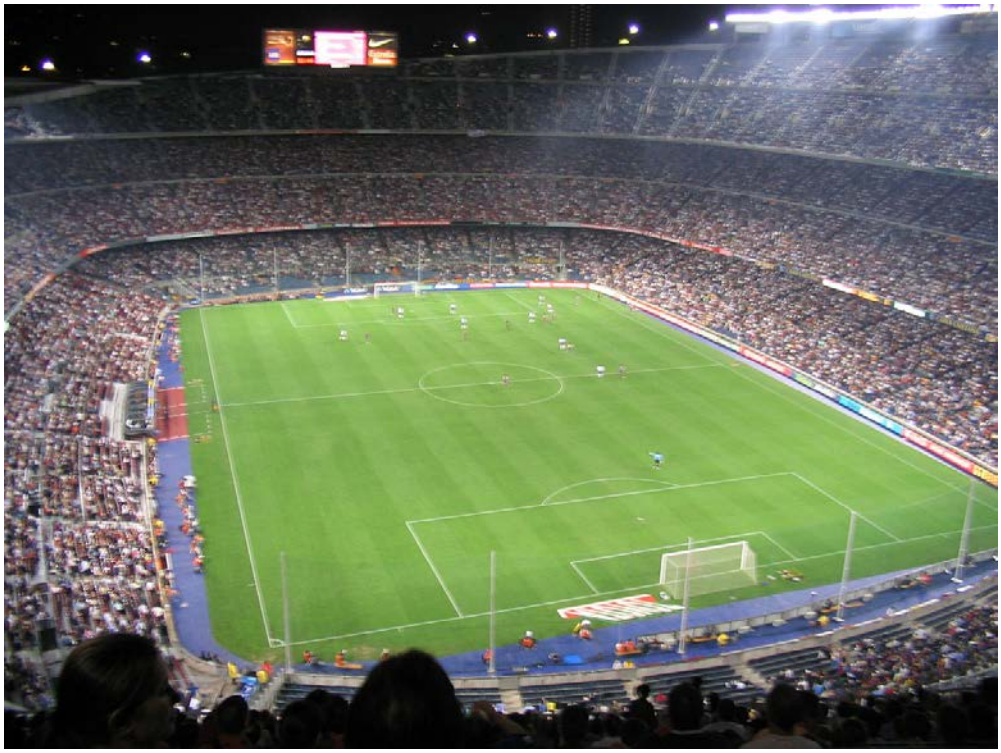

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Playing the Carbon Game:
A Study of Climate Change Impacts and Responses at Organisations Managing Major Australian Sport Stadia

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*An example of a major sport stadium albeit one from outside Australia. Blogspot.com. *The Nou Camp Stadium*. Retrieved from: http://2.bp.blogspot.com/_f06zQ7HHIQU/S7W8B7S_r2I/AAAAAAAAAbE/VXmCP-1imp8/s1600/nou-camp-stadium.jpgf

Abstract

This study aimed to answer three research questions: (1) What, if any, issues are posed by the phenomenon of anthropogenic climate change for major Australian sport stadia (MASS) and the organisations that manage them?; (2) How are the organisations that manage major Australian sport stadia responding to climate change?, and; (3) Why are the organisations that manage major Australian sport stadia responding to climate change in the way they do? Although previous management and sport management research have examined a range of environmental and some climate change issues, there has not been a study of the implications of climate change for major sport stadia – or the organisations that manage them – in Australia, or overseas. Although some management studies have identified climate change specifically as an important problem, little attention has been paid to its physical impacts on sport, and none have considered potential impacts on major sport stadia, or the regulatory and commercial impacts on the organisations that manage them. Equally, few previous studies have examined how sport organisations interpret climate change, contribute to it by way of the direct or indirect generation of greenhouse gas emissions, or respond to its various impacts.

In response to calls by various sport management scholars for "sport specific" theory development, this knowledge gap was addressed by applying Cepeda & Martin's (2005) qualitative method for theory development from case studies. This inductive method uses a four-stage process of research planning, data collection, data analysis, and critical analysis to develop an iterative conceptual framework that in this study responds to the three research questions. The conceptual framework was inductively developed from the units of analysis/case studies for this study – the organisations that manage major Australian sport stadia – and this enabled insights into the implications for their management of climate change issues. The twelve case study organisations were chosen using a two-stage "purposeful sampling" approach involving both selective and theoretical samples, with data collected using "focused" (in-depth) interviews, documents, and direct observations. Reliability of the data was achieved by using a case study protocol, checking data sample congruence with the research questions, and coding checks. The data was analysed using within-case, and cross-case analysis where coding was used as a basis for major theme identification. External validity was achieved through the multiple case research design, thick description, and cross-case analysis, while internal validity was achieved by developing a rationale for each iteration of the conceptual framework.

The results showed that while climate change was not the primary management issue for the twelve cases, three major issues were consistently evident: (1) the management of water and (2) energy resource inputs, and (3) waste outputs. Other issues evident were organisational uncertainty about climate change, some limited vulnerability to the physical impacts of climate change, and increased operating costs that were largely a consequence of indirect climate change-related regulatory changes. The results also highlighted the existence of barriers to more holistic and integrated organisational responses, key internal and external influences on these responses, and some evidence that individual manager agency was critical to responses in some cases.

Student Declaration

I, Greg Dingle, declare that the PhD thesis titled, Playing the Carbon Game: A Study of Climate Change Impacts and Responses at Organisations Managing Major Australian Sport Stadia, is no more than 100,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

Signed Date

Acknowledgements

This thesis is dedicated to my parents, Stan Dingle (dec.) and Wilga "Nan(ette)" Pearson (dec.), who wanted a better life for me and who saw a university education as the means to that end. I thank them for their unconditional love, support and inspiration.

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List of Publications

No publications form part of this thesis. However, the following works were accepted for publication during candidature and are relevant to this thesis:

McDonald, K., Stewart, B. & Dingle, G. (2014). Managing multi-purpose leisure facilities in a time of climate change. *Managing Leisure*. *19*(3), 212-225.

McDonald, K., Dingle, G., & Stewart, B. (2011). In the deep end: A study of how and why aquatic facilities in Melbourne respond to climate change. In M. Burke, C. Hanlon & C. Thomen (Eds.), *Sport, Culture and Society: Approaches, Methods and Perspectives*, Melbourne: Maribyrong Press, 89-106.

Dingle, G. (2010). Climate change, sport and management research: A review. In B. Stewart (Ed.), *Research Digest*, *1*(1), Melbourne: Victoria University Sport and Culture Group, 6-10.

Dingle, G. (2009). Sustaining the race: A review of literature pertaining to the environmental sustainability of motorsport. *International Journal of Sport Marketing and Sponsorship*, *11*(1), 80-96.

Dingle, G. (2007). Sport in a carbon-constrained twenty-first century. *Bulletin of Sport and Culture*, (27), 3-10.

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Abbreviations

ABBREVIATION	FULL TITLE
AAS	Australian Academy of Science
ACC	Australian Climate Commission
ACCA	Australian Climate Change Authority
ACER	Australian Clean Energy Regulator
AFL	Australian Football League
AGO	Australian Greenhouse Office
APC	Australian Productivity Commission
APPCDC	Asia-Pacific Partnership on Clean Development and Climate
ASC	Australian Sports Commission
BEED	Building Energy Efficiency Disclosure Act (2010)
BOM	Australian Bureau of Meteorology
CEPAARB	California Environment Protection Agency Air Resources Board
CC	Climate Change
CO_2	Carbon Dioxide
CO_2-e	Carbon Dioxide equivalent
CoTEC	Commission of the European Communities
CPRS	Australian Carbon Pollution Reduction Scheme
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CF1	Conceptual Framework 1
CF2	Conceptual Framework 2
CSR	Corporate Social Responsibility
DCCEE	Australian Department of Climate Change and Energy Efficiency
ETS	Emissions Trading Scheme
GEO-5	Global Environment Outlook-5 report
GHG	Greenhouse Gases
IPCC	Intergovernmental Panel on Climate Change
IT	Institutional Theory
IEA	International Energy Agency
Kt	Kilotonnes (a measure of greenhouse gas emissions)
LEED	Leadership in Energy and Environmental Design
LEPID	Liable Entities Public Information Database
MASS	Major Australian Sport Stadia
MDC	Massive Discontinuous Change

MO	The Met Office (United Kingdom national weather service)
MPCCC	Multi-Party Climate Change Committee of the Australian Parliament
MRET	Mandatory Renewable Energy Target
NABERS	National Australian Built Environment Rating System
NCCARF	Australian National Climate Change Adaptation Research Facility
NGER	National Greenhouse and Energy Reporting Act (2007)
OECD	Organisation for Economic Cooperation and Development
PEP	Punctuated Equilibrium Paradigm
PPP	Polluter Pays Principle
QLDG	Queensland Government
RBT	Resource-Based Theory
RBV	Resource-Based View theory
RET	Renewable Energy Target
SWDS	Solid Waste Disposal Sites
SCM	Supply Chain Management theory
ST	Stakeholder Theory
SRT	Sport and Recreation Tasmania
SRV	Sport and Recreation Victoria
10/3 Climate Change Framework	The 10-factor, 3-response Climate Change Framework for MASS Organisations
TJ	Terrajoules (a measure of energy)
UN	United Nations
UNCCS	United Nations Climate Change Secretariat
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
UNEP	United Nations Environment Programme
USEPA	United States Environment Protection Agency
VCCCAR	Victorian Centre for Climate Change Adaptation Research
VEPA	Victorian Environment Protection Authority
WADSR	Western Australia Department of Sport and Recreation
WEMP	Water Efficiency Management Plan
WMO	World Meteorological Organisation

Preface – Thesis Structure and Formatting

The chapters of this thesis are organised in the following way. The thesis consists of four sections: Section A – which consists of Chapter One – is the *introduction*. Section B – comprising chapters Two and Three – outlines the *background* to the study. In Chapter Two, literature is reviewed from a range of disciplines pertaining to the issue of climate change, including literature documenting the science of climate change, while in Chapter Three, a review of the major theoretical perspectives that are relevant to the organisational impacts of and responses to climate change are presented.

Section C – comprising chapters Four and Five of the thesis – is an *account of my Ph.D. research*: Chapter Four sets out the research design, paradigmatic context, methodology and method, and offers an overview of the significance of sport, sport stadia and the sport stadium industry in Australia. In Chapter Five, the results of the data analysis are presented, including the major themes evident in the data.

Section D – comprising chapters Six and Seven – is a *synthesis* of the study: Chapter Six offers an interpretation of the data in light of previous knowledge, and discusses the implications for theory, while in Chapter Seven, conclusions are presented, the main contributions of the study are articulated, limitations of the study discussed, and avenues of further research are highlighted.

The reader of this thesis should also note that this thesis uses APA (6^{th} edition) referencing method. This is consistent with the referencing requirements of most management, and sport management, journals that are relevant to this research study.

Furthermore, the phrases “major Australian sport stadia”, and “greenhouse gases” are both used extensively in this thesis – by necessity. Therefore in order to enhance the readability of this thesis, the acronym “MASS” is used in place of the phrase “major Australian sport stadia”, while the acronym “GHG” is used in place of “greenhouse gases”, as appropriate. Other key terms and their abbreviations are defined in the “Abbreviations” table immediately preceding this preface.

Finally, italics have been used in the text at different times to *emphasise* certain key terms or concepts. Italics have also been used in the text when referring to publication titles, as is appropriate for the APA referencing method.

Chapter One: Introduction

This thesis is an account of a Ph.D. study investigating the impacts of, and responses to, climate change at organisations who manage major Australian sport stadia (MASS). More specifically, it articulates *what* issues are posed by climate change for MASS and their organisations, and *how* and *why* these organisations have responded to these issues. Major sport stadia, both globally and in Australia, are significant facilities for economic and cultural reasons, and are now important for their environmental impact, and so are worthy of scholarly investigation. The aims of this chapter are to introduce the background to the study, the research problem, the aims of the study, the research questions, the major contributions and limitations of the study, and some key terms that are frequently used.

Background to the study

Since the 1990s, climate change – defined by Pittock (2009, p. 2) as "changes in the behaviour of weather over longer time scales, such as one century to another..." – has become a problem of global importance. This is reflected in evidence of environmental damage (DCCEE, 2011c; IPCC, 2007a; Rockström et al., 2009; UNEP, 2007), implications for economic activity (Stern & Treasury, 2006) and in political responses (DCCEE, 2011b, 2011g, 2011j; UNFCCC, 2011a, 2011b) to the threats and opportunities that it poses.

Climate change is one of the most important issues facing governments, industry, and civil society around the world in the 21st century with environmental, market, moral and socio-political dimensions (Okereke, Wittneben, & Bowen, 2012, pp. 10, 14). For example, climate change has become a major problem for business due to its financial impact and the unpredictability of increasingly frequent natural disasters (Haigh & Griffiths, 2009; Mills, Lecomte, & Peara, 2002; Stern & Treasury, 2006). Its implications are evident in the growth of legislative and policy responses by governments, and in the emergence of new markets for products associated with the mitigation of greenhouse gas (GHG) emissions (Newell, Pizer, & Raimi, 2013) that lie at the centre of its causation. Its significance has increased with the accumulation of evidence of the role of human and industrial activity in changing the Earth's climate beyond that which occurs naturally (IPCC, 2007a; Pittock, 2006, 2009; UNEP, 2007).

Despite the extended global debate that has occurred about the accuracy and legitimacy of climate science[1], in recent years, a scientific consensus about anthropogenic (i.e. human-caused) climate change has emerged (Killeen, Otto-Bliesner, & Prather, 2008) to underpin the economic, social and

[1] The matter of climate change scepticism will be addressed later in Chapter One.

political responses that have followed. This has resulted in a growing acceptance by organisations of the need to be informed about climate change, to identify relevant risks and opportunities, and if necessary, adapt the way they operate. This awareness is now reflected in the growing management literature about how organisations have, or can, respond to the issue (Haigh & Griffiths, 2009; Hoffman, 2005b, 2007a; C. A. Jones & Levy, 2007; Linnenluecke, Griffiths, & Winn, 2011, 2013; Okereke et al., 2012; Pinkse & Kolk, 2007; Porter & Reinhardt, 2007).

The research problem

Sport is important in Australia and globally. As Meenaghan & O'Sullivan (1999, p. 242) remind us, sport has the potential to, "speak a universal language and capture the interest of people across all political and cultural boundaries." Sport is also a largely outdoor and climate-dependent industry. Most sports rely, to varying degrees, on a stable climate. From snow-based ones such as skiing and ice hockey, to winter sports such as the various football codes, to summer sports such as tennis, golf and cricket, sport depends on a climate that supplies the necessary environmental conditions for sporting activities such as appropriate temperatures, winds, rainfall, snowfall, and humidity. Sport's reliance on a stable climate that is able to provide such conditions, is problematic in a period where as previously indicated, global climate is changing. However despite its importance, no research has been reported into *what* – if any – impacts climate change has on sport organisations, or *how* and *why* such organisations might respond to climate change. This *knowledge gap* stands in stark contrast with the growing range of literature examining how non-sport organisations are impacted by, and respond to, climate change. This lack of empirical research is surprising given the historical, cultural and commercial significance of sport in Australia, especially elite sport. This gap in our knowledge represents a significant *research problem* to which this study responds.

The rationale for this study is clear. First, the sport industry is globally important. Sport is a commodity (Real, 1996) that crosses language and national boundaries (Miller, Lawrence, McKay, & Rowe, 2001, p. 1; Wolfe, Meenaghan, & O'Sullivan, 2002) where international competitions such as the Olympic Games and the FIFA World Cup dominate media attention, and are prime sites for celebrating and demonstrating national prowess. Widespread media coverage of these events generate vast spectator attendances and media audiences around the world (Nicholson, Kerr, & Sherwood, 2015), which in turn create vast advertising and sponsorship revenues. Zygband & Collignon (2011) valued this global sport industry at between $US480-620 billion. This sport-media-industrial "complex" is global, corporatised, institutionalised and homogenised in nature (Maguire, 1999, pp. 145-175; 2005, pp. 159-176). While sport is just one sphere of a society in a globalised world, it is also a unique institution (CoTEC, 2007; Crosset & Hums, 2012; EC, 2000; Foster, Greyser, & Walsh, 2006; Hoye & Cuskelly, 2007; Hoye, Nicholson, & Smith, 2008; A. Smith & Stewart, 2010; Stewart & Smith, 1999) with idiosyncratic organisational structures linked to the historical origins of sport

(Szymanski, 2009). Smith & Stewart (2010; 1999) underline the uniqueness of sport, identifying no less than ten features that distinguish it from non-sport business and mark it as "special", which in turn requires specific forms of management and management education (Crosset & Hums, 2012, p. 20).

Second, sport also occupies a pivotal place in Australian culture. It is important in Australia for historical reasons (Cashman, 1995, 2010; Vamplew & Stoddart, 1994), for its role in our social and political structures (Stewart, Nicholson, Smith, & Westerbeek, 2004, p. 84), and for its role in communicating national identity (Cashman, 1995; Hutchins, 2002; Maguire, 1999, 2000). Sport also makes a valuable economic contribution to Australia (Cashman, 1995, pp. 187-204) that on the latest available data was valued at over $AUS8 billion per annum (ABS, 2006), employing nearly 95,000 people (ABS, 2011) and 2.3 million volunteers (ABS, 2012). As a consequence, Australian sport is supported by significant infrastructure for both elite and community participation.

The research problem was also worth investigating for other reasons. First, while different theoretical explanations have been used to account for how non-sport organisations are impacted by – and respond – to climate change, these theoretical perspectives have not been applied to the impacts and responses to climate change for organisations in the sport sector. Second, given sport's historical, social and economic significance both globally and in Australia, major sport stadia are examples of what may be called "iconic architecture" (Horne, 2011; Sklair, 2005) – "spaces with special symbolic/aesthetic significance" – which are important symbols of a nation's economic power. Such stadia are important public places that attract the interest and involvement of institutions such as the media, business and government, as well as that of the thousands of ordinary citizens who attend them as spectators and we ought to know more about what climate change means for them and the organisations that manage them. Third, the symbolic importance of these stadia also offer an opportunity to eventually communicate to wider audiences some strategies for effective organisational responses to climate change. Fourth, the study is warranted because it offers the opportunity to break new theoretical ground through the intersection of climate science, organisational economics, management theory and these energy-intensive major stadia – a field that has not previously been the subject of empirical investigation. Finally, the research problem represents an opportunity to develop the theory and practice of sport management in light of changing environmental, economic and regulatory conditions associated with climate change.

Aims of the research

The aim of this study then was to address this knowledge gap by investigating a sample of Australian organisations whose primary purpose is to stage major sporting competitions and events at major sport stadiums. Thus, the study investigated the responses to climate change from twelve

organisations that manage fifteen of Australia's major sport stadia. The *general aim* of the research was to develop theory that explains the nature of climate change impacts on these organisations, and the manner of – and reasons for – the responses of these organisations to an emerging physical, economic and regulatory environment in which the unrestrained emission of GHG's is inconsistent with the scientific consensus on contemporary climate change.

Within the general aim of the research, four *specific aims* were pursued: (1) to identify *what*, if any, climate change impacts exist for major Australian sport stadia and the organisations that manage them; (2) to identify *how* these organisations *respond* to climate change; (3) to reveal the reasons *why* the organisations that manage these stadia respond to climate change the way they do, and; (4) to *compare* and *contrast* their responses to the other stadia organisations under investigation.

Research questions

To achieve the stated research aims, the following research questions were used to guide this study:

1. *What*, if any, issues are posed by climate change for major Australian sport stadia and the organisations that manage them?
2. *How* are the organisations that manage major Australian sport stadia responding to climate change?
3. *Why* are the organisations that manage major Australian sport stadia responding to climate change in the way they do?

In addition to these three research questions, there are four specifying questions (SQ):

1. (SQ1) How do organisations that manage major Australian sport stadia *interpret* climate change?
2. (SQ2) What, if any, GHG mitigation and/or climate change *adaptation responses*, are being employed at major Australian sport stadia?
3. (SQ3) How do such responses *compare* to those of other organisations managing major Australian sport stadia?
4. (SQ4) What, if any, factors are *barriers* to these responses?

Contribution to knowledge

The study is an original contribution to knowledge, and in particular, the discipline of sport management. It goes *further than other research* in three ways. First, because it takes into account how and why major sport venues respond in a situation of emerging "carbon constraint" (Goldmark & Von Weizsäcker, 2007; Stern & Treasury, 2006): the emerging physical, economic and regulatory context where the unrestrained emission of GHG's is increasingly difficult to justify. Second, it inductively builds theory from organisational case studies to explain their responses. The researcher chose this theory-building-from-cases approach for this study, and rejected a *theory testing* approach,

for four reasons: (a) existing research does not address the research questions of this study (Eisenhardt & Graebner, 2007, p. 26). While existing non-sport literature addresses similar research questions for non-sport organisations, it is inadequate theoretically because it does not consider the, "distinct and special features which make sport a unique institution" (A. Smith & Stewart, 2010; Stewart & Smith, 1999). These features may shape the response of the organisations managing MASS to climate change, and influence how, "theories, principles, and strategies are applied by sport managers" (Hoye et al., 2008); (b) *how* and *why* research questions are better suited to theory-building than theory testing (Edmondson & McManus, 2007; Eisenhardt & Graebner, 2007, pp. 26-27); (c) because of its capacity for methodological rigour (Eisenhardt & Graebner, 2007, p. 26), and; (d) because it is appropriate to topics in the early stages of research (Eisenhardt, 1989b, p. 548), such as the responses of sport organisations generally to climate change, and stadia specifically.

Third, this study goes beyond existing research because it contemplates these sport organisations from two viewpoints articulated by Porter & Kramer (2006) and Porter & Reinhardt (2007): (1) the "outside-in" view of the potential impacts from climate change (i.e. the "outside") on MASS and their organisations (i.e. the "in"), and; (2) the "inside-out" view of the potential contribution of MASS and their organisations (the "inside") to the global problem of climate change (the "out"). Fourth, by examining major Australian sport stadia, the study will lead to a better understanding of the types of *strategies* that are, or could, be used by organisations to respond to climate change in different sport settings.

Limitations of this study

Given the constraints of a Ph.D. in terms of timeframe, word limit, and available resources, the *scope* of the study is limited to that which is manageable within these constraints. As a result, the scope of the study was limited in four ways. First, the study is limited to *research questions* concerned with the nature of climate change impacts on these organisations and their stadia, and the method of – and reasons for – their organisational responses to climate change. As a result, the study is not concerned with quantitative questions such as "how much?" or "how often?." Second, the *human participants* to the study were limited to the population of company executives and senior to middle-level managers at the twelve organisation cases. Third, the study is limited to *stadia* that are mainly concerned with playing elite-level cricket and football including Australian Rules, Rugby Union and Rugby League and soccer. The study does not extend to stadia used for significant sports such as swimming, tennis, motor racing or horse racing. Finally, the study is also limited *geographically* to Australian capital cities where the organisations operating these major sport stadia are located. It is beyond the scope of this study to examine organisational responses to climate change in geographic areas outside of Australia, or institutional contexts such as other non-sport industries.

Key terms and organisations

There are a number of key terms that are relevant to the study. Firstly, the organisations that own and/or manage the MASS comprise the *study population* for this project. The actual names of these organisations, and their managers who were interviewed for the study, are not identified in this thesis as they participated on the basis of anonymity. To protect their identity, and ensure ethical treatment of the participants, these organisations are instead referred to by their pseudonyms devised by the researcher such as, "Organisation A", "Organisation B", and "Organisation C", and so on. Similarly, the managers who were interviewed for the study are referred to by their pseudonyms devised by the researcher such as, "Manager A1", "Manager A2", "Manager B1", "Manager B2", and so on. The organisations that own and/or manage the MASS examined in this study, however, include three types of organisations. These are (1) public-sector, not-for-profit statutory authorities who are both proprietors and managers of their stadia, (2) membership-based, not-for-profit organisations who are both proprietors and managers of their respective stadia, and (3) privately-owned, for-profit stadia managers and proprietors.

In addition, there are five other key terms that require definition. First, a widely-recognised, three-part definition of *sport* is used. That is, sport is any human activity that is: (1) competitive; (2) physical, and; (3) structured according to rules or laws (Guttman, 1978; Nicholson et al., 2015, p. 4). Second, this thesis adopts the Oxford English Dictionary definition of *stadia*. That is, a stadium (the singular form) is, "an athletic or sports ground with tiers of seats for spectators" ("Stadium," 2014). "Stadia", the term used most often in this thesis, is simply the plural form of "stadium" Third, the definition of *MASS* – the aforementioned "Major Australian Sport Stadia" – was devised by the author of this thesis and is based on three criteria: (1) venues designed to stage major sport events; (2) major sport offered by each stadium is sport played at the "elite" (Nicholson et al., 2015, p. 5) /"professional" level (Stewart et al., 2004, pp. 19-20), and; (3) are large scale venues with a seating capacity of 25,000 spectators or more. A more detailed discussion of how this definition was developed is offered in Chapter Five of this thesis pertaining to this study's research design.

Fourth, for the purposes of this thesis, the author has adopted a definition of *climate change* used by the Intergovernmental Panel on Climate Change (IPCC). That is, "any change in climate over time, whether due to natural variability or as a result of human activity" (IPCC, 2007a, p. 2). This definition is used because the IPCC is widely recognised as the world's most authoritative voice on this subject. Finally, the term "*response*" is a concept that originates in climate science literature of the early 1990's, and which was subsequently adopted in organisational management literature pertaining to climate change. It is used in this thesis in its broadest sense. That is, organisational responses to the issue of climate change can range anywhere from the "defensive", to "opportunistic/hesitant" (Ihlen, 2009, p. 246) or "adaptive" ones (Linnenluecke & Griffiths, 2010a), with significant proactive

organisational changes according to climate change-related risks or opportunities (Lash & Wellington, 2007), to ones where the issue is ignored.

Conclusion

The central concerns of this study are the *impacts* of climate change on major Australian sport stadia and the organisations that manage them, and *how* and *why* these organisations respond to this phenomenon. This study is significant because it is the first attempt to interpret and understand the nature of potential impacts of climate change for these organisations, and the influences that shape their responses to it. This study is situated within broader management research – and specifically within sport management work – that seeks to depict and explain the changes that are occurring in organisations in response to this critical environmental, economic and political issue. This thesis now turns to Section B where the background to this study is presented. Section B of the thesis begins with Chapter Two where a review of the key literature that is relevant to the research questions is presented.

Chapter Two: Why climate change? Climate change as a multidisciplinary issue

"Climate change is now a fact of political life and is playing a growing role in business competition."

Michael E. Porter & Forest L. Reinhardt (2007, p. 22).

"...climate change is increasingly accepted as a fact of organizational life."

Winn, Kirchgeorg, Griffiths, Linnenluecke & Günther (2011, p. 158).

Introduction

This chapter begins Section B of the thesis and is intended to present the background to this study. In this chapter, I review literature from a variety of fields of study that have discussed climate change, or reported results of climate change-related studies. The review shows that climate change has a considerable history, and that management theorists can gain from the insights that this work has developed. The chapter has four main aims. The first aim is to synthesise the significant body of non-management literature on climate change, and to identify the insights this literature provides for management theorists. The review discusses literature from a range of disciplines including natural sciences and economics, but also policy literature that highlights how governments in Australia and overseas are responding to climate change. The second aim of this chapter is to critically review management literature that has considered the relationship between organisations and climate change, and to locate this study within that literature. The third aim is to critically review relevant literature pertaining to the management of sport organisations and climate change. Finally, the chapter discusses the gaps in the literature that this study seeks to address. In doing so, this chapter identifies and discusses the major themes that thread their way through this diverse body of literature.

Climate change science literature

Climate change has been defined in various yet similar ways. The Intergovernmental Panel on Climate Change (IPCC), which according to Oreskes & Conway (2010, p. 2) is, "the world's leading authority on climate issues", describes climate change as, "any change in climate over time, whether due to natural variability or as a result of human activity" (IPCC, 2007a, p. 2). The IPCC's definition is a simplified version of its 2001 one of, "statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period (typically decades or longer)" (IPCC, 2001). Similarly, the world renowned United Kingdom National Weather Service – the "Met Office" – defines climate change as, "a large-scale, long-term shift in the planet's weather patterns or average temperatures" (M.O., 2015). The World Meteorological Organisation (WMO) describes it as "variability" in "average weather" caused by, "natural" and "anthropogenic (human-induced) factors" (WMO, 2011a, 2011b), while the Australian Department of Climate Change & Energy Efficiency

(DCCEE) refers to it as the, “change in the average pattern of weather over a long period of time” (DCCEE, 2011h). In contrast, the United Nations Framework Convention on Climate Change (UNFCCC) attributes climate change – directly or indirectly – to human activities. Australian climate scientist Barrie Pittock (2006, p. 2; 2009, p. 2) describes it as, “changes in the behaviour of weather over longer time scales, such as one century to another”, while Houghton describes climate change as variations in, “average weather over a period that may be a few months, a season or a few years” (Houghton, 2004, p. 2).

Climate change has also been defined by other authoritative sources. The United States National Snow and Ice Data Center (USNSIDC) defines it as, “variations in climate on many different time scales from decades to millions of years” (USNSIDC, 2011), while the journal, *Climatic Change*, refers to climate change simply as, “variation” in climate ("*Climatic change - aims and scope*," 2011). The journal’s founder and editor, leading climate scientist Stephen H. Schneider, referred to “dangerous climate change” as being caused anthropogenically (i.e. by humans) (Schneider & Lane, 2006) as does another leading climate scientist, James Hansen, who refers to “human-made”/ “anthropogenic” climate change (Hansen et al., 2007) caused by “changes in the atmosphere...due to burning fossil fuels” (Hansen, 2011). In simple terms, climate change refers to changes in long-term weather patterns. However, contemporary climate change is widely understood as being “anthropogenic” (Houghton, 2004; IPCC, 2007a; Pittock, 2009) as a result of the “enhanced greenhouse effect” (DCC, 2007) that is overwhelmingly caused by human activities rather than natural causes. For the purposes of this study, the IPCC definition – “any change in climate over time, whether due to natural variability or as a result of human activity” – is adopted given that the IPCC is the world’s most authoritative collective voice on this subject.

Scientific climate change research has a long history dating back over 150 years (Oreskes & Conway, 2010, p. 170). Houghton notes that the warming effect of greenhouse gases (GHG) was first recognised by French scientist Jean-Baptiste Fourier in 1827, and whose work lead to the idea of a “greenhouse effect” (2004, p. 17; Schneider, 2009, p. 10). Around 1840, English engineer G.S. Callander calculated warming from carbon dioxide (CO_2) caused by burning fossil fuels (Houghton, 2004; Schneider, 2009) while around 1860, English scientist John Tyndall extended Fourier’s work by measuring the absorption of infrared radiation by CO_2 and water vapour, and hypothesised that ice ages might be caused by a decrease in atmospheric CO_2 levels and therefore the greenhouse effect (Houghton, 2004, p. 17; Oreskes & Conway, 2010, p. 170). In 1896, Swedish chemist Svante Arrhenius calculated the effect of atmospheric CO_2 concentrations on global average temperatures and by 1937, American geographer Glenn Trewartha had popularised the term, “greenhouse effect” (Schneider, 2009).

By 1957, American oceanographer Roger Revelle, and Austrian chemist and nuclear physicist, Hans Suess, published research expressing concern that CO_2 might alter the climate, and that by emitting GHG's into the atmosphere, "human beings are now carrying out a large-scale geophysical experiment" (Houghton, 2004, p. 17; Schneider, 2009, p. 11). Around the same time, American chemist Charles Keeling began measuring atmospheric CO_2 systematically (Oreskes & Conway, 2010, p. 170). Revelle & Suess's concern about the risks of CO_2 emissions was recognised in a 1965 address to the United States Congress by President Lyndon Johnson who said: "This generation has altered the composition of the atmosphere on a global scale through...a steady increase in carbon dioxide from the burning of fossil fuels" (Oreskes & Conway, 2010, p. vii). Since the 1960's, the rapid growth of fossil fuels and growth of the environment movement led to climate change "moving up the political agenda" in the 1980's, and later to the *United Nations Framework Convention on Climate Change* (UNFCCCC) being signed in Brazil in 1992 (DCCEE, 2011i; Houghton, 2004, p. 17).

Climate science: the role of the IPCC

Since the 1990s, climate change has become a scientific problem of global importance and is reflected in evidence of environmental damage (IPCC, 2007a; UNEP, 2007), growth in climate change research (Grieneisen & Zhang, 2011), and in political responses (UNFCCC, 2011b) to the threats and opportunities that it poses. A key source of knowledge about climate change is the IPCC whose credibility was recognised by being awarded the 2007 Nobel Peace Prize (Nobel-Foundation, 2007). Established in 1988 by the WMO and the United Nations Environment Programme (UNEP) (Houghton, 2004, pp. 218-219; Oreskes & Conway, 2010), the key purpose of the IPCC is to prepare, "comprehensive assessment reports about the state of scientific, technical and socioeconomic knowledge on climate change, its causes, potential impacts and response strategies" (IPCC, 2011a). The IPCC has prepared five such peer-reviewed assessment reports (AR) with each proving to be key contributions to the climate change science literature. The first "AR" (FAR) was released in 1990, the second ("SAR") in 1995, the third ("TAR") in 2001, and the fourth ("AR4") in 2007 (IPCC, 2011b). The fifth assessment ("AR5") is being released in stages during 2013 and 2014 (IPCC, 2011a) with the first section a "comprehensive assessment of the physical science basis of climate change", and the second section concerned with impacts, vulnerability and adaptation.

Each assessment report is a "massive undertaking" involving contributions from a "very large proportion of the climate science community" (IPCC, 2010). For example, in the case of AR5's section on the "physical science basis" alone, it was authored by 259 scientists drawn from thirty-nine countries while 54,677 review comments were made (IPCC, 2014a). For AR5's section on "impacts, adaptation and vulnerability", "309 coordinating lead authors, lead authors, and review editors, drawn from 70 countries were selected to produce the report. They enlisted the help of 436 contributing

authors, and a total of 1,729 expert and government reviewers" (IPCC, 2014c). Houghton (2004, p. 221), a former vice-president of the WMO and contributing author to IPCC scientific reports, asserts that the ARs are, "authoritative statements of the contemporary views of the international scientific community." Three major themes of the IPCC assessment reports are that: (1) evidence of a warming global climate is "unequivocal"; (2) this warming is overwhelmingly due to the massive increase in atmospheric and ocean stores of heat-trapping GHG's, and; (3) that human activities are the "dominant" cause of climate change (Oreskes & Conway, 2010, p. 169). As AR5 makes clear: "It is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century" (IPCC, 2014b). Such findings by the IPCC have been "repeatedly ratified" by, "all but a tiny handful of climate scientists" (Oreskes, 2004; Oreskes & Conway, 2010, p. 169).

The scientific evidence presented in the IPCC reports underpin claims about the seriousness and urgency of climate change, and is clear and well documented. Firstly, there is clear evidence that the levels of heat-trapping GHG's in Earth's atmosphere and oceans have increased dramatically since the industrial revolution of the 1850's. The IPCC's (2013a) AR5 report states that:

> *The atmospheric concentrations of carbon dioxide (CO_2), methane, and nitrous oxide have increased to levels unprecedented in at least the last 800,000 years. CO_2 concentrations have increased by 40% since pre-industrial times, primarily from fossil fuel emissions and secondarily from net land use change emissions. The ocean has absorbed about 30% of the emitted anthropogenic carbon dioxide, causing ocean acidification.*

Secondly, it is clear the Earth has warmed as a consequence of the release of these GHG's. The IPCC's AR5 report states that the "globally averaged combined land and ocean surface temperature" has increased 0.85 °C since 1880 (IPCC, 2013a). These fundamental scientific observations of change are supported by other literature. Drawing upon the work of the IPCC and other institutions, the Australian Government's Department of Climate Change and Energy Efficiency (DCCEE, 2011e) reported that, "all measurements of the climate system indicate the long term warming trend is continuing", and that, "there are no known natural factors that can explain the observed warming."

Two Australian reviews of climate science prepared for the Australian Government reinforce the dramatic conclusions drawn in the IPCC's AR4 and AR5 reports. The first, prepared by the Australian Climate Commission (DCCEE, 2011c), concurs stating that, "the evidence for a long-term warming trend in Earth's climate is overwhelming" (p. 6), and that there is a "very large body" of consistent obeservations that point to "atmospheric concentration of greenhouse gases" – especially carbon dioxide (CO_2) – as the ultimate cause for the observed warming (p. 13). The second review, prepared by climate change economist, Professor Ross Garnaut, concluded that:

> *Observations and research outcomes since 2008 have confirmed and strengthened the position that the mainstream science then held with a high level of certainty, that the*

> *Earth is warming and that human emissions of greenhouse gases are the primary cause* (Garnaut, 2011, p. 2).

Both reviews draw conclusions that are consistent with other assessments published by the Australian Climate Commission (Steffen & Hughes, 2013), the Commonwealth Scientific and Industrial Research Organisation (CSIRO) (Cleugh, 2011; CSIRO, 2009), the Australian Bureau of Meteorology (2011), Hansen & Sato (2011), Mastrandrea & Schneider (2010), and the Royal Society (2010).

These concerns are echoed by other recent reviews of climate science. Anderson & Bows (2011) assert that current and projected global GHG emissions & atmospheric concentrations are cause for grave concern. In their words:

> *...there is now little to no chance of maintaining the global mean surface temperature at or below 2°C. Moreover, the impacts associated with 2°C have been revised upwards, sufficiently so that 2°C now more appropriately represents the threshold between "dangerous" and "extremely dangerous" climate change* (p. 41).

An increase in global mean surface temperature of no more than 2 °C above pre-industrial levels is significant because up until now, it has been widely recognised as the threshold for "dangerous climate change" (DCCEE, 2011c; Lorenzoni, Lowe, & Pidgeon, 2005; Schellnhuber, Cramer, Nakicenovic, Wigley, & Yohe, 2006; J. B. Smith et al., 2009), and is a "widely accepted and quoted political goal" (DCCEE, 2011c; UNFCCC, 2009). Known as the 2 °C "guardrail" against dangerous climate change (DCCEE, 2011c, p. 18; EC, 2005; IPCC, 2007a), Anderson & Bows claim that without dramatic and immediate reductions in global GHG emissions[2] and an associated period of economic "austerity" for which there is no political "appetite" anyway, it is now impossible to stay within this guardrail and we are instead more likely facing "extremely dangerous" climate change. Such an assessment highlights the gravity and urgency of climate change as an issue for policymakers, organisations and citizens alike. The likelihood that the 2 °C guardrail cannot be achieved has since been supported by Peters et al. (2012). Instead, current trajectories of GHG emissions are consistent with planet Earth being "about 4 °C to 6.1 °C above pre-industrial global near surface air temperatures by 2100" (Canadell, 2012).

Climate science: the consensus

As a consequence, despite some areas of uncertainty (Mastrandrea & Schneider, 2010, p. 11), there is an overwhelming *scientific consensus* about the evidence for, and causes of, climate change. Whilst the question of scientific consensus has been debated (Oreskes, 2007), it is nevertheless expressed in three inter-related parts (Oreskes, 2004, 2007): (1) in the IPCC assessment reports published between 1990 and 2007; (2) in surveys of opinion of peer-reviewed climate scientists, and; (3) in the statements of scientific bodies of national or international standing. The first part of this scientific

[2] The Hadley Met Office (2014) – the National Weather Service of the United Kingdom – claim that a scenario offering a "50% probability of limiting warming to 2 °C" requires global GHG emissions to "peak" by 2016 or earlier, followed by a "4% rate of global emissions reduction."

consensus – the "IPCC AR's" – is based on surveys of peer-reviewed climate science literature, and has already been discussed. The second part of this scientific consensus – "surveys of peer-reviewed scientific opinion" – is equally clear. For example, in a survey by Naomi Oreskes (2004, pp. 70-71; 2007, pp. 70-71) – a Professor of history and science studies – of 928 climate change papers published in refereed scientific journals between 1993 and 2003, it was found that none provided data to refute anthropogenic climate change. Doran & Zimmerman (2009), in a survey of over 3000 Earth scientists, concluded that:

> *It seems that the debate on the authenticity of global warming and the role played by human activity is largely nonexistent among those who understand the nuances and scientific basis of long-term climate processes.*

Similarly, Anderegg, Prall, Harold & Schneider (2010) found in a survey of 1,372 climate researchers and their publication & citation data that 97–98% of those most actively publishing in the field support the tenets of anthropogenic climate change outlined by the IPCC. Farnsworth & Lichter (2011, p. 5) also found that 97% of American climate scientists agreed that, "global average temperatures have increased in the past 100 years", while 84% agreed that "human-induced" climate change was occurring. Finally, the most comprehensive study of the scientific literature pertaining to climate change confirmed this consensus. Cook et al. (2013), in a survey of 11,944 scientific papers published in the twenty years between 1991 and 2011 found that "97.1% endorsed the consensus position that humans are causing global warming", and that, "the number of papers rejecting the consensus on AGW [anthropogenic global warming] is a vanishingly small proportion of the published research."

The third part of this scientific consensus about the causes of climate change – "statements of scientific bodies of national or international standing" – is best reflected in the statements of major science academies around the world. In 2008, the Australian Academy of Science was one of thirteen national science academies from "G8+5" nations to sign a joint statement endorsing the IPCC's conclusions about the human cause of climate change (AAS, 2007). In 2009, the United States Global Change Research Program (USGCRP) issued a statement saying that evidence of "the warming climate" over the last fifty years was "unequivocal", and that the primary cause was the release of "heat-trapping gases" by humans (USGCRP, 2009). The scientific consensus was neatly summarised (Manne, 2012, p. 37) in a letter from the American Association for the Advancement of Science (AASS) to every United States Senator on October 21st, 2009. The AASS letter, sent on behalf of eighteen national scientific and mathematical organisations, referred explicitly to this consensus:

> *As you consider climate change legislation, we, as leaders of scientific organizations, write to state the consensus scientific view. Observations throughout the world make it clear that climate change is occurring, and rigorous scientific research demonstrates that the greenhouse gases emitted by human activities are the primary driver. These conclusions are based on multiple independent lines of evidence, and contrary assertions*

> *are inconsistent with an objective assessment of the vast body of peer-reviewed science* (AASS, 2009).

Over thirty other statements of the scientific consensus position on climate change have been made by national science academies around the world. These academies include: the World Meteorological Organisation; the Royal Society of the United Kingdom; the Australian, and, American Meteorological societies; Royal Meteorological Society (UK); Canadian Meteorological Society; the Inter-academy Council; International Council for Science; European Academy of Sciences and Arts; European Science Foundation; Federation of American Scientists, and; the United States National Research Council. When these statements are considered in their totality, it is clear that there is a strong, global scientific consensus that current climate change is primarily caused by human actions.

Another key theme of the climate science literature is the clear relationship between human activities on a global scale, and the resultant likelihood of "dangerous" climate change. On the role of humans in causing climate change, the IPCC's latest assessment of the scientific "basis" – the "AR5" report (IPCC, 2013b) – is unequivocal:

> *Human influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, in global mean sea level rise, and in changes in some climate extremes. This evidence for human influence has grown since AR4. It is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century.*

This confidence in this primary role of humans in climate change is long established with Schneider & Lane (2006, p. 8) noting that,"…virtually all climatologists agree that the cause is human activity, predominantly the burning of fossil fuels." Importantly, they noted that the probability of dangerous climate change, known as "Dangerous Anthropogenic Interference", is associated with increases in average global air temperatures of anywhere between 1.1 °C and 6.8 °C. The IPCC's AR5 (IPCC, 2013a) subsequently noted that the "globally averaged combined land and ocean surface temperature" had already increased 0.85 °C since 1880. The IPCC (2013a) also noted that:

> *Continued emissions of greenhouse gases will cause further warming and changes in all components of the climate system. Limiting climate change will require substantial and sustained reductions of greenhouse gas emissions (Chapters 6, 11, 12, 13, 14).*

In order to avoid dangerous climate change, the IPCC's 2007 AR4 report noted that the increase in global temperatures would need to be limited to 2 °C above the pre-industrial average, and in order to achieve this, developed nations such a Australia would need to reduce their GHG emissions 25-40% by 2020, and by 80-95% by 2050 (IPCC, 2007b).

The AR5 report (IPCC, 2013a) subsequently estimated that, depending on which global GHG emissions scenario eventuated, the most likely increase in average global temperatures up to 2100 would be between 0.3 °C and 4.8 °C. AR5 (IPCC, 2013a) also predicted such temperature increases were "virtually certain" to increase the frequency of hot temperature extremes, and that it is "very

likely that heat waves will occur with a higher frequency and duration." By the end of the 21st century, "extreme precipitation [heavy rain] events over most of the mid-latitude land masses and wet tropical regions will very likely become more intense and more frequent", while sea levels are "likely" to increase by between 26 and 82 centimetres (IPCC, 2013a). The relationship between such extreme weather events exacerbated by climate change, and the risks of large scale disasters is clear (IPCC, 2012). As a consequence, eight major categories of risk are posed by climate change (IPCC, 2014b) including "death, injury, ill-health, or disrupted livelihoods" for low-lying coastal zones; "severe ill-health and disrupted livelihoods for large urban populations"; "breakdown of infrastructure networks and critical services" due to "extreme weather events"; "food insecurity and the breakdown of food systems" due to "warming, drought and flooding"; and loss of marine, coastal and inland water ecosystems, biodiversity, and ecosystem goods, functions, and services.

Climate science: the key concepts

Climate science literature has therefore generated three fundamental concepts that inform scientific and public debate, and which also inform recent organisational literature. First, the scientific literature highlights the *vulnerability* (Füssel, 2007b; IPCC, 2014b) of Earth's ecosystems and many species, including humans, to climate change. Vulnerability is a highly significant and recurring theme in the IPCC reports which devote key sections to this concept, and was the subject of an IPCC special report in 1997 (IPCC, 1997). Another special report in 2012 focused on the relationship between climate change, vulnerability and disaster risk (IPCC, 2012). Second, as a result of the vulnerabilities of ecosystems, plant and animal species to climate change, *adaptation* (Füssel, 2007a; IPCC, 2014b) is another highly significant and recurring theme in the climate science literature. Although adaptation has been defined in a range of ways[3] (VCCCAR, 2012), in essence the climate change literature refers to the capacity of ecosystems or species to adjust to a warmer planet and altered climatic patterns, and like vulnerability, is the basis for key sections of the IPCC assessment reports. Third, *mitigation* is the reduction of GHG emissions through human intervention (IPCC, 2014d). As a consequence, vulnerability, adaptation and mitigation have subsequently influenced economic and organisational literature and inform notions such as organisational vulnerability, organisational adaptation and mitigation of organisation-related GHG emissions.

Taken together, climate change science literature poses a fundamental implication: that is, if dangerous climate change is to be avoided, the unrestrained global emission of GHG's is no longer possible. Allison et al. (2009) conclude that, "annual per-capita emissions will have to shrink to well under 1 metric ton[ne of] CO_2 by 2050" (p. 7) which represents a reduction of, "80-95% below the

[3] The Victorian Centre for Climate Change Research note that climate change adaptation has been defined in various but similar ways by the IPCC, UNFCCC, the UN Development Program, the UK Climate Impacts Program, the Australian National Climate Change Adaptation Research Facility (NCCARF), and the Victorian Government. Key terms used in these various definitions include coping, adjusting, reducing harm or adverse consequences, seizing any opportunities and realising benefits that climate change may present.

per-capita emissions [of] developed nations in 2000." The burning of fossil fuels such as coal, oil and natural gas for electricity generation, transport, agriculture, manufacturing, and chemical production, are therefore clearly problematic because of their role in producing high levels of GHGs and climate change. Such a drastic reduction in GHG emissions are characterised as "carbon-constraint" (Goldmark & Von Weizsäcker, 2007), a widely-used concept in policy discourse.

However, despite the overwhelming global scientific consensus around the existence of climate change, and the role of humans in this phenomenon, some *climate scepticism* remains (Hamilton, 2007; Hodgkinson & Garner, 2008). There are some scientists, business leaders and commentators who strongly disagree with the scientific agreement about the existence, causes and urgency of climate change. For example, geologists Ian Plimer (2009) and Bob Carter (2010) are notable Australian examples of critics of climate change science. However, neither has contributed to IPCC reviews or journals such as *Climatic Change*. Overall, despite the concerns of a small minority of scientists, and the objections of other types of climate sceptics, "the basic processes that cause climate change are scientifically well established" (Mastrandrea & Schneider, 2010, p. 11). Human activities have been clearly identified as the "main driver" of climate change over the past few decades, and such conclusions are based on a, "vast preponderance of accumulated scientific evidence" (Mastrandrea & Schneider, 2010, p. 11). The scientific basis for acting to address climate change has therefore led to a range of other research, and this chapter now addresses that literature.

Policy and legislative responses to climate change

Even though the first scientific evidence of climate change was reported in the 19th century, it did not reach the global scientific and political agenda until 1979 (Gupta, 2010). Climate change was first discussed at the global level at the 1979 World Climate Conference although the next global forum for discussing the problem did not occur until 1985, while the IPCC was not established until 1988 (DCCEE, 2012b; Gupta, 2010). Although the World Commission on Environment and Development – the so-called "Brundtland Commission" – had placed climate change within a context of broader global environmental issues in 1987, these events are part of what Gupta (2010, pp. 636-639) calls the "pre-1990 phase" of climate change policy development where it was "framed" as a problem of global significance. This "framing the problem" phase is the first of five phases of climate change policy history described by Gupta that includes (2) "the period leading up to the adoption of the Climate Change Convention"; (3) "the period of the Kyoto Protocol until US withdrawal"; (4) "the period thereafter focusing on the entry into force of the Kyoto Protocol", and; (5) "the post-2008 period that coincides with the financial crisis." Critically, the "pre-1990" phase of climate change policy development presaged a number of other key developments that mark the period between Gupta's first and second phases. These events are: the second World Climate Conference (held in 1990); the

first IPCC scientific "Assessment Report" (1990); the UN General Assembly Resolution to launch climate negotiations (1990), and; the 1992 UN Climate Change Convention (UNFCCC).

International policy responses

The phases of climate change policy development identified by Gupta (2010) have been played out in an international context. Beginning with the United Nations (UN), it is notable that the UN have declared the years 2005-2014 as the "Decade of Education for Sustainable Development" (UNESCO, 2005). This sustainability program is mirrored by a range of institution building, program development and global agreements by the UN with the general aim of preserving the natural environment. *Institutions* created by the UN with environmental purposes include the United Nations Environment Programme, and the IPCC. UN *programs* include the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UNEP, 2011). UN *agreements* include the United Nations Framework Convention on Climate Change (UNFCCC, 2011b) and the "Kyoto Protocol", a global agreement linked to the UNFCCC that limits GHG emissions (UNFCCC, 2011a). This focus on sustainability symbolises the UN's role in building a global knowledge base, and capacity for, environmentally sustainable development, and is a clear illustration of the importance attached to environmental management by international organisations.

UN action to address climate change is also widely reflected in measures taken by national governments and features institution building, policies, plans, and government programs. Examples of government *institutions* created to address climate change include the European Union Directorate–General for Climate Action (EU, 2011a), the United Kingdom Department of Energy and Climate Change (UKDECC, 2011), and China's Department of Climate Change (NDRC, 2011). A sample of government *programs* includes the European Union Emissions Trading Scheme (EU, 2011b), China's National Climate Change Programme (CDCC, 2007), the United States Climate Change Technology Program (USEPA, 2011), and the New Zealand Emissions Trading Scheme (NZME, 2011). Finally, local governments from around the world also have policies or plans for tackling climate change including New York (NYCDEP, 2011), London (GLA, 2011), Vancouver (COV, 2011), Singapore (SMEWR, 2008), and the City of Melbourne (COM, 2009).

The genuinely international policy response to climate change by governments is a strong trend (Jackson, 2012), and is evidence of a gradual global shift towards carbon constraint. A recent summary of international climate change policy measures (Jackson, 2012) identified that over one hundred nations now have policies with "carbon prices or supporting renewable energy"; eighty-five countries have renewable energy targets; thirty-two countries having "national carbon trading schemes", while ten have introduced a carbon tax." These measures are supported in sixty nations by

almost 500 climate change laws (Nachmany et al., 2014). (2012)It is also reported that most developed and developing countries have energy efficiency initiatives (DCCEE, 2012e), while more than 1000 carbon policy measures have been introduced in nine countries alone: (1) Australia, (2) China, (3) the USA, (4) Germany, (5) India, (6) Japan, (7) South Korea, (8) United Kingdom and (9) New Zealand (Commission, 2011, p. xv).

Climate change economics and policy responses

As the understanding of the effects of human beings and industry on global climate change has developed, literature has emerged detailing the economics of climate change and policy relating to it (Haigh, 2008b). Like the scientific literature aiming to model and predict global climate patterns, in recent years a significant economic and policy literature has emerged that seeks to model and predict the effects of climate change on economies and the effects of GHG emissions policy on climate change and economies (Haigh, 2008a, p. 10). A range of studies since the early 1990's have sought to model a range of economic questions affected by climate change including cost-benefit analysis of various policy actions and inaction (Goldemberg et al., 1996; Stern & Treasury, 2006; Van den Bergh, 2004) risk (Fisher et al., 2007; Yohe, 2009), adaptation (Smit & Pilifosova, 2001), vulnerability (J. B. Smith, Schellnhuber, & Monirul Qader Mirza, 2001), and mitigation (Fisher et al., 2007; Goldemberg et al., 1996).

A highly influential contribution to the literature on the economics of climate change was the *Stern Review on the Economics of Climate Change* (Stern & Treasury, 2006). Sir Nicholas Stern's report for the United Kingdom government reached a number of conclusions including that climate change, "is the greatest market failure the world has ever seen", that the global costs of addressing climate change is approximately 1% of global annual Gross Domestic Product (GDP), and critically, that the cost of inaction would be up to 20% of global GDP. The latter has been highly influential in public debate over climate change in recent years and has been interpreted by some commentators as having made the broader economic "case" for strong action on climate change. Stern's conclusions about the macro environment imply that many organisations at the micro level of economic activity will be *vulnerable* to climate change, will need to *adapt* their activities, and need to *mitigate* their GHG emissions.

Stern's assessment that it was cheaper for nations to address climate change than to ignore it is slowly being adopted by nation-states. A 2011 report by the Australian Productivity Commission (APC) (Commission, 2011) that reviewed the, "effective carbon prices that result from emissions and energy reduction policies in Australia and other key economies", concluded that "virtually all" of the eight OECD countries studied plus China have implemented "more than 1000" GHG mitigation measures, ranging from "(limited) ETS's to policies that support particular types of abatement technology." The APC's assessment that an increasing number of countries around the world are addressing climate

change was echoed in a 2012 report by the Australian Climate Commission (ACC). Among the ACC's key findings (Flannery, Beale, & Hueston, 2012) were that every major economy (China, the United States, India, European Union, Russian Federation and Brazil) – which represent most of the major polluters – as well as other key OECD nations such as Germany, Japan, Canada and the United Kingdom, have policies for reducing GHG emissions. Importantly, the ACC asserted that: "ninety countries covering around eighty-three per cent of global greenhouse gas emissions and ninety per cent of the global economy have pledged to limit their greenhouse gas emissions" (Flannery et al., 2012, p. 8).

These policies include different types of responses such as explicit carbon pricing, investment in renewable energy, energy efficiency, maintaining carbon stores by avoiding deforestation and technology development. These responses are being implemented nationally, bilaterally and regionally. Nachmany et al. (2014) claim that of sixty-six countries surveyed, ninety-two per cent had legislation to promote clean energy use, and that the "stock of climate laws has risen from less than 40 in 1997 to almost 500 now." Such responses are also now mirrored by the World Bank (Schellnhuber et al., 2012) who describe climate change science as "unequivocal", and advocate "ambitious action" on climate change because "it makes good economic sense." Together, this literature points to a consistent and long-term international policy response to climate change that, although still evolving, clearly illustrates the global significance of this issue.

Government responses to climate change in Australia

In line with the international policy trend and other measures to address climate change, federal, state and local governments have all reacted with a variety of policies and associated institutional development. Although climate change has been a contentious issue in Australian politics since the late 1990's (Nachmany et al., 2014), government responses to this issue in Australia illustrate its importance in policy terms. At the federal level from the late-1980's onwards, climate change policy evolved under successive Australian governments. In 1989, the Australian government led by Labor Prime Minister Bob Hawke, became the first to recognise the global importance of climate change when it signed the Hague Convention and agreed to participate in the United Nation's framework convention – the "UNFCCC" (Hamilton, 2001), a preliminary step toward ratifying the Kyoto Protocol. Australian ratification of the UNFCCC occurred on December 30th 1992 (Nachmany et al., 2014) however this "progressive stance" was curtailed in the early-to-mid 1990's under the subsequent Labor government led by Prime Minister Paul Keating, and was entrenched in 1996 with the election of the Coalition government led by Prime Minister John Howard. The Howard government brought a generally sceptical attitude toward the science underpinning climate change (MacIntosh, 2007, p. 46) and refused to take explicit, measurable action to reduce GHG emissions (Bonyhady, 2007, pp. 10-11; Christoff, 2007a, p. 13; 2008a, p. 868; Fowler, 2007, p. 113; Hamilton,

2007; Pearse, 2007, 2009). Accordingly, when the Howard government inherited the Hawke government's commitment to the Kyoto Protocol negotiation process, it argued for and won significant concessions from signatory nations including – most notably – the "Australia clause", where Australia was granted a much criticised approval to increase its GHG emissions by eight per cent above 1990 levels (Christoff, 2005, p. 34; 2007b, p. 92; Hamilton, 2001). Nevertheless, having secured this clause, in April 1998 the Howard government formally joined the Kyoto Protocol (Australia, 2011).

As a consequence, the Howard government began Australia's *legislative* response to climate change. Whilst still refusing to ratify the Kyoto Protocol, and instead seeking a voluntary "framework for cooperation" in the form of the six nation Asia-Pacific Partnership on Clean Development and Climate (AP6) (Christoff & Eckersley, 2007, p. 33), the Howard government was among the first at the national level to institutionalise a response to climate change with the creation of the Australian Greenhouse Office (AGO) in 1998, an agency that was claimed to be the world's first, "government agency dedicated to cutting greenhouse gas emissions" (ACCC, 2011). The AGO was established in 1998 as part of a "nationally-agreed policy", the *National Greenhouse Strategy*, for reducing GHG emissions (Fowler, 2007, p. 113). This was followed in 2001 by the introduction of the Mandatory Renewable Energy Target (MRET) (DCCEE, 2013g), and in 2007, the *National Greenhouse and Energy Reporting (NGER) Act* which set thresholds for Australian organisations to measure – and where necessary – report either their energy use and/or their GHG emissions to government (DCCEE, 2011d).

