technology fair [+1238 injustice]		neutral^political imperatives
1238	injustice	7	disproportional^inequitable^not equal^not fair^unequal^unfair				disadvantage	negative
570	human rights	6	civil libertarians^civil liberties				social equity	social equity

Appendix A7 – Organisations

[EXAMPLES]

Id	Name	Lev	Alt_Names	NickName	Acr	Exceptions	Parent	Topic
403	media	5	additional reporting^airplay^anchorman^anchormen^anchorwoman^broadcast^broadcasted^broadcaster^broadcasting^broadcasts^column^columnist^correspondent^correspondents^Fleet Street^footage^headline^headlines^journalism^journalist^journalists^journo^journos^news^newspaper^newspapers^paparazzi^press conference^press release^press secretary^press statement^publicity^radio^report that^reporter^reporters^reports that^screenwriter^screenwriters^tabloid^tabloids^televise^televised^televises^televising^television^the press^TV	anchor^anchors^hack^hacks^presenter^presenters^published^report^reporting^scribe^scribes^sector^stories^story	MSM	a report^adviser's report^advisers report^annual report^annual reports^appraisal report^bad news^companies reporting^company reporting^different story^earnings reporting^final report^good news^great report^growth stories^growth story^half year report^ headline inflation^headline prices^headline rate^intelligence report^multi-media works^report advised^report by^report from^report of the^report season^report to^reporting season^reporting standards^sales report^says the correspondent^the report^this report^to report		media
4145	Auckland Star	7					media^business	media^light industry and commercial
2825	APN	6	APN News & Media^News&Media^APN News	board^ceo^chair^chairman^chief^company^director^executive^it^its^listed company^manager^New Zealand company	APN		Independent News and Media^publishers^media^New Zealand stock exchange^Australian stock exchange	media^light industry and commercial
2	NZ Herald	7	Business Herald^BusinessHerald^Herald^Herald Entertainment Team^Herald files^HERALD ON LINE STAFF^Herald on Sunday^Herald Online^Herald Online Staff^New Zealand Herald^New Zealand Herald Travel^Nz Herald Staff^nzherald^Nzherald Staff^staff reporter^ The Harold^Weekend Herald		HoS	The Business Council	APN	media^light industry and commercial
15	Bay of Plenty Times	7	BOP Times		BPT		APN	media^light industry and commercial
21	Northern Advocate Whangarei	7	Northern Advocate (Whangarei^Northern Advocate				APN	media^light industry and commercial
189	Rotorua Daily Post	7	Daily Post (Rotorua^Daily Post				APN	media^light industry and commercial
202	Listener	7					APN	media^light industry and commercial
816	Hawkes Bay Today	7	Hawke's Bay Today				APN	media^light industry and commercial
2337	Oamaru Mail	7					APN	media^light industry and commercial
2378	Christchurch Star	7					APN	media^light industry and commercial
3532	Wilson & Horton	7					APN	media^light industry and commercial
3535	Stratford Press	7					APN	media^light industry and commercial
203	Fairfax Media	6	John Fairfax Holdings^Fairfax			John B Fairfax	media^Australian stock exchange	media^light industry and commercial
3	Stuff	7				Stuff like that	Fairfax Media	media^light industry and commercial

Appendix A8 – Persons

[EXAMPLES]

