Exploring operational managers' logic around trade-offs related to sustainability

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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, 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.

Tobias Daubenschüz

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LIST OF ABBREVIATIONS

ACI – Airports Council International
AM1 – Airline Operations Manager 1
AM2 – Airline Operations Manager 2
AM3 – Airline Operations Manager 3
AOA – (British) Airport Operators Association
APU – Auxiliary Power Unit
BAA – British Airports Authority
BARNZ – Board of Airline Representatives New Zealand
CO2 – Carbon dioxide
CPRS – Carbon Pollution Reduction Scheme
EEC – Eurocontrol Experimental Centre
ETS – Emissions Trading Scheme
EU – European Union
FAA – Federal Aviation Administration
GHG – Greenhouse Gas
GP – Ground Power
GPU – Ground Power Unit
GRI – Global Reporting Initiative
IATA – International Air Transport Association
NGO – Non-Governmental Organisation
PCA – Preconditioned Air
UNFCCC – United Nations Framework Convention on Climate Change
WCED – World Commission on Environment and Development

ABSTRACT

This dissertation investigates how managers perceive trade-offs in relation to sustainability. The dissertation results from a research project with both a theoretical and applied orientation, following the argument that both in business and in theory, a "win-win paradigm" of sustainability prevails. According to the win-win paradigm, the extent of a company's environmental and social commitment is principally restricted by its positive economic value. Drawing on a practical case, this dissertation contributes to this new and underexplored field of research around the win-win paradigm of sustainability. The dissertation 1) investigates the win-win paradigm with regard to the business case to be made for adoption of a particular initiative; and 2) explores operational managers' logic around trade-offs related to sustainability.

Academic and practitioner literature regarding sustainability, the win-win paradigm and sustainability-related trade-offs was reviewed, as was the context for business decisions. Data collection was based on in-depth interviews with operational managers from four different companies with an interest in a particular sustainability initiative. The data were analysed thematically and integrated with the afore-mentioned literature to inductively develop a series of hypotheses.

The dissertation confirms that companies are trapped within the limits of the win-win paradigm of sustainability. Externally-oriented initiatives are regarded as more likely to overcome financial boundaries than are internally-oriented initiatives. It is found that the specifics of an industry determine the scope of the win-win zone for companies. The dissertation moreover argues that competitive forces reinforce the boundaries of the win-win paradigm and that the win-win zone is likely to expand in future in the particular initiative at the centre of this dissertation. Visible problems, which affect companies in exploiting their environmental and economic (win-win) opportunities, can be grounded in the hidden context of stakeholder-related trade-offs. These trade-offs stem from a lack of incentives for involved stakeholders. The recognition of these trade-offs is impeded by a lack of communication.

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Chapter 1 Introduction

Greenhouse gas (GHG) emissions resulting from burning of fossil fuels are now generally agreed to be the major reason for climate change, with climate researchers maintaining that the increasing global warming will have a destructive effect on future generations (Schneider, Rosencranz & Mastrandrea, 2009). Preventing this destructive effect requires the achievement of some sort of ecological sustainability within a narrow time frame. However, researchers commonly argue that too little is done in order to achieve this favourable future state (Hahn, Figge, Pinkse & Preuss, 2010; Kearins, Collins & Tregidga, 2010). Focusing on GHG emissions, and drawing on an applied business context, this dissertation discusses fundamental issues, which lead to shortcomings with regard to the achievement of sustainability.

Section one and section two of this chapter explain and clarify the concept of sustainable development by outlining the contrasting perspectives of weak and strong sustainability. In focusing on the weak sustainability perspective, the third, fourth and fifth sections highlight shortcomings in sustainability theory and practice, discuss implications of the lacking ambitiousness with regard to sustainability and present the restrictive win-win paradigm of sustainability as a possible reason for the shortcomings. Section six describes sustainability trade-offs as a concept which might help to overcome the win-win paradigm. In the seventh and eighth sections the rationale for the research as well as the intended contribution to theory is stated, and also the research question is presented. The chapter concludes with a summary and an outline of the structure of the dissertation.

1.1 Sustainable development

Academic literature, which addresses "issues of changes to environmental behaviour and attitudes in light of global warming an climate change in particular", is often oriented towards the concept of 'sustainable development' (Härtel & Pearman, 2010, p. 27). In 1987 the Brundtland Commission defined an ultimate goal stating that the "the needs of current generations" should not compromise "the ability of future generations to meet their own

needs" (WCED, 1987, p. 43). As illustrated in Figure 1 sustainable development is a process which is supposed to lead to a favourable, sustainable future state (Brown, Hanson, Liverman & Merideth, 1987). Sustainable development relates to three dimensions, namely economic prosperity, ecological integrity, and social equity (as implied in Elkington's 1997 triple bottom line), which should be achieved simultaneously.

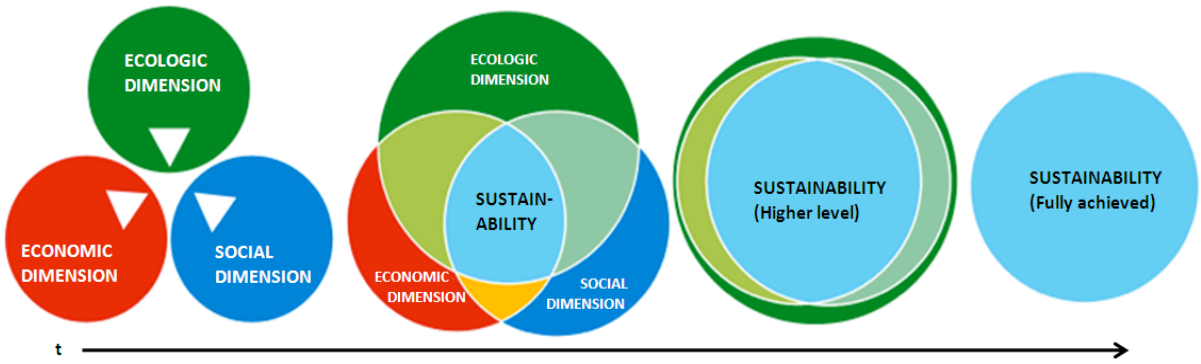

Figure 1: The sustainable development process (drawing on Dodds & Venables, 2005)

1.2 Weak and strong sustainability

The criteria for sustainable development, and also for a sustainable future state, are debatable. Sustainability can be seen from two contrasting perspectives, namely weak and strong sustainability (Turner, 1992; van den Bergh, 2010). The difference between weak and strong sustainability is grounded in the understanding of what extent natural capital (environment and natural resources) can be traded-off against economic (monetary) capital (Hahn et al., 2010).

The goal of the concept of weak sustainability is to maintain total capital as the sum (or aggregation) of natural and economic capital; in other words natural capital can be substituted by economic capital (van den Bergh, 2010). Weak sustainability means, "even if the quantity of natural capital is decreasing, by creating man-made capital, total capital can be maintained, which would be enough to fulfil the criteria of sustainability" (Malovics, Csigene & Kraus, 2008, p. 908). The concept of weak sustainability is grounded in an anthropocentric view, which principally regards the needs of human beings as more valuable than the needs of non-human nature (Grey, 1993).

In contrast, the concept of strong sustainability regards the types of capital separately. Natural capital is critical for human life; it cannot be substituted for, or aggregated, and needs to be maintained as a whole (Malovics et al., 2008). The concept of strong sustainability is grounded in a (deep) ecological view, considering the conservation of non-human nature as an indispensable requirement for maintaining the wellbeing of human beings (Grey, 1993).

According to van den Bergh (2010, p. 3) "a compromise version of strong sustainability focuses on preserving ecosystems and environmental assets that are critical for life-support or unique and irreplaceable". This view of sustainability strikes a balance between the polar positions of weak and strong sustainability and the opposing viewpoints of anthropocentrism and deep ecology. This view can be seen as a way that helps to create a deeper and realistic understanding of sustainability and to support a stronger valuation of natural capital.

1.3 Shortcomings in sustainability theory and practice

Companies today draw "on the discourse of weak sustainability", trading-off natural and economic capital and using the easy pathway to "sustainability" (Laine, 2010, p. 246). Hahn et al. (2010) associate the slow progress in relation to sustainability with the prevailing view of weak sustainability. Orsato (2009) translates the concept of sustainable development into business terms, and explains in a meaningful way how theory embraces the concept of weak sustainability. His definition is: "The ability of companies to satisfy the economic needs of shareholders without compromising nature and the needs of current and future generations" (p. 207). Consequently, through company action, both the economic needs of shareholders and the needs of future generations are presumed to be able to be satisfied while nature is preserved simultaneously. In other words, the needs of future generations are seen to be satisfied under the premise that the economic needs of shareholders are satisfied. The definition of sustainable development thus supports the view that "business profitability is the main concern of managers, even when dealing with environmental and social issues" (Orsato, 2009, p. 207).

1.4 Implications of shortcomings

Regarding sustainability from a weak sustainability perspective might undermine the awareness required for attending to more ambitious and far-reaching environmental demands. Kearins, Collins, and Tregidga (2010, p. 515) criticise "corporate environmental management for not offering any fundamental reassessment of the business-nature relationship, which would be required to achieve ecological sustainability." Arguing for a higher valuation of natural capital, they claim, "the manifestation of nature's importance ... is inescapable - as climate change experts and others concerned about nature and natural resource depletion are increasingly reminding us" (p. 515). Similarly, Homer-Dixon (2006, p.13) criticises the prevailing anthropocentric view by arguing: "We will learn, probably the hard way that nature matters: we are not separate from it, we are dependent on it, and when there is trouble in nature, there is trouble in society." Respectively, Hahn et al. (2010, p. 218) argue companies "do not recognize all potentially positive corporate contributions to sustainable development". According to Hahn et al. (2010) managers generally tend to abandon environmental ideas if there is no obvious economic benefit. While Kearins et al. (2010) urge companies to radically rethink their relationship to nature, Hahn et al. (2010, p. 218) call more pragmatically for a fundamental change in "core business practices".

1.5 Win-win paradigm

According to Hahn et al. (2010) the shortcomings regarding sustainability efforts relate to the "win-win paradigm of sustainability". This win-win paradigm means both the economic and environmental dimensions "win" at the same time. As argued by Hahn et al. (2010), however, the extent of a company's environmental and social commitment is principally restricted by its positive economic value. This restriction means, sustainability initiatives, which are not financially beneficial for a company, are not carried out. In contrast to the limited win-win view, some "proponents of sustainable business practices" argue that "being environmentally responsible will inevitably lead to higher profits in the long-term" (Reinhardt, Stavins & Vietor, 2008, p. 235).

Investigating the relation between profits and sustainability activities, Margolis, Elfenbein, and Walsh (2007) prove that the average affect on sustainability efforts is positive but small and it does not pay-off in all cases. Hence, Margolis et al. (2007, p. 13) point out that a

positive relationship between economic and environmental aspects should "be treated with caution". Orsato (2009, p. 21) goes even further and claims, "only a few actions toward environmental action will generate economic returns or competitive advantages." Reinhardt et al. (2008, p. 232) argue, "instead of altruistically sacrificing profits, companies engage in a more limited, but more profitable, set of socially beneficial activities that contributes to their financial goals." Beyond these initiatives, which promise easily achievable and obvious short-term financial benefits, there are great environmental improvement opportunities but they involve financial risks (Orsato, 2009). Confirming the limited win-win perspective, "evidence of companies actually sacrificing profits in the social interest is lacking ... despite a large and growing literature on sustainability" (Reinhardt et al., 2008, p. 235).

Given that "sustainability issues are ultimately judged through the lens of profit maximisation" (Hahn et al., 2010, p. 219) and sustainability initiatives are often only carried out if they are financially beneficial, it is not surprising that there are some studies finding a strong positive relation between corporate sustainability and financial aspects of a company (Lo & Sheu, 2007; Margolis et al., 2007). The win-win logic thus masks "important potential for positive corporate contributions to sustainable development" (Hahn et al., 2010, p. 218) and "prevents widespread improvements consistent with social welfare" (Haigh & Jones, 2007, p. 19). Hahn et al. (2010, p. 217) argue that besides practice, the "mainstream of the literature on corporate sustainability" also relates to the win-win paradigm.

According to Russo (2010), in future, companies will increasingly operate on a more environmentally sound basis. This scenario does not imply that companies will ignore the win-win paradigm. Rather companies are affected by stronger regulations or a shift of society expectation (Russo, 2010), which is seen to a stronger overlapping between social, environmental and economical dimensions. Russo (2010, p. 135) claims, "over the long haul [there will be] greater opportunities for meeting the three dimensions simultaneously".

1.6 Sustainability-related trade-offs

Extending the ideas of Porter and van der Linde (1995), Hahn et al. (2010) provide an answer to overcome this restricted view on sustainability by proposing a view which focuses on trade-offs in sustainability. According to Byggeth and Hochschorner (2006, p. 1420),

managing trade-offs requires making sacrifices "in one area to obtain benefits in another". In a strong contrast to the win-win view of sustainability, the focus on trade-offs relates to the understanding of situations, which are not simultaneously environmentally and economically beneficial. Hahn et al. (2010, p. 226) claim, "the world is full of trade-offs" between the described dimensions and stress trade-offs to be "the rule rather than the exception … given the complexity and diversity of sustainability issues". Stressing a broader perspective on sustainability, Hahn et al. (2010, p. 217) argue, "turning a blind eye to trade-offs results in a limited perspective on corporate contributions to sustainable development". Overcoming the prevailing practice of companies, which generally involves engaging only in a limited profitable set of social/environmental activities (Reinhardt et al., 2008), requires recognising trade-off situations, and making economic sacrifices towards the environment (Hahn et al., 2010). Similarly, Orsato (2009, p. 207) claims, a realistic view of "what works or pays and what does not in the realms of corporate environmentalism" can help companies "to be more effective and hence become increasingly ambitious with their sustainability strategies".

Hahn et al. (2010) introduce an analytical framework (see Figure 2), addressing four levels of sustainability trade-offs, which are: individual level, organizational level, industry level and societal level; each having a process component (corporate strategies, processes and transformations for sustainable development), a temporal component (trade-offs between present and future aspects in sustainability-related corporate behaviour) and an outcome component (actual effects of corporate activities with regard to sustainable development).

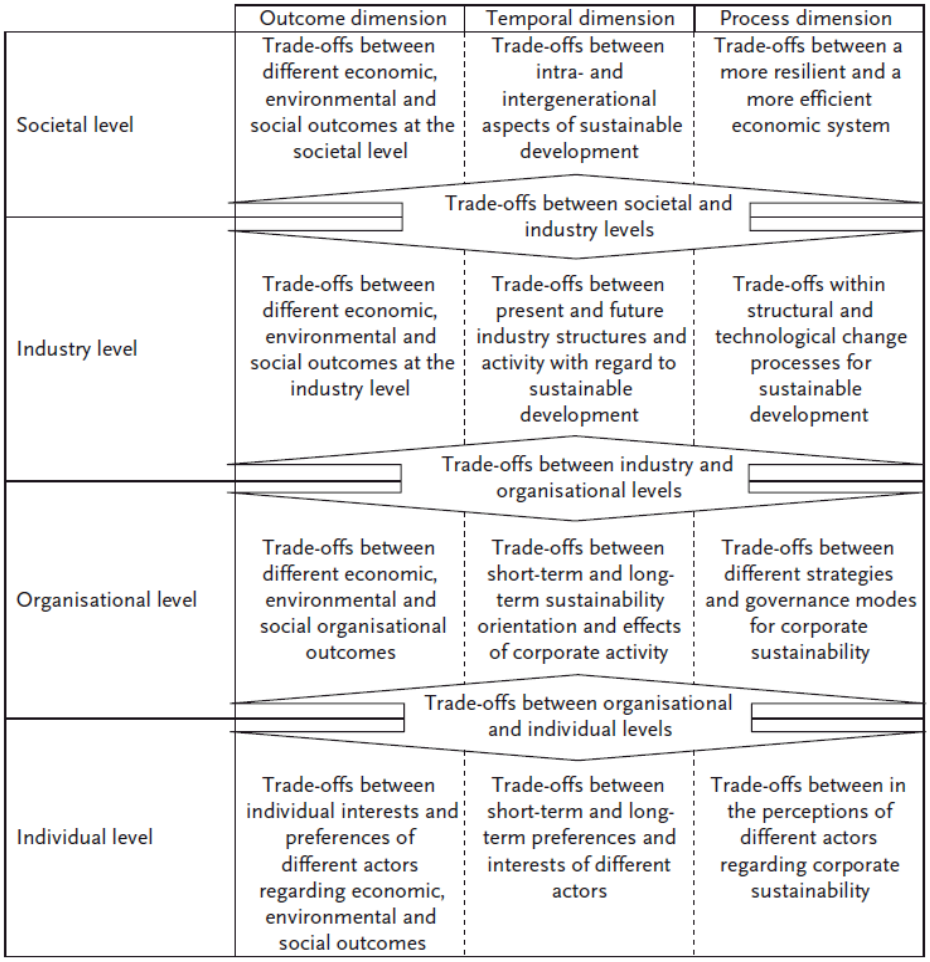

Figure 2: Analytical framework for trade-offs in corporate sustainability (Hahn et al., 2010, p. 223)

1.7 Rationale for the research and intended contribution

Research on trade-offs in sustainability is a new field, and the framework introduced by Hahn et al. (2010) represents an "initial attempt to bring more structure to the analysis of trade-offs in corporate sustainability, and to undertake the task of working out the principles and guidelines for managing trade-offs" (Hahn et al., p. 226). At the same time, Hahn et al. (2010) call for more exploration in this field.

Härtel and Pearman (2010, p. 27) argue that "social science approaches to climate change ... to date have either taken too broad a sweep of the issue, or neglected to engage with it at all" and also stress a research approach, which looks at the specifics of a certain issue. They furthermore stress the need for research, which addresses "institutional ... logic informing

the adaptation and responses to the unpredictable effects of climate change." Similarly, Nilsson and Biel (2008, p. 204) state, "more focus should be devoted to decision makers in the private sector and to what determines their attitudes" towards sustainability initiatives. As highlighted by Margolis and Walsh (2003, p. 284), it would be particularly interesting, to analyse how managers perceive the two competing environmental and economic considerations, as well as to prove "what gives them weight, and [to] explore their relationship". While there are numerous studies providing theoretical frameworks addressing the issue of climate change, only a few studies apply these frameworks specifically to the issue (Härtel & Pearman, 2010).

1.8 Research question

Based on a conflict situation related to a particular sustainability initiative, the overall research question for this dissertation is:

How do operational managers make sense around trade-offs related to sustainability?

In order to investigate the validity of the argument that managers tend to abandon environmental ideas if there is no obvious economic benefit, this dissertation (1) explores how managers valuate environmental aspects as opposed to economic aspects and draws conclusions with regard to the win-win paradigm. In order to contribute to the field of sustainability related trade-offs, this dissertation (2) investigates how managers perceive trade-offs around sustainability in relation to the conceptual trade-off model offered by Hahn et al. (2010). Besides its theoretical contributions, this dissertation provides a practical contribution relating to the particular sustainability initiative.