The evolution of Australia's policy and legislative responses continued in November 2007 with the election of the Labor government led by Prime Minister Kevin Rudd. In contrast to the Howard government, in December 2007 the Rudd government appointed Australia's first Minister for Climate Change, Senator Penny Wong, and formally ratified the Kyoto Protocol. A key proposed legislative response under the Rudd government was the proposed Carbon Pollution Reduction Scheme (CPRS) – a GHG Emissions Trading Scheme (ETS) – although it was defeated three times in the Australian Parliament between 2007 and 2010. Key climate change legislation enacted by the Rudd government was the Renewable Energy Target (RET) that required twenty per cent of Australia's electrical energy to be produced from renewable energy sources by the year 2020 (DCCEE, 2013g). In 2010, Australian climate change policy evolved again with the re-election of the federal Labor government – led by newly-elected Prime Minister Julia Gillard – and the appointment of Australia's second Minister for Climate Change, Senator Greg Combet. The Gillard government negotiated a package of climate change responses with the federal parliament's Multi-Party Climate Change Committee (MPCCC). The MPCCC agreed to a revised ETS instead of the CPRS that was introduced following

the implementation of an initial fixed-rate carbon price[4] [5], in conjunction with compensation payments for individual citizens and trade exposed, energy-intensive sectors of Australian industry (MPCCC, 2011a, 2011b).

Federal government policy since the end of the Howard government in 2007 assumed that climate change is a serious threat to much of Australia, and that significant responses are required. The policy aimed for three broad responses referred to as the "three pillars strategy" (Crowley, 2013; DCCEE, 2011j): (1) *mitigation* (i.e. reduction) of GHGs produced by Australia; (2) *adaptation* to the hotter and mostly drier climate that is forecast by the CSIRO and Bureau of Meteorology to become a reality in coming decades, and; (3) a *global agreement for mitigation and adaptation*. Sectors likely to be most vulnerable to climate change, and therefore requiring significant adaptation responses include agriculture, coast lines and water-intensive infrastructure (DCCEE, 2011a). National policy at that time was informed, in part, by the work of Professor Ross Garnaut on the *Garnaut Climate Change Review* (2008) and the preceding *Australian Government Green Paper* (DCC, 2008) that canvassed options for the proposed CPRS. Garnaut's economic analysis guided the 2011 framework developed by the MPCCC (MPCCC, 2011b) which in turn provided the basis for the Australian Government *Climate Change Plan* (DCCEE, 2011f). This plan formalised the introduction of key mitigation measures such as the initial fixed carbon price, and the revised ETS.

Australian climate policy under the former Gillard Labor government was founded on three mid-to-long term national *GHG emissions reduction targets*. The mid-term mitigation target for the year 2020 was either: (1) a conditional twenty-five per cent reduction compared with 2000 levels by 2020 that depends upon, "the world agree[ing] to an ambitious global deal" to stabilise atmospheric GHG levels at 450 ppm CO_2-e or lower, or; (2) an unconditional emissions reduction of between five to fifteen per cent compared with 2000 levels by 2020 if there is a global agreement which falls short of securing atmospheric stabilisation at 450 ppm CO_2-e where major developing economies agree to substantially restrain their emissions, and advanced economies commit to reductions comparable to Australia's (DCCEE, 2012c). However, the third, longer-term mitigation target was for an eighty per cent GHG reduction compared with 2000 levels by 2050. All of these measurable targets for "national net emissions" were agreed to under the Cancun round of global emissions reduction negotiations (DCCEE, 2012c), and are a symbol of the recent evolution of Australian climate policy.

In the Australian context, climate change is a serious issue for environmental, economic, and human-health reasons. Climate change risks for Australia include more frequent and longer heatwaves, more

[4] This initial fixed-rate carbon price is widely known as the "carbon tax."

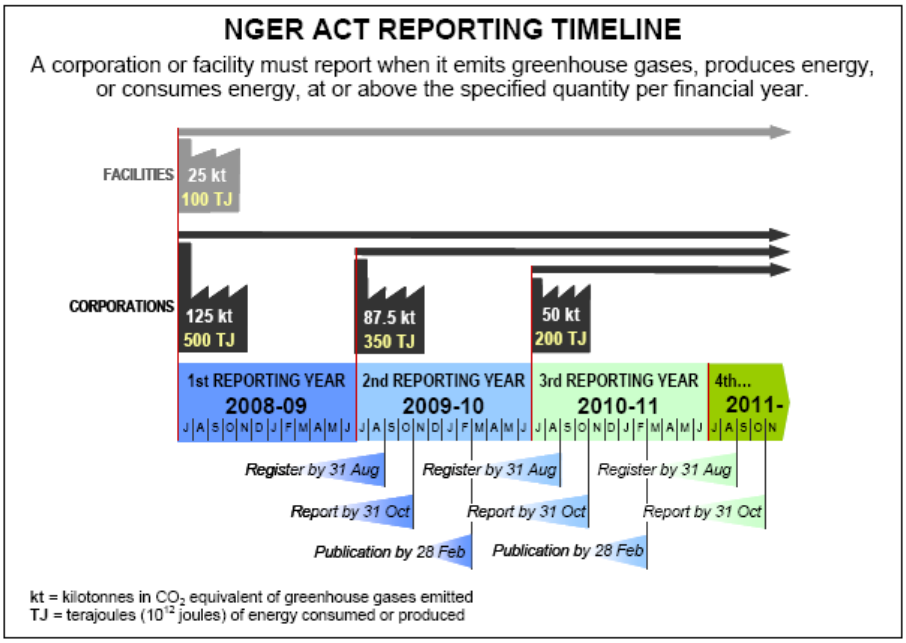
[5] Carbon pricing simply refers to a requirement for organisations that create greenhouse gas emissions to pay for the environmental cost of such pollution. Carbon pricing is therefore the practical implementation of the "Polluter Pays Principle" (PPP) (Caney, 2010; Dellink et al., 2009; Duus-Otterström & Jagers, 2012).

droughts, more bushfires, coastal flooding, biodiversity loss, threats to water supplies, property and infrastructure, and higher human mortality associated with these risks (AAS, 2010; Cleugh, 2011; Steffen & Hughes, 2013; Steffen, Hughes, & Perkins, 2014). Climate change is identified as a major global risk by the World Economic Forum (Hajkowicz, Moody, & CSIRO, 2010), and as a specific risk for Australia (pp. 15-17). Consistent with these concerns, successive Australian governments have responded to climate change with *policies*, *institution building*, *legislation* and *programs for emissions reduction* & *adaptation*. There are nine federal government examples of climate change *institution building* beginning with the Howard Government's Australian Greenhouse Office in 1998. Under the Rudd-Gillard governments, eight government institutions were established including the Department of Climate Change and Energy Efficiency (DCCEE), the Australian Climate Commission (ACC), the Australian Climate Change Authority (DCCEE, 2013a), the Australian Renewable Energy Agency (DCCEE, 2013b), the Australian Clean Energy Finance Corporation (DCCEE, 2013d), and the National Climate Change Adaptation Research Facility (NCCARF) (DCCEE, 2011b). In 2012, two further agencies were established: the Australian Climate Change Authority; and the Australian Clean Energy Regulator (ACER). Furthermore, extra resources for studying climate mitigation and adaptation were made available by the Rudd/Gillard governments to science agencies concerned with climate change such as the CSIRO.

Climate change institution building and policy development is accompanied by *legislation* with two being most prominent: first, the Howard government's *National Greenhouse and Energy Reporting* (NGER) *Act* (2007) (DCCEE, 2011d); and second, the Rudd government's *Building Energy Efficiency Disclosure* (BEED) *Act* (2010). Both laws were overseen by the Australian Government DCCEE, and were direct responses to climate change. The *NGER Act* requires organisations of sufficient energy use and/or emissions generation to report these to the government (DCCEE, 2011d), while the *BEED Act* requires organisations of sufficient size to report and certify their *National Australian Built Environment Rating System* (NABERS) energy ratings and general energy efficiency (DCCEE, 2012a; NSWOEH, 2012).

The *NGER Act* is a significant example of how such recent national climate change legislation is designed to encourage big GHG polluters to mitigate their emissions so that Australia can reach its aforementioned emissions reductions targets. Prominent Australian carbon management entrepreneur, Dave Sag (2008), asserted that the *NGER Act* was introduced by the Howard Federal Government to facilitate the then "forthcoming national emissions trading scheme" (ETS), and that the application of the ETS to facilities depended on whether they met the legislation's thresholds for energy use ("100TJ of any kind of energy") or GHG pollution ("25kt of CO_2 equivalent (CO_2-e"). A diagrammatic explanation of the reporting thresholds for the *NGER Act* is offered in Figure 1 below.

Figure 1: Reporting thresholds for the NGER Act (2007). Source: DCCEE. (2011d).



The *NGER Act* requires facility managers to calculate and then report their direct or indirect GHG emissions. Reporting under the Act requires organisations that meet the thresholds to complete a "comprehensive greenhouse emissions audit." As Sag (2008, p. 43) noted:

> *The GHG Protocol defines three 'scopes' of emissions. Scope 1 emissions are those directly emitted by the operation of your facility, i.e. fuel you burn, boilers you run and so forth. Scope 2 emissions are indirect emissions resulting from energy you buy. In this case the emissions are caused by the power-provider, but they are considered to be your responsibility as you are paying for them. Scope 3 covers all of the other indirect emissions generated by your supply chain.*

This illustrates the pivotal role that the NGER legislation plays in implementing Australian Government GHG mitigation policy, and how far national climate change policy has changed in only a few years.

Climate change policy, institution building and legislation in Australia have also been supplemented by federal climate change *programs* for emissions reduction and adaptation. By the time of the defeat of the Gillard government at the federal election of September 2013, approximately seventeen programs existed (DCCEE, 2013f) with examples including the Energy Efficiencies Opportunities (EEO) program (DRET, 2012), the Carbon Farming Initiative (DCCEE, 2013c), the Clean Technology Investment Program (DCCEE, 2013e), and the National Climate Change Adaptation Program (DCCEE, 2007a). The EEO program was intended to encourage "large energy-using businesses to improve their energy efficiency" by requiring them to, "identify, evaluate and report publicly" opportunities for cost-effective energy savings.

However, the election of the new federal government in September 2013 led by incoming Liberal Prime Minister Tony Abbott, marks a significant change in direction for Australian climate policy. As this government's election is so recent there is no scholarly literature yet available to consider for an analysis of its climate change policy. However, policy statements and discussion papers released by the Liberal Party of Australia (LPA) whilst in opposition together with recent media commentary by policy scholars and economists give some insights into what is happening in the short-term, and some clues as to what is likely in the medium-term. First, the Abbott government intends to continue with the so-called three pillars of Australian climate policy – mitigation, adaptation, and seeking a global agreement – although with markedly less ambition. Beginning with GHG mitigation, the Abbott government's top priority was to abolish the carbon tax and the ETS and instead replace these market instruments with its "Direct Action" policy (LPA, 2013a, 2013b, 2013c). Although the exact detail of this policy is yet to be announced, it appears that the polluter-pays principle that underpinned the carbon tax and ETS will be abandoned and replaced with a pay-the-polluter principle whereby large GHG polluters identified through the NGER scheme will be offered incentives to reduce their direct emissions. These incentive payments are to be made through the proposed "Emissions Reduction Fund", the so-called "centrepiece" of the Abbott government's climate change policy, whereby the Government will purchase "the lowest-cost abatement via reverse auctions – a 'carbon buy-back' " (DOE, 2013). The government is also only committed to a five per cent reduction of Australia's GHG emissions compared to 2000 levels by 2020. This is significantly less than the IPCC recommended range of twenty-five to forty per cent for industrialised nations (IPCC, 2007b), the fifteen to twenty-five per cent recommended by the Australian Climate Change Authority (CCA, 2013; Christoff, 2013), and dramatically less than thirty-eight per cent below 2000 levels advocated by Australian climate change policy scholar, Peter Christoff (2013).

Second, the Abbott government is currently abolishing most of the climate change institutions introduced by the Rudd & Gillard governments starting with the Department of Climate Change & Energy Efficiency (DCCEE), the Clean Energy Fund, and the Australian Climate Commission. Instead, climate change policy is now overseen by the Department of the Environment (DE) headed by the Minister for the Environment, Greg Hunt[6]. Third, the Abbott government has also abandoned all climate change mitigation programs introduced by the Rudd & Gillard governments and replaced them with four of their own. These programs are the "Emissions Reduction Fund", "Solar Towns and Solar Schools", "One Million Solar Roofs", and "Twenty Million Trees" (DOE, 2013). The twenty per cent Renewable Energy Target (RET) for 2020 established by the Rudd-Gillard government is being reviewed by a government committee led by a "climate sceptic" (Arup, 2014; "Sceptic Warburton to head RET review," 2014), and may be reduced or abandoned. This would leave the

[6] The ministerial title previously used by the Rudd & Gillard governments – "Minister for Climate change" – has also been abandoned.

"NCCARF" – an adaptation research program – as the only Rudd-Gillard government program being retained. The Abbott government's "direct action" policy is inconsistent with the aforementioned trend in international climate change policy[7], and has recently been criticised by Australian economists – a recent newspaper survey of thirty-five "prominent university and business economists" found that eighty-six per cent preferred the Gillard government's carbon pricing scheme (Wade & Hutchens, 2013) – and some media[8]. Nevertheless, given the long-term trajectory in international climate change negotiations and the grave implications of climate change science, it is likely to be a pause in Australian climate policy rather than an end point.

Policy and legislative responses of Australian state and local governments have followed similar paths to that of the federal government. Every state and territory has created government departments or agencies of climate change and in three of these states – Victoria, New South Wales and Queensland – a Minister for Climate Change has been appointed. In addition, all states except Western Australia and the Northern Territory have climate change legislation (Power et al., 2010) for various purposes including GHG mitigation targets, public planning, renewable energy targets and subsidies. State and territory legislation has also enabled the development of climate change adaptation programs. For example, in the state of Victoria, the Victorian Government has its Victorian Climate Change Adaptation Program, and under its *Climate Change Act* (P. o. Victoria, 2010), has previously had a GHG mitigation reduction target of twenty per cent below 2000 levels by 2020[9]. Local governments around Australia have also developed formal policy and legal responses to climate change including the setting of municipal GHG emissions reduction targets, the development of local climate change adaptation measures, and the widespread appointment of staff responsible for the development and implementation of such policies (Pillora, 2011).

However, and in stark contrast, at the level of national sport policy pertaining to climate change there is a notable gap. Put simply, there is none. A literature search revealed that neither the Australian Government, nor the Australian Sports Commission (ASC) – its agency for sport policy and development – has a climate change policy for Australian sport, or even a general environmental one. While the ASC does link its commitment to Corporate Social Responsibility (CSR) to environmental goals such as reducing transported-related GHG emissions for sport events (ASC, 2012), the absence of any documentation about the actual or potential impacts of climate change on sport suggests that at best, it is a low priority at the highest levels of the Australian sport bureaucracy. With no scholarly

[7] Australia and Japan are the only nations amongst sixty-six surveyed recently to have undone "progress" on climate change legislation in the last two decades. See Nachmany et al. (2014). *The GLOBE climate legislation study: A review of climate change legislation in 66 countries.*

[8] It was recently described as "a fig leaf to climate change deniers in the Liberal Party." See White, A. (2013).

[9] It is however worth noting that this mitigation target was abandoned by the Baillieu Liberal Government after the 2010 Victorian election.

literature around this policy vacuum either, this knowledge gap however highlights an opportunity for scholarly inquiry, and reinforces the compelling justification for this study.

Climate change as a multidisciplinary issue

Climate change today has moved beyond the realm of climate scientists specifically – and the natural sciences more generally – and has become a genuinely *multidisciplinary* issue (Grieneisen & Zhang, 2011, p. 72; Haigh, 2008a, p. 7; Haigh & Griffiths, 2009, p. 356). The variety of disciplines that have studied climate change spans most of the major discipline groups including the natural sciences, the social sciences, humanities, and the professions & applied sciences, and dates back some decades. This multidisciplinarity has fuelled the "exponential growth" in climate change research over the past nineteen years. In a study of the status of climate change research, Grieneisen & Zhang (2011) observed the number of publications per year doubling from, "1997 to 2004, and from 2005 to 2009", and reported 110,139 publications found on the "Web of Science" database. Grieneisen & Zhang (p. 73) note the magnitude of climate change research is illustrated by comparing this achievement with Stanhill's (2001) prediction that by the, "middle of the twenty-first century", the cumulative climate change literature would reach "100,000 [articles], equal to that of a major scientific discipline", and concluding that, "it appears to have exceeded that level already." This multidisciplinarity illustrates the intellectual depth and breadth of climate change as a management issue, and its global significance.

Research into the impacts of climate change involves a wide variety of disciplines. Beginning with the *natural sciences*, disciplines making key contributions include climatology and meteorology, and include topics such as climate change impacts on glaciers (Barry, 2006), rainfall patterns (Fensham, Fairfax, & Archer, 2005), sea levels (Bindoff et al., 2007; Kopec, 1971), flora & biodiversity (Briones, Ineson, & Piearce, 1997; Hannah, Lovejoy, & Schneider, 2005), and food production (Fischer, Shah, Tubiello, & van Velhuizen, 2005; Shah, Fischer, & van Velthuizen, 2008). Within the *humanities*, historians have canvassed the impact of climate change on civilisations (Fagan, 1999, 2004; D. W. Schwartz, 1957), while the ethics discipline has also contemplated climate change (Gardiner, 2004, 2010).

Within the *professions and applied sciences*, climate change research has come from disciplines such as architecture (Jentsch, Bahaj, & James, 2008; Sharples & Lee, 2009), medicine (Epstein, 2005; Epstein & Ferber, 2011), engineering (Parkin, 2000), urban planning (Vasey-Ellis, 2009), and law (Bonyhady & Christoff, 2007; Fowler, 2007) where the specialisation of climate law has emerged. In particular, the business discipline has examined a range of topics including emissions trading (Paulsson & von Malmborg, 2004), the responses of financial institutions (Furrer, Hamprecht, & Hoffmann, 2012), implications for the aviation industry (Gössling & Upham, 2009), tourism

adaptation (Craig-Smith & Ruhanen, 2005; Jopp, DeLacy, & Mair, 2010), and electricity supply (Haigh & Griffiths, 2012).

Finally, the *social science* disciplines have been perhaps the most active contributors outside of the natural sciences. Topics of social science climate change research include ecological citizenship (Wolf, Brown, & Conway, 2009), geography (Rice, 2010), social and behavioural dimensions (Adger et al., 2009; Martens & Ting-Chang, 2010), and anthropology (Batterbury, 2008; Roncoli, Crane, & Orlove, 2009). However, within the social sciences, two disciplines are most prominent: first, the policy studies discipline has made a number of contributions to the emergent specialisation of climate policy (Christoff, 2008b, 2010a, 2010b; Gupta, 2010; Hoffman, 2002; Schneider, Rosencranz, Mastrandrea, & Kuntz-Duriseti, 2010), while climate change implications for energy policy is another topic to have received scholarly attention (Schläpfer, 2009; Unruh, 2000). Second, the economics discipline has been critical to informing climate change policy development. For example, Stern's (2006) review of the economics of climate change has been a key influence on global climate change policy debate, although economics clearly remains divided about the best economic model for responding to climate change (Garnaut, 2008, 2011; McKibbin, 2012; Nordhaus, 1991, 1993; Van den Bergh, 2004). Other contributions have discussed the role of economics in climate change policy (Garnaut, Howes, Jotzo, & Sheehan, 2008; McKibbin & Wilcoxen, 2002), and the economic implications of international climate change agreements & negotiations (McKibbin, Morris, & Wilcoxen, 2010; McKibbin & Wilcoxen, 2004).

However most of this multidisciplinary literature was created in a western context, particularly from Western Europe and North America, and so reflects the cultural perspectives and resources that such regions hold. Nevertheless, Grieneisen & Zhang (2011, p. 73) conclude that "interdisciplinarity", in the sense of individual studies "examining issues across multiple disciplines", is not yet a "prominent feature of current climate change research" (Bjurström & Polk, 2011, p. 542). Nevertheless, such research reflects the high priority that climate change now holds at a policy level, and to illustrate the policy significance of climate change, the next section of this chapter offers a brief discussion of international climate change policy.

Why climate change is important for management

> *"One of the indicators of the strength of an academic discipline, or sub-discipline, is the quantity and quality of the literature by which it is underpinned"*
>
> Trevor Slack (2003, p. 118)

Although Trevor Slack was talking about the discipline of sport studies when he wrote these words, his observation is pertinent to many disciplines. Specifically, Slack's observation may be extended to the growing body of management literature contemplating the impacts of the natural environment on organisations, and more recently, the impacts of climate change on organisations. Citing Mirvis, Googins & Kinnicutt (2010), Rondinelli (2004), and Snider, Hill & Martin (2003), Gibson (2012, p. 15) asserts that the environment has become an "integral part of the business literature and practice" with many major corporations integrating environmental issues into mission statements, and investing in preservation and remediation of the natural environment. Climate change has become a major problem for business due to its financial impact and the unpredictability of increasingly frequent natural disasters (Haigh & Griffiths, 2009; Mills et al., 2002; Stern & Treasury, 2006), while Berkhout (2012, p. 91) argues that "organisations will be the central actors in societal adaptation to climate variability and change." Its implications are also evident in the growth of legislative and policy responses by governments, the response of the global insurance industry (Mills, 2009; Thistlethwaite, 2012), and in the emergence of new markets as a consequence of climate change (Stern & Treasury, 2006). While this body of literature has emerged predominantly in the last ten years, the strength of this literature has grown through its increasing quality and quantity to the point where it has arguably become a management sub-discipline in its own right. Haigh (2008a, p. 15) classifies such literature in two ways: first, "that which recognises that organisations operate within natural environmental constraints but does not concentrate on climate change" and; second, "that which specifically considers the impacts of climate change."

For work that does not focus specifically on climate change, the view that the natural environment is an important consideration for organisations began to enter management literature in the mid-to-late 1990's (Winn & Kirchgeorg, 2005, p. 236), and has since been accepted by a range of management scholars (Benn, Dunphy, & Griffiths, 2006; Eiadat, Kelly, Roche, & Eyadat, 2008; T. Hahn, Kolk, & Winn, 2010; Hart, 1995, 1997; Hoffman, 2005a; Kolk & Mauser, 2002; Linnenluecke & Griffiths, 2010a, 2012, 2013; Orsato, 2006, 2009; Winn & Kirchgeorg, 2005). However, the initial acceptance of the natural environment's place in managerial consideration occurred amidst criticism that the natural environment was, "irrelevant to business practice" (Gladwin, Kennelly, & Krause, 1995; Purser, Park, & Montuori, 1995; Shrivastava, 1995 as cited in Winn and Kirchgeorg, 2004, p. 232). This divergence of opinion points to the initially contested nature of the debate about the relationship between organisations and the natural environment whilst highlighting a recent shift in thinking by some scholars over this period.

Scholarly debates over the role of environmental considerations in organisational management span at least three decades and involve a range of views. Nobel Prize-winning economist, Milton Friedman (1970), dismissed the role of managers in improving the "environment" by arguing that the purpose of business is, "to increase its profits." Similarly, Drucker (1984, p. 62) while acknowledging the social responsibility of business, nevertheless asserted that the "proper" social responsibility of business was to, "tame the dragon, that is to turn a social problem into economic opportunity and economic benefit, into productive capacity, into human competence, into well-paid jobs, and into wealth." However in the early 1990s, business scholar Michael E. Porter (1991a) sparked "heated" academic debate (Orsato, 2006, p. 127) about whether it "pays to be green" for organisations. At this time, some scholars attempted to identify the difficulties for firms in using environmentally-friendly practices (Clarke et al., 1994; Walley & Whitehead, 1994) whilst Porter & Van Der Linde (1995) elaborated some arguments for greener organisations. In contrast, Palmer, Oats & Portney (1995) warned that the "private costs" of pro-environment regulation were higher than they needed to be and argued that the economic benefits to firms of environmental regulation should be tested through cost-benefit analysis that included social benefits. Levy (1997) however, in one of the first papers that extended the management-environment nexus to the issue of climate change, concluded that whilst business has, "a substantial influence over the timing and shape of international environmental agreements", in the case of climate change, it would nevertheless eventually be forced to accept, "some form of emission limitation." In retrospect, the divergent emphases of these scholars mark a significant shift in attitudes toward the natural environment and point to a broadening of management debate about what is relevant to managing organisations.

In this context, Hart (1995) was a relatively early advocate of the importance of the natural environment to organisations by suggesting that "historically" management theory had, "ignored the constraints imposed by the biophysical (natural) environment" (p. 986). Hart's seminal article offered a theoretical innovation by proposing a natural-resource-based view of organisations with three "interconnected strategies" based on the firm's relationship to the natural environment: (1) "pollution "prevention; (2) "product stewardship", and (3) "sustainable development." Building on the work of Porter (1990) and Meadows, Meadows & Randers' (1992) "Limits to Growth" thesis, Hart's linking of competitive advantage to the natural resources available to a firm paved the way for other scholars to pursue the natural environment as a management consideration, and in particular, highlighted the value of resource-based view (RBV) theory as a means of explaining the organisation-natural environment relationship.

Another key contribution to this body of literature was Kolk & Mauser's (2002) work which documented the evolution of environmental management for organisations over nearly two decades

from the 1980's until the early 2000's. The authors classified the environmental behaviour of organisations and attempted to evaluate their performance, and in doing so, identified a range of models of environmental management and associated typologies. Surveying developments since Petulla's (1987) study, the article outlined forty examples of continuum models, and seven of typologies of environmental management, and charts the rise in the 1990's of standardised organisational environmental management performance evaluation systems such as the International Standardisation Organisation's (ISO) "14031 Standard", the Global Reporting Initiative guidelines, the World Business Council for Sustainable Development's eco-efficiency guide, and the Dow Jones Sustainability Group Index. A key theme of the article is the "greening of business" thesis that has been advanced with gradually increasing frequency since the late 1990's by a range of management scholars. This "greening" of management literature is now well documented (Linnenluecke & Griffiths, 2013, p. 7).

Since the early-to-mid 2000's, the publication of scholarly literature examining the role of the natural environment in management considerations has gathered pace. Recognising the wider acceptance of the natural environment in business decision making, Hahn, Kolk & Winn (2010) argue for a, "rethinking of the theoretical foundations of management and the practice of business strategy" (p. 385). This comment reflects their recognition of: "the broader social and environmental challenges faced by companies and society at large and by their implications for corporate decision making, performance and viability" (p. 386). Questions considered in this literature include corporate sustainability (Linnenluecke & Griffiths, 2010b, 2013), the role of business in contributing to life-supporting environmental systems (Valente, 2010), underlying conceptualisations of the relationship between business, society and nature (Marcus, Kurucz, & Colbert, 2010), and critiques of existing corporate environmental management (Kearins, Collins, & Tregidga, 2010). The common thread running through this literature is dissatisfaction with the status quo of business research and practice, and appeals for managers and management scholars to imagine new and sustainable approaches to the business-natural environment relationship. A key assumption underlying all of this literature is that previous business models that assumed that the environment will provide an, "endless source of resources and a limitless depository for waste" (Hoffman & Bazerman, 2007, p. 86), are no longer sustainable and therefore must be replaced with ones that are.

Another interesting feature of organisational literature that contemplates the relationship between the firm and the natural environment – work that is often referred to as organisations and the natural environment (ONE) literature (AMJ, 2013; Hoffman, 1999; Starik & Marcus, 2000) – is how it is consistent with Porter & Kramer's (2006) *"inside-out"* and *"outside-in"* perspectives of organisations. That is, some of this literature focuses on the impact of a firm's activities on the society or natural environment in which it operates (inside-out), while other ONE literature focuses on the

impact that the society or natural environment in which it operates may have upon the firm (outside-in). Winn & Kirchgeorg (2005), while not using Porter & Kramer's inside-out/outside-in terminology, also recognise these dual perspectives of organisations. They point out that managers and management researchers have concentrated more on how organisations affect the natural environment (i.e. inside-out), than the impacts of the natural environment on organisations (i.e. outside-in). This position is supported by empirical studies (Sharma & Henriques, 2005; Sharma & Vredenburg, 1998), and is reflected in the foci of other empirical studies (Henriques & Sadorsky, 1999; Russo & Fouts, 1997; Sharma, Pablo, & Vredenburg, 1999).

Consistent with general greening of management literature, publications that specifically consider the organisational impacts of – and responses to – climate change is growing (Okereke et al., 2012, p. 10). However, whilst evidence that climate change *can* and *will* have a significant impact on organisations (Hoffman, 2007a) has increasingly been the subject of scholarly debate in management journals, acceptance of this problem has been surprisingly slow to emerge (Goodall, 2008). Goodall cites five reasons for this (pp. 415-418): (1) the "science has only just been confirmed"; (2) there is a "time lag" between the "discovery of scientific knowledge, its interpretation in the social sciences, and its eventual publication in top journals"; (3) climate change "is a practical problem and not a conceptual one"; (4) "it's a reflection of political bias", and; (5) "promotion incentives are skewed in business schools toward incremental additions to known knowledge." In contrast, while Winn et al. (2011, p. 2) agree that management and business journals were slow to publish articles in relation to climate change, this is "understandable" given the, "profound uncertainties associated with the type, the occurrence, the scale and the location of anticipated impacts" on organisations that have "severely constrained" earlier publication.

Nevertheless, organisations and climate change literature now has a considerable breadth and depth that reflects a dramatic shift in wider policy and strategy debate that has occurred in less than a decade (Kolk & Pinkse, 2005, p. 6). This literature canvasses a wide variety of topics although three standout: first, organisational climate change *strategies* are by far the most prevalent topic in this body of work and this indicates the extent to which climate change has become an important consideration for managers (Carr-Cornish, Linnenluecke, & Griffiths, 2013; Haigh & Griffiths, 2012; Hoffman, 2005b, 2007a, 2010; C. A. Jones & Levy, 2007; Kolk & Pinkse, 2004, 2005, 2011; Michalisin & Stinchfield, 2010; Okereke et al., 2012; Park, 2008; Pinkse & Kolk, 2009; Porter & Reinhardt, 2007; Sussman & Freed, 2008; Weinhofer & Busch, 2013; Wittneben & Kiyar, 2009). Carbon management, a specific form of organisational climate change strategy, is an extension of this topic (Hoffman, 2007a, 2010; Lamberton, 2013; Okereke & Küng, 2013). Second, organisational *adaptation* and *resilience* to extreme weather events is another topic reported in recent literature (Linnenluecke & Griffiths, 2010a, 2012; Linnenluecke, Griffiths, & Winn, 2008; Linnenluecke, Griffiths, et al., 2011; Linnenluecke,

Stathakis, & Griffiths, 2011). Third, *competitive advantage* is the next most frequently reported topic in this literature (Kolk, Levy, & Pinkse, 2008; Kolk & Pinkse, 2004, 2005; Lash & Wellington, 2007; Michalisin & Stinchfield, 2010). Together, these publications illustrate the *depth* of scholarly work around organisations and climate change.

Other publications examining the implications of climate change for organisations illustrate the *breadth* of this literature. These topics include corporate perceptions of climate science (Rothenberg & Levy, 2012), corporate political strategy (Clark & Crawford, 2012), corporate partnerships (Kolk, Pinkse, & Hull van Houten, 2010; Pinkse & Kolk, 2012), greenhouse gas emissions trading (Kolk & Hoffman, 2007; Page, 2011; Paulsson & von Malmborg, 2004), responses by multi-national corporations (Kolk, 2008; Kolk & Pinkse, 2008), organisational innovation (Pinkse & Kolk, 2010), and the physical impacts on organisations from climate change (Winn et al., 2011). Other topics include stakeholders (Haigh & Griffiths, 2009; Kolk & Pinkse, 2007b); the impact on institutional governance systems (Griffiths, Haigh, & Rassias, 2007; Kolk & Pinkse, 2008), risk management (Busch & Hoffman, 2006); emissions reporting (Kolk et al., 2008); brands and climate change (Lippincott, 2008); environmental markets (Haigh, 2008b), and emissions regulation (Hoffman, 2007b). Like the multi-disciplinary climate change research considered earlier in this chapter, this management and climate change literature is mostly derived from western European and North American contexts. Another key feature of this literature is a shared and underlying assumption that climate change is a long-term issue of ongoing importance to organisations, especially business ones.

However, the importance of climate change to business is underlined by this breadth of management research. The management literature pertaining to climate change covers a range of industries (Haigh & Griffiths, 2012, p. 108) including housing construction (Berkhout, Hertin, & Gann, 2006; Hertin, Berkhout, Gann, & Barlow, 2003), water supply (Arnell & Delaney, 2006; Berkhout et al., 2006), electricity supply (Haigh & Griffiths, 2012; Wittneben & Kiyar, 2009), skiing (Hoffmann, Sprengel, Ziegler, Kolb, & Abegg, 2009), the automotive industry (Kolk & Levy, 2004), aviation (Gössling & Upham, 2009), and the oil & gas industry (Kolk & Levy, 2004; Levy & Kolk, 2002).

The management literature documents a range of issues that are posed by the phenomenon of climate change for organisations, and which are important to this study. The first two of these are *vulnerability* (Füssel, 2007b; Füssel & Klein, 2006; Tubi, Fischhendler, & Feitelson, 2012) and *risk*. Organisations may be vulnerable to impacts of climate change and the degree of vulnerability varies depending on the nature of their activities and whether they have a "direct" or "indirect" relationship with impacts on the climate system. The significance of vulnerability to management research is underlined by Füssel (2007b) who argues that it is a "generally applicable conceptual framework for climate change research." On the other hand, the concept of risk for organisations has been elaborated

with Winn, Kirchgeorg, Griffiths, Linnenluecke, & Gunther (2011, pp. 157-158) having identified three types: (1) extreme weather events, such as fires, storms and floods; (2) gradual impacts, such as sea level rise and increased ocean acidity, and; (3) abrupt large-system changes. Winn et al. (2011) argue that such climate change risks to firms exist in eight dimensions including severity, time, space, mode and predictability. Busch & Hoffman (2006) identified "financial" risks for firms according to their "intensity of and dependency on carbon-based materials and energy", Hoffman (2002) identified risks such as government policy change, while Lash & Wellington (2007, p. 96) cast climate change as risk that is global, long-term and with harm that is essentially irreversible.

Haigh & Griffiths (2009) argue that climate risks are reflective of two key perspectives on the organisational-natural environment relationship, namely: (1) what impact does an organisation have on the natural environment?, and; (2) what impact does the natural environment have on an organisation? This argument, the so-called "dual perspectives" of organisations identified by Winn & Kirchgeorg (2005), may also be interpreted as the aforementioned inside-out/outside-in perspectives of organisations developed by Porter & Kramer (2006). No matter which terminology is preferred, these perspectives are an extension of earlier ONE literature pioneered by Hart (1995), Winn (1995), Starik & Marcus (2000), Bansal & Roth (2000), and others – from organisations and the natural environment generally – to organisations and climate change specifically. This highlights two valid and potentially very useful perspectives for this study that together could allow for a more holistic understanding of what exactly climate change means, or does not mean, for major Australian sport stadia.

Vulnerability however is an issue of degrees, rather than an absolute for all organisations, and so is related to the idea of *resilience* (Linnenluecke & Griffiths, 2012; Linnenluecke et al., 2008; Winn et al., 2011). According to Winn et al. (2011), the notion of organisational resilience refers to the capacity of the firm to be able to cope with "discontinuities" (Drucker, 1969), "hyper-turbulence" (Brown & Eisenhardt, 1997), "uncertainties" (Milliken, 1987), and "disruption" (Christensen, 2006) in the operating environment with economic globalisation, technological change, socio-political pluralism, and even war being typical examples of such problems. Winn et al. (2011, p. 160) argue that with the problem of climate change, "the resilience of societal institutions and entire nation states is at stake", and that its "scale, scope and systemic uncertainty" has the potential for massive discontinuous change (MDC) to the social and ecological (or biophysical) systems within which firms operate. Organisational resilience to climate change therefore becomes another valid and potentially very useful concept for this study.

However, the management literature makes clear that climate change issues do not end for organisations with risk, vulnerability and resilience. On the contrary, when faced with such problems,

organisations are then faced with the secondary question of, *"How should we respond to such issues?"* The two key response issues for organisations are GHG *mitigation* and, organisational *adaptation*, to climate change (Linnenluecke & Griffiths, 2010a). Both of these key concepts originate in the scientific literature pertaining to climate change and their significance is underlined by being key subjects of IPCC assessment reports as early as their first in 1990 (IPCC, 1990). The mitigation or reduction of GHG emissions (Weinhofer & Hoffmann, 2010), and adaptation to climate change, implicitly reflect "*inside-out"* and "*outside-in"* perspectives of an organisation's relationship with the natural environment, including global climate (Porter & Kramer, 2006; Porter & Reinhardt, 2007). In the context of management and climate change research, "inside-out" refers to the need for business leaders to, "understand the impact of the firm's activities on the climate", while "outside-in" refers to them understanding how, "changing climate (in both its physical and its regulatory manifestations) may affect the business environment in which the firm competes" (Porter & Reinhardt, 2007, p. 23). Mitigation of an organisations directly or indirectly-produced GHG emissions represents a key example of inside-out thinking, whilst adaptation to altered physical, economic and political circumstances due to climate change represents a key example of outside-in thinking. Both perspectives are indicative of the gradual shift among management scholars toward greater consideration of climate change as an organisational issue. Both perspectives are therefore part of the recent general "greening" of management literature.

A significant challenge for organisations has always been to adapt to unexpected changes in their operating environments (King, 1995; Linnenluecke & Griffiths, 2010a, p. 478; Weick & Sutcliffe, 2001; Winn et al., 2011). Unexpected changes have often been framed in the context of disruptions to "economic systems and activities" such as through "strikes", "changes in customer demand and competition, industrial crises, and accidents" (p. 478). However, climate change and extreme weather events represent as much, "uncertainty and potential for disastrous consequences", as those associated conventional economic or industrial disruptions (Linnenluecke & Griffiths, 2010a, p. 478). Few environmental changes, however, exhibit as much uncertainty and potential for disastrous consequences as those associated with climate change and extreme weather events in particular (Barnett, 2001, as cited in Linnenleucke & Griffiths, 2010, p. 478).

The process of adapting an organisation to unexpected changes such as climate change-related events has been a topic of increasing discussion. Füssel (2007a), in a paper focussed on broader human – and not just organisational – adaptation to climate change, nine dimensions for adaptation were identified including climate sensitive domains, climate hazards, predictability, non-climatic conditions, purpose, timing, planning horizon, and actors. In contrast, Hertin et al. (2003) identified four "modes" of organisational adaptation: (1) "commercial adaptation", (2) "technological adaptation", (3) "financial adaptation", and (4) "monitoring" climate stimuli and search process for

adaptation measures. Extending this work, Berkhout et al. (2006) made a key contribution to organisational adaptation literature by identifying four climate change adaptation "strategies" in a study of organisations in the United Kingdom housing and water sectors. Framing these strategies as a process of organisational learning, Berkhout et al. identified: (1) "wait and see" (a deferral strategy based on "scepticism or uncertainty about climate change"); (2) "risk assessment and options appraisal"; (3) "bearing and managing risks" (a strategy focused on minimising risks and exploiting opportunities), and; (4) "sharing and shifting risks" (a strategy of externalising risks through "insurance and collaboration"). In other significant but more recent research, Linnenluecke & Griffiths (2010a) extended adaptation literature further by arguing that "resilient" organisations are needed when faced with significant climate change impacts, while Linnenluecke, Griffiths & Winn (2011) went further again advocating "anticipatory" adaptation, and Linnenluecke, Stathakis & Griffiths (2011) raised the example of "organisational relocation" as an adaptation strategy for firms vulnerable to climate impacts such as sea level rises, extreme weather events, or agricultural disruptions.

Given these climate issues, some key contributions to the management literature reveal a number of strategic responses by firms. Organisational responses to climate change differ considerably because of location-specific, industry-specific and company-specific factors (Kolk & Levy, 2004; Kolk & Pinkse, 2007b, p. 370), and which can operate at different organisational levels that are either internal (company-level), or external (supply chain-level, or beyond the supply chain) (Kolk & Pinkse, 2005; 2007b, p. 372). Kolk & Pinkse (2005, pp. 8-10) identified two aims/dimensions of "strategic intent" that overlap the three organisational levels: (1) "innovation", and (2) "compensation", to form a typology of strategy for climate change. The typology reveals six strategic options, three for each dimension, for managers to choose from. Innovation options include "process improvement", "product development", and "new product/market combinations", while compensation options include "internal transfer of emissions reductions", "supply chain measures", and buying "emissions credits." This typology is indicative of the sophistication that has emerged in recent years in management literature to climate change, and organisational responses.

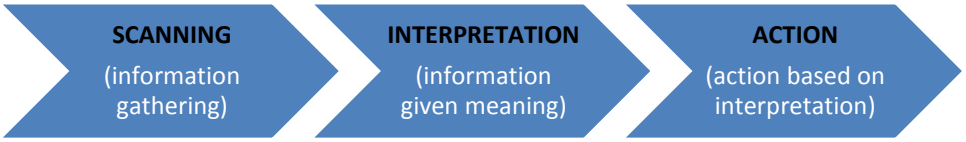
Making sense of climate change – literature of how organisations interpret the issue

Fundamental to how and why organisations respond to climate change is organisational interpretation of the issue. The manner in which organisations interpret and respond to different events or issues, and the reasoning that underpins such collective interpretations and actions, is the subject of an extensive body of management literature. Whilst routines, capabilities, experimentation, knowledge and feedback are all recognised as factors for explaining organisational interpretation (Berkhout et al., 2006), one well recognised framework is that of *sensemaking* (Daft & Weick, 1984; Thomas, Clark, & Gioia, 1993; Vlaar, Van den Bosch, & Volberda, 2006; Weick, 2001; Weick & Sutcliffe, 2001;

Weick, Sutcliffe, & Obstfeld, 2005) – an interpretive process by which people in organisations organise how they understand the world and then act upon it. Developed principally by organisational researcher, Karl Weick, sensemaking is thought by a range of scholars to be critical in shaping the actions or responses of organisations to such circumstances.

Sensemaking has three key stages (Daft & Weick, 1984; Thomas et al., 1993): (1) "scanning", a process of information gathering about important events or issues; (2) "interpretation", a process of translating important events and issues into meanings or concepts shared by senior managers, and; (3) "action", a new response or action based on organisational interpretation. In an extension of Daft & Weick's (1984) original sensemaking model, Thomas, Clark & Gioia (1993) added a fourth stage, that of "outcomes." An overview of Daft & Weick's three-sstage sensemaking model is given in Figure 2 below.

Figure 2: Daft & Weick's (1984) Sensemaking model: Scanning, interpretation & action



Daft & Weick's original model of sensemaking was based on four assumptions (pp. 285-286) about organisations: first, that organisations are "open social systems that process information from the (operating) environment"; second, while it is the individuals within organisations who make sense of the outside world, they do so in a collective fashion with information sharing being a key activity in creating the organisation's "cognitive systems and memories" – knowledge, behaviours, mental maps, norms and values; third, that "strategic-level managers formulate the organization's interpretation", and; fourth, that organisations differ systematically in the way they interpret the environment based on their internal characteristics, and that these differences flow through to organisational strategy, structure and decision making. Although Daft & Weick's original sensemaking model has been criticised for failing to take into account the role of "broad social and historical contexts"(Sutcliffe, Brown, & Putnam, 2006; Weber & Glynn, 2006) in processes of organisational interpretation, the sensemaking model is still advocated in recent management research although with some institutional theory revisions (Vlaar et al., 2006).

One issue that organisations make sense of is climate change. Like many other circumstances or issues, organisations can and do interpret the issue of climate change, and then develop actions or

responses toward the issue based on their sensemaking. The organisational literature pertaining to organisations, sensemaking and climate change is limited and – consistent with the general "greening" of management literature – emerged only in recent years. This literature considered climate-related issues such as organisational adaptation (Berkhout et al., 2006; Haigh & Griffiths, 2012; Linnenluecke & Griffiths, 2010a), and how managers perceive climate change (Angus-Leppan, Benn, & Young, 2010). However, even this limited body of work illustrates sensemaking's value as a conceptual framework for understanding how organisations interpret climate change.

Therefore, sensemaking also represents a useful conceptual framework for understanding how the organisations that manage major Australian sport stadia (MASS) interpret, and then respond, to climate change. It is clear from the limited literature on sensemaking and climate change that organisations, like many other issues, scan for information, form interpretations, and then act/respond to climate change based on their interpretations. As a consequence, this suggests that sport organisations such as those that manage MASS might also go through the same process of scanning for information about climate change, interpreting it, and then acting on it in some way. However, there is no reported literature on how or why sport organisations use sensemaking in relation to climate change. There is a small body of sensemaking literature focused on issues in sports contexts (Boessenkool, Eekeren, Knoppers, & Anthonissen, 2006; Claringbould & Knoppers, 2008; Verweel, Knoppers, & Anthonissen, 2006), particularly gender and diversity, however this is not at all related to climate change or other environmental issues. As a result, sensemaking became a key topic of interest for this study.

Why study climate change?

It is clear from this review of the preceding literature around climate change that there is a *compelling* case for a range of disciplines – including sport management – to research the implications of climate change. The science underpinning present knowledge of climate change is deep and broad despite some areas of uncertainty. A three-part scientific consensus about the existence *and* anthropogenic causes of climate change has emerged in recent years consisting of: (1) IPCC assessment reports published between 1990 and 2007; (2) the statements of dozens of scientific bodies of national or international standing, and; (3) surveys of opinion of peer-reviewed climate scientists. This scientific consensus is based on multiple lines of evidence of climate change and its anthropogenic causes reported in multiple peer-reviewed publications. The science of climate change is widely accepted by governments around the world who have formulated policies for adaptation to climate change and GHG mitigation. Over 100 nations around the world have implemented policies with carbon prices or that support renewable energy (Jackson, 2012), and at least 500 laws have been enacted globally to address climate change. As a result, climate change is arguably the most important issue facing humanity today, and for the foreseeable future.

The natural environment, climate change and sport

Earlier in this chapter, Slack's (2003, p. 118) observation that, "one of the indicators of the strength of an academic discipline, or sub-discipline, is the quantity and quality of the literature by which it is underpinned", was invoked. In relation to sport management literature that contemplates the natural environment, this sub-discipline is really only in its early stages. Nevertheless, some consensus has already emerged amongst scholars that while this body of literature is relatively rare – Mallen et al (2011) described a "paucity" of such work – it is growing (Mallen, Adams, Stevens, & Thompson, 2010; Mallen, Stevens, Adams, & McRoberts, 2010; Tranter & Lowes, 2009, p. 64). A range of topics have been broached by sport management scholars since the mid-1990's with the three major ones being: (1) *sport and the environment* (Jarvie, 2006, pp. 23-27; Pfahl, 2011; Schemel, 2001; A. Smith & Westerbeek, 2004; Thibault, 2009; Westerbeek & Smith, 2003; Wheeler & Nauright, 2006); (2) *sport environmental sustainability* (Chard, Mallen, & Bradish, 2010; Dingle, 2009; H. J. Gibson, Kaplanidou, & Kang, 2012; Mallen, Adams, et al., 2010; Mallen & Chard, 2011, 2012; Mallen, Chard, Adams, & McRoberts, 2013; Nguyen, Trendafilova, & Pfahl, 2014; Pfahl, 2010; Schmidt, 2006; Spector, Chard, Mallen, & Hyatt, 2012), and; (3) *environmental impacts of Olympic games* (Horton & Zakus, 2010; Jin, Zhang, Ma, & Connaughton, 2011; Kearins & Pavlovich, 2002; May, 1995; Paquette, Stevens, & Mallen, 2011; Samuel & Stubbs, 2012; Schmidt, 2006; A. Smith & Westerbeek, 2004).

Other topics addressed in this body of literature include communication of sport sustainability initiatives (Mallen, Chard, & Sime, 2013), environmental impacts of major sport events (Collins, Flynn, Munday, & Roberts, 2007; Dolles & Soderman, 2010), CSR and sport (Fairley, Tyler, Kellett, & D'Elia, 2011; Trendafilova, Babiak, & Heinze, 2013; Trendafilova, Pfahl, & Casper, 2013), environmental programs and golf (Minoli & Smith, 2011), environmental responsibility and indoor sports (Salome, van Bottenburg, & van den Heuvel, 2013), environmental change and extreme sports (Brymer, Downey, & Gray, 2009), environmental impacts of sport tourism (C. Palmer, 2004), sustainability and sport marketing (Chard, Mallen, & Bradish, 2013; Inoue & Kent, 2012). An interesting feature of this body of literature is how it illustrates Porter & Kramer's (2006) and Porter & Reinhardt's (2007) *"inside-out"* perspective of organisations. That is, this particular literature consistently discusses the negative impacts of sporting activities (the "inside") on the natural environment (the "outside"). This common view of sport is probably best explained as the genuine concerns of these authors for minimising the damage caused to the environment by sport.

However and in clear contrast, there are few examples in this literature of the application of Porter's *"outside-in"* perspective of sport and the natural environment. That is, there is little recognition of the impact of the environment (the "outside") on sport (the "inside"), and this indicates a general lack of research amongst sport management scholars into how the environment can disrupt sport. Although

this body of literature makes no direct or conscious references to the inside-out and outside-in perspectives, they are nevertheless implicit to this body of work.

Sport management literature that considers the natural environment, however, is a relatively recent phenomenon with few publications prior to 1995. In a key contribution, Mallen & Chard (2011) were the first to use a theoretical perspective to understand the relationship between sport and environmental sustainability, using "appreciative theory" (p. 3) to construct their eight-point framework. As a consequence, there has been little debate about what impact sport has on the natural environment, and equally, what impact the natural environment has on sport, a point recognised by Mallen & Chard (2011) whose framework was proposed as a "starting point" for such debate. Sport management literature is therefore unlike its counterpart in mainstream/non-sport management literature which has a much longer antecedence dating back to the 1970's. However, both sport management and non-sport management literature share an assumption that environmental issues are a growing concern for their organisations, and since the mid 2000's, a growing number of publications considering the natural environment. These trends coincide with the huge growth in scientific climate change literature in the same period highlighted by Grieneisen & Zhang (2011) and associated policy responses by governments.

Mirroring this scholarly literature pertaining to sport and the environment is a body of industry-based and popular literature that illustrate how a number of significant sport organisations have embraced environmental sustainability (ES) in the last twenty years. Mallen et al. (2011, pp. 241-242) highlight a range of "practical developments" beginning with the 1992 United Nations "Earth Summit" and its call for environmentally "sustainable development" in its Agenda 21 report (UN, 1992). This influenced subsequent developments including the International Olympic Committee's (IOC) decision to adopt an "Earth Pledge"; the European Council's development of a *"Sports Charter"* (COE, 1992) that committed partner countries to ES; the IOC's 1996 incorporation of environmental protection in the Olympic Charter (IOC, 2008); the subsequent commitment of Organizing Committee(s) of the Olympic Games (OCOG) to environmental protection; the 2000 European Code for Sustainability in Sport; the 2003 IOC Olympic Games Global Impact project, and; the 2005 Helsinki World Athletics Championships "ECOMass" program. Magazines such as *Sports Illustrated* are another example of how popular publications have mirrored the increasing attention paid by academic journals to environmental issues and sport. In his article titled, "Going, going, green", Alexander Wolff (2007) discussed the impact of climate change on snow sports, but also the contribution of major sports stadia to GHG pollution, and efforts by athletes and teams to avoid this through energy efficiency.

Another relevant area of the sport literature is that of Corporate Social Responsibility (CSR) because of what it could reveal about the motivation of sport organisations to address environmental issues

generally, and climate change issues specifically. Building upon the significant growth in non-sport management literature in recent years (Benn & Bolton, 2011; M.-D. P. Lee, 2008), the nexus between CSR and sport more broadly has been one of increasing research interest in recent years, and has covered a range of topics. These include social capital (Spaaij & Westerbeek, 2010), (Walker & Parent, 2010), corporate citizenship (A. C. T. Smith & Westerbeek, 2007), sport tourism (Walker et al., 2012), CSR's use in professional sport (Babiak & Wolfe, 2009; Breitbarth & Harris, 2008), and the influence of CSR on sport consumer attitudes (Walker & Heere, 2011; Walker & Kent, 2009). Interestingly, CSR & environmental initiatives in sport have also been a small but growing area of this literature (Babiak & Trendafilova, 2011; Inoue & Kent, 2012; Trendafilova, Babiak, et al., 2013). Surprisingly though, despite the breadth and depth of this body of literature, the impacts of climate change for sport organisations, and how and why they might respond to such impacts, has not been addressed. Furthermore, despite the growth of non-sport management research into the links between climate change and CSR (Pinkse & Kolk, 2010; Reid & Toffel, 2009; Stanny & Ely, 2008; Sullivan, 2009), there is no reported research that examines the influence of CSR on the responses of organisations that manage major sport stadia to climate change. As a result, the potential links between CSR, climate change and stadia became an area of interest for this study.

Literature that specifically considers the relationship between *sport and climate change* is smaller in volume than sport-environment literature, although a range of topics are considered. However, this body of literature is representative of the wider, global recognition that climate change is a highly significant issue, and also represents an emerging theme in sport management literature. One of the key contributions is a theoretical and conceptual framework for debating environmental sustainability (Mallen & Chard, 2011). Other topics include the renewable energy initiatives at Canadian sport stadiums (Chard & Mallen, 2013), the impact of climate change on snow sports (Moen & Fredman, 2007; Weiss, Norden, Hilscher, & Vanreusel, 1998), climate impacts of major sport events (Otto & Heath, 2010), climate change impacts on horse racing (Muscatello & Knight, 2010), climate change impacts, adaptation and GHG mitigation (Chard & Mallen, 2012; Dingle, 2007; McDonald, Dingle, & Stewart, 2011; McDonald, Stewart, & Dingle, 2014), greenhouse emissions (Schmidt, 2006), motorsport and marketing (Dingle, 2009; Tranter & Lowes, 2009), climate change and sport management (Dingle, 2010), and business impacts of the Kyoto Protocol (Smith & Westerbeek, 2004). Chernushenko et al. (2001) were among the first to canvass climate change, while Muscatello & Knight (2010) were the first in the world to call for a sport (horse racing) to "tackle, modify or justify activities which may be seen as significantly contributors to carbon emission(s)." Smith & Westerbeek (2004, pp. 132-138) listed climate change as one of a range of global environmental concerns in the 21st century that are causing sport to become greener, and that will "continue to do so in the long-term."

An interesting feature of this body of literature is how it also illustrates the value of Porter & Kramer (2006) & Porter & Rienhardt's (2007) "inside-out" and "outside-in" perspective of organisations. That is, most of the abovementioned authors recognise that many sports (the "inside") are sites for creating, directly or indirectly, GHG's that contribute to changing the climate (the "outside"). Equally, some of these authors in this particular literature also adopt an outside-in perspective when they recognise the impacts of climate change (the "outside") on the sports (the "inside"). For example, Tranter & Lowes (2009) and Dingle (2009) respectively point out the practical and symbolic problems that marketers of motor sport face in an era of climate change when such sport is particularly and conspicuously reliant on carbon-intensive fossil fuels for propulsion. Similarly, the outside-in perspective of climate change and sport is illustrated by Weiss, Norden, Hilscher, & Vanreusel (1998) and Moen & Fredman's (2007) discussion of how snow sports are negatively affected by climate change, while Swan, Otago, Finch, & Payne (2008), Muscatello & Knight (2010) and Dingle (2007) all discuss how water-dependent outdoor sports may be degraded by lower rainfall associated with climate change.

In another interesting development in the literature, government sport agencies have also started to publish non-academic publications that specifically address climate change issues and strategies for sport organisations. The Western Australian Department of Sport and Recreation (WADSR), and Sport and Recreation Tasmania (SRT)[10], provide three prime examples of how climate change is becoming an increasingly important issue for sport and governments in Australia. First, WADSR's report, *Climate Change is No Longer Just A Concept* (2007), identifies five "direct" and "indirect" climate impacts on sport: (1) "reduced rainfall", (2) "increased temperatures", (3) increased evaporation", (4) more "frequent" and "extreme weather events", and (5) "sea level rise." These "impacts" highlight some significant vulnerabilities of some sport and recreation activities, especially those played outdoors. These vulnerabilities include dependence on stable water and energy supplies, and reliance on stable habitats and climatic conditions. However, the extent to which climate change has become a major issue is best illustrated by the strategy framework developed by WADSR in this report for sport and recreation organisations to, "assess and respond to the impacts of climate change." Crucially, the eight part framework is specifically intended to enable sport and recreation organisations in Western Australia to "adapt" to climate change. Additionally, WADSR's *Sustainability Pack* (2012) for Western Australian sport & recreation organisations also identifies climate change as the predominant issue, and offers a strategy framework for addressing climate-related issues such as energy efficiency, biodiversity, water management, and waste management. Lastly, SRT's Strategic Plan 2009-2014 (SRT, 2009) also acknowledges that climate change poses, "challenges regarding water availability for sports grounds." Nevertheless, the small volume of published sport management literature inquiring into the implications of climate change for sport,

[10] Tasmania is one of Australia's eight states and territories.

despite the considerable attention given to this issue by other disciplines, highlights both a knowledge gap, and a general reticence on the part of sport management scholars and journals to address this issue.

However, there is some academic literature suggesting climate change is also an issue for sport in ways not previously anticipated. For example, there is some evidence highlighted in four Australian publications to suggest climate change either is, or has the potential to, damage the surfaces of sports grounds, and as a consequence, pose physical risks to sport participants. Townsend et al. (2003) were among the first scholars to consider potential links between climate change, physical activity such as sport, and human health. These relationships were acknowledged explicitly by Swan, Otago, Finch & Payne (2008, p. 172), and implicitly by Twomey et al. (2008, p. 11) in the rationale for a study of development standards for artificial turf for Australian rules football and cricket, two essentially outdoor sports exposed to the physical impacts of climatic change. Swan et al. (2008) highlighted the risks posed by playing surfaces hardened by the kind of dry climatic conditions associated with climate change in recent years.

Sport management literature, to the extent that it considers climate change at all, has two clear features. First, just as the mainstream management literature has done in recent years for non-sport organisations, it shares an assumption that climate change is a long-term issue of ongoing importance to sport organisations. A second clear feature is the lack of theoretical resources mobilised to consider this issue. In contrast to the science disciplines that have marshalled various theoretical perspectives leading to the development of pivotal concepts of climate change adaptation and GHG mitigation, climate change as it affects sport management has had very little specific consideration through theoretical lenses. Equally, as suggested earlier in this chapter, a range of scholars in the mainstream management literature have demonstrated the value of the key theories such as institutional theory, RBV, stakeholder theory, and supply-chain theory. Just as the community of sport management scholars has been slow to consider environmental issues generally, and with little breadth or depth compared to mainstream issues – such as the management of volunteers, marketing, sponsorship, finance, and organisational culture – none of these theoretical perspectives have been brought to bear on sport management issues or organisations. However, perhaps this is understandable given the special features of the sport industry, its heavy operational focus, and in many cases, comparatively scarce organisational resources. Sport organisations, faced with such limited resources are regularly forced to make difficult decisions as to where and how to deploy such resources. Nevertheless, this scarcity of theory serves to underline why this study is an important and timely contribution to extant sport management literature.