Id	Name	Lev	Alt_Names	NickName	Description	Hon	G	Parent	Topic
1692	Editorial	9			Editor. Contributor to NZ Herald.		S		media ^light industry and commercial
534	staff reporter	9	staff reporters ^staff writers		Special case for [publisher as source]. Contributor to NZ Herald. Contributor to [Northern Advocate Whangarei [NZ Herald]].		S		media ^light industry and commercial
2	Marta Steeman	8		Steeman ^Marta ^hers ^her ^she	Contributor to The Press [Stuff].		F		media ^light industry and commercial
3	Peg Mackey	8		Mackey ^hers ^Peg ^her ^she	London. Contributor to Reuters [NZ Herald].		F		news ^media ^light industry and commercial
4	Brian Fallow	8		Fallow ^Brian ^him ^his ^he	Columnist. Economics Editor. Contributor to NZ Herald Economics.		M		media ^economics ^light industry and commercial
6	James Daley	8		Daley ^James ^him ^his ^he	Contributor to Independent [NZ Herald].		M		media ^light industry and commercial
9	Liam Dann	8		Dann ^Liam ^him ^his ^he	Contributor to NZ Herald. Stockmarket commentator. Contributor to media [NZ Herald].		M		media ^sharemarkets
11	Anna Chalmers	8		Chalmers ^hers ^Anna ^her ^she	Contributor to NZ Herald.		F		media ^light industry and commercial
15	Arnold Pickmere	8		Pickmere ^Arnold ^him ^his ^he	Contributor to NZ Herald.		M		media ^light industry and commercial
16	Richard Inder	8		Richard ^Inder ^him ^his ^he	Contributor to NZ Herald.		M		media ^light industry and commercial
17	Anne Gibson	8		Gibson ^Anne ^hers ^her ^she	Business Herald's property editor. Contributor to NZ Herald. The Business Herald's property editor.		F		media ^light industry and commercial
18	Neil Chatterjee	8		Chatterjee ^Neil ^him ^his ^he	Singapore. Contributor to Reuters [NZ Herald].		M		news ^media ^light industry and commercial
19	Ghaida Ghantous	8		Ghantous ^Ghaida ^hers ^her ^she	Contributor to Reuters [NZ Herald].		F		news ^media ^light industry and commercial
115	Michael Richardson	8		Richardson ^Michael ^him ^his ^he	Former Asia editor of the International Herald Tribune, is a senior research fellow at the Institute of Southeast Asian Studies in Singapore. Former Asia editor of the International Herald Tribune, researches energy and security at the Institute of South East Asian Studies. Contributor to [NZ Herald]. [Guest Columnist].		M		media ^science & research
116	Fran O'Sullivan	8		Fran ^her ^hers ^Ms Fran ^Ms Fran O'Sullivan ^Ms O'Sullivan ^O'Sullivan ^she	Contributor to NZ Herald.	Ms	F		media ^light industry and commercial
425	Iain McGregor	8		McGregor ^Times ^Iain ^him ^his ^he	Photographer for Waikato [Stuff]. Waikato Times.		M		media
747	Richard Robinson	8		Robinson ^Richard ^him ^his ^he	NZ Herald Photographer.		M		media
254	guest columnist	9	guest columnists		[Guest Columnist]. Contributor to [Bloomberg [NZ Herald]]. Contributor to [NZ Herald]. Contributor to [ODT [NZ Herald]]. Contributor to [Otago Daily Times [NZ Herald]]. Contributor to [Observer [NZ Herald]].		S		media
33	Matt McCarten	8		McCarten ^Matt ^him ^his ^he	[Guest Columnist]. Unite's General Secretary. Head of a Union. Political commentator. Contributor to [NZ Herald].		M		NGOs ^lobbying ^community support ^workers and unions
167	James Glennie	8		Glennie ^James ^him ^his ^he	[Guest Columnist]. Wind Energy Association chief executive. Chief Executive of NZWEA. Contributor to [NZ Herald].		M		lobbying ^wind power
921	Angela Merkel	8		Angela ^Chancellor Angela ^Chancellor Angela Merkel ^Chancellor Merkel ^her ^hers ^Merkel ^she	German Chancellor. Chairing the annual.	Chancellor	F		government players
1901	Ulrich Wilhelm	8		Wilhelm ^Ulrich ^him ^his ^he	Merkel's Spokesman. German Government.		M	Angela Merkel	government players

Appendix A9a – Organisation Types

Organisation types were allocated to organisation entities where possible, and were used to help with the consistency of parent and topic allocation.

Table A13.1 – Organisation_Type

Code	Description	Notes
1	Political Party	
2	Media Organisation	
3	SOE	
4	Private Company	
5	Public Company	
6	Government Department	
7	NGO	not elsewhere defined
8	Other	or Unknown
9	School	or childcare
10	Regulator	or Mediator or Disputes Investigator or Enforcer
11	Lobby Group	or Advocate (eg Union)
12	Government Executive	
13	Overseas Government	or Research, University or Non-Profit Org
14	University	or tertiary institution
15	Trust	
16	Crown Entity	or CRI
17	UN Organisation	or International Body
18	Charity	
19	Local Body	
20	Bank	or Investment Bank or Investment Company or Finance Company

Appendix A9b – Document Types

Document types were allocated to document entities where possible, and were used to help with the consistency of parent and topic allocation.