In addressing the above research question, this dissertation seeks to uncover individual logic regarding responses to climate change by analysing decision-making in (mainly) private companies[1]. The individuals' logic is contextualised within actual companies' decisions and operations. Taken together these constitute a way of thinking and acting that is relatively consistent and might be described as an institutional logic operating in this setting at this time. Thus, the researcher seeks to uncover individual logic and institutional logic. The

[1] *It is acknowledged that Auckland International Airport Limited is partly publicly owned. Also, one airline company, which is also subject to this research, is fully publicly owned.*

dissertation refers to the specifics of a particular sustainability initiative. The researcher furthermore applies the trade-off-framework of Hahn et al. (2010) to the issue of climate change. The dissertation thereby provides exploration in this new field of research, and reflects on the competitive economic and environmental aspects.

1.9 Chapter summary and outline of the dissertation

As shown in this chapter, there are different ways to define the notion of sustainability. Both companies and scholars draw on the concept of weak sustainability, which supports the view that natural capital can be principally substituted by economic capital. Critics state, acting under the premise that natural capital can be used interchangeably with economic capital is not adequate to the task of achieving ecologic sustainability. Rather, the view of weak sustainability justifies managers restricting their companies' environmental and social commitments to achieve positive economic value. This restriction, which is described as the win-win paradigm of sustainability, leads to the fact that a vast number of potentially important corporate contributions to sustainable development are not implemented. Overcoming the win-win paradigm of sustainability means broadening the perspective and recognising, as well as addressing, trade-offs between economic and environmental aspects. The dissertation provides insight into the new field of research around the win-win paradigm logic and investigates how operational managers make sense of sustainability trade-offs.

The dissertation is structured to address the research question as follows. Next, Chapter 2 draws on academic literature on sustainability to address how climate change related effects influence companies and describes ways in which companies respond to these effects. Chapter 3 provides the research context of the aviation industry and discusses the industry response to climate change, drawing on information from both academic literature on aviation and also industry documents, such as reports from companies, industry associations and non-governmental organisations (NGOs). Chapter 4 describes the research approach, data collection method and data analysis method of the dissertation. Chapter 5 presents the empirical data from the research in a thematically structured manner. Informed by the previously reviewed literature, Chapter 6 offers a discussion of the findings and provides answers to the research question. Chapter 7 summarises the key findings of the discussion, highlights the limitations of the research and suggests areas for future research.

Chapter 2 Climate change in the business context

Companies are increasingly faced with environmental challenges. This chapter describes key influences on business decision-making and highlights possible reasons for the underdevelopment of business practices that might lead to sustainability in a broad systems sense. Moreover, this chapter explains approaches companies take in responding to these influences.

2.1 Key influences on business decisions

In spite of the fact that companies have increasingly become aware of the context of climate change, they are not willing to establish fundamental changes, and thus the progress of sustainable development remains slow (Bendick, Dahlin, Smoliak, Kumler, Jones, Aktipis et al., 2010; Wagner and Svensson, 2010; Hahn et al., 2010). In this section, the trade-off between environmental issues and short-term orientation of companies are highlighted first. Second, multiple factors of environmental uncertainty in the context of climate change are described. Third, the concept of social costs is explained. Fourth, the significance of stakeholders in business practice is highlighted. Fifth, the role and effects of governmental regulations with regard to emissions are described. Last, the focus is on how environmental issues can influence the practice of corporate decision-making.

2.1.1 Short-term business orientation

Given that the direct impacts of climate change will affect human kind in the future, but are not obvious today, direct pressure to address climate change is not immediate (Bruce, Yi & Haites, 1996). According to Crane and Matten (2007, p. 512) "sustainability implies goals that lie behind the (short-term oriented) time horizons of business". Here they suggest that both direct and less direct costs caused by environmental degradation, are not so immediate and uncertain and, therefore, mostly neither noticed nor addressed (Dyllick & Hockerts, 2002). According to Held (2001), sustainable development is a long-term process, which is incompatible with short-term business thinking. Similarly, Dyllick and Hock-

erts (2002, p. 132) note: "An obsession with short-term profits is contrary to the spirit of sustainability".

2.1.2 Uncertainty

Arguably, climate change receives a lack of recognition. First, since human senses are not capable of perceiving GHG emissions, people's awareness of the damage caused is relatively low (Antes, 2006). Second, direct damage caused by "local concentrations of GHGs can be ruled out because the sinks of GHGs arise not locally but instead globally in the atmosphere" (Antes, 2006, p. 201). Third, due to the long duration of the process of global warming, it will affect future generations but not people today (Bruce et al., 1996). Fourth, it is not clear how and when the direct impact of global warming will be manifested (Young, 2001).

The above-stated points suggest strong uncertainties with regard to GHG emissions. Uncertainty is commonly defined as "the inability to assign probabilities as to the likelihood of future events" (Milliken, 1987, p. 134). Despite these uncertainties, climate scientists agree that future generations will be seriously affected in the form of regular catastrophic weather events such as drought periods, flooding, and hurricanes at some stage (Easterling, Evans, Groisman, Karl, Kunkel, Ambenje et al., 2000).

2.1.3 Social costs

As noted above, the process of climate change is not foremost in most peoples' minds and companies' agendas. Currently, many managers do not willingly take responsibility for environmental harm their companies might cause, and probably only partially recognise their contribution to climate change. Harmful impacts are described as "social costs of carbon" measured by "each additional tonne of GHG put into the atmosphere" (Hardisty, 2009, p. 209). The emitter sees no need to take responsibility for the caused harm, and "externalises" the social costs. This issue of externalising costs points to the common dilemma, which is often referred to in literature on sustainable development. The common dilemma occurs if "the good of the individual (minimisation of the individual costs and risks)

contradicts the good of the greater (minimisation of the collective costs and risks)" (Härtel & Pearman, 2010, p. 27). This self-interest driven mindset linked to the low recognition of harmful GHG emissions probably slowed the sustainable development process.

2.1.4 Stakeholders

Broadly defined, stakeholders can be "any group or individual who can affect or is affected by the achievement of the organisation's objectives" (Freeman, 1984, p. 46). In its value creating activities, a company is connected to and influenced by a range of different stakeholders through complex networks and interactions. Thus, a company incurring social costs is likely to negatively influence its stakeholders. In turn, stakeholders can influence the company. Stakeholders thus play a critical role in shaping the environment and affecting the directions of companies (Nordberg, 2008).

In addressing stakeholders claims, companies give priority to those stakeholders that are regarded as most important, or that "control resources that are relatively critical" for an organisation's achievement of objectives in a certain field. Stakeholders that "have put climate change on corporate agendas" are governments (see Subsection 2.1.5), which are regarded as the most significant driver for environmental initiatives in the area of GHG emissions (Kolk & Pinkse, 2007, p. 371), NGOs, shareholders and other investors, suppliers, competitors, customers, the public, and under some interpretations, the environment itself (Jensen, 2001; Svensson, Wood & Callaghan, 2010; Buysse & Verbeke, 2003).

2.1.5 Governmental regulations

Governments have tried to diminish the damage caused by emitters by introducing regulations, such as carbon markets, carbon taxes or fuel tariffs (GRI, KPMG, 2007). These regulations impose direct costs on companies. Consequently, even if climate change does not directly affect emitters, it can indirectly affect them in the form of regulatory penalties, by putting a market price on the social costs caused. The stronger companies perceive these pressures, the more they are tempted to initiate sustainable practices. Although there has been an increase in climate change regulations, regulations are "continuously changing ... in various regions/countries and [there is a] lack of global agreement" (Pinkse & Kolk, 2010,

p. 262). According to Hardisty (2009, p. 209), currently, regulatory forces target only certain sectors in certain countries, and represent thus "only a fraction of the true value of the damage".

2.1.6 Impact of environmental issues on corporate decision making

In order to quantify this "true value of the caused damage" as argued by Hardisty (2009), Stern (2006) presents a method that calculates social costs from a macro-economic perspective. He estimates the social costs of carbon at US$ 85/tCO2e. This amount of social costs could reduce the profit per additional emitted tCO2e over time, and would thus have consequences on decision-making involving GHG emissions (Hardisty, 2009). Although Stern's carbon price calculation basis is controversially discussed in literature, it highlights the significance of the social costs caused (Nordhaus, 2007).

Young (2001) argues that managers do not take into account social costs, which no market prices exist for. Instead it is claimed that business decisions are usually based on strict cost benefit analyses. From a business perspective, "whenever benefit exceeds costs" value is created (Figge & Hahn, 2004, p. 176). In the area of sustainability and particularly in reference to GHG emissions, the use of standard cost benefit analysis is limited, or even impossible, since the value or pay off of environmental improvements is difficult to quantify (Young, 2001). Often, projects on energy efficiency, assessed without incorporating costs of carbon, "cannot provide internal rates of return, which meet these hurdle rates and are therefore rejected; ... this trap is seen as one of the biggest barriers in improving sustainability in industry" (Hardisty, 2009, p. 211). Consequently, value in the case of decisions around sustainability, must be understood as a benefit, which "exceeds the total costs, but with considerations of environmental and social sustainability criteria as well" (Tiwari, 2000, p. 271). Young (2001, p. 22) claims, social costs should be "incorporated by the use of environmental valuation techniques wherever possible". Similarly, Kavuncu (2007) argues against the standard practice of cost benefit discounting regarding decisions on sustainability issues.

In light of the uncertainties around the direct and indirect consequences of climate change and its evaluation by parties who can directly influence a company (such as regulators, customers and other stakeholders) (Young, 2001; Milliken, 1987), Hardisty (2009, p. 211)

states that the consideration of alternative energy approaches may become increasingly important; his contention is "that the external damages caused by GHG production will gradually come to be recognised and valued at some point during the life of [a] project". Resulting value could include cost savings, product differentiation, reputation improvement, or recruitment benefits (Renneboog, Ter Horst & Zhang, 2008; Haigh & Jones, 2007).

Several authors dispute the use of standard cost benefit analysis. It is argued, however, that various factors identified lead to risk: long-term sustainability horizons; a lack of recognition and awareness as well as the existence of uncertainty with regard to the effects of climate change; along with varying regulations and changing preferences of customer and other stakeholders. Thus, the risk of incorporating uncertain sustainability criteria can be too high since investments are mostly irreversible (Pindyck, 1991) and can involve significant adjustment costs (Huettel, Musshoff, Odening, 2010). Because of pay-off uncertainties, companies tend to delay their investments, "in order to wait for new information to arrive about prices, costs, and other market conditions before it commits resources" (Pindyck, 1991, p. 1110). Thus, drawing on a weak sustainability perspective, short-term financial solutions are regarded as more efficient and companies often adopt a "wait and see approach" (Nitkin, Medalye & Foster, 2009).

The argument, in summary, is that companies cause social cost (e.g. GHG emissions), which have a negative effect on their stakeholders. If there is a market price on social costs (e.g. imposed by governmental regulations), companies can easily add these costs to their cost benefit calculations. However, such regulations seem to be pre-mature, and address only a small share of the caused social costs. Thus, there is a low direct pressure for companies to reduce their emissions. Several authors suggest incorporating social costs without a market price into corporate decision-making, highlighting the argument that doing so will pay off at some stage in the future. Given the multiple factors of environmental and regulatory uncertainty linked to the short time horizon of business decisions, companies might perceive it as risky to make decisions based on the expectation of abstract long-term benefits. So it is that many companies take the easier route, externalising social costs, and staying within the short-term orientation.

2.2 Business responses to environmental influences

As proposed in Chapter 1, a broadened perspective of sustainability, which considers initiatives that require economic sacrifices towards the environment, could open up a large range of environmental opportunities. Although it seems to look attractive to move towards more environmentally responsible practices, in the strict sense, making economic sacrifices means that companies have to reduce profits. These costs are not merely difficult to justify to shareholders, but rather financial aspects are essential for companies and their survival.

Companies are exposed to competition and have therefore a limited scope for environmental improvements, given the argument that sustainability initiatives do not pay off generally (Margolis et al., 2007), or pay off in only a few cases (Orsato, 2009). According to Reinhardt et al. (2008), costly sustainability initiatives can force companies to raise prices, decrease wages, or accept smaller returns, with consequences such as the decline of stock prices, the difficulty to attract new capital, shrinking market shares, higher insurance costs, and a damaged reputation. They argue, "in the long-term, firms may face shareholder litigation, corporate takeover, or closure" (p. 227).

According to Orsato (2009), it is possible to escape from competitive pressures, which can be achieved by the creation of new markets through sustainability-based innovation. Although the creation of new markets can be seen as a possible solution to the problem, prompt revolutionising innovation strategies across a broad range of industries, which could ultimately trigger a global change in business practice, seems to be very unlikely.

Thus, the focus remains on the limited scope, constrained by the rules of competition. Within that limited scope for environmental improvements, companies pursue different strategies with regard to sustainability. The choice of strategy is based on the perception of risk and uncertainty, and affects the priority of environmental and economic dimensions. Consequently, some companies are somewhat more tempted to make a move towards sustainability than are others.

According to Hoffman (2000, p. 9), an environmental strategy reflects the way companies "view both environmental problems and the role of the corporation in responding to

them". Mintzberg (1989, p. 27) describes a company's environmental strategy as a "pattern in action over time"

Three options for companies responding to climate change are described next. These are: internal and external orientation, defensive, compliant and proactive postures, and the distinction between so-called "mainstream" and "mission-driven" companies (see Table 1).

Author	**Strategic orientation/posture**	**Trade-off**
Weinhofer & Hoffmann, 2010	External orientation Internal orientation	compensation vs. reduction/independence
Kolk & Pinkse, 2007	Defensive posture Compliant posture Proactive posture	Non-Action vs. Action
Russo, 2010	Mainstream posture Mission-driven posture	Strict economic focus vs. environmental/social orientation

Table 1: Strategic choices for companies responding to sustainability issues (researcher's own table)

2.2.1 External and internal orientation

Companies can decrease their GHG emissions in different ways. Weinhofer and Hoffmann (2010, p. 78) describe two ways of companies responding to GHG-related challenges, by referring to an internal and an external orientation.

Internal orientation refers to "activities within a company's own business operations". First, the strategy of emission reduction includes measures that change production processes towards less emission intensive technologies. These technologies, for example, use energy sources, which cause fewer emissions and/or that reduce emissions by working more efficiently (Pinkse & Kolk, 2009). Second, the strategy of carbon independence targets cutting emissions by adapting technologies based on renewable energies. The aim of this strategy is to achieve independence from fossil fuels. Both internal-oriented emission reduction and carbon independence strategy are regarded as important contributors to less

unsustainable business practices, since they decrease emissions in the long run (Weinhofer & Hoffmann, 2010).

External orientation corresponds to all measures that compensate emissions externally, for example buying offset credits. Externally oriented strategies decrease the pressure on companies to "reduce their own emissions" but do not induce "processes of organisational change" (Pinkse & Kolk, 2009, p.100), which would "solve the underlying cause of such pressure" (Weinhofer & Hoffmann, 2010, p. 80). Thus, a compensation strategy decreases emissions in the short term only. In order to place themselves optimally in a complex and uncertain environment, companies combine the afore-mentioned strategies (Weinhofer & Hoffmann, 2010).

2.2.2 Defensive, compliant, and proactive postures

Due to uncertainty in multiple fields, a numerical incorporation of ecological factors in business decisions is difficult. Nevertheless, it has been argued that business decisions in the presence of ecological influences have to be reconsidered, anticipating changes in the business environment that lead to a different competitive situation. In response to changing market conditions induced by climate change, companies maintain different postures, namely defensive, compliant and proactive.

Defensive companies view environmental issues "as an economic externality" and environmentalism as a "restriction on or a deviation from the central corporate activities" (Hoffman, 2000, p. 9). Thus, their effort is minimal, with regard to sustainable initiatives, unless the government or other important stakeholders force them. They typically oppose pressure to respond to climate change, emphasising a lack of scientific evidence for human-induced global warming and costs that would likely be incurred.

Compliant companies "rely on the course set by their national governments" and other actors (Kolk & Pinkse, 2007, p. 370) and prepare to make changes if they become necessary, but they see no need to take the risks involved in being the first to make changes (Kolk & Pinkse, 2004). Furthermore, these companies take a "cautious approach in public" (Kolk & Pinkse, 2004, p. 305).

Proactive companies regard "potential consequences and risks of climate change ... as so serious that a precautionary approach should be taken" (Kolk & Pinkse, 2004, p. 305). They do not only act ecologically when a certain claim materialises, but also in anticipation of "possible future claims" (Kolk & Pinkse, 2007, p. 375), in relation to "future policy, societal or competitive developments" (Kolk & Pinkse, 2007, p. 370). For proactive companies sustainability initiatives do not arise from external market pressures, but rather stem from strategic choice (Sharma, 2000). This posture allows companies to "seek environmental solutions voluntarily at their own pace, in harmony with their evolving organisational structures" (Sharma, 2000, p. 693). Proactivity can open up 'first mover' advantages, such as technological or reputational opportunities and prevent "an overall loss of competitive advantage if proactive environmental management becomes a common practice among its rivals" (Buysse & Verbeke, 2003, p. 459).

Furthermore, a proactive posture has implications on the way managers act in their jobs. Sustainability practices generally require some sort of innovation, which in turn increases the level of risk for a company and its managers (Russo & Fouts, 1997). This means, if managers perceive sustainability initiatives as an opportunity within their jobs, rather than a risk, they are more likely to act proactively (Sharma, 2000, p. 684). Furthermore, if environmental issues are legitimated as a part of a company's corporate identity, and a company's financial performance is oriented towards the long term, "positive emotional associations in managerial interpretations [can be created] and opportunity-seeking behaviour rather than threat aversion [is stimulated]", which makes in turn proactive behaviour more likely (Sharma, 2000, p. 684).

2.2.3 Mainstream companies and mission-driven companies

Drawing on the win-win paradigm of sustainability, Russo (2010) introduces two views of company strategies.

First, mainstream companies operate purely within the win-win paradigm of sustainability. These companies allocate "resources such as money, people, and physical assets, across possible uses in order to realise" the goal of profit maximization (Russo, 2010, p. 183). Mainstream companies' environmental and social investments also serve the purpose of profit or value maximisation. According to Russo (2010, p. 183), "the rule is to continue to

increase the company's performance in these areas so long as the economic return (including reputation, brand and recruiting benefits) from those activities outweighs the possible (risk adjusted) return from other potential uses of those resources."

Second, Russo (2010) describes a strategy, (in practice barely) pursued by for-profit enterprises that seek simultaneously to "meet profit goals and social and environmental goals that reflect the values of [... their] owners". These companies, he calls "mission-driven" companies. According to Russo (2010, p. 5) "values are abstract principles about what is right or proper. In practice, these values are reflected in the goals of mission-driven companies for instance to ... reduce the carbon footprint of their operations". By introducing "the idea of moral imperatives that are not subject to an economic test" mission-driven companies operate in some cases outside of the win-win paradigm of sustainability. Companies undertake these activities to "recognise and celebrate their values and the type of moral imperatives to which they hold themselves" (Russo, 2010, p. 10). Such values are derived from "religious principles, philosophical frameworks or prevailing social norms" (Haigh & Jones, 2007, p.17). As Adam Smith in *The Theory of Moral Sentiments* states, "how selfish soever man may be supposed, there are evidently some principles in his nature, which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it, except the pleasure of seeing" (in: Lo & Sheu, 2007, p. 356). Thus, "some shareholders may gain utility from the knowledge that their profits have been invested in socially responsible projects" (Reinhardt et al., 2008, p. 233).