Major sport stadia, the environment and climate change

Sport stadia have been defined in different ways. The *Oxford English Dictionary* ("Stadium," 2014) defines a stadium as, "an athletic or sports ground with tiers of seats for spectators", or as, "(in ancient Rome or Greece) a track for a foot race or chariot race", or as, "an ancient Roman or Greek measure of length, about 185 metres (originally the length of a stadium)." Surprisingly, however, none of the academic literature offered a definition of sport stadia. Nevertheless, the only other available definition proved to be an interesting one. English stadia architects, Geraint John, Rod Sheard and Ben Vickery characterise stadia as essentially, "huge theatre[s] for the presentation of heroic feats" (John & Sheard, 1997, p. 1; John, Sheard, & Vickery, 2007, p. 1). Their definition is tied to the historical origins of this building type in ancient Greek *stadia*, meaning "foot racecourses", and ancient Roman "amphitheatres and thermae" (facilities for bathing). They cite the earliest examples of stadia being from Greek cities such as Delphi, Ephesus, Thebes, Epidauros, Olympia and Athens in the 8th century B.C., and refer to a, "kinship with the Greek theatre" that is "unmistakable"[11]. Such stadia were sporting facilities of "civic importance" that took their place alongside "temples and altars."

Greek hippodromes, "course(s) for horse and chariot races", were another antecedent of the modern stadia, as were 1st century A.D. Roman amphitheatres such as the Colosseum, elliptical-shaped arenas[12] for "mortal combat." The 3rd and 4th century A.D. Roman circuses, U-shaped horse and chariot racing courses, were another early form of stadia, modelled on the earlier Greek hippodromes. However, stadia, as a building type, went into a 1400-year decline with the advent of the mediaeval period of history where the rise of Christianity saw the construction of churches become an architectural priority over building places for sport and entertainment (John & Sheard, 1997, pp. 5-6; John et al., 2007). These authors argue that stadia were not revived until after the industrial revolution of the mid-to-late 1800's when a combination of growing demand for mass spectator events, entrepreneurs willing to cater for this demand, and new construction technologies enabled the modern era of stadia design to begin.

The global popularity of building large sport stadia lies in a combination of a range of factors. First, a range of studies report that building large sport stadia is seen as a means of economic development, urban renewal and modernisation (Ahlfeldt & Maennig, 2010; Buckman & Mack, 2012; Chanayil, 2002; Dyreson, 2008; Feddersen, Grötzinger, & Maennig, 2009; C. Jones, 2002; Newman & Tual, 2002; Thornley, 2002). Horne (2011, p. 206) notes the 2008 Olympic Games afforded this opportunity to the city of Beijing, and that, "Olympic Games and other sports mega-events have long

[11] The kinship of Greek stadia with theatre refers to U-shaped stadia that were modelled on U-shaped Greek theatre designs.

[12] The term 'arena' is derived from the Latin word for sand, which was spread onto amphitheatres to absorb the blood spilt by combatants at these venues (John & Sheard, 1997, p. 4; John, Sheard & Vickery, 2007, p. 4).

provided opportunities for nations to signal emergence or re-emergence on the international stage" (p. 215). Second, "cities increasingly build and utilize iconic architecture and urban spaces to flag their presence in the world", and building large sport stadia is an important element in attracting tourists and investment in business and finance. Third, there are powerful commercial reasons for builders and architects to design such venues.

This literature however overlooks a salient feature of modern major sport stadia, namely that they are at least in part a creation of modern markets, and competitive forces within those markets (Westerbeek et al., 2005, p. 52; 2006, p. 52). Westerbeek et al. (2005, 2006) point out that any decision to build, or not to build, major sport facilities is heavily influenced by the feasibility of such venues to succeed in the context of changing demographic, economic, sociocultural, technological, ecological and political factors that comprise the "macro-environment", as well as several types of competition. These authors cite Porter's "Five Forces" model and give sport examples for each: Force 1 ("intensity of competition") may come from other stadia; Force 2 ("bargaining power of buyers") may come from spectators, members or sponsors; Force 3 ("substitutes") can be from other entertainment products or services; Force 4 ("bargaining power of suppliers") such as players, or player unions, and; Force 5 ("the threat of new entrants") may come from other organisations willing to build major sport stadia in the same market. Their application of Porter's "Five Forces" model is an indicator of the sophistication with which decisions to build or not to build major sport stadia are subject to today.

Major sport stadia have been sites for some high quality academic work over the last two decades covering a range of topics. These topics include stadium financing (P. Lee, 2002; Scherer & Sam, 2008; Weiner, 2004), design, construction and safety (Horne, 2011; Paramio, Buraimo, & Campos, 2008), governance (Hoye & Nicholson, 2010), gender dimensions to stadia marketing (Lisle, 2011), stakeholder management (Walters, 2010), spectator psychology (Koenigstorfer, Groeppel-Klein, & Kunkel, 2010; Uhrich & Benkenstein, 2010; Wakefield, Blodgett, & Sloan, 1996), naming rights sponsorship (K. K. Chen & Zhang, 2011), the impact of stadia on property markets (Davies, 2005, 2006), and home team advantage (Pollard, 2002). Despite the breadth of the research pertaining to major sport stadia, it is relatively rare among sport management literature, especially in comparison to topics such as sport marketing. Nevertheless, a consistent and noteworthy feature of this literature is an almost complete silence on environmental issues generally, and climate change in particular.

However, the literature pertaining to major sport stadia, the environment and climate change is small, and consists of some scholarly work but mostly of non-academic, industry magazines and journals intended for a readership consisting mainly of facility owners and managers. Whilst this non-academic industry literature does not have the intellectual standing or scholarly rigour of academic

work, it does afford some insight into the degree to which the major sport stadia industry takes seriously environmental issues generally, and the issue of climate change specifically. In the rare examples of scholarly literature pertaining to stadia and the environment, topics considered include green stadium initiatives (Jin, Mao, Zhang, & Walker, 2011), environmental impacts (Westerbeek et al., 2005, 2006), environmentally friendly facility management (Westerbeek et al., 2005, 2006), and pro-environmental stadia (Kellison & Mondello, 2012). This body of literature, like the management and sport literature discussed previously in this review, may be divided into two major categories: first, that which concerns major sport stadia and the environment generally, and; second, that which discusses major sport stadia and climate change specifically. Of these, only two scholarly articles referred to climate change with both having a renewable energy theme (Chard & Mallen, 2013; Oldmeadow & Marinova, 2010). A small number of industry publications that canvass both categories are prominent in this literature, and these include the Australian publications *Facility Perspectives* and *Facilities Manager*, the European-based *Panstadia International*, and *Stadium & Turf* from the United States.

Industry-based literature that specifically addresses major sport stadia and climate change examines a number of topics including the impact of an emissions trading scheme on building costs (Pears, 2008), solar power for major stadia (Rittenberry, 2010), reducing stadia carbon emissions (Coxeter-Smith, 2008), the energy efficiency, carbon footprints and carbon offsetting of major stadia ("Green ambition," 2008), and the role of energy-efficient stadia lighting systems in reducing indirect carbon emissions (Oldenkotte, 2009b). The fact that such publications have emerged so consistently in recent years emphasises the importance attached to climate change by the global major stadia industry. They reflect a shared understanding that stadia do make an indirect contribution to climate change by way of their large energy consumption, and to some degree, an understanding that government regulatory responses can also add to the operating costs of such facilities.

Other noteworthy examples of why climate change should be an issue of strategic interest for MASS organisations were published in *Facility Perspectives*, a publication resulting from a partnership of "Executive Media and the Facility Management Association of Australia", and that is, "designed to address facility management issues and topics of interest to facility managers." Topics of relevance to this study that are covered by this magazine include a low-carbon economy (M. Winter, 2008), green buildings (Drummond, 2007), water management (Navarro, 2010), and environmentally sustainable design (ESD) (M. Winter, Lee, & Snow, 2007). Of these topics, energy management and water management are also two key issues that have emerged from the data for this study, and are part of wider thinking from the stadia industry about climate change. For example, this publication clearly states the risks of climate change legislation to facility management organisations. In an article titled "Facilities Management in A Carbon Economy" by Dave Sag (2008) – Executive Director of "Carbon

Planet", an Australian carbon management company – Sag explained the new obligations of big carbon polluters or energy users under the *NGER Act* to report their GHG emissions or energy user to government. The article was introduced by the editor of *Facility Perspectives*, in the following way:

> *Climate change, and fear of the inherent uncertainties surrounding this current policy problem, is driving a raft of economic reforms and, in some cases, revolutionary changes in the legislative landscape. This is having a direct impact on a plethora of industries, and facilities managers are among those at the coal-face.*

Sag then went on to assert the importance of the *NGER Act* to facilities because of its authority to require facility managers to calculate and then report their energy use, or their direct or indirect GHG emissions, to the Australian Government. To support his argument, Sag pointed out that the *NGER Act* underpinned the then "forthcoming national emissions trading scheme" (ETS), and that the application of the ETS to facilities depended on whether they met the legislation's thresholds for energy use ("100TJ of any kind of energy") or GHG pollution ("25kt of CO_2 equivalent (CO_2-e")[13].

Sag (p. 43) then explained how the *NGER Act* would operate and potentially require facilities managers to calculate and then report their direct or indirect GHG emissions. Sag then reminded readers of the significant financial penalties that applied to organisations that did not measure their emissions. Simply failing to register or to report attracts a $220,000 fine with a further $11,000 per day overdue while "similar fines are levied for failing to keep proper records, or failing to commission an independent audit of your emissions if requested to do so" (p. 43). Significantly, Sag then warned building owners and facilities managers – of which MASS organisations must be considered prime examples – about the looming risks posed by Australian government policy responses to climate change in general, and the NGER and ETS legislation in particular:

> *...building owners and facilities managers that don't make an immediate start on determining their facility's baseline emissions will be left at a disadvantage when emissions trading commences and they have not factored the "cost of carbon" into their strategic planning. The Government is rolling out their plans with an unprecedented amount of public consultation and industry briefing; failing to make the most of these opportunities may well result in a raft of shareholder and other stake-holder actions as they, and their lawyers, start demanding answers* (p. 43).

Whilst Sag, as a business person with a vested commercial interest in encouraging demand for the sorts of carbon management services offered by his company (Carbon Planet), this comment nevertheless points to a key reason why climate change should be an issue of strategic interest for MASS organisations; namely, that regardless of whether climate change poses direct physical risks to the operation of such stadia such as lower rainfall and higher evaporation, government policy and legislative responses may impose the Polluter Pays Principle (Caney, 2010; Dellink et al., 2009; Duus-Otterström & Jagers, 2012) on them. That is, governments may apply financial incentives for such organisations to mitigate their direct or indirect GHG emissions.

[13] A diagrammatic explanation of the reporting energy use and GHG emissions reporting thresholds is offered in Figure 1 in Chapter Two of this thesis.

However overall, so little is known about what climate change means for major sport stadia. This is surprising given their industrial and cultural significance to sport, the emphasis on "energy" and "carbon" issues in the industry-based literature, and in Australia, the evolution of climate change policy. Therefore, given the scarcity of knowledge and literature around MASS and climate change, a research question that has emerged and should be answered is: (1) *what*, if any, issues are posed by climate change for major Australian sport stadia and the organisations that manage them? Given these knowledge gaps, it also clear that there are two further research questions this study should investigate: (2) the methods (i.e. how) such organisations might use to respond to climate change, and also (3) the reasoning (i.e. why) for such responses. To assist with answering these research questions, it is clear this study should ask the following specifying questions: how MASS organisations *interpret* climate change? What, if any, adaptation responses are being employed by them? How such responses compare to those at other MASS organisations? And what, if any, *barriers* exist to such responses?

Conclusion

This chapter presents a review of literature from a variety of fields of study that have discussed climate change, or reported results of climate change-related studies, and it is clear that a number of themes have emerged. Beginning with the climate change science literature, it is clear that there is an overwhelming body of global, peer-reviewed scientific evidence that demonstrates that global climate has been warming for several decades – a clear theme of this work – and that it is highly likely to continue to do so for the foreseeable future. A second theme of this literature is that the primary cause of this warming is the release of heat-trapping greenhouse gases (GHG) from burning fossil fuels associated with human activities. A third key theme of the scientific literature is that human activities are rapidly leading to "dangerous" climatic change. From this body of literature emerged key concepts such as climate change vulnerability, risk, resilience, adaptation and GHG mitigation. While there remains some uncertainties about future climate change given the range of possible GHG emissions scenarios (IPCC, 2012), the mechanisms and causes of this phenomenon are generally well understood. This literature is therefore very significant because firstly, it conveys the clear scientific consensus that is the foundation for global action on climate change, and; secondly, it provides the basis for the wealth of multidisciplinary climate change research that has followed.

The second section of this chapter then reviewed a range of literature outside the natural sciences and a clear theme from this large body of work is that climate change is multidisciplinary research topic. Climate change is an issue of such significance that it is the subject of research by most of the major discipline groups including the professions & applied sciences, the humanities and the social sciences. Whilst much of this multidisciplinary research has occurred mainly in the last ten years, this is an indicator of the urgency with which climate change is now being afforded by scholars. The third and fourth sections of this chapter canvassed policy and economics literature pertaining to climate change,

and clear themes of this work are that policies for mitigation and adaptation are now common, and are economically rational responses to a warming global climate. Key policy responses evident among this literature include mitigation measures such as carbon taxes and emissions trading schemes – and in Australia – the development of government institutions with the capacity for understanding the issue, and advising on how best to mitigate emissions and adapt to climate change. Significantly, this literature offers an Australian policy and institutional context within which climate change can be understood.

The fifth section of this chapter reviewed an extensive body of management literature and two clear themes emerged from this body of work. First, there is a growing acceptance by researchers of the importance of environmental issues generally to organisations, the so-called "greening of business" thesis. Second, climate change specifically is an issue of growing importance for organisations because of the risks – and opportunities for competitive advantage – that it poses. Management literature builds upon the scientific literature around climate change, and adopts key concepts that originated in it including vulnerability, resilience adaptation and mitigation. Accordingly, this section argues that climate risks and opportunities, and strategies for climate change mitigation and adaptation, were all important lines of inquiry for this study. However, there remain significant knowledge gaps in the management literature pertaining to climate change. For example, as Winn et al. (2011) note, there is little literature around which capabilities enhance adaptive capacity or which business types are best adapted to the disruptions posed by climate change. Finally, this section also argued that whilst management literature pertaining to climate change has been somewhat slow to develop, it is now of sufficient quality and quantity to justify being considered a sub-discipline of its own. In other words, there is now a compelling argument for management researchers to research the implications of climate change. This argument is supported by clear conceptual and evidentiary underpinnings, and offers a context in which future research may be located.

Building on this management literature, the sixth section of this chapter introduced another key body of literature relevant to this study, namely *sensemaking.* A clear theme of this work is that organisations interpret, or make sense of their operating environments – including climate change – and that "making sense" of this issue is an important factor shaping how they respond to it. Founded mainly on the work of Kark Weick, this literature is important because it offers some insights into how and why organisations understand climate change, and then build strategy responses to the issue. This section therefore argues that sensemaking is another important line of inquiry for this study.

The seventh section of this chapter reviews CSR literature that relates to organisations and climate change. A key theme of the CSR literature considered here is that organisations have social and environmental obligations to a society to address climate change. Specifically, literature pertaining

CSR and sport was also canvassed yet it was clear that there is a gap in scholarly understanding of how and why CSR might influence the responses of sport organisations to climate change. As a consequence, this chapter argues that CSR is another worthy line of inquiry for this study.

The eighth section of this chapter reviewed literature pertaining to the natural environment, climate change and sport. This section revealed that there is a small but growing body of literature that has considered a range of topics about the natural environment and sport, although with most of this emerging in only the last ten years, it was really only in its early stages of development as a sub-discipline. Building upon literature of the natural environment and sport was that which specifically addressed the relationships between climate change and sport, and this work is smaller in quantity again. Issues that emerged from this literature include the importance of mitigation, adaptation, safety of participants, management of water and energy resources, and waste management. The sport management literature, to the extent that it considers climate change at all, has two clear themes. First, just as the mainstream management literature has done in recent years for non-sport organisations, it shares an assumption that climate change is a long-term issue of ongoing importance to sport organisations. A second clear theme is the lack of theoretical resources mobilised to consider this issue. In fact, the specific problem of how climate change affects sport organisations, has had no specific consideration through theoretical lenses. This gap in sport management literature therefore is another reason why this study will make an important contribution to extant literature. It was also argued that this body of literature illustrated Porter & Kramer's (2006) and Porter & Reinhardt's (2007) "inside-out" and "outside-in" perspectives of organisations. As a consequence, the "inside-out" and "outside-in" perspectives are worthy of application in this study.

The ninth and final section of this chapter reviewed literature pertaining to major sport stadia, the environment and climate change. Whilst major sport stadia have been sites for some high quality academic work over the last two decades, it was argued that scholarly literature on climate change and stadia is almost completely absent: only two articles obliquely referred to climate change and stadia. The topic has been left to industry publications to consider, and whilst clear themes of this work were issues of water, waste, energy and design management, no theoretical perspectives are discussed. It was therefore argued that climate change should be an issue of strategic interest for organisations that manage major Australian sport stadia, and that this study will expand the extant literature.

Finally, when the various knowledge gaps within the intersecting strands of literature are considered, and with the emergence of the important unanswered research questions, there is a compelling argument for undertaking this study. Having reviewed this diverse collection of literature from a range of disciplines relevant to the key research questions of this study, this thesis now turns its attention to the key theoretical perspectives that might inform this study. In the next chapter, Section B of the

thesis continues with a critical review of the major relevant theoretical options for pursuing a study of climate change and major Australian sport stadia.

Chapter Three: A review of theoretical perspectives relevant to organisational implications of climate change

> *"Institutional, resource-based, supply chain and stakeholder perspectives are all important to characterize and understand current corporate strategic responses to this sustainability issue."*
>
> Ans Kolk and Jonatan Pinkse (2007b, p. 371).

Introduction

In the previous chapter, the multidisciplinary nature of the literature pertaining to climate change was evaluated. In this chapter, there are three aims. The first is to critically evaluate relevant theoretical perspectives with the potential for explaining the organisational implications, and responses to, climate change. In doing so, this chapter will assess their strengths, and also their limitations. Second, this chapter seeks to illustrate the evolution of these theories by examining the linkages between them, links that are acknowledged in the literature for their capacity to offer insights into the implications of climate change for organisations. Third, this chapter presents a rationale for choosing appropriate methods for this study that will be discussed in Chapter Four.

Theory, its importance, and theoretical possibilities for the study

Before discussing the theoretical options for framing this study, some brief comments on theory's importance, nature and purposes are required. First, literature about what theory actually is reveals some contrasting views: Cunningham (2013) defines theory as "a statement of constructs and their relationships to one another that explain how, when, why, and under what conditions phenomena take place", while Chelladurai (2013) notes that theorising is "focused on explaining the observed phenomena." Mintzberg (2005) also agrees that theory is essentially "explaining things." Both Fink (2013) and Mintzberg agree on an "inclusive" theory continuum that ranges from "lists" and "typologies" at one end through to "relationship(s) among factors", "causation", and "explanatory models", at the other end. Whetten (1989) however, drawing on Dubin (1978), identified four elements to any theory: (1) *what* (factors, variables and constructs); (2) *how* (relationships between factors); (3) *why* (a rationale for including factors and relationships), and; (4) *who, where and when* (limitations to the generalisability of the proposed theory). In contrast, Sutton & Staw (1995) argue there is more certainty about five things that are <u>not</u> theory – specifically, references, data, lists of variables, diagrams and hypotheses – rather than what is. Weick (1995) is broadly supportive of Sutton & Staw's assessment, these five items nevertheless contribute to "theorizing", the "process" of creating theory.

Theory is also fundamentally important to academic work. Cunningham (2013) notes that theory is a "critical element in the advancement of an academic discipline", and that "sport management is no exception." Cunningham (2013) – citing Doherty (2013), Irwin & Ryan (2013), and Chelladurai (2013) – notes that theory is the "foundation of research, practice and teaching." It also guides "service and outreach activities", and is the, "bedrock upon which scholarship rests."

This chapter reviews five theories which have been repeatedly recognised in scholarly management literature as providing insights into the organisational implications of, and responses to, climate change. Whilst management theorists may have been slow to begin publishing on the implications of climate change for organisations (Goodall, 2008), there is now a substantial body of scholarly work in this area. Furthermore, as Kolk & Pinske's (2007b) quote at the beginning of this chapter makes clear, there are four key theoretical perspectives that have been key contributions for understanding the implications of climate change for organisations. These are resource-based view (RBV)/resource-based theory (RBT), institutional theory, stakeholder theory, and supply chain theory. However, a fifth perspective that may offer some insights is that of Corporate Social Responsibility (CSR) theory. As a result, this chapter will now consider the merits of each of these five theories for framing this study.

Resource-based view/Resource-based theory

It is argued by RBV theorists that, "resources and capabilities are important for understanding the sources of sustained competitive advantage for firms" (Barney, Ketchen, & Wright, 2011, p. 2). As these scholars point out, in 1991, RBV was considered important enough to warrant a special issue of the *Journal of Management* where "resources and capabilities" were defined as:

> *...bundles of tangible and intangible assets, including a firm's management skills, its organizational processes and routines, and the information and knowledge it controls that can be used by firms to help choose and implement strategies* (p. 2).

Barney's (1991) influential article, drawing upon the work of Daft (1983), defined "firm resources" as:

> *…all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness* (p. 101).

Barney, using the "language of traditional strategic analysis", described such resources as internal "strengths" of an organisation that contrast with "opportunities" and "threats" that exist in the "external" operating environment. Resources exist in different forms and Barney (1991, p. 101) divided these into three categories: physical capital resources; human capital resources, and; organizational capital resources. Physical resources are "tangible" ones (Russo & Fouts, 1997) and include technology, plant and equipment, its geographic location and access to raw materials. Human resources are "intangible" ones and may include reputation (Russo & Fouts, 1997) stocks of

knowledge, skills, training, experience, judgment, relationships, and the intelligence of individual managers and workers (Barney, 1991; Barney & Clark, 2007). Organizational resources includes a firm's formal reporting structure, its formal and informal planning, controlling and coordinating systems, and informal relations among groups within a firm and between a firm and those in its operating environment.

The major scholarly debates around RBV/RBT centre on five themes (Barney et al., 2011, pp. 5-6): (1) "interlinkages with other perspectives"; 2) "processes of resource acquisition and development"; 3) "the micro-foundations of RBT"; 4) "RBT and sustainability", and; 5) "method and measurement issues." As RBV/RBT has evolved over the past two decades, an increasingly sophisticated distinction has emerged in the literature between organisational resources and capabilities. Capabilities have been widely recognised as an organisational resource (Amit & Schoemaker, 1993; Barney, 1991; Barney et al., 2011; Barney, Wright, & Ketchen, 2001; Kogut & Zander, 1992; Kraaijenbrink, Spender, & Groen, 2010; C. Oliver, 1997b; Teece, 2007; Teece, Pisano, & Shuen, 1997), and are important to this study because it is recognised that capabilities play a role in shaping how organisations respond to climate change (Arnell & Delaney, 2006; Haigh, 2008a; Haigh & Griffiths, 2012; Linnenluecke & Griffiths, 2010a; Linnenluecke, Griffiths, et al., 2011; Linnenluecke, Stathakis, et al., 2011). However Hart & Dowell (2011, p. 2), drawing upon the work of Karim & Mitchell (2000) and Winter (2000), distinguish between resources as: "...something that a firm possesses, which can include physical and financial assets as well as employees skills and organizational (social) processes", and by contrast, capabilities are something that firms "perform" and which stem from, "resources and routines upon which the firm can draw."

For this study, I have adopted Hart & Dowell's (2011, p. 2) simple but effective definition of *capabilities* that is routines-based but which also acknowledges the close relationship with resources. Drawing upon previous work by Winter (2000) and Karim & Mitchell (2000), Hart & Dowell defined an organisational capability as: "...something a firm is able to perform, which stems from resources and routines upon which the firm can draw." Other examples of capabilities identified in the literature include knowledge management (Teece et al., 1997); regulatory ones such as intellectual property rights, contracts, trade secrets (R. Hall, 1993); cultural capabilities such as habits, attitudes, beliefs and values and capacity to learn (R. Hall, 1993); technology, product, design, production, and distribution processes (Hart, 1995); environmental capabilities such as pollution prevention, product stewardship, and sustainable development (Hart, 1995; Winn & Kirchgeorg, 2005), base of the pyramid innovation (Berchicci & King, 2007; Hart & Dowell, 2011), and; dynamic capabilities (Eisenhardt & Martin, 2000; Teece, 2007; Teece et al., 1997). Dynamic capabilities are defined in different ways including "combinations of competences and resources"(Teece et al., 1997, p. 510), or, as "organizational and strategic routines" or processes for integrating, configuring, acquiring and

disposing of resources to create market change (Eisenhardt & Martin, 2000, p. 1107). Examples of dynamic capabilities identified in the literature include cross-functional research and development teams, new product development routines, quality control routines, technology transfer and/or knowledge transfer routines, performance measurement systems (Eisenhardt & Martin, 2000; Teece, 2007), as well as "proactive environmental strategy" for achieving competitive advantage (Aragón-Correa & Sharma, 2003).

Building on Porter's (1979, 1980, 1990, 1991b, 1998) competitive advantage thesis, the RBV asserts that competitive advantage is strongly linked to the acquisition, development and use of resources, and capabilities that are not easily acquired or duplicated by others (Barney, 1991; Barney et al., 2011, p. 8; Finney, Lueg, & Campbell, 2008; Hart, 1995; Levitas & Ndofor, 2006; Teece, 2007; Teece et al., 1997; Wernerfelt, 1984). A central proposition of RBV is that if a firm is to develop competitive advantage, it must acquire resources and capabilities that are: (1) valuable; (2) rare; (3) inimitable and (4) non-substitutable (VRIN) in addition to having an organisation (O) that can use them (Barney, 1991, 2002; Kraaijenbrink et al., 2010). Resources that are difficult to acquire or develop represent a "Sustainable Competitive Advantage" (Barney, 1991, p. 102):

> *A firm is said to have a sustained competitive advantage when it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitors and when other firms are unable to duplicate the benefits of this strategy.*

Put another way, creating advantage-inducing strategy depends on "adopting an approach that competitors either do not understand or cannot copy"(Amis, 2003, p. 189). Amis described such an advantage as the, "foundation" of "increased profits, improved market share" and overall "positive performance."

RBV, known in more recent years as resource-based theory (RBT)[14], is according to Barney, Ketchen & Wright, "widely acknowledged as one of the most prominent and powerful theories for describing, explaining, and predicting organizational relationships." However, RBV/RBT has undergone an evolution that mirrors the first three stages of Levitt's (1965) "product life cycle" concept (Barney et al., 2011): (1) introduction; (2) growth, and; (3) maturity. Barney et al. argue the "introduction" stage began in 1959 and ended in 1991 with key contributions including Penrose's (1959) analysis of how resources constrain growth of the firm; Wernerfelt's (1984) seminal article that coined the phrase "resource-based view", and emphasised the role of resources rather than products in an organisation's growth, as well as Barney's (1991) original article.

[14] Barney, Ketchen & Wright (2011) claim that although use of the term RBT 'can be traced back to Conner (1991), this term seldom appeared in print in the 1990s'.

The "growth" stage between 1992 and 1999 is marked by key contributions pertaining to distinctive competencies and links with organisational economics and industrial organisation theory (Mahoney & Pandian, 1992); combinative capabilities and knowledge as a resource (Kogut & Zander, 1992); the division of resources into *resources* and *capabilities* (Amit & Schoemaker, 1993); the development of a natural RBV of the firm (Hart, 1995); linkages between RBV and institutional theory for explaining competitive advantage (C. Oliver, 1997b), and; the concept of dynamic capabilities for explaining competitive advantage (Teece et al., 1997). Key contributions for RBV that mark the "maturity" stage period between 2001 and 2011 include the value of RBV to entrepreneurship (Alvarez & Busenitz, 2001); human resource management (Wright, Dunford, & Snell, 2001); economics (Lockett & Thompson, 2001); international business (Peng, 2001), and marketing (Srivastava, Fahey, & Christensen, 2001). As a consequence, there are now three key indicators of the maturity of RBV as a theory (Barney et al., 2011, p. 5) including: first, its transition from a view (RBV) to a precise and sophisticated theory (RBT) marked by scholar's increased use of the phrase RBT in the literature; second, the development of "conceptual spin-offs" such as Grant's (1996) knowledge-based view, Hart's (1995) natural resource-based view and dynamic capabilities (Teece, 2007; Teece et al., 1997), and; third, the integration of RBV/RBT with other theories such as institutional theory and the publication of retrospective assessments of RBV/RBT (Alvarez & Busenitz, 2001).

In addition to the assumption about resources and the organisational capacity to use them to create competitive advantage described in the VRIN/O formula, RBV assumes other things. For example, Oliver (1997b) points out that RBV assumes that individuals are motivated to "optimize available economic choices." However, in a recent review of critiques of RBV, Kraaijenbrink, Spender & Groen (2010, p. 350) assert that RBV also assumes that firms are: "profit-maximizing entities directed by boundedly rational managers operating in distinctive markets that are to a reasonable extent predictable and moving toward equilibrium." Similarly, Oliver argues that firms are assumed to make "economically rational choices that are shaped by the economic context of the firm" (p. 700). Kraaijenbrink et al. criticise RBV for having an "uncomplicated view of firms" as bundles of resources, and for therefore being "explicitly reductionist" (pp. 350-351). Kraaijenbrink et al. (2010, p. 353) also note that another assumption of RBV is that sustainable competitive advantage (SCA) can actually be achieved even if it is not permanent. In addition, RBV assumes that is contested by some scholars is that SCA is derived from individual resources. Kraaijenbrink et al. (p. 355) acknowledges criticisms from other scholars that SCA may also be derived from "synergistic" combinations or bundles of resources.

For organisations and environmental issues, there are several key contributions to RBV/RBT in the management literature. The major development has been Hart's (1995) natural resource-based view (NRBV) however, others include Hart & Dowell's (2011) reflection on the development of NRBV

after 15 years; Etzion's (2007) review of RBV/RBT literature that identified four resources that are critical to the environmental performance of firms (1) "innovativeness"; (2) "employee involvement"; (3) "effective communication", and; (4) "integration of multiple stakeholder concerns"); Aragón-Correa & Sharma's (2003) paper on corporate environmental strategy, and Berchicci & King's (2007) thesis that RBV has overlooked the value of external stakeholders in creating competitive advantage. Hart & Dowell (2011, p. 7) argue that two key "developments" for RBV/RBT and the natural environment are: first, corporate sustainable development strategies such as clean technology and base-of-pyramid innovation, and; second, the related emergence of dynamic capabilities (Teece, 2007; Teece et al., 1997). The latter is important for explaining how organisations develop new resources and capabilities in changing operating conditions, including the natural environment, where discontinuous change such as "ecosystem degradation" and "resource depletion" can occur.

In relation to organisations and climate change specifically, RBV/RBT has been used by scholars for a much smaller range of topics. These include strategy responses by multinational oil companies (Levy & Kolk, 2002), electricity generation in Australia (Haigh, 2008a), the relationship between proactive climate change strategies and financial performance (Michalisin & Stinchfield, 2010), and corporate carbon strategies (S.-Y. Lee, 2012).

For RBV/RBT's use in sport literature, it has been used to broach several topics. The predominate application has been for sport sponsorship (Amis, 2003; Amis, Pant, & Slack, 1997; Amis, Slack, & Berrett, 1999; Farrelly & Quester, 2003) but other topics include constraints and opportunities for a green team in professional sport (Nguyen et al., 2014); sustainable competitive advantage in intercollegiate athletics (Smart & Wolfe, 2000); success of winter sports destinations (Flagestad & Hope, 2001); professional sport franchises (Mauws, Mason, & Foster, 2003); the contribution of human resources to organisational success in Major League Baseball (Smart & Wolfe, 2003); sport management research (Gerrard, 2003); the impact of coaching staff on team performance (Cunningham & Sagas, 2004); organisational efficiency of professional sport teams (Gerrard, 2005), and; the success of Kenyan distance runners (Ochieng, 2010).

Limits of RBV/RBT for investigating organisations and climate change

Despite the insights that RBV/RBT has been able to offer management literature, as well as management and environmental issues, it has some limitations. First, a major omission of RBV/RBT is that it systematically ignores the constraints of the natural environment (Hart, 1995, p. 986; Hart & Dowell, 2011, p. 2) and assumes the Earth is an inexhaustible source of resources that can be acquired. Much RBV/RBT work assumes that natural resources do not change state (e.g. water or soils), or that they will never be so scarce as to be unavailable. Assumptions about the continuous and unchanging state of natural resources and ecosystems upon which organisations rely are increasingly

being drawn into question in management literature. Jolts or shocks from the operating environment with the potential to disrupt the operation of organisations are not new (Meyer, 1982; Winn & Kirchgeorg, 2005). Large scale, destructive, systemic and non-linear "ecological discontinuities" (Winn & Kirchgeorg, 2005) such as droughts and storms – whether associated with climate change or not – have been identified by a range of scholars as threats to organisations (Linnenluecke & Griffiths, 2010a, 2012; Linnenluecke, Griffiths, et al., 2011; Linnenluecke, Stathakis, et al., 2011; Winn et al., 2011). The destruction caused by cyclones/hurricanes in recent years such as Hurricane Katrina in New Orleans, and Cyclone Larry in Queensland, are examples that illustrate how changeable nature can be. While Hart's NRBV addresses the RBV/RBT's blind sport of overlooking the constraints of the natural environment, on its own, RBV/RBT is insufficient for explaining how and why organisations respond to climate change.

Institutional theory

Institutional theory (IT) has become one of the leading perspectives for organizational analysis over the past three decades (Heugens & Lander, 2009; Mizruchi & Fein, 1999; D. R. Palmer & Biggart, 2002). Oliver (1997b, p. 699), citing Zukin and DiMaggio (1990), argued that central to the "institutional view" is the assumption that, "the motives of human behavior extend beyond economic optimization to social justification and social obligation." Oliver also argues that IT is based on social explanations for human behaviours with people assumed to be motivated to comply with external social pressures, while firms are assumed to make "normatively rational choices" that are shaped by their "social context." According to Oliver, IT asserts that: "firms operate within a social framework of norms, values, and taken-for-granted assumptions about what constitutes acceptable economic behaviour" (p. 699). Similarly, Heugens & Lander (2009) emphasise that IT is based on the idea that "exogenous" or external influences to the firm are critical in shaping internal organisational action. Citing Zucker (1987) and Scott (1995), Oliver argued that IT assumes that individuals and organizations are "approval seeking, susceptible to social influence, and relatively intractable creatures of habit and tradition" (p. 699). In this way, IT focuses on external factors for explaining what individuals and organisations do, and stands in contrast to the internally-focused RBV/RBT.

IT, however, shares other assumptions. One assumption shared by IT scholars is that accounts of social processes and organizational behaviour by "neo-classical economists" and "rational choice political scientists" are "undersocialized" conceptions that ignore the influence of social forces on organizational action and decision making (Heugens & Lander, 2009, p. 61). Another IT assumption is that the legitimacy of an organisation's actions – defined as those which are desirable, proper, or appropriate – are shaped by an external, social framework of "norms, values, beliefs, and definitions" (Dacin, Oliver, & Roy, 2007). That is, the moral authority of an organisation's actions is shaped by the community or society within which the organisation operates. Oliver (1997b, p. 699) expresses

this assumption in terms of "appropriate or acceptable economic behaviour" that is constrained not just by the "technological, informational, and income limits" emphasised by neoclassical scholars, but also by "socially constructed" limits such "norms, habits and customs." A further assumption in IT is that individual managers commonly make "non-rational choices" shaped by external social forces such as "social judgment, historical limitations, and the inertial force of habit" (C. Oliver, 1997b, p. 701). Such "normative rationality" is shaped by "historical precedent and social justification." These non-rational decisions stand in contrast to the assumption made by neo-classical economists that managers make economically rational decisions.

Not surprisingly, IT scholarship is marked by key debates. Perhaps the most important is the "structure versus agency" debate where the question of whether organisational behaviour is primarily caused by "macro social forces" or "organizational agency", is contested by "structuralist" and "agency" IT scholars (Heugens & Lander, 2009, p. 61). Another debate is about the "effect of isomorphic conformity on performance" between "conformance scholars", who argue that organizations change themselves in order to be perceived as acceptable and appropriate, and "performance scholars" who argue that organisations respond not just for external social approval but also to reap "substantive benefits"(Heugens & Lander, 2009).

IT has been used in management research for a variety of topics. A small sample of these include competitive advantage (C. Oliver, 1997b); institutional change (Dacin, Goodstein, & Scott, 2002); policy debates (Hoffman & Ventresca, 1999); strategic alliances (Dacin et al., 2007), and; development of IT (Heugens & Lander, 2009; Scott, 1987, 2001). Among these topics are those involving the natural environment such as: barriers for achieving environmental sustainability (Hoffman & Bazerman, 2007); environmentally destructive behaviour (M. Bazerman & Hoffman, 1999); climate change as a cultural and behavioural issue (Hoffman, 2010), and; organisational paradoxes in natural resource management (Browne & Bishop, 2011). However, IT's use in sport literature has broached several topics. These include change in national sport organisations (L. M. Kikulis, T. Slack, & B. Hinings, 1995; L. M. Kikulis, T. Slack, & C. R. Hinings, 1995; Slack & Hinings, 1992); sport management research (Washington & Patterson, 2011); managing the Olympic experience (Chatziefstathiou & Henry, 2012), and; occupational segregation of African Americans in intercollegiate athletics administration (Cunningham, 2012). IT research emphasises three key elements – regulative, cognitive and normative – (Hoffman & Ventresca, 1999; Scott, 1995), and Hoffman & Ventresca (1999) argue that a key insight of IT is that all three elements are "intertwined" in the practical life of organisations.

Limits of Institutional Theory for investigating climate change

Whilst IT has afforded scholars several insights for explaining how organisations behave, including sporting ones, IT has some limitations for explaining the impact of climate change on organisations. This is because IT explains three key behaviours of institutions – regulative, normative and cognitive – and the natural world that includes changes in climate, does not have these behaviours because it does not have a mind (Haigh & Griffiths, 2009, p. 349; Orts & Strudler, 2002, p. 223) or a political voice that can influence humans (R. A. Phillips & Reichart, 2000, p. 188). Given IT's emphasis on socially-driven external factors that influence how organisations behave, it offers some capacity for understanding what climate change may mean for them, and for how and why they might respond to this issue. However, just as RBV/RBT concentrates on internal resources and capabilities, IT's limitation to external factors means that by itself, it is unlikely to offer a complete account for the implications of, and responses to, climate change by sport organisations.

Stakeholder theory

Kolk & Pinkse (2007b) point out that stakeholder theory (ST) is one of a range of perspectives that are valuable for explaining the meaning of climate change for organisations. However, ST is also widely accepted in management scholarship and industry practice (Agle et al., 2008; R. K. Mitchell, Agle, & Wood, 1997). ST is a theory of "organizational management and ethics" (R. Phillips, Freeman, & Wicks, 2003, p. 480), and is conceived in terms that are "explicitly and unabashedly moral." ST is based on four key assumptions (T. Jones & Wicks, 1999, p. 207): first, that organisations have relationships with "many constituent groups"/stakeholders that affect, and are affected by, its decisions; second, that ST centres on the nature of these relationships; third, that the "interests of all (legitimate) stakeholders have intrinsic value" with none assumed to dominate the others (Clarkson, 1995; Donaldson & Preston, 1995), and; fourth, that ST is focused on "managerial decision making" (Donaldson & Preston, 1995).

Since 1963, there have been many attempts to define the term "stakeholder" with the range of definitions developed depending on whether each scholar adopts a broad or narrow understanding of the concept (R. K. Mitchell et al., 1997, pp. 856-858). Mitchell et al (1997) note that the earliest narrow definition in the literature was developed by Stanford University – "those groups without whose support the organization would cease to exist" – and that narrow definitions rest on perceived "legal legitimacy" of the stakeholder and, "direct relevance to the firm's core economic interests." In contrast, broad definitions acknowledge that organisations can affect, or be affected by, "almost anyone." For example, Freeman's (1984, p. 46) oft-referred to definition is simple but broad in its scope: "any group or individual who can affect or is affected by the achievement of the organization's

objectives." Alternatively, Mitchell, Agle & Wood (1997, pp. 853-854) note that if taken so broadly, a "maddening variety" of stakeholders may include:

> *...primary or secondary stakeholders;...owners and nonowners...; owners of capital or owners of less tangible assets; ... actors or those acted upon; ... those existing in a voluntary or an involuntary relationship with the firm; ... rights-holders, contractors, or moral claimants;...as resource providers to or dependents of the firm; ...risk-takers or influencers; and ... legal principals to whom agent-managers bear a fiduciary duty.*

To reduce the ambiguity of these possibilities, Mitchell et al. developed a typology of stakeholders in order to identify those stakeholders to whom "managers should pay attention" based on three attributes: power, legitimacy and urgency. The typology identifies seven classes of stakeholders with varying degrees of "salience" or importance to managers depending on to what degree power, legitimacy and urgency are all present.

In recent years, some scholars have argued for the broadening of the definition of stakeholders to include the natural environment (Driscoll & Starik, 2004; Haigh & Griffiths, 2009; Kolk & Pinkse, 2007b; R. K. Mitchell et al., 1997; Starik, 1993, 1995), while others have applied ST to environmental issues (Buysse & Verbeke, 2003). Kolk & Pinkse (2007b, p. 371) note that climate change is an example of how the natural environment can have both direct and indirect impacts on an organisation. Orts & Strudler (2002) and Gibson (2012) share their concern for the natural environment although dispute whether the environment should be viewed as a stakeholder. For this study, however, Freeman's broader definition is adopted for three reasons. First, it widely cited in the ST literature. Second, Freeman's definition is consistent with a growing recognition in broader management literature that the environment has become an "integral part of the business literature and practice" (K. Gibson, 2012, p. 15). Third, Freeman's definition is important because although it is broad, it acknowledges two perspectives in the relationship between organisations and nature: (1) where humanity impacts on nature, and; (2) where nature can impact on humans, and specifically their organisations. These perspectives are useful in relation to climate change because, as Kolk & Pinkse note, organisations can impact on climate through their greenhouse gas (GHG) emissions, but they may also be impacted by climate change directly – through drought or extreme weather events – or indirectly through government requirements to constrain greenhouse gas (GHG) emissions.

Like RBV/RBT and IT, ST has been evolving and is debated extensively by key scholars. Whilst Freeman & Read (1983) were amongst the first scholars to contemplate ST, in the late 1990's in particular, considerable debate occurred over what stakeholder theory actually means. Donaldson & Preston (1995) were key early contributors proposing that ST was management-centred and that ST had three key characteristics: that is, it was "descriptive", "instrumental" and "normative." Building on this work, Jones & Wicks (1999) cast these three types into two "divergent" strands of ST: first, ST as social science with descriptive and instrumental variations, and; second, ST as normative

ethics. While Jones & Wicks' proposal for converging these strands of ST was welcomed by some scholars (Donaldson, 1999; H. E. Freeman, 1999), it was also criticised for lack of managerial focus (Donaldson, 1999), for misunderstanding the need for theoretical divergence (H. E. Freeman, 1999), and for misunderstanding ST (Trevino & Weaver, 1999). Normative ST compared with stockholder theory is another key debate (Agle et al., 2008).

Stakeholder theory has been used in management research for a variety of topics. These include: ; integrating stakeholder strategy and ethics (Minoja, 2012); stakeholder influence on business ethics (R. E. Freeman, Rusconi, Signori, & Strudler, 2012; Heath, 2006; Purnell & Freeman, 2012); managing stakeholder ambiguity (J. Hall & Vrendenberg, 2005); stakeholder influence on corporate social responsibility (Moir, 2001; Roberts, 1992); the role of stakeholders in promoting sustainable development (Poudyal, Siry, & Bowker, 2012); and sustainable tourism (Getz & Timur, 2005). Similarly, ST has been a popular theoretical lens in sport management literature used to canvass a broad range of topics including bidding for major sporting events (Hautbois, Parent, & Séguin, 2012); corporate social responsibility and professional sport teams (Inoue, Kent, & Lee, 2011); motor racing (Xue & Mason, 2011); American college sport (Covell, 2005; L. A. Kihl, Leberman, & Schull, 2010; Welty Peachey & Bruening, 2011); managing sport issues (M. T. Friedman, Parent, & Mason, 2004); legacies of the 2000 Sydney Olympics (Toohey, 2008), and; professional sport franchises (Heffernan & O'Brien, 2010; D. S. Mason & Slack, 1997). However, ST has not been used before to examine the implications of climate change for sport organisations.

Limits of stakeholder theory for investigating climate change

Whilst ST has been an influential theory in management research, it has limitations for explaining what might happen in this study. Just as RBV/RBT and IT were limited to respectively internal and external perspectives of a firm, ST has limited support amongst ST scholars for its application to potentially non-human stakeholders such as the natural environment. Furthermore, to the extent that such support exists, it has only emerged in recent years. Whilst in recent years a number of scholars support broadening the definition of stakeholders to the natural world (Driscoll & Starik, 2004; Haigh & Griffiths, 2009; Kolk & Pinkse, 2007b; Starik, 1993, 1995), that includes Earth's climate system, others oppose this. For example, Orts & Strudler (2002) and Philips & Reichart (2000) concluded that ST "cannot account for duties to non-humans" (R. Phillips et al., 2003, p. 496), while Gibson (2012, p. 15) opposed including the natural environment as a stakeholder because it is "theoretically vague and lacks prescriptive force." Another key criticism of ST is its "breadth of interpretation" (R. Phillips et al., 2003). As Phillips et al note, the term stakeholder means "different things to many different people", and whilst this breadth is one of ST's greatest strengths, this lack of definitional precision lends ST to misapplication and "misinterpretation." A further criticism is that it has been applied by

researchers mainly to examine large, publically-owned corporations rather than small, not-for-profit or family-owned organisations (R. Phillips et al., 2003, p. 495).

Supply-chain theory

The final theory identified by Kolk & Pinkse (2007b) as being important to studies on climate change is the supply chain management (SCM) perspective. The key debate in SCM literature is over what supply chains actually are with a variety of definitions on offer. Ketchen & Hult (2007, p. 573) define a supply chain as, "a series of units that transforms raw materials into finished products and delivers the products to customers." In contrast, Rönnqvist, Bernstein, Caldentey & D'Amours (2012, p. 632) refer to, "all processes from procurement and manufacturing to sales and support", while Darnall, Jolley & Handfield (2008, p. 33) define it as: "all parties who are involved in fulfilling a customer request, including the suppliers, transporters, warehouses, retailers and customers themselves." On the other hand, Mentzer et al. (2001, p. 4) prefer a very specific definition of "three or more entities (organizations or individuals)" that are, "directly involved in the upstream and downstream flows of products, services, finances and/or information from a source to a customer." Ketchen et al. (2007, p. 33) hint at the ambiguity over where supply chains begin and end noting that some of the elements in a supply chain are, "located inside a single organization's borders while others cross such borders in complex and evolving ways."

For SCM theory, Kolk & Pinkse (2007b, p. 372) – citing Sharma & Henriques (2005) – acknowledge this ambiguity arguing that SCM is a theory that, "transcends organizational boundaries." Giannakis and Croom (2004, p. 29) also acknowledge the broader scope of SCM noting that the typical units of analysis in SCM research are, "interacting and interdependent functions, groups and organizations." As a consequence, unlike RBV/RBT or IT, SCM is not limited to either an internal or external organisational focus. Rönnqvist et al. (2012) define SCM as: "as the management or coordination of a network of interconnected business and their activities to support suppliers, producers, transporters, and end users in order to create net value or profit." However for this study, the preferred definition of SCM is that of Mentzer et al. (2001) whose article is one of the most significant in SCM literature, and because it is a comprehensive one that is also endorsed by Giunipero et al. (2008), another key contribution. Mentzer et al. (2001, p. 18) define SCM as the:

> *systematic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within a supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole.*

In a comment that signals SCM's importance in management literature, Rönnqvist et al. (2012, p. 631) note that SCM has made a, "major contribution to the improvement of profitability and competitiveness in many companies." Similarly, Ketchen et al. (2007) observe that managing supply chains is "vital to organizational success."

The phrase "supply chain management" originated in the 1980s (I. J. Chen & Paulraj, 2004; Giannakis & Croom, 2004; Giunipero et al., 2008; R. K. Oliver & Webber, 1982), and according to Giannakis & Croom (2004, p. 28), was popularised with key contributions by Houlihan (1984, 1985, 1988). SCM's central thesis is that organisations "do not exist in isolation", and that their success is significantly influenced by the actions, capabilities and resources of suppliers, customers and collaborators in their supply chain (Giannakis & Croom, 2004; Håkansson & Shenota, 1995). SCM is in part a response to the increasing trend by organisations to externalise some of their functions in a globalised world marked by rapid technological change (Giannakis & Croom, 2004). Key contributions on SCM include: reviews of SCM literature (C. R. Carter & Ellram, 2003; Giunipero et al., 2008); a theory of SCM (I. J. Chen & Paulraj, 2004); the history of SCM (Lummus & Vokurka, 1999); limitations of SCM (Larson & Halldorsson, 2002; Monczka & Morgan, 1997); SCM's relationship with logistics literature (Cooper, Lambert, & Pagh, 1997; Tan, 2001); distinctions between supply chains and supply networks (Harland, 1996), and; characteristics of SCM (Ellram & Cooper, 1993). Key concepts that emerge from this literature include SCM strategy, alliances and relationships, outsourcing, e-commerce, and environmental & social responsibility (Giunipero et al., 2008). Within sport literature, only Hung et al's (2012) examination of green smart lighting for stadiums specifically used SCM which indicates that it has very limited relevance to sport scholarship. The only exceptions found were Mallen & Chard (2012), and Kellett & Russell (2009) who mentioned supply chains but only in limited ways with neither using SCM theory.

However, a number of scholars have in recent years proposed that SCM be extended to include the natural environment. This evolution is consistent with the growing recognition of the natural environment that has occurred with SCM's counterparts in RBV/RBT, IT and ST. Examples of topics that illustrate this theme include green, or the greening of, supply chain management (Darnall et al., 2008; Handfield, Walton, Sroufe, & Melnyk, 2002; Hervani, Helms, & Sarkis, 2005; Seuring, 2009; Solér, Bergström, & Shanahan, 2010; Vachon & Klassen, 2006; Q. Zhu, Sarkis, & Geng, 2005); environmentally sustainable SCM (Gold, Seuring, & Beske, 2010; Seuring & Müller, 2008a, 2008b; Seuring, Sarkis, Müller, & Rao, 2008); environmental management and SCM (Handfield, Sroufe, & Walton, 2005; S. Y. Lee & Klassen, 2009; Sharfman, Shaft, & Anex Jr., 2009); and incorporating either green or sustainable SCM into the automotive industry (Koplin, Seuring, & Mesterharm, 2007; Thun & Müller, 2010). Significantly, Carbone & Moatti's (2012) note that linkages have emerged between SCM and CSR literature.

Despite this "greening" of the SCM literature, there is nevertheless very little specifically addressing climate change. Whilst Brickman & Ungerman (2008) assert that firms view climate change as an opportunity to reduce costs embedded in their supply chains, it is a rare example. Kolk & Pinkse

(2007b) highlight the relevance of SCM theory to organisations and climate, while Kolk & Pinkse (2004) is another yet its discussion is confined to supply chain strategy for climate issues and makes no mention of SCM theory. The problematic nature of climate change for organisational supply chains is highlighted by another article outside the SCM theoretical literature (P. Schwartz, 2007) where it was claimed that climate change has the potential to cause organisational supply chain breakdowns. This is important because it underlines the importance for managers and management scholars to take a supply-chain "view" of climate change, and the need for identifying both supply chain vulnerabilities to climate change – and potential organisational responses – to such disruptions.

Limits of supply chain theory for investigating climate change

Whilst SCM theory has been a valuable perspective for management research, and is increasingly cognisant of environmental issues, it nevertheless has limitations for shedding light on the implications of climate change for organisations. First, there is still disagreement in the literature about a definition of SCM. Second, the complexity of supply-chains is one area that makes it difficult to apply (Giunipero et al., 2008). Third, most of the SCM literature is focused at the firm-level leaving much research to be done across the multiple levels of supply chains (Giunipero et al., 2008). Fourth, there is very limited application of SCM to either management or, sport organisations.

Corporate Social Responsibility theory

A theory that was not contemplated by Kolk & Pinkse (2007b) for its relevance to organisations and climate change is that of Corporate Social Responsibility (CSR). However, it is considered here because CSR has been applied in management research in relation to climate change by a number of scholars in recent years. Dating back to at least the 1950's (Benn & Bolton, 2011, p. 56; Carroll, 1999, p. 268), CSR has been defined in a range of ways including "corporate social performance" and "corporate responsiveness" (Wood, 1991), and overlaps with literature using the term "corporate sustainability" (Linnenluecke & Griffiths, 2013). CSR is based on three principles: (1) "social legitimacy" (the institutional level), (2) "public responsibility" (the organisational level), and (3) "managerial discretion" (the individual level) (Carroll, 1999, p. 289; Wood, 1991, p. 694). According to Fredrick (1986) the fundamental assumption underpinning the idea of CSR is that, "business corporations have an obligation to work for social betterment" (Wood, 1991, p. 694). Similarly, Kolk & Pinkse (2010, p. 16) note that whilst it is an "elusive concept", there is nevertheless some consensus that CSR refers at least to, "voluntary attention to the ethical, social and environmental implications of business." According to Carroll & Shabana (2010), the notion that business owes broader obligations to "society" dates back centuries (Benn & Bolton, 2011, p. 56), yet the contemporary significance of CSR is underlined by Montiel's (2008) claim that there is, "broad agreement that social and environmental responsibility is now a core business issue, no matter how it is defined" (Benn & Bolton, 2011). Benn & Bolton (2011) illustrate the breadth of CSR's acceptance

by citing Lee's (2008) claim that it has been adopted by "major international" institutions such as the United Nations (UN), the Organisation for Economic Cooperation and Development (OECD), the World Bank and the International Labour Organization (ILO), and ninety per cent of "Fortune 500" companies had included CSR in their organisational goals.

The two key business obligations inherent in CSR literature – *social* and *environmental* – are spread across a range of topics. These include CSR reporting (Benn & Bolton, 2011, pp. 51-55; Carnevale, Mazzuca, & Venturini, 2011; D. Dunphy, Griffiths, & Benn, 2007, p. 201; Haddock-Fraser & Fraser, 2008), CSR for the world's most successful firms (Snider et al., 2003), information technology (Jenkin, McShane, & Webster, 2011), banking (van den Heuvel, Soeters, & Gössling, 2011), strategy (Orlitzky, Siegel, & Waldman, 2011; Schepers, 2006), the role of CSR in recruiting employees (Randy & Davis, 2011), stakeholder management (Garcia-Castro, Ariño, & Canela, 2011), regulation (Kurland & Zell, 2011), and competitive advantage (Tetrault Sirsly & Lamertz, 2008).

The key debates in scholarly CSR literature revolve around three perspectives that in essence ask, what is the most morally correct approach to CSR for firms?; what is the economically most advantageous?, and; how can a firm be a responsible corporate citizen? Windsor (2006) asserts that these two of these three approaches to CSR offer "competing moral frameworks and political philosophies." First, "ethical CSR" draws on ethical responsibility theory and emphasises the moral responsibility of organisations for "self restraint" and "altruism." In contrast, "economic CSR" draws on economic responsibility theory and emphasises the responsibility of organisations to maximise "investor property rights", "consumption", and "material gains for society." The citizenship approach to CSR "falls somewhere in between" (McWilliams, Siegel, & Wright, 2006) ethical and economic CSR and is given either an instrumental or idealised emphasis by scholars advocating this view.

In recent years, the relationship between climate change and CSR has also been explored by a number of management scholars. Issues linking climate change and CSR include strategies that support environmental and social capabilities (Benn et al., 2006; D. Dunphy et al., 2007), sensemaking (Angus-Leppan et al., 2010), corporate disinformation (Rockwood, 2009), disclosure of corporate "carbon risks, opportunities, strategies, and emission levels" (Reid & Toffel, 2009; Stanny & Ely, 2008), corporate governance (Kolk & Pinkse, 2010), emissions trading (Paulsson & von Malmborg, 2004), policy instruments for GHG mitigation (Bradford & Fraser, 2008; Hansford, Hasseldine, & Woodward, 2004), management of GHG mitigation (Sullivan, 2009), and workforce diversity (Ciocirlan & Pettersson, 2011). A key feature of this segment of CSR literature is a shared understanding that organisations, although specifically business ones, owe an obligation to the societies within which they operate to address climate change.

The extent to which CSR is an issue for sport, however, is one that has been canvassed in sport literature generally, and sport management literature specifically. Smith & Westerbeek (2007, p. 44) make the case for linking CSR and sport by arguing that sport can be a "vehicle for deploying CSR" and that it can act as a "stakeholder-inclusive bridge across social and economic gaps." Topics pertaining to CSR in sport include social and economic development (Levermore, 2010), social capital (Spaaij & Westerbeek, 2010), CSR and citizenship in sport (Walker & Parent, 2010), corporate citizenship (A. C. T. Smith & Westerbeek, 2007), sport gambling sponsorship (Lamont, Hing, & Gainsbury, 2011), and sport tourism (Walker et al., 2012). Within sport management literature, CSR has been applied to management principles and practice (Bradish & Cronin, 2009; Filizöz & Fişne, 2011), CSR and sport management (Godfrey, 2009), professional sport (Babiak & Wolfe, 2009; Breitbarth & Harris, 2008), its influence on sport consumer attitudes (Walker & Heere, 2011; Walker & Kent, 2009), and environmental initiatives in sport (Inoue & Kent, 2012). However, despite the breadth and depth of this body of literature, the question of how and why sport organisations respond to climate change has not been addressed. Specifically, there is no reported literature that examines whether CSR is relevant to the responses of organisations that manage major sport stadia to climate change. Nevertheless, given CSR's application in non-sport management studies in recent years, it was clearly a theory worth considering for this this study.

Limits of CSR theory for investigating climate change

Whilst CSR has been used to develop several insights into how organisations behave, including sporting ones, there are limitations for explaining the impact of climate change on organisations. First, CSR's relevance is limited to those organisations that adhere to a CSR ethos, or who apply it to their climate issues. Conversely, CSR explains little about those that do not. Second, CSR influences organisational behaviour only up to a point (Carroll & Shabana, 2010). Citing Mintzberg (1983), Caroll & Shabana note that beyond a certain level of CSR investment, markets will "cease to reward" corporate actions based on CSR alone. Third, Carroll & Shabana (2010) note Williamson et al.'s (2006) argument that CSR actions are often influenced by regulation and the pursuit of direct cost reductions. As climate change is a relatively new issue for business in Australia, and regulation of climate issues such as GHG emissions has only just emerged, it is possible that there may at this point be little regulation-driven or cost-driven corporate action in relation to climate change.