Table A13.2 – Document_Type

Code	Description	Notes
1	Act	Law.
2	Bill	Proposed law.
3	Policy	Stated set of principles, underlying intended actions.
4	Regulation	Set of rules.
5	Guideline	Helpful assistance.
6	Goal	or target. Something to aim for.
7	Project	or programme. Usually fixed time period, reasonably short term.
8	Strategy	or plan. Overarching intention, longer term.
9	System	or process. Mechanism, or method.
10	Certificate	or standard or classification.
11	Report	
12	Article	
13	Book	or play, song, radio program. Mediums other than film or TV.
14	Film	or TV program. Visual canned media.
15	Indicator	Concrete well known indicator.
16	Measure	Anything we can or tend to measure.

Appendix A10 – Entity Keyword Lists

The following lists of keywords (by entity class) were used by ETAT to indicate that a proper case phrase containing an unmatched proper case word might be part of a new entity name requiring addition to the list of entities for that class. Unlike person names which were added automatically with no checking, each of these entities required user confirmation before adding.

Many of these keywords were also used to automatically assign nick names, organisation or document types, parent entities, and topics.

DocumentKeywordList

```
Accord,Act,Agreement,Atlas,Bill,Book,Bulletin,Chronicles,Code,Column,Declaration,Do
cument,File,Framework,Guide,Guideline,Guidelines,Initiative,Journal,Law,Magazine,Ma
p,Paper,Plan,Poll,Programme,Project,Proposal,Protocol,Quota,Regulation,Regulations,
Report,Research,Review,Outlook,Scheme,Strategy,Study,Survey,Treaty
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EventKeywordList

```
Age,Anniversary,Assembly,Award,Awards,Birthday,Camp,Carnival,Ceremony,Challenge,Cha
mps,Championship,Championships,Commissioning,Concert,Conference,Cup,Cyclone,Day,Dem
onstration,Expo,Festival,Forum,Funeral,Games,Gig,Hurricane,Launch,Luncheon,Motorsho
w,Meeting,Premiere,Prix,Prize,Rally,Revolution,Seminar,Series,Show,Storm,Summit,Sym
posium,Talks,Tour,Tournament,War,Week
```

OrgKeywordList