As stated above, mission-driven companies operate in some cases outside of the win-win paradigm of sustainability. This slice (which the author calls mission zone, illustrated in Figure 3), representing "a class of activities ... that will not yield economic gains but will advance social and environmental welfare is necessarily slender, though, because all companies must meet their minimum economic return to stay viable" (Russo, 2010, p. 183). Russo (2010, p. 183) advocates mission-driven-strategies by arguing, "it is a mistake to see all social and environmental initiatives strictly in financial terms because this strips away their moral content and treats them like some other factor of production."

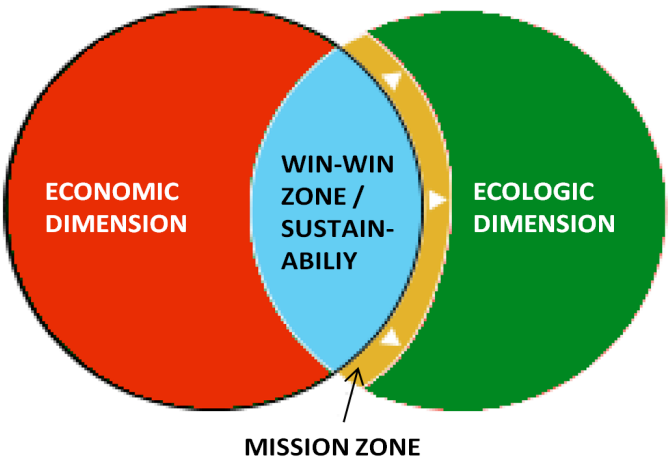

Figure 3: Expansion of the win-win zone of sustainability (drawing on Russo, 2010, p. 10)

Companies clearly have different strategy choices with regard to their sustainability efforts. First, companies can draw on internal and external strategies to reduce their GHG emissions. In a pragmatic sense, internally oriented strategies can be seen as more effective, since they actually decrease emissions in the long run, and solve the underlying emission problem (unless one company can save a greater share of emissions at the smaller expense of another company's emissions). Second, strategic choices can make companies act more or less sustainably than others. Judging potential consequences and risks of climate change as significant, companies can pursue proactive strategies, anticipating potential future claims and thus giving more priority to stakeholders. Third, the concept of mission-driven companies vs. mainstream companies provides insight as to how companies balance economic and environmental aspects. Mission-driven companies pursue social and environmental goals simultaneously with economic goals; this means, not all activities are subject to an economic test. According to their values, business owners may gain satisfaction from the increase of social and environmental welfare.

2.3 Chapter summary

This chapter highlighted that the pressure for companies to reduce their emissions depends at least in part on the extent of regulations imposing a market price on the social costs caused and pushing companies towards less unsustainable business practices. If there is a market price for emissions (for example imposed by regulations), then the reduction of

emissions will obviously constitute an additional economic benefit. In this case the potentially reducible emissions have a clear influence on decision-making.

In order to analyse the willingness of companies to go beyond the win-win zone of sustainability, it is interesting to investigate how companies perceive unquantifiable social costs. Companies could either externalise these social costs, or internalise them to the advantage of uncertain and abstract potential long-term benefits. The degree to which a company might act towards becoming less unsustainable and internalising social costs might depend on its strategic orientation or posture in relation to environmental issues, which in turn is influenced by competitive forces. Companies, which pursue a proactive strategy, perceive more opportunities and risks in relation to the environment and thus, they might be more willing to internalise social costs. Companies, which are "mission-driven", might internalise social costs although their managers are aware that doing so will likely be financially unbeneficial for the company. Companies, which internalise social costs within their internal operations, may be demonstrating willingness to effect long-term changes, rather than an orientation towards doing good short-term deeds.

The literature discussed in this chapter is regarded as relevant for this dissertation, since the empirical research approach (described in Chapter 4) involves business managers, describing climate change related influences on their companies and explaining how they respond to these influences. Since the research relates to a particular sustainability initiative within the aviation industry, both the specifics of the industry and the initiative are regarded as relevant contextual factors of this dissertation and are thus described in the next chapter.

Chapter 3 Research context - Aviation industry and GPU/PCA initiative

In the first section of this chapter, the aviation industry's impact on the environment is reviewed. Second, pressures on the industry are outlined. Third, the significance of emissions trading schemes (ETSs) for the aviation industry is considered. In the fourth section, the role of fuel and emission reductions in response to the pressures is explained. Fifth, the initiative of ground power units and pre-conditioned air investigated in the dissertation is described. The chapter concludes with a summary.

3.1 Impact on the environment

With fossil fuel use as its major production factor, the aviation industry accounts for around two percent of the world's economy's carbon emissions (IATA, 2010). Hence, the sector can be regarded as a major contributor to global warming (Ryerson & Hansen, 2010). The low cost and competitiveness of air travel has increased its popularity. Growth is also now attributed to the rapid growth of developing countries. Both freight transportation and passenger travel are increasing. In recent years, this increase has risen to around five percent each year (McCollum, Gould & Greene, 2009). Due to the growth, the industry will require more fuel, which leads in turn to increasing GHG emissions and respectively an increasing negative impact on world climate.

3.2 Pressures on the industry

In the past ten years, the public has become increasingly aware of this impact. Forced by "lobby group campaigns that have captured the political agenda and are driving policy change", the "aviation sector is today under acute pressure to deliver" large emission reductions and "make a fair contribution to the costs of mitigating climate change" (Lawrence, 2009, p. 89).

Today, an airline's fuel expenditure comes to about 40 percent of operating costs, and is thus "greater than labour costs for many carriers" (Lawrence, 2009, p. 81). Hence, airlines

are highly exposed to oil prices. In recent years, the price of oil has been highly volatile, rising to 150$/b in July 2008 (due to increasing demand, from China in particular) and falling to under 50$/b in November 2008 (due to the beginning of the global recession) (Dray, Evans, Reynolds, Schäfer & Vera-Morales, 2009; Tiwari, 2000). Overall, the price of aviation fuel/kerosene has risen rapidly in recent years and is expected to increase further in future years (Lawrence, 2009; Vespermann & Wald, 2010). Consequently, alongside public pressure, the exposure to oil prices has additionally forced airlines to focus on fuel and emission reductions.

Governments increasingly put pressure on the aviation sector in terms of regulations. In 1997, a majority of the world's countries signed the Kyoto Protocol, committing to reduce and stabilise their GHG emissions "at a level that avoids dangerous anthropogenic interference with the climate system" (UNFCCC, 1990). Countries, which ratified the Kyoto Protocol, committed themselves to a pre-specified level of reduction. In order to achieve this level, governments generally impose similar targets on companies (especially in strongly emitting industries) located in these countries; in other words, "national commitments have trickled down to the private sector" (Kolk & Pinkse, 2007, p. 372). Hence, alongside the above-described pressures, governmental regulations additionally push companies in the aviation industry to focus on fuel and emission reductions.

3.3 Emissions trading schemes

The centrepiece of the Kyoto Protocol is the introduction of the carbon ETS, which have been introduced in some parts of the world. Based on a benchmark of past emissions, governments allocate free permits to companies in emission intensive industries (Morrell, 2009). These free permits represent the standard emission limit for the future and decreases steadily over the years. Each emitted tonne, which exceeds this limit, needs to be purchased. Companies, which do not meet the requirements, have to pay a penalty fee per tonne of GHG emissions (Kiesel & Gruell, 2010).

The European Union Emission Trading Scheme (EU ETS) will include the aviation sector mandatorily in 2012 (Dray et at., 2009; Vespermann & Wald, 2010). Also, New Zealand has launched a mandatory emission-trading scheme (NZ ETS), which affects all domestic flights in 2010 (Morrell, 2009). Australia will launch a similar programme, called the Carbon

Pollution Reduction Scheme (CPRS) in 2011, which will also be mandatory for the aviation sector and affect only domestic flights (Grosso, 2010). While Europe, Australia and New Zealand are the only blocks/countries with mandatory emissions trading schemes, many other countries are expected to develop similar programmes in upcoming years (ACI, 2009).

The impact of ETSs will be relatively low in the early years (Albers, Bühne & Peters, 2009). Air France, for example, calculated additional costs of around one percent of the company's current costs in the first EU ETS year (Vespermann & Wald, 2010). However, seeing as "free allowances are fixed at historic emissions [and] the share of allowances allocated free of charge is constantly decreasing" (Vespermann & Wald, 2010, p. 7), and the industry is estimated to grow strongly at the same time, the schemes are likely to burden the industry with significant costs in future (Lawrence, 2009). Additionally, "an increased auctioning degree of the emissions scheme or a geographical system expansion (e.g. North America, Oceania) may lead to additional costs for airlines" (Vespermann & Wald, 2010, p. 7). In tune with these predictions, managers in energy intensive industries in Europe perceive the EU ETS as "one of the primary factors affecting their long-term investment decisions" (Enkvist, Nauclér & Rosander, 2007, p. 1).

3.4 Emissions reduction and fuel efficiency

With increasing public awareness and a predicted rise in fuel costs, particularly since the introduction of ETSs, pressure will be imposed on companies in the aviation industry to decrease their GHG emissions.

GHG emissions in the aviation industry mainly arise from the combustion of fossil fuels by aircraft engines, but also occur in airport operations, such as apron vehicles, power generation equipment, and ground transportation (Upham, Maughan, Raper & Thomas, 2003).

Technological efficiency improvements with regard to aircraft design and airport operations have contributed to substantial fuel savings in the last 40 years (FAA, 2005). Improvements in aircraft design include more efficient engine designs, greater application of lightweight materials, changes in aerodynamics, and sophisticated engine control systems (McCollum, Gould & Greene, 2009). Airport operational and infrastructural improvements

have affected changes towards the use of electric power and efficient procedures. Low emission airport vehicles and the provision of electricity and air for aircraft parked at the gate are examples for this category. Furthermore, additional runways shorten the flight times and waiting times for aircraft and the use of yield management increases load factors (FAA, 2005; Lawrence, 2009).

Despite the fact that there have been great efficiency improvements in the aviation sector, strong industry growth results in an overall increase in GHG emissions. Furthermore, the efficiency improvement potential is exploited to a large extent, which means, "annual improvements have significantly slowed down over the past two decades" (McCollum, Gould & Greene, 2009, p. 10).

According to IATA (2010), current efficiency improvements are mainly realisable in the area of aircraft ground operations. Similarly, AOA, Sustainable Aviation, and the Clinton Climate Initiative (2010) argue, although ground operation GHG "emissions are small relative to air operations, they are still significant [... and provide] real opportunities to achieve material reductions". It is estimated that "the global savings potential from aircraft ground operations is in the order of 6 million tonnes CO2 annually" (Green Air, 2010). Especially important in this area is the use of electric power and preconditioned air to aircraft at airport gates (in the main generated from renewable energy sources). According to IATA (2010), reduced usage of auxiliary power units (APU) is essential in order to achieve the industry's emission reduction targets.

3.5 Ground power unit and pre-conditioned air initiative

Aircraft parked at airport gates require power to run their electrical systems (AOA et al., 2010). Since the main aircraft engines are down during parking time, power is generated by jet fuel burning APUs. These small turbines, which contribute to five to ten percent of the emissions generated at airports (EEC, 2006), are usually located in the rear fuselage of the aircraft (Green Air, 2010).

In most cases, power generated by APUs can be substituted by the provision of externally generated power from fixed electrical ground power units (GPU) at the aircraft gate. Through an electrical supply cable, plugged into the underside of the aircraft, the aircraft

can draw its "power from the airport's electrical supply" (AOA et al., 2010). However, for technical reasons, GPUs cannot substitute for the APUs with regard to air conditioning and circulation. The restriction of the use of APUs thus makes a further system necessary, which supplies the aircraft with preconditioned air (PCA).

In contrast to inefficient fossil fuel burning APUs, GPUs/PCA derive power from the public power supply system. Power from the public power supply system is generated in an efficient way and is partly generated from renewable energy sources. In New Zealand, where this research is set, for example, renewable sources accounted for 67 percent of the total electricity generation in 2007 (New Zealand Ministry for the Environment, 2010). Thus, GPU/PCA use contributes to significant GHG emission reductions. Besides the environmental benefits of reduced emissions, financial savings are also expected, through the saving of fuel. However, deriving the exact potential for financial saving is complex and dependent on a multitude of factors, such as local operating procedures and financial charging structures (Green Air, 2010; Bishop & Grayling, 2003).

Currently, GPU and PCA facilities are available at 35 percent of the airports in the world. The fact that only approximately 50 percent of these facilities are used indicates that there are some problems involved. It also signals interesting decision-making around the use of GPU/PCA (Hansman, Kar, Marais, Reynolds, Bonnefoy & Azzam, 2010). In order to increase GPU/PCA use, some international airports have recently introduced mandates, which force airlines to use the technology. For example, London's Stansted Airport set a policy that "APU is not to be used unless the stand that the aircraft is parking on is not equipped with GPU or the GPU is unserviceable", given a 99.9 percent availability of GPU/PCA at the airport (BAA, 2003).

Auckland Airport is the setting for this study. It finished its GPU/PCA facilities installations in 2009, without mandating their use. Conflicts around the use of the technology came to light, and consequently, the utilisation rates were not as high as expected.

3.6 Chapter summary

Forthcoming regulatory and increasing public pressure connected to the strong growth of the aviation sector and increasing oil prices are likely to see the companies within the avia-

tion industry incur significant financial burdens. Despite extensive efficiency gains in the past, the industry will increasingly be under strong pressure to achieve further fuel consumption and GHG emission reductions. Although achieving additional fuel and emission reductions have been argued to be difficult, GPU/PCA has been identified as an area that promises further significant reduction opportunities.

Given that only around one third of international airports provide the requisite technology, and these facilities are about 50 percent utilised, international airports obviously hesitate in mandating its use. The researcher thus argues that different opinions and perceptions regarding the benefit of GPU/PCA initiatives exist.

Interestingly, due to conflicts around the GPU/PCA initiative and resulting low utilisation rates, Auckland Airport management have questions around whether there should be a policy mandating the use of GPU/PCA. This study explores airport and airline operational managers' logic around their companies' engagement with and decisions about the use of GPU/PCA at Auckland Airport. Not only does this dissertation seek to provide a theoretical contribution but also a contribution to practice, helping airport and airline managers gain some broader understanding of the underlying problems in the context of the GPU/PCA initiative.

Chapter 4 Research method

4.1 Research approach

Given the focus on individuals' logic, the application of a qualitative approach is regarded most appropriate for this research. In contrast to quantitative research, qualitative research allows the researcher to get close to the interviewees perspective (Denzin & Lincoln, 2000). According to Denzin and Lincoln (1998b, p. 3), "qualitative research addresses things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people brings to them". These authors see qualitative research as necessary to describe "routine and problematic moments and meanings in individuals' lifes" (p. 3). Rather than addressing "what" the outcome of the described sustainability initiative is, this dissertation seeks to find out "how" managers make sense of the issues underlying their companies' decisions about the use of GPU/PCA in what is a currently non-mandated airport context.

For qualitative researchers, detail is found in the precise particulars of people's understandings and interactions. The social world is complex, and each situation, which is analysed needs to be understood and interpreted in a certain context and meaning (Denzin and Lincoln, 1998a). According to Denzin and Lincoln (1994, p. 110-111), "realities are apprehendable in the form of multiple, intangible mental constructions, socially and experientially based, local and specific in nature, and dependent for their form and content on the individual persons or groups holding the constructions. Constructions are not more or less 'true', in an absolute sense, but simply more or less informed and/or sophisticated." Thus, given the focus on individual logic around the particular research context, and the in-depth interaction between the researcher and the interviewees, the dissertation draws on a constructivist model of reality.

Inductive research is common for topics, which do not provide sufficient academic ground, for initial hypotheses that can be tested (Seale, Gobo, Gubrium & Silverman, 2004). Given a lack of knowledge in the studied field, the actual relevance and relationships of the concepts usually become "apparent ... after the data have been collected" (Bryman & Bell, 2007, p. 13). Thus, inductive techniques require research from scratch (Seale et al.,

2004). The field of sustainability trade-off research is young, and very few researchers have linked their research to the "extended view" of sustainability as proposed here. There is little relevant theory available with regard to managerial logic around sustainability that could be ground for testable hypotheses in this context. Although companies' understanding and responses to climate change have some characteristics, which are described in Chapter 2, that information is not used to predict findings, but rather to inform the dissertation and provide background information that helps in understanding and interpreting the empirical findings.

In summary, this dissertation is based on a qualitative research approach, and draws on a constructivist model of reality. The hypotheses in this dissertation are generated inductively.

4.2 Data collection

4.2.1 Interviewee selection

According to Silverman (2005, p. 9), "qualitative researchers are prepared to sacrifice scope for detail" and thus, often qualitative research designs "work with a relatively small number" of interviewees.

A focused view on a certain issue makes the findings stronger, since it provides a more coherent picture within and between interview outcomes. Consequently, instead of conducting a general analysis of managers' logic around sustainability decisions, the aim was to relate the dissertation purposely to a particular sustainability initiative, as noted above.

For companies in emission intensive industries, GHG management can be vital and constitute "significant challenges" (Martin & Rice, 2009). Thus, companies in these industries are of particular interest when it comes to GHG-related research in business and management studies. Consequently, an initiative within the emission-intensive aviation industry (Kivits, Charles & Ryan, 2010) was chosen.

Prior to the study commencing, the sustainability advisor at Auckland International Airport Limited was contacted, to see, if there was any sustainability initiative, he would wish to see investigated. He indicated there were issues to be better understood and, if possible, resolved around the GPU/PCA initiative. He described the airline companies as the main stakeholders with regard to the initiative, since they are the actual users of the GPU/PCA technology (the airport company provides the technology to the airlines). Thus, the interviews involved four operational managers, namely one airport sustainability advisor, who represents the airport company and three fuel efficiency managers who represent three major international airline companies using the facilities at Auckland Airport. Table 6 provides an overview of the interviewee selection criteria used.

Interviewee	**Corporation**	**Emission intensive sector**	**Has a major stake in GPU/PCA**	**Company's relationship to GPU/ PCA**
Sustainability Advisor	Airport	Aviation industry	Yes	User and provider to airlines
Operational manager	Airline 1	Aviation industry	Yes	User
Operational manager	Airline 2	Aviation industry	Yes	User
Operational manager	Airline 3	Aviation industry	Yes	User

Table 2: Interviewee selection criteria (researcher's own table)

The chosen interviewees are experts within their companies in the area of the GPU/PCA initiative and, therefore, key decision makers or key influencers on top management decisions. Thus, these individuals' statements and logic are regarded as a fair representation of the respective company rationales and logic for action/inaction.

The general coherence between the three airline managers' arguments and the airport managers' argument, as evident in the data, would suggest their statements were a fairly truthful representation of the situation.

4.2.2 Interview characteristics

According to Denzin and Lincoln (1998b, p. 36), "the interview is the favourite methodological tool of the qualitative researcher". Especially for a study of managerial logic, the

interview is a useful approach to begin to understand managers' particular rationale, as well as the companies' current stance on the GPU/PCA initiative.

Two of the four in-depth interviews were conducted on a face-to-face basis. The other two interviews were conducted over the telephone, due to the relevant managers being located off-shore. The interviews were unstructured, with mainly open-ended questions. The duration of each face-to face interview was approximately one hour. The telephone interviews durations were limited to a maximum of 45 minutes, since it is more difficult for the telephone-interviewees to maintain concentration over a longer period of time than on a face to face basis. Each interview was electronically recorded.