Linkages between theories relevant to organisations and climate change

Although the theories considered so far in this chapter have individually offered a range of insights for understanding the organisational implications of climate change, there are a number of linkages between them that are also worth discussing. For example, Oliver (1997b) has identified linkages between RBV/RBT and IT for explaining competitive advantage. In a widely cited conceptual paper, Oliver (1997b) was one of the first to do this by arguing that a firm's "sustainable advantage depends

on its ability to manage the institutional context of its resource decisions" (p. 697). Noting that a firm's "institutional context includes its internal culture as well as broader influences from the state, society, and interfirm (sic) relations", Oliver developed a process model for describing how sustainable competitive advantage is generated by firms through the combination of RBV and IT factors at "the individual, firm, and interfirm (sic) levels of their ability to generate rents" (p. 698).

Campbell (2007) has also identified linkages between IT and CSR, arguing that corporate behaviour is mediated by institutional factors including government regulation, monitoring by non-governmental organisations, and dialogues between corporations and their stakeholders. Similarly, Branco & Rodrigues (2007), and Munilla & Miles (2005), identified linkages between stakeholder theory and CSR theory. Similarly, McWilliams & Siegel (2011) identified a linkage between RBT and CSR arguing that CSR can be a resource for some organisations that can lead to "rent generation and competitive advantage." As noted in the SCM section of this chapter, Carbone & Moatti (2012) observe that linkages have emerged between SCM and CSR literature. Furthermore, in a study of multinational firms based in the United States, Riahi-Belkaoui (2003) identified linkages between RBV and stakeholder theory.

These linkages are important because they illustrate the value of being prepared to use combinations of theories to explain organisational issues. They are also important because they testify to the evolution of organisational theories. Given the potential for each of the five theories reviewed in this chapter to shed light on what climate change means for organisations, for this study it is therefore worth keeping an open mind to the possibility of using a combination of some or all of them to explain the implications of climate change for Australian sport stadia (MASS) organisations, and how and why they might respond to this issue. An advantage of such an approach for this study is that it might also enable the identification of further linkages.

The potential for theory development instead of theory testing

Whilst the existing theoretical perspectives canvassed in this chapter are widely used, have a number of strengths and offer insights into a range of climate change research problems, they nevertheless all have limitations. As Mayer & Sparrowe (2013, p. 917) note, individual theories cannot fully answer many research questions. Similarly, Gerrard (2003, p. 143) points out that: "Theoretical frameworks provide a sort of intellectual searchlight that only ever illuminate part of reality." RBV focuses attention internally on "the strategic resources deployed by firms to create a sustainable competitive advantage." IT theory focuses attention externally on social explanations for human and organisational behaviour. ST focuses attention internally and externally on the role of stakeholders in shaping, and being shaped by, organisations. SCM theory focuses attention externally on the role of suppliers, customers and collaborators in a supply chain that shape the success of organisations.

Lastly, CSR theory focuses attention on the ethical, social and environmental obligations of organisations to the community within which they operate. Given the limited scope of the existing theories considered in this chapter, there is a strong justification for the use of a *theory development* approach in this study rather than a conventional *theory testing.* This approach offers the potential to overcome their limited scope, while combining their strengths.

A key part of this justification is that, despite the valuable role that each of these theoretical lenses play in developing insights into organisational behaviour, because of their limited scope, they do not individually explain all climate issues for particular organisations. In addition to the limited scope of each theory, corporate understandings of – and responses to – climate change vary according to location-specific, industry-specific and company-specific factors (Kolk & Levy, 2004; Kolk & Pinkse, 2007b). For example, regulations vary between countries, and even between regions/states. Public pressure to act on climate change and, the degree to which climate change impacts the location of organisations, also varies between countries, regions and jurisdictions. For example, while the Unites States has not ratified the Kyoto Protocol and does not have a national carbon pricing law, individual states such as California have their own GHG emissions trading schemes[15] (CEPAARB, 2013). In light of these market and regulatory idiosyncrasies, climate change is an issue that shows the value of different theoretical perspectives (Kolk & Pinkse, 2007b, p. 371). Therefore, in order to fully understand the implications of – and responses to – climate change by MASS organisations, for this study it is likely that a theory development approach (Cunningham, 2013) would be more effective than a theory testing one. This is because a theory development approach would take into account the limitations of individual theories such as RBV/RBT, IT, ST, SCM and CSR, but also the various linkages between them. Furthermore, if a sport sector-specific theory development approach were used, it would likely open greater possibilities for understanding the impacts and responses to climate change of organisations managing major sport stadia that may be unique to that sector. As Gerrard (2003, p. 143) notes: "Ultimately the success of any new theoretical framework in sport management depends on its capacity to generate consistent explanations of the observed behaviour of sports organisations." Gerrard's comment underlines the value that a sport sector-specific theory development approach could have for this study, and as such, would be consistent with Chalip's (2006) call for more sport-specific theories from sport management researchers.

While acknowledging the difficulty of theory development, Cunningham (2013, p. 3) notes that it has the potential for "discoveries not otherwise possible." Although there is no single method for theory development, Cunningham argues that it is justified where there is a desire to "understand and explain large, complex issues." Climate change is precisely the sort of issue for which theory development is

[15] The Government of California refer to their emissions trading regime as a 'Cap and Trade' scheme.

suited. It is a 'wicked problem' (Prins & Rayner, 2007; Winn et al., 2011), with scientific complexity, global and regional impacts across uncertain timescales that poses challenges for science, policy, governance and management (Folke & Rockström, 2009). Cunningham also recognises Chalip's (2006) call for "sport-specific theories", and that the "uniqueness of sport" was a cornerstone of the "recent theoretical advances" by several recent exemplars of theory development in sport management. In the examples cited (Chelladurai & Carron, 1977; Fink, 2013), the authors: "observe[d] phenomena in sport that were particular to that context, and in some cases, contrary to what scholars had theorized in other settings." As a result, the argument for a sport-specific approach to theory development for this study becomes even stronger. It is more likely to make a meaningful contribution to sport management scholarship than a traditional theory testing approach.

There are however further reasons for eschewing the individual application of the RBV/RBT, IT, ST, SCM or CSR perspectives; reasons that make the argument for a theory development approach for this study compelling. Firstly, as Whetten (1989, p. 491) notes, "the mission of a theory-development journal is to challenge and extend existing knowledge, not simply to rewrite it." Whilst Whetten was referring specifically to a key purpose of peer-reviewed academic journals, this point applies to academic research more generally. Secondly, Gersick (1991), in a widely-cited article[16], reminds us of the nature of change in a variety of settings with the Punctuated Equilibrium Paradigm (PEP) that is used to argue that "fundamental change" does not occur in piecemeal, slow, gradual or comfortable ways – but rather that it happens in short "revolutionary" bursts after long periods of stability ("equilibrium").

Developed from domains as diverse as biological science, and individual and group psychology, Gersick argues that the PEP also has significant *methodological* and *interpretive* implications for research and theory: first, "different methods may be needed to answer different questions" (p. 32), and; second, the diversity of fields affected by the PEP suggests that, "assumptions about what change is and how it works must fundamentally influence how research is designed and how findings are interpreted" (p. 33). Gersick's PEP model was developed with "organizational studies" in mind, and has been applied in settings as varied as higher education (Parsons & Fidler, 2005) and information systems management (Saberwhal, Hirschiem, & Goles, 2011), with the latter integrating various theories to yield insights into organisational alignment processes. PEP raises the possibility that theories too are subject to long periods of equilibrium followed by short periods of turbulence or change with particular forces being catalysts for change. This last point suggests the question, "Is

[16] According to *Google Scholar* (July, 2013), Gersick (1991) has been cited 1645 times.

climate change the sort of issue that might lead to change for theoretical perspectives such as RBV/RBT, IT, ST, SCM or CSR after long periods of equilibrium?"[17]

Some organisational literature in recent years suggests that climate change is such an issue with the potential to shape these theories, and their meaning for organisations. For example, Linnenluecke & Griffiths (2010a) cited Gersick (1991) to argue that "major disturbances [such as climate change] require quite different organizational response mechanisms compared with minor disturbances, or gradual change." Linnenluecke, Griffiths & Winn (2011) later cited Gersick (1991) to argue that organisational resistance to change can "hinder adaptive responses, even when the consequences are disastrous." Winn et al. (2011) also cited Gersick (1991) to argue that the physical impacts of climate change are of sufficient "scale, scope and systemic uncertainty" to create "massive discontinuous change" (MDC) for firms. Defining MDC as: "a significant, sudden, disruptive change in the broader ecological or social systems of which organizations and economic systems are a part" (p. 161), Winn et al. (2011, pp. 161-162) contend it as massive in scope and scale (spatial and temporal), systemic, non-linear, "discontinuous", "unpredictable" with "limited controllability and manageability", irreversible and destructive. As such, MDC is greater than "other types of change in organizational environments" such as the "environmental jolts" contemplated by Meyer (1982). Winn et al. (2011) suggest that climate-related MDC is outside the incremental change that characterises Gersick's (1991) view of equilibrium, and instead is consistent with the radical change that Gersick associated with "punctuated events." Together, these articles support my contention that climate change is the sort of issue with the potential to be a catalyst for theoretical change in relation to organisations.

Winn et al. (2011) offer two further reasons why existing management theory does not enable organisations to adequately deal with issues of the magnitude and unpredictability of climate change. Firstly, citing Meyer et al. (2005) and Santos & Eisenhardt (2005), they argue that organisation science has a "deeply rooted bias" toward "the predominance of stable states and the linearity of change processes in organisations and their environments." However, the stable state and linear change assumptions are flawed because they are inconsistent with the known characteristics of climate change instability, unpredictability and non-linearity. Secondly, citing Purser et al. (1995), they argue that the systems of the natural world – such as the climate system – are typically externalised by organisations and this makes it "difficult for economic and management theories to recognize (and theorize) the co-dependency between firms and the natural environment." As a consequence of this, as Winn et al. (2011, p. 158) point out:

> *adequate concepts of organizational environments that incorporate nature's functioning are in short supply, as are methods that can capture nonlinear change such as longitudinal or process-focused research methodologies (Meyer et al., 2005). The*

[17] Although all of these theories have evolved over time, they all have histories that are decadal - or multi-decadal - , in nature.

> *combined shortage of concepts and methodologies creates formidable obstacles to research in this arena, but it also provides exciting opportunities to reconfigure future directions of management research.*

The lack of concepts that take into account the relationship between nature and organisations, and the lack of methods capturing the non-linear change posed by climate change therefore give the final justification for a theory development approach to this study. In this situation, a study such as this is a good example of the 'exciting opportunities' for reconfiguring future management research that Winn et al. (2011) refer to.

As a consequence, a theory development approach for this study has a compelling justification. It would enable the development of sport-specific theory to the issue of climate change. It would take into account the scale and complexity of climate change. It would be grounded in data about what climate change means for MASS organisations, and it would therefore have implications for how the existing theories of RBV/RBT, IT, ST, SCM or CSR could respond to climate change. Theories are typically not permanently static or fixed: as indicated earlier in this chapter, they are proposed, tested, revised – and if necessary – abandoned in favour of better theories. In other words, theories develop over time. Theory development is an important task for scholars, and is appropriate for this study.

Conclusion

This chapter aimed to achieve three things. First, it aimed to critically evaluate relevant theoretical perspectives with the potential for explaining the organisational implications, and responses to, climate change. In doing so, the chapter assessed the strengths and limitations of five relevant theories: resource-based view/resource based-theory; institutional theory; stakeholder theory; supply chain management theory and corporate social responsibility theory. This review identified key gaps in the literature. For example, whilst RBV/RBT, IT, ST, SCM and CSR have all been applied in mainstream management, only two articles in the sport literature (Hung et al., 2012; Inoue et al., 2011) discuss their use in relation to the natural environment, and none have been used in relation to climate change and sport. Second, this chapter aimed to illustrate the evolution of these theories and in doing so concluded that in recent years, there has been a general trend for management literature to recognise and examine the importance of the natural environment for organisations. Reflecting this trend, sport management literature is also slowly acknowledging the relevance of the natural environment to sport organisations. Furthermore, consistent with these trends in the literature is the extension of the five theories issues of the natural environment, and in some cases, to address the issue of climate change.

Third, after reviewing key literature relevant to each of the five theories, this chapter aimed to develop a rationale for choosing appropriate methods for this study. This review of literature identified

linkages between most of the five major theories, and a range of limitations for each. Based on these limitations, it was concluded that in order to fully understand the implications of – and responses to – climate change by MASS organisations, for this study it is likely that a theory development approach will be more effective than a traditional theory testing approach would be. This thesis now turns to Section C where an account of my Ph.D. research is presented. Section C of the thesis begins with Chapter Four where the research design of this study, in particular the methodology and method, is discussed. Chapter Four begins with a discussion of this study's paradigmatic, ontological, epistemological and methodological context.

Chapter Four: Research design, methodology and method

Introduction

This chapter marks the beginning of Section C of this thesis which is an account of my Ph.D. research. In this study, my aim was to develop theory about *how* and *why* organisations that manage major Australian sport stadia (MASS) respond to climate change. In this chapter, I explain the research design, methodology and method that were used to achieve this aim. The research questions have emerged from and guided the literature reviews in Chapters Two and Three. In turn, as advocated by Eisenhardt (1989b, pp. 544-545) and Yin (1994, pp. 28-29; 2009, pp. 36-37), the literature reviews have shaped the qualitative case study research design described below. This chapter therefore has four aims. The first is to outline the paradigmatic, epistemological and ontological choices of the researcher that inform the choices of methodology and method applied in the study. The second aim is to explain the qualitative methodology and case study method in detail. The third aim is to explain my choice of theory development from case studies, and why it is appropriate for this study. Finally, this chapter aims to explain this study's industry context, and methods for sampling, data collection and data analysis.

Paradigm, epistemology and ontology

The design of this study is underpinned by my constructivist perspective of research, a perspective that fits the intent of this project. Denzin & Lincoln (2011) argue that there are five paradigms within which researchers can situate themselves: positivism, post positivism, critical theory, constructivism and participatory action, with each having their own "criteria, assumptions, and methodological practices" (p. 91). Gratton & Jones (2010, p. 23) divide these paradigmatic options into "two broad research traditions" available to researchers: a positivist, quantitative and deductive one, or; the interpretative, qualitative and inductive approach where the latter is concerned more with "how" and "why" questions. Denzin & Lincoln (2011) argue that a research paradigm encompasses "four terms": "ethics (axiology), epistemology, ontology and methodology" (p. 91). Denzin & Lincoln (2011) note that ethics is concerned with morality; epistemology is concerned with the nature of knowledge; ontology with the nature of reality, and; methodology with methods of gaining knowledge. Sarantakos (2005, p. 29) emphasises the importance of researchers of being aware of the different ontological and epistemological assumptions that underlie specific methodologies and suitable research designs and instruments. Accordingly, ontological, epistemological and methodological prescriptions of social research are, "packaged in paradigms that guide everyday research" (p. 30). Edwards and Skinner (2009) agree by arguing that sport management researchers need to understand, "the process by which other researchers have come to their conclusions" (p. 16).

The constructivist paradigm (Edwards & Skinner, 2009, pp. 26-27; Lincoln, Lynham, & Guba, 2011, pp. 102-115), has a number of attributes. Firstly, Edwards & Skinner, quoting Denzin & Lincoln (2005) describe the constructivist paradigm as having: ...a "relativist ontology (there are multiple realities), a subjectivist epistemology (knower and respondent co-create understandings), and a naturalistic (in the natural world) set of methodological procedures." Lincoln, Lynham, & Guba (2011) agree that constructivism has a relativist ontology, and subjectivist epistemology (pp. 102-103). The subjectivist ontology may also be understood as "interpretivism", and interpretivist research aims to understand human action, of which the responses of organisations managing MASS are an example. Subjectivist/interpretivist researchers assume that reality is created by people (researchers) acting as interpreters to assign meaning (Edwards & Skinner, 2009, p. 27). Sarantakos (2005, p. 37) agrees, explaining that subjectivist/interpretivist researchers assume that reality is actively constructed by people:

> *The reality people experience in everyday life is a constructed reality – their reality – based on interpretation. The presence of an objective reality is not disputed here; objective reality exists but it is not accessible. Hence, impressions of reality gained by researchers who listen to respondents talking about their lives are constructions of the constructed reality of the respondents; they are impressions of a constructed reality.*

Therefore, when researchers assign meanings to the behaviours of the humans in the organisations they study, they cannot be value-free. However, as Sarantakos (1998) suggests, "value neutrality is neither necessary or possible" (as cited in Edwards & Skinner, 2009, p. 27). This is supported by Maykut & Morehouse (1994) who contend that the values of a researcher are embedded in, "all aspects of the research, from what is chosen as the topic, how it is examined, and in the relationship between the researcher and the researched" (as cited in Edwards & Skinner, 2009, p. 28).

Constructivist research, in order to access these constructions, may also be described as inductive as it is associated with qualitative, naturalistic methods such as interviewing and observing human respondents (Lincoln et al., 2011, p. 105). Also, as suggested by Lincoln et al. (2011), the constructivist paradigm may be useful for informing "praxis", that is, improving practice. By this I mean that the meanings derived from the data obtained in this study have the potential for shaping future public policy for sport organisations in relation to climate change, industry practice, and sport management education. Overall, given that the research question for the study is concerned with investigating how and why organisations managing MASS respond to climate change, it is consistent with the constructivist, interpretative, inductive and qualitative research paradigm. Nevertheless, whilst the constructivist paradigm is an appropriate one to situate myself within for this study, I acknowledge Silverman's (1998, p. 7) assertion that qualitative research can address a "plurality of research paradigms", and Edwards & Skinner's point that the demarcations between the various paradigms outlined above are not always clear. Indeed, it is worth noting that no, "single paradigm,

and/or methodology" can meet the needs of all "sport management researchers and all research questions." Rather, researchers must choose a paradigm that is, "the most appropriate" (p. 37).

Methodology and method

Consistent with the constructivist paradigm, this study therefore has a qualitative methodology. Dey (1993, p. 1) claimed that there are over forty types of qualitative research, which according to Gibbs (2002, p. 3) share six "distinctive" characteristics. These characteristics include: (1) seeing through the eyes of participants; (2) description of the research setting; (3) contextualism and holism; (4) process; (5) flexibility and lack of structure, and; (6) the development of theory and concepts in tandem with data collection rather than in an a priori fashion. Guba & Lincoln (1989, p. 86) refer to the existence of, "multiple, socially constructed realities ungoverned by laws, natural or otherwise", that are created by individuals but are usually shared. Gibbs asserts that the role of qualitative researchers then is to reflect as accurately as possible these constructions without commenting on the underlying reality (2002, p. 6). The inductive nature of qualitative research means its "logic of explanation" involves basing general statements upon a number of observations or facts (Gibbs, 2002, p. 7).

This study uses a qualitative methodology because the researcher believes it to be the most appropriate one for responding to the research questions. According to Miles & Huberman (1994), an interpretivist stance requires qualitative research methods because these, "enable researchers to explore how people make sense of their lives" (as cited in Edwards & Skinner, 2009, p. 28). However, I wish to first make clear an important distinction between research "methodology" and "method"; *methodology* is the "branch of knowledge that deals with method and its application in a particular field of study", while *method* refers to the design and measures employed in research projects (Evans & Gruba, 2002, p. 89). As a result, Evans & Gruba argue that the researcher must make clear the methodology, or "stance", underlying the method being employed. This study therefore adopts a qualitative methodological stance that is aligned with appropriate qualitative methods.

Qualitative research methodology is appropriate for sport management research because it enables a strong analysis of the causes of phenomena to be undertaken, and facilitates a deeper understanding of the issues by the researcher as he or she interacts directly with their research participants. Qualitative research allows for a number of benefits. These include: to find out not only "what" happens but also "how" and "why" (Edwards & Skinner, 2009, p. 49); "depth and richness of results"; opportunities for "follow-up questions" not afforded by quantitative data collection instruments such as surveys; "flexibility; and the "ability to address complex "why" questions" (D. P. S. Andrew, Pedersen, & McEvoy, 2011, p. 46). Examples of qualitative methods often used for sport management research include ethnography, grounded theory, case studies and phenomenology (D. P. S. Andrew et al., 2011,

p. 46) but also include narrative analysis, action research and conversation analysis (Edwards & Skinner, 2009, pp. 52-54).

Case study method

Case studies are a common way to do qualitative research (Stake, 2008, p. 119). Merriam (2002) defines a qualitative case study as a "holistic and intensive analysis of a social unit, single instance, or phenomenon", while Stake (2008, p. 121) defines a case as a, "specific, unique, bounded system." Case study research typically serves three purposes: explanation, exploration, and description (Maylor & Blackmon, 2005; Yin, 2009, p. 21). Explanatory cases seek to answer *how* and *why* questions about phenomena, while exploratory and descriptive cases address *who*, *what*, *where* and *when* questions (D. P. S. Andrew et al., 2011, p. 132). A case study may be described as a "research strategy" (Cepeda & Martin, 2005, p. 852; Eisenhardt, 1989b, p. 534) that is used to develop understanding of a phenomenon in "single" (Eisenhardt, 1989b, p. 534) or "natural" settings" using "multiple methods of data collection" (Cepeda & Martin, 2005, p. 853).

In general, case studies are the preferred method when: (1) "how" and "why" questions are being posed"; (2) "the investigator has little control over events, and; (3) "the focus is on contemporary phenomenon within a real-life context" (Yin, 2009, p. 2). For this study, all three of these "conditions" (p. 8) were present and justify the choice of case study method. However another key reason why case study method was an appropriate choice was because of its close alignment with the type of research questions being suggested by the research problem, and addressed by the researcher. As "how" and "why" research questions were being asked, Yin notes that such questions are "explanatory" in nature and therefore are well suited to case study method (Yin, 2009, p. 4). Whilst Yin concedes that "histories" and "experiments" are also well suited to "how" and "why" questions, the focus of the former on historical events, and need of the latter for control of behavioural events, mean case study method was the logical choice for this study (p. 8). Yin also asserts that case studies are well suited to "real-life events" including "organizational and managerial processes" (p. 4).

Case studies are also widely used in management, marketing and strategy research (Yin, 2009, p. 5) and are exemplified in the work of Eisenhardt (1989b, 1991); Cepeda, Galán González, & Leal (2004); Cepeda & Martin (2005); Cepeda & Vera (2007); Voelpel, Leibold, Tekie & von Krogh (2005), and; Hacklin & Wallnöfer (2012). Cepeda & Martin (2005, pp. 852-853) cite three reasons why case study research is a "viable management research strategy":

> *First, the researcher can study management in a natural setting, learn about its state-of-the-art, and generate theories from practice. Second, the case method allows the researcher to answer "how" and "why" issues in order to understand the nature and complexity of the processes taking place. Third, a case study approach is an appropriate way to explore areas where research studies are scarce.*

Importantly, all three reasons cited above were applicable to this study and highlight case study method as an appropriate choice. However, as advocated by Yin (2009, p. 3), the strengths and limitations of case study method should be made explicit. The strengths of case studies include the capacity for investigating in holistic and meaningful ways the characteristics of real-life events (Yin, 2009, p. 4), for capturing the complexity of such events (Patton, 2002, p. 297), for securing insights through a variety of perspectives and sources of evidence, for studying organisations or phenomena in depth, for studying the relationships between functions, individuals and entities (D. P. S. Andrew et al., 2011, p. 130), and for building theory (D. P. S. Andrew et al., 2011, p. 130; Cepeda & Martin, 2005; Eisenhardt, 1989b; Eisenhardt & Graebner, 2007). Flyvbjerg (2011) argues that the main strength of case studies is depth: "detail, richness, completeness, and within-case variance" (p. 314). For these reasons, case study method is well suited to the key research problem that underlies this study, namely that very little is known about what climate change means for organisations managing MASS.

However, case study method has some distinct limitations. Firstly, they are less suited to research questions such as "who", "what", "where", "how much", or "how often" (Yin, 2009, p. 9) than quantitative methods. Furthermore, results relate to the unit of analysis only, findings entail personal impressions and biases, and there is limited access to the field (Sarantakos, 2005, pp. 216-217). In addition, Flyvbjerg (2011, pp. 302-313) outlines five key criticisms of case study method: (1) that theoretical knowledge is more valuable than case knowledge; (2) that researchers cannot generalise on the basis of cases; (3) that cases are not suited to theory building; (4) that cases contain a bias toward verification, and; (5) it is difficult to develop general propositions and theories from cases. Nevertheless, Flyvbjerg describes each of these criticisms as "myths", offering rebuttals for each, and concludes that case study method is complementary to quantitative research methods, while Sarantakos (2005) asserts that no method is free of problems, and case studies are a useful and popular method that are as legitimate as any other social research method.

Case study method is also widely used in sport management research (D. P. S. Andrew et al., 2011, pp. 130-131). While Edwards & Skinner (2009, p. 217) note its "valuable" contribution to the discipline, Smith (2010, p. 155) argues that the value of case study research in sport is that by searching for evidence in a natural context, the researcher is able to look at specific meanings of processes that may have led to particular outcomes or changes within a case. Andrew, et al. (2011) list a variety of sport management topics that have been investigated using case study method including sport or event policy and development (Green, 2005; Misener & Mason, 2009; Sam & Jackson, 2006), sport marketing (Amis et al., 1997; Parent & Seguin, 2008), decision making in sport (D. Mason, Thibault, & Misener, 2006; Parent, 2010), sport and organisational economics (D. Mason & Slack, 2003; Weight, 2010), strategic management (Babiak, 2007; Sack & Nadim, 2002), sport participation

(Frisby, Crawford, & Dorer, 1997), organisational change (Amis, Slack, & Hinings, 2004; Parent, 2008), sport communication (Wenner, 2004), sport behaviour (R. B. Mitchell, Crosset, & Barr, 1999), amateur and professional sport (L. Kihl & Richardson, 2009; O'Brien & Slack, 2003), image management (Parent & Foreman, 2007), and gender issues (Shaw, 2006; Sibson, 2010). To this list may be added other examples including sustainable sport tourism (H. J. Gibson et al., 2012); personnel management, and; board governance in sport (Ferkins & Shilbury, 2010).

A multiple case, replication design was employed for this study since it allows more powerful and valid conclusions to be drawn than a single case design (D. P. S. Andrew et al., 2011, p. 138; Miles & Huberman, 1994, p. 29; Yin, 2009, p. 53). It also expands the external generalisability (Cresswell, 2009, p. 190) of the findings where "common conclusions" can be drawn from cases from "varied circumstances." Multiple case designs also provide a stronger basis for theory building (Cepeda & Martin, 2005, p. 861; Eisenhardt & Graebner, 2007, p. 27). The study design used "replication logic", rather than "sampling logic", where each case was chosen based on the prediction of similar results, (D. P. S. Andrew et al., 2011, p. 138; Yin, 2009, p. 54) – in other words, that within certain theoretical categories of MASS organisation, each would respond in similar ways to the issue of climate change.

In outlining the rationale for choosing case study method, I wish to make clear that other possible methods were considered but rejected. Firstly, the sole use of quantitative methods was rejected because they were inconsistent with the "how" and "why" research questions that had emerged in the early stages of the literature review. Furthermore, quantitative methods were inconsistent with my epistemological and ontological stance. They are also mostly outside of my research expertise. For qualitative alternatives to case method, one possibility was "grounded theory" (B. Glaser, 1992; B. Glaser & Strauss, 1967) which is widely used in management research (R. Jones & Noble, 2007; Locke, 2001), and, as Edwards & Skinner (2009, p. 347) note, has also been applied by some sport management researchers including Roy (2004), Dunphy (2006) and Sotiriadou & Shilbury (2010). Grounded theory was initially rejected for this study because of its limited application in sport management research, and again later in the candidature because it was clear that it should be applied from the beginning of the research process (Patton, 2002, p. 490; Sarantakos, 2005, p. 119). In addition, upon further consideration, grounded theory was also considered an unwise choice because of methodological confusion that has arisen in recent years around its application in management research (Fendt & Sachs, 2008; R. Jones & Noble, 2007; Suddaby, 2006), and inherent difficulties with applying it. This confusion includes the division of grounded theory into differing "Glaserian and Straussian Schools" (R. Jones & Noble, 2007, pp. 85-87), "inconsistencies in the method itself", and misconceptions and misunderstanding of its seminal texts (Fendt & Sachs, 2008, p. 432; Suddaby, 2006, p. 634); while difficulties with applying it include the need for systematic application of "foundational procedures" such as joint collection, category development, and constant comparison

(R. Jones & Noble, 2007, p. 100). All of this, despite the lack of clear grounded theory training for researchers (Fendt & Sachs, 2008, p. 432) – an essential prerequisite for such a method – made it inappropriate to choose.

Theory building from case studies as a research strategy

Case studies can be used to develop theory (D. P. S. Andrew et al., 2011, p. 136; Cepeda & Martin, 2005, p. 852; Edwards & Skinner, 2009, pp. 208-209; Eisenhardt, 1989b; Eisenhardt & Graebner, 2007; Silverman, 2000; Yin, 2009, p. 35). This is consistent with the observation of Easterby-Smith, Golden-Biddle & Locke (2008, p. 424) who state that most qualitative management research is, "directed toward " "inductively" " developing or extending theory." Theory *building* from case studies, instead of *testing* a preconceived theoretical perspective, was chosen for three reasons. First, as Eisenhardt & Graebner (2007, p. 26) point out, theory building is preferable to theory testing where existing theory does not address the research questions of a study – a situation that exists for this study. While other research has applied existing theories such as resource-based view (RBV)/resource-based theory (RBT), institutional theory (IT) and stakeholder theory (ST) to similar research questions for non-sport organisations, they are inadequate for explaining how and why sport organisations respond to climate change because they do not take into account the, "distinct and special features which make sport a unique institution" (A. Smith & Stewart, 2010; Stewart & Smith, 1999). These features are significant because they may shape the response of the organisations managing MASS to climate change. Second, "how" and "why" research questions are better suited to theory building than theory testing (Edmondson & McManus, 2007; Eisenhardt & Graebner, 2007, pp. 26-27). Third, because it is appropriate to topics in the early stages of research (Cepeda & Martin, 2005, p. 852; Eisenhardt, 1989b, p. 548), such as the responses of sport organisations generally to climate change, and stadiums specifically.

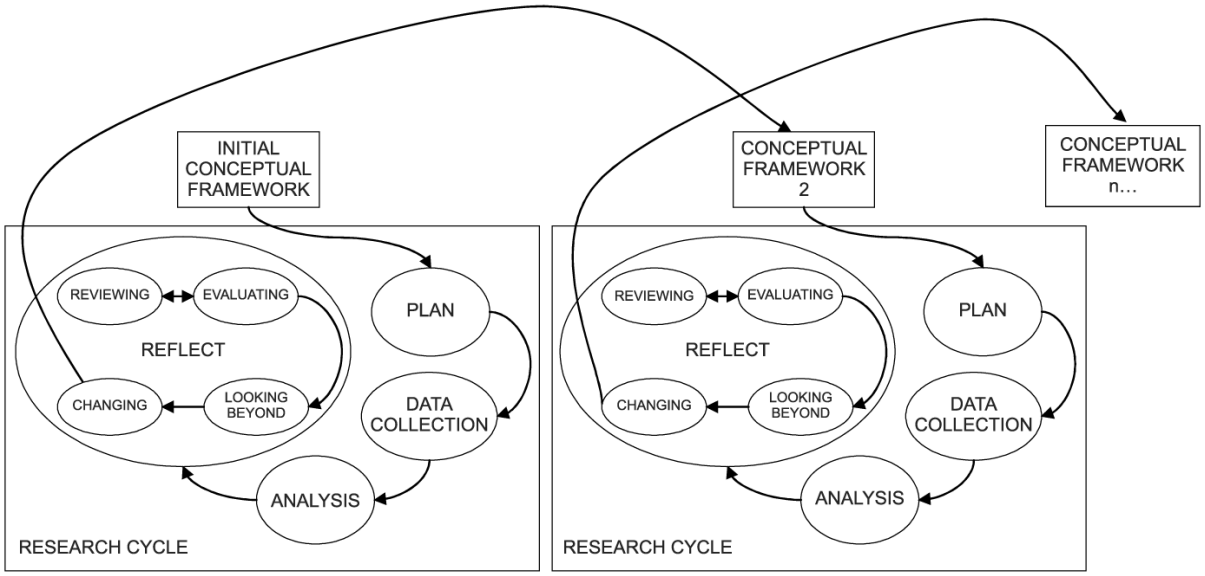
The unique features of sport organisations are important and illustrate why existing theory does not address the research questions of this study. Hoye, Nicholson & Smith (2008) recognise that these unique attributes influence how, "theories, principles, and strategies are applied by sport managers." More precisely the management of sport: "...invokes the same basic considerations as any other form of business management, but the specific application is subject to a range of contextual quirks that demand customised adjustments" (A. Smith & Stewart, 2010, p. 2). Smith & Stewart (2010, pp. 2-3) cite a range of unique features of sport highlighted in recent literature including: the importance of, "winning trophies, sharing revenue, and channelling the passions of both" players [employees], and fans [customers] (Foster et al., 2006); the "social, educational, and cultural function inherent in sport" (EC, 2000); the "specificity" of sporting activities, rules and structures (CoTEC, 2007); specific "systems of governance, patterns of ownership, the mix of stakeholders, corporate partnerships, and...regulatory context" (Hoye & Cuskelly, 2007); and idiosyncratic organisational structures linked

to the historical origins of sport (Szymanski, 2009). Similarly, the sport-as-a-unique institution thesis is accepted by Crosset & Hums (2012, pp. 19-21) who argue sport's uniqueness is a result of "management structures" such as clubs, leagues and professional tournaments, and "intricacies" such as sponsorship and volunteer management. Similarly, Kerwin, Doherty & Harman (2007), and Chelladurai & Carron (1977) also support the sport-as-a-unique institution thesis. However, during the evolution of the five theoretical perspectives reviewed for Chapter Three of this thesis, these unique features of sport have not been widely taken into account in the published scholarly literature pertaining to them.

This study uses Cepeda & Martin's (2005) iterative model for building theory from case studies. This model, based on Klein & Myers' (1999) widely cited[18] guidelines for evaluating interpretative case studies, has three steps including: (1) developing an *a priori* conceptual framework; (2) a four-stage research cycle consisting of planning, data collection, data analysis, and critical analysis (reflection), and; (3) literature-based scrutiny of the developed theory. Cepeda & Martin (2005, p. 861) argue that this theory building model enables the researcher to move from "substantive theory (specific to a particular case) to formal theory (may be applied to a variety of situations)." The final product of this process is a theory that explains how and why organisations that manage MASS respond to climate change. The model offers a process for methodologically rigorous theory building from case studies and responds to criticisms of the validity and rigor of earlier models of theory building from case studies such as Eisenhardt's (1989b) eight-step model, and Yin's (1994, 2009) case study protocol. However, Cepeda & Martin's model is also preferred for two other reasons advanced by these authors (2005, p. 854). Firstly, because Eisenhardt's and Yin's models do not, "adequately describe the theory building process." Secondly, because both Yin's and Eisenhardt's models emerged from a positivist paradigm and so "address issues of validity and rigour from that perspective" – an approach that is less consistent with my constructivist and interpretivist paradigmatic stance. Cepeda & Martin's model is illustrated in Figure 3 below.

[18] As of April 2014, a Google Scholar search showed that Klein & Myers' (1999) case study guidelines had been cited 3,316 times.

Figure 3: Cepeda & Martin's (2005, p. 861) model for building theory from case studies



As can be seen from Figure 3, the process is an iterative one of, "continuous interplay between the research cycle and conceptual framework" (p. 873). Each phase of the research cycle refined the initial conceptual framework until saturation – the point at which incremental learning is minimal because the researcher observes phenomena that has been seen before, or – as Corbin & Strauss (2008, p. 145) suggest, the point at which "all the concepts are well defined and explained" – , was achieved. Iterating between theory and data stopped when saturation was reached, and this occurred after investigating nine cases whereupon only incremental improvement to the theory was occurring. Replication logic was central to building theory from these cases (Eisenhardt & Graebner, 2007, p. 25).

An "essential" feature of theory building from case studies was the development of an *a priori* conceptual framework (Cepeda & Martin, 2005, p. 858). The conceptual framework (CF) approach proposed by Cepeda & Martin is based on Miles & Huberman's (1994, p. 18) work and should explain, "in either graphical or narrative form", the main things to be studied. As Cepeda & Martin (2005, p. 858) advocate, it also represented my, "initial understanding of the research topic", and was used to clearly set out the "territory to be explored." As suggested by the authors, the conceptual framework was reviewed at the end of each research cycle in order to incorporate insights gained from that cycle and as such, was an evolving construct. As a construct, the initial conceptual framework – herein referred to as "CF1" – represented my first interpretation of how MASS might be impacted by, and their organisations respond to, climate change.

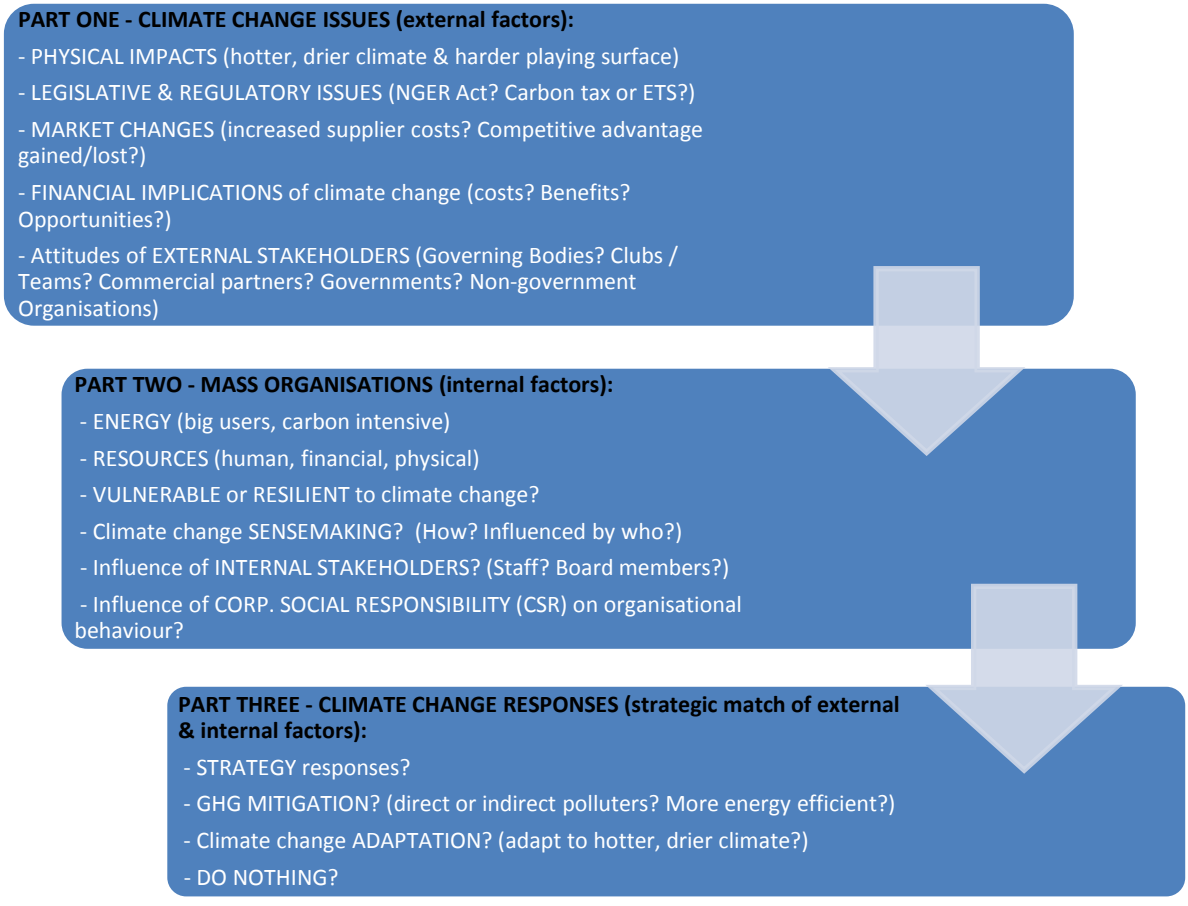
CF1 was comprised of three key parts: (1) external climate change-related issues; (2) internal organisational factors, and; (3) the role of interacting internal and external factors in shaping the organisational responses to climate change. Each part of CF1 was based on my assumptions and

understandings of how climate change would affect MASS prior to data collection, and was also influenced by some key themes and concepts that had emerged from my review of literature. For example, Part One assumed that five categories of potential climate change issues were external to MASS organisations. These categories of issues included: (1) physical impacts (hotter, drier climate and harder playing surfaces); (2) legislative and regulatory issues (compliance with, and/or costs caused by, the *NGER Act*, a carbon tax or ETS); (3) market changes (increased supplier costs, and/or competitive advantage or disadvantage); (4) financial implications (of cost changes, or other benefits and opportunities), and; (5) attitudes of external stakeholders. Given that the management literature highlighted the value of stakeholder theory (ST) for offering insights into climate change issues, *external* stakeholder factors were included here. However, institutional factors were rejected for Part One of CF1 as a means for understanding external influences on MASS organisations. This is because it was thought unlikely at that stage that external groups who were not primary, or even secondary, stakeholders in the activities of MASS organisations would have much influence on potential responses to climate change. Instead, it was thought that stakeholder factors would be more relevant because it was assumed by the researcher that tangible influences like primary and even secondary stakeholders that are often commercially relevant would exercise greater influence on what MASS organisations would – or would not do – in relation to climate change than less tangible and commercially relevant influences such "habit", "tradition", "social pressures" and the desire for external "approval" that are cited by Institutional Theory scholars (Heugens & Lander, 2009; C. Oliver, 1997b; Zukin & DiMaggio, 1990). Similarly, supply chain factors of MASS organisations were not included in this part of CF1 because of the limitations to supply chain management theory outlined in Chapter Three of this thesis, and particularly its very limited relevance to sport management research.

Part Two of CF1 envisaged six potential internal factors: (1) impacts on energy use; (2) resources; (3) vulnerability or resilience; (4) how MASS organisations made sense of climate change; (5) influence of internal stakeholders (staff or board members); and, (6) the influence of Corporate Social Responsibility (CSR) on organisational behaviour. Given that the management literature highlighted the value of RBV/RBT for offering insights into the role of internal resources and capabilities in climate change issues, *internal resource* factors were included here. Similarly, as stakeholder theory has an internal dimension to it, *internal stakeholder* factors were included here. Furthermore, the sport literature had also shown that both resource factors and stakeholder factors were prominent in sport research and so were deemed potentially valuable to this part of CF1. In addition, as the literature had shown that CSR theory offered some insights into the role of CSR in understanding climate change issues for organisations, it was included as a factor for investigation here.

Finally, Part Three of CF1 envisaged four potential responses to climate change: (1) specific strategy responses; (2) mitigation of GHG's; (3) adaptation to a hotter and drier climate; or, (4) to do nothing. CF1 is illustrated in Figure 4 below. Two key response concepts that had emerged from the management literature pertaining to climate change were those of greenhouse gas (GHG) mitigation, and organisational adaptation. As a consequence, these two concepts figured prominently in Part Three of CF1. My initial understanding of the research topic assumed that MASS as large sports facilities would be large users of energy, especially electrical energy. In an era of climate change, I considered this to be potentially problematic given the high carbon intensity of Australia's electrical energy system (GEM, 2011), and legislative and regulatory responses in recent years such as the *NGER Act*, and the carbon tax and ETS. As a result, MASS were considered to be potential sites in the sports industry for climate change responses, and in particular, adaptation and GHG mitigation. CF1 is illustrated in Figure 4 below.

Figure 4: The researcher's initial conceptual framework (CF1) for the study: A climate change impact-response framework for MASS organisations



Although CF1 is in hindsight fairly "rudimentary", as Miles & Huberman (1994, p. 18) note, conceptual frameworks do not have to be "elaborate". CF1 also proved to be a valuable tool in guiding the subsequent data collection and analysis.

The four-stage research cycle consisting of planning, data collection, data analysis, and critical analysis (reflection) was also integral to the theory building process. This section of the chapter will discuss how these four stages were carried out for this study. As advocated by Cepeda & Martin (2005, pp. 858-859), research planning served as a guide for "collecting, recording, processing and analysing data", and reporting findings. The next stage of the research cycle, data collection, also overlapped with data analysis, and is a practice encouraged by these authors in order to respond to "opportunities, unexpected outcomes and emergent themes." The data analysis stage used data coding to identify emergent patterns within the data and highlights the inductive nature of this study. The critical analysis or reflection stage was an ongoing and iterative process in accordance with Cepeda & Martin's guidelines and involved evaluating the outcomes of the analysis by developing but then challenging interpretations of the data by seeking "disconfirming evidence" of the initial findings. Critical analysis (reflection) also involved considering "implications" of the findings for building theory, and then updating the conceptual framework with new insights and interpretations as they emerged. When the framework had been challenged, confirmed or revised, this signalled the end of each research cycle and the beginning of the next one. The reflection stage continued with theory building. The findings were interrogated by the researcher with questions of what the findings meant, whether there were alternative explanations, contradictory evidence, and how the findings related to the insights gained from the previous research cycle.

As advocated by Cepeda & Martin, the theory building process concluded with a literature-based scrutiny of the developed theory. When the researcher concluded that theoretical saturation had been reached, the most recent iteration of the conceptual framework was compared with extant literature to determine two issues. First, to what extent was there agreement between the findings and the extant literature? Second, to what extent was there conflict between the findings and the extant literature? Where similar findings in different contexts were identified, the theory developed in this study was strengthened. Where there was disagreement between the findings and the extant literature, explanations that accounted for the differences were sought.

Unit of analysis

Patton defines a *unit of analysis* as that which, "you want to be able to say something about at the end of the study" (Patton, 2002, p. 229). Yin (2009, p. 30) asserts that fundamentally, the unit of analysis is the "case" about which a researcher writes, and is tied to the primary research questions. For this study, the fundamental unit of analysis is any organisation that manages a "major Australian sport stadium" (MASS)[19]. These MASS organisations therefore are the *cases* on which this study is based.

[19] It is worth noting that MASS organisations may in some cases manage smaller sport stadia that are not classified as MASS.

Organisations are commonly chosen as units of analysis in management research (Eisenhardt, 1989b) although other possibilities include organisational programs, events and individuals. Yin (2009, p. 32) argues that in determining the unit of analysis, consideration should be given to spatial, temporal and other "concrete boundaries", but more importantly, the unit of analysis/case should be, "some real-life phenomenon, not an abstraction such as a topic, an argument, or even an hypothesis." Another key consideration is the role of research literature and the ability of the findings of a study to be able to be compared to previous research (Yin, 2009, p. 32). This means that units of analysis/cases need to be able to be compared to similar units of analysis/cases in previous, or future, research. The latter was a key consideration when framing the unit of analysis for this study as it was anticipated early in the process that this study's general investigation of the implications of climate change for sport, and specific interest in the implications of climate change for MASS, might not be the last of its kind in Australia or overseas. Specifically, at some future point, other sport management scholars may wish to compare the findings of this study to similar studies of major sport stadia and climate change.

The units of analysis/cases for this study were organisations that managed "major" Australian sport stadia. However, in order to identify such organisations, it was first necessary to define such stadia. As indicated in Chapter One of this thesis, there is no single, nationally or internationally agreed definition of major sport stadia, and so in the absence of such a definition, the researcher devised three criteria to define MASS:

1. *Venues offering sport*, which itself is defined as having three attributes (Nicholson et al., 2015, p. 4): (a) competitive; (b) physical; (c) structured according to rules or laws;
2. *Venues offering "elite"/"professional" level sport* (Stewart et al., 2004) such as national sport leagues and championships and international sport events, and;
3. Venues with a minimum seating capacity of 25,000 spectators.

The second attribute – "sport played at the "elite"/"professional-level" – was used to help distinguish MASS from comparatively minor Australian sport stadia. This is based on a typology of sport (Stewart et al., 2004) that distinguishes "elite"/"professional" level sport that is typically played at large scale stadia, from sport that is "regional and community competitive", "recreational", "exercise" or "spontaneous." Adding weight to the "major" nature of large scale sport stadia is their "nexus" (Nicholson et al., 2015, pp. 6-8) with major sport organisations, major media organisations and major non-sport commercial partners. The stadia described in this study as MASS, by virtue of their role as venues to major/elite/professional-level sport competitions in Australia, all have commercial relationships with major national and international sport governing bodies, major national sport clubs, major national media organisations, and major national companies acting either as event or team sponsors, or as corporate guests of the stadia, at the major sport events that they stage.

The third attribute – "a seating capacity of 25,000 spectators or higher" – was also used to help distinguish MASS from comparatively minor Australian sport stadia used for "regional and community competitive sport." Whilst small organisations managing regional and community sport facilities may contribute to the impacts of climate change through directly or indirectly-produced GHG emissions, or equally, be impacted by the physical or economic dimensions of climate change, it was thought that their smaller scale meant that such stadia were of less cultural, economic or sporting significance than large scale sport stadia where Australia's most popular national and international sports competitions are conducted, and therefore were not as high a priority for investigation. MASS were also thought likely to be of greater theoretical interest given that, as large venues hosting tens of thousands of spectators, they were likely to be larger users of energy sources linked to GHG emissions, but also because the organisations that manage them were thought likely to have greater human and financial resources for managing responses to the issue of climate change. The figure of 25,000 spectators was based on the Queensland (state) Government legislative definition of major sport events as being those having 25,000 or more spectators (QLDG, 2001) although it should be noted, in June 2011, this figure was increased to 35,000 in order to comply with other legislative requirements (Hurst, 2011; QLDG, 2011). The three attributes chosen for MASS are broadly consistent with Allen et al.'s (2011) definition of major events (p. 14), including sporting ones, which in turn is based on Getz's (1997) influential typology of events (pp. 6-11).

Sampling and industrial context

Twelve MASS organisations/cases were selected using a two-stage "purposeful sampling" approach. The first stage of purposeful sampling was "selective sampling" (Becker, 1993; Coyne, 1997; Sandelowski, Holditch-Davis, & Harris, 1992), while the second stage was "theoretical sampling" (Coyne, 1997; Eisenhardt, 1989b; Eisenhardt & Graebner, 2007; Patton, 2002; Sarantakos, 2005). Miles & Huberman (1994, p. 27) argue that purposeful sampling is appropriate for qualitative studies, while Patton (2002) suggests that the logic and power of purposeful sampling derives from selecting "information rich" cases that enable an in-depth understanding of the research problem. *Selective sampling* involves selecting a sample of subjects based on a "preconceived, but reasonable initial set of criteria" (Sandelowski et al., 1992, p. 628). Selective sampling typically occurs prior to theoretical sampling because neither ethics committees nor funding agencies are likely to approve research projects without prior specification of the desired types of research subjects (Sandelowski et al., 1992). Selective sampling provides a "sampling frame" that allows the researcher to develop the conceptual lines that ultimately "drive theoretical sampling" (Coyne, 1997; Sandelowski et al., 1992). For this study, the researcher had a preconceived idea that sport facilities generally would be important sites for investigating the implications of climate change for sport; an idea that was informed by a "typology" (Silverman, 2000, p. 105) of Australian sport organisations.

The selective sampling process began with, and was guided by, the typology adapted from Stewart et al. (2004). Four conceptualisations – or types – of sport organisations emerged from this typology: (1) sport governing bodies; (2) sport clubs; (3) organisations managing sport facilities, and; (4) sport leagues/competitions. These types of sport organisations exist along a continuum from major national level sport down to the local, community-level, and span both winter and summer seasons. This typology is illustrated in Table 1 below.

Table 1: A typology of Australian sport organisations (Adapted from Stewart et al., 2004, pp. 19-20).

TYPES OF SPORT	TYPES OF SPORT ORGANISATIONS			
	Sport Governing Bodies	Sport Clubs	Org's Managing Sport Facilities	Sport Leagues/Competitions
Elite/Professional/National level sport	Yes	Yes	Yes	Yes
State/Regional/ Community level sport	Yes	Yes	Yes	Yes
Recreational level sport	Yes	Yes	Yes	No
Exercise sport	Yes	Yes	No	No
Spontaneous sport	No	No	No	No
Publically-owned[20]	No	No	Yes	No
Privately-owned[21]	Yes	Yes	Yes	Yes
Winter season	Yes	Yes	Yes	Yes
Summer season	Yes	Yes	Yes	Yes

The above four types of Australian sport organisations portray the diversity of this industry, but also revealed how difficult it would be to investigate an entire population of such breadth and depth. As a consequence, it was decided to focus attention on "organisations managing sport facilities." These facilities represent the "target population" (Corbin & Strauss, 2008, p. 145; Sarantakos, 2005, p. 152) for this study. The purposeful selection of organisations managing sport facilities ahead of governing bodies, clubs and leagues/competitions was informed by climate change concepts that had already emerged from the literature review. The concepts of "fossil fuel-based energy systems", "greenhouse gases", "Australia's high per capita greenhouse emissions", and "carbon-intensive" were clear themes emergent from the climate science, climate policy and organisational management literature. As a result, the researcher thought that "organisations managing sport facilities" – who would very likely rely on significant use of electrical energy generated from carbon-intensive, fossil fuel-based, greenhouse gas-emitting energy systems – were more likely to be important sites for revealing climate change impacts and organisational responses. To identify the relevant sport facility management *organisations* for this study, it was first necessary to identify the types of sport *facilities* available for

[20] For the purpose of this study, public ownership refers to ownership by the state (i.e. usually some level of government).

[21] Private ownership includes both for-profit, and not-for-profit, sport organisations. For example, collective forms of ownership such as for not-for-profit sports governing bodies and clubs are considered privately-owned (i.e. owned by the members).

investigation. As a result, a secondary "typology of Australian sport facilities" was devised by the researcher, and is illustrated in Table 2 below.

Table 2: A typology of Australian sport facilities

TYPES OF SPORT	TYPES OF SPORT FACILITIES			
	Major Australian Sport Stadia (MASS)	**State/Regional/ Semi-professional Sport Stadia**	**Training Facilities**	**Multi-purpose Exercise/ Fitness/Rehabilitation**
Elite level (National & International)	Yes (n = 17)	No	Yes	No
State/Regional/ Community level	No	Yes	Yes	No
Recreational level	No	No	Yes	Yes
Spontaneous	No	No	No	No
Ownership-management structure	Public-ownership, public management; Public-ownership, private management; Private-ownership, private management	Public-ownership, public management; Public-ownership, private management; Private-ownership, private management	Public-ownership, public management; Public-ownership, private management; Private-ownership, private management	Public-ownership, public management; Public-ownership, private management; Private-ownership, private management
Winter season	Yes	Yes	Yes	Yes
Summer season	Yes	Yes	Yes	Yes

Emergent from this second typology were four conceptualisations – or types – of sport facilities: (1) major, national and international-level Australian stadia (i.e. MASS); (2) smaller stadia used for state/regional/semi-professional-level sport; (3) training facilities, and; (4) multi-purpose exercise/fitness/rehabilitation/recreational sport centres.

Whilst it was possible that the impacts of climate change – and associated organisational responses – could have been investigated within any of the four categories of sport facilities, again the range and differing scale of such facilities suggested that only one category could be selected for this study. As a result, major Australian sport stadia (MASS) were selected as the key *criterion* for choosing relevant organisations for the study. This choice was based on three factors: (1) the likely scale of direct or indirect natural resource use at such stadia, especially fossil fuel-based energy but also climate-sensitive resources like water; (2) the likely scale of associated indirect greenhouse gas (GHG) emissions from such energy use, and; (3) their shared national sporting, economic and cultural significance.

As indicated in this second typology, only seventeen sport facilities in Australia *consistently* meet the aforementioned definition of MASS. Although twenty-nine[22] facilities in total met the MASS seating capacity criterion of 25,000 spectators or more (Ausstadiums.com, 2011)(Ausstadiums.com, 2011)(Ausstadiums.com, 2011)(Ausstadiums.com, 2011)(Ausstadiums.com, 2011) twelve of these were for horseracing, car racing, athletics or showground events, and so only rarely – if ever – attract crowds of that size. As a result, these facilities were not considered to be MASS and so they – and the organisations that manage them – were excluded from the study.

An important feature of the "typology of sport facilities" is a set of concepts that emerged from it. For every one of these categories of Australian sport facilities – including MASS – *organisations* exist that own and/or manage them. As a result, emerging from this second typology was a set of three categories of "ownership-management structure" of such sport facilities. From this intersection between facility ownership and facility management, the categories of facility "ownership-management structure" to emerge were: (1) "public-ownership, public management"; (2) "public-ownership, private-management", and; (3) "private-ownership, private management." These three conceptualisations are important insights into the diversity of facilities – and the organisations that manage them.

The seventeen stadia that met the definition of MASS were collectively managed by fourteen separate organisations. Together, these fourteen MASS organisations represent the "study population" (Sarantakos, 2005, p. 152). Most organisations that owned and/or managed a MASS were responsible for a single stadium, although two organisations owned and/or managed two or more stadia. Twelve of the fourteen MASS organisations in Australia participated in this study, representing eighty-five per cent of the total study population. These twelve MASS organisations collectively own and/or manage fifteen of the seventeen MASS stadia, or eighty-eight per cent of the total. These twelve MASS organisations, and their fifteen MASS stadia, are located in five of Australia's six states[23], and hence are located in a variety of climate zones ranging from sub-tropical with "warm/humid" summers to a temperate one with warm summers and cold winters (BOM, 2014). Consistent warming across these climate zones however has likely meant broadly similar climate experiences for MASS organisations.[24]

[22] It should be noted that the Ausstadiums.com (2011) website actually lists thirty-two Australian stadia that meet this study's MASS criterion of a seating capacity of 25,000 or more spectators. However, three of these thirty-two stadia are inactive. That is, they are no longer used for professional competitions, and are now principally training venues for professional sport teams.

[23] Australia's states are both geographic regions, and legal jurisdictions that exist within a federal system of government.

[24] The reader should note that despite the variation in Australian climate zones, the physical impacts of climate change in Australia are broadly the same. Australia's climate has warmed "by 0.9°C since 1910, and the frequency of extreme weather has changed, with more extreme heat and fewer cool extremes." Further, "seven of the ten warmest years have occurred since 1998" (BOM, 2015).

Having identified MASS as the key criterion for choosing relevant organisational cases, it was possible to begin the second stage of sampling – *theoretical sampling*. Theoretical sampling – a "method of data collection based on concepts/themes derived from data" (Corbin & Strauss, 2008, p. 143) – is another type of purposeful sampling (Coyne, 1997, p. 629; Patton, 2002, p. 46) whereby the sample is purposefully selected according to the "developing categories and emerging theory. As Sandelowski et al. (1992, p. 302) put it, theoretical sampling is a sampling decision made on "analytic grounds developed in the course of a study." Theoretical sampling was also chosen specifically because it is appropriate to building theory from case studies (Eisenhardt, 1989b, p. 537; Eisenhardt & Graebner, 2007, p. 27).