```
&^Academy^Advertiser^Advisors^Agency^Air^Airport^Airways^Alliance^Associates^Associ
ation^Authority^Bank^Board^Bookshop^Brothers^Business^Cafe^Capital^Carpets^Centre^C
lub^Co^Coalition^College^Commission^Company^Congress^Conservation^Consultants^Consu
lting^Contractors^Corp^Corporation^Council^Court^Coy^Crown^Dealer^Dealers^Departmen
t^Developers^Development^Earth^Economic^Electricity^Energy^Engineering^Enterprises^
Equities^Equity^Exchange^Exploration^Factory^Federal^Federation^Finance^Financial^F
orce^Foundation^Fund^Funds^Gallery^Global^Government^Group^Hapu^Holdings^Healthcare
^Hospital^Hotel^Inc^Incorporated^Industry^Information^Infrastructure^Institute^Inst
itution^International^Investment^Investments^Investors^Iwi^Kindergarten^Kiwi^Labora
tory^Library^Limited^Ltd^Mail^Magazine^Market^Markets^Management^Marae^Mine^Ministr
y^Motors^Movement^Museum^National^Network^Office^Offices^Officers^Oil^Orchestra^Org
anisation^Owners^Partners^Party^Petroleum^Port^Power^Prison^Products^Project^Proper
ties^Property^Pty^Public^Registry^Research^Resources^Restaurant^Roundtable^School^S
ecurities^Service^Services^Shop^Society^Solutions^Steel^Stockbroking^Sustainable^Su
stainability^Systems^Technology^Technologies^Trading^Transport^Travel^Trust^Union^U
nited^University^Utilities^Utility^Works^World^Zoo
```

Appendix A11 – NZ Herald Articles by Month

The "Herald Count" column values in Table A15.1 below are expected to be slightly high.

Table A15.1 – Study Article Count Proportions

Year Mth	Start Objectid	End Objectid	Herald Count	Study Count	%
2006 01 (Jan)	10362062	10366201	4139	240	5.8%
2006 02 (Feb)	10366202	10370438	4236	181	4.3%
2006 03 (Mar)	10370439	10375445	5006	215	4.3%
2006 04 (Apr)	10375446	10379660	4214	191	4.5%
2006 05 (May)	10379661	10384410	4749	205	4.3%
2006 06 (Jun)	10384411	10389149	4738	293	6.2%
2006 07 (Jul)	10389150	10393856	4706	183	3.9%
2006 08 (Aug)	10393857	10399079	5222	261	5.0%
2006 09 (Sep)	10399080	10403730	4650	249	5.4%
2006 10 (Oct)	10403731	10408512	4781	245	5.1%
2006 11 (Nov)	10408513	10413214	4701	257	5.5%
2006 12 (Dec)	10413215	10417333	4118	219	5.3%
2007 01 (Jan)	10417334	10421781	4447	213	4.8%
2007 02 (Feb)	10421782	10426343	4561	248	5.4%
2007 03 (Mar)	10426344	10431889	5545	268	4.8%
2007 04 (Apr)	10431890	10437025	5135	238	4.6%
2007 05 (May)	10437027	10442963	5936	290	4.9%
2007 06 (Jun)	10442964	10448839	5875	379	6.5%
2007 07 (Jul)	10448840	10454950	6110	394	6.4%
2007 08 (Aug)	10454951	10461017	6066	308	5.1%
2007 09 (Sep)	10461018	10466865	5847	309	5.3%
2007 10 (Oct)	10466866	10473267	6401	357	5.6%
2007 11 (Nov)	10473268	10479322	6054	323	5.3%
2007 12 (Dec)	10479323	10484874	5551	308	5.5%
Total			**122788**	**6341**	**5.2%**
Max			**6401**	**181**	**6.2%**
Min			**4118**	**394**	**4.4%**
Mean			**5116**	**266**	**5.2%**

Source: nzherald website (2010).

Appendix A12 – Relevant NZ Herald Subject Tag Codes

Table A16.1 – Relevant NZ Herald Subject Tag Codes

Code	Description	Comments
1	National	
2	World	
3	Business	
4	Sport	Results lists were excluded.
5	Technology	
6	Life Style	
7	Travel	
8	Property	
9	Motoring	
10	Weather	
11	Employment	
12	Personal-Finance	
16	[Unknown]	
18	Arts & Literature	
24	Building	
25	Business Services	
26	Climate Change	
28	Commercial Property	
30	Crime	
34	Economy	
37	Energy	
39	Environment	
42	Fashion & Beauty	Excluded.
45	Food & Beverage Industry	
47	Forestry	
49	[Unknown]	
63	Journalism	
64	Mining	
72	Personalities	
74	Workplace	
76	Residential Property	
82	Science	
87	Social Issues	

95	Tourism & Leisure	
97	Transport	
134	Books	
136	Liquor Industry	
143	CDs	
144	NZ Government	
152	Coal	
154	Comedy	
161	Concerts	
169	Dance	
187	Electricity	
206	Food & Wine	Excluded.
244	Kyoto Protocol	
250	Local Government	
264	Music	
273	Oil & Gas	
280	Politics	
343	Theatre	
364	What's On	Weekly entertainment schedule. Excluded.
466	Opinion	
516	Mortgages	
702	Sideswipe	Amusing anecdotes.
812	Horoscopes	Excluded.
500814	Cartoons	Excluded.
500837	Nuclear Power	
1500914	Home-Truths	
1501084	Forward Thinking	Entertainment.
1501119	Entertainment	
1501154	Your Views	Reader responses on designated topics. Excluded.
1502967	Entertainment Reviews	Concerts, plays, albums, etc.
1502988	Herald Homes	