The goal of any interview is, to "enable the interviewee to give the relevant information in as accurate and complete a manner as possible" (May, 2002, p. 226). According to Seale et al. (2004, p. 15) the face-to face interview enables "a 'special insight' into subjectivity, voice and lived experience" of the interviewees.

Instead of strictly delimiting the conversation to a predetermined agenda (Seale et al., 2004), the use of an unstructured questioning design gives the interviewer the flexibility to adjust to unanticipated developments and allows to assess the emotional dimensions in a sufficient way (Denzin and Lincoln, 1998b). Neuman (1997, p. 241) argues that important information "may be lost when an individual's belief and feelings are forced into a few fixed categories that a researcher created".

Given the complexity of the studied topic, open-ended questions are regarded as most appropriate. According to Neuman (1997, p. 241), open-ended questions "provide creativity, self-expression, and richness of detail", "permit an unlimited number of possible answers", and "reveal a respondent's logic, thinking process, and frame of references".

The interview duration was limited to a maximum of one hour, since an overload of information leads to the analyst "missing important information, overweighting some findings [and] skewing the analysis" (Denzin and Lincoln, 1998b, p. 198).

Angus-Leppan, Benn & Young (2010) justify the electronic recording of the interviews, by highlighting the opportunity of the exact use of direct quotes and the advantageousness for the researcher to concentrate on questioning and listening.

4.3 Data analysis

The data collected from the interviews were transcribed and analysed after the data gathering. Within the analysis process, data was analysed from an overall perspective, coded, classified into themes, with a view to a hypothesis or a model being generated (Boyatzis, 1998; Sarantakos, 2005). The method of thematic analysis was chosen, due to its theoretical freedom, which means it is easily adaptable to many kinds of data and "can be applied in almost all circumstances" (Mays, Pope & Popay, 2005, p. 7). It is easy to learn and to conduct – this makes it attractive for people relatively inexperienced in qualitative research. By summarising key features, the method can handle a large body of information, as is generated by in-depth interviews (Braun & Clark, 2006).

The thematic analysis of the data was conducted inductively with identified themes based on the provided data.

The analysis process was based on six phases, described by Braun and Clark (2006). These are (1), "familiarising yourself with the data", (2) "generating initial codes", (3) "searching for themes", (4) "reviewing themes", (5) "defining and naming themes", (6) "writing down the findings". Given that the model presented by Braun and Clark (2006) represents a guideline for thematic analyses, it is necessary to clarify that the phases cannot be regarded as entirely separable. As Higginbotham, Albrecht, and Connor (2001, p. 247) mention, the analysis is an "iterative process" involving reading, writing, coding and theorising that "takes place simultaneously". The actual process used, which generally follows the Braun and Clark (2006) guidelines above, is described in detail next.

To ensure familiarity with the data (phase 1), the researcher himself conducted the interviews, transcribed the recorded data and isolated distinctive thoughts into small paragraphs using a spreadsheet technique. Consequently, the researcher had insights into the topic from the outset. Starting the actual analysis, the researcher read the whole data set actively and repeatedly, and made notes with regard to potential codes.

To generate initial codes (phase 2), the researcher began "working systematically through the entire data set" (Braun & Clark, 2006, p. 89) and examining each thought thoroughly. Features (e.g. keywords) were identified that were similar to other data or/and appeared interesting with regard to the research question. Drawing on these features, the researcher

started generating initial codes, such as "temperature" or "health and safety". Some thoughts were given two different codes indicating links between the codes. At the end of this phase a long list of different codes was available to the researcher. Despite the fact that the first initial codes were rather detailed and variable in nature, some common themes became apparent. As suggested by Boyatzis (1998), the researcher made sure that all codes were meaningful with regard to the research question.

In searching for themes (phase 3), the researcher tried to create a clearer picture by merging themes. By looking for common patterns across the codes, the researcher found, for example, that "health and safety risks" mostly relates to "ground handling". Consequently, "health and safety risks" were grouped under the code "ground handling issues". Also, part of this phase was to identify potential themes by connecting the codes (Crabtree & Miller, 1999). For example, both the code "ground handling issues" and the code GPU/PCA related to operational problems. Consequently, the researcher created the theme "operational problems". Using different colours within the spreadsheets for each potential theme increased clarity further.

In reviewing, defining and naming themes (phases 4 and 5 combined), the researcher read each data fragment again, and to see if it proved to match with the theme. Also, the researcher made sure not to miss out any information, which referred to a different theme. At the end of these two phases, five main themes, and sixteen distinctive codes were identified (see Figure 4).

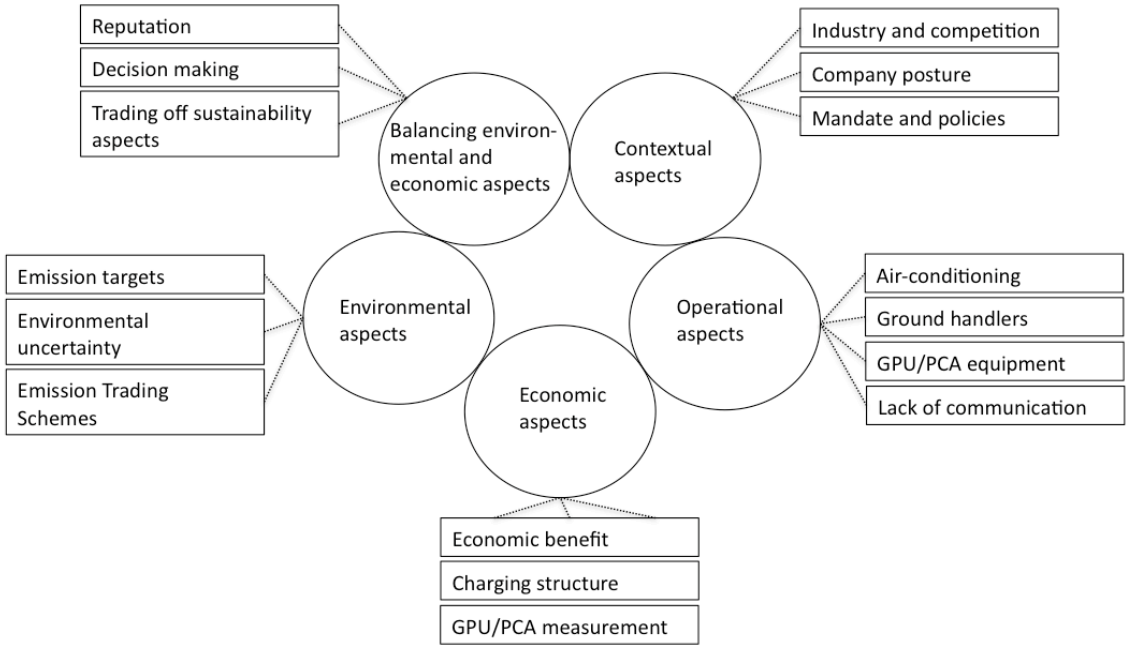

Figure 4: Identified themes and codes (researcher's own figure)

Writing down the findings (phase 6) takes place in the next chapter. There, the themes are presented and the findings derived from the thematic analysis are described. Following the suggestions by Braun and Clark (2006), the researcher attempted to provide a coherent and overall (narrative) story about the data that helps to answer the research question, instead of solely describing the themes. According to Braun and Clark (2006, p. 92) it is important to identify "the 'essence' of what each theme is about", and this is what the researcher attempted to do. In Chapter 6 the findings are discussed and hypotheses are generated.

Chapter 5 Findings

In this chapter the collected and analysed empirical data are presented. First, the theme "contextual aspects" offers background on the actual initiative and company decision-making. "Operational aspects", the second theme came to the fore as critical factor with regard to the GPU/PCA initiative. The third theme is how the managers make sense of economic aspects relating to the initiative. The fourth theme focuses on the managers' understandings and evaluation of environmental factors. The fifth theme highlights, how the managers set criteria (and how they see their company set criteria) for balancing environmental and economic aspects, in relation to the GPU/PCA initiative, and also more widely in relation to their general business practice. The chapter concludes with an overall summary of the findings.

5.1 Contextual aspects

In order to capture all aspects of the GPU/PCA initiative, broader contextual factors appeared to be important. Thus, this theme first describes the interviewed managers' perception of the aviation industry and competitive aspects. Second, it is explained how the managers perceive their own companies' orientation/posture with regard to competition and the environment. Then it is highlighted how managers understand the context of an airport mandate and airline policies with regard to GPU/PCA.

5.1.1 Industry and competition

One airline operations manager's perception is that the aviation sector has long been under pressure. Stressing the sector as a "small contributor to the overall emissions," he states that the sector is an obvious emitter, which is "easily regulated" and thus is an "easy target" (AM2). He argues, this trend of getting "beaten up" historically began with issues concerning aircraft noise, followed by nitric oxides, and now GHG emissions (through mechanisms like ETSs). He claims that the aviation sector is treated unfairly, highlighting that "only ten percent of the airport-related nitric oxides come from the aircraft, and 90 percent come from the service vehicles and from the cars coming to and from the airport". He

argues that compared with the aviation industry, other sectors "seem to get away with everything". Besides potentially unfair demands on the aviation sector, one airline operations manager highlight strongly varying kerosene prices as a key reason for difficult financial conditions.

From the perception of one airline operations manager, "generally airlines are constrained by their budgets; the margins are so small now and the money we are making is hardly anything on what we actually have to spend; competition makes it hard and lots of airlines have even failed" (AM2). Another airline operations manager argues, "we are still running a business and we need to bear in mind that despite the fact that we actually moved towards being a greener airline, we still have to be profitable; otherwise we would not be in business next year. You can actually keep your eyes closed and sort out the environment problem, but there will not be an airline soon" (AM3). One airline operations manager explains, since the airlines "have to have a profit" they have "put a lot of time and effort into fuel saving initiatives" (AM2). Additionally he argues that strong public awareness forces the need for "looking more efficient" than the competitors, and the need to "differentiate ourselves". Moreover, from his perspective, the difficult circumstances constitute a trigger for the aviation industry to be "highly competitive" and to be "world leaders in a lot of things". From another airline operations managers' viewpoint, competitiveness led aviation to be "one of the first industries to set up industry wide targets for the reduction of carbon emissions" (AM3).

5.1.2 Company posture

All interviewees regard their companies as proactive in terms of the environment. The airport sustainability advisor claims, "it is unique for an NZX50 company and for a company in the aviation sector to have such a comprehensive sustainability orientation". "With Auckland Airport being the first New Zealand airport to actually have GPUs/PCA", he highlights the company's environmental leadership position in New Zealand. One airline manager argues, his company won "an award for sustainability", and he regards his company as "good in terms of sustainability" (AM1). Another even regards his company as one of the best sustainability-performing airline in the world, which is reflected by strong top management support. Also, a third describes his company as proactive: "We do a lot of

proactive work. For example, we are the first international carrier to get our fuel burn emission IT system approved by Europe" (AM3).

5.1.3 Mandate and policies

One airline operations manager highlights that some airports across the world with GPUs in place, have introduced mandates, which force the airline companies to use the facilities. From the airport sustainability advisor's viewpoint, Auckland Airport "took a slightly more pragmatic approach; rather than having it mandatory, we would obviously communicate to the airlines that it is available now at our airport, so it is there for your use". He states, his company made this decision because it "did not want to come across that kind of thing, being an airport company doing mandates". From his viewpoint, the airport company focused on maintaining "good working relationships with particular airlines" instead of exercising enforcements.

The airport sustainability advisor highlights that around 2006/2007, when initial decisions around the initiative were made, "fuel prices were much higher than now, which was impacting the operating costs and a lot of airlines that already had fuel conservation policies in place, were reviewing those and actually looking for ways to achieve more fuel savings". Consequently, from his perception the airport company clearly expected the airlines "to actually take advantage of the technology", given the opportunity for considerable fuel savings.

However, the airport sustainability advisor noted that it has turned out that the GPUs have not been fully utilised: "The fact was, the utilisation rates were low or lower than expected; [the strongest GPU-using airlines] have utilisation rates of 80 percent" and other airlines utilise them to a much lower extent. At the same time he admits: "It was hard to say why."

The underutilisation made Auckland Airport management review its approach in terms of reconsidering the introduction of a mandate for the use of GPUs. From the airport management perspective, not knowing what the actual reason for the underutilisation was, a mandate on the use of GPUs might result in potential conflicts and could put relationships at risk. The airport sustainability advisor maintains, "we could mandate that GPUs are

used, but there would have to be an agreement with the airlines, and they must say yes, we would live with that mandate".

Besides the importance of maintaining working relationship with the airlines, there are other aspects, which discourage the airport company from the introduction of a mandate. For example, reasons that affect the use of GPUs (see in depth in Section 5.2) are the co-operation, availability and ability of ground handling agents, and also the cooperation of the aircrew, along with wind and temperature conditions, aircraft type characteristics, poor equipment, and health and safety risks. A mandate on GPU/PCA use would require the airport to address any problems, and from the perception of the airport sustainability advisor, "it is not simple to deal with all of these things; a mandate would have to include some nuances … and it is difficult to get people to change".

Furthermore, as described later in Section 5.3, the benefits with regard to a stronger utilisation for the airport company are low. The pressure to introduce a mandate can be regarded as comparably weak. In line with these conclusions, the airport sustainability advisor states: "Do we have a significant driver to mandate it at the moment? - Probably not."

At the same time the airport sustainability advisor puts the relevance of an airport mandate into perspective: "If the airlines had a mandate to their ground handling agents, whenever aircraft come onto the gate, they would have to be available, and then we would not need to have a mandate ourselves. The mandates from the airlines apply to the pilots, who are in charge of the aircraft. If we mandated it, the mandate would be to the airlines, and they would have the problem with getting their ground handling agents to meet their responsibilities".

As the interviews revealed, certain airlines have mandates around fuel conservation and GPU/PCA use. One airline operations manager states, his company has an internal policy saying "we should use GP whenever it is available" (AM1). Another one argues, "we will use it wherever we are, if we can" (AM2). At the moment, he is "going through, facing, and reinforcing old procedures, to make sure that everything is up to date. Within the updated and new procedures there will be a policy, saying that if electrical power and preconditioned air is available on the airbridge, then it should be used."

Despite the fact that some airlines have their own GPU/PCA policies, all interviewed airline operations managers strongly support the introduction of an airport mandate. The perception on the part of the airline operations managers is that an airport mandate has a high relevance, since it has the power to effect changes. One airline operation manager states that standard procedures "make life simpler ... are both less confusing and hazardous" for all involved parties (AM2). Another one argues, "if the use of GPU is mandated, then there will be no argument or discussion about whether we use GPU or APU ...; it forces the ground handlers and it forces the airlines and the airport into introducing procedures to shut the APU down." "Gatwick, Heathrow and Zürich have mandates, and it works well; people understand, and actually it makes my life easy" (AM3). The remaining airline operations manager calls for a mandate: "If Auckland Airport said 'you must use it', then it would be fantastic, because then there would be no digression by our guys to do it or not to do it. They just have to do it. Also, [with regard to the ground handlers, who often do not comply with the airline policies] we could start shaking the contract at that company, and say: 'Hey you are meant to plug in the ground power'" (AM1).

5.1.4 Theme summary

To summarize the contextual aspects reported above, the interviewed managers perceive the aviation industry as strongly pressurised, highly competitive and low-margin which forces the companies to exercise extensive efforts in regards to cost savings and to put a strong focus on corporate reputation. In light of this pressure the interviewed managers understand their companies as proactive with regard to sustainability. The GPU/PCA initiative provides both cost savings and emission reductions and contributes therefore to an overall beneficial situation. Because of a concern for good working relationships with the airline companies, the airport company did not put a mandate on the use of the technology. The airlines effectively wanted to fully utilise it, but they could not due to mainly operational reasons. Consequently, all three airline operational managers would welcome an airport mandate, since – in contrast to airline policies - an airport mandate was perceived as powerful enough to effect positive changes in operational procedures.

5.2 Operational aspects

Operational problems were identified as a major reason for the underutilisation of GPU/PCA. This section first explains how air-conditioning affects the use of the technology. Second, it is described how poor ground handling procedures contribute to low plug-in rates. Third, the interviewees indicate that lack of equipment is a constraint with regard to the use of GPU/PCA. The fourth part highlights one manager's perception of a lack of communication between the involved parties with regard to operational procedures.

5.2.1 Air-conditioning

One airline manager reports operational problems with regard to the provision of preconditioned air: "The preconditioned air [which is provided by large flexible pipes] often is not as good as using the APUs" (AM1). Another confirms, "the PCA cannot always cope with cooling down the aircraft, so that is one concern we have" (AM2). A third reports "passenger complaints", and the reception of "abusive phone calls from cleaners [just after introducing the initiative], because it was too hot" in the aircraft (AM3).

Air-conditioning problems especially occur at airports located in countries with extreme temperatures. One airline operations manager states, "if it is hot outside, we cannot turn off the APU since the aircraft cabin gets too hot" (AM1). In light of the airport location aspect, all three airline operations managers agree that the relevance of air-conditioning issues is minor, since temperatures in Auckland are moderate.

In spite of the lower relevance of air-conditioning issues at Auckland Airport, problems can occur. One airline operations manager stresses technical problems with the GPU/PCA equipment as a reason for high temperatures in the aircraft cabin: "Even moderate winds make the docks move around on the ground, and then the flexible PCA pipes kink, and you do not get the required amount of preconditioned air in the cabin" (AM2).

According to this airline operations manager, temperature issues especially occur, in the event of "a flight being swapped to a later departure time" implying that "the aircraft has to be taken off the gate" since the gate needs to be available for other aircraft (AM2). He explains, "the aircraft could be waiting there for hours and it could be really hot and sunny".

Another airline operational manager states: Offside there is no PCA available, and thus depending on the outside conditions, "the aircraft cabin can be 50 to 60 degrees inside; the PCA really struggles to bring down a hot cabin, so that might be an issue" (AM1).

From the perception of one airline operations manager (AM2), technical reasons also contribute to high temperatures. He states:

> The in-flight entertainment systems heats up the interior. In our 747s we installed 350 monitors and displays and especially this aircraft-type was just not designed for it. If you leave it on for a long period of time, it will get hot. The problem is you cannot switch it off, since it takes quite a while to reboot, and the last thing you want is that thing to fail, just prior to push back. If there are temperatures around 25 or 28 degrees, and you cannot control it anymore, the perception is that the air-conditioning of the airbridge is not as efficient in cooling the cabin down as the APUs.

One airline leaves it up to its aircrew to switch the APU on "if a certain temperature is not acceptable" (AM2). However, given the above-described problems, the airline operations managers argue, "the pilots would generally rather use [the more effective] APUs" (AM1); if people have the choice, they "take that choice and say, hmm, it is a bit warm, we will leave that on" (AM2).

Thus, one airline introduced an internal policy saying, "if the airplane cabin is less than 21 degrees, then we turn off our APU; if it is more than 21 degrees, then we operate the APU only for the air-conditioning" (AM1). Similar to this airline policy approach, one airline operations manager claims: "There must be exceptions with regard to an airport mandate, because [in the event of a hot aircraft cabin] we obviously need to be able to run the APU".

5.2.2 Ground handling

According to the airport sustainability advisor, at the airport gate there is always "a certain number of people assigned to ground handling operations" employed by a third party company. These ground handling agents are supposed to plug in the ground power and the preconditioned air to the aircraft waiting at the gate. From the airport sustainability advisor's viewpoint, the ground handling agents "have very strict responsibilities … so they know what they should do when the aircraft arrives".