With the three categories of MASS revealed, the theoretical sampling process began with analysis of the fundamental *purposes* for MASS organisations, and the types of *ownership* of such organisations. Analysis of publically available information[25] about organisations that own and/or manage MASS revealed that they have two fundamental purposes (either for-profit, or not-for-profit), and that they have two fundamental types of ownership arrangements (either public or private). To make sense of these factors, a matrix analysis was conducted in order to reveal the intersections between them. This analysis revealed that there were four potential theoretical categories. These were: (1) public-ownership, not-for-profit; (2) public-ownership, for-profit; (3); private-ownership, not-for-profit, and; (4) private-ownership, for-profit. These potential categories are illustrated in Table 3 below.

Table 3: A matrix of potential theoretical categories of organisations managing MASS

		FUNDAMENTAL PURPOSES OF MASS ORGANISATIONS	
		Not-for-profit	**For-profit**
FUNDAMENTAL TYPES OF OWNERSHIP OF MASS ORGANISATIONS	**Public**	Public-ownership, not-for-profit	Public-ownership, for-profit
	Private	Private-ownership, not-for-profit	Private-ownership, for-profit

However, after consideration of these four categories, and cross-checking with the publically available information about MASS organisations, it was clear that only three of these categories were realistic. The "public-ownership, for-profit" category could not really apply to any of the known MASS organisations because publically-owned organisations in the sport industry in Australia exist essentially to provide either opportunities for public participation in sport, or for public access to major sport events and competitions. They do not exist purely to return a financial dividend to the governments that own them. Although it was possible that such organisations may be expected to

[25] The fundamental purposes, and types of ownership, of MASS organisations were established by surveying the websites and annual reports of a range of such organisations.

produce operating surpluses, it was clear that this was not their primary purpose. Therefore, whilst in theory such a category exists, in practice, it does not.

As a consequence, the "public-ownership, for-profit" category was eliminated from the theoretical sampling process. The analytical process had therefore identified three theoretical categories of MASS organisations/cases: (1) "publically-owned, not-for-profit"; (2) "privately-owned, not-for-profit", and; (3) "privately-owned, for-profit." These three categories/conceptualisations of MASS organisations are the analytic grounds on which it was decided to sample MASS organisations for this study. The theoretical categories of major Australian sport stadia organisations are illustrated in Table 4 below.

Table 4: The three theoretical categories of organisations managing major Australian sport stadia (MASS)

1.	Publically-owned, not-for-profit MASS organisations
2.	Privately-owned, not-for-profit MASS organisations
3.	Privately-owned, for-profit MASS organisations

The twelve MASS organisations were therefore chosen for theoretical, not statistical, reasons that can be classified in four ways (Eisenhardt, 1989b, p. 537; Eisenhardt & Graebner, 2007, p. 27): (1) replication of previous cases; (2) extension of theory; (3) contrary replication by providing categories of "polar types", and; (4) elimination of alternative explanations. In order to build a theory that is applicable across the full range of organisation types that manage MASS, a range of organisations were purposefully chosen using the aforementioned "replication logic."

Specifically, the cases were chosen for a literal (direct) replication (Yin, 2009, p. 54; 2012, p. 8). That is, despite the diversity of ownership structures, core organisational purposes and locations, the cases were chosen predicting similar results (D. P. S. Andrew et al., 2011, p. 138; Yin, 2009, p. 54) – specifically, *that the MASS organisations within each theoretical category would respond in similar ways to the issue of climate change*.[26] This is because organisation ownership (public or private), and organisational basic purposes (not-for-profit, or for-profit) were thought to be critical factors shaping how organisations would respond to climate change.

Each organisation/case was given an alphabetical codename as a unique identifier such as "A", "B", "C", and so on. The organisations that own and/or manage the MASS examined in this study, however, include organisations that fall within the three aforementioned theoretical categories. For

[26] "My choice of organisational cases on the basis of my prediction of similar responses to the issue of climate change was grounded in insights into the operational nature of MASS and their organisations from the publically available materials about them. These materials included annual reports, MASS organisation websites, government legislation, the stadia industry website (www.austadiums.com), and the following stadia industry magazines: the Australian publications – *Facility Perspectives* and *Facilities Manager* – the European-based *Panstadia International*, and *Stadium & Turf* from the United States."

theoretical Category 1 (publically-owned, not-for-profit), there was a sample of five cases (replications). For theoretical Category 2 (privately-owned, not-for-profit), there was a sample of four cases/replications, while for theoretical Category 3 (privately-owned, for-profit), there was a sample of three cases/replications. Although the number of cases/replications per category is unequal, this simply reflects the proportion of MASS organisations in each category in the industry. For example, as there are only three privately-owned, for-profit (Category 3) MASS organisations in the entire industry sector, a sample of three meant that 100 per cent of the cases in that category had been sampled. An overview of the cases/replications is given in Table 5 below.

Table 5: Overview of MASS organisations investigated (the cases)

THEORETICAL CATEGORIES	MASS ORGANISATION (CASE)	TYPES OF MASS ORGANISATION	NO. OF MASS OWNED[27]	NO. OF MASS MANAGED
Category 1 – Publically-owned, not-for-profit	Case A	Government-owned statutory authority	5[28]	3
	Case D	Government-owned statutory authority	2	2
	Case E	Government-owned statutory authority	1	1
	Case I	Government-owned statutory authority	1	1
	Case J	Local government	1	1
Category 2 – Privately-owned, not-for-profit	Case B	Not-for-profit governing body	0	1
	Case G	Not-for-profit governing body	1	1
	Case H	Not-for-profit governing body	1	1
	Case K	Not-for-profit, membership-based club	0	1
Category 3 – Privately-owned, for-profit	Case C	Privately-owned for-profit company	0	1
	Case F	Privately-owned for-profit company	1	1
	Case L	Privately-owned for-profit company	0	1
TOTALS	**12**	**5**	**13**	**15**

The fact that eighty-five per cent of the study population was investigated in the study meant that all theoretical categories had sufficient replications, and adds to the confidence in the findings presented in the discussion section of this thesis. This very strong participation rate also meant that all sports played at the MASS were accounted for and enabled the researcher to explore the influence of key sporting organisations on the response of MASS organisations to climate change. The study was also conducted within a single industry. Sampling organisations from a single industry enabled data to be

[27] Not every stadium was owned and managed by the same organisation. While most MASS were both owned and managed by the same organisation (case), some MASS were owned by a separate organisation that was typically a publically-owned, not-for-profit organisation.

[28] Case A own five stadia that meet this study's definition of MASS, but they manage only three of these. Case A incorporates data referring to only four of the five stadia that they own. After examining five "Category 1 – Publically-owned, not-for-profit" MASS organisations (Cases A, D, E, I and J), it was decided that it was unnecessary to obtain data about Case A's fifth stadium. This was because, with no new themes emerging after analysis of five Category 1 MASS organisations, the researcher felt theoretical saturation had already been reached.

collected within a consistent industry and institutional context (Sharma et al., 1999) and helped with comparison of cases. This enhances the generalisability of the findings drawn in this thesis.

The third and final stage of sampling was for within-case samples of *research participants*. Amis (2005) notes that sampling proceeds at two levels: first, deciding what to focus on; and second, "identifying participants able to provide levels of insight into the phenomenon being studied" (p. 117). After having identified an appropriate sample of organisations to investigate, within-case samples (Miles & Huberman, 1994, p. 29) of research participants were identified at each organisation/case that could help to answer the study's research questions. In each case, the most senior manager, typically holding the title of Chief Executive, was identified as the person most likely to be able to comment on the strategic implications of climate change for his/her organisation and stadium(s). However, given the potential operational implications of climate change for each stadium, the researcher also asked to interview the most senior operational managers who would likely be responsible for implementing strategic responses to climate change, and in doing so, would be suitable participants.

Data collection

Data collection was guided by Yin's "three principles of data collection" (2009, pp. 114-124): (1) use multiple sources of evidence; (2) create a case study database, and; (3) maintain a chain of evidence. Yin asserts that there are six sources of evidence: documents, archives, interviews, direct observations, participant observations and physical artefacts (Yin, 2009, p. 101). Accordingly, the study collected primary (raw) data from three types of sources: first, focused interviews (Yin, 2009, p. 107); second, documents were sought and obtained where available; and third, archival records (Yin, 2009, pp. 105-106). Observation comprised a fourth but minor data source. The documents consisted primarily of publically available annual reports as they were the main ones that MASS organisations were prepared to release, although Case B did provide a consultant's report on the environmental impact of one event at its stadium, while Case A provided a report from a supplier. Organisation websites were also examined. This meant that administrative documents that may have been relevant – such as strategic plans, policy statements, letters, agendas, and press releases – were not made available on the grounds of confidentiality. Where possible, and if relevant, secondary source data such as websites, newspaper articles, stadia industry journals, histories and newsletters were collected. The three qualitative data sources were appropriate to this qualitative study, and were chosen with the data validation method of "data triangulation" in mind (Miles & Huberman, 1994, p. 266; Stake, 2008, p. 133; Yin, 2009, p. 116).

The study had a 100 per cent response rate with all twelve MASS organisations that were approached ultimately agreeing to participate. Data collection took place over a twelve month period from January

2011 to January 2012, and ended after the twelfth organisation had participated. After collecting data from the twelve cases/organisations, the researcher saw no new themes emerge from the data, and it was concluded that theoretical saturation had been reached. It was therefore decided that it was necessary to obtain data about only four of the five MASS owned by Organisation "A". Nevertheless, the researcher regularly reflected on whether enough cases had been investigated. Yin (2012, p. 9) suggests this is an "age old" question asked of multiple case research designs, yet he asserts that the appropriate answer is one of judgment: "the more cases (or experiments), the greater confidence or certainty in a study's findings", a claim supported by Miles & Huberman (1994, p. 29). After investigating twelve cases, the researcher was satisfied that in addition to achieving the necessary replication of cases, a sufficient number of cases had been investigated in order to be confident in the study's findings.

Focused interviews

Interviews are commonly used for qualitative research (Liamputtong & Ezzy, 2005, p. 56; Miles & Huberman, 1994, p. 9; Patton, 2002, p. 341; Sarantakos, 2005, p. 269), including case study research (D. P. S. Andrew et al., 2011, p. 133; Patton, 2002, p. 450; Yin, 2009, p. 106), because they enable researchers to collect data about that which cannot be observed (Patton, 2002, p. 340). *Focused interviews* (Liamputtong & Ezzy, 2005, p. 56) were used to collect primary data for this study, and are a variation of "in-depth interviews" that are variously known as "unstructured", "non-directive", "open-ended", "active", and "semi-structured." Sometimes also referred to as an "interview guide approach" (Amis, 2005, p. 108; Patton, 2002, pp. 343-344), or "structured interview" (D. P. S. Andrew et al., 2011, p. 95; Edwards & Skinner, 2009, p. 210), the interviews used questions that focused on predetermined themes that had emerged from the literature review. However, the interviews were designed to be flexible enough to probe themes that emerged during these conversations that the interview questions did not address (Amis, 2005, p. 107). The questions used to guide these interviews form the Case Study Questions section of the case study protocol (see Appendix 4). Open-ended questions (Patton, 2002, p. 21) were used as much as possible to encourage fuller and more descriptive responses in order to allow respondents to, "state their answers in the way they see appropriate, in their own way and in their own words" (Sarantakos, 2005, p. 245).

The interview questions (see Appendix 4) are linked to themes developed from the relevant literature on organisations and climate change. For example, questions about interpreting the phenomenon of climate change were developed out of the literature on sensemaking that originated with the work of Karl Weick. In the same way, questions about defining climate change, and vulnerability and resilience to climate change emerged from the scholarly scientific and management literature. Equally, the questions about climate change risks for organisations emerged from the organisational literature that emphasised the various, commercial regulatory and reputational risks associated with

this phenomenon. In the same way, the questions about organisational responses to climate change such as greenhouse gas mitigation, adaptation or doing nothing arose from the organisational management literature. Such literature also emphasised the importance of strategy responses to climate change and so were included in the Schedule of interview questions. Finally, the interview questions pertaining to the influence of internal and external stakeholders on organisational perceptions of climate change and responses to it were derived from the scholarly organisational management literature

In total, twenty interviews were completed with twenty-one staff at mainly senior-executive level but also including a number of operational-level managers. The interviews resulted in fourteen hours & forty-nine minutes (889 minutes) of interview data from which 249 pages of interview transcripts were produced. Each of the interviewees were given an alphanumeric codename as a unique identifier such as “A1”, “A2”, “B1”, “B2”, and so on with the letter indicating the organisation, and the number indicating the order of interviewees at that organisation. In the second-last interview, two staff members were interviewed at the same time for Organisation K. The letter of invitation to each organisation (see Appendix 1) was directed to the Chief Executive, and requested interviews with the most senior staff responsible for either developing, or implementing, strategy that pertained to organisational responses to climate change. In most cases the organisation’s Chief Executive referred the request to a senior manager, usually at General Manager level, and this person then made available other operational level staff. Each interview was recorded using a digital voice recorder in order to produce accurate transcripts. An overview of the interview data is offered in Table 6 below.

Table 6: Overview of interviewees & interview data

INTERVIEWEES' JOB TITLES	MASS ORGANISATIONS (CASES)	INTERVIEWEE CODENAME[29]	MINUTES OF AUDIO DATA	PAGES OF TEXT
General Manager, Asset Management and Development	**Case A**	A1	59:51	14
Stadium Manager (1)	**Case A**	A2	44:56	12
Stadium Manager (2)	**Case A**	A3	50:46	11
Director for Facilities and Planning	**Case B**	B1	97:22	24
Venue Operations Manager	**Case B**	B2	17:01	13
General Manager, Asset Management	**Case C**	C1	70:44	20
OH&S Supervisor	**Case D**	D1	35:22	9
General Manager, Properties	**Case D**	D2	40:04	10
Executive Manager, Turf Development and Environment	**Case E**	E1	87:21	27
General Manager, Commercial Business	**Case F**	F1	61:43	17
Chief Financial Officer	**Case G**	G1	30:57	11
Membership and Stadium Operations Executive	**Case G**	G2	18:15	7
Manager, Venues & Operations	**Case H**	H1	47:06	13
General Manager, Sales & Commercial	**Case H**	H2	16:05	5
Manager, Food and Beverage	**Case H**	H3	14:08	3
Chief Executive	**Case H**	H4	10:24	3
General Manager, Stadiums	**Case I**	I1	51:15	12
Venue Co-ordinator	**Case J**	J1	59:06	16
Stadium Manager **Facilities Manager**	**Case K**[30]	K1 K2	41:50	12
Stadium Manager	**Case L**	L1	34:59	10
20 [interviews] for 21 interviewees	**TOTALS**	**21**	**889:15**	**249**

Before each interview, the background and aims of the study were explained to the interviewee. Interviewees were offered the opportunity to withdraw their consent at any time during or after interviews, and permission was sought – and granted – to tape each interview. Prior to each interview, it was explained to each participant, both verbally and in the *Information to Participants Form* (see Appendix 2) that was provided prior to each interview, that their interview data would be stored securely and in such a way that would maintain the confidentiality of their responses. Each interviewee was interviewed only once, and given the consistent clarity of the data provided, no follow up phone calls were necessary. Of the twenty-one interviews, sixteen were done face-to-face and five were completed by phone.

Observation

Participant observation (D. P. S. Andrew et al., 2011, p. 106; Patton, 2002, p. 21; Yin, 2009, p. 111) was done if the opportunity arose but comprised a very minor part of the data collection. This was

[29] Interviewee codenames were allocated in the order in which they were interviewed.
[30] A joint interview was conducted with the managers at Case K. This was decided by the interviewees, rather than the researcher.

largely because there were very limited opportunities for observation given the nature of the organisations managing the MASS where employees were very busy and the general impression was that the interviewees were sacrificing enough precious time for interviews without adding to this by allowing the researcher further access to their organisations. The key observations were made just before or during the interviews where the researcher was able to observe some management staff undertaking their duties, and some areas of each stadium visited. As each interview was conducted at a stadium, the researcher had brief opportunities to informally observe the playing surfaces and spectator seating areas and form broad impressions of the conditions at each venue, as well as the range of physical, human and underlying financial resources available to each organisation. The observations were recorded using Nvivo's "notes" function. No formal coding sheet was used to record the observations, however they were recorded in Nvivo after every site visit and interview and were included in the data analysis.

Ethical issues

Ethical standards are an integral part of any research design (Sarantakos, 2005, p. 16). Accordingly, the researcher sought to behave in line with ethical principles of integrity, competence, respect for people's dignity, social responsibility, concern for other's welfare (Edwards & Skinner, 2009, p. 62), free and informed consent, the right to anonymity, and the right to confidentiality (Sarantakos, 2005, p. 18). Interviews are recognised as interventions with the potential to affect people (Patton, 2002, p. 405), and accordingly ethical protections of the participants were used. One key measure for protecting the MASS organisations and their managers who were interviewed for the study was anonymity (Sarantakos, 2005, p. 21). These organisations and managers were offered the opportunity to participate anonymously because it was anticipated that potentially sensitive information would be discussed in the interviews. In this context, in order to strike a balance between obtaining data that could answer the research questions, and protecting the participants from harm (Patton, 2002, p. 415), anonymity was offered to participants, and accepted in all instances. As a result, the participants are not identified in this thesis. To protect their identity, these organisations are instead referred to by their codenames devised by the researcher such as "Organisation A", "Organisation B", and "Organisation C", and so on. Similarly, the managers who were interviewed for the study are referred to by their alphanumeric codenames devised by the researcher such as "Manager A1", "Manager A2", "Manager B1", "Manager B2", and so on. A second key measure for protecting the participants from harm was to ensure confidentiality (Sarantakos, 2005, p. 21) so that stored interview data could not be linked to any participants.

A *"case study protocol"* was used to guide data collection from each case. A case study protocol contains the "instrument" for collecting data and the "procedures and general rules" for collecting data, and so is essential, especially for multiple-case study designs (Yin, 2009, p. 79). Yin advocates

the use of a protocol as it guides data collection from each case, a major way of "increasing the reliability of case study research", and forces the researcher to anticipate problems. As advocated by Yin (2009, p. 81), the protocol had four sections including: an overview of the study; field procedures; case study questions, and; a guide for the case study report (for the protocol used for the study, see Appendix 4 of this thesis). The protocol contained the Schedule of Case Study Questions, which guided the focused interviews and, as advocated by Yin (2009, p. 87), distinguished clearly between different "levels of questions": those at Level One asked of specific interviewees, and; those at Level Two asked of each individual case although with the greatest emphasis on those at Level Two. The schedule was divided into six different sections: (1) the interview opening; (2) the organisation's understanding of climate change (sensemaking/interpreting); (3) the stadium and climate change; (4) organisational implications of climate change; (5) action (organisational responses), and; (6) the interview ending. The framing of the questions in Sections Two to Five of the schedule was guided by the literature pertaining to climate change and organisations.

Data analysis

Cepeda & Martin (2005, p. 859) note that analysis is an "iterative, ongoing task", and so as indicated earlier in this chapter, data analysis overlapped with data collection and began during the period of the interviews. Yin (2011, pp. 177-179) asserts that for qualitative research, there are five phases of data analysis: (1) compiling data into a database; (2) disassembling data into smaller fragments; (3) reassembling data into themes; (4) interpreting the data themes that have emerged and creating a narrative, and; (5) concluding, which involves drawing conclusions for an entire study. Yin's five-phase approach was adopted for this study and so data analysis began with the compiling of data into a database comprising interview transcripts, field notes, and documents obtained from each MASS organisation. The *disassembling phase* of data analysis, known as "data reduction" by Miles & Huberman (1994, pp. 10-11) and Edwards & Skinner (2009, p. 132),was done in two parts for this study: (1) familiarisation with the raw interview data by listening to the tapes, reading the transcripts and reflecting upon my notes, and; (2) coding.

The disassembling phase of data analysis continued with coding, the process of tagging or labelling "chunks" of similar information collected during a study with meanings (Bazeley, 2007, p. 66; Miles & Huberman, 1994, p. 56), and a central task of most qualitative research (Gibbs, 2002, p. 57; Richards, 2005, p. 85). Miles & Huberman (1994) argue that "coding is analysis" (p. 56) as codes can be used to retrieve and organize data in meaningful ways. Coding also allows for conceptualisation of data and such "recontextualisation" is also important in helping with theorising (Bazeley, 2007, p. 66). The first level of coding was "open" (C. Hahn, 2008, pp. 6-8; Yin, 2011, p. 187) or "descriptive" (Miles & Huberman, 1994, p. 57) in nature whereby segments of interview text were coded to the concepts present in the literature review and, my initial conceptual framework. Examples of these

concepts that were translated into descriptive codes include the stadium, sensemaking, vulnerability, resilience, mitigation, adaptation, resources, stakeholders, and strategy. Once completed, the more interpretive process of topic coding (Richards & Morse, 2007, p. 139) was used to assign the descriptive codes to patterns that had emerged from the data. The two key topics that emerged from the data were: (1) methods of organisational responses to climate change, and; (2) reasoning, that respectively corresponded to the how and why research questions of this study. Analytic coding (Richards & Morse, 2007, p. 141), also known as second level coding (C. Hahn, 2008; Yin, 2011), was then used to refine the data further by developing concepts in which each of the descriptive and topic codes were assigned to[31]. All three forms of coding were a precursor to the identification of themes in the data, and were assisted by the use of computer-aided data analysis (Sarantakos, 2005, p. 357) software in the form of NVivo – Version 9.

The next step for disassembling the data was "data display" (Miles & Huberman, 1994, p. 11). As advocated by Miles & Huberman (1994) and Edwards & Skinner (2009), displaying data in a visual form such as tables, matrices or graphs, is a part of analysis, and enables the researcher to systematically draw conclusions from the data. Data from the interview transcripts was displayed in table form to enable an analysis of what it meant. Disassembling the data then continued with cross-case analysis (Bazeley, 2007, p. 186; Eisenhardt, 1989b, p. 540). Cross-case/multiple-case analysis increases generalisability and offers deeper understanding, more "sophisticated" description, and "more powerful" explanation by allowing the researcher to see how "local" conditions shape processes and outcomes evident in single cases (Bazeley, 2007, p. 186; Miles & Huberman, 1994, p. 173). It therefore strengthens theory development (Bazeley, 2007, p. 186; Miles & Huberman, 1994, p. 173) with "negative cases" useful for this purpose (Miles & Huberman, 1994). As advocated by Miles & Huberman (1994) and Bazeley (2007), cross-case analysis was approached in two ways: first, "case-oriented analysis", where the complexity of case was retained during comparison, and then with "variable-oriented analysis", where groups of cases were based on common codes. Both approaches were carried out with the assistance of NVivo matrix coding queries (Bazeley, 2007, p. 143; Gibbs, 2002, p. 188).

The disassembling phase of data analysis for this study continued with content analysis (D. P. S. Andrew et al., 2011, pp. 119-122; Liamputtong & Ezzy, 2005, pp. 259-260) of the available MASS organisation documents. Content analysis is widely used in sport management research (D. P. S. Andrew et al., 2011, p. 119) and so was deemed an appropriate method for the documents obtained from the MASS organisations for this study. As previously mentioned, these documents consisted mainly of annual reports, but also of a very limited number of internal documents plus material from

[31] Examples of key conceptual categories that emerged during this analysis include energy management, water management, waste management, resource impediments, change agents, and stakeholder influence.

organisation websites. Content analysis requires explicit rules called criteria of selection that included: (1) developing categories prior to searching for them in the data; (2) selecting the sample to be categorised, and; (3) systematically recording the number of times the categories occurred (Berg, 1989, p. 106; Liamputtong & Ezzy, 2005, p. 260). In this study, the categories developed prior to searching for them in the data were codes based on the key concepts evident in the initial conceptual framework. Additionally, the sample of organisation documents was identified, and where appropriate, segments of document text were allocated to the same codes used for the interview data. If new categories emerged during this process, then new codes were added.

The *reassembling phase* of data analysis for this study began with the development of a thematic framework consisting of all the key themes and concepts that were emerging from the data codes. As advocated by Edwards & Skinner (2009, p. 133), the thematic framework then enabled the production of a comprehensive coding index for systematically indexing the interview data with the codes. Themes were identified where, as advocated by Braun & Clarke (2006, p. 82): (1) something in the data was important to the research questions, and; (2) represented some level of pattern. In this way, the themes were strongly linked to the data (Patton, 2002) in an inductive/bottom up manner. At this stage, links were made between coded data, and the principal research questions, particularly *how*, and *why* are organisations managing MASS responding to climate change? As advocated by Miles & Huberman (1994, p. 11), results are to be presented in table form in the next chapter.

The reassembling phase of data analysis continued with the development of a descriptive case narrative (Yin, 2009, p. 171) of each MASS case from the interview data. This was a starting point for writing each case study. Furthermore, developing case narratives of each MASS case enabled "within-case analysis" (Bazeley, 2007, p. 185; Eisenhardt, 1989b, p. 540) to occur and was aimed at developing a basic understanding of each organisation – to answer the question – "what is going on here" – before making claims about them. Each case summary included: a description of the ownership, governance and management structures for the MASS managed by each case organisation; a description of the sports or other entertainment activities offered at each MASS; a description of how the organisation made sense of climate change, description of each stadium's vulnerability or resilience to climate change; a description of their energy use and/or GHG emissions and any reporting of these to government, and; a description of issues posed by climate change and the organisation's responses to each issue.

Yin's interpreting phase of data analysis corresponds to the fourth stage of the research cycle identified by Cepeda & Martin – "critical analysis" (reflection). For this study, critical analysis was an ongoing and iterative process where the emerging themes and findings (i.e. outcomes) from the data analysis were interpreted (reflected upon). As advocated by Miles & Huberman (1994, p. 57),

explanations for these themes were sought. Data that either supported or contradicted these themes and findings was sought. As the findings were not theory by themselves, I tried to look beyond the data and findings to see what implications they held for building a theory of how and why MASS organisations respond to climate change. The conceptual framework was updated with new insights and interpretations as they emerged. As the framework was challenged, confirmed or revised, each research cycle concluded and the next one began.

The next and final stage of the reflection process was a "conscious" process of seeking to build theory by interpreting the study's findings and the evolving conceptual framework. As advocated by Cepeda & Martin (2005, p. 861), this reflection involved interrogating the findings with the following questions: (1) What do these findings mean? (2) What are the alternative explanations for these findings? (3) What disconfirming evidence is there for these explanations? (4) How do these findings relate to the insights gained from the previous research cycle? As these questions were answered, "expert" views of the emergent theory were sought from my two research supervisors in order to enhance its credibility.

The final stage of the theory building process was, as suggested by Cepeda & Martin (2005, pp. 861-862), a "literature-based scrutiny of the developed theory." When I concluded that theoretical saturation had been reached, the most recent iteration of the conceptual framework was compared with extant literature to determine two issues. First, to what extent was there agreement between the findings and the extant literature? Second, to what extent was there conflict between the findings and the extant literature? Where similar findings in different contexts were identified, the theory developed in this study was strengthened. Where there was disagreement between the findings and the extant literature, explanations that accounted for the differences were sought.

Bias, validity and reliability – criteria for evaluating research quality

Bias is an issue for researchers (Patton, 2002; Sarantakos, 2005), including case study researchers (Yin, 2009, p. 72). Potential sources of bias include the research topic, literature review, research design, data presentation, data analysis (Sarantakos, 2005, p. 14) and, analytic bias (Miles & Huberman, 1994, p. 263). Eisenhardt & Graebner (2007, p. 28) also recognise that bias is an issue for researchers building theory from cases, and so for this study controls for guarding against bias were used. The three methods used in this study to manage potential researcher bias were: (1) "numerous and highly knowledgeable informants who view the focal phenomena from diverse perspectives", as advocated by Eisenhardt & Graebner (2007, p. 28); (2) data triangulation, and; (3) cross-case analysis.

Validity and *reliability* are key aspects of quality control in case study research design (D. P. S. Andrew et al., 2011, p. 139; Cepeda & Martin, 2005, p. 862). Validity is an attribute of knowledge,

not methods (Patton, 2002, p. 587), and is "integral" to qualitative research (Sarantakos, 2005). So for this study I applied different techniques to establish the validity of the knowledge claims made in the results and discussion chapters of this thesis. More specifically, Andrew et al. (2011) support Yin's assertion that the credibility or trustworthiness of a case study can be evaluated according to four key criteria: construct validity, internal validity, external validity and reliability. *Construct validity* – the process of "identifying correct operational measures for the concepts being studied" (Yin, 2009, p. 40) – was, where possible, – assisted by *data triangulation* whereby claims made in the interviews were corroborated through the analysis of documents and my observations, because multiple sources of evidence provide multiple measures of each construct. As suggested by Miles & Huberman (1994, p. 267), a "matrix of findings" was used to check for consistencies and contradictions evident between these three types of data. Internal validity is a concern for explanatory case studies (Yin, 2009, p. 42), such as those used in this study, and was addressed by recording the rationale for each update of my conceptual framework which, as Cepeda & Martin (2005, p. 860) argue, provides "internal validation of the findings." *External validity*, the degree to which the generalisability can be extended to other study populations, was enhanced through three measures: (1) the multiple case design (Miles & Huberman, 1994, p. 173) that provided sufficient replications for each of the sampling categories; (2) "thick descriptions" in the form of each case study narrative that provided sufficient detail, "for readers to assess the potential transferability appropriateness for their own settings" (Cepeda & Martin, 2005, p. 855; Miles & Huberman, 1994, p. 279), and; (3) cross-case analysis (Bazeley, 2007, p. 186; Eisenhardt, 1989b, p. 540).

To ensure the consistency or *reliability* of the data, as mentioned earlier in this chapter, a key instrument was the Case Study protocol (see Appendix 4) where consistent questions were asked of participants. However, as advocated by Miles & Huberman (1994, p. 278) other measures for ensuring reliability were to: (1) check that the data sampling, collection and analysis features of the research design were congruent with the research questions; (2) specify the research paradigm (constructivist and interpretivist) for the study; (3) the use of a "coding check" to verify whether they showed adequate agreement, and where practicable; (4) peer review though discussions with my research supervisors.

Conclusion

In this chapter, the paradigmatic, epistemological and ontological choices of the researcher that informed the choices of methodology and method applied in the study were discussed. Additionally, the qualitative methodology and case study method were explained in detail, including sampling, data collection, analysis and the four stage method for theory building. Importantly, the rationale for the choice of theory building design rather than theory testing one was made clear as were the alternative approaches to inductive inquiry that were contemplated. Of equal importance, the measures adopted

for ensuring the validity and reliability of the data and findings were also discussed. The organisations managing major Australian sport stadia were also described, their sectoral significance, and their industrial context was discussed. Furthermore, guidance was also provided to the reader as to how the case studies might be understood. This chapter therefore serves as a basis for understanding the results and findings of the study that are reported in the next part of Section C of this thesis, Chapter Five.

Chapter Five: The results

"...we have got a hundred priorities. Is [climate change] number one? No, but it is seen as a legitimate issue for us to be across at all levels".

(Quote from Case B, interviewee B1, p. 2)

"[Climate change] is a high priority".

(Quote from Case E, interviewee E1, p. 6)

"[The] major issue for us is we're still reliant on rainfall".

(Quote from Case J, interviewee J1, p. 6)

Introduction

This chapter is an account of my Ph.D. research. It builds upon the reviews of literature in Chapters Two and Three, and upon Chapter Four where the research design was explained in detail. There are three key aims for this chapter: first, to address the research questions by presenting the results that emerged from the data collected for this study; second, to articulate the evidentiary basis for the theory building from case studies proposed in Chapter Four, and; third, to present key findings about the results that will be discussed in Chapter Six. These results address Research Question 1: "*What*, if any, issues are posed by climate change for major Australian sport stadia (MASS) and the organisations that manage them?" These results also address Research Question 2: "*How* are the organisations that manage MASS responding to climate change?", and; Research Question 3: "*Why* are the organisations that manage MASS responding to climate change in the way they do?"

In this chapter, the results of cross-case analysis are divided into the key themes that emerged from the data. After completing the coding process, seven major themes were evident. These were: (1) how the MASS organisations perceived (made sense of) climate change; (2) climate change issues for each organisation; (3) how and why the organisations responded to climate change; (4) barriers to effective responses to climate change; (5) influences on MASS case responses to climate change; (6) the role of individual manager agency in explaining how and why MASS organisations respond to climate change, and; (7) relevance of theoretical categories to climate impacts, and responses to, climate change. Within each of these themes, several sub-themes were identified and these will be discussed in this chapter. A range of documents that were relevant to this study were also examined and their relationship to the interview data will also be discussed. However, before presenting those results in a thematic fashion, this chapter now turns to the results for each of the twelve case MASS cases derived from *within-case analysis*.

The case studies: results reported using within-case analysis

As outlined in Chapter Four of this thesis, each of the MASS organisation cases was chosen for theoretical reasons. The cases conformed to one of three theoretical categories: for theoretical Category 1 (publically-owned, not-for-profit), there were five cases (replications); for theoretical Category 2 (privately-owned, not-for-profit), there were four cases/replications; and for theoretical Category 3 (privately-owned, for-profit), there were three cases/replications. However, in order for the reader to have a deeper understanding of each of these cases, summaries of the within-case analysis have been prepared. The following cases, derived from within-case analysis, identify the following features:

- the theoretical category in which each case fits;
- the basic organisational purpose of each case;
- the number of MASS venues owned and/or operated by each case;
- their core product/service;
- the types of sports offered at each of their MASS venues;
- a brief description of their governance structure;
- a brief description of their management structure and;
- key interpretations, issues and responses.

These cases have two main sections. The first section of each case is largely *descriptive*; that is, it describes the broad features of the organisation. The second section of each case is largely *interpretive*; that is, it outlines how they made sense of climate change, what the climate change issues are, and interprets the climate change responses of that organisation. An overview of the twelve cases is provided in Table 7 below.

Table 7: Overview of MASS organisations investigated (the cases)

THEORETICAL CATEGORIES	MASS ORGANISATION (CASE)	TYPES OF MASS ORGANISATION	NO. OF MASS OWNED[32]	NO. OF MASS MANAGED
Category 1 – Publically-owned, not-for-profit	Case A	Government-owned statutory authority	5[33]	3
	Case D	Government-owned statutory authority	2	2
	Case E	Government-owned statutory authority	1	1
	Case I	Government-owned statutory authority	1	1
	Case J	Local government	1	1
Category 2 – Privately-owned, not-for-profit	Case B	Not-for-profit governing body	0	1
	Case G	Not-for-profit governing body	1	1
	Case H	Not-for-profit governing body	1	1
	Case K	Not-for-profit, membership-based club	0	1
Category 3 – Privately-owned, for-profit	Case C	Privately-owned for-profit company	0	1
	Case F	Privately-owned for-profit company	1	1
	Case L	Privately-owned for-profit company	0	1
TOTALS	**12**	**5**	**13**	**15**

Case A

Case A is a statutory authority established and owned by government to manage a number of major sport venues. It therefore fits into theoretical Category 1 (*Publically-owned, not-for-profit*). Case A manages five stadia that may be described as MASS. The core product or service of the organisation is to provide sporting facilities that offer elite-level sport (A1, p. 6). The full range of venues managed by Case A offer international, national and state level sporting competitions for a range of sports including Australian rules football, cricket, soccer, rugby league, rugby union, swimming, tennis and athletics. Some of these facilities are also used for non-sport entertainment activities. The organisation has a board of directors responsible for overall corporate governance, including strategic direction which is defined by the relevant act of parliament, and who report to the relevant government minister. Reporting to the board is the Chief Executive who oversees the implementation of strategic direction, the day-to-day management of the organisation, and all staff including a number of senior executives called General Managers. A key feature of the management of the organisation is the requirement to manage all venues on a "commercial" basis, with all venues expected to be cost-neutral to government but preferably able to operate at a profit.

[32] Not every stadium was owned and managed by the same organisation. While most MASS were both owned and managed by the same organisation (case), some MASS were owned by a separate organisation that was typically a publically-owned, not-for-profit organisation.
[33] Case A own five stadia that meet this study's definition of MASS, but they manage only three of these. Case A incorporates data referring to only four of the five stadia that they own. After examining five "Category 1 – Publically-owned, not-for-profit" MASS organisations (Cases A, D, E, I and J), it was decided that it was unnecessary to obtain data about Case A's fifth stadium. This was because, with no new themes emerging after analysis of five Category 1 MASS organisations, the researcher felt theoretical saturation had already been reached.

The organisation manages five venues that meet the definition of MASS. Construction, or significant redevelopment, of these major stadia was completed between 2003 and 2011. Each stadium has a Venue/Stadium Manager, who collectively report to the relevant General Manager of the organisation. Each Venue Manager then oversees the operation of the venue on behalf of Case A. The organisation, however, has two different approaches to management structures for MASS venues: the first is an internal one where Case A own and operate three MASS themselves; the second approach involves contracting two external organisations – one a privately-owned, for-profit company, and the second a member-owned, not-for-profit organisation – to manage one MASS each. In the two cases that are managed externally, Case A is still the owner of each venue. In these latter cases, the management organisations have close working relationships with Case A.

Key interpretations, climate change issues and responses for Case A:

In terms of how they made sense of climate change, Case A accepted the basic science of climate change and had a reasonable grasp of its primary anthropogenic causation and consequences for Australia. Media coverage of climate change was the major source of information shaping how they understood it. Case A was aware of basic elements of climate change such as greenhouse gas (GHG) emissions and mitigation, and where possible, the need to mitigate them. They also reported having discussed it as a management issue although it was largely seen as a question of costs associated with three key climate change issues: water, energy and waste. As a result, whilst they believed it important to act as good corporate citizens, their primary motivation for addressing these issues was to reduce the financial costs associated with them. Case A also felt its stadia were largely resilient to the impacts of climate change although some vulnerability was reported in relation to lower rainfall.

For climate change responses, they occurred within existing strategic plans, and were mainly aligned with the major issues of water, energy and waste. As a consequence, Case A reported investment in water management infrastructure, improvements in energy efficiency, and a waste recycling program. Case A is a large user of electrical energy for activities such as stadium lighting, air-conditioning, information technology, and mobile lighting rigs to help grow grass on the stadium playing surfaces. However, they did not have a formal climate change strategy. Interestingly, Case A was one of only two MASS cases whose aggregate energy use was sufficient to meet the reporting threshold for the *NGER Act* indicating that they were large energy users. Whilst the influence of a corporate social responsibility (CSR) ethos was evident in their comments, a key influence of their understanding of, and responses to, climate change was their state government stakeholder. As a statutory authority, government policy and legislation was a critical influence on their activities and attitudes. For

example, they saw themselves as being able to take a "leadership"[34] role in displaying responsible corporate behaviour in relation to climate change. By "leadership", Case A appeared to be referring mainly to responsible use of energy and water resources at their stadia that would set an example to other public and private sector organisations. Another key influence on their responses was the attitude to climate change of senior staff. The key barrier for Case A to effective responses to climate change was the lack of financial resources. With regard to climate change adaptation, in terms of Berkhout et al. (2006), they were cautiously *"bearing and managing risks"*.

Case B

Case B is a not-for-profit corporation that acts as a State Sporting Association (SSA), a governing body for its sport, and is an operator, but not owner, of a single MASS. It therefore fits into theoretical Category 2 (*Privately-owned, not-for-profit*). The venue managed by Case B offers international, national and state level Australian Rules football, rugby union, and occasional non-sport entertainment activities. Their site has been a football and cricket venue for over 100 years although the stadium was not completed until the mid-1990s. As a sport governing-body, the organisation is principally responsible for the promotion and development of its sport within its particular region, and is led for this purpose by a board of volunteer directors responsible for overall corporate governance of the organisation, including strategic direction. However, the management of its MASS is delegated to it by the relevant government who is the actual owner of the stadium. Reporting to the board is the Chief Executive Officer who oversees the implementation of strategic direction, the day-to-day management of the organisation, and all staff including a number of senior executives called directors.

The organisation manages its MASS on a "commercial" basis, with the venue expected to operate at an annual profit which is then reinvested in the stadium for its ongoing improvement, with any remaining surplus variously used to promote and develop its sport, and distributed between its stakeholder clubs and associations. It is worth noting that over 80 per cent of Case B's revenue is derived from the operating surplus of this stadium. This MASS then has a critical and strategic role in funding the promotion and development of the sport which Case B represents. The stadium itself has a Venue Manager responsible for operational management, and who reports to Director for Facilities and Planning.

Key interpretations, climate change issues and responses for Case B:

In terms of how they made sense of climate change, Case B accepted the basic science of climate change and had a reasonable grasp of its primary anthropogenic causation and consequences for Australia. State and local government's information on climate change were the major sources of

[34] The word "leadership" was used by Interviewee A1 about Case A, and was not defined further (interviews often are time-constrained, and this particularly applied for Interviewee A1).

information shaping how they understood it. Case B was aware of basic elements of climate change such as GHG emissions, and where possible, the need to mitigate them. They also discussed it as a management issue although they too largely saw it as a question of costs associated with three key climate change issues: water, energy and waste. As a result, whilst they too believed it important to act as good corporate citizens, their primary motivation for addressing these issues was to reduce the financial costs associated with them. Case B also felt its stadium was largely resilient to the impacts of climate change although some vulnerability was reported in relation to lower rainfall and rising energy prices.

For climate change responses, they occurred within existing strategic plans, and were mainly aligned with the major issues of water, energy and waste. As a consequence, it reported investment in water management infrastructure, improvements in energy efficiency, and a waste recycling program. Case B was one of the ten MASS cases whose aggregate energy use was not sufficient to meet the reporting threshold for the *NGER Act* indicating that they were not the largest energy users among MASS cases. Nevertheless, Case B is a large user of electrical energy for activities such as stadium lighting, air-conditioning, and information technology. Interestingly, they were the only MASS case to have a formal climate change adaptation strategy although it was not limited to their stadium. The CSR ethos was also evident in their comments although they too reported that government was a key influence of their understanding of, and responses to, climate change. Another key influence on their responses was the attitude to climate change of senior staff, especially the Director for Facilities & Planning who initiated energy efficiency improvements and climate change-specific planning. The key barrier for Case B to effective responses to climate change was also a lack of financial resources. Expressed in terms of Berkhout et al. (2006), they were *"bearing and managing risks"*, plus a *"risk assessment and options appraisal"* adaptation strategy. Overall, Case B was one of the more sophisticated examples from this study of *playing the carbon game*.

Case C

Case C is a *privately-owned, for-profit company* (theoretical Category 3) acting as a leasee-operator, but not owner, of a single MASS. The organisation is a wholly-owned subsidiary of another private company that is itself owned by another Australian Stock Exchange-listed company. The stadium offers international and national level Australian Rules football, international rugby union, international, state and national-level rugby league, national-level cricket, international-level soccer, and occasional non-sport entertainment activities. Four of these five sports have clubs that act as major tenants of the stadium. Their stadium was completed in the late 1990s but redeveloped in the early 2000s. Case C is led by professional board directors responsible for overall corporate governance of the organisation, including strategic direction. However, the management of its MASS is delegated to it by the relevant government through a government-owned statutory authority who is

the legal owner of the stadium. Reporting to the board is the Chief Executive Officer who oversees the implementation of strategic direction, the day-to-day management of the organisation, and all staff including a number of senior executives called General Managers. The organisation manages its MASS on a for-profit basis with annual operating profits distributed back to its shareholders as dividends. The stadium's response to climate change is led by its General Manager, Asset Management, who reports to the Chief Executive.

Key interpretations, climate change issues and responses for Case C:

In terms of how they made sense of climate change, Case C accepted the basic science of climate change and had a good grasp of its primary anthropogenic causation and consequences for Australia. Media coverage of climate change was the major source of information shaping how they understood it. Case C was aware of basic elements of climate change such as GHG emissions, and where possible, the need to mitigate them. They also discussed it as a management issue although they too largely saw it as a question of costs associated with three key climate change issues: water, energy and waste. As a result, whilst they too believed it important to act as good corporate citizens, their primary motivation for addressing these issues was to reduce the financial costs associated with them. Case C also felt its stadium was largely resilient to the impacts of climate change although some vulnerability was reported in relation to lower rainfall.

For climate change responses, they occurred within existing strategic plans, and were mainly aligned with the major issues of water, energy and waste. As a consequence, it too reported investment in water management infrastructure, improvements in energy efficiency, and a waste recycling program. Case C was a large user of electrical energy for activities such as stadium lighting, air-conditioning, information technology, and the use of mobile lighting rigs to help grow grass on the stadium playing surface. However, like all other MASS cases, they did not have a formal climate change strategy. Case C was one of the ten MASS cases whose aggregate energy use was not sufficient to meet the reporting threshold for the *NGER Act* indicating that they were not the largest energy users among MASS cases either. The CSR ethos was also evident in their comments although they too reported that government was the key influence of their responses to climate change. Another key influence on their responses was the attitude to climate change of senior staff, especially the General Manager for Asset Management who regarded climate change as a *"high priority."* They were particularly concerned about their reputation for being *"socially responsible"* and had been able to attract some events on the basis of the good environmental management. However, the key barrier for Case C to effective responses to climate change was also a lack of financial resources. With regard to climate change adaptation, in terms of Berkhout et al. (2006), they were cautiously *"bearing and managing risks."*

Case D

Case D is a government-owned, statutory authority, and as such, it therefore fits into theoretical Category 1 (*publically-owned, not-for-profit*) established by government to manage three major sport and entertainment venues, two of which may be regarded as MASS. Case D's first major stadium is a venue for national level Australian Rules football, international, national-level cricket, and occasional non-sport entertainment activities. This stadium has two major tenants, one each representing different aspects of Australian Rules football and cricket. While the site of this stadium has been a football and cricket venue for over 100 years, the most recent redevelopment of this stadium was not completed until 2014. Case D's second major stadium offers international, national and state level rugby league, international rugby union, international and national-level soccer, and occasional non-sport entertainment activities. Construction of this second stadium was completed in the late 1980s. A single Manager (Venue & Asset Management) is responsible for the operational management of the two stadiums who in turn reports to the General Manager, Properties. Case D is led by volunteer board directors, appointed by the responsible government minister.

The board is responsible for overall corporate governance of the organisation, including strategic direction that is consistent with the relevant act of parliament under which Case D is established. Reporting to the board is the Chief Executive Officer who oversees the implementation of strategic direction, the day-to-day management of the organisation, and all staff including a number of senior executives called General Managers. A key feature of the management of the organisation is the requirement to manage all of its venues on a "commercial" basis, with all venues expected to be cost-neutral to government but preferably able to operate at a profit. Any profits however are reinvested in the stadium and not to shareholders. The stadium's response to climate change is principally overseen by its "General Manager, Properties", who reports to the Chief Executive.

Key interpretations, climate change issues and responses for Case D:

In terms of how they made sense of climate change, Case D accepted the basic science of climate change and had a basic grasp of its primary anthropogenic causation and consequences for Australia. Management consultants were the major source of information shaping how Case D understood it, although they did not have a formal corporate view. Case D was aware of basic elements of climate change such as GHG emissions, and where possible, the need to mitigate them. However, they had not discussed it at management level or governance level – instead, they talked about *"sustainability"*. They too largely saw climate change as a question of costs associated with three key climate change issues: water, energy and waste. As a result, whilst they too believed it important to act as good corporate citizens, their primary motivation for addressing these issues was to reduce the

financial costs associated with them. Case D also felt its stadium was largely resilient to the impacts of climate change although some vulnerability was reported in relation to lower rainfall.

For climate change responses, they occurred within existing strategic plans, and were mainly aligned with the major issues of water, energy and waste. As a consequence, it too reported investment in water management infrastructure, improvements in energy efficiency, and a waste recycling program. Case D was one of the ten MASS cases whose aggregate energy use was not sufficient to meet the reporting threshold for the *NGER Act* indicating that they were not the largest energy users among MASS cases either. Nevertheless, electrical energy use at Case D includes stadium lighting, services such as air-conditioning and information technology, and the use of electric-powered mobile lighting rigs to help grow grass on the stadium playing surfaces – an activity that uses large amounts of electrical energy. However, whilst they had a *Sustainability Plan* and an *Asset Management Plan* and had fulfilled their statutory responsibility to report their water and energy efficiency, they did not have a formal climate change strategy. The CSR ethos was also evident in their comments although they too reported that government was the key influence of their responses to climate change. While senior staff took their environmental management responsibilities very seriously, climate change did not appear to figure prominently in their thinking. Nevertheless, they were very mindful of being a *"good corporate citizen."* However, the key barrier for Case D to effective responses to climate change was also a lack of financial resources. With regard to climate change adaptation, in terms of Berkhout et al. (2006), they were cautiously *"bearing and managing risks."*

Case E

Case E is a not-for-profit, membership-based club (theoretical Category 2 – *privately-owned, not-for-profit*) that has been delegated the responsibility for managing its stadium by a state government through a government-appointed corporation. The corporation oversees the governance, management and development of the stadium on behalf of its owner, a government. The MASS managed by Case E offers international and national-level Australian Rules football, international and national-level cricket, international rugby union, national-level rugby league, international soccer, and out-of-season non-sport entertainment activities. While the site of this stadium has been a football and cricket venue for over 100 years, the most recent redevelopment of this stadium was not completed until the mid-2000s. Case E is led by a committee that is appointed by the directors of the corporation through which management of the stadium is delegated by government. The Committee, the equivalent of a board of directors, oversees a team of professional managers, and is responsible for the overall corporate governance of the organisation, including strategic direction that is consistent with the relevant act of parliament. Reporting to the Committee is the Chief Executive Officer who oversees the implementation of strategic direction, the day-to-day management of the organisation, and all staff including a number of senior executives called General Managers. Whilst Case E is a not-for-profit

organisation, like other organisations managing MASS, it manages its stadium on a "commercial" basis with the venue expected to operate at a profit. Any profits however are reinvested in the stadium and not to shareholders.

Key interpretations, climate change issues and responses for Case E:

In terms of how they made sense of climate change, Case E was the most sophisticated in its understanding. They accepted the basic science of climate change and had a good grasp of its primary anthropogenic causation and consequences for Australia. Media coverage of climate change was only a minor source of information shaping how they understood it with the Australian Department of Climate change & Energy Efficiency and peer-reviewed journal articles about climate science being the strongest influences. Case E was aware of basic elements of climate change such as GHG emissions and mitigation, and where possible, the need to mitigate them. They also reported having discussed it as a management issue, although it was also seen as an opportunity to reduce costs associated with three key climate change issues: water, energy and waste. As a result, they strongly believed it important to act as good *"corporate citizens."* Nevertheless, addressing climate change issues had a strong financial dimension to it and they were concerned about costs associated with climate change such as increased energy costs and their carbon tax liability. Case E also felt its stadia were largely resilient to the impacts of climate change although some vulnerability was reported in relation to lower rainfall, and in particular the playing surface.

For climate change responses, they occurred within existing strategic plans, and were mainly aligned with the major issues of water, energy and waste. As a consequence, it reported investment in water management infrastructure, improvements in energy efficiency, and a waste recycling program. While they did not have a formal climate change strategy, they were the most advanced in terms of their thinking about climate change. They were the only organisation to have quantified the impact of the carbon tax (CT) – and did so before it was introduced. Their analysis of its impact was so sophisticated, they were able to express their expected CT liability in annual dollar terms (*"At $20 a tonne, it would cost us about $600,000 a year"*). This was because Case E was one of only two MASS cases whose aggregate energy use was sufficient to meet the reporting threshold for the *NGER Act* indicating that they were large energy users. This was in part because, in addition to stadium lighting and other electrical services such as air-conditioning and information technology, they use electric-powered mobile lighting rigs to help grow grass on the stadium playing surface – an activity that uses large amounts of electrical energy. Whilst reducing costs was a very important factor informing their "business case" for addressing climate change, it was not the only one. The influence of a corporate social responsibility (CSR) ethos was also very evident in their comments. They felt they owed a *"responsibility"* to *"do the right thing"* for the *"community"* in which they operate.

However, government policy and legislation were critical influences on their activities and attitudes.[35] Another key influence on their responses was the attitude to climate change of senior staff. Their Executive Manager of Turf Development and Environment was critical to conceiving and implementing strategies for addressing climate change issues. Among these was a multi-million dollar investment in water management infrastructure. Nevertheless, the key barrier for Case E to effective responses to climate change was still the lack of financial resources. With regard to climate change adaptation, in terms of Berkhout et al. (2006), they were employing both *"bearing and managing risks", "risk assessment and options appraisal"* adaptation strategies. Overall, Case E is the most sophisticated example of *playing the carbon game.*

Case F

Case F is a privately-owned, for-profit corporation (theoretical Category 3 – *privately-owned, for-profit*) that owns its stadium, and manages it on behalf of its shareholders. The MASS managed by Case F offers international and national-level Australian Rules football, international and national-level cricket, international rugby union, national-level rugby league, international and national-level soccer, and out-of-season non-sport entertainment activities. Construction of this stadium was completed in the early-2000s. Case F is led by the Board of Directors that are appointed by shareholders. The Board of Directors oversees a team of professional managers, and is responsible for the overall corporate governance of the organisation, including strategic direction. Reporting to the Board of Directors is the Chief Executive Officer who oversees the implementation of strategic direction, the day-to-day management of the organisation, and all staff including a team of senior executives called General Managers. As Case F is a for-profit organisation, it manages its stadium on a "commercial" basis with the venue expected to operate at an annual profit, with profits distributed to shareholders as dividends.

Key interpretations, climate change issues and responses for Case F:

In terms of how they made sense of climate change, Case F accepted the basic science of climate change and had a good grasp of its primary anthropogenic causation and consequences for Australia. Their awareness of climate change first developed during the public debate about it in Australia around 2005. Therefore, media coverage of climate change was a source of information that shaped how they understood it although this was supplemented by consultants, industry conferences, and their own Communications Department. Case F was aware of basic elements of climate change such as GHG emissions, the need to mitigate them and their overall *"carbon footprint."* They also discussed it as a management issue, and were particularly concerned about their reputation for being a

[35] Specifically, these influences were Australian Government policy at the time to introduce a carbon price (tax) and renewable energy target, and legislation such as the *NGER Act* (2007), the *Building Energy Efficiency Disclosure Act* (2010) as well as state government legislation requiring energy and water efficiency.

"green" venue that their market research had indicated was increasingly important to some customers. For example, before the global financial crisis arrived in 2008, they considered introducing an optional ticketing surcharge for customers who wished to offset their GHG emissions associated with the event they were attending. Although the idea was abandoned for financial reasons, it is an indicator of their awareness of public opinion on climate change, and of the market changes it can bring. Another example of the climate change awareness was their decision to purchase carbon offsets for the indirect GHG emissions associated with the extra electricity needed to operate their lighting rigs used to stimulate grass growth on their playing surface. However, they too largely saw it as a question of costs associated with three key climate change issues: water, energy and waste. As a result, whilst they too believed it important to act as good corporate citizens, their primary motivation for addressing these issues was to reduce the financial costs associated with them. Case F also felt its stadium design meant that it was largely resilient to the impacts of climate change.

For climate change responses, they occurred within existing strategic plans, and were mainly aligned with the major issues of water, energy and waste. As a consequence, it too reported major investment in water management infrastructure, as well as improvements in energy efficiency and waste recycling. However, like all other MASS cases, they did not have a formal climate change strategy. Case F was one of the ten MASS cases whose aggregate energy use was not sufficient to meet the reporting threshold for the *NGER Act* indicating that they were not the largest energy users among MASS organisations either. Nevertheless, Case F is a large user of electrical energy for activities such as stadium lighting, air-conditioning, information technology, and mobile lighting rigs to help grow grass on the stadium playing surface. The CSR ethos was also evident in their comments, and they suggested this was for reasons of perceived social obligation – and – to ensure that negative public perceptions of their environmental management were not allowed to develop that have the potential for damaging their competitive situation. Case F regarded climate change as not their highest priority, but not their lowest either. Like other cases, the key barrier for Case F to effective responses to climate change was also a lack of financial resources. With regard to climate change adaptation, in terms of Berkhout et al. (2006), they were cautiously *"bearing and managing risks."*

Case G

Case G is a membership-based, not-for-profit corporation (theoretical Category 2 – *privately-owned, not-for-profit*) that acts as a State Sporting Association (SSA), a governing body for its sport. It is also the owner and manager of its stadium on behalf of its members and stakeholders. The MASS managed by Case G offers international and national-level Australian Rules football, and out-of-season non-sport entertainment activities. The most recent redevelopment of this stadium was not completed until the early-2000s. Case G is led by a board of directors that are appointed by the directors of its key stakeholder organisations. The board oversees a team of professional managers,

and is responsible for the overall corporate governance of the organisation, including strategic direction. Reporting to the Board of Directors is the Chief Executive who oversees the implementation of strategic direction, the day-to-day management of the organisation, and all staff including a team of senior executives called General Managers. Although Case G is a not-for-profit organisation, it manages its stadium on a "commercial" basis with the venue expected to operate at an annual profit, with profits reinvested in the development of stadium, and distributed to key stakeholder organisations as dividends. This MASS therefore plays a strategic role in funding the development of the sport that Case G, as an SSA, represents.

Key interpretations, climate change issues and responses for Case G:

In terms of how they made sense of climate change, Case G's awareness of it was among the least sophisticated. Although they could articulate the basic science of climate change and had a reasonable grasp of its primary anthropogenic causation and consequences for Australia, they had not discussed it as a management issue and had no formal corporate view of it. Media coverage of climate change was the only source of information shaping how they understood it. None of the data collected for Case G indicated that they were aware that their stadium might directly or indirectly be responsible for GHG emissions, or that mitigation might be a potential management strategy. Aside from higher water costs associated with long-term water scarcity in their region, they did not identify any specific climate change issues. Case G felt its stadium was largely resilient to the impacts of climate change although some vulnerability in relation to lower rainfall was *"probably"* true. Essentially, Case G did not "see"/"sense" climate change as an issue for them.

For climate change responses, there were none except to essentially do nothing. As a result, Case G is the best example from of this study of ***not*** *playing the carbon game*. Interestingly, Case G indicated that a lack of resources, a lack of *"man power"*, *"financial capability"*, and *"budget constraints"* was driving this. In other words, they simply did not have the resources to, *"to put our mind to that."* As a consequence, "[climate change] just hasn't got a priority to hit the strategic table." Not surprisingly then, they did not have a formal climate change strategy. To be fair to Case G, they most likely had the most limited financial resources among MASS cases to devote to responding to climate change. They were not aware of the *NGER Act* and so it is unknown whether their aggregate energy use was sufficient to meet the reporting threshold for this legislation. The key barrier for Case G to effective responses to climate change was the lack of resources, especially financial ones. To the extent that they have adapted to climate change, in terms of Berkhout et al. (2006), theirs was both a commercial and technological adaptation within a cautious *"do nothing"/"wait and see"* type of strategy.