However, the airline operations managers' perceptions are that aircraft sometimes cannot use GPU/PCA due to poor ground handling procedures. One airline manager states, "the ground handlers do what they are told really, well, at least we like them to" (AM2). Another argues more directly: "But obviously at this airport ... they are not doing it as often as they should" despite the existence of an airline policy to plug in GP and PCA (AM1). He explains "we have complained about that issue a few times; they then do it for a week or so, and then they drop off again." All airline operational managers agree that a mandate would improve the procedures, since it would force the ground handling agents to plug in GP/PCA.

All those interviewed agree that one major reason for the problems of plugging in the GP/PCA is the availability of sufficient labour. From the airport sustainability advisor's viewpoint, sometimes GP/PCA cannot be plugged in since "there is a delay in terms of ground handling agents getting to the gate". Similarly, one airline operations manager claims: "we do not always have enough ground handlers; they are not available because they are running around at other places and if there is nobody there, they cannot do it" (AM2). He furthermore claims, "you have to have plenty of people out there, you cannot just have a little girl out there; we have to make sure we do have sufficient manpower there to do it". In light of ground handling problems, the airport sustainability advisor confirms: "Maybe we need an increase in manpower; that is what we need to look at".

The perception on the part of the airline operations managers is that contractual matters are a potential reason for the underutilisation of GPU/PCA. One airline operations manager states: "These are contractual matters we should get the ground handlers to take care of. The manpower has been quantified in the contract based on the old tasks. Now we say 'we need to do this extra bit'. The ground handling agents would then say 'look we only have one person for one hour. He or she cannot do that on her own'. There will be one person for one hour, to do something, because it is all charged of course" (AM2). As highlighted by another airline operations manager, without adapting the contracts to the new requirements, "there is an obvious resistance in terms of change in working practice" (AM3).

Also, as raised by the airport sustainability advisor, the process of plugging in PCA, which is delivered through "quite large flexible pipes that have to be attached to the aircraft" re-

quires some physical effort, which might be too big for a single person. Similarly, one airline operations manager stresses that "large and wide aircraft require two people" to connect the GP/PCA (AM2).

Moreover, from the perspective of the airport sustainability advisor, if an aircraft "is early or late, turnaround times might overlap, then the aircraft may actually be assigned a different gate. He explains, in these unplanned situations "the ground handling agents might not be informed well in advance and thus do not wait for the aircraft to arrive".

Also, as considered by the airport sustainability advisor, the manual attachment process of the large preconditioned air pipes to the aircraft can result in health and safety risks for the ground handling agents if "strong winds are blowing". These risks could trigger some general resistance towards plugging in PCA. The airport sustainability advisor perceived these health and safety risks as a "restriction on our ability to introduce a mandate"

Furthermore, from the airline operations managers' viewpoint, some ground handling agents have a lack of knowledge about policies and standard procedures. One claims, "people might not understand the importance of what we are asking, and thus we do not get compliance with the procedures we want" (AM3). A second one argues, "they are not clear in their mind about what they should be doing", given a lack of training (AM2). Similarly, a third one proposes the ground handlers should "get some training" (AM1). The airport sustainability advisor confirms: "Physically attaching the aircraft to the GPU and PCA obviously does require training" All interviewees, however, agree that the ground handlers do in fact receive training.

Poor interaction with the aircrew in terms of turning off the engines and plugging in the GP/PCA is raised as a further possible reason for the shortcomings.

The perception on the part of the airline operations managers is that a lack of operational control reduces the ability to improve procedures. One airline operations manager claims that plugging in GP/PCA is "certainly an issue on foreign stations" particularly, since there are various kinds of companies assigned for ground handling (AM2). He explains, since contact with these foreign companies is not very close and the operational control is low, "they may or not follow what we tell them". Another claims that the contracts do not always specify the operating procedures, which means "sometimes they need to make chan-

ges and it is quite difficult to manage this in foreign airports" (AM3). A third argues, "it is more of a discursive issue to use certain companies' ground staff in a foreign country" (AM1).

All in all, as argued by one airline operations manager, there are "a lot of issues with regard to human factors ... which make people start to go back to their own ways, and have excuses for not doing things" (AM2).

5.2.3 GPU/PCA equipment

One airline operations manager argues that GPU/PCA is not a standard piece of equipment, there are lots of different systems, and the "equipment that the airport company selected" revealed some problems over the years (AM2). He acknowledges, "it is not an area that we are necessarily an expert in and we have supposedly learned something."

The first problem he raises concerns the time intensive plug-in process: "At present times, if the aircraft taxis to the gate, the airbridge moves up to the door of the aircraft and only after it stops do the ground handlers drag the cables around, and plug them it into the aircraft." Since different aircraft types come in, the ground handling agents need to keep some room between the airbridge and the aircraft, and thus it takes time to reach the aircraft. The whole process takes "at most probably 10 to 15 minutes, which is too long." He claims, "the aircraft are not supposed to run their main engines for long at the gate, thus they switch on the APUs to supply the aircraft with power; and this additional APU cycle is a cost!" In his perception, for domestic operating aircraft, "with short turnaround times, say 45 minutes, it is then not really worth the effort to switch off the APUs, given that the APU has to be started 20 minutes prior to the aircraft departure". The airport sustainability advisor confirms this time-lag problem, stating that some aircraft are just not "here long enough to benefit from it".

A second problem raised by an airline operations manager is the constant clicking over between ground power and APUs, especially for aircraft with shorter turnaround times. The pilot needs some time, "managing his computers, loading the route, doing all those sorts of things, so you have a higher risk of the data to be interrupted or lost if you have a power switching" (AM2).

A third problem, one airline operations manager states is that the equipment requires an "additional cycle on the APU", which leads to a stronger mechanical load (AM1). Switching them on and off makes them become unreliable, and consequently they have to be changed more often.

A lack of reliability is identified as a fourth problem. One airline operations manager sees problems in terms of "reliability and how the technology was working daily" (AM2). In order to reach the plug, the cables must be stretched and thus they tend to break. Another one stresses: "the equipment must be totally reliable; if the GPU fails, then there are issues around the electronic systems; the computers in the aircraft shut down, and you need to start all over again, so the equipment needs to be robust and reliable" (AM3).

One airline operations manager came up with a solution for some of the above problems. He hopes the airport company will agree on a new technology, allowing access to GP and PCA straight from the ground, rather than dragging cables along the airbridge. This would allow plugging in the cable "literally within a minute after the aircraft stopped and would thus not require an additional APU cycle" (AM2). Furthermore, he argues, the new technology would "protect the ground handlers" since it involves less physical effort on their part. It appears that the airport company has according to the airport sustainability advisor plans to get new technology, which will reduce the manual element of plugging in PCA.

5.2.4 Lack of communication

From the perception of the airport sustainability advisor, a general lack of communication leads to problems around the utilisation of the GPU/PCA. He states:

> There was a desire to utilise GPU/PCA, but alongside that there should have been some kind of communication, policy or procedure with the airlines to engage and keep engaged with it; a kind of an open dialogue was not established as part of the installation and operation, which the airlines had agreed to. It is an opportunity that has been missed; ... I think we could have a better utilisation if we had that process in place, definitely. This especially applies to the airline ground handler relationship. Maybe, that is where the problem lies and we can do something to assist both or all parties.

5.2.5 Theme summary

The above described findings in relation to the operational aspects theme come together as follows. Since the airlines derive a major economic benefit from using GPU/PCA, the airlines principally want the ground handling agents to plug in ground power. The process of plugging in GPU/PCA, however, does not always happen for reasons such as ground handling-related contracts, which were not adapted, poor judgement, lack of training, communication and health and safety risks. Also, technical problems with the GPU/PCA equipment contribute to low utilisation rates. The plug-in process requires too much time, making it uneconomical for aircraft with short turnaround times, which necessitates an additional APU cycle. The additional APU cycle in turn brings along a range of further problems, such as the interruption of processes, the loss of data and a stronger mechanical load. Moreover, the fact that electric cables tend to break increases the likelihood of power supply interruptions and consequent computer system shutdowns. Lastly, issues around air-conditioning might be a reason for the underutilisation of the technology. Although the temperatures in Auckland are moderate, aircraft cabin air conditioning issues can occur in some cases. In cases of temperatures being too high in the aircraft cabin, the more effective APU has to be used in order to sustain or produce a certain temperature. The airport sustainability advisor did not previously recognise all of the listed operational problems as important issues. Thus, a lack of communication between the airport company and the airlines on this matter is identified. Communication around operational procedures could have created clarity for the airport company about the existing problems and the airlines' perceived importance of GPU/PCA use. Further informing the situation, communication would have revealed the importance and impact of GPU/PCA as well as the airlines' desire for an airport mandate.

5.3 Economic aspects

In most cases financial aspects are the main driver for companies and thus play a significant role around the GPU/PCA initiative. First, this section describes the nature of benefits both the airline operations managers and the airport sustainability advisor expect. Reflecting the allocation of financial benefits, the second part shows how the managers perceive the investment-costs and linked to those, the GPU/PCA charging structure. The third part of this section highlights how the interviewees understand and measure financial and to a lesser extent environmental aspects of the initiative.

5.3.1 Nature and allocation of economic benefits

The perception on the part of the airline operations managers is that using GPU/PCA at Auckland Airport clearly generates financial benefits. One states, in most airports the use of GPUs/PCA is "only around 20 percent of the operating costs of the APU", and across the whole network "we believe in total we could save ten million dollars" by utilising the technology (AM1). Another one argues, "it cost us a lot of money to use the APUs, it is definitely a lot better since we have that project" in place (AM2). According to a third one, the International Air Transport Association (IATA) have identified the APUs as an area, within "one of the of the biggest savings", which airlines can achieve today; "if we reduce our fuel burn, that goes straight to the financial bottom line of the company as lowered cost; it is free money" (AM3).

All airline operations managers furthermore see clear maintenance, cost saving and life span expansion opportunities. One states, "you spend less on APU maintenance" (AM1). Another one states that there are savings "in terms of servicing the APU" (AM3). A third one explains: "Say you have to service the APU every 1 000 hours; if you use them less, then it takes you two years rather than one year before you have to service it" (AM2). One airline operations manager notes, "of course if we are not running the APUs for so long, we would hope that they are going to last longer" (AM2). Although, as highlighted by two airline operations managers, the additional load of switching APUs on and off makes them become unreliable. Although, for technical reasons, an additional APU cycle is required in

Auckland (see Section 5.2.3), it is concluded that it is still much more efficient to keep switching APUs on and off and use GPU/PCA at the airport gates.

Given major financial benefits to the airlines, it is not surprising that the installation of the technology was initiated by the airline companies, more precisely, the Board of Airline Representatives of New Zealand (BARNZ), an incorporated society representing all international carriers and most domestic airlines in New Zealand.

The airport company profits from the GPU/PCA initiative in a different way than the airline companies. From the perspective of the airport sustainability advisor, "one of the key motivations was the idea of assisting the airlines in terms of reducing their climate change impacts by giving them the opportunity to use GPU and PCA; that was more the motivation than potential cost recovery or revenue generation from the alliance charges". As later described in Subsection 5.3.2, the so-called "alliance charge" makes the airlines pay for GPU/PCA, no matter if they use it or not. In terms of the alliance charge the airport company would not increase its financial benefit if the airlines utilised it to a stronger extent.

The use of GPU/PCA generates financial benefits for the airport company in terms of a network charge around the airport. The airport sustainability advisor explains: "If people are using electrical equipment, we actually generate an income from that, because an element of electricity pricing comes from us; this additional fee, however, is quite insignificant ..., and thus the benefit of plugging it in is the airlines' benefit more than ours." One airline operations manger confirms the airport sustainability advisor's viewpoint, arguing with regard to the use of GPU, "the major benefit is for the airlines" (AM3).

While, for the airlines it is important to use the GPU/PCA equipment (given the significant cost savings opportunities) from the airports' perspective, it is rather more important to have GPU/PCA equipment, in terms of improving competitive advantage in the long term. From the perception of the airport sustainability advisor, "the drivers were not really (directly) financial, so it was more basically having an airport infrastructure up-to-date, having the technology that comparable airports have around the world in Europe or the US or Australia." He states:

> When a long haul operating international airline chooses to come to New Zealand, they have got a choice to go to either Christchurch or Auckland. So if we could do

> something to differentiate ourselves from other airports, like Christchurch, then there is a business benefit. Raising our profile in sustainability provides us with opportunities right across the business. As an airport that has been focusing quite significantly on growth in recent times, we are required to raise capital. For the purpose of raising capital we have to be seen as a good investment opportunity. Also, there are benefits regarding human resources and recruiting. Recent graduates or people who have worked overseas internationally always ask questions around corporate social responsibility, and sustainability seems to be part and parcel of that. There is also a mind set in terms of dealing with our supply chain, procurement. If we are working with suppliers who share similar aims, then we can look at more long-term supplier arrangements because they are thinking along those sustainability lines.

5.3.2 Charging structure

There has been an agreement between Auckland Airport and the airlines concerning the installation of the GPUs. According to the airport sustainability advisor, the airport company funded the initial capital investment and recovers its cost by increasing the "overall network charge for the use of the equipment and access to the gate".

Consequently, the perception on the part of the airline operations managers is that "the airlines pay for it in the long term", because the overall alliance charge applies for each aircraft movement, and a part of this fee relates to the ground power equipment (AM2). This charging structure leads to the perception that the airlines get charged for the GPU equipment if they "use it or not" (AM2). Besides the standard charge, the airlines have to pay for the electricity used and ground handling work. The airport company charges the cost for the electricity used separately. The cost for the ground handling is also charged separately, but by the ground handling company. One of the airline operational managers estimates the additional costs of using GPU /PCA to be no more than "20 percent of the operating costs of the APU" at Auckland Airport (AM1).

All three airlines operations managers agree that the use of GPU/PCA in Auckland is cheap in comparison to some other international airports and thus offers significant financially benefit to their companies. One speaks about "massive" financial benefits (AM1). Similarly, another highlights that a mandate would generate benefits "in terms of fuel cost savings" (AM3). And a third argues: "You are having a basic cost and the electricity is on top and the electricity is very small … if we do not use it here, we would be stupid because

running the APUs is a lot more expensive" (AM2). Similarly, the airport sustainability advisor argues, since the airlines have a clear financial benefit "they should be utilising it".

However, as described by one airline operations manager, the charging structures for GPU/PCA are "different at different places". For example, in some airports "you actually pay for the amount of time you use the electrical power", including power and equipment cost (AM2).

Since there is no industry wide standard charging approach in place, some airports "charge us on the base they know the APU costs to run, and so they put the price of the GPU up towards the costs of the APU, which is just revenue generating for the airport" (AM3). Consequently, all airline operations managers admit they will not use the technology if it is too expensive. One states, "in some airports, we deliberately do not use the GPU because it is more expensive than the APU" (AM3). A second reports, "some airports have historically charged what we would argue an extraordinary high rate ... to a point to we say that it is more economic to run APUs" (AM2). A third explains, "we do not use GPU/PCA in Singapore, because APU is cheaper" (AM1).

Similar to Singapore, in Beijing, the cost of using GPU/PCA is as high as using APU. However, in Beijing the use of GPU/PCA use is mandated. A mandate in the Beijing example would mean the airlines have to use the GPU/PCA despite the high price. Consequently, the mandate can obviously constitute an additional cost for the company, implying a loss of operational control (in terms of using expensive GPU/PCA). Having the Beijing example in mind, the operations managers become cautious when it comes to the introduction of a mandate in Auckland, given that high GPU/PCA charges could also occur in Western countries. One states, "how we get charged will also be an issue" in the GPU/PCA mandate discussion (AM2). Another one claims, "the airport must make sure the cost model is not about trying to make a profit or anything" (AM1).

5.3.3 GPU/PCA measurement

All interviewed airline operations managers argue that the airlines do calculations about how much fuel and money they save by using GPU/PCA instead of APUs. This measurement, however, only applies to an overall calculation of APU use. One reports, "we do not

do it by airport at the moment" (AM3). Similarly, a second one states that his company does not analyse the utilisation rates and financial benefits in terms of particular airports; they "monitor it from another end", which means they are "more worried about how long the APU generally is running for" (AM2). This kind of measurement allows him to "watch trends, in terms of seeing that a particular fleet is using the APUs more or less". In contrast to the airlines, the airport company records the GPU/PCA connection rates, which means it records if an aircraft is connected or not. However, the airport company does not know, for how long GPU/PCA is connected and what aircraft type is connected. In terms of the fuel saving quantification, the information on the aircraft type is important, since the engine size and the fuel consumption varies from aircraft to aircraft. According to the airport sustainability advisor, only by having this information "we could say you saved this amount of fuel and CO2". The airport company tried to quantify the effect of their GPUs/PCA initiative and obtained the missing data from an airline. However, from the airport sustainability advisor's viewpoint, the airline company "had only some patchy information available", showing that "they are not actually recording their utilisation accurately." He notes: "We are just not seeing them following through with an analysis of actual fuel/CO2 reductions ...; until they do that they cannot really quantify what they have saved by utilising this technology". Furthermore, he highlights that more communication and the exchange of documentation data with, for example, the "two main carriers would enable them to recognise what they could achieve at this airport and it might persuade the airlines to do more". In spite of these complications, one airline operations manager argues that the EU ETS forces his company to "put a system in place", which allows more and detailed measurements in future (AM3).

5.3.4 Theme summary

While, airlines derive major direct financial benefits with regard to cost savings from using and utilising GPU/PCA, the airport generates rather smaller indirect financial benefits in terms of reputation from having GPU/PCA as an asset. An increase in utilisation thus would provide benefits mainly to the airline companies. Since the airline companies are the parties that derive a major economic benefit from the use of GPU/PCA, they bear the costs, by paying a charge to the airport that initially funded the capital for the equipment. Even though the airline companies pay a charge to the airport there is a clear economic

benefit for the airline companies seeing as the airport charge for GPU/PCA is small in comparison to the costs of the use of the APU. The airline managers stress the importance of keeping the price for GPU/PCA low; otherwise a mandate, which disallows the choice between using APU or GPU/PCA, could imply a cost for the company. The level of charge for using GPU/PCA might thus be seen as the only reason why the airline companies could hesitate to support a mandate. The airlines are aware of the major overall financial benefits generated by the initiative, but when it comes to airport-related utilisation measurements the documentation is patchy or even non-existent. This measurement issue might limit the airline companies' capability to fully recognise and realise the GPU/PCA benefits. When additional measurements required by the EU ETS are in place, a more detailed analysis could be possible, but whether it would necessarily extend to relevant data on the use at Auckland Airport is debatable.

5.4 Environmental aspects

Using ground power and pre-conditioned air instead of APUs, reduces GHG emissions, and contributes to less unsustainable business operations. The following section explains how the managers make sense of GHG emission reductions. First, this section describes how the managers evaluate their companies' emissions targets. Second, it is explained how the managers regard the GHG emissions caused by their company with regard to climate change. Third, this section highlights how the managers perceive the impact of the evolving ETSs.

5.4.1 Emission target

All airline operations managers report that their companies set up emission targets under the guidance of the IATA, with an ultimate goal for 2020, to reduce the emissions by 1.5 percent each year. One explains, the IATA advised in particular areas, in terms of "what they could potentially achieve and what they should aim to achieve", both in litres of fuel and tonnes of emissions (AM2). Having an overview of targets and potential for each fuel efficiency initiative (such as GPU/PCA) creates performance transparency for the airline companies. As stated by one airline operations manager, these procedures helped his company record a detailed number of 132 000 tonnes of GHG emission savings overall be-

tween 2005 and 2010. The fact that this equates to an overall improvement of four percent (which is not even one percent per year) shows that the ultimate goal of 1.5 percent a year reduction is ambitious and difficult to achieve for the companies, also given almost constant growth in the industry.

However, the airline operations managers' perception is that the IATA emissions goal is of minor relevance to their companies. One states, there is "no financial cost" in not achieving the targets apart from the potentially saved fuel costs (AM1). Another one argues: "There is no external agency at the moment telling us, you should reduce by so much" (AM2). The third sees no immediate negative consequences for not achieving targets since the static targets cannot be applied to all companies in the same way. He states, for airlines with efficient and modern fleets, it is more difficult to achieve improvements, since these airlines "already moved to where everybody else has to move to" (AM3). He furthermore stresses the fact that for strongly expanding airline companies, emission reductions are harder to achieve, than for airlines, which do not grow. He explains, many "details are still to be worked out by IATA".

The airport company also has emission targets in place. In contrast to the airline companies, the airport company came up with its targets (reducing their footprint by 5 percent from 2008 to 2012) independently. Although the airport had some consultation with their key stakeholders, the stakeholders did not contribute specifically with regard to the details and the ambitiousness of the targets. In calculating its carbon footprint the airport follows the Greenhouse Gas Protocol Initiative, which sets standards and provides guidance regarding corporate GHG accounting and reporting. These standards say that only power that is used within operational control of the respective company is part of the company's footprint. This for example, accounts for "electricity that is used in public spaces", but also for the use of ground power at the gates, which is accessed by the airlines. In contrast to the airline companies' carbon footprints, the use of APUs/GPUs does not have an effect on the airport's carbon footprint. Thus, the airport does not document the GHG emission savings of the GPU initiative, nor does it set specific reduction targets in this area. Furthermore, as argued by the airport sustainability advisor with regard to the airport's recorded targets, "there are no regulatory drivers to do that, and there is no stakeholder pressure for us to do anything". The only problem would be that "we would have to publicly disclose the fact that we have not achieved it, and obviously we would have to explain it".

5.4.2 Environmental uncertainty

One airline operations manager highlights the prevailing uncertainty surrounding global warming and his company's impact. He states: "No one of us really knows what effect is happening: We were saving 130 000 tonnes of CO2 in the last years and we can maybe say this is 0.00001 percent of the emissions in the air, so who is going to say that stops global warming? It might be in 5 years' time to say 'well that CO2 stuff is rubbish'. Who knows? But we still want to reduce our impact, since it is the right thing to do" (AM2).

He furthermore highlights the lack of knowledge with regard to the overall effect on global warming: "Of course, the EU ETS is only in one part of the world. Across all of these airlines, you get your own little percentage of it. If you would expand it across the world, you could then say you are doing all this to actually reduce the CO2 in the world. Thus, it is a bit unfortunate that obviously the EU ETS is just applied to the EU. But really, it should all be integrated in a world system" (AM2). Without having a global system in place, there is no clear picture about the emitted GHG for the company, and "this will limit control of how much CO2 we save and report" (AM2).

Because of different kinds of uncertainty, the only driver for emission reductions that airlines operations managers name is the financial one. Responding to the question about emission reduction drivers, one airline operations manager states: "What do the 130 000 tonnes of CO2 equate to? They equate to 41 000 tonnes of fuel, which we are saving. So if we did not do that, you could argue that we would be spending 1 dollar per kilogram, we could spend 41 million more dollars in fuel" (AM2).

5.4.3 Emissions Trading Schemes

As stated by the airport sustainability advisor, the airport company is "not involved in the ETS and even if we were, the GPU electricity usage would not actually be, since it is excluded from our carbon footprint". He does not perceive "any further regulatory drivers" surrounding GHG emissions.

In contrast, the airline companies are affected by ETSs. According to one airline operations manager, the New Zealand ETS has "only started in July so we don't know anything really,

and I don't have anything to do with that, really. It is driven more by the financial side of the company. But I definitely know a lot about the EU one and, even if it does not apply for very many flights for us, it is obviously an additional driver to measure and reduce CO2 emissions" (AM2).

All three interviewed airline operations managers agree that ETSs will have an increasing impact on their companies. One states: "On the burnt fuel we pay carbon taxes; reducing our fuel burn helps to reduce the exposure to that trading scheme" (AM1). Another one contends that "going forward, it would be very important, because basically we will be paying a tax on the fuel that we burn". By the time the emissions trading schemes are established, "we will realise that we have to become more and more efficient" (AM2). A third one confirms, "the ETS will effectively be a tax on carbon, and this is why we believe the issue of ground power is so important".

The perception on the part of the airline operations managers is that the ETS has mainly negative consequences for their companies. One states, "GHG emissions are just seen as an additional cost; we are already discounting the EU ETS, which is coming in a year's time, in our budgets, into our costs of operations" (AM1). Similarly, another one argues: "It will add costs; we look upon the emissions trading very negatively within the airlines" (AM3). The ETS impacts airline companies mainly negatively, since they can adapt to the ETS only to a limited extent. One airline operations manager explains: "There is no real alternative for us; ... the use of fuel won't change too much" in the future (AM1). Another one argues, the final target of the ETS is "to basically push all the emissions down to zero. How the hell do you get to that? I don't know" (AM2).

Referring to the Arab Oil crisis in the 1970s, one airline operations manager explains how the ETSs affect his company. When the prices for oil went up, the airline companies focused on fuel efficiency to a stronger extent. Similarly, now that the ETSs emerge, there is an increasing financial pressure again to become more efficient. He argues, " today it is the same thing ... it is all dollars that matter" (AM2).

In spite of their concerns, the airline operations manager also sees some opportunities in relation to the ETS. One states, especially for the EU ETS, "we have to record all of our fuel usage, and this makes us keep control about the fuel that we burn, not just on the APU" (AM3). Another one explains, again for the EU ETS, "we will have to collect a lot

more technical data because we have to know how much we are burning and how many passengers we carry" (AM2). From his perception, the ETS will thus help "to understand the issues about fuel efficiency more and more and improve our efficiency better; we can also look good if we are one of the best doing it, and then it can work for us instead of solely being a burden".

5.4.4 Theme summary

For the airline companies, emission targets exist, which help the airlines to overview their overall performance, and gives them detailed insights into certain initiatives, such as the GPU initiative. However, these targets are highly ambitious, pre-mature and voluntary, which makes it difficult to get companies to follow through on achieving them. In contrast, the airport company, has neither targets set by any organisation or government (it sets up its own targets independently), nor does it include GPUs in its calculations. Moreover, given the multifaceted uncertainties around the issue of climate change, the managers are not able to fully comprehend the negative effects of their operations. Consequently, it is argued that emissions (in contrast to economic factors) play a more nominal role for the interviewed managers. The low significance of environmentally driven emission reductions is also reflected in the perception of the ETSs. The airline companies are involved in the ETSs. Since an ETS imposes taxes on caused emissions, fuel use will be more expensive. This additional cost, in the airlines' budgets and decision-making models, constitutes an additional efficiency-driver for airlines. Given that most airlines grow, and further efficiency gains are difficult to achieve, the ETS will put the airlines under increasing financial pressure. In spite of the prospect of positive consequences in environmental terms, airline managers tend to regard ETSs as negative since it will constitute a cost to their companies. The only benefit mentioned is that more comprehensive measurements required by the ETS will ultimately help to recognise new fuel efficiency opportunities in the future. In contrast, the airport company is not involved in any ETS.

5.5 Balancing environmental and economic aspects

Although the airline and airport companies emphasize financial aspects in their decisions, environmental and social aspects received increasing priorities in recent years. First, this

section describes how the managers perceive their companies' decision-making with regard to sustainability aspects. Second, the role of reputation in these decisions is explained. Third, this section describes examples of managers striking a balance between the contrasting environmental and economic dimensions of their business decisions.

5.5.1 Decision making structures

One airline operations manager (AM2) provides insights into his company's (environmental) decision-making processes. In his company, there are regular environmental meetings involving the operational managers, sustainability advisors and members of the top management. In these meetings the operational managers report on the achievement of potential environmental targets. He states that environmental matters are discussed in these meetings because it is very hard for all the decision makers around the company, for example those in catering or engineering to incorporate environmental aspects in their areas. In contrast to the top management, who is also concerned about environmental issues, the lower and middle managers have a strong focus on financial aspects and budgets. The top management (and sustainability team) tries to educate and lead the lower and middle managers towards a more environmental focus. An environmental focus, however, does not mean that financial aspects are neglected. Rather, the goal is to broaden the horizons in terms of environmental issues. He states:

> Obviously we try to strike a balance. For example new cutlery - I have been involved in the decision making process regarding the purchase for new cutlery sets for the aircraft. We set up a matrix and calculations identifying the cost of carrying extra weight on the aircraft. So we say that set of cutlery will be so much weight in kilograms. If we buy that lighter set, then we can save 150 kilograms over the year. We can actually come up with a cost, and then we can compare that cost with the basic cost of buying the cutlery, how long it lasts, how often you have to turn it over, just simple stuff really.

In financial terms, the difference between the light and the more heavy set might be marginal. However, "the environmental benefit may be the final tipping point, which makes an otherwise marginal and unperceived business case into one that we carry out". A couple of years ago, fuels saving initiatives were carried out to stronger extent when the fuel price went up. In contrast, by incorporating environmental aspects, the process of fuel efficiency improvement is more constant now.

5.5.2 Corporate reputation

Reputation plays a major role according to the interviewed managers. One airline operations manager claims, corporate "reputation [is] a big topic in the aviation industry" (AM3). Another airline operations manager highlights the media awareness with regard to the aviation sector: "We do not want the media to perceive things as having wrong intent" (AM1). The airport sustainability advisor claims, "the biggest risk for any organisation is putting yourself out there in terms of being a sustainable organisation, and then, not actually doing what we say. The effect of reputation is huge. So we will be very careful to make sure we will not ruin that."

The airlines operations managers are concerned about consumer perceptions. One airline operations manager reports that "a lot of customers do take notice" of environmental performance. He perceives people, especially Europeans, as "more and more discerning" and argues, they "make their decisions based on your environmental credentials" (AM2). Given the strong competitive pressure in the industry, he argues furthermore, it is "very important to look more efficient than all the rest of them especially with regard to our environmental credentials".

In contrast to the mainly consumer-oriented airlines, the airport sustainability advisor perceives reputation as important for following reasons: "As an airport that has been focusing quite significantly on growth in recent times we have to go to raise capital, so we need to be seen as a good investment opportunity. And having a good profile in the corporate social responsibility area adds some weight to those people in the capital market." Also, he sees advantages with regard to recruitment. "Recent graduates or people who have worked overseas internationally always ask questions around your CSR, and sustainability seems to be part and parcel of that. Therefore, we have got a strong focus on sustainability and on our own emissions profile".

One airline operations manager states that besides financial benefits, indirect reputational benefits are important drivers for using GPUs/PCA: "Even the airports think it will be better for their image if the aircraft are not burning fuel all the time; and you can visibly see it" (AM2). He believes that the GPU/PCA project "is quite a visible one to passengers ... since they will look out of the windows while they are waiting", and it is therefore valuable with regard to reputation. In his perception, running APUs "do not make us look good –

we are supposed to be green." In contrast, another airline operations manager does not "think we would really share this with our passengers ... it is something we need to do because it is good business practice, it is good environmental practice" (AM3). However, he claims, "it might appear in the next year corporate sustainability report." The airport airline advisor argues that even if the use of the technology is not directly noticed by the passengers, "there is an opportunity in terms of promoting the fact that the airlines are utilising it and what the environmental benefits are".

Reputation as an indirect financial driver can influence investment decisions. As stated in Section 5.3, for the airport company, small investments will only be made if they can generate a payback within two years. The airport is discussing a lighting project which has a 4.5-year return on investment and which is obviously outside of the 2-year frame. However, in contrast to the airport sustainability advisor's usual energy efficiency projects around heating, ventilation, conditioning (which is all behind-the-scenes), the lighting project, with lights going on and off automatically, has a very visual effect and adds thus additional value in terms of corporate reputation. He argues, the reputational effect can balance the financial disadvantages of the project, and thus might convince the top management to accept it.

Although the companies may be reluctant to introduce internally oriented sustainability initiatives with uncertain pay-offs (such as for the airport the lighting project) they spend money externally, such as for sponsoring, community relationships, and maintaining sustainability web pages, which are regarded as a cost to the company. In contrast to sustainability investments in operational procedures, the named initiatives have a strong visual effect, which leads to reputational benefits. The airport sustainability advisor claims, "even if we are not benefited on a purely financial basis, we will have, when you take it as a whole, a win-win situation for the company, because it is a comprehensive sustainability plan, including reputation".

Although it is evident that corporate reputation is important for the interviewed managers, it is difficult to define the actual value for the company. One airline operations manager summarises this uncertainty as follows: "You cannot really measure it, and it is hard to know whether they actually make their decision about who they go with based on your reputation. ... If they did not highlight environmental performance, would they be any less

profitable? Who knows, I don't know, you cannot tell" (AM2). From his viewpoint, however, top management will probably not say: "This is going to cost us a couple of millions a year, but it is the right thing to do, we are going to save the planet."

5.5.3 Trading off sustainability aspects

Subsection 5.5.1 describes how an airline company incorporates environmental aspects in its decisions. One operations manager argues, "some years ago, it was all based on dollars, but in the last couple of years we have changed the emphasis to the environment" (AM2). His company tries "to make a decision not just based on dollars", but at the same time he confesses, "it is a little bit subjective". Reducing the environmental impact means in the airlines operations managers' perception "doing the right thing" which equates to "being efficient" and "not wasting things" (AM1, AM2). An example of "doing the right thing" is described earlier in relation to the airline decision about cutlery.

The airport sustainability advisor emphasises the importance of having a comprehensive sustainability plan as the right thing to do as well as good for reputation. He regards "maintaining the sustainability website, updating the information, maintaining the transparency ... and the engagement with the local community" as efforts with no economic return. Despite these non-profit-generating efforts, he maintains that the comprehensive sustainability plan, as a whole, generates a win-win situation for the company. Similarly, one airline operations manager claims, "all those things e.g. sponsoring are a cost to the company in dollar terms, but we are hoping to get a lot of good publicity", and this in turn is "of course again driven by dollars" (AM2).

Updating the sustainability website, sponsoring and community involvement are externally oriented initiatives. In contrast, the airline operations managers could not name many internally oriented, operational process-related initiatives. Just one airline operations manager states, "we separate waste, we recycle, that costs us money, and we get no benefit from that" (AM3).

The perceptions on the part of the airline operations managers are that cost savings are the main driver for the use of GPU/PCA. One claims, "we do it not so much for the environment, it is the cost savings why we are doing it. ... We have the costs of the APUs and

we have the cost of GPUs and PCA. If it cost you more, you probably would not do it" (AM2). Another airline operations manager highlights: "The business case is always from a financial perspective" (AM1). The third one argues, "obviously we are keen to reduce our carbon footprint, but actually there is a business rationale and a lot of business pressure for us to do that" (AM3). Some further examples highlight the strong focus on financial aspects:

One airline operations manager argues with regard to the lack in ground handling agent manpower that additional people "need to be paid and this has to be balanced with what you save on fuel" (AM2).

The same operations manager argues with regard to the reduction of his company's environmental impact:

> We are not stupid; just to use as an illustration - fuel is extremely expensive in the Pacific Islands, Tonga, Samoa, Cook Islands. ... So the most cost effective option is to take up more fuel in Auckland and to fly it to the islands; we will burn fuel to carry the fuel, so 10 percent of the fuel will be burned, and this means we would produce more CO2. But it makes significant economic sense to do that.

As described earlier, the fuel efficiency efforts were mainly reinforced, when the prices for oil went up. The oil crisis in the 1970s, the oil price peak around 2005 and the emerging ETS (with regard to emission taxes for burned fuel) are all salient examples triggering reinforcements of fuel efficiency and sustainability efforts.

According to the airport sustainability advisor, "if you can prove that a particular project will pay for itself within two years - it must be a two year pay back -, then it is very easy to get that signed off by the senior manager and the chief financial officer". He argues that projects outside of this timeframe are difficult to get signed off by senior management.

One airline manager (AM2) highlights the impacts of competitive challenges:

> We know the right things to do, but obviously competition makes it hard, and the margins are so small now, you have to have a profit. There has always been a drive from a purely financial perspective to minimize fuel burn. ... We are a business, we have to make money. I suppose if an airline was totally bothered, it would just stop flying. That is not our business, and that is not realistic. No one is going to do that.

Citing the example of Swissair going bankrupt from making fuel efficiency investments, he concludes his company cannot "spend excessive amounts of money" for sustainability, especially in cases of not having safe financial returns.

In spite of the described money-environment trade-offs, all three airline operations managers agree that their financial pressure in terms of fuel efficiency can mostly be seen as positive for the environment. One states, "we make financial decisions, but quite often cost savings mean emission reductions, the two go hand in hand" (AM1). Similarly, another one states, "if you save fuel then you save money - that means the money aspects are very attractive ... but benefits in terms of hard dollars of fuel means you are also going to reduce CO2 emissions" (AM2). A third one confirms, "every time you can save fuel and carbon emissions you actually make a good business case for the company; it goes hand-in-hand" (AM3).

5.5.4 Theme summary

There seems to be increasing top management support for initiatives that improve environmental and social performance, where there is a positive financial effect, even if minor. A value change towards sustainability in connection to aviation industry-related public pressure force the companies to focus increasingly on social and environmental aspects. In light of this trend, it is important for the companies to focus on reputational aspects. Due to the described significance, reputational effects with regard to sustainability can influence corporate decision-making. Even in operational areas, reputational effects can constitute indirect financial benefits, which add weight to the financial side and prompt managers to change the rankings between decision alternatives. However, only initiatives that are visible to customers or other stakeholders are regarded as effective with regard to reputation. With regard to the visibility of the GPU/PCA initiative, there is some disagreement about the extent to which the GPU/PCA initiative has an influence on corporate reputation. All in all, despite the increasing focus on environmental and social aspects as well as the incorporation potential reputational effects into decision-making, direct financial factors play a superior role. Sustainability initiatives are principally subject to an economic test. Initiatives that contribute to less unsustainable business practices are generally carried out only if they generate financial returns. Strong competitive pressures justify this practice. Only in some external oriented cases, such as sponsorship, or maintaining the sustainability homepage for

transparency, do the managers highlight initiatives carried out without direct financial return. However, at the same time they admit that they expect long-term reputational benefits from these initiatives.