Case H

Case H is a membership-based, not-for-profit corporation (theoretical Category 2 – *privately-owned, not-for-profit*) that also acts as a State Sporting Association (SSA), a governing body for its sport. It is also a leasee-manager, but not owner of its stadium. Ownership of this MASS resides with a local government who lease it to Case H. The MASS managed by Case H offers international and national-level Australian Rules football, international and national-level cricket, and out-of-season non-sport entertainment activities. While the site of this stadium has been a football and cricket venue for over 100 years, the most recent redevelopment of this stadium was not completed until 2014. Case H is led by a board of directors that are elected by directors of its key stakeholder organisations. The board oversees a team of professional managers, and is responsible for the overall corporate governance of the organisation, including strategic direction. Reporting to the Board of Directors is the Chief Executive who oversees the implementation of strategic direction, the day-to-day management of the organisation, and all staff including a team of senior executives with various managerial titles. Although Case H is a not-for-profit organisation, it manages its stadium on a "commercial" basis with the venue expected to operate at an annual profit, with profits reinvested in the development of the stadium, and distributed to key stakeholder organisations as dividends. This MASS, like several others examined in this study, therefore plays a strategic role in funding the development of the sport that Case H, as an SSA, represents.

Key interpretations, climate change issues and responses for Case H:

In terms of how they made sense of climate change, Case H accepted the basic science of climate change and had a reasonable grasp of its primary anthropogenic causation and consequences for Australia. Media coverage of climate change was the major source of information shaping how they understood it although local government, a state government environmental agency, and the Venue Managers Association were also reported. Case H was aware of basic elements of climate change such as GHG emissions and mitigation, and where possible, the need to mitigate them. However, they had not discussed it at management level or governance level. Despite this, climate change was largely seen as a question of costs associated with three key climate change issues: water, energy and waste. As a result, whilst they believed it important to act as good corporate citizens, their primary motivation for addressing these issues was to reduce the financial costs associated with them. Case H also felt its stadium was largely resilient to the impacts of climate change although some vulnerability was reported in relation to lower rainfall.

For climate change responses, they occurred within existing strategic plans, and were mainly aligned with the major issues of water, energy and waste. As a consequence, it reported investment in water management infrastructure, improvements in energy efficiency, and a waste recycling program.

However, while they have a *Sustainability Management Plan*, they did not have a formal climate change strategy. Case H was not aware of whether its aggregate energy use was sufficient to meet the reporting threshold for the *NGER Act* although it was aware of this legislation and other venues reporting under it. Nevertheless, Case H is a user of electrical energy for activities such as stadium lighting, air-conditioning, and information technology. Key influences of their understanding of – and responses to – climate change were their perceived obligation of corporate social responsibility (CSR), and the practices of other major sport stadia. Government policy and legislation were not cited as key influences. Interestingly, this case was an example of the role of the agency of individual senior-level managers in shaping an organisational response. Manager H1 decided that climate change was an important issue to the organisation, and personally decided to hire an energy consultant to measure their energy use and GHG emissions. In terms of key barriers to effective responses to climate change, a poor understanding of climate change by board directors, and inadequate stadium design, were cited although - as with other cases - the key barrier was the lack of financial resources. With regard to climate change adaptation, in terms of Berkhout et al. (2006), they were cautiously *"bearing and managing risks."*

Case I

Case I is a not-for-profit, government-owned, statutory authority established by government to manage a number of major sport venues, including but not limited to, one that may be described as a MASS. It therefore fits into theoretical Category 1 (*publically-owned, not-for-profit*). The organisation was established under a specific act of parliament that authorises such stadia management and development activities. Ownership of this MASS resides with a government who delegate management of this venue to Case I. The MASS managed by Case I offers international and national-level rugby league, international and national-level rugby union, international and national-level soccer, and out-of-season non-sport entertainment activities. Construction of this stadium was completed in 2010. Case I is led by a board of directors that are appointed by the relevant Minister of government. The board oversees a team of professional managers, and is responsible for the overall corporate governance of the organisation, including strategic direction that is consistent with the act of parliament under which the organisation was established. Reporting to the Board of Directors is the Chief Executive Officer (CEO) who oversees the implementation of strategic direction, the day-to-day management of the organisation, and all staff including a team of senior executives with various managerial titles. This MASS also has a responsible manager whose title is "Stadium Manager" and who reports to the CEO. Although Case I is a not-for-profit organisation, it manages its stadium on a "commercial" basis with the venue expected to operate at an annual profit, with profits reinvested in the development of stadium, or retained by the organisation for other purposes.

Key interpretations, climate change issues and responses for Case I:

In terms of how they made sense of climate change, Case I accepted the basic science of climate change and had a reasonable grasp of its primary anthropogenic causation and consequences for Australia. Media coverage of climate change was the major source of information shaping how they understood it. Case I was aware of basic elements of climate change such as GHG emissions and mitigation, and where possible, the need to mitigate them. However, they had not discussed climate change within the organisation and so they did not have a formal corporate view of it. As with other cases, it was largely seen as a question of costs associated with three key climate change issues: water, energy and waste. As a result, whilst they believed it important to act as good corporate citizens, their primary motivation for addressing these issues was to reduce the financial costs associated with them. Case I also felt its stadium was likely to be resilient to the impacts of climate change although some vulnerability was reported in relation to lower rainfall.

For climate change responses, they occurred within existing strategic plans, and were mainly aligned with the major issues of water, energy and waste. As a consequence, it reported the stadium design incorporated water management infrastructure, good energy efficiency, and waste recycling equipment. However, they did not have a formal climate change strategy. They were not aware of the *NGER Act* and so it is unknown whether their aggregate energy use was sufficient to meet the reporting threshold for this legislation. Nevertheless, Case I is a user of electrical energy for activities such as stadium lighting, air-conditioning, information technology, and mobile lighting rigs to help grow grass on the stadium playing surface. CSR was not cited as a critical influence although as a not-for-profit, government-owned, statutory authority, they were mindful of their role as *"managers of a public asset"* and to *"provide a service to the communit[y]."* The key barrier for Case I to effective responses to climate change was the lack of financial resources. With regard to climate change adaptation, in terms of Berkhout et al. (2006), they were cautiously *"bearing and managing risks."*

Case J

Case J is a local government, owned by the citizens who live within the municipality which this organisation represents (theoretical Category 1 – *publically-owned, not-for-profit*). The organisation was established in 1993 under an act of state parliament that authorises the existence and operation of local government within that state. The organisation is also the manager/operator of a number of sport venues, only one of which may be regarded as a MASS. The MASS managed by Case J is used for national-level Australian Rules football only, has one major tenant - a professional football club – and a number of smaller tenants. While the site of this stadium has been a football and cricket venue for over 70 years, the most recent redevelopment of this stadium was not completed until 2013. Case J is led by a "Council" of twelve councillors, who each represent the ratepayers of their respective council

areas (wards). An interesting feature of the Council is that they have an approved climate change adaptation strategy, while one of the councillors has a portfolio of responsibility that includes climate change. The Council oversees a team of professional managers, and is responsible for the overall corporate governance of the organisation, including strategic direction that is consistent with the organisation's strategic plan according to which the organisation operates.

Reporting to the Council is the Chief Executive (CE) who oversees the implementation of strategic direction, the day-to-day management of the organisation, and all staff including a team of senior executives known as General Managers (GM). The GM responsible for recreational activities supervises a team of staff responsible for sport and recreation venues within the city, and within this team is the Coordinator of the MASS that Case J owns and operates. Although Case J is a not-for-profit organisation, it manages its stadium on a "commercial" basis with the venue expected to operate at an annual profit, with profits reinvested in the development of the stadium.

Key interpretations, climate change issues and responses for Case J:

In terms of how they made sense of climate change, Case J accepted the basic science of climate change and had a clear understanding of its primary anthropogenic causation and consequences for Australia. Media coverage of climate change was cited as the key source of information – particularly the internet and the Venue Manager's Association – for shaping how they understood it although they did not have a formal corporate view. Case J was aware of basic elements of climate change such as GHG emissions, and where possible, the need to mitigate them. They had also discussed it as a management issue although they too largely saw it as a question of costs associated with three key climate change issues: water, energy and waste. As a result, whilst they too believed it important to act as good corporate citizens, their primary motivation for addressing these issues was to reduce the financial costs associated with them.

For climate change responses, they occurred within existing strategic plans, and were mainly aligned with the major issues of water, energy and waste, but particularly water. As a consequence, it reported major investment in water management infrastructure in particular, but also some improvements in energy efficiency, and waste recycling. After the extended drought culminating in the mid-2000's, they adopted an *"aggressive"* approach to water management centred on water harvesting and recycling but also the use of drought-tolerant grass types for their playing surface. As a result, Case J now felt its stadium was reasonably resilient to the impacts of climate change although some vulnerability to lower rainfall was an ongoing concern. Prior to these measures though, it felt *"absolutely"* vulnerable to climate change-related lower rainfall, and were very mindful of their perception as a large user of scarce water resources. Interestingly, their water management changes are an indicator of climate change adaptation. Case J was one of the ten MASS cases whose aggregate

energy use was not sufficient to meet the reporting threshold for the *NGER Act* indicating that they were not the largest energy users among MASS cases. Nevertheless, Case J is a user of electrical energy for activities such as stadium lighting, air-conditioning, and information technology. Their CSR ethos was also evident in a comment about their *"social responsibility"* to adapt to a hotter, drier climate. They also reported that as a local government facility with environmental sustainability being a key organisational objective, their understanding of, and responses to, climate change were significantly influenced by this. Another key influence on their responses was the attitude to climate change of the Venue Co-ordinator who felt that climate change was an important issue. However, the key barrier for Case J to effective responses to climate change was also a lack of financial resources. With regard to climate change adaptation, in terms of Berkhout et al. (2006), they were employing both *"bearing and managing risks"*, and *"risk assessment and options appraisal"* strategies.

Case K

Case K is a member-owned, professional sports club that manages (theoretical Category 2 – *privately-owned, not-for-profit*), but does not own, one MASS. The organisation is contracted to manage its stadium on behalf of Case A, a government-owned, statutory authority with responsibility for managing major sport venues. The MASS managed by Case K is used only for national-level Australian Rules football, and some off-season non-sport entertainment events. Construction of this stadium was completed in 2011. Case K is led by a board of directors who are elected by club members. The board oversees a team of professional managers, and is responsible for the overall corporate governance of the organisation, including strategic direction that is consistent with the organisation's strategic plan. Reporting to the board is the Chief Executive Officer (CEO) who oversees the implementation of strategic direction, the day-to-day management of the organisation, and all staff including a team of senior executives with various job titles.

However, as an organisation contracted to manage this MASS on behalf of Case A, it is the Asset Manager of Case A who oversees the stadium management role of Case K. The manager responsible for the operation of the venue is the Stadium Manager (SM), who reports to the CEO, but also to the Asset Manager of Case A. Assisting the SM is the Facilities Manager who is mainly responsible for managing the grass playing surface, and who reports to the SM. Although Case K is a not-for-profit organisation, it manages its stadium on a "commercial" basis with the venue expected to operate at an annual profit, with profits reinvested in the development of stadium, or retained by the organisation for other purposes. This MASS therefore plays a fundamental and strategic role in the funding the operation of the club/Case K.

Key interpretations, climate change issues and responses for Case K:

In terms of how they made sense of climate change, Case K was somewhat divided about the basic science of climate change. Whilst their Stadium Manager (participant K1) accepted that the primary causation of climate change was anthropogenic, the Facilities Manager (participant K2) described himself as a *"climate change sceptic"*, and so did not accept anthropogenic explanation of climate change.[36] The views of the Board of Directors and the CEO were not investigated and so are not known, and in any case, they did not have a formal corporate view about it. Despite not having discussed it as a management issue before, both interviewees were able to offer a competent definition of climate change. The major sources of information shaping how they understood it were industry publications, documents from their waste management partners, and media coverage. Case K was aware of basic elements of climate change such as GHG emissions, and where possible, the need to mitigate them. They too largely saw it as a question of costs associated with three key climate change issues: water, energy and waste. As a result, whilst they too believed it important to act in a socially responsible way, their primary motivation for addressing these issues was to reduce the financial costs associated with them. Case K also felt its stadium was vulnerable to lower rainfall associated with climate change because they did not have enough water storage capacity to supply all their water needs during extended drought periods.

For climate change responses, they occurred within existing strategic plans, and were mainly aligned with the major issues of water, energy and waste. As a consequence, it reported some investment in water management infrastructure, energy efficiency, and waste recycling. Interestingly, Case K thought they were probably the industry *"leader"* in terms of using renewable energy by having a *"220 kilowatt solar power system around the roof rim of the stadium."* With around 200 solar panels, they were able to generate on average approximately one megawatt of electricity that equals 18-20 per cent of their total electric energy needs. The decision to install such infrastructure however was not made by Case K, but instead was made by Case A who as a statutory authority, owned the stadium managed by Case K. This initiative reflected state government policy at the time and was facilitated by the stadium architects who incorporated the solar panels in its design. However, like all other MASS cases, they did not have a formal climate change strategy. Case K was one of the ten MASS cases whose aggregate energy use was not sufficient to meet the reporting threshold for the *NGER Act* indicating that they were not the largest energy users among MASS cases. Nevertheless, Case K is a user of electrical energy for activities such as stadium lighting, air-conditioning, and information technology. The CSR ethos was also evident in comments about *"doing the right thing"* by the *"community"*, although as the state government is the ultimate owner of the stadium, it too was a key

[36] Nevertheless, K2 was concerned about the 'environment' and 'minimising the impact' of Case K on it. K2 was motivated to do so because 'protecting the future of [his] kids, [his] grandkids, your [the interviewer's] kids', was 'doing the right thing'. Such environmentally responsible behaviour was also an opportunity for Case K to 'lead the way'.

influence in their understanding of, and responses to, climate change. They were also sensitive to the views of public opinion and stakeholders such as one of the national sport organisations whose sport was played at the stadium. However, the key barrier for Case K to effective responses to climate change was also a lack of financial resources. With regard to climate change adaptation, in terms of Berkhout et al. (2006), they were cautiously *"bearing and managing risks."*

Case L

Case L is a privately-owned, for-profit company (theoretical Category 3 – *privately-owned, for-profit*) that manages, but does not own, one MASS. The organisation is, like Case K, contracted to manage one stadium on behalf of Case A, a government-owned, statutory authority with responsibility for owning and managing major sport venues. The MASS managed by Case L is owned by Case A, and is used only for international and national-level soccer rugby union, and rugby league as well as some off-season non-sport entertainment events. While the site of this stadium has been a football venue for over 50 years, the most recent redevelopment of this stadium was not completed until the early 2000s. Unlike Case K, Case L is led by a board of directors who are elected by shareholders and are responsible for the overall corporate governance of the organisation, including strategic direction. The board of Case L, however, does not have a close relationship with the team of professional managers, instead employing a hands-off relationship with the stadium staff. Instead, the management of Case L is overseen by the Asset Manager of Case A. Reporting to the board of Case L, and the Asset Manager of Case A, is the Stadium General Manager who oversees the day-to-day management of the stadium, and all staff including a team of senior executives with various job titles. As Case L is a for-profit organisation, it manages its stadium on a "commercial" basis with the venue expected to operate at an annual profit, with profits distributed to shareholders as dividends.

Key interpretations, climate change issues and responses for Case L:

In terms of how they made sense of climate change, Case L accepted the basic science of climate change and had a reasonable grasp of its primary anthropogenic causation and consequences for Australia. Therefore, media coverage of climate change was the main source of information that shaped how they understood it unless the *"state government department"* that they collaborate with *"had a specific role."*[37] *"Climate change was not one of their main business drivers"* and so it was not something they devoted *"a lot of resources and time to."* However, they also discussed it as a management issue, and were particularly concerned about *"waste collection and removal"* and *"probably energy."* Case L was aware of basic elements of climate change such as GHG emissions, and what they *"may be able to contribute to alleviating any adverse impacts from climate change."* To the extent it was a management issue, they saw it as a question of costs associated with three key

[37] This implies that Case A (a state government statutory authority) had not previously raised the topic of climate change with Case K.

climate change issues: water, energy and waste. As a result, one thing they *"pride ourselves on is being a good corporate citizen."* Another is they think that, *"it's important that we can always show that we're being responsible."* Yet, another motivation for addressing these issues was to reduce the financial costs associated with them (*"the other one really is a commercial consideration or a business case"*). The comments about being a *"good corporate citizen"* – and *"being responsible"* – indicate that a CSR ethos was an influence on their general approach to management. Case L also felt its stadium was *"definitely vulnerable"* to extreme weather events however they had taken *"safeguards"* to now make them *"more resilient."*

For climate change responses, they occurred within existing strategic plans, and were mainly aligned with the major issues of water, energy and waste. Whilst they were not thought of as responses to climate change, they too reported major investment in recent years in water management infrastructure, and improvements in energy efficiency and waste recycling. However, like all other MASS cases, they did not have a formal climate change strategy. Case L was likely one of the ten MASS cases whose aggregate energy use was not sufficient to meet the reporting threshold for the *NGER Act* indicating that they were not the largest energy users among MASS organisations either. Nevertheless, Case L is a large user of electrical energy for activities such as stadium lighting, air-conditioning, and information technology. They were only *"vaguely"* aware of this legislation and *"thought"* they did not meet its reporting thresholds. Interestingly, Case L was not convinced the carbon tax (CT) would ever be implemented. While they were aware that the CT was an Australian Government policy and was to be introduced in 2012, they thought that, *"there may or may not be a guarantee that it'll come in."*[38] This highlights current uncertainty about national climate change policy by MASS cases that will be discussed later in this chapter. Like other cases, the key barrier for Case L to effective responses to climate change was also a lack of financial resources although they also alluded to having very limited climate change organisational capability and literacy. With regard to climate change adaptation, in terms of Berkhout et al. (2006), they were cautiously *"bearing and managing risks."*

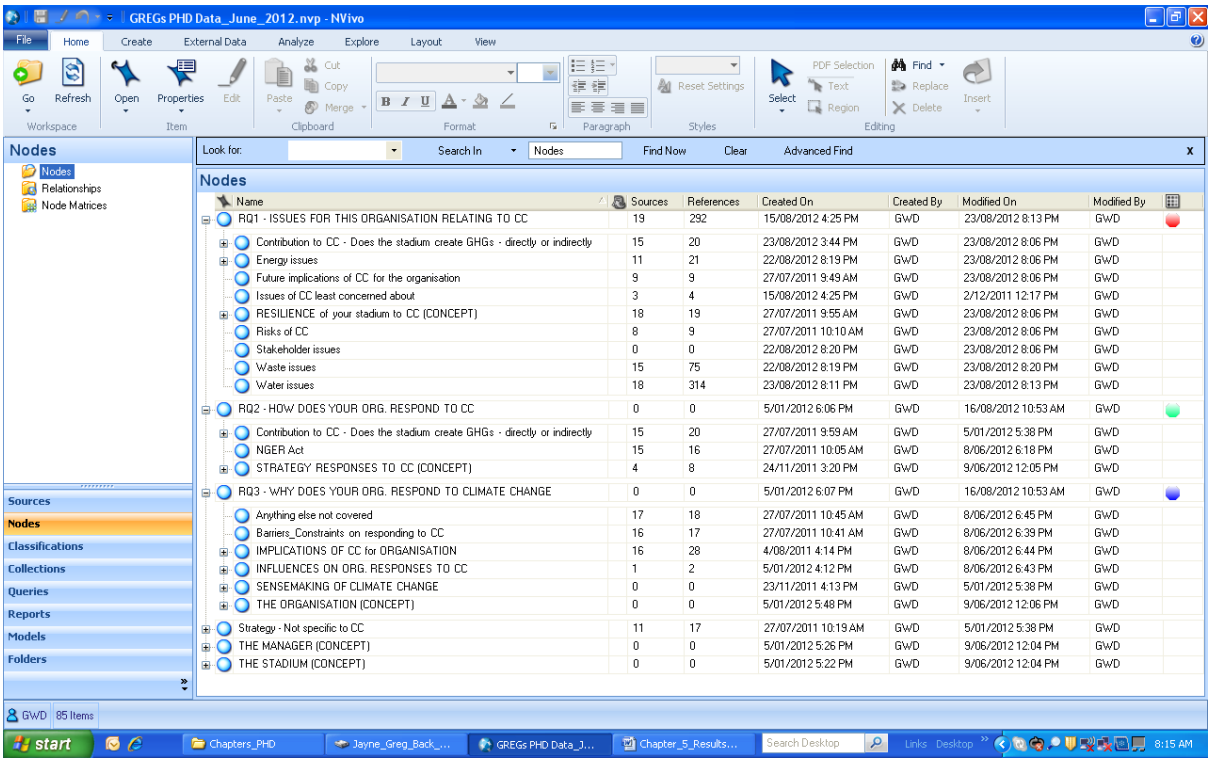
Cross-case analysis: the results

As stated in the introduction to this chapter, seven key themes emerged from the data. These themes were identified during the data analysis phase using data coding that was assisted by computer-aided data analysis (CADA) software in the form of NVivo – Version 9 The first three major themes align directly with the three research questions for this study identified in Chapter One of this thesis. The first major theme – "issues for each stadium arising from climate change" – aligns with Research Question 1 (RQ1) ["*what*, if any, issues are posed by climate change for major Australian sport stadia

[38] This comment appears to refer to public comments by the Federal Leader of the Opposition, Mr. Tony Abbott, that he would repeal the current carbon tax legislation if his party won the 2013 federal election.

and the organisations that manage them?"]. The second major theme – "*how* and *why* the organisations responded to climate change" – aligns with Research Question 2 (RQ2) ["*how* are the organisations that manage major Australian sport stadia responding to climate change?"], and with Research Question 3 (RQ3) ["*why* are the organisations that manage major Australian sport stadia responding to climate change in the way they do?"]. A visual depiction of how these themes were interpretively coded is offered in Figure 5 below.

Figure 5: Interpretative coding - The six major interview data themes with their "open" codes 24/08/13



As can be seen from Figure 5 above, the first three major themes are accompanied by major data Themes 4, 5 and 6. Theme 4, *MASS manager-specific data*, was accompanied by Theme 5 – *stadia-specific data rather than the MASS organisations* – and Theme 6, *barriers to responding to climate change*. Each of these Themes 4, 5 and 6 also helped to answer the three research questions although they were not limited to any single research question. Both Themes 5 and 6 were suitable for conceptualising and so are marked respectively as concepts in the NVivo database. Within each of these six key themes, various sub-themes emerged and were given open codes.

Theme 1: How the MASS organisations perceived (made sense of) climate change

The first key theme arising from analysis of the data was that the senior management of each MASS organisation perceived, or made sense of, climate change in particular ways. The results presented here, because they deal with perceptions/sensemaking of climate change that shapes the reasoning of MASS cases, helps to answer Research Question 3 ["*why* are the organisations that manage major Australian sport stadia responding to climate change in the way they do?"].

Whilst climate change is an issue that has been intensely debated in Australia in recently years, only seven of the twelve MASS cases (Cases A, B, C, E, F, J and L) or fifty-eight per cent, reported having discussed it as a management issue for the stadia. For the remaining five cases (D, G, H, I, and K) or forty-two per cent, it has not been specifically discussed by management. In either situation, there was no formal corporate view of the phenomena reported by any cases. A summary of these results is presented in Table 8 below.

Table 8: Results of whether MASS organisations have discussed climate change

VARIABLES	INCIDENCE ACROSS THE THREE THEORETICAL CATEGORIES			MANAGERS REPORTING THIS (N = 14)
	Category 1 - Publically-owned, not-for-profit	Category 2 - Privately-owned, not-for-profit	Category 3 - Privately-owned, for-profit	
MASS organisations that <u>have</u> discussed climate change (n = 7)	Case A Case E Case J	Case B	Case C Case F Case L	A1, B1, C1, E1, F1, J1, L1
MASS organisations that have <u>not</u> discussed climate change (n = 5)	Case D Case I	Case G Case H Case K		D1, G1, G4, H1, H2, I1, K1
Totals	**5**	**4**	**3**	**14**
	12 cases			

In those cases where climate change had <u>not</u> been explicitly discussed, it was explained that it had been either assumed to be a general environmental issue, or that no one had raised it as an issue for discussion.

However, all twelve MASS cases did have a basic grasp of what climate change is. That is, most were able to articulate that global climate, often referred to as "weather", was warming and that the principal cause of this was GHG emissions produced by human activities. The interview data shows that eleven out of the twelve MASS cases – and nineteen out of twenty interviewees – accepted the main claims of the science of climate change, that is, that global climate was warming, and that this warming was principally caused by GHG emissions associated with human activities. Several participants used terms that either explicitly acknowledged the role of humans in climate change such as "contribution" (A3, L1) or "human" (H1, K2), or which did so implicitly "emissions" (E1, F1). Participants referred to "global warming" (G1, K2), "rain and storms" (I1), and changes or modifications to "weather patterns" (A2, J1). Another, when asked, referred to indirect changes such as "water and energy" (B1). Perhaps the most sophisticated explanation was offered by Case A:

> *Climate change is about modification to the regular weather patterns that we experience all year round* (A2, p. 1).

Case E put it this way:

> *I mean I don't think our, our board...is any different to anybody else. I mean they'll see a body of evidence that says there are gases and emissions going in the atmosphere and it's contributing to global warming* (E1, p. 2).

Only one manager in Case K did not accept that climate change was caused by human activities. When asked who at their organisation was responsible for leading their "response to climate change?", Manager K2 explained that his work in reducing the stadium's impact on the environment was not motivated by a belief in anthropogenic climate change:

> *Well, first up, I've got to say I'm a climate change sceptic, so it's not climate change. It's more a matter of better utilising the resources that we currently have and minimising the impact that we do have on the environment as such from the waste products that are generated from those* (Case K, p. 3).

However, this participant was the only one of the twenty interviewees to describe themselves as a "sceptic" and to contest the basic climate science. K2's view also contrasted with that of his close colleague and supervisor K1, who did accept the consensus scientific view of climate change.

Although in total, MASS cases based their understanding of the issue on a diverse range of information sources, media reportage of climate change was the most significant influence. Typically, media interpretations of climate change were influential with nine cases (A, C, D, G, H, I, J, K & L) reporting that media coverage – with television and newspapers in particular – had shaped their understanding of the issue. Nevertheless, some others had read government or industry publications while Case E had even read peer-reviewed climate science research reports. Case E was wary of bias in media coverage of climate change and so looked for what it perceived to be more reliable sources of information, such as the Australian Department of Climate Change & Energy Efficiency, on which to shape their understanding:

> *...we think in the last five or ten years or something it's been contaminated with political agendas etc., so the information is different and it's slanted. We certainly had a look at…we had a protocol that came in. So we get an understanding of what it is, and then we try not to actually put too many other things on it. We don't need to. We only need to get convinced to a point, so once we decided, "Yes, we think global warming and climate change is real and relevant so we should respond to that." We just make that decision to move, we don't go back and reassess that all the time* (E1, p. 1).

The next most important influence on how the cases understood climate change was government. Four cases (A, B, H & L) reported state government agencies as influences while federal (Case E) and local government (B, H) were also cited. Interestingly, only Case E cited the Department of Climate Change & Energy Efficiency as a source of information, while none reported the Australian Bureau of Meteorology – who have extensive information about climate change on their website – as a source. After government, industry publications such as those by the Venue Manager's Association were the next biggest influence (Cases A, H & J). Other influences included energy consultants – Manager D2 relied on the work of energy consultants to inform his organisation of the issue's relevance – other

industry publications (Cases J & K), and industry partners such as contractors (Case F). Case C also reported having been influenced by scientists who had written about climate change:

> *Me personally, I'm very interested in the subject and I've read a number of books. James Lovelock and Tim Flannery and other people, so I have that interest in it and I guess I'll hold that information from an organisation's point of view* (C1, p. 3).

A summary of the key influences in shaping how they understood climate change is offered in Table 9 below.

Table 9: Key influences shaping how MASS cases understood climate change

VARIABLES	INCIDENCE ACROSS THE THREE THEORETICAL CATEGORIES			MANAGERS REPORTING THIS (N = 13)
	Category 1 - Publically-owned, not-for-profit	Category 2 - Privately-owned, not-for-profit	Category 3 - Privately-owned, for-profit	
Media (n = 9)	A, D, I, J	G, H, K	C, L	A1, C1, D1, D2, G1, H1, I1, J1, K1, L1
Government (state) agencies (n = 4)	A	B, H	L	B1, A1, H1, L1
Government (Federal) agencies (n = 1): - Department of Climate change & Energy Efficiency	E			E1
Government (local) (n = 1)	B	H		B1, H1
Venue Managers Association: (n = 3)	A, J	H		A1, H1, J1
Industry publications (n = 2)	J	K		J1, K1
Industry stakeholders (n =2)	E	B		B1, E1
Consultants (n = 2)	B		F	B1, F1
Peer-reviewed journal articles (n = 1)	E			E1
Contractors (n = 1)	D			D2
Scientists (n = 1)			C	C1
Industry conferences (n = 1)			F	F1
Internal Communications Department: (n = 1)			F	F1
TOTALS	**5**	**4**	**3**	**13**
	12 CASES			

Most MASS organisations expressed their understanding of climate change from the perspective of three key issues: water, energy and waste. For example:

> *The areas that we have emphasis is water and energy, okay? So it is climate change in those terms...* (B1, p. 1).

That is, and quite reasonably, MASS organisations thought about climate change in terms of what it would mean to their organisation. Case J was typical of this and put it this way:

> *Climate change to me is I guess the theory that the Earth's air temperature is rising and as a result weather patterns are changing. So drier winters, drier summers but more*

> *frequent storm events, so one in hundred year storms being maybe one in fifty or one in twenty instead of being on in a hundred. That's what I think, so more extreme weather events but less I guess what you'd call sort of standard average rainfall* (J1, p. 3).

Given that none of the interviewees were experts in climate science, the reported understandings were quite reasonable.

Nevertheless, some MASS cases were still waiting for the full implications of climate change to become clearer. Whilst water, energy and waste were clearer issues, longer-term national energy and GHG emissions policy were less clear to them. For example, when asked, "What uncertainties does climate change pose for this organisation?", the manager at Case E reported that:

> *[E1]:* *Well the uncertainties it causes me particularly is that we can't develop a strong strategic plan unless the government does, so…*
>
> [Interviewer]: So there's a policy uncertainty?
>
> *[E1]:* *Correct. There's a bit of a wait for us and the thing that I'm fearful of with us is while you've got this hiatus of people trying to make up their mind how they're going to deal with the climate change, this organisation could actually say well we don't think is an issue anymore, this drops off our radar a little bit and then it wouldn't get actually picked up again, or if it did get picked up it wouldn't get picked up in the same form* (E1, p. 9).

When Case L was asked about the implications of carbon pricing, they alluded to uncertainty in government policy. Manager L1 remarked that, *"there's probably still a lot of that detail to be worked out"* (p. 7). He then commented further on the impending carbon price in Australia:

> *Again, as I say, we really haven't done a lot of work on that. I mean, at the moment, it's still, there may or may not be a guarantee that it'll come in, so I guess there's still a lot of work to be done on there. So we'll probably be a waiting a little bit more for that to be clarified a little better. To give us a better feel for where that might happen. We have arranged for one of our financial advisors to start doing a bit of work on that, but at this point in time,...we don't have a clear picture (L1, p. 7).*

Whilst a "wait and see" attitude was not a dominant theme, it was present in these cases and is consistent with other uncertainties about climate change.

Finally, MASS organisations consistently perceived climate change as an issue of cost. To the extent that MASS organisations had thought about the issue, ten out of twelve (eighty-three per cent) saw the phenomenon in terms of definite or likely financial impact. A summary of this perception is provided in Table 10 below.

Table 10: Perception of climate change as a cost issue

	MASS CASES IDENTIFYING CLIMATE CHANGE AS A COST ISSUE			MASS MANAGERS REPORTING THIS (N = 15)
	Category 1 - Publically-owned, not-for-profit	Category 2 - Privately-owned, not-for-profit	Category 3 - Privately-owned, for-profit	
Cases perceiving climate change as a cost issue (n = 12)	A, D, E, I, J	B, G, H, K	C, F, L	A1, A2, A3, B1, C1, D2, E1, F1, G1, H1, H4, I1, J1, K1, L1
TOTALS	**5**	**4**	**3**	**15**

The word "cost" was mentioned frequently during the interviews (n = 254) but only eight times by the interviewer. Whilst not all of these 254 references to "cost" were specifically about the cost of climate change, with some being about general management costs or other issues mentioned in passing, many were. For example, when asked about the implications of carbon pricing, Case A said:

> *Look I think generally caring for the environment probably costs money and you've mentioned carbon tax but there's other things such as the additional costs of developing a stadium because you are putting in water efficient and energy efficient fittings and fixtures. You are building extra infrastructure to accommodate for that so the cost of stadiums is going to increase marginally based on that and the cost of construction generally...* (A1, p. 3).

Case F also nominated higher infrastructure costs for water and energy generation (F1, p. 16) while Case J (p. 3) reported having already paid the cost of significant investment in water harvesting and storage infrastructure. Case B illustrated the perception of climate change as a cost issue by saying that, "in climate change here, the major issue is electricity and the cost of electricity" (B1, p. 4). Case C highlighted increased water costs: *"Yeah, hotter drier means we'll harvest less rainwater which will cost us more"* (C1, p. 5), while cases G (G1, p. 9) and H (H1, p. 2) reported concern about increased cost of water supply. Cases D, E and I highlighted increased energy costs as a result of the carbon tax (D2, p. 3; E1, p. 11; I1, p. 6) while Case L thought the carbon tax would increase their air conditioning and refrigeration costs (L1, p. 7). Case F cited higher turf replacement costs as a result of higher temperatures associated with climate change (F1, p. 11). Case K (p. 8) was also concerned about higher operating costs associated with climate change and the impact of such increases on hirers of its stadium. Overall then, climate change was strongly perceived as a cost issue by MASS organisations.

Theme 2: Climate change issues for MASS organisations

The second key theme was that particular *issues* arose as a consequence of climate change, or climate change-related factors such as changes in legislation or market conditions, for most of the organisations that manage MASS and which participated in this study. These climate change, or climate change-related, issues for MASS organisations were divided into five sub-themes as follows: (1) general uncertainty about climate change; (2) water issues; (3) energy issues; (4) waste issues, and; (5) other issues (vulnerability and resilience; reluctance of some key stadium stakeholders to

address climate change; vulnerability of playing grass to extreme temperatures). For three of these issues – water, energy and waste – a notable common feature was that the *financial cost* of each was reported. For introductory purposes, a summary of each issue is provided in Table 11 below.

Table 11: Summary of climate change issues identified by MASS organisations

CLIMATE CHANGE ISSUES	THEORETICAL CATEGORIES		
	Category 1 – Publically-owned, not-for-profit MASS cases	**Category 2 – Privately-owned, not-for-profit MASS cases**	**Category 3 – Privately-owned, for-profit MASS cases**
Uncertainty about climate change	Yes	Yes	Yes
Water issues	Yes	Yes	Yes
Energy issues	Yes	Yes	Yes
Waste issues	Yes	Yes	Yes
Cost issues associated with water, energy and waste	Yes	Yes	Yes
Minority issues: 1. Vulnerability (or resilience) to increased incidence of extreme weather events (such as storms or droughts); 2. Reluctance of some key stadium stakeholders to address climate change; 3. Vulnerability of grass on the playing surface to extreme heat	Yes	Yes	Yes

Issue 1: General uncertainty about the full implications of climate change

A general uncertainty about the full implications of climate change was an issue that was implicitly, rather than explicitly, evident in the interview data. The strongest indicator of this uncertainty was in the language used by the MASS managers interviewed for the study, especially certain key words. The word *"probably"* is the best example, and was used repeatedly by eleven out of the twelve MASS cases in their interview responses (n = 799) across the twenty interviews. Although the interviewer was also responsible for using this term, a check of the frequency of this revealed that it happened on only six out of the 799 times it was spoken, or only 0.76 per cent, leaving the term to be uttered by the MASS managers on 99.24 per cent of occasions. Although the term was not used exclusively to refer to climate change issues or responses, when allowance was made for its use in relation to other matters such as staff responsibilities, general management matters, or other issues mentioned in passing, this term was clearly a recurring one. Even by comparison, the term was used frequently by MASS managers: the word "probably" was spoken more than other frequently used keywords such as "stadium" (n = 688), "energy" (n = 686), "government" (n = 436), and "emissions" (n = 300). Given that it was used so frequently in the context of interviews about climate change issues and responses, and importantly – across the three theoretical categories of MASS organisations

– it indicates the general tentativeness that was displayed by most of these MASS managers and observed by the interviewer in response to many of the questions pertaining to climate change.

Another term that indicated the general *uncertainty* of these MASS organisations about the full implications of climate change was the word "guess." Whilst the word was used in different ways, such as describing the exact actions or responsibilities of other staff members – about which it could not reasonably be expected that these managers should be confident in knowing – it was used frequently (n = 465) and in ten of the twelve cases (the exceptions being Case F and Case L), in relation to the topic of climate change. Again, it is a term used more often than other prominent keywords such as "government" (n = 436), and "emissions" (n = 300).

Another indicator of the uncertainty of MASS organisations, as represented by the MASS managers that participated in this study, is the relative scarcity of terms used that suggest managerial *confidence* about the topic of climate change and its implications for MASS. For example, an adjective such as the word "certainly" (n = 266), was used far less often. In comparison, the term "probably" was used at a ratio of almost 3:1. Again, while the word "certainly" could have been used by the researcher in the interviews, a word check revealed that it was not (n = 0), so it was clearly used by the MASS managers. Other relatively scarce terms that are indicative of confidence about the topic was "absolutely" (n = 102) and "definitely" (n = 69). For each of these words, there was very low or no usage by the researcher ("absolutely", n = 5/102; "definitely", n = 0/69). However, despite the apparent uncertainty about the topic of climate change displayed by some of the MASS cases, it is not suggested that the managers interviewed were incompetent. On the contrary, the managers interviewed appeared in all cases to know their organisations and responsibilities, and seemed highly competent at performing their jobs. For more familiar topics, such as those specific to their job descriptions, their language was observed by the interviewer to be generally more assertive and confident.

The general uncertainty of these MASS organisations about the full implications of climate change tends to confirm another result of the study – that MASS cases reported having explicitly discussed climate change as an issue.

Issue 2: Water issues

The second issue pertaining to climate change was that of *water*. Restrictions on water supply and increasing costs of water supply as a consequence of climate change were particular points of vulnerability repeatedly identified by these MASS managers. All twelve cases reported it as a climate change issue, with seventeen out of twenty-one managers (eighty per cent) referring to it. Terms used to describe different elements of water as an issue included *"drought", "water restrictions",*

"evaporation", "water conservation", "water recycling", "water management", "water efficiency", "Water Efficiency Management Plan", "water harvesting", "water storage", and *"water treatment."* Although flooding from extreme weather events such as storms is nominated as a general issue for Australia in the climate science literature, only two cases (A and L) thought that was a point of vulnerability. In particular, as water-dependent organisations, MASS organisations were concerned about significantly reduced rainfall associated with climate change. A summary of these results is presented in Table 12 below.

Table 12: Water issues identified by MASS organisations relating to climate change

WATER ISSUES	MASS CASES IDENTIFYING WATER AS A CLIMATE CHANGE ISSUE			MASS MANAGERS REPORTING THIS (N = 17)
	Category 1 - Publically-owned, not-for-profit	Category 2 - Privately-owned, not-for-profit	Category 3 - Privately-owned, for-profit	
MASS cases identifying water as a climate change issue (n = 12)	A, D, E, I, J	B, G, H, K	C, F, L	A1, A2, A3, B1, C1, D1, D2, E1, F1, G1, H1, H4, I1, J1, K1, L1
Water consumption/need to reduce water consumption (n = 4)	A	B, K	L	A1, A2, A3, B1, L1
Water efficiency reporting (NABERS) (n = 2)	D, J			D2, J1
Water harvesting & storage (n = 9)	A, E, I, J	H, K	C, F, L	A1, A2, C1, E1, F1, H1, I1, J1, K1, L1
Water prices (n = 6)	A, D, E, J	G, H		A2, D1, E1, G1, H1, J1
Reduced rainfall / water shortages / drought (n = 8)	A, D, E, J	B, G, K	C	A1, A2, B1, C1, D2, E1, G1, J1, K2
Water restrictions / allocations (n = 5)	A, D	G, H	L	A2, D2, G1, H1, L1
Water evaporation (increased) (n = 3)	E	H, K		E1, H1, K2
Negative public perception of high water use (n = 3)	A, E, J			A3, E1, J1
TOTALS	**5**	**4**	**3**	**17**

Only one of the documents supplied by Case D was able to confirm water as an issue however, this lack of triangulation is more a reflection of the difficulty in obtaining internal documents than a lack of concern on the part of all MASS cases.

As water-dependent organisations, it is nevertheless clear from the interview data that all of these MASS organisations are concerned about significantly reduced rainfall associated with climate change. Significant declines in rainfall in recent years that were mainly described by MASS managers as "drought" – a phenomenon linked by Australian weather authorities to climate change (BOM & CSIRO, 2012, p. 11) – was explicitly identified as an issue of high importance by seven of the twelve

MASS cases. This concern was shared across two of the three theoretical categories: Category 1 - *publically-owned, not-for-profit*, and; Category 2 - *privately-owned, not-for-profit*, although there was no clear reason why this was not explicitly expressed by cases in the third theoretical category - *privately-owned, for-profit*. An example of how concern over extended "drought" associated with climate change was expressed by Manager A1 from Case A. When asked how climate change first came to the attention of his organisation, he replied in the following way:

> *Well certainly the focus was a few years ago with the drought and the state of...*[39]*and our lack of preparedness for the drought conditions and a reduction in the dam levels down to 20 per cent and lower than that in some of the other catchment areas. The state government understood that they needed to do something pretty serious about it and I guess we got off quite early in the piece realising that this was the case before the Water Commission started to require agencies to complete Water Efficiency Management Plans or WEMPS. We kicked off early in order to lead the way for government and get some runs on the board. So yeah certainly the drought conditions had brought it to the forefront for us* (A1, pp. 2-3).

When asked if his organisation's conversations about climate change were largely "indirect", Case B also associated recent drought conditions with climate change. The following quote illustrates the drought/climate issue, but also that these MASS organisations address the direct issues in front of them rather than macro-issues such as climate change:

> *Well it is in the product of climate change so for example in...*[40]*, we had a drought here last year and so there have been restrictions placed on local authorities relating to water management and so the good old days of just turning on the sprinkler and everything getting green are rapidly becoming a thing of the past* (B1, p. 1).

Manager J1 from Case J also highlighted drought as a concern. When asked whether there was "anything in your job that you've described that relates to responding to climate change?", he said:

> *Yeah absolutely. Obviously been involved with the maintenance of the bricks and mortar, there's a fairly heavy focus that coming from a corporate, also from a Council level to green the way we operate. So...*[41] *got hit really, really hard by the drought five or six years ago. ...got hit really hard, our water storages got down to 10 per cent and Council adopted a very aggressive and probably sort of leading viewpoint on changing the way we manage our infrastructure as a result of that drought* (J1, p. 2).

Other MASS cases referred to this period of drought/water scarcity indirectly by instead referring to *"water restriction policies"* (D2, p. 7), or limited *"water allocation"* (G1, p. 3).

MASS organisations, however, also had a financial incentive to reduce their water use as they reported being concerned about the increasing costs of purchasing water from water suppliers. Six of the twelve cases (A, D, E, G, H & J) specifically referred to the problem of increasing water supply costs. As one manager said:

[39] The name of this state has been removed in order to preserve anonymity of the case.
[40] The name of this state has been removed in order to preserve anonymity of the case.
[41] Name of this city deleted to preserve the anonymity of this case

> *...our water rates are likely to go up 30 or 40 per cent next year, so we certainly have needed a fair allocation of water. We've got 23 hectares on the precinct of grass, so yeah* (G1, p. 3).

Another manager from Case J also expressed the financial implications of rising water bills:

> *Yeah, our water bills are pretty high. Within the region we were considered an extremely high user. I think we were number two behind [oil company] only. So we were using somewhere around 20 mega litres a year on the field itself, just the field. All said and done, I think we were using about 50 mega litres a year. By taking the field offline we're down to 30 mega litres per year. So we've saved a massive amount of water just from that* (J1, p. 5).

As big users of water, these organisations therefore have large water supply bills to the extent that such water is purchased from water suppliers and so have a financial incentive to reduce those costs.

Two MASS cases (E and J) also identified an issue arising out of the significant decline in rainfall/drought of recent years namely, negative public perceptions associated from being large water users during a time of significant water restrictions. As Manager E1 hinted at, being an organisation that is publically identified as a large water user during a drought is undesirable:

> *...we are also one of the highest water users in the state, so it's another label that we don't particularly like, so it sits with us that we need to mitigate that* (E1, p. 10).

Being identified as a large water user during drought periods also poses political problems. While MASS in recent years – due to their financial resources and need to continue to provide major public sport events even during drought periods – have been able to continue to keep their water-dependent playing surfaces green and playable, this situation has not extended to many smaller community-level football and cricket grounds where facilities have become dry, hardened and degraded (ABC, 2011; MAV & Coverdale, 2007; SRV, 2007; Stark, 2006; C. Victoria, 2006). For Case J, having a publically-owned stadium using large amounts of water while community-level sports grounds were severely impacted by water restrictions prompted support by the relevant political representatives for the introduction of water-saving infrastructure:

> *[J1]:* *So we were looking at that sort of stuff and also within the region itself, the actual perception that everybody else's sports have been cancelled, their fields are dying but in here's nice and green because we're using all the water that we've got that was a really poor public perception.*
>
> *[Interviewer]:* *Ah, so public perception played into the decision to…*
>
> *[J1]:* *Well that's influenced the local politicians (J1, p. 5).*

As a consequence, this study found a degree of sensitivity among some MASS organisations to public perceptions that they were using scarce water resources in times of drought.

Issue 3: Energy issues:

The next climate change issue was that of energy. All twelve cases reported climate change issues around energy, with nineteen out of twenty managers (ninety per cent) interviewed referring to it.

When asked, "What (if any) were the major issues pertaining to climate change?", MASS organisations consistently referred to energy, and *electrical* energy in particular. Terms used frequently to describe different elements of energy as an issue included *"energy conservation"*, *"energy management"*, *"energy efficiency"*, *"black energy"*, *"green energy"*, and *"renewable energy."* One energy issue stands out above all others for MASS organisations: that is, the need to reduce energy use – frequently referred to as "energy conservation" – as a strategy for minimising energy costs, especially those of electrical energy. Seven out of twelve MASS cases reported a need to reduce energy consumption. The major Australian sport stadia examined in this study are all large buildings that cater for crowds of over 25,000 people, and in the majority of cases, much more than that. As a consequence, these stadia are large users of electrical energy which peaks on event days, and drops to lower levels on non-event days. Two of the twelve MASS cases (A and E) use so much energy that they meet the reporting thresholds of the *NGER Act* and so report their energy and emissions to the Australian Government. All MASS organisations have large plant and equipment, large corporate entertainment facilities, large catering facilities, large administration areas, large refrigeration units for food storage, and significant information technology systems. Other systems managed by MASS organisations that require large amounts of electrical energy include air-conditioning, television broadcasting, stadium lighting, security, car parking, communications, waste disposal, pools for player rehabilitation, and internal movement such as elevators and escalators.

However, the desire to conserve energy was not primarily caused by concerns about climate change; rather, energy conservation was instead driven primarily by the need to reduce operating costs. Nevertheless, most MASS organisations also recognised that a second-order benefit of energy conservation was the minimisation or mitigation of GHG emissions associated with energy use. Therefore, a *second-order* issue for these organisations was GHG emissions mitigation. A summary of these results is presented in Table 13 below.

Table 13: Energy issues identified by MASS organisations relating to climate change

ENERGY ISSUES	ENERGY AS A CLIMATE CHANGE ISSUE FOR MASS CASES BY THEORETICAL CATEGORY			MASS MANAGERS REPORTING THIS (N = 19)
	Category 1 - Publically-owned, not-for-profit	Category 2 - Privately-owned, not-for-profit	Category 3 - Privately-owned, for-profit	
MASS cases identifying energy as a climate change issue (n = 12)	A, D, E, I, J	B, G, H, K	C, F, L	A1, A2, A3, B1, C1, D1, D2, E1, F1, G1, G2, H1, H3, I1, J1, K1,K2, L1
Energy consumption/need to reduce energy consumption (n = 8)	A, D, E, J	H, K	C, L	A1, A2, C1, D1, E1, H1, K1, L1
Mainly indirect GHG emissions (n = 11)	A, D, E, I,	B, G, H, K	C, F, L	A1, A2, B1, C1, D2, E1, F1, G2, H1, I1, K2, L1
Link between energy use and indirect GHG emissions (n = 11)	A, D, E, I,	B, G, H, K	C, F, L	A1, A2, B1, C1, D2, E1, F1, G2, H1, I1, K2, L1
Mitigation of GHG emissions (n = 10)	A, D, E, J	B, H, K	C, F, L	A1, A2, A3, B1, B2, C1, D1, E1, F1, H1, J1, K2, L1
Carbon pricing (n = 5)	A, E, I	K	F	A2, E1, F1, I1, K2
Reporting energy use and GHG emissions under NGER Act (n = 2)	A, E			A1, E1
Energy efficiency reporting (NABERS) (n = 1)	D			D1, D2
Concern about negative public perceptions of energy use (n = 2)	E, F			E1, F1
TOTALS	**5**	**4**	**3**	**19**
	12 cases			

Only one of the documents supplied by Case B was able to confirm energy as an issue, however this lack of triangulation is more a reflection of the difficulty in obtaining internal documents than a lack of concern on the part of all MASS cases.

As stated previously in this chapter, while all MASS organisations reported energy as an important climate change issue, it was done so in the context of it being a second-order issue to the need to reduce energy costs. The fact that five of the twelve cases reported not having discussed climate change at all (see Table 8) underlines the secondary importance of the phenomena. Statements by several MASS managers gave insights into its level of importance relative to cost reduction. For example, when asked, "What do you do in your role with the organisation that relates to climate change?", Manager A1 reported that:

> *We haven't focused particularly on climate change or specifically on climate change. We generally have some environmental initiatives that certainly I have a large involvement in* (A1, p. 1).

A1 then went on to say:

> *I guess our organisation sees climate change as important. Probably not of critical importance, but certainly elements of climate change as I mentioned before the water initiatives and moving forward toward energy initiatives, we've recognised that they are important elements, issues that the organisation needs to address and consider. So a, "real and serious issue"? Well it's certainly a significant issue. It's probably not at the forefront of everything, however in saying that in any new developments that we carry out we certainly are aware of water conservation and energy conversation* (A1, p. 1).

Such comments were typical of a majority of MASS cases. Similarly, Case B expressed climate change as an issue in a similar way. When asked, "To what extent does this organisation view climate change as a real and serious issue that demands a response?", Manager B1 said:

> *It is a bit like as I said before, we have got a hundred priorities. Is it number one? No, but it is seen as a legitimate issue for us to be across at all levels* (B1, p. 2).

Manager H1 also made a similar comment about whether climate change was a real and serious issue, although a distinction was drawn with the individual manager's view:

> *Honestly I think because of the position, it's not up there with the big issues. Personally, from my end, and from a stadium management perspective, it is* (H1, p. 5).

The role of thinking about climate change and energy is starkly revealed in a comment from Case K. When asked if climate change was a, "real and serious issue", Manager K1 reported that:

> *Yeah, we do view climate change as a real and serious issue, the environment, but it's given high priority because, I think we touched on earlier, that we're a community venue and a state government asset... As I said earlier, I think the fact that we, I suppose, put a high priority to this area has a flow-on effect from a business point of view, that we obviously can reduce our operating costs associated with running the venue* (K1, p. 5).

This remark illustrates a common view among some of the cases. That is, environmental issues such as climate change can be also used as a catalyst for reducing operating expenses, and energy costs were the best example of this.

All of these MASS organisations recognised the link between their energy use and GHG emissions. Based on this recognition, most reported that their emissions were mainly *indirect* in nature and were through their purchase of electrical energy through supply networks that are heavily reliant on coal-fired electricity generators. For example, when asked whether their stadium contributed GHG emissions indirectly, Case E reported that:

> *Absolutely, as I say we report, we're over 25,000 tonnes so that puts us in I think one of the top 700 or 800 contributors in the country* (E1, p. 14).

Whilst nearly all cases reported there were some *direct* GHG emissions, mainly from the use of diesel or gas-powered machinery such as vehicles and kitchens with gas cooking equipment, such GHG emissions were very much a small component of overall emissions. However, only two MASS organisations reported being responsible for sufficient GHG emissions to require them to report them to the Australian Government under the *NGER Act*. Only Cases A and E – both theoretical Category 1, publically-owned, not-for-profit organisations – reported meeting the NGER threshold of 25,000

tonnes of GHG emissions per year. For Case E, while this meant that they would therefore be liable for the carbon tax when introduced, they also thought that they would not be over this threshold for much longer:

> *...we report international greenhouse and energy with our carbon footprint, so we're above 25,000 tonnes, which is in one way good for us because it means that we have to report and we've got some obligations to the government so our board [of trustees] is happy to actually keep pushing the program forward. But when we get some reduction we'll be under that target...* (E1, p. 10).

With emissions of a mostly indirect nature, and only two cases reporting under the *NGER Act*, this suggests that MASS are facilities that are relatively small GHG emitters when compared with larger non-sport facilities such as oil refineries, airlines and waste disposal sites.

It is nevertheless clear from the interview data that a majority of these MASS organisations are still concerned about mitigating (minimising) their GHG emissions. Whilst GHG mitigation was mostly a second-order issue to the first-order issue of reducing energy costs, it was nonetheless a consistent sub-theme emerging from the interview data. Mitigation was reported by ten out of the twelve MASS cases (A, B, C, D, E, F, H, J, K and L) or eighty-three per cent, and was present across all three theoretical categories. Mitigation was also reported to be an important issue. For Case E, mitigation of GHG emissions was explicitly recognised:

> *One, two things: the public has an expectation that we will be responsible managers in terms of energy use and carbon and climate change. I put those under the one umbrella which I shouldn't have, it's a broad umbrella. But we've really focused on the sceptre of carbon emissions, carbon management for us which becomes energy use, energy management, and then driving that really through efficiency gains as well. So any efficiency gains we make as a venue cuts our carbon production, helps contribute to mitigating global warming and all of those wider responsibilities...* (E1, p. 1).

Three cases (A, E and F) also reported purchasing renewable or so-called "green" energy from electricity suppliers as a means to mitigate some of their emissions. For example, one manager explained it like this:

> *We introduced [mobile] lighting rigs at the venue, the first to do it within Australia. Those lighting rigs use around $120,000 worth of power a year and we didn't want to be perceived as an organisation that was having lights on 24 hours a day to stimulate grass growth without offsetting that grass growth with a green energy provider, so we use a green energy provider* (F1, p. 1).

Case A reported two approaches to mitigation: first, participation in the Howard Government's mitigation awareness scheme, the "Greenhouse Challenge", until it ceased operating, and; second, installation of zero emission solar panels on one of its stadia that produced up to twenty per cent of their electricity. Four cases (B, E, F and H) also reported the use of energy monitoring systems for measuring energy use, identifying opportunities for reducing energy consumption, and by extension, mitigating indirect GHG emissions. Cases B, F and J also reported the use of consultants to help identify opportunities for reducing energy use, and therefore mitigation of indirect GHG emissions,

with energy audits common to both. Two cases (B and F) also reported the use of inter-departmental committees, known as a "green team", to help devise strategies for GHG mitigation and other environmental improvements.

However, a majority of MASS organisations reported that mitigating GHG emissions was incidental to reducing energy consumption, and therefore primarily, energy costs. When asked, "What was the goal of their energy conservation efforts?", Case D stated the following:

> *While reducing energy consumption can be varied, it can be just trying to improve the lighting level in particular areas like the...*[42]*, but in other areas it can be a direct goal to reduce energy consumption by replacing say fluoro lights with better fluoro lights with halogen lights. So a replacement policy or replacement program of improved lighting lamps to reduce energy consumption. That's our goal, not necessarily to reduce carbon footprints, but that would result in that* (D2, p. 4).

So while GHG mitigation is important, given the imperative of these organisations for minimising costs and, their strong operational focus, it is a second-order priority.

An energy-related issue that was also identified by four MASS organisations (Cases E, F, I & K) was the prospect of carbon pricing through either a carbon tax or an ETS. For Case E, the most advanced in its thinking about this issue, they had already modelled some possible financial consequences. When asked, "What would a carbon price mean for this organisation?", Manager E1 was unequivocal:

> *[E1]:* *At $20 a tonne, it would cost us about $600,000 a year.*
>
> *[Interviewer]:* *So that's $20 a tonne of CO_2...*[43]
>
> *[E1]:* *If we wanted to then be, if we wanted to be carbon neutral, or I shouldn't...not carbon neutral. If we wanted to offset 100 per cent, that's what our cost would be, about.*
>
> *[Interviewer]:* *$600,000 a year?*
>
> *[E1]:* *About five or $600,000. Now I've, it was part of the business case that I put up to the organisation and I did some numbers on $20, but having also said to the organisation that potentially in Europe at some stage that may reach higher than that. So the organisation has a bit of an idea of what our ongoing costs might be, and for us it doesn't really matter whether it's a direct tax on us as an organisation, or it's a direct tax on the energy provider…*

Whilst not all MASS organisations have the same electricity provider, energy use profile or number of events – and so would not have the same carbon tax liability – this comment suggests carbon pricing is a financial issue for this population of organisations in two ways: first, if energy use is high enough to meet the NGER thresholds, a direct carbon tax liability can exist; second, through higher electricity costs. Electricity generation in Australia is currently heavily carbon-intensive, and with the

[42] The names of these stadia have been removed to preserve anonymity of this case.

[43] The Australian Government's carbon tax commenced nearly 18 months after this interview at a price of $23 per tonne of GHG pollution. The 'fixed-price' period applies only for three years from 2012-2015 after which it will be replaced by market-based floating price under the ETS (MPCCC, 2011b, p. 4).

introduction of the Polluter Pays Principle (Duus-Otterström & Jagers, 2012, p. 747) via the carbon tax and ETS, it is reasonable to suggest that large electricity users like these stadia will have the carbon price passed on to them through electricity bills even if they are not directly liable for the carbon tax itself. Case F recognised that higher energy costs as a result of carbon pricing may have to be passed on to stadium users:

> *Yeah, I think what would end up happening is that the company would need to then make a decision as to whether or not we absorb that fee or indeed we pass that on through our hirers and our end patrons attending the venue. So for us obviously we've got investors who are looking to receive a return on their investment, and if a new tax was introduced – and we saw that with the state government introducing a car parking levy – well ultimately that influences how you operate your business* (F1, p. 11).