5.6 Chapter summary

The main problem in the case of GPU/PCA is the low utilisation rates. This chapter revealed a wide range of factors contributing to low GPU/PCA utilisation rates. From an airlines' perspective, strong competition forces the companies to be proactive with regard to the exploitation of economic opportunities. The GPU/PCA initiative is clearly economic beneficial to them. In light of the economic benefits, the operational managers interviewed want to utilise the technology to a stronger extent and call for an airport mandate, since it would address operational problems. The operational problems relate to air-conditioning, ground handling, and GPU/PCA equipment issues. It seems due to a general lack of communication, the problems remain unsolved. As stated, the airline companies derive major benefits from utilising the technology (although it is found that they do not fully recognise airport-related opportunities). The airport's benefit, however, is minor, which means its driver to increase utilisation rates is regarded as low. For a whole range of reasons, GHG emissions as such, have a low priority for the managers currently. GHG emissions, however, will effectively be more important for airline companies in future, since ETSs will impose costs on their caused emissions. Thus, in spite of the managers' opinion, saying that corporate decision-making is increasingly focused on environmental aspects and corporate reputation, it is not surprising that currently the focus is more on economic rather than environmental aspects.

Chapter 6 Discussion

This chapter discusses and interprets the managers' arguments around the GPU/PCA initiative, which have been described in the previous chapter, drawing on and integrating the theoretical information given in Chapter 1 and Chapter 2. The first section of this chapter discusses to what extent the win-win paradigm can be confirmed in practice. Second, this chapter discusses sustainability trade-offs in relation to the GPU/PCA initiative. The chapter concludes with an overall summary of the discussion.

6.1 Win-win paradigm

By investigating how managers evaluate environmental aspects in comparison to economic aspects, this section discusses the practical applicability of the win-win paradigm of sustainability. First, it discusses how interviewees perceive their companies' posture towards sustainability. Second, the underlying view of sustainability, and the role of social costs are discussed. Third, this section describes to what extent the win-win paradigm can be confirmed in the investigated business context. Fourth and fifth in this section, the boundaries of the win-win paradigm are assessed, and the scope of the win-win zone is analysed. Sixth, this section describes how win-win opportunities are exploited and how the win-win zone might extend in future. Seventh, the absence of the exploitation of win-win opportunities in relation to the GPU/PCA initiative is discussed.

6.1.1 Environmental leadership

By describing their companies as industry leaders, award winners, and first movers, all interviewees regard their companies as proactive in terms of the environment. Although it is debatable if the interviewed companies fulfil the criteria for proactive companies (see Kolk & Pinkse, 2007), it is assumed that these companies have a relatively strong alignment towards sustainability in relation to their industry. Thus, with regard to win-win paradigm related findings, it cannot be argued that the sample refers to very unsustainable companies and thus limit the value of the findings. Rather, it is argued that the chosen companies pro-

vide a representative albeit perhaps rather optimistic picture about how companies within the industry deal with sustainability issues.

6.1.2 Weak sustainability and the role of social costs

In spite of the claimed proactive posture with regard to the environment, the interviewed mangers have problems in comprehending their companies' effect on global warming. In light of the uncertainties, described in Section 2.1, they question the actual effect of GHG emissions on the world climate, do not know their company's overall share and stress their minimal control of and contribution to the world's overall emissions. They do not perceive any real pressure with regard to emission savings and cannot explain why the airline companies would try to reduce their emissions (apart from fuel cost savings and carbon tax reductions). Thus, uncertainty and also a lack of transparency mean the managers do not openly recognise the social costs caused by harmful GHG emissions by their companies.

The issue of being liable for the caused damage obviously results from a lack of external pressure to internalise the social costs. Furthermore, there are currently no comprehensive emission targets in place, which enables the public to understand a company's emission reduction performance or impose penalties for not achieving targets, nor has the EU ETS come into force for airlines yet. Consequently, currently, there is no market price on the social costs of the airline-caused GHG emissions. It is argued that only if there is a market price on the caused social costs, will the companies be willing to internalise them.

This lack in recognising and addressing the social costs caused, confirms the prevailing view that companies draw on the perspectives of weak sustainability. In contrast to the advice by Young (2001), saying that social costs should be internalised whenever possible, the social costs are not yet routinely internalised in the context under discussion.

6.1.3 Applicability of the win-win paradigm

The companies do not meet the criteria of mission-driven companies (see Russo, 2010). Given that companies principally examine financial aspects, they are obviously not willing to go beyond the win-win paradigm of sustainability. Although most interviewees report a

move towards sustainability, a short-term profit orientation prevails, decisions are strictly cost-benefit oriented, and social costs are not internalised voluntarily. Consequently, even though the managers describe their companies as environmentally proactive, they are not willing to sacrifice profits and cost savings for the sake of less unsustainable business practices. This practice especially applies to internally-oriented activities, in other words activities within a company's own business operations (see Weinhofer & Hoffmann, 2010). Thus,

Hypothesis 1. Sustainability-related trade-offs trap companies strictly within the limits of the win-win paradigm of sustainability, especially with regard to internally oriented sustainability initiatives.

The interviewed managers argue that in some externally oriented cases, e.g. sponsoring, or updating the sustainability homepage for transparency, they do sacrifice profits. However, at the same time they admit that they expect long-term reputational benefits from such activities, given their strong visibility and the risk of bad publicity as well as the public pressure on the aviation industry[2]. Thus,

Hypothesis 2. Some externally visible (mostly externally-oriented) sustainability initiatives are carried out although they can be cost-ineffective in the short term; due to high visibility they are regarded as a long-term pay off in terms of corporate reputation.

6.1.4 Boundaries of the win-win zone

As noted above, the companies are clearly located within the restrictive win-win paradigm of sustainability. The findings in this dissertation highlight that strong competitive forces cause financial challenges for the companies, and hence, hold them back from making risky investments or even sacrificing profits for the sake of the environment (also given the constant risk of increasing oil prices). Consequently, the argument by Orsato (2009), highlighting negative effects of competition on sustainability, can be confirmed, and it is argued that

[2] *Weinhofer and Hoffmann (2010) apply their internal-external orientation concept to GHG emission reducing activities. In this example, the concept is applied to sustainability initiatives in general.*

strong competition can reinforce the boundaries of the win-win zone of sustainability. Thus,

Hypothesis 3. Competitive forces can reinforce the boundaries of the win-win zone.

6.1.5 Scope of the win-win zone

It is also argued that the win-win zone for airline companies is large in comparison to companies in other sectors, since fuel savings directly relate to emission reductions. Fuel is one of the biggest cost factors for airlines, and at the same time the emissions caused by the use of fuels account for the biggest share of the companies' environmental damage. Sustainability in environmental terms can thus be mainly seen as a financially attractive field of endeavour for airline companies. Within the attractive field of fuel efficiency, the GPU/PCA initiative opens up massive fuel, maintenance cost saving opportunities as well as future emission tax savings to airline companies. The described cost saving opportunities have a direct and effective impact on a company's profit and loss statement and can thus be accurately placed in the win-win zone. In contrast, even though all interviewees regard corporate reputation as a long-term revenue-generating factor, it is difficult to place it accurately within win-win zone, due to its uncertain pay-off ability and time. Thus,

Hypothesis 4. The (win-win paradigm-limited) potential for companies to be sustainable is related to the specifics of their industry.

6.1.6 Exploitation and expansion of the win-win zone

As highlighted in the findings, the strong competitive pressure in the industry in combination with small profits forces companies to be highly competitive. In order to survive companies have to exploit financial opportunities to a strong extent, which also accounts for opportunities within the win-win zone of sustainability (and these opportunities are large in the aviation industry, as highlighted in Subsection 6.1.5). Consequently, although competitive pressures can be seen negatively in terms of exploiting opportunities beyond the win-win paradigm (see Subsection 6.1.4), competitive pressure can have positives effects on sustainability, since they push companies to exploit opportunities within the win-win zone.

In other words, pressurised by competitive forces, companies will recognise more opportunities that have both positive environmental and economic effects.

Also, environmental leadership and education has an increasing effect on corporate decision-making and will lead to an increasing transparency on environmental opportunities. For example, as described by the managers, in future, there might be a constant focus on fuel efficiency improvements independent of fuel prices; also, increasing aircraft efficiency programs with minimal financial effects are carried out (as in the cutlery example). Hence, environmental leadership and education might contribute to an increasing exploitation of opportunities within the win-win zone, even in cases of minor financial benefit.

Social costs will be increasingly recognised in future, since upcoming ETS will price GHG emissions. This market price means the reduction of emissions will increasingly benefit companies financially. Thus, in future years, the win-win zone with regard to GHG emissions will most likely extend.

Also, more comprehensive emission targets might lead to a higher visibility in terms of industry-related emission performance and increasing public pressure (e.g. influencing changing consumer behaviour, business values, supply chain, and recruitment aspects). In some years' time, poor emission performances could constitute an obvious cost to airlines. Reputational pressures might then be strong enough, to convince companies to "price" their caused emissions voluntarily. Consequently, GHG emissions will increasingly have an industry-related market price. The lighting example in Subsection 5.5.2 shows that reputational aspects can add long term-value to short-term cost savings and may convince business decision makers to carry out investments that are outside the required financial return timeline, even today. In this example, the reputational effect is regarded as major, due to high visibility to customers. In the example of GPU/PCA, there is some disagreement about the effect on corporate reputation. Some managers claim the initiative has a positive effect on corporate reputation due to the visibility to passengers. Other managers regard the reputational effect as minimal, stressing the assumption that customers do not notice the use of GPU/PCA, given the low emission transparency within the industry. In sum, although corporate reputation is regarded as an important aspect within the aviation sector, the significance of utilising GPU/PCA with regard to corporate reputation is assumed to be low, due to its limited visibility and the industry's low current emission transparency.

However, given that corporate environmental performance (in terms of GHG emissions) will be more transparent in some years' time, the concept of corporate reputation will become more comprehensible and measurable, and thus it can be more easily related to financial numbers. Consequently, the win-win zone for the companies might extend in future. Thus,

Hypothesis 5. The win-win zone will expand in future, since emissions will increasingly be related to actual monetary costs.

6.1.7 Problems in exploiting win-win opportunities

Utilising GPU/PCA to a stronger extent would effectively increase fuel efficiency, which means airlines could exploit financial opportunities, and at the same time become less environmentally harmful. However, this attractive opportunity has not even been fully exploited by the airline companies. Although there is obviously a desire to utilise GPU/PCA airlines did not fully utilise the technology, mainly due to problems in operational procedures. Hence, instead of going beyond the win-win paradigm of sustainability, the airlines' win-win zone is rather reduced by a slender piece related to lacking operational procedures. Consequently, in contrast to the example of Russo (2010) of mission driven companies escaping the boundaries of the win-win zone/paradigm, this dissertation argues that companies cannot exploit all opportunities within the win-win zone (represented by the white zone in Figure 5). The following section analyses the issue of the reduced win-win zone, more deeply.

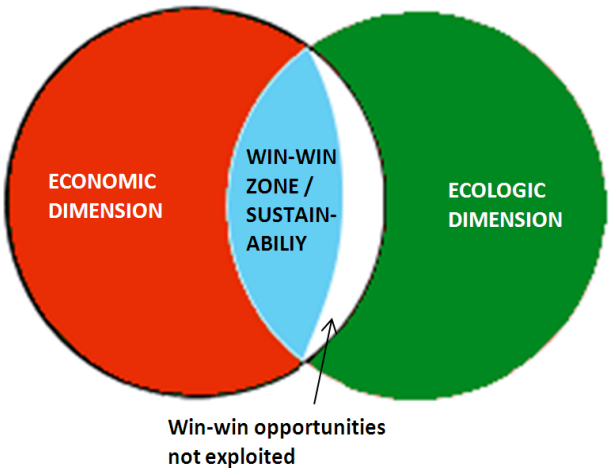

Figure 5: Reduced win-win zone of sustainability (researcher's own figure, drawing on Russo, 2010)

The above described conclusions can be summed up as follows. The interviewed managers regard their companies as proactive with regard to the environment. The companies, however, draw on the notion of weak sustainability and do not internalise many of their caused social costs. Consequently, this dissertation clearly confirms the argument that the companies are located within the limits of the win-win paradigm. Also, the dissertation confirms that strong competition reinforces the boundaries of the win-win zone and traps the companies within the limits of the win-win paradigm. It is found that the win-win zone for airline-companies is probably large in comparison to many companies in other industries, since fuel savings directly relate to emission reductions, and fuel constitutes one of the largest cost factors for airlines. Furthermore, it is highlighted that competitive forces can push companies to exploit win-win opportunities. Similarly, environmental leadership and education, future carbon taxes imposed by ETS, and more comprehensive emission targets push companies not just to exploit win-win opportunities, but also extend the win-win zone. However, the findings also reveal that problems in operational procedures, related to stakeholder issues, can reduce the ability of companies to exploit opportunities within the win-win zone.

6.2 Trade-offs

Operational problems are the main reasons for the underutilisation of GPU/PCA. It is argued that operational reasons are inherent in the trade-off logic. Drawing on the win-win

paradigm of sustainability, the stakeholders involved in operational procedures are not willing to make financial sacrifices in order to reduce GPU/PCA-related GHG emissions. Thus, with regard to the analysis of GPU/PCA-related trade-offs, it is essential to assess to what extent the initiative implies benefits for the stakeholders involved.

Consequently, first in this section, the operational problems are reviewed. Second, it is investigated to what extent the initiative implies benefits for the involved stakeholders. Third, this section identifies and discusses a range of sustainability trade-offs in relation to each affected stakeholder group.

6.2.1 Issues around operational procedures

The underutilisation of the GPU/PCA technology can directly relate to operational problems in the areas of ground handling, ground handling equipment and aircraft air-conditioning. Problems around ground handling are mainly caused by unadjusted business and working contracts and task descriptions as well as health and safety risks. Furthermore, problems with the GPU/PCA equipment, requiring too much time to plug in GP/PCA in particular, are regarded as main problems. As stressed by the airline operations managers it is argued that an airport mandate would contribute to improved operational procedures. At the same time, however, it is argued that the airport company may not fully recognize the operational problems and also the mandate-supporting position of the airline companies. The operational procedures are under the airport's operational control, rather than under the airlines' control. Therefore, in order to address the prevailing problems, the airlines call for an airport mandate.

6.2.2 Nature and allocation of economic and environmental benefits

The GPU/PCA initiative involves a range of different stakeholders and the economic benefits derived from this initiative are allocated between these stakeholders in different ways. This subsection describes the nature of benefits expected. Drawing on these expected benefits, it is described how the benefits are allocated, to the airline companies, to the airport company, and to other important stakeholders.

- **Understanding environmental and economic benefits**

As described in the findings, the GPU/PCA initiative generates financial benefits in terms of direct fuel and maintenance cost savings (mainly for airlines) and reputation (mainly for the airport company). The following discussion highlights, to what extent emission reductions relating to this initiative can yield economic benefits. Given that the IATA emission targets are not well-developed and thus do not impose pressure on companies (in terms of making emission reduction performances comprehensible to the public, or impose penalties for not achieving targets), the fact that the comprehensive EU ETS has not been in place yet, and the limited visibility of the GPU/PCA initiative to customers (with regard to reputational benefits), emissions (isolated from fuel savings) are not perceived to affect companies in financial terms currently. In other words, today there is no market price on the caused GHG emissions. Going further, given the uncertainties of climate change and the managers' lacking comprehension of GHG emissions, it is argued that emissions do not affect the companies beyond financial terms either. Currently, the companies do not attach particular value to GHG emissions.

In future, however, GHG emissions will be increasingly recognised, since an ETS will price the emissions. With emissions having a market price, the companies will incorporate this cost into their decisions. It is assumed that in the longer term, low emission performances of companies in relation to their competitors might become more visible to the public, also due to more mature emission targets. Consequently, stronger reputational pressures with regard to emissions might impose a further price on emissions, which needs to be incorporated by companies. In contrast to the immediate ETS effects, the managers do not perceive longer-term transparency effects today.

- **Influence of GHG emissions**

Regarding the GPU/PCA initiative, the airlines are the only party who will be affected by emissions. The GPU/PCA initiative, as one of their emission reduction initiatives, affects their carbon footprint. Thus, using GPU/PCA influences the airlines' emission targets now and in the long term. Also, the airline companies are subject to the ETS in New Zealand and elsewhere it is in force.

In contrast, the airports' carbon footprint is not affected by the GPU/PCA initiative, and also, the airport is not involved in any ETS (since the airline are the only companies, which are involved in ETS within the aviation sector).

Ground handling companies are responsible only for the service of plugging in. They are neither focused on by the public, nor involved in ETSs. Therefore, GPU/PCA/APU-emission-related issues do arguably neither affect the airport company, nor the ground handling company.

- **Influence of economic factors**

Even though the airlines bear the costs of the GPU/PCA equipment (by paying a charge to the airport company, which initially funded the capital for the equipment), they derive direct and major financial benefits by utilising the technology. Given a basic cost, the more the airlines use the technology, the more they increase their financial benefit, in terms of fuel and maintenance-cost savings. Also, since the airline companies' emissions are subject to external emission targets, and will be priced by ETS, emissions reductions themselves (as provided by the GPU/PCA initiative) will yield further financial benefits in future. Consequently, airline companies have significant drivers for utilising the GPU/PCA technology.

In contrast, the airport rather has an indirect financial driver in terms of corporate reputation. For the airport, it is mainly important for reputational reasons to have the ground power equipment in its asset profile. It is argued that the incentive of increasing utilisation rates is less significant to the airport company, since it does not increase its financial benefit if the airlines utilise it to a stronger extent. Additionally, emission-related aspects with regard to GPU/PCA do not affect the airport. Thus, the pressure for the airport to increase utilisation and introducing a mandate can be seen as relatively low, and the perceived risks regarding a mandate seem to predominate.

It is argued that besides the airline companies and the airport company, other important stakeholders, such as ground handling companies, ground handling agents, and the aircrew do not currently or foreseeably derive benefits from using the GPU/PCA technology. Consequently, the drivers for stronger GPU/PCA utilisation can be regarded as low.

The above described conclusions can be summed up as follows. The benefits of the GPU/PCA initiative are allocated unevenly. The airline companies obviously derive the major share of the benefit, with regard to fuel, maintenance and future emissions savings. Since their economic benefit increases respectively with greater utilisation, they have strong drivers to increase their utilisation rates. In contrast, having GPU/PCA as an asset, the airport company derives benefits in terms of reputation. Since utilisation-based cost savings and emission reductions relate only to the airlines, it is argued that the airport has no significant drivers to increase utilisation rates (and to introduce a mandate). Other stakeholders such as ground handling companies, ground handling agents, and the aircrew do not derive benefits from higher utilisation rates either and thus have no significant driver to increase utilisation rates.

Since the emissions affect only the airline companies' carbon footprint, and the utilisation is mainly beneficial to them the following trade-off analysis is conducted mostly from an airline perspective.

6.2.3 Identified trade-offs

Table 3 provides an overview of the trade-offs identified, in relation the affected stakeholder group. It also reflects the trade-off model by Hahn et al. (2010) in relation to trade-off categories and dimensions.

Expl.	Stakeholder	Trade-off description	Trade-off category	Trade-off dimension
1	AIRLINE	Aircraft with short turnaround times do not use GPU/PCA since it is does not make economic sense.	Organisational trade-off	ENV -ECON
2		Airlines do not use GPU/PCA in airports that charge for the technology more, than it costs to run APUs.	Organisational trade-off	ENV -ECON
3		Airlines would not pay for additional ground handling staff if it did not pay off.	Organisational trade-off	ENV -ECON
4		Airlines would not use GPU/PCA if the cabin temperature was too high, leading to negative effects on corporate reputation.	Organisational trade-off	ENV–ECON

5	AIRPORT	Installing new and more efficient equipment requires extra effort in terms of purchasing and renegotiating with the airlines, but does not yield additional financial benefits.	Organisational trade-off	ENV -ECON
6		The airport perceives a mandate as potentially harmful to working relationships with their airline customers.	Organisational trade-off	ENV–ECON
7		An airport mandate would shift the responsibility for reliable operational procedures to the airport company, which would cause organisational effort for the airport.	Organisational trade-off	ENV -ECON
8	GROUND HANDLING COMPANY	The ground handling companies do not provide sufficient staff since contracts / compensation rates are based on old task descriptions.	Organisational trade-off	ENV-ECON
9		Due to old contracts / compensation rates, the ground handling companies might be reluctant to provide expensive training and education to their staff.	Organisational trade-off	ENV-ECON
10	GROUND HANDLING AGENTS	Having contracts based on old job descriptions / compensation rates, the ground handling agents may be reluctant to make an extra effort.	Individual trade-off	ENV-ECON
11		The ground handling agents are reluctant to plug in GPU/PCA due to health and safety risks.	Individual trade-off	ENV–ECON/SOC
12	AIR CREW	The aircrew has no direct benefit with regard to using GPU/PCA. Using the technology could be rather negative for them with regard to passenger and cleaner complaints about heat, the loss board computer data, as well as additional effort in switching between APU and GPU.	Individual trade-off	ENV–ECON/SOC

Table 3: GPU/PCA initiative related trade-offs (researcher's own table)

The analysis drew on a particular sustainability initiative within an airport company, affecting several parties. Thus, it is not surprising that the identified trade-offs fall into individual trade-off and organisational trade-off categories. In order to avoid additional complexity, the researcher does not divide the twelve identified trade-offs further into process, temporal, and outcome components as described by Hahn et al. (2010).

As above described, airline companies are not willing to overcome trade-offs between the economic and the environmental dimension for the sake of the environment. Examples 1, 2, 3, and 4[3] clearly show that the airlines would not use GPU/PCA if it was not financially beneficial to them. This posture confirms the above-described conclusion, that the companies' business activities are located within the win-win paradigm of sustainability. In other words, the airline companies are not willing to exploit environmental opportunities that are located outside the win-win zone.

Interestingly, given the underutilisation of GPU/PCA, the airlines cannot fully exploit the opportunities within the win-win zone. The airline operations managers highlight that their companies' business activities are hampered in terms of not having operational control over their stakeholders (especially at foreign airports) and thus cannot address operational issues. As examples 5-12 show, the airlines' stakeholders' goals are in some cases not in line with the airlines' goal of utilising GPU/PCA. Arguing that each organisational (and in some interpretations each individual) stakeholder group is subject to the win-win paradigm of sustainability, the researcher concludes that they are interested in satisfying their own economic needs. In some cases these economic needs are contrary to the airlines' economic and environmental needs. Regarding the organisational trade-offs (Examples 5-9), the stakeholder-companies are not willing to effect changes (which would mean additional effort on their part) in favour of the airline companies, without having any additional economic pay-off. Consequently, they are not willing to overcome the trade-offs. Similar conclusions can be drawn for the individual trade-offs (Examples 10-12): Individuals are not willing to make an extra effort, since it a) does not yield additional money and b) involves personal risks. However, it is argued that the classification of trade-off dimensions with relation to individual trade-offs (especially in Example 10 and 12) is difficult. Drawing on Example 10 it could be argued that the ground handling agents are reluctant to plug in GPU/PCA since it requires more physical (and also perhaps more psychological) effort, which relates to social aspects. At the same time, it could be argued that the ground handling agents are not willing to make any extra effort since they do not get financially compensated for it, which relates to financial/economic aspects. Drawing on Example 12 it could be argued that the aircrew is reluctant to use GPU/PCA since switching over between the units requires more psychological effort, or because resulting hot cabins imply potential confrontations with passengers, which have to be managed. Thus, one could ar-

[3] *Example 4 refers to longer-term financial risks related to negative implications on corporate reputation.*

gue that the trade-off relates rather to more social aspects. In contrast, passenger complaints or the loss of board computer information, affecting the whole organisation, could imply employment risks to the aircrew. From their perspective, one could argue that the trade-off relates to more financial aspects in the longer term. Consequently, it is argued that – in contrast to organisational trade-offs – it is difficult to categorise individual trade-offs precisely according to economic, environmental, or social dimensions of sustainability.

The airline operational managers obviously notice that their companies are negatively affected by the low GPU/PCA utilisation rates. They also recognise that poor operational procedures contribute to the low utilisation. It is more difficult for the companies to recognise the reasons that trigger the operational problems, since these reasons are mostly hidden in stakeholder-related trade-off contexts (see Figure 6).

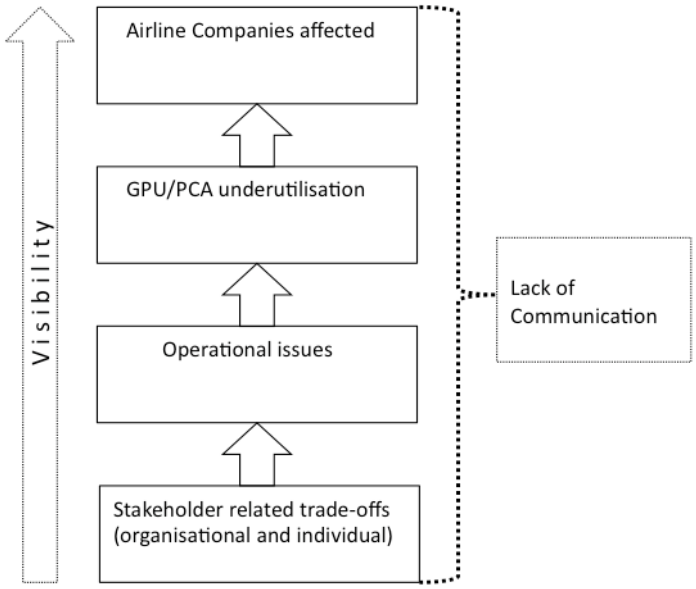

Figure 6: Relationship between stakeholder-related trade-offs and companies' impairment (researcher's own figure)

In lights of stakeholder-related trade-off contexts, the airlines did not state that installing new, and more efficient equipment requires extra effort for the airport company in terms of purchasing and renegotiating with the airlines, instead of yielding additional financial benefits. Furthermore, they do not know that the airport perceives a mandate as potentially harmful with regard to working relationships. Also, they did not mention that the airport

might regard a mandate as negative, since it would shift more responsibilities onto the airport. Similar issues apply to trade-offs related to other stakeholders. Thus,

Hypothesis 6. Visible problems, which affect companies exploiting their environmental and economic opportunities are grounded in (hidden) stakeholder-related trade-offs.

Also, it is argued that, besides economic aspects, in some cases social aspects (e.g. health and safety risks) can hamper environmental improvements (see Example 11). Thus,

Hypothesis 7. Trade-offs can also occur between social and environmental dimensions, but these may be less obvious or common.

Communication and close collaboration, which did not happen effectively, could have created clarity for the airport company in terms of recognising the inadequate operational procedures and the airlines' perceived importance of GPU/PCA use (instead of assuming, the low utilisations stems from the airlines' own choice), and also the airlines' desire for an airport mandate. Also, communication about operational problems could have revealed stakeholder-related trade-offs. If the companies communicated about the operational problems from the outset, utilisation rates could have been increased and, in turn, an airport mandate might have been obsolete.

The weak drivers for the airport company and ground handling companies with regard to an increase in utilisation rates might explain why there was no communication from their sides. It is not fully clear why the airline companies did not push for stakeholder communication. A reason might be that they did not fully recognise issues related to particular airports, due to patchy measurements, which target only overall fleets instead of airport-related utilisation rates. Thus,

Hypothesis 8. Communication can potentially reveal stakeholder-related trade-offs.

It is assumed that close communication between the stakeholders could have generated transparency about operational issues as well as the underlying stakeholder-related trade-offs. Transparency around all issues, however, could reveal high costs to be incurred in

order to address the problems. Consequently, it could be argued that these issues could be resolved financially. However, as Subsection 2.1.2 shows, companies are reluctant to invest under uncertain conditions, given additional adjustment costs. Also, in light of additional costs the win-win paradigm can be put into play once again. In relation to the organisational trade-off examples 2 and 3, it is argued that only if it makes economic sense for the airline companies to pay for the underlying problems, would the problems be addressed. Moreover, beyond organisational trade-offs, individual trade-offs are involved. Firstly, additional investments can be risky for managers. Secondly, as argued by the managers, it is hard to change the problems that are related to underlying human behaviour. Consequently, operational changes will only be achieved if individuals cooperate (see individual trade-off examples 10, and 12). Thus,

Hypothesis 9. Incentives to stakeholders can resolve stakeholder-related trade-offs

The above described conclusions can be summed up as follows. It is found that the underutilisation is caused by poor operational procedures. The airline companies' stakeholders mostly control these operational procedures. However, since their financial benefit with regard to the resolution of the issues is low, the drivers to effect changes are arguably weak. Hence, it is concluded that stakeholder related trade-offs hamper the airline companies in exploiting GPU/PCA utilisation related benefits. Communication between stakeholders could have created transparency about the operational problems and the trade-offs. Also, communication might have revealed financial costs in addressing the trade-offs. These costs in turn might imply additional (organisational, economic vs. environmental) trade-offs by the airline companies. Organisational trade-offs can be clearly classified according to economic/social and environmental dimensions, and (if they involve the economic dimension,) they can often be resolved by financial expenditures. However, in contrast to organisational trade-offs, individual trade-offs are more difficult to specify and linked to that, the resolution of these trade-offs might be more complex, since they require the difficult task of changing human behaviour.

6.3 Chapter summary

Although the interviewed managers regard their companies as proactive with regard to the environment, they draw on the notion of weak sustainability, with their companies not willing to internalise many of their caused social costs. Consequently, the dissertation clearly confirms the argument that the companies are located within the limits of the win-win paradigm, reinforced by competitive pressures. According to Hahn et al. (2010, p. 226) research should "undertake the task of working out the principles and guidelines for managing trade-offs". Following this call, the dissertation initially revealed a range of organisational and individual trade-offs, which have a negative influence on the utilisation of GPU/PCA and respectively contribute to more GHG emissions. Airline-related trade-offs limit the airline companies within the win-win paradigm of sustainability. As the dissertation shows, it is important to examine trade-offs not just from an individual company perspective (e.g. the airport or airline perspective), but to broaden the perspective with regard to stakeholders. As highlighted, operational problems are the main reason for the underutilisation of GPU/PCA. Operational problems are visible and effectively trigger the issues of underutilisation. However, the operational problems might only be the visible trigger for the underutilisation. It is argued that the visible operational issues in turn are triggered by a range of stakeholders who act according to their own win-win paradigm restricted interests and benefits. Since the utilisation of GPU/PCA is not principally in the stakeholders' interest, it can be related to trade-offs. Having no pay-off, stakeholders are not willing to improve the procedures. Moreover, due to a lack of communication, the stakeholders may not even recognize the operational issues. It has been noted that the improvement of the operational procedures might require some financial commitment by the airline companies. Given that they operate within the limits of the win-win paradigm, not being prepared to resolve their own and their stakeholders' organizational trade-offs (due to associated costs and debatable benefits), it is questionable to what extent the airline companies are willing to pay for the improvement of operational procedures. This situation arises due to environmental uncertainties. In light of operational changes, individual trade-offs probably play a role, too. As argued in this chapter, individual trade-offs can be more difficult to specify and to resolve than organisational trade-offs.

Overall, it has been found that the win-win zone for airline companies is large, since fuel efficiency effectively pays off. Thus, there could be some scope for financial compensation

of stakeholders. Ongoing competitive pressure encourages companies to increasingly exploit opportunities within the win-win zone. Also, since the win-win zone will likely expand in the future, fuel savings could become more attractive. All these factors could contribute to stronger commitments and efforts regarding the utilisation of GPU/PCA (including communication as well as stakeholder commitment and compensation).

Chapter 7 Conclusion

7.1 Introduction

This dissertation investigated, inductively, how individual and institutional logic respond to the issue of climate change, drawing on a specific, airport-related sustainability initiative. Qualitative data derived from in-depth interviews were analysed thematically. The findings were discussed in relation to academic literature around the concept of sustainability, climate change in the business context, and information on the aviation industry context. As discussed in this chapter, the research was intended to make a contribution to practice, helping operational managers understand issues around the GPU/PCA initiative. Also, the research was intended to contribute to environmental management theory, investigating the win-win paradigm from an applied perspective, and analysing trade-offs in relation to the trade-off-model by Hahn et al. (2010). The chapter also discusses limitations of the dissertation and concludes with directions for future research.

7.2 Contribution to practice

The airline companies' goal is to increase the utilisation of GPU/PCA, since the use of GPU/PCA is linked to significant financial benefits. The contribution to practice points at issues that need to be addressed with regard to the goal of increasing the GPU/PCA utilisation. It is found that the underutilisation is mainly caused by stakeholder-related operational problems around ground handling procedures, GPU/PCA equipment, and aircraft air-conditioning. These problems have not been addressed due to a lack of communication with stakeholders. Poor utilisation measurements and problem recognition might explain the lack of communication. Hence, the airline companies are recommended to consider implementing airport-related GPU/PCA/APU measuring instruments. Such instruments would highlight utilisation rates per airport and potential utilisation-related lost profits. Consequently, problems would be easily recognised and could also be specifically addressed. Well-aimed communication to the airlines' stakeholders, such as the airport company, ground handling companies, and aircrew, would (1) allow the stakeholders to recognise the relevance of GPU/PCA use for the airlines, (2) highlight the airlines' expectations

from the particular stakeholder group, (3) inform the stakeholders about their shortcomings, and also (4) inform the airline companies about the reasons for these shortcomings. The stakeholders' drivers for effecting changes in operational procedures are arguably low, since they do not actually generate any benefit from it. Consequently, the airline companies, as the major major beneficiary, are suggested to carefully reflect upon the provision of incentives to the described stakeholders.

7.3 Contribution to theory

With regard to the research question, "how do operational managers make sense around trade-offs related to sustainability?", this dissertation provides a contribution to theory in two respects, namely (1) in terms of the "win-win paradigm of sustainability", and (2) in terms of sustainability-related trade-offs.

First, companies are found to be trapped within the limits of the win-win paradigm of sustainability, especially in relation to internally oriented initiatives. Externally oriented initiatives are regarded as more visible to the public and other stakeholders. Drawing on long-term pay offs in terms of corporate reputation, these sorts of initiatives are carried out even though they are cost-ineffective in the short term. It is found furthermore that specifics of a particular industry are likely to determine the scope of the win-win zone for companies, and respectively the potential of contributions to less unsustainable business practices. The findings also show that competitive forces reinforce the boundaries of the win-win paradigm. Lastly, given that emissions can increasingly be related to actual monetary costs, the dissertation argues that the win-win zone will likely expand in future.

Second, the dissertation finds that visible problems, which affect companies in exploiting their environmental and economic opportunities, are grounded in the hidden context of stakeholder-related trade-offs. These trade-offs can be revealed by communication with stakeholders. In order to resolve stakeholder-related trade-offs, it might be necessary to provide incentives to particular stakeholders.

7.4 Limitations of the dissertation

First, a logical limitation within the dissertation is acknowledged. The dissertation argues that companies cannot exploit all opportunities within the win-win zone. Obviously this argument is based on the premise that the opportunities that cannot be exploited are actually located within the win-win opportunity. However, a little later in the dissertation, it is acknowledged that the resolution of trade-offs might require financial expenditures. Hence, these financial expenditures could have been incorporated from the outset, implying that a small share of the opportunities (which initially were assumed to be part of the win-win zone), in fact lie outside the win-win zone. Consequently, it could be argued that not all of GPU/PCA utilisation related opportunities are located within the airlines' sustainability win-win zone. In order to reduce the complexity of the discussion, this logic has not been incorporated into the dissertation.

Second, within the conclusions, a conceptual limitation is acknowledged. The dissertation is based on a "snapshot-view", which means the interviewees could share their GPU/PCA-related experience up to the present day. Consequently, problems such as operational issues could be clearly identified since they actually "exist" in some form. The identified problems were not yet resolved. The dissertation provides suggestions on how to resolve certain issues. These suggestions are subject to the nature of the underlying problems, the managers' opinions as recorded and reported, and the researchers' conclusions, and should thus not be regarded as a indisputable fact.

Third, it is acknowledged that the dissertation involves a range of methodological limitations. In some (albeit few) situations, the researcher recognised responses as potentially biased by a concern for corporate reputation. Arguably, there is some imbalance between the interviews. Auckland Airport constitutes the home airport of one of the airline companies whose operational manager was interviewed. It is argued that the manager of this company is more familiar with actual airport-related GPU/PCA issues. Consequently, he has contributed to the collected information to a possibly stronger extent than the other airline managers. Furthermore, due to large geographic distances, two interviews with airline managers were conducted by telephone. These conditions lead to slightly restricted interview durations and scope. Also, it has to be acknowledged that the dissertation refers to a specific initiative within a specific situation within in a specific industry. These specifics

evidently affect the generalisations of the findings. Lastly, the conclusions are drawn by interpreting the operational managers' statements. Reflecting the underlying research approach, the research might include potential biases.

7.5 Directions for future research

The dissertation confirmed the argument that companies are subject to the win-win paradigm of sustainability. Thus, conclusions drawn in this dissertation mostly reflect issues within this paradigm. The conclusions open up some interesting pathways for future research.

First, it is claimed that companies risk losses in terms of externally oriented, visible sustainability initiatives (and therefore risk passing the win-win zone limits). Therefore, it would be interesting to shed more light on internal and external sustainability initiatives, and investigating the role of visibility in determining which potential sustainability initiatives are enacted in particular contexts.

Second, as argued, industry specifics determine the scope of the win-win paradigm. The investigation and comparison of win-win zones between different industries might provide valuable applied and theoretical insights.

Third, it is concluded that competition reinforces the boundaries of the win-win paradigm. Knowing more about the factors, which keep companies within the limited perspective of the win-win paradigm could be the first step to address how the boundaries might be extended.

Fourth, the dissertation claims that the win-win zone will likely expand in the future, since emissions will be increasingly related to actual monetary costs. Focusing on the process of relating dollars to emissions could constitute an effective sustainability pathway for researchers, public policy makers and environmental NGOs.

Fifth, as found in the dissertation, communication between stakeholders can reveal stakeholder-related trade-offs. However, no communication happens since parties do not see potential benefits with regard to communication, and also because problems that could be

communicated are not recognised. Assessing reasons for poor stakeholder communication would be the first step to address stakeholder-related trade-offs.

The suggested future research areas mainly focus on areas within the win-win paradigm. Given that the prevailing win-win paradigm restricted business practice is far away from what is required to achieve ecological sustainability, the value of these suggestions might appear limited. However, the fact that the paradigm in practice cannot just be "wiped away", might critically challenge theory in terms of going beyond the paradigm. A theory, which actually helps companies to overcome the win-win paradigm of sustainability would be groundbreaking but appears rather unlikely to be developed by management scholars. Reflecting on entrepreneurship theories, the researcher wonders whether a solution for overcoming the win-win paradigm might rather be a random and unplanned "lucky shot". Consequently, it is argued that research first must accept the realities and second make the best within the realms of possibility. In general terms, research could for example contribute to theories with regard to the exploitation of win-win opportunities, promoting stricter regulations, or pushing for an accelerated change in values towards the notion of strong sustainability.

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