Case F also reported that carbon pricing would likely cause them to consider purchasing more renewable energy, which becomes comparatively cheaper when carbon-intensive electricity is priced for its GHG pollution. They also reported that producing their own electricity through co-generation technology would be more desirable. For Case B, carbon pricing was an uncertain issue although they did feel that it had the potential to affect their electrical energy costs, and therefore other core programs:

> *I suppose if it started sort of getting to a real cost but where it does result in money as a cost to us then obviously, yes, it provides that incentive but it is money that we'd be having to be redirected from what we would see as our primary function* (B1, p. 9).

For Case I, "the likelihood is that obviously utility costs for us will go up" (p. 8), while for Case K, the carbon tax was, "another overhead that we need to consider" (K2, p. 7).

However, for the majority of MASS cases (eight out twelve), carbon pricing was a topic of uncertainty. Three cases said they didn't know what the implications of carbon pricing would be for them (B, C, G & H), although cases C and D thought it might be an issue in the future. For most, it wasn't a high priority. Four hadn't yet got around to thinking about it in detail (A, I, J & L) although their responses suggested that they would need to at some point.

Issue 4: Waste issues

Waste was the third key area of issues linked to climate change. For a majority of MASS organisations, climate change-related waste issues were reported. Nine out of the twelve MASS cases, or seventy-five per cent, identified waste as a climate issue with only cases C, F and G not doing so. This meant that waste as a climate issue was evident in all three theoretical categories although Category 1 (publically-owned, not-for-profit), was where it was indicated most strongly. Waste manifested as a climate issue because it was widely recognised by MASS organisations that GHG emissions, such as methane (CH_4), can be produced when the solid waste that was generated at their stadia is disposed of as landfill, and decomposes, at Solid Waste Disposal Sites (SWDS). The creation of GHG emissions from the decomposition of solid waste when dumped as landfill – sometimes

referred to as "landfill gas" – is a valid point that is recognised by the International Energy Agency (IEA, 2008), the United Nations Environment Programme (UNEP, 2010), the United States Environment Protection Agency (USEPA, 2015), the Australian Department of Climate Change & Energy Efficiency (DCCEE, 2007b, p. 190; 2012d), and the Victorian Environment Protection Authority (VEPA, 2012). A summary of these results is presented in Table 14 below.

Table 14: Waste issues identified by MASS organisations relating to climate change

CLIMATE CHANGE-RELATED WASTE ISSUES	ENERGY AS A CLIMATE CHANGE ISSUE FOR MASS CASES BY THEORETICAL CATEGORY			MASS MANAGERS REPORTING THIS (N = 13)
	Category 1 - Publically-owned, not-for-profit	Category 2 - Privately-owned, not-for-profit	Category 3 - Privately-owned, for-profit	
MASS cases identifying waste as a climate change issue (n = 8)	A, D, E, I, J	B, H, K	L	A1, A2, A3, B1, B2, D1, D2, E1, H1, I1, J1, K1, L1
Recognition of the link between waste and indirect/landfill GHG emissions (n = 10)	A, D, E, I, J	B, H, K	C, F	A1, A2, A3, B1, B2, C1, D1, D2, E1, F1, H1, I1, J1, K1
Recycling cited as a means for reducing GHG emissions (n = 10)	A, D, E, I, J	B, H, K	C, F	A1, A2, A3, B1, B2, C1, D2, E1, F1, H1, I1, J1, K1
TOTALS	**5**	**3**	**3**	**13**

Waste as a climate issue was reported in different ways. For example, several cases talked about their attempts to reduce solid waste disposed as "landfill" that had the effect of reducing GHG gases from SWDS. The word "landfill" was used eleven times by MASS managers in the interviews, and the following is a good example of a link that was drawn between it and GHG emissions. When asked if stakeholders have any impact on how their organisation "responds to climate change?", Manager A2 said:

> *As we turnover contractors and service providers, etc., we have certain policies in place that they have to adhere to and they would modify our tender program going about what our requirements are. And a lot of those are based on waste as a closed loop attempting to get towards 100 per cent closed loop so we are not going to landfill. That's got an impact on our carbon footprint...* (A2, p. 8).

Other cases also connected waste with climate change. Waste reduction was a clear example that illustrated the relationship; if you reduced waste, you also reduced GHG emissions. Case J expressed it this way:

> *Our things that we've looked at in regards to mitigating any emissions are reducing waste. So obviously with the recycling programmes and separating glass, cardboard and bulk recycling from waste which has been, I mean we were looking at moving around 40 cubic metres of just general waste beforehand, that's what we'd do after every AFL game. Now we move about 35 cubic metres of recycling in general and about 10m of rubbish or general waste. So that's probably where we're looking at mitigating greenhouse gas emissions* (J1, p. 11).

Case H also understood the relationship between lower waste and lower GHG emissions reporting that, *"waste management again is a big part of reducing that carbon footprint"* (H1, p. 5). Case E also reported that it was important for governments to legislate for reducing solid waste to landfill in order to create *"meaningful reductions"* in landfill gas emissions (E1, p. 6). However, as with their energy reduction strategies, the goal of reducing waste was not solely about reducing GHG emissions. Other factors that were identified for this included cost savings, corporate social responsibility, and pressure to reduce solid waste volumes from state and local governments.

Most MASS organisations also had sophisticated solid waste recycling programs in place that meant that they had already reduced their contribution landfill gas/GHG emissions. Ten out of the twelve MASS cases, or eighty-three per cent, reported having recycling programs in place for solid waste from their stadia. Four of the twelve MASS cases (A, F, I, & J), or thirty-three per cent, reported using the Closed Loop Recycling (CLR) system that aims to eliminate the disposal of all recyclable material as landfill. Recyclable materials diverted from landfill by the CLR process include metal and plastic drink containers, and all paper and cardboard waste.

Issue 5: Other issues

There were also other results from the interview data that, whilst not common to all or even most of the MASS organisations, nevertheless were noteworthy. For example, an issue reported by a minority of MASS cases was *vulnerability* to climate change and here the results are somewhat contradictory. Whilst all MASS organisations reported extreme weather events such as drought, and associated water issues, only two felt vulnerable (H, K). Case K also reported that their stadium was vulnerable to lower rainfall because they did not have enough water storage capacity to supply all their water needs during extended drought periods.

By contrast, vulnerability's antithesis – resilience – was frequently reported. Nine of the twelve MASS cases (seventy-five per cent) reported that their stadia were resilient to climate change (Cases A, B, C, D, E, G, I, J, & L). This meant that resilience to climate change was reported in each of the three theoretical categories identified for this study. However, given the significance of water issues to MASS identified previously, the degree to which these organisations have developed resilience to drought related to climate change because of their investment in water-saving infrastructure will be discussed in the next chapter. Finally, Case F reported their stadium being "somewhat resilient." A summary of resilience reported is presented in Table 15 below.

Table 15: Resilience to climate change reported by MASS organisations

VARIABLES	MASS CASES REPORTING VULNERABIITY OR RESILIENCE TO CLIMATE CHANGE			MASS MANAGERS REPORTING THIS (N = 15)
	Category 1 - Publically-owned, not-for-profit	Category 2 - Privately-owned, not-for-profit	Category 3 - Privately-owned, for-profit	
MASS cases reporting resilience to climate change (n = 9)	A, D, E, I, J	B, G	C, L	A1, A2, A3, B1, C1, D2, E1, G1, I1, J1, L1
MASS cases reporting being vulnerable to climate change (n = 2)		H, K		H1, K1, K2
MASS cases reporting being somewhat vulnerable to climate change (n = 1)			F	F1
TOTALS	**5**	**4**	**3**	**15**

The disparity between the reporting of resilience to the physical impacts of climate change and the reporting of vulnerability, is an interesting point. Whilst it may be true that seventy-five per cent of these stadia are resilient to such impacts, there is at least the potential for this to be an example of a "socially desirable" response bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Such bias is particularly associated with "face-to-face" interviews of the kind used in this study (Podsakoff et al., 2003, p. 885). Equally, as climate change vulnerability and resilience were concepts raised by the interviewer, there was potential for it to be an example of "measurement item" bias (Podsakoff et al., 2003). That is, it is possible that reporting "resilience" was perceived by some of the respondents to be more desirable than reporting "vulnerability." However, one valid "procedural remedy" for such a potential problem is to "protect respondent anonymity and reduc[e] evaluation apprehension" (2003, p. 888; Podsakoff, MacKenzie, & Podsakoff, 2012, p. 562), a procedure that was followed for this study. By assuring the respondents to this study prior to the interviews that there were no "right or wrong answers" and that they should "answer the questions as honestly as possible", they were less likely to "edit their responses" to make them socially desirable. Where possible, the use of multiple respondents and/or secondary sources was another procedure adopted (Podsakoff et al., 2003; Podsakoff et al., 2012, p. 548). As a consequence, it is reasonable to be confident in this finding about resilience.

One point of physical vulnerability to climate change identified by one of the MASS organisations that was noteworthy was that of the grass playing surface to increased evaporation of water. Case E reported that, due to a warming climate in Australia, they had experienced increased rates of evaporation of water that they used to grow the grass playing surface of their stadium. The senior manager who reported this directly linked this increased evaporation to climate change. When asked

whether the climate in the city in which his stadium was located was changing, he reported the following:

> *The thing that we notice more than anything else with turf and some of those things on the ground is the level of evaporation we have. The humidity is much lower than what it was, we've got drying days here that, and it's something, it's a subject that never gets talked about in terms of environmental change. People talk about ºC increase and some of those things, but the air is much dryer, so... the way we apply water to the turf's surface, we know how much evaporation occurs on a daily basis and we put 75 per cent of that water back fundamentally. We're putting more water on than what we ever have in terms of that because the evaporation levels are so high (E1, p. 9).*

Similarly, Case H alluded to evaporation as an issue:

> *As it gets drier we need to water more, as we water more it increases the costs and it's not just a standard. As it's getting hotter, we have to water more (H1, p. 2).*

Although no other MASS managers reported increased water evaporation caused by climate change as an issue, these remarks highlight a vulnerability for MASS organisations over the mid-to-long term.

The vulnerability of grass playing surfaces to periods of extreme heat that may be associated with climate change was identified in five cases. For example, Manager F1 reported:

> *As far as temperatures, our number one asset I would argue is our playing surface... We've got rye grass at the venue. The plant shuts down at around 28 ºC, so it's difficult to grow grass if the climate is increasing and the plant has actually shut down that whole time because it can't process it because it's too hot (F1, pp. 7-8).*

Case J also reported changing the type of grass used on their playing surface in recent years from, *"a really thirsty ryegrass to drought tolerant couch grass"* (J1, p. 2). Other cases also reported that they may have to change the type of grass on their playing surface if higher average temperatures were to persist (A, D & H).

Another climate issue highlighted by only one MASS case was the reluctance of some key stadium stakeholders to address climate change. Case E reported that some sport organisations that used their stadium were unwilling to do more about climate change:

> *...our major sporting providers into this venue, we would want them to have some responsibility about environmental initiatives, and sometimes they do and sometimes they don't. I mean they don't do..., we don't think they do enough [that is] meaningful. When you have a look at venues, when you understand players flying all around the country or flying interstate to do other things all the time and that sort of component gets forgotten about. Hotel nights, the patrons come to a game and gets spent in a city that have a carbon impact. Where some of our primary sporting bodies ignore all of that, they'll say, "Well that's outside of our control. What we will do is we will pay an energy supply company to offset 50 per cent of the energy usage of the venue for one event." Big deal! I mean it's not a sustainable or responsible outcome we don't think. So we're trying to convince them that they should be doing more, but as with a lot of organisations it's, they see it as probably taking dollars off their bottom line. So it becomes a bit difficult at times unless there's enough incentive for them to do that. Our view is public pressure would be one of those incentives. We have with this venue, and a lot of other venues that*

are such a high energy use when these things are lit up at night, with light towers on I mean it's just as much this code's responsibility as ours (E1, p. 5).

This quote gives an insight into how the financial costs of mitigating direct or indirect GHG emissions are a crucial barrier for national sport organisations and, organisations that manage MASS. Case E also reported that some other major sport stadia were reluctant to do more about climate change, and that to a degree, this was tied to uncertainty about government policy. When asked why this was the case, he suggested the following:

[E1]: *I think it's a minimalist attitude.*

[Interviewer]: *Minimalist?*

[E1]: *I think it'll be about, "What does the legislation say we have to do? What do the laws of the land say we have to do?" and, "Do we need to do any more than that?" And I think their answer to both of those is, "Well there's some confusion about what the laws of land are, if there's going to be a carbon tax and the government's not setting strong definite targets at the moment..." Every time the US [United States] government, and our government, and world governments start to hesitate about what future [GHG reduction] targets should be, it gives a lot of organisations an out clause I think not to do [reduce] carbon emission[s]. And I think a lot of organisations are waiting to see what the world sort of policy becomes before they act, and I think they're using just, "What, we're doing. What we're supposed to do. We'll put enough advertising spin on it so that it sounds a little more than what it really is", and, "That'll do us." But I think unless there's some legislation around…let me give you an example. A few years ago, I mean in Europe about stadiums and waste management and some of those things, it wasn't until legislation was brought in that you had to recycle 80 per cent of your waste from your stadium, had to be recycled, could not go to landfill. It was only at that point that stadiums actually put some time, effort into this to make sure that happened. Before that there was lots of rubbish going to landfill. So unless it's legislated, I think it'll be really difficult to actually get any meaningful [GHG] reductions out of this* (E1, pp. 5-6).

This passage highlights the impact of recent failures to achieve international and national agreement to reduce GHG emissions on organisations. In particular, it highlights a "wait and see" attitude where organisations are waiting for a clearer policy direction from government before contemplating – and taking – more action to reduce direct or indirect GHG emissions. This passage also highlights the key role that government regulation plays in shaping the responses of major stadia to environmental issues.

Theme 3: How and why MASS organisations responded to climate change

Where MASS organisations responded to climate change, they did so in two broad ways: (1) *directly*, and; (2) *indirectly*. As stated earlier in this chapter, the MASS cases reported three major types of climate issues to which they have, or would, respond to: first, water issues; second, energy issues, and; third, waste issues. However, whilst all MASS cases reported these climate issues, in the view of

a number of cases, they did not necessarily perceive themselves to be responding directly to climate change issues. Rather, and given their need to manage practical operational matters, some saw themselves as responding to the flow-on effects of climate change. For example, whilst direct physical impacts of climate change on their stadia such as lower rainfall, higher evaporation rates and the impact of higher temperatures on grass playing surfaces could in a majority of cases be easily attributed to climate change, more abstract climate issues such as higher water prices as a result of government water efficiency policy, higher energy costs as a result of a carbon tax that had yet to be introduced by government, and the need for the mitigation of direct or indirect GHG emissions to become an operational priority, were less clear. As a consequence, other and more operationally-related objectives – such as the need to reduce operating costs – were in most cases the primary driver of management strategy. Whilst the efficient management of water and energy resources, and of waste materials, was consistent with broader national and international climate policy – and with the perceived obligations of these organisations to be socially responsible corporate citizens – such strategies were primarily aimed at achieving non-climate objectives.

However, these MASS cases were adopting some management strategies that were consistent with wider responses identified in the literature for responding to climate change. While they were doing so in the absence of integrated climate change plans, water management, energy management and waste management were the primary ways in which these organisations were responding to climate change. As the methods for responding to climate issues (the "how") were so closely linked to specific issues or other factors (the "why"), the next section of this chapter will discuss how and why the MASS cases responded to climate change together.

How and why MASS organisations responded to climate-related water issues

Beginning with water issues related to climate change, MASS organisations reported a number of ways in which they respond. Chief among them was investment in, and installation of, water saving infrastructure. Key examples of water saving infrastructure included water harvesting equipment, water storage tanks, water recycling equipment, and water saving devices such as low-flow taps and showers. Additional to water saving infrastructure was water saving products such as drought-tolerant/low-water grasses for playing surfaces, whilst one case reported working with their water supplier in a partnership for identifying opportunities for water savings. A summary of these responses is given in Table 16 below.

Table 16: How MASS cases responded to water and climate change issues

RESPONSES TO WATER ISSUES	HOW MASS CASES RESPONDED TO WATER & CLIMATE CHANGE ISSUES			MASS MANAGERS REPORTING THIS (N = 15)
	Category 1 - Publically-owned, not-for-profit	Category 2 - Privately-owned, not-for-profit	Category 3 - Privately-owned, for-profit	
Water harvesting & storage (n = 9)	A, E, I, J	H, K	C, F, L	A1, A2, A3, C1, E1, F1, H1, I1, J1, K1, L1
Water recycling (n = 7)	A, I, J	H, K	C, L	A3, B2, C1, H1, H4, I1, J1, K1, L1
Water treatment plant (n = 1)	E			E1
Water management for playing surfaces (n = 5)	E	B, H, K	L	B1, B2, E1, H1, H4, K1, L1
Water efficiency equipment (n = 2)	D, J	B		B1, D2, J1
Water efficiency reporting (NABERS) (n = 2)	D, J			D2, J1
Partnership with water supplier (n = 2)	J	B	F	B1, F1, J1
Switched to drought-tolerant/water-efficient grass varieties (n = 1)	J			J1
Considering switching to drought-tolerant/water-efficient grass varieties (n = 3)	A	D	H	A2, D2, H1
TOTALS	**5**	**4**	**3**	**15**

All MASS organisations reported responding to this water-constrained operating environment with significant investment in water saving infrastructure because of lower rainfall/drought conditions of recent years, and, associated government-mandated requirements for water efficiency. Such infrastructure centred on a water harvesting process that used stadium roofing as the site for capturing rainwater, and then storing that captured water in huge water tanks. Such water tanks were in some cases above ground, but most commonly were located underground. However, this equipment was supplemented by other water-saving technologies aimed at water efficiency such as low-water – or waterless – toilets, low-flow taps and showerheads, re-engineering of hose pipes to increase water pressure, drought-tolerant grass for playing surfaces, and for Case E, even the installation of a major Class-A water recycling plant designed to clean up sewerage to the point where it can be used for drinking purposes. The following quote from Case A offers insight into the way in which the drought of recent years is linked to water saving infrastructure:

> *...[44] had a real issue with a drought so we looked at retrofitting or reducing consumption of water across all of our venues and that was achieved by retrofitting most of our fittings and fixtures in the venues with water saving devices, also by reducing consumption from an operation point of view through our grounds managers and grounds staff reducing when they watered and how they watered their pitches. And we*

[44] Name of this state removed to preserve anonymity of this case.

> *also looked at putting in tanks, installing tanks to reduce the consumption of mains water and mainly use water that had been captured onsite. So most of our venues have in excess of about 1 million litres of water tanks storage onsite* (A1, p. 1).

A 2009 public document from Case F also highlighted the use of water harvesting technology:

> *In late 2008, the stadium installed a network of 17 large water tanks throughout the venue which has allowed...stadium to harvest rain water and store up to 1 million litres of storm water at any one time* (Case F, p. 16).

The 2010 version of the same document stated that, *"in excess of 23 million litres of rainwater"*, had been harvested by Case F (p. 12). Case C also identified significant use of rainwater harvesting equipment:

> *...we harvest rainwater off the roofs so for seven years or through the drought, we got 3.2 million litre storage capacity of rainwater. A lot of the time when that runs out we actually go back to using recycled water which is from...*[45]*Recycling Plant which is still better than potable water, but it costs us money obviously from a business perspective. But in the last year we haven't had to rely on that at all. We've harvested our own rain water. We've harvested somewhere between nine and ten million litres of rainwater a year which we use for irrigation on the arena...* (C1, p. 5).

In this context, water infrastructure was frequently linked to climate change by these organisations.

However, the widespread uptake of water-saving infrastructure by MASS organisations was not solely explained by lower rainfall/drought. The interview data also showed that there was a clear relationship between government legislation requiring large water users like MASS organisations to – report water use, restrict water use and meet water efficiency targets – and MASS organisations investing in water-saving infrastructure. As Case A put it, the installation of huge water storage tanks was intended to, *"reduce the consumption of mains water and mainly use water that had been captured onsite"* (A1, p. 1). Several cases either explicitly (A, B, D, E & J) or implicitly (B, G, H) referred to the role of government water requirements introduced during the recent years of drought to explain their introduction of water-saving infrastructure. Installation of water-saving infrastructure was prompted by the combination of government-mandated water restrictions, and associated legislation requiring water saving targets to be met. For example, Case B reported that their state government had *"embraced"* the scientific claim that climate change was happening, and with it, there was a decline in rainfall that required water restrictions:

> *If our water use exceeds a certain level as such, we are now required to, "participate in water efficiency measures by 28th January, please present us with your annual reporting plan", etc., etc. So it has moved from the scientist sort of saying, "yes we see a pattern of decline here, this is how we might sort of describe the impact" to "here is regulation" saying this is how you need to respond to it and now that is across the board in...*[46]*for entities that use a certain level of water* (B1, p. 3).

As a consequence, investment in water-saving infrastructure was a response not only to declining rainfall associated with climate change, but was also closely linked to legislative and regulatory

[45] Name of this suburb removed to preserve anonymity of this case.
[46] Name of this city removed to preserve anonymity of this case.

responses to climate change by state governments around Australia. In other words, in a *top-down* manner, state governments were now requiring MASS organisations to have formal water management strategies.

However, lower rainfall and government legislation alone did not account for investment in water-saving infrastructure. Installation of water-saving infrastructure was also prompted by a desire to be good corporate citizens at a time of depleted public water supplies. For example, in explaining their multi-million dollar investment in a Class-A water recycling plant, Case E made it clear that they were motivated by both financial reasons and a desire to be a good corporate citizen:

> *One of those is upgrading the condition of...*[47]*, because we're accused of car parking on there and degrading the..., we have a different view, we have a different view that we need water so we're going to build a Class-A recycling plant..., so that we can provide water to...and then also we'll provide all the water requirements for... and then also we're going to pump water within the stadium* (E1, p. 7).

Case E went further to explain that the expensive water treatment plant wasn't just explained by the *"business case"* for it:

> *It is, it's an opportunity to save money within our organisation, it's an opportunity to run some interpretative, to put another arrow in our sling I guess about educating people. We have three million people through here a year, we have 300,000 school groups and we want to run some interpretative issues around a place and talk about this venue, not, in another light besides sport. We talk about it in some other initiatives that we're doing as well...*[48] *It also enables us, we think, to actually put ourselves in a leadership role in venues around the world, because we don't think other venues are doing this, we don't think they're doing it well, and we think we're able to* (E1, p. 8).

The notion of these MASS organisations, "doing the right thing", or being, "a good corporate citizen" – as indicated earlier in this chapter – was one that would be stated by most of the cases.

How and why MASS organisations responded to climate-related energy issues

To the extent that MASS organisations reported responding to climate-related energy issues, they did so with a range of energy conservation measures. Whilst energy conservation was not solely a climate change-related issue in the eyes of most MASS organisations, ten out of twelve MASS cases (eighty-three per cent) recognised that saving energy also saved (mitigated) GHG emissions. This was because, as reported earlier in this chapter, these stadia are big users of energy. As a result, energy conservation was a high priority in order to reduce costs, and secondarily, to reduce GHG emissions. These organisations used a variety of measures to reduce energy use including: switching off all electrical equipment unless needed, installation or testing of energy-efficient lighting, motion sensors to switch off lighting unless people were present in that area, purchasing energy and GHG emissions

[47] The name of this area has been deleted to preserve the anonymity of this case.
[48] Part of the quote deleted in order to preserve anonymity of the case.

monitoring software, and the use of security staff or consultants to identify opportunities for energy and GHG emissions savings. A summary of these responses is presented in Table 17 below.

Table 17: Energy management responses reported by MASS organisations relating to climate change

RESPONSES TO ENERGY ISSUES	RESPONSES TO CLIMATE-RELATED ENERGY ISSUES FOR MASS CASES BY THEORETICAL CATEGORY			MASS MANAGERS REPORTING THIS (N = 12)
	Category 1 - Publically-owned, not-for-profit	Category 2 - Privately-owned, not-for-profit	Category 3 - Privately-owned, for-profit	
Mitigation of GHG emissions through energy conservation measures (n = 10)	A, D, E, J	B, H, K	C, F, L	A1, A2, A3, B1, B2, C1, D1, E1, F1, H1, J1, K2, L1
Installation or testing of energy-efficient lighting (n = 5)	A, D, E, J		F	A1, A2, A3, D1, E1, F1, J1
Motion sensors (n = 1)			C	C1
Use of consultants to identify opportunities for mitigation of GHG emissions through energy conservation measures (n = 3)	A, D		F	A1, D2, F1
Reporting energy use & GHG emissions under NGER Act (n = 2)	A, E			A1, E1
Creation of a "Green Team" to identify opportunities for reducing GHG emissions (n = 2)		B	F	B1, F1
Energy efficiency reporting (NABERS) (n = 1)	D			D1, D2
Energy & GHG emissions monitoring software (n = 1)		B		B1
TOTALS	**4**	**3**	**3**	**12**

Whilst for most cases responding to climate-related energy issues was a second-order issue to lowering energy costs, most did report that mitigation of emissions was important.

Case E explained that their response to climate change wasn't just explained by the "business case" for it. When asked, "What is it in your role that relates to climate change?", Manager E1 said this:

> *I guess under the heading of environment, climate change is one of those aspects and we really came from a position of Corporate Social Responsibility. I mean we report basically on a financial basis through this organisation, people through the gate, etc. We haven't got a mature reporting process of Triple Bottom Line, and one of the elements that I suggested to our board we go away every year at a strategy retreat was to talk about this corporate responsibility and talk about the effects of environment, and environment change, and up until about four years ago, or five years ago, not too many within this organisation had a, had any sort of strong idea about protocols and what was actually happening in the world in terms of climate change, potential impact of carbon tax, etc. So I volunteered to actually do some work and do some research on that and present a case to board. We now have the subject of the environment as one of our five strategic initiatives as an organisation so it's been coming a long way to actually get to that point where we've had to convince our board that (1) this was a worthwhile exercise*

> *that we should pursue; (2) there was some value in it. And so it's been an educational process within, and without, of the organisation* (E1, p. 1).

This general attitude was evident in nine out of the twelve cases. Eight cases spoke of, *"doing the right thing"* (Cases A, B, C, D, E, H, J & K), while six cases referred to being a, *"corporate citizen"* (Cases B, D, E, F, & H), and so corporate social responsibility (CSR) was a recurring theme. Case A also spoke of balancing corporate objectives with wider responsibilities:

> *...this organisation achieves the Government outcomes and its corporate objectives by balancing its environmental, social and commercial responsibilities. So in a fairly broad way we are looking at balancing the environment against trying to achieve our core outcomes I guess* (A1, p. 1).

When asked why the stadium's impact on the environment was important to his organisation, Manager C1 simply said: *"Social responsibility"* (C1, p. 4). These comments suggest a belief among MASS organisations that they have a wider responsibility to manage their stadia in the interests of the community, and not just in the narrow interests of their members or other stakeholders.

How and why MASS organisations responded to climate-related waste issues

Only four out of the twelve MASS cases (thirty-three per cent) reported responding to climate-related waste issues. To the extent that MASS organisations reported responding to climate-related waste issues, they did so essentially with a recycling strategy. Whilst waste management was not solely a climate change-related issue in the eyes of most MASS organisations, it was widely recognised that reducing waste also reduced GHG emissions by avoiding landfill. As these stadia are big public facilities that cater for thousands of spectators on event days, each year they generate hundreds of tonnes of solid waste such as cans, bottles, cups and other food packaging. As a result, waste management was a high priority; partly in order to reduce costs, and secondarily for reasons of corporate social responsibility, to reduce GHG emissions. To the extent that these MASS organisations were responding to the need to mitigate GHG emissions, the primary response of these MASS organisations was the use of extensive waste recycling processes such as Closed Loop Recycling (CLR) where recyclable waste was sorted on site, and diverted from landfill by sending it to CLR companies for recycling. A summary of these responses is presented in Table 18 below.

Table 18: Waste management responses reported by MASS organisations relating to climate change

RESPONSES TO WASTE ISSUE	RESPONSES TO CLIMATE-RELATED WASTE ISSUE FOR MASS CASES BY THEORETICAL CATEGORY			MASS MANAGERS REPORTING THIS (N = 4)
	Category 1 - Publically-owned, not-for-profit	Category 2 - Privately-owned, not-for-profit	Category 3 - Privately-owned, for-profit	
Use of Closed Loop Recycling process (n = 4)	A, I, J		F	A2, F1, I1, J1
TOTALS	**3**	**0**	**1**	**4**

Theme 4: Barriers to effective responses to climate change

It was clear from the interview data that for these MASS organisations, some barriers existed to responding to climate change more effectively. These barriers include lack of funds to implement climate initiatives, problems with stakeholders, poor understanding of climate change, and inadequate stadium design. However, the key barrier to responding to climate change more effectively was a resource issue, especially the lack of financial resources. The lack of financial resources for responding to climate change was especially critical given the overriding priorities of MASS organisations of staging good quality events at their stadia, and for either generating financial surpluses from their operations, or at the very least, to break even. The importance of generating financial surpluses was especially acute in the case of those Category 3 organisations that were privately-owned and for-profit. Overwhelmingly, lack of financial resources was reported as the biggest barrier to responding effectively to climate change. Nine out of twelve (seventy-five per cent) of MASS cases cited lack of money as the biggest obstacle to doing what they would like to do. A summary of all barriers is presented in Table 19 below.

Table 19: Barriers to responding effectively to climate change

BARRIERS TO RESPONDING EFFECTIVELY TO CLIMATE CHANGE	BARRIERS TO RESPONDING EFFECTIVELY TO CLIMATE CHANGE			MASS MANAGERS REPORTING THIS (N = 16)
	Category 1 - Publically-owned, not-for-profit	Category 2 - Privately-owned, not-for-profit	Category 3 - Privately-owned, for-profit	
Lack of money (n = 9)	A, D, I, J	B, K	C, F, L	A1, A2, A3, B1, C1, D1, D2, F1, H2, I1, J1, K1, L1
Stakeholders (n = 1)	A			A1
Poor understanding of climate change by board directors or stakeholders (n = 3)	E, I	H		E1, H1, I1
Lack of a long-term view (n = 1)	E			E1
Lack of appropriate governance structure (n = 1)		G		G1
Inadequate stadium design that does not take climate change not into account (n = 2)	B	H		B1, H1
Lack of information and technology (n = 1)			L	L1
TOTALS	**5**	**4**	**3**	**16**

For example, when asked "what makes it difficult or challenging to respond to climate change?", Manager A1 reported that lack of money and stakeholders were barriers:

[A1]: *Just funding generally.*

[Interviewer]: *Funding? Yeah okay.*

[A1]: *And stakeholders, in whatever form stakeholders might be like to see the most effective and efficient use of money to deliver core outcomes for an organisation. And it's always a challenge to have funding that*

> *might be perceived to not to deliver direct outcomes to our constituents, to the public. That's not to say that we don't get support because we certainly do but in terms of it being potential barrier. There's only so much money to go around* (A1, p. 10).

Similarly, Case B cited a lack of funds as the biggest barrier to his desired response:

> *I'd say money. You might say it doesn't necessarily take money but I think money is always – the capacity, the resources that are to actually do things. For example, one of the things that I would like to do, and I might have mentioned this to you, is the – one of the things with stadiums is they've got extensive roofs so they're a great space for solar panels. So, for example, if we look across there where you've got what we call the...*[49]*stand, that's facing north, it's on an angle, it's probably about 18 degrees so it needs to be a bit more, that's perfectly placed for solar panels* (B1, p. 12).

Case C had a similar story:

> *As I say the nature of the business is we try and hold as many events as we can pretty much and maximise the number of people we get to each event as well so it's obviously cost related. I guess cost is the main factor I mean if I had unlimited budget then I could get the generators running power back into the grid now and I could maybe get a couple of generators on site and do some more and get solar power all over the, all over solar panels all over the roof, etc. So cost would be a barrier to really making major changes but we're always, like I said previously, we're always investigating opportunities and are willing to spend money...*(C1, pp. 15-16).

Case J cited the financial barrier very bluntly:

> *Funding. Money. Accountants rule the world. If the payback period is not in an economical timeframe, it won't happen. Unless there is money left in a budget somewhere so, "okay, well yes, we can spend it"* (J1, p. 14).

A lack of financial resources was therefore the key barrier to responding effectively to climate change.

However, lack of money was not the only barrier. Case E also reported that a poor understanding of climate change at board of director level can contribute to organisational inertia for responding to climate change:

> *I think the perception. I still think it's got some proving to do whether it's real or not, and I think that always comes up as a barrier. And we actually think...I mean because our board changes over every four years we get new members on. Every time we get a new member on it will be about, "I think that what you're doing is a good idea", or, "I think what you're doing is not a good idea and you're wasting money." That discussion will happen again* (E1, p. 22).

In contrast, Case L reported that lack of reliable and accurate information, and the absence of information technology:

> *I think what helps us is information about various activities, or activations that could be put in to place that might contribute or help. I think having the right tools, and the right equipment, whether it's software, or hardware, to be able to manage things, to have people who have got a focus on those things, to continually monitor and manage* (L1, p. 9).

[49] Name of this stadium grandstand deleted to preserve the anonymity of this case.

Whilst a lack of financial resources was overwhelmingly considered to be the key barrier to doing better in relation to climate change, only Case L alluded to a lack of organisational capability in the form of staff skills and experience, as a barrier. Despite some of the complexities posed by climate change such as identifying, measuring, and mitigating GHG emission for which they were directly or indirectly responsible, this suggests that these organisations mostly feel they have the capabilities to manage such issues.

Theme 5: Influences on MASS cases responses to climate change

It was clear from the interview data that different factors influenced how and why MASS organisations responded to climate change. Seven different factors were identified as influences on the responses to climate issues. These influences include government stakeholders and their information on climate change, corporate social responsibility, stakeholders/corporate partners, organisational values, public opinion, the views of staff, and the action of other stadia. Of these seven influences, government stakeholders and their information on climate change was the strongest, being nominated by eight out of twelve cases (seventy-five per cent). These influences are summarised in Table 20 below.

Table 20: Influences on MASS cases responses to climate change issues

INFLUENCES ON MASS CASES	INFLUENCES ON MASS CASES RESPONSES TO CLIMATE ISSUES BY THEORETICAL CATEGORY			MASS MANAGERS REPORTING THIS (N = 13)
	Category 1 - Publically-owned, not-for-profit	Category 2 - Privately-owned, not-for-profit	Category 3 - Privately-owned, for-profit	
Stakeholder [government] (n = 8)	A, D, E, J	B, K	C, F	A1, A2, B1, C1, D1, D2, E1, F1, J1, K1
Perceived obligation of corporate social responsibility (n = 5)	E, J	H, K	F	E1, F1, H4, J1, K1
Organisational values (n = 6)	A, E, J	B, K	F	A1, A3, B1, E1, F1, J1, K1
Public opinion (n = 4)	A, J	K	F	A3, F1, J1, K1
Stakeholders [corporate partners] (n = 3)	E	K	F	E1, F1, K1
Staff (n = 3)	A, E, J	B		A3, B1, E1, J1
Other stadia (n = 2)		H	F	H1, F1
TOTALS	**4**	**3**	**2**	**13**

For example, government stakeholders were cited as an influence on what MASS organisations did in relation to climate change. Case K, as a privately-owned, not-for-profit organisation, was a case in point:

> *Yeah, we have a lot of pressure on from, I suppose, our shareholders and our stakeholders in terms of the government and from that the ...[50], our landlord, so there's a lot of review of contracts to ensure compliance with policies and that sort of stuff from their point of view. They've got a very heavy focus on strict KPIs and achieving reductions and improvements with regard to recycling, water usage, all that sort of thing. So there's a bit of pressure on there from government bodies. There's also obviously heavy reporting and compliance matters associated with the solar panels and the solar system* (K1, p. 10).

Case B also highlighted the important influence of government:

> *I would have thought primarily government rather than business though. I think business is more than willing to respond and to be a participant but I don't see it as the driver in that sense. I think that's an important role for government to develop policy, provide incentives, provide some direction, and if it's of a view that this is of broader public benefit, then it needs to put in place different sort of programs or incentives in order for that to occur* (B1, p. 11).

The powerful influence of government in shaping specific action – or lack of action – to address climate change was illustrated by Case D's manager. When asked why his organisation did not discuss climate change, he reported that they didn't because essentially, no government legislation required them to:

> *Look, it may be because various acts of parliament do not stipulate anything in respect of climate change. I'm just looking at our Sustainability Plan and the Energy and Utilities Administration Act (1987). It states that, "state government agencies and businesses stipulated in the Energy Act are required to prepare an energy savings action plan." So I suppose we're not original in our thought to save money, although we had done that in many areas, but there is a requirement in...[51] for agencies or government departments to in fact to save energy and then reduce energy production, energy use or greenhouse gas emissions as a flow through from that. Even in the Act that I'm referring to, it doesn't talk about climate change as an entity in itself* (D2, p. 7).

Compliance with the narrow confines of government legislation was therefore a key influence for these organisations. Case J also reported that climate change was a "political issue" at both federal and state levels and as a consequence, government policy meant it became an issue for their organisation.

Earlier in this chapter, it was reported that nine out of the twelve cases identified corporate social responsibility (CSR) as an important influence on their responses to climate change-related energy issues. Five MASS cases also specifically cited CSR as key influence. When asked about the influence of the board of directors, Case E said this:

> *[E1]:* *Well they have because they've accepted and committed funds to actually making things work. But I think they've done it under the umbrella of, "This is a box we can tick for corporate social responsibility." Now I don't care, or really know what the motivation is. I mean we're trying to get an outcome on some of those things, so we will shape things as we think we need to get them through, and it doesn't really matter. I mean but the board's been very supportive.*

[50] Name of this organisation removed in order to ensure the anonymity of the case.
[51] Name of this state removed in order to ensure the anonymity of the case.

They could've just as easily said, "No, we don't think it is relevant", or, "Let's revisit this in 12 months' time", but they didn't. So they've been... nothing would happen without that approval from board level.

[Interviewer]: *From what you've said about corporate social responsibility, is CSR something that's important to the Board?*

[E1]: *I think it's becoming more important. I think, I mean we are a public, very public organisation and we're questioned about lots of things that we do, that we do well or we do badly, and this is one of those topics. I mean we need to be able to demonstrate, as I was saying before, we need to be able to not say, "We're doing things." We need to be able to demonstrate we're doing things as well. We're a large membership-based organisation as well, so we've got our members that are quite vocal about how well we manage this venue and what we do for them, and what our sort of ethics, and character and charter is so it all adds to that" (E1, pp. 20-21).*

The most senior executive of Case H reported similar social obligations:

> *Then I think secondly, you've got, as an organisation, I suppose a corporate or a moral responsibility, and there is a place for people to work and what they look to, to also do things that potentially the environment and those things is something that is part of the consciousness of an organisation that you also need to be focused on going forward* (H4, p. 2).

Case J also reported CSR as a key influence. Referring to their statement of key values, he said:

> *I think the innovation bit and the responsibility are probably the two key drivers with the way that it's shaped the way the actual stadium and the park itself has been proactive in making an adaptation. Innovation being, you know, we had to change so and we're going to be the first to do it because you know the constraints that we've had put on us by other people, we've got to do it. So we did it first and then the responsibility; well, being one of the biggest users [of water] in the region and also being probably the most visible and one the majority of the community can relate to and probably visits, we have a social responsibility to make it happen* (J1, p. 13).

Case K also reported that its key organisational values were intertwined with perceived social obligations as an influence:

> *I suppose our values. We're a value-based organisation and one of our values is about the fact that community is a high priority from our values, the business. In saying that, the community and being, I suppose, heavily open to the community and obviously making sure that what we're doing is seen as a positive role model in the industry, or in the community in general* (K1, p. 10).

In contrast, Case F reported the overlapping influence of CSR and competitive advantage. As a privately-owned, for-profit organisation, social obligations were not separate from commercial ones:

> *I think our ownership structure, we're a private business. A majority of stadiums in Australia are run by government. We're a private business. Primarily our ownership structure is via superannuation funds and I can provide you with that information, so for them also it's important that their investment is following I suppose a charter that is sympathetic to the needs of our patrons. We have close to 3,000,000 patrons a year and if we can increase our attendances by demonstrating to the public that we are mindful and it's very important for our patrons to understand that the venue…there's opportunities for people to choose other venues, other content, so we need to be at the forefront of the state of the art world's best practice venue investigating whatever*

> *opportunity there is, whether it be from a commercial perspective, an environment perspective or an operational perspective* (F1, p. 2).

This data is consistent with comments pertaining to CSR discussed earlier in this chapter, and so CSR was therefore a key influence in shaping how several MASS organisations thought they should respond to climate change.

However, CSR overlapped with another influence – *organisational values*. CSR was sometimes embedded in the corporate values of MASS organisations. Whilst none of these values referred specifically to climate change, some referred to the natural environment, and climate change was typically considered to be part of this. For example, Case A reported organisational outcomes statements:

> *...through sound business practices, this organisation achieves the government outcomes and its corporate objectives by balancing its environmental, social and commercial responsibilities. So in a fairly broad way, we are looking at balancing the environment against trying to achieve our core outcomes, I guess* (A1, p. 10).

Specific organisational values could not always be recalled however; their essence appeared to be known by managers. This is characterised by the following quote from Case D:

> *...we do have a list of values, of which I can't quote them off the top of my head...Look Greg, it's all about honesty and integrity, those sort of things. It's not about being the world's best champion for, you know, environmental change I can tell you now. Once again, not to say that it's not high on the list of priorities but we've got a business to run and we're trying to be the best sporting stadium in the world* (D1, pp. 7-8).

Organisational values were therefore an influence on how these organisations perceived and responded to climate change, but one of lesser importance. They did however reinforce the importance of climate change as an issue as perceived by individual MASS managers.

Public opinion was another influence. In several instances, managers thought that what the public thought about climate change, and any relationship major sport stadia might have with it, did matter. Case A was a good example of this:

> *I also think that there is an expectation certainly by the members of the public that we do participate to be as efficient as possible because they see us as a big building if nothing else and it is a building where people have to feel good about coming. All stadia, if people don't feel good about it or they think they are doing the wrong thing they will immediately respond in a negative way so you have to be very careful that you respond in a positive way in public opinion* (A3, p. 10).

Two MASS managers (A3 and F1) reported that their organisations undertook market research in order to identify issues of public concern, and that environmental issues, of which climate change was a subset, were important. For example, Case F highlighted that their market research showed there was a market segment that want "green events."

Two managers from different cases (A and J) also indicated the relationship between public opinion and potential political problems. In commenting about the importance of public opinion in shaping its organisational response to climate change, Manager A3 pointed out that, *"and then there is the political imperative that we can never ignore"* (p. 10). Public opinion was therefore a key consideration for these organisations.

A minority of MASS cases also reported that the views of corporate partners were another influence. For example, F1 drew a link between "public scrutiny" of Case F and potential negative consequences for their commercial partners:

> *[F1]:* *I personally think it's probably just public scrutiny, public scrutiny and comment and people's understanding or appreciation of the issue at hand.*
>
> *[Interviewer]:* *So there was public scrutiny around that time, what then happened? What was your organisation's first response? Is it something that you raised at meetings or is it something that...?*
>
> *[F1]:* *We have weekly GM [General Manager] meetings and it's a forum for the management team and executive to sit down and discuss topics. We've got a Communications Department who are mindful of how our naming rights partner is very aware and businesses who are associated with our business, so we believe that there is a significant benefit being associated with this venue and obviously people pay a premium to be associated. The worst thing that we could have is have a story of detriment to our business and it has a flow on to our commercial partners. So we probably get scrutiny also from our partners to ensure that we are adopting world's best practice (F1, p. 6).*

This comment highlights the role of stakeholders in shaping climate change as an issue of significance for MASS organisations. However, only one MASS organisation (Case F) reported that any of their corporate partners asked them to address climate change issues. Case F reported that an energy company had partnered with one sport governing body to implement some "green programs." Nevertheless, Case D reported that one of the professional football clubs based at its stadium had suggested "strategies" of addressing some sustainability issues – specifically saving energy and water (D2, p. 4) – although there was no mention of climate change.

However, one MASS case reported that it was prepared to reject proposals from potential corporate partners for significant sponsorships on the basis of the potential sponsor not having adequate environmental credentials. Case E was unequivocal that some carbon-intensive businesses would not be welcome as commercial partners:

> *[Interviewer]:* *Commercial partners, do they …?*
>
> *[E1]:* *Absolutely. I mean we actually, we refused a million dollar sponsorship because a commercial partner wasn't, we didn't quite think they had the environmental qualifications that we wanted as a venue. And we will do that, and it's the same thing as I talked about*

before with suppliers we have some dedicated sponsors here that sponsor this venue. But they need to actually be squeaky clean if I can say that as well, they need to be environmentally responsible. They need to treat their people properly, all sorts of ethical behaviour. We, because of what we are, we don't want to be associated with anybody that's not. So it does affect, not just the environmental or global warming issues, it's about who the organisations are.

[Interviewer]: *Without naming the organisation whose million dollar sponsorship you turned down, what was the nature of their business?*

[E1]: *An airline* (E1, p. 22).

This comment, although limited to a single MASS case, illustrates the degree to which a lack of climate change credibility can be an obstacle to forming corporate partnerships for such stadia. Case J also reported that their water supply partner was a critical influence on why they thought climate change was important saying that, *"When the water storages got right down, obviously they pulled the trigger and said, "Righto, cut the water off"* (J1, p. 12).

Staff were also cited by four MASS cases (A, B, E & J) as an important influence on their response to climate change, particularly the most senior executive manager or Chief Executive Officer (CEO). For example, Case J cited the critical role of their "Environment Unit" in developing measures to address climate change that was supported by senior management:

> *Most of it was driven by the Environment Unit, so that was obviously supported by the CEO and Councillors because that doesn't get funded without the corporate level support* (J1, p.11).

Case B also emphasised the critical role of "empowered" staff to develop their "Green Team" initiative that merely required imprimatur of the CEO, rather than originating with him:

> *What the CEO has to do is to be able to support or sanction, not to oppose, but the organisations are bigger than the CEO and so our particular way, the way this organisation works is, and we sort of talk about it here, it's a very empowered organisation...Here the expectation is you're employed to do the job - "That is your job, get on with the job" - , and a higher tolerance of risk, and a greater encouragement of creativity. If that is within the organisation, then it doesn't mean it has to be just sort of top-down for things to happen* (B1, p. 12).

Case E said the support of their CEO was very important to their climate change responses, while Case D also reported that senior managers and the CEO were critical to developing its Sustainability Plan. Another influence cited by only two MASS cases (less than twenty per cent) was the actions of other major sport stadia, including those overseas. Case H highlighted this point:

> *Particularly, look at North America and they pride themselves on being a green venue and that's almost a big part of their marketing and their sales pitch and I think that's absolutely where Australia will head. We tend to follow them in those areas a lot* (H1, p. 1).

Case F was the only other to report other stadia as an influence and this involved senior managers travelling overseas to learn from the example of major sport stadia (F1, p. 6).

Theme 6: The role of individual manager agency in explaining how and why MASS organisations respond to climate change

The sixth key theme that emerged from the interview data was the importance of initiatives of senior individual managers in driving direct and indirect management responses to environmental issues such as climate change. It was clear from these interviews that some senior individual managers at five MASS organisations were *agents for change* and were personally responsible for many of the management responses to climate change issues. The agency of these senior middle-level managers was critical to the development of strategies that assumed that climate change was an important issue, and the implementation of measures that moderated their organisation's contribution to climate change in the form of direct or indirect GHG emissions. This means that any climate change-related initiatives came from this senior middle-level of management rather than the executives and board directors who supervised them – a case of *middle-up* and *middle-down*, rather than a *top-down* approach. In most instances, climate-specific initiatives were developed at this middle-level of management and proposed to the Executive Manager and their board for approval. In every case, however, boards of directors ratified such proposals, even those that required significant financial investment such as the water treatment plant of Case E. A summary of these acts of agency related to climate change by senior middle-level MASS managers is outlined in Table 21 below.

Table 21: Acts of agency related to climate change by senior middle-level MASS managers

ACTS OF AGENCY	ACTS OF AGENCY RELATED TO CLIMATE CHANGE BY SENIOR-LEVEL MASS MANAGERS BY THEORETICAL CATEGORY			MASS MANAGERS REPORTING THIS (N = 6)
	Category 1 - Publically-owned, not-for-profit	Category 2 - Privately-owned, not-for-profit	Category 3 - Privately-owned, for-profit	
Personally deciding that climate change as an important issue for the organisation (n = 5)	E, J	B, H	C	B1, C1, E1, H1, J1
Developing a climate change adaption strategy (n = 1)		B		B1
Hire an energy consultant to determine energy use and GHG emissions (n = 2)		B, H		B1, H1
Researching & proposing a Class-A water treatment plant (n = 1)	E			E1
Green ticketing proposal (n = 1)			F	F1
TOTALS	**3**	**2**	**2**	**6**

For example, when asked, "What is it in your role that relates to climate change?", Manager E1 said the following:

> *We haven't got a mature reporting process of Triple Bottom Line, and one of the elements that I suggested to our board we go away every year at a strategy retreat was to talk about this corporate responsibility and talk about the effects of environment, and*

> *environment change, and up until about four years ago, or five years ago, not too many within this organisation had a, had any sort of strong idea about protocols and what was actually happening in the world in terms of climate change, potential impact of carbon tax, etc., so I volunteered to actually do some work and do some research on that and present a case to board (E1, p. 1).*

When asked about the whether the origins of Case E's climate change-related initiatives were at the board of director's level, E1 was quite clear:

> *No, it was … and it really started for me when I actually, as an interest, as a personal interest did some calculations about if a carbon tax came into this organisation, "What would a carbon tax cost this organisation?" So we did some numbers about that. So really for us is about, it started mitigating a cost exposure, and then leveraging back into some other elements of that. So it was a matter of talking to board in board's terms actually to try and get this up as an initiative, and they've been very good, been very proactive and because they can see (E1, p.1).*

The agency of this manager extended to other climate change-related proposals. The proposal for Case E to build a $22 million Class-A water treatment plant so that they would have their own supply of potable water was also developed by Manager E1. Another was to prepare the "business case" of GHG mitigation for the board (E1, p. 11). Similarly, Manager F1 demonstrated agency in relation to a climate issue. When asked about his organisation's motivation for a green ticketing proposal, he said:

> *It actually was a motivation based on some stadiums I'd spoken to and visited. As part of my role, I travel and secure a content for the venue and there's probably an appetite from the younger generation and we see with some event ticketing firms that people are selective on the events and festivals they're attending based on the fact they're seen as "green events"* (F1, p. 2).

Manager B1 also demonstrated agency by initiating an organisational climate change adaptation strategy:

> *In 2007 we undertook, at my initiative, we undertook an exercise which we called the Climate Change Adaptation Strategy:...*[52]*. So that was to sort of try and explore rather than map out I think but just explore how is this thing relevant to us? At that stage it was very much coming from a water motivated background because of the realities about changing rainfall and runoff in this part of Australia and so that was a particular sort of prompt to explore, "Let's just see how this is relevant to us." It was to ask that question* (B1, p. 2).

Manager B1 also initiated the hire of an energy consultant to determine energy use and GHG emissions (B1, p. 8). A number of managers (C1, E1, H1 and J1) also personally decided that climate change should be an important issue for their organisations and did not wait for direction from their Executive Manager or board to do so. For example, when asked about the "extent that climate change is a real and serious issue for this organisation", Manager C1 was unequivocal:

> *Absolutely, I mean from my point of view, definitely… (C1, p. 3).*

C1 spoke of his passion for driving organisational change in terms of the natural environment:

> *I mean partly, my passion as well for reducing the impact of the stadium is getting people aware of what's going on. So some people in the team are aware* but *they're pretty,*

[52] Title of this document deleted to preserve the anonymity of this case.

> *they're not, they wouldn't consider when they're buying a car the environmental impacts of that car (C1, p. 12).*

As a consequence, agency is a key concept to emerge from the interview data and will be discussed in the next chapter.

Theme 7: Relevance of theoretical categories to climate impacts, and responses to, climate change

None of the cases reported being significantly influenced by their ownership structure or organisational purpose as to *how* or *why* they were impacted by – or responded to – climate change. Therefore, in relation to impacts of climate change on the stadia, there was no discernible difference between MASS organisations based on whether they were: (1) *publically-owned, not-for-profit* (Category 1); (2) *privately-owned, not-for-profit* (Category 2), or; (3) *privately-owned, for-profit* (Category 3) entities. Whilst the study population is spread across continental Australia, and are therefore located in climatically different areas, no data indicates that public or private ownership – whether for-profit or not – made any difference to impacts. For example, water was identified by all twelve MASS cases (100 per cent) as a climate change issue and regardless of ownership type or purpose. There was a similar pattern with the lower rainfall issue associated with climate change reported by all theoretical categories although with slightly different incidence. Four out of the five (eighty per cent) "publically-owned, not-for-profit" (Category 1) cases reported lower rainfall; three out of the four (seventy-five per cent) "privately-owned, not-for-profit" (Category 2) did the same, while one out of the three (33.3 per cent) "privately-owned, for-profit" (Category 3), did so too. Similarly, energy was reported as a climate issue by all twelve MASS cases (100 per cent). Furthermore, the mainly indirect nature of GHG emissions was reported by all cases, whilst all cases reported understanding the link between energy use and indirect GHG emissions. For waste as a climate issue, all five Category 1 cases (100 per cent), three of the four Category 2 cases (seventy-five per cent), and two of the three (sixty-six per cent) of the Category 3 cases recognised the link between their solid waste and indirect GHG emissions from landfill. In short, climate impacts such as lower rainfall, energy conservation, and GHG emissions from waste occurred regardless of the ownership type or purpose of MASS organisations.

Nor was it obvious that MASS organisations behaved significantly in radically different ways in response to climate change within the three categories. For example, whilst four out of five (eighty per cent) of Category 1 cases reported government as a key influence on how and why they responded to climate issues, so too did cases in Category 2 (two out of four/fifty per cent) and Category 3 (two out of three/ sixty-six per cent). Similarly, water harvesting and storage as a response to lower rainfall and/or government water efficiency regulation was reported in all three categories: four out of five (eighty per cent) in Category 1, two out of four (fifty per cent) in Category 2, and all three (100 per

cent) in Category 3. Furthermore, mitigation of GHG emissions through energy conservation was reported in all three categories: four out of five (eighty per cent) for Category 1, three out of four (seventy-five per cent) for Category 2, and all three cases (100 per cent) for Category 3.

That MASS organisations were impacted by climate change in the same way regardless of their ownership type or purpose – that is, no matter what their theoretical Category – and also responded to climate change regardless of their ownership type/theoretical category is a critically important finding of this study. It is important because it means that any theory proposed later in this thesis is generalisable to the entire study population of MASS organisations rather than being limited to one or two categories.

Documents

While all of the twelve MASS cases reported climate change as an issue, and seven of the twelve MASS cases reported *discussion* of climate change as a management issue, this was rarely corroborated by internal documents. Of the sixty-three public and private documents examined for this study, only one specifically links climate change to a major Australian sport stadium. Public documents examined include Annual Reports dating back to 2005, "Fact Sheets", and organisational websites. Confidential documents that were made available and examined include: a "Sustainability Assessment", a stadium "Energy Review", and a presentation on energy monitoring (Case B); a "Corporate Plan"; an "Asset Management Strategy Plan", a "Sustainability Plan", "NABERS" water & energy rating reports (Case D), and; a facility "Master Plan" (Case E). No MASS organisations reported having specific climate change strategy for their stadia. Of the documents examined, few explicitly linked climate change to their stadia either. Of all the cases considered, Case B was able to offer the most confirmation of its specific efforts to address climate change (three documents). Only three documents referred explicitly to climate change, and of these, only one explicitly referred to climate change and a stadium. A summary of these results is presented in Table 22 below.

Table 22: MASS documents that directly refer to climate change

REFERENCES TO CLIMATE CHANGE	INCIDENCE ACROSS THE THREE THEORETICAL CATEGORIES			DOCUMENTS (N = 3/63)
	Category 1 - Publically-owned, not-for-profit	Category 2 - Privately-owned, not-for-profit	Category 3 - Privately-owned, for-profit	
INTERNAL-only, confidential documents of MASS organisations that directly refer to climate change (n = 2)		Case B		Case B (2007 Climate change Adaptation Strategy). [53]Case B (2010 consultant"s *Sustainability Assessment*).
EXTERNALLY-available documents of MASS organisations that directly refer to climate change (n = 1)		Case H		Case H (2007/08 Annual Report, p. 18).
TOTALS	**0**	**2**	**0**	**3**
TOTAL DOCUMENTS EXAMINED				**63**

The only document explicitly referring to climate change and a stadium was a consultant's report about the environmental sustainability of one AFL football match played at Case B's stadium in 2010. As a "sustainability audit", and "benchmark for future games", it cited Case B's recognition of:

> *the value in embedding sustainability practices into their events, working towards reducing their environmental impacts, and raising community awareness of issues such as climate change, waste management and water use (p. 3).*

The report quantified total GHG emissions related to the event, and per attendee, and also provided recommendations for reducing GHG emissions and water use. The second document – the annual report of one theoretical Category 2 case (i.e. a privately-owned, not-for-profit sport governing body) – referred to climate change, but not in relation to their stadium; it was actually about their local sport competition:

> *[Case H][54] continued to review the governance structure of ... in ... as well as focusing heavily on the impact of climate change on playing and practice facilities. A "water management" forum was held in September and as a result, water management audits were conducted each month at Grade club grounds. This valuable information was provided to Grade clubs and their local councils (Case H 2007/08 Annual Report, p. 18).*

The third document, provided by Case B, was titled the *"Climate Change Adaptation Strategy."* Whilst this document highlighted the vulnerability of water-dependent outdoor grass playing surfaces – such as those used at MASS – to lower rainfall, higher temperatures and increased evaporation associated with climate change, these were clearly linked to community facilities for Australian Rules football managed by local government, rather than the major stadium of Case B.

[53] This is the only document to explicitly refer to both climate change and a major Australian sport stadium.
[54] Identifiers of this case have been removed to preserve its anonymity.

However, there were some indirect references to climate change among the documents. The *2009/10 Sustainability Plan* of Case D referred obliquely to climate change in its "Executive Summary" (p. ES-1) with its target for saving carbon dioxide (CO_2) emissions over a three-year period of 630 tonnes CO_2 equivalent (CO_2-e). Case D's *"2010 NABERS[55] Energy Ratings Report"*[56] also hinted at the organisation's genuine efforts to address GHG emissions, although without direct reference to climate change. Another indirect reference to climate change was found in Case F's *"2007 Year in Review"* where, in the context of a report about the introduction of mobile lighting rigs for the purpose of aiding the growth of grass on the stadium playing surface:

> *[Stadium of Case F][57] intends to forge an association with a supplier of green energy. Research has indicated that the use of lighting rigs will lead to only a marginal increase in energy use (p. 15).*

Implicit in the reference to "green energy" is recognition that due to the high carbon-intensity of electricity generation in Australia (GEM, 2011), consumption of electrical energy results in GHG emissions. One external document – an advertisement from the Sustainable Energy Association of Australia (SEA) about Case B's installation of an energy monitoring system at its stadium – referred obliquely to climate change by highlighting the system's capacity to reduce energy consumption and GHG emissions: In it, Case B's Director of Facilities and Planning, was quoted as saying:

> *It will also stimulate ideas and ways for all venue occupiers to explore further savings in energy usage and greenhouse emissions (p. 13).*

A summary of these results is presented in Table 23 below.

[55] The National Australian Built Environment Rating System (NABERS) is an energy performance rating system for existing buildings that is coordinated by 'the New South Wales Office of Environment and Heritage (NSWOEH), on behalf of Commonwealth, state and territory governments'. NSWOEH. (2012). NABERS. Retrieved from: http://www.nabers.gov.au/public/WebPages/Home.aspx

[56] The reader should note that Case D volunteered to participate in the NABERS program. It uses NABERS data for, 'internal benchmarks for sustainability performance' (Case D, 2010 NABERS Energy Rating Report, p. 1).

[57] Identifiers of this case have been removed to preserve its anonymity.

Table 23: Documents that refer indirectly to MASS organisations and climate change

EXTERNALLY-AVAILABLE DOCUMENTS THAT INDIRECTLY REFER TO CLIMATE CHANGE	DOCUMENTS	INCIDENCE ACROSS THE THREE THEORETICAL CATEGORIES		
		Category 1 - Publically-owned, not-for-profit	Category 2 - Privately-owned, not-for-profit	Category 3 - Privately-owned, for-profit
Case B (reference to energy monitoring systems and GHG emissions reduction) (n = 1)	Case B (advertisement from Sustainable Energy Association of Australia – SEA)		Case B	
Case D (target for saving CO_2 emissions) (n = 1)	Case D (2009/10 Sustainability Plan)	Case D		
Case D (efforts to address GHG emissions) (n = 1)	Case D (2010 NABERS Energy Rating Report)	Case D		
Case F (section of annual report about mobile lighting rigs) (n = 1)	Case F (2007 Year in Review)			Case F
TOTAL	**4**	**2**	**1**	**1**
TOTAL DOCUMENTS EXAMINED	**63**	**4**		

Overall, the almost complete absence of discussion of climate change in the official documents of MASS organisations is consistent with interview data that identifies climate change as a second-order issue, and is inconsistent with interview data that identifies climate change as a high priority.

Conclusion

In this chapter, the results of the study are reported in two ways: first, for each of the twelve individual MASS organisation cases that were derived from within-case analysis, and; second, in a thematic fashion derived from cross-case analysis. These results are aimed to address the three research questions: (1) "*What, if any*, issues are posed by climate change for major Australian sport stadia and the organisations that manage them?"; (2) "*How* are the organisations that manage major Australian sport stadia responding to climate change?"; and; (3) "*Why* are the organisations that manage major Australian sport stadia responding to climate change in the way they do?" Six major themes were evident from the data. These were: (1) how the MASS organisations *perceived (made sense of)* climate change; (2) issues for each organisation arising from climate change; (3) *how* and *why* the organisations responded to climate change; (4) the role of *individual manager agency* in explaining how and why MASS organisations respond to climate change; (5) *influences* on MASS cases responses to climate change, and; (6) *barriers* to responding effectively to climate change. Given the very similar nature of the stadia and the operational imperatives of their organisations, these MASS organisations are faced with broadly the same issues pertaining to climate change, with water, energy and waste issues being the most pressing among them.

However, these issues are interlinked with a range of factors that together explain how and why these organisations are affected by, and respond to, climate change. These factors include GHG mitigation, lower rainfall, energy conservation, the extensive influence of corporate social responsibility as a management ethos, the influence of key stakeholders – especially government – internal and external pressures to be environmentally sustainable, the enabling and limiting capacity of organisational resources, and the capacity of senior staff to act as agents of change. As a result, these factors will be discussed in the next chapter.

This thesis now turns to Section D, a *synthesis* of the study, comprising Chapters Six and Seven. Chapter Six presents a critical discussion of the results and findings presented here in Chapter Five. In the next chapter, the results and findings are linked to the main themes that emerged from the literature review with a view to building theory from analysis of the case studies.

Chapter Six: Discussion of results, and theory development

> *"There is some very good news about the climate problem: we do not need to worry about how the climate science turns out or whether this is a real problem or not...because we ought to do the same things about it anyway just to save money..."*
>
> Amory Lovins (1997)

Introduction

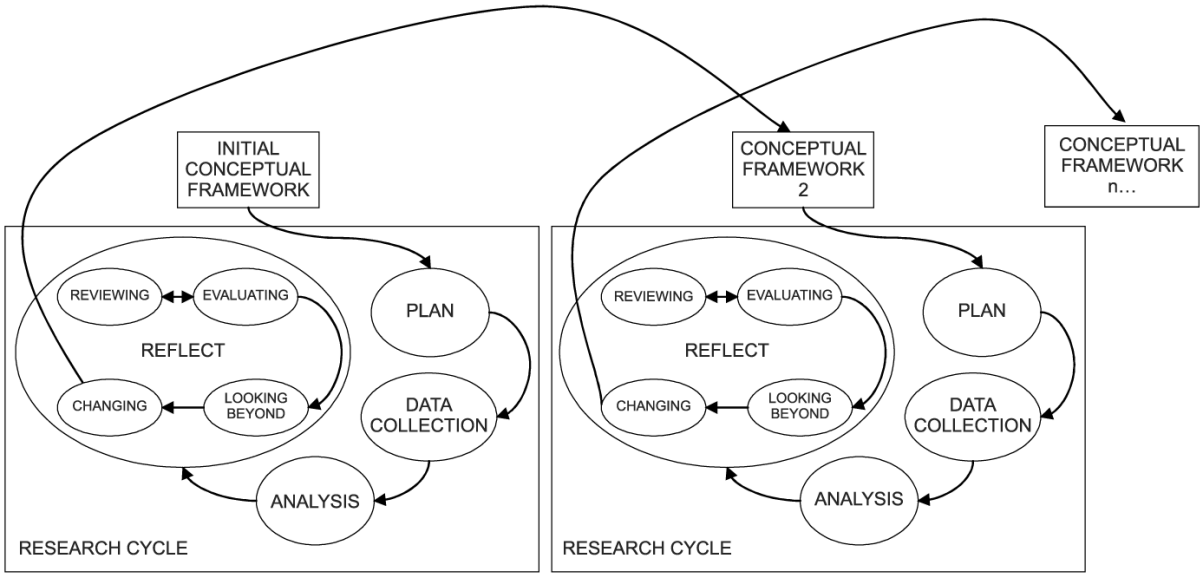
In the previous chapter, the results and key findings of this study were presented. This chapter marks the beginning of the fourth and final section of this thesis, Section D, which is a *synthesis* of the study. This chapter has two purposes. The first is to respond to the research questions of this study by discussing the results and findings that emerged from the data and offering an interpretation of these. In doing so, this chapter will place this study in its theoretical context by evaluating the results in light of existing theory. The second purpose of this chapter is to build on these interpretations and discuss the development of theory from the cases reported in Chapter Five of this thesis.

The findings are discussed according to seven major themes that thread their way through this thesis, and thus provide a framework for organising and interpreting the results of each case. These themes are: (1) how major Australian sport stadia (MASS) organisations perceive (make sense of) climate change; (2) climate change issues for MASS organisations; (3) minority issues; (4) how and why MASS organisations respond to climate change; (5) influences on response to climate change by MASS cases; (6) the role of individual managers in explaining how and why MASS organisations respond to climate change, and; (7) barriers to responding effectively to climate change. Each major thematic area has a number of key sub-themes which are also discussed in light of existing knowledge and theory. Also, the reader should note that formal conclusions will not be presented in this chapter, and will instead be reserved for Chapter Seven of this thesis - the conclusion. However, before discussing the results, the next section will first offer a brief recap of the accompanying theory development process.

Theory development from the results of this study

As indicated in Chapter Four of this thesis, this study uses Cepeda & Martin's (2005) iterative model for developing theory from case studies. This model has three steps including: (1) developing an a priori *conceptual framework*; (2) a four-stage *research cycle* consisting of planning, data collection, data analysis, and critical analysis (reflection), and; (3) *literature-based scrutiny of the developed theory*. The aim of this process for this study is to develop theory that explains how and why organisations that manage MASS respond to climate change. Cepeda & Martin's model is illustrated in Figure 6 below.

Figure 6: Cepeda & Martin's (2005, p. 861) model for building theory from case studies

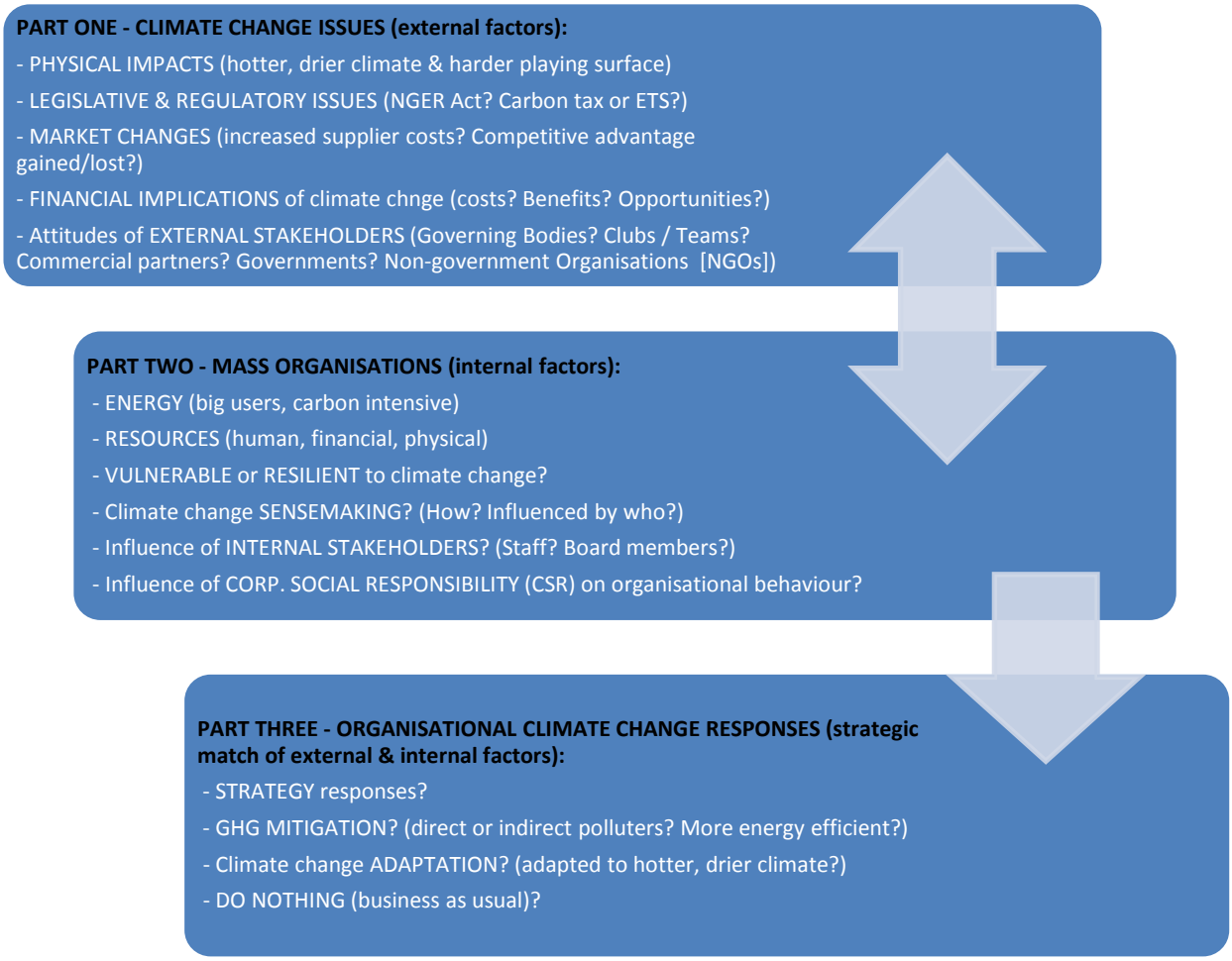


As suggested in Chapter Four of this thesis, Figure 6 above illustrates an iterative process of, "continuous interplay between the research cycle and conceptual framework" (p. 873). Each phase of the research cycle refines the initial conceptual framework until *saturation* – the point at which incremental learning is minimal because the researcher observes phenomena that has been seen before, or as Corbin & Strauss (2008, p. 145) suggest, the point at which "all the concepts are well defined and explained", is achieved. This discussion now continues with a brief reflection on step one of Cepeda & Martin's (2005) method – developing the *a priori* conceptual framework.

The a priori conceptual framework

The a priori conceptual framework (CF) – herein referred to as CF1 – represented my initial understanding of the research problem, and was based on my assumptions and understandings of how climate change might affect MASS organisations that were developed through reviewing relevant literature. Consistent with Cepeda & Martin's method, the conceptual framework was reviewed at the end of each research cycle in order to incorporate insights gained from that cycle and as such, was an evolving construct. CF1 had three parts: Part One assumed that five categories of potential climate change issues were external to MASS organisations; Part Two of CF1 envisaged six potential internal factors, and; Part Three envisaged four potential organisational responses to climate change. CF1 is illustrated in Figure 7 below.

Figure 7: The researcher's initial conceptual framework (CF1) for the study: A climate change impact-response framework for MASS organisations



Part One of CF1 assumed that five categories of potential climate change issues were external to MASS organisations. The five categories of issues (physical impacts, legislative & regulatory issues, market changes, financial implications and attitudes of external stakeholders) emerged from the review of literature. These issues appeared to be reasonable choices for inclusion in CF1. Part Two of CF1 represents six potential internal factors that were envisaged as being reasonable possibilities for MASS organisations. Again, these factors were informed by my review of literature. Part Three of CF1 represents four potential responses to climate change by MASS organisations. As such, it represents the strategic match of both the internal factors contemplated in Part One of CF1, and the external factors contemplated in Part Two. As with Parts One and Three, these potential organisational responses were informed by my review of literature, and were therefore considered to be reasonable possibilities to include.

The four stage research cycle

Having developed CF1, the next stage of theory development was the four-stage research cycle consisting of: (1) planning; (2) data collection; (3) data analysis, and; (4) critical analysis (reflection).

The research cycle was integral to the theory development process. As stages one to three (i.e. planning, data collection, and data analysis) of the research cycle have already been discussed in Chapter Four of this thesis, this section will concentrate on stage four – *critical analysis (reflection)*.

As indicated in Figure 6, the critical analysis (reflection) part of the process itself involved three parts: (1) reviewing/evaluating; (2) looking beyond, and; (3) changing the conceptual framework. As advocated by Cepeda & Martin (2005, p. 861), critical to this was asking key questions of the data and my interpretation of it. These questions were: (a) "What do these findings mean?"; (b) "What are the alternative explanations of such findings?"; (c) "What disconfirming evidence is there for these explanations?", and; (d) "How may these findings relate to outcomes from previous research cycles?"

Literature-based scrutiny of the developed theory

After repeating several research cycles and reaching a point where my conceptual framework passed through different iterations, literature-based scrutiny of the developed theory (LBSDT) was the final step in my theory development method. LBSDT involves comparing the latest version of the conceptual framework with a "wide selection of the literature (both similar and conflicting)." LBSDT requires two elements to consider: first, the extent to which there is agreement between the findings and the literature so that the theory built is "replicating, consolidating or extending existing literature"; second, conflict between the findings and literature needs to be examined to provide "persuasive explanations accounting for the differences" (Cepeda & Martin, 2005, p. 862).

Discussion of results

It is clear from the results of this study canvassed in Chapter Five that climate change has significant implications for MASS organisations and the stadia that these organisations manage. It is also clear that MASS organisations responded to climate change in different ways. Across the study population, these responses varied between being direct, and indirect[58]. However in some cases, there was no response to climate change at all; that is, they were not *"playing the carbon game."* The results will now be discussed in a thematic fashion.

Theme 1: How the MASS organisations understood (made sense of) climate change

How organisations react to climate change depends on how they understand – or make sense of – it. Kolk & Pinkse (2011, p. 8) and Porter & Reinhardt (2007) note that organisational responses to climate change are shaped by how they perceive its impact on their core business, while Kolk & Pinkse (2005) argue that responses depend on whether they see opportunities or risks. Put another way, although organisations may not necessarily use terms used in the scientific and management

[58] For discussions of the terms "direct" and "indirect", when used to describe physical impacts of climate change on assets or organisations, or when used to refer to organisational responses to such impacts, see Hertin et al. (2003), Berkhout et al. (2006), and Berkhout (2012).

literature like "vulnerable" or "resilient" when they think about climate change, their perception of this issue depends on whether they perceive themselves as either. Furthermore, if organisations are to take climate change seriously – including those concerned with sport such as MASS organisations – they still need to persuade themselves that it is indeed real and that its principle causation is human in origin. In Australia in recent years, public opinion on the causes – or even existence of – climate change is divided (Leviston, Leitch, Greenhill, Leonard, & Walker, 2011) despite the wealth of scientific opinion confirming both. As a result, it cannot be automatically assumed that all organisations – including MASS ones – agree with the scientific consensus. For this study, it was left as an open question until data could be collected to address it. Another salient point is that even if an organisation accepts that climate change is real and overwhelmingly human in causation, it needs to satisfy itself that it is directly or indirectly vulnerable to the impacts of climate change before a strategic response to it is warranted. Tellingly, most cases (nine of twelve, or seventy-five per cent)[59] thought their stadia were resilient even if points of vulnerability such as their playing surfaces to extreme heat and lower rainfall, were reported. This perception of their situation in relation to climate change was critical to explaining their lack of specific response(s) and the absence of specific climate change strategy.

For example, one finding outlined in Chapter Five of this thesis is that, "climate change is discussed by some MASS organisations and not by others." Only seven of the twelve MASS cases (A, B, C, E, F, J & L) or fifty-eight per cent, discussed it as management issue for their stadia. For the remaining five cases (D, G, H, I & K) or forty-two per cent, it had not been specifically discussed by management. In either situation, there was no formal corporate view of the phenomena reported by any cases. In those cases where climate change had <u>not</u> been explicitly discussed, it was explained that it had been either assumed to be a general environmental issue, or that no one had raised it as an issue for discussion. This suggests that climate change is a priority for barely half of the study population, and is consistent with another finding of this study, that it is second-order issue for most MASS cases. While climate change was reported as an important issue by some cases, given the strong operational focus of all MASS organisations and the imperative for minimising operating costs, it was a relatively lower priority. Whilst it was seen as a *"legitimate"* (B1, p. 2) and *"significant"* (A1, p. 1) concern, it was perceived as, *"not up there with the big issues"* (H1, p. 5), *"probably not at the forefront of* everything" (A1, p. 1), and not the, *"number one"* priority (B1, p. 2). Given also the overriding objectives of these organisations to provide entertainment experiences to corporate partners and thousands of spectators and members, perhaps this is reasonable. To achieve their fundamental purpose, MASS organisations must concentrate on their core business, and so environmental issues are not their top priority.

[59] For details, see Table 8 in Chapter Five.

That climate change is discussed by some organisations within an industrial sector and not others is a finding not made elsewhere in management literature and so represents one of the contributions of this study. Ihlen (2009) examined corporations that do or do not "discuss" climate change however, even this work does not distinguish between those that do – from those that don't – within a single industry. Nevertheless, that some organisations discuss it while others don't is consistent with Kolk & Pinkse's (2011, p. 8) argument that, "it is not always the case that climate change is necessarily an issue of strategic importance." If an organisation perceives climate change to be strategically important, they have a reason to discuss it. Furthermore, that climate change is discussed by some *sport* organisations – and not others – is a finding not found anywhere in sport management literature either, and as such, represents another contribution of this study.

This is possibly because sport organisations have only once before been a unit of analysis for climate change issues in sport; in Chard & Mallen's (2013) study of renewable energy initiatives at Canadian major sport stadiums. Outside of this study, for the very small body of research literature that specifically examines the relationship between climate change and sport, the units of analysis were aquatic and leisure organisations (McDonald et al., 2011; McDonald et al., 2014); stakeholder groups (Otto & Heath, 2010); the location of motorsport (Tranter & Lowes, 2009); and climate data, climate change projections and economic expenditure (Moen & Fredman, 2007). This finding is consistent with Schmidt's (2006, p. A290) observation of the International Olympic Committee that when it comes to the criteria for choosing Olympic cities, while environmental sustainability is important, it is not a "deal breaker." As this study is only the second where sport organisations have been the unit of analysis in relation to climate change, there are opportunities for other sport management researchers to follow this path.

However, all twelve MASS cases did have a basic grasp of climate change. Most were able to articulate that global climate, often referred to as "weather", was warming and that the principal cause of this was greenhouse gas (GHG) emissions produced by human activities. Eleven of the twelve MASS cases – and nineteen of the twenty interviewees – accepted the main claims of the science of climate change. That is, that the global climate was warming, and that this warming was principally caused by GHG emissions associated with human activities. Whilst climate change is not their area of expertise, and so represents one of the areas of uncertainty that emerged from the interview data, most MASS organisations were nevertheless able to identify elements of climate change such as changing weather patterns (cases A, B, C, E, G, J & K), extreme weather events (cases A, C, I & J), the role of humans in climate change (C, E, F, H, I, K & L), and the role of GHG emissions in trapping heat (cases E, F, G & J).

This basic understanding of climate change, although somewhat limited and tentative, is still consistent with the scientific consensus on climate change discussed in Chapter Two of this thesis. As such, it represents a basic scientific literacy on the part of these MASS organisations, and could be the basis for developing operational – or even *dynamic capabilities* – for adapting to climate change. That is, understanding why an organisation might act on climate change is a precursor to *action* – and the effectiveness of such action. Understanding the basics of climate change is arguably one of the foundations for management in the early decades of the 21st century in the context of the widely-recognised long-term transition toward the *decarbonisation* of economies (Bruckner et al., 2007; Bruckner et al., 2010; Edenhofer, Carraro, & Hourcade, 2012; J. A. Glaser, 2007; Goldmark & Von Weizsäcker, 2007; Luderer et al., 2010; Luderer et al., 2012; Luderer et al., 2009; Shinnar & Citro, 2008; Steckel, Jakob, Marschinski, & Luderer, 2011; Weinhofer & Hoffmann, 2010) that is occurring – and is likely to be the norm[60]. Carbon management (Hoffman, 2007a, 2010; VEPA, 2011), carbon taxes, emissions trading schemes, the polluter-pays principle, and climate change-related legislation such as the *NGER Act* are likely to be ongoing matters for managers in Australia – including those in MASS organisations. Looking beyond the data, as advocated by Cepeda & Martin (2005, p. 860), the importance of climate change capabilities suggests that inclusion of resource factors in CF1 based on the RBV/RBT literature was correct, although CF1 lacks specific mention of capabilities. It also suggests that RBV/RBT offers an insight into how and why MASS organisations respond to climate change.

However, another finding of this study – that MASS organisations consistently perceive climate change as an issue of cost – highlights a weakness in CF1. Whilst CF1 anticipated that the *"physical impacts"* of a hotter, drier climate associated with climate change may pose *"legislative and regulatory issues"* and *"market changes"* for MASS organisations, it failed to anticipate just how much climate change was perceived as a cost issue. All MASS cases (100 per cent) investigated for this study reported climate change as a cost issue. For these organisations, they have nothing to sell in relation to climate change: they don't have any climate change-related products or services for their customers from which they can earn revenue. As a consequence, to perceive climate change in cost-only terms makes perfect sense. While CF1 anticipated that there might be some positive *"financial implications of climate change"*, such as increased opportunities for "green" sponsorships – something that was present only in Case F's partnership with an energy supplier – it does not adequately articulate the cost side of this issue as perceived by MASS organisations. Nor does CF1 explain how the three key climate change issues – water, energy and waste management – were seen

[60]Two examples neatly illustrate this point. First, since 2007, the Council of the European Union (CotEU) has been committed to decarbonising the European economy by reducing GHG emissions by sixty to eighty per cent by the year 2050 (CotEU, 2007; Weinhofer & Hoffmann, 2010). Second, a recent national survey concluded that, 'nearly three quarters' of senior Australian business executives believed that carbon pricing would survive in Australia even if the Federal Opposition is elected to government at the 2013 election with its pledge to repeal the current carbon pricing legislation. See Morton (2012, p. 4), 'Carbon pricing spurs business on'.

as sites for increasing costs but also as opportunities for lowering those costs. That CF1 did not foresee this suggests that further examination of the extant literature is warranted to see what it might offer for a second iteration of the conceptual framework – a CF2.

Media reportage of climate change was a significant influence on how MASS cases formed their understanding of the issue was another important finding of this study. In terms of Daft & Weick's (1984) original three-stage sensemaking model, they *scan/collect* data about climate change mainly from the media. That the media is a strong factor in determining how people understand climate change, even in different cultures, is now well established (Cordon, 2010; Leiserowitz, Maibach, Roser-Renouf, Feinberg, & Howe, 2012; Leiserowitz & Thaker, 2012). Although recent work points out that public perceptions of climate change cannot be separated from social factors (Leiserowitz, 2006, 2007; Marx et al., 2007) and individual psychology (Kahan, 2012; Kahan et al., 2011; Maibach, Roser-Renouf, & Leiserowitz, 2008), the media is still critical in shaping how we understand it.

For example, von Storch & Krauss (2005) argue that while national culture is a key influence on how people perceive climate change, media interpretations are also important with "frameworks(s) of vulnerability" used in both Germany and the United States. The role of media interpretations of climate change in how the building industry makes sense of it is also known (Hertin et al., 2003, pp. 281-282). The media's role in influencing corporate responses to environmental issues more generally – beyond just climate change – is however well established (Bansal, 2005, p. 203). Indeed, a range of empirical studies have demonstrated the media's pivotal influence on such responses (Bansal & Clelland, 2004; Bansal & Roth, 2000; Bowen, 2000; Henriques & Sadorsky, 1996) which underlines the importance of this factor. That the media turned out to be such a strong factor in how MASS organisations made sense of climate change represents another weakness in the initial conceptual framework. CF1 anticipated that sensemaking would be an internal factor in determining how MASS organisations perceived climate change however, it did not identify the media as a key influence in this process. This is further justification for modifying CF1 to create a second iteration – a CF2.

Most MASS organisations expressed their understanding of climate change around three key issues: water, energy and waste. This is a key finding of this study and the first in sport management research. Whilst to some degree these organisations were still waiting for the full implications of climate change to become clearer, these three issues were clear and consistent themes in the data. This combination of issues have not been reported in the sport management literature before, although water issues have been raised before in relation to sport in Western Australia (WADSR, 2007), and outside sport in the electricity industry (Haigh & Griffiths, 2012) and the housing and water sectors (Berkhout et al., 2006). The consistent linking by MASS organisations of water, energy and waste issues to climate change is likely influenced by media portrayals of climate change. Extreme weather

events such as drought are frequently portrayed in the media in Australia as a climate change problem[61]. Lower rainfall is evident in such portrayals, but is then reinforced by government requirements for large organisations to use water efficiently and incentives to install water management infrastructure such as water harvesting, water storage, and water recycling. Equally, the carbon-intensive nature of electrical energy production in Australia is frequently reported by the media[62] and government as the underlying motivation for climate change policies such as the carbon tax and ETS, and renewable energy targets. It is not surprising therefore that MASS organisations report energy as a climate change issue. Lastly, the data showed that most MASS cases understood the link between solid waste that accrues at their stadia, its disposal, and landfill waste GHG emissions. GHG emissions from landfill feature much less in media portrayals of climate change in Australia and probably are not as easy to attribute to this influence. However, the relationship between waste, landfill and GHG's is a topic raised by waste contractors, the Venue Managers Association, and industry publications that also influenced how MASS organisations perceive climate change. The latter suggests that stakeholder theory may offer some insights into how they do this and tends to confirm that it was appropriate to include stakeholder factors in CF1.

Whilst water, energy and waste were clearly perceived as issues, MASS organisations were largely uncertain about longer-term national energy and climate change policy. Legislation for carbon pricing including an ETS were not familiar. Even the *NGER Act*, the law most likely to apply to MASS as big energy users, was familiar to only two cases (A & E). This uncertainty about climate change is consistent with some management literature: Okereke (2007) identified corporate uncertainty about the "marketplace", Kolk & Pinkse (2005) identified corporate uncertainty about the "competitive effects" of the Kyoto Protocol and future "regulatory measures", while uncertainty in assessing climate change evidence is another issue (Berkhout et al., 2006; B. Levitt & March, 1988). climate change "policy uncertainty" is also reported as an issue for business (Dunn, 2002; Heal & Kriström, 2002; Okereke, 2007), while Dunn (2002) claims that uncertainties over renewable energy technologies and emissions markets have deterred investment in both. In terms of Daft & Weick's (1984) sensemaking model, most were unaware of climate change policy or legislation because they had not *scanned* (collected data) for them, and so they had not interpreted or learned (acted on) them. For CF1 however, overall it was useful for offering some insights into how MASS organisations understood climate change and should be retained for CF2.

[61] A good example of this is Jones, D. (2008). 'Our hot, dry future', *The Age*. Fairfax Newspapers, p. 11.

[62] Major Australian newspapers are a good example of this. The *Australian Financial Review*, the *Australian* and the *Age* have all frequently reported the implications of the Australian Government's carbon pricing policy for the electrical energy industry since it was announced on Sunday July 10th, 2011. For example, the *Australian Financial Review*'s report of Monday July 11th, 2011 (Chinnery, 2011, p. 16) – 'Fund to assist orderly buyouts' – among many others, illustrates how carbon-intensive electricity generation businesses are affected by carbon pricing.

Theme 2: Climate change issues for MASS organisations

A conundrum inherent in nearly all of the interview data, and implied by its absence of documents, is that while nearly all of the cases – and regardless of the theoretical category – reported climate change issues pertaining to water, waste and energy (and some reported it to be a high priority), very few of them could provide any documents that verified they had actually done much thinking about climate change. Only Case B could provide a document (Sustainability Assessment, June 2010) that referred to climate change at all (GHG emissions), and even it referred to these as part of broader sustainability issues such as water and waste. Only two cases (A & E) said they reported to the Commonwealth Government under the *NGER Act* – legislation that is specific to climate change – , and none had a specific climate change plan. No references to climate change, or climate change-related issues such as carbon pricing, were found in the annual reports of these cases either. It was therefore almost entirely impossible to triangulate the claims made in the interviews with documents. As a consequence, after some time analysing the data I found myself asking, *"Are they really thinking about climate change?"* If they were, most did not appear to be doing so systematically.

Nevertheless, water, waste and energy are the primary climate change issues for MASS organisations. Beginning with water, it was clear that these organisations were heavily water-dependent and that they were concerned about lower rainfall associated with climate change. It was also clear that the increasing costs of purchasing water from water suppliers was creating a financial incentive for them to reduce their water use and costs. A minority also reported being concerned about "negative public perceptions" associated from being large water users during a time of significant water restrictions. While climate change-related water issues are identified in a small number of non-sport management literature (Linnenluecke & Griffiths, 2010a; Winn et al., 2011), this is new to sport literature. Another concern highlighted by this study is one of an organisational perspective of climate change. As discussed in Chapter Two of this thesis, an interesting feature of the small body of sport literature that discusses sport and climate change is that most of it illustrates the value of Porter & Kramer's (2006) and Porter & Reinhardt's (2007) *inside-out* and *outside-in* perspectives of organisations. That is, unlike sport-environment literature that consistently discusses the negative impacts of sporting activities (the "inside") on the natural environment (the "outside") – what can be called an *inside-out* view – sport and climate change literature tends to see sport and sport organisations from the opposite perspective of *outside-in*. In other words, this literature unconsciously shares a view of sport that emphasises the impact of climate change on sport, and tends to highlight potential vulnerabilities of sport to climate change. For example, Weiss, Norden, Hilscher & Vanreusel (1998) and Moen & Fredman (2007) discuss how snow sports are negatively affected by climate change, while Swan, Otago, Finch & Payne (2008), Muscatello & Knight (2010), and Dingle (2007) all discuss how water-dependent outdoor sports may be degraded by lower rainfall associated with climate change, a

problem that has also been reported in the Australian media[63]. The results of this study show that in relation to water issues, MASS organisations are also most concerned with how the *outside* (lower rainfall associated with climate change, increased evaporation, and government water regulation) affect their *inside* (playing surfaces, operations and costs). This suggests that CF1 was correct in two ways: first, in identifying *physical impacts* of climate change as an external factor in Part One, and second, in identifying *vulnerability* or *resilience* to climate change in Part Two.

However, a weakness of CF1 is one of the physical impact factors of climate change. In CF1, an assumption is made that lower rainfall ("drier climate") associated with climate change would result in harder playing surfaces at MASS stadia. This was not reported by any cases. This was so for three reasons: first, ground staffs at MASS were able to compensate for lower rainfall through an adaptation – by using their water harvesting and storage infrastructure to catch more of what rainfall there was; second, they adapted again by supplementing this water resource by using water from water suppliers, and; third, they again adapted by using water-efficient grass varieties. In other words, they were able to use a mix of resources to avoid the ground-hardening problem and afford themselves extensive resilience. In turn, this suggests that internal organisational resources were critical to addressing this potential vulnerability for MASS and including such factors in CF1 was correct. Harder playing surfaces should therefore be removed from CF2. Nevertheless, this water-dependence of MASS highlights the value of Hart (1995), and Hart & Dowell's (2011) natural resource-based view thesis. Organisations that are aware of the value of natural resources such as water, and their vulnerability if that resource significantly declines, are better placed to develop and use capabilities for developing resilience to climate change.

For climate change-related energy issues, there was a range of results. First, all twelve MASS cases reported climate change issues around energy, with eighteen out of twenty-one managers (eighty-five per cent) interviewed referring to it. Second, the main energy issue above all others was the need to reduce energy use – sometimes referred to as "energy conservation" – as a strategy for minimising energy costs, especially those of electrical energy. While MASS organisations were concerned about mitigating (minimising) their GHG emissions, this was a second-order issue. Third, all MASS organisations recognised the link between energy use at their stadia and GHG emissions. This relationship between major sport stadia, energy use and GHG emissions has been previously recognised by Otto & Heath (2010). Fourth, whilst nearly all cases reported some *direct* GHG emissions – mainly from the use of diesel or gas-powered machinery such as vehicles and kitchens with gas cooking equipment – such GHG emissions were very much a small component of overall

[63] See Quayle, Boulton, Coulter, Eddy & Johnson (2006). 'High and Dry', in *The Age*. Melbourne: Fairfax Media, December 10th, Sport 11-12. Although this article refers to 'drought' rather than climate change adversely affecting football, golf, tennis, bowls, horse racing, cricket and soccer in Victoria at that time, I argue that this drought – then in its 11th year – was part of climate change in Australia.

emissions. Fifth, with emissions of a mostly *indirect* nature, and only two cases reporting under the NGER Act ("National Greenhouse and Energy Reporting Act 2007," 2012), MASS facilities are relatively small GHG emitters when compared with larger non-sport facilities such as electricity generators, oil refineries, mines, airlines and waste disposal sites. As of 2012, of the 258 "liable entities" in Australia for the carbon tax (CT), no MASS organisations reported sufficient GHG emissions to make them liable for the CT of $23 per tonne CO_2-e. Nevertheless, Case E reported that their annual emissions met the *NGER Act*'s reporting threshold (25,000 tonnes of CO_2-e) while Case A also thought they met this threshold. Sixth, the prospect of carbon pricing through either a carbon tax or an ETS was an energy-related issue identified by four MASS organisations (Cases E, F, I & K). However, for seventy-five per cent of MASS cases, carbon pricing was a topic of uncertainty. These results suggest that energy was viewed from both inside-out – and – outside-in perspectives. MASS organisations were genuinely concerned about their direct and/or indirect contribution to climate change, and were aware of their capacity – and in most cases, even their responsibility – to mitigate GHG emissions. However, the dominant view was an outside-in one: MASS require large amounts of energy, especially electrical energy, to operate and this costs money. As a result, they were concerned that energy costs could increase as a consequence of changes in energy markets and government climate change policy, and it was therefore an opportunity to seek increases in energy efficiency and cost reductions. This suggests that CF1 was correct in identifying financial implications of climate change as an external factor, although it was inadequate in that it failed to anticipate the primacy of cost concerns as a motivation for adapting their behaviour in relation to energy issues.

For climate change-related waste issues, the results of this study illustrate both inside-out – and outside-in – perspectives. First, a majority of MASS organisations (eight of the twelve) reported climate change-related waste issues. That waste was a climate issue was evident in two out of three theoretical categories although Category 1 (publically-owned, not-for-profit) was where it was indicated most strongly. Second, most MASS organisations also had in place sophisticated solid waste recycling programs that meant that they had already reduced their contribution to landfill gas/GHG emissions. Third, waste was a climate issue because it was widely recognised by MASS organisations that GHG emissions, such as methane, can be generated when the solid waste that was produced at their stadia is disposed of as landfill, and decomposes at Solid Waste Disposal Sites (SWDS). Ten cases recognised this link (A, B, C, D, E, F, H, I, J & K) and most thought it appropriate, or felt compelled by local government[64], to minimise such emissions. This illustrates an inside-out view of the problem. However, a key concern in minimising solid waste was to reduce the cost of disposing of it by introducing waste recycling programs such as VISY's "Closed Loop System." SWDS are generally charging higher costs for greater volumes of waste and this extends to MASS organisations.

[64] The reader should note that most SWDS in Australia are mostly owned and/or operated by local governments.

As a result, they had a good financial reason to see this in outside-in terms. This suggests that CF1 was correct in identifying such market changes as an external factor however it was deficient in failing to anticipate the link between solid waste and climate change.

Climate change as a second-order issue for MASS organisations

MASS organisations, with a strong operational focus and concern for their financial constraints, generally thought of climate change as just one of many issues to manage, and so it was subordinate to financial objectives. This is understandable. Whilst only three of the twelve cases were for-profit organisations, setting a goal of achieving an annual surplus was not limited to such organisations. State-owned, and privately-owned, not-for-profit organisations also need to manage themselves in a financially prudent way and this includes making a surplus. Whilst the surplus may be treated differently – for-profit organisations typically distribute *profits* to shareholders as dividends while not-for-profit organisations typically reinvest *surpluses* back into their organisation – the goal of making a surplus is an appropriate one in both situations. Achieving financial surpluses is important to the viability of most organisations and so the issue of climate change was perceived as one that was merely consistent with existing measures and the higher priorities of staging successful events, reducing costs, and achieving a surplus.

That economic concerns are priorities that override social and environmental ones is not surprising and is recognised in the non-sport literature. Ihlen (2009), Ketola (2007) and Livesey (2002) agree that the "reality" for organisations is that economic objectives are prioritised over social and environmental concerns. In other words, where organisations perceive that social and environmental concerns are inconsistent with economic ones, the economics win out. In the sport management literature, the challenges of incorporating environmentally-sensitive management in sport organisations are already recognised (Mallen & Chard, 2011, 2012). Evidence of this "second-order" phenomenon at major sport facilities is evident to a degree in another study of fifteen Canadian sport stadia where Chard & Mallen (2013) noted that although there is some evidence of environmentally-sensitive management, only four stadia (twenty-six per cent) had "renewable energy initiatives." As yet, there is little to suggest that climate change is a significant priority for governing bodies, community-level clubs or professional teams either, whether they be *win/utility-maximisers* (Sloane, 1971) or *profit-maximisers* (Késenne, 2007; Szymanski & Smith, 1997).

Why climate change is a second-order issue for most MASS organisations is probably best explained by a perception that their stadia are not affected by it in significant ways – in climate change terminology they are mostly "resilient" – , and a lack of awareness of the direct and indirect impacts that it can have. However, an alternative explanation of this understanding of climate change is possible particularly for those that had not discussed climate change before. It be could be that

environmental concerns – such as climate change – are not perceived as central to the economic imperatives that are dominant among management of most MASS organisations. That is, perhaps the "reality" of this population is that they assume that the environment and climate change are irrelevant to their core economic priorities? If so, this would mean little or no active consideration of climate change that would limit their ability to see all its risks, or even the opportunities it might create such as resource efficiency or green sponsorships. One of the key conclusions from sense-making research in organisations is that organisational, "interpretations of experience depend on the 'frames of reference' within which that experience is understood" (Berkhout, 2012, p. 95; Berkhout et al., 2006, p. 138; Daft & Weick, 1984). Berkhout, Hertin, & Gann, citing Levitt & March (1988, p. 333) note that:

> *There is generally a resistance to drawing conclusions that challenge these frames of reference, so that organisational myths, beliefs and paradigms are maintained, often in the face of considerable counter-evidence. Evidence derived from experience is more likely to be recognised the more frequent, unambiguous and salient it is to an organisation. Research has identified a range of reasons why evidence from experience may fail to be recognised and interpreted as significant. These include scarcity of evidence, blindness to evidence, and uncertainty in assessing the relevance of evidence.*

The dominant *frame of reference* for most MASS organisations appeared to be financial concerns such as minimising costs and achieving a surplus – or at the very least, avoiding financial losses – even if good corporate citizenship and environmental management were also important goals. Perhaps this dominant frame of reference, in combination with their uncertainty about the specifics of climate change, means these organisations are unable to discuss or specifically address it with strategy responses. However, this study does not have an answer to this question as its scope did not extend to the role of "frames of reference" in these organisations. The role of such learning about climate change – and barriers to it – in sport organisations remains an avenue for future sport management research.

Nevertheless, the results of this study suggest that it is not necessary for MASS organisations to relegate climate change to a second-order issue. Generally, they overlook the possibility that it can be integrated into the core of their management thinking and strategy in ways that are consistent with their economic imperatives, and which could enhance their competitive position, not detract from it. This is illustrated by the water, energy and waste issues. Nearly all cases understood that measures for increasing water and energy efficiency – and solid waste minimisation – reduced their costs and helped them achieve their environmental goals. These goals were complementary, not contradictory. In Porter's terms, the inside-out and outside-in perspectives can co-exist quite comfortably. This compatibility of economic and environmental objectives is recognised in the literature. For example, Lovins (1997) notes that measures such as GHG mitigation are consistent with objectives for lowering operating costs:

> *There is some very good news about the climate problem: we do not need to worry about how the climate science turns out or whether this is a real problem or not...because we ought to do the same things about it anyway just to save money...*

Commenting on Lovin's claim, Hoffman & Ventresca (1999, p. 1369) note that in relation to climate change:

> *Lovin's insight is to recognize the possibilities of better outcomes by looking beyond conventional practices and ideology; our challenge is to imagine how this can be accomplished.*

By the mid-2000's, a coalition of investors, firms and environmental organisations argued that lack of action on climate change would be inconsistent with companies' economic objectives:

> *Companies at the vanguard no longer question how much it will cost to reduce greenhouse gas emissions, but how much money they can make doing it. Financial markets are starting to reward companies that are moving ahead on climate change, while those lagging behind are being assigned more risk* (Cogan, 2006, pp. 1, as cited in Kolk, Levy & Pinkse, 2008).

These statements reflect a wider shift in management and other literature in recent years to acknowledge the value of addressing climate change. As noted in Chapter Two of this thesis, competitive-advantage can be achieved by incorporating climate change into strategic thinking (Kolk et al., 2008; Kolk & Pinkse, 2004, 2005; Lash & Wellington, 2007; Michalisin & Stinchfield, 2010; Porter & Reinhardt, 2007). MASS organisations are effectively addressing cost-advantage anyway through their water and energy efficiency measures. For CF1, the value of the market changes external factor is reinforced by this although it does not specify MASS organisation's emphasis on cost-advantage.

Issues in a minority of cases

Despite the consistency of findings across the cases examined in this study, there were two findings limited to a minority of cases. First, although nine of the twelve MASS cases (seventy-five per cent) reported their stadia were resilient to climate change (cases A, B, C, D, E, G, I, J & L), a minority of MASS cases still reported some *vulnerability*. One example of this was of the grass playing surface to increased *evaporation* of water (cases E, F, H & J). Three cases (A, D & H) also reported that they may have to change the type of grass on their playing surface if higher average temperatures were to persist. The vulnerability of MASS playing surfaces is an example of what could be described as a "sector-specific" (Kolk & Pinkse, 2011; Pinkse & Kolk, 2009) influence on their corporate position on climate change. Although such a finding has not previously been reported in the sport literature in relation to major sport stadia, this is not the first time such a finding has been raised for sport more generally. For example, Muscatello & Knight (2010) identified "suboptimal track performance" as one of three risk factors resulting from climate change that, "may deleteriously impact upon the athletic performance of the horse and the viability of race meetings." Swan et al. (2008, p. 172) also cited climate change as an issue for the safety of playing surfaces on sports grounds while Otago et al.

(2009), although referring to "ongoing" and "prolonged" drought rather than climate change, note the impact of such conditions on the safety of grass sports playing surfaces. Importantly, the Western Australia Department of Sport & Recreation (2007, p. 3) also cite "reduced playing surface quality" as a "direct impact" of "reduced rainfall and increased evaporation" associated with climate change. This literature is consistent with the concerns of cases E, F, H & J in this study about the vulnerability of their playing surfaces. Together, these claims validate the inclusion of vulnerability as an internal factor in CF1. Nevertheless, as indicated in earlier in this chapter, adept use of internal resources and capabilities can address such vulnerability.

Second, an issue highlighted by one MASS case was the reluctance of some key stadium stakeholders to address climate change. Case E made it clear that some sport organisations that used their stadium were unwilling to take "meaningful" steps to address climate change. The example given of this was a preference for using carbon credits to offset their GHG emissions rather than actually reducing them because of the cost of doing so. This suggests that for hirers of such stadia, costs are perceived as a barrier to more effective climate change action as well. That the cost of addressing climate change is a concern to business (Kolk et al., 2008; Kolk & Pinkse, 2004, 2007a; Lash & Wellington, 2007) is not new to management literature however, this finding is relatively new for sport management literature. Only Moen & Fredman (2007), who identified the cost to ski resorts of investing in snowmaking technology; WADSR (2007) who identified increased insurance and lighting costs for community sport, and; Dingle (2007) who also identified insurance costs as an issue for sport – have done so. That a significant MASS stakeholder is concerned about the cost of addressing climate change reinforces the value of including external stakeholder factors in CF1.

Theme 3: How and why MASS organisations respond to climate change

How MASS organisation's responded to climate change was in two broad ways. First, for some their response was to not consciously respond at all. Five of the twelve cases (forty-two per cent) fell into this group (cases D, G, H, I & K). They reported <u>not</u> discussing or specifically acting on climate change issues. Although this group associated water, energy and waste issues with climate change, they had not consciously identified any aspect of their operations as specific responses to climate change. This was because of a combination of either lack of awareness of climate change, lack of financial incentive to do anything, and/or a perception that their stadia were not directly impacted. Second, for the seven MASS organisations (fifty-eight per cent) who <u>had</u> discussed climate change (cases A, B, C, E, J, F & L), their responses appeared to be more conscious. However, even for water, energy and waste issues – that they too associated with climate change – their behaviour was essentially the same (water efficiency, energy efficiency and waste reduction that for most was aimed at the primary goal of cost reduction). There had been some discussion amongst staff of these organisations as to how climate change was affecting their stadia (directly or indirectly), and what

might be appropriate or responsible responses to it. This raises an important question: if some MASS organisations had consciously responded to climate change while the others had not, yet their behaviour was essentially the same, why is this so?

Part of the reason *why* they did respond to climate change is because of what it means in a practical sense for MASS organisations. For the purposes of this study, the IPCC definition of climate change – outlined in Chapter Two of this thesis – was adopted: "any change in climate over time, whether due to natural variability or as a result of human activity". However, for MASS cases that were conscious of climate change when they addressed water, energy or waste issues, the *direct* physical climate change impacts were not the exclusive problem that they were responding to. For these cases, direct physical climate change impacts – reduced rainfall, increased water usage on the playing surface as a result of higher evaporation, greater incidence of extreme weather events like storms or floods, reduced water allocations by water suppliers – were not the main problems. Rather, consciously addressing climate change largely still meant responding to the *indirect* climate change issues, which usually involved external stakeholders. These included: complying with government regulation requiring increased water and efficiency; complying with government building codes requiring energy efficiency; complying with the *NGER Act* that requires energy use or GHG emissions to be monitored, and if necessary, reported; increased electricity costs as a result of the looming carbon tax, and; local governments asking them to reduce their solid waste to landfill. For this group, climate change largely meant these indirect issues. To help conceptualise this practical understanding of climate change, both may be regarded as *outside-in* impacts. Yet, when their genuine concerns for minimising their direct and indirect climate change impacts are taken into account, the *inside-out* perspective is also useful.

Nevertheless, for those MASS cases that did <u>not</u> consciously see themselves as responding to climate change, in a practical sense their response to climate change impacts on them was essentially the same. Whilst this group did not see themselves as responding to climate change impacts, when asked, they still identified the same issues focusing on water, energy and waste – and the same actions – water efficiency, energy efficiency, and waste minimisation. The direct and indirect impacts were the same as for the group that did see themselves as responding to climate change: only the *perception* differed. For this group, direct impacts such as a hotter and drier climate did not make their way into management discussions. Similarly, legislative requirements for water and energy efficiency, complying with building codes, and local government demands to minimise solid waste were not woven together as a narrative about responding to climate change issues. Rather, they tended to be understood as "environmental", compliance and costs issues that were unrelated to the phenomena of climate change. For this group, an outside-in perspective is also useful although the *outside* issues were not viewed operationally through the prism of climate change – and their actions were not

conceptualised as responses to climate change. Nevertheless, this group also had genuine concerns for *doing the right thing* by the natural environment, and in this sense an inside-out perspective is also helpful to understanding how they acted and why they did. This combination of perspectives and direct and indirect climate change impacts are therefore interwoven and are illustrated in Table 24 below.

Table 24: Matrix of inside-out and outside-in perspectives, and direct and indirect climate change impacts at MASS organisations

	DIRECT IMPACTS	**INDIRECT IMPACTS**
Outside-in perspective	**Direct impacts of climate change ON MASS organisations:** • Hotter, drier climate • Increased water evaporation • Flood from more frequent extreme weather events (e.g. Case L)	**Indirect impacts of climate change ON MASS organisations:** • Compliance with legislation requiring increased water efficiency • Compliance with legislation requiring increased energy efficiency • Compliance with *NGER Act* requiring reporting of energy or GHG emissions • Cost of installing water harvesting & storage infrastructure • If likely to have sufficient energy or GHG emissions, need to report these to the Australian Department of climate change & Energy Efficiency • Increased electrical energy costs passed on by suppliers as a result of the carbon tax (or ETS after 2015)
Inside-out perspective	**Direct impacts on climate change OF MASS organisations:** • Direct GHG emissions from equipment, vehicles • Solid waste (including recyclable plastics, metals, paper and cardboard) • Water consumption	**Indirect impacts on climate change OF MASS organisations:** • Indirect GHG emissions mainly from electrical consumption • Methane emissions as a result of disposing solid waste at landfill

As can be seen from this matrix, most of the climate change impacts on MASS organisations are of an *indirect* nature. However, they are inextricably linked to broader direct impacts of climate change.

Regardless of whether MASS organisations were responding consciously or not to climate change – or directly or indirectly – water, energy and waste were the key issues. For *how* they addressed water issues, there were several responses. First, there was significant investment in, and installation of, water saving infrastructure. Second, there was a clear relationship between government legislation requiring large water users like MASS organisations to – report water use, restrict water use and meet water efficiency targets – and MASS organisations investing in water-saving infrastructure. Investment in water-saving infrastructure was a response not only to declining rainfall associated with climate change, but was also closely linked to legislative and regulatory responses to climate change by state governments around Australia. Third, switching to more water-efficient grass varieties for

playing surfaces was another response. Together, all of these responses suggest that some climate change adaptation has occurred among these organisations, the first time such findings have been reported in sport management research. However, for *why* such responses occurred, there are three reasons. First, increasingly efficient water management practices address the cost issue – put simply, saving water saves money over the long-term despite the short-term capital cost of installing water-saving infrastructure. Second, government regulation of the use of natural resources such as water was a catalyst for more efficient water management. Third, such measures were also prompted by a desire to be good corporate citizens at a time of prolonged low rainfall and depleted public water supplies. MASS organisations consistently want to *do the right thing* by the communities in which they operate.

Together, these water, energy and waste management "responses" to climate change point to an interesting and fundamental insight about these MASS organisations: they were mostly not responding *directly* to climate change at all, even those whose management had discussed climate change. Instead, they were mainly responding *indirectly* to the reported climate change issues. Despite a range of water, energy and waste management issues that were reported to be "climate change" issues, there is little in the overall data emerging from these organisations to suggest that climate change was the primary consideration for these organisations, and that many of their reported actions were specifically prepared as direct responses to climate change. Although climate change does matter for MASS organisations – the reported climate change issues are clear evidence of this – at best there appears to be only limited evidence of a simple *climate change-adaptive response relationship*. Rather, the relationship between climate change and these organisations is more nuanced. This conclusion therefore has important implications for the initial conceptual framework – CF1.

For Part Three of CF1 – the "climate change responses" section – the identified "responses" suggest that the *strategic match of external and internal factors* was therefore partly correct. CF1 correctly anticipated "strategy responses" however in eleven of the twelve cases (ninety-two per cent), they were not specific to climate change, and none had integrated climate change plans. Although MASS organisations shared a common strategy of increasing water efficiency, only Case E's investment in its $22 million Class-A water treatment plant specifically factored in long-term decline in rainfall as a result of climate change. In this regard, the next iteration of the conceptual framework would be more accurate if it excluded direct climate change-specific strategy responses. Although climate change is a long-term phenomenon and its physical and competitive impacts – and regulatory responses – are yet to be fully realised, the evidence of this study suggests that the current responses of such organisations are mainly indirect in nature. Nevertheless, responses to climate change-related water issues suggest

that CF1 correctly anticipated some adaptation responses, although it did not specify these as water efficiency or the introduction of water infrastructure and water-efficient grass varieties.

For responses to energy climate change issues, a similar story has emerged. To the extent that MASS organisations did respond to climate change-related energy issues, *how* they did so was based on existing energy conservation strategy. *Why* they did so was primarily to reduce energy costs with concerns for mitigating GHG emissions being a largely secondary objective. Examples of such responses include the installation of motion sensors, more energy efficient lighting, inter-departmental committees ("green teams") identifying opportunities for GHG mitigation (cases B & F), hiring consultants to identify opportunities for energy efficiency, reporting energy use and/or GHG emissions under either the *NABERS* scheme or the *NGER Act*, and the purchase of energy monitoring software. Although all were primarily aimed at reducing energy costs, nearly all stadia recognised that saving energy also reduced indirect GHG emissions and this was part of being good corporate citizens. For CF1, in the absence of any climate change-plans, again it is difficult to discern any climate change-specific strategy responses. However, mitigation of indirect GHG emissions was recognised as an important, even if a largely secondary, goal and as such CF1 was correct to anticipate it. In CF1, for energy issues there is little justification so far for the "adaptation" response, although as the carbon tax was introduced only three-quarters of the way through the period of interviews for this study[65], this response may become more important over time if energy prices increase as anticipated. Interestingly, the "do nothing (business-as-usual)" response was justified given the lack of awareness and action by Case G where climate change had been ignored.

To the extent that MASS organisations responded to climate change-related waste issues, *how* they did so was essentially by recognising that their existing waste recycling strategies helped to reduce GHG emissions by reducing solid waste disposal at landfill. Although eleven of the twelve cases (ninety-two per cent) reported waste as a climate change issue, only four of the twelve cases (A, I, J & F) – or one third - reported their waste recycling processes as a climate change response. *Why* they used waste recycling was again primarily motivated by a need to reduce waste disposal costs, although this coincided with a genuine desire to reduce their environmental impacts – in particular to reduce their contribution to GHG emissions from landfill – and be true to their shared goals of acting as good corporate citizens. Mitigation of indirect GHG emissions was evident in their recognition (ten of twelve cases) of its link with solid waste disposal and as such, CF1 was correct to anticipate it. The "adaptation" response in CF1 has little justification so far based on waste issues although as the carbon tax was introduced during the course of the study, this response may become more important

[65] The carbon tax commenced on July 1st 2012.

over time if carbon pricing and national GHG emissions reduction targets mean that solid waste disposal costs continue to increase.

MASS organisations and adaptation to climate change

To explain the responses of MASS organisations, it is helpful to contemplate recent organisational climate change adaptation research. Berkhout (2012) identifies five categories of responses to climate change – or "adaptations" – that should all be seen as part of "deeper" organisational strategy. Comparing the work of Willows & Connell (2003), Arnell & Delaney (2006), Berkhout, Hertin & Gann (2006), and Hoffmann, Sprengel, Ziegler, Kolb & Abegg (2009), organisational adaptation spans the following possibilities: (1) "do nothing"; (2) "assess"; (3) "reduce risk"; (4) "share risk", and; (5) "diversify" risk. These five strategies illustrate the areas of agreement across organisational climate change adaptation literature with the consensus being strongest around the reduction, and sharing, of risk. In contrast, the consensus is weakest around doing "nothing" and the assessment of risk, yet both add nuance to the range of possible responses by organisations. This range of adaptation strategies is summarised in Table 25 below.

Table 25: Organisational adaptation strategies (reproduced from Berkhout, 2012, p. 100)

ADAPTATION STRATEGY	Willows & Connell (2003)	Arnell & Delaney (2006)	Berkhout et al (2006)	Hoffmann et al (2009)
1. Do nothing			Wait and see	
2. Assess			Risk assessment and options appraisal	
3. Reduce risk	Manage hazard or manage exposure	Risk avoiding	Bearing and managing risks	Protect affected businesses
4. Share risk	Offset risk	Risk sharing	Sharing and shifting risks	Share risks
5. Diversify	Diversification			Expand beyond affected business

Of these five typologies, Berkhout et al's (2006) offers the most comprehensive explanation of the responses of MASS organisations to climate change. Although developed from a study of housing and water services companies in the United Kingdom rather than sport or sport-focused organisations, their paper offers some insights into what MASS organisations are doing. Building on earlier work by Hertin et al. (2003), these authors identify four factors that shape patterns of an organisation's approach to climate change adaptation: (1) *core competencies*: companies can be expected to search for and adopt adaptation measures in areas that match their core competencies; (2) *core business*: if climate change is seen to have a significant physical impact on the core business, companies tend to engage with the issue on a technical level; (3) *dynamic capabilities*: whether a firm is an early or a late adapter will depend on its dynamic capabilities (i.e. the ability to modify and adapt organisational routines and behaviours in response to external drivers of change), and; (4) *organisational culture*: a key determinant of the way in which a firm responded to new risks posed by climate change.

Berkhout et al. (2006) argue that these factors shape four adaptation strategies for organisations: (a) *wait and see* – "a strategy of deferral, based on scepticism or uncertainty about the possible impacts of climate change and about the benefits of adaptation"; (b) *risk assessment and options appraisal* – "a strategy of appraising options in preparation for adaptation of organisational routines"; (c) *bearing and managing risks* – "a strategy of handling risks and opportunities arising from climate impacts employing organisational resources and capabilities", and; (d) *sharing and shifting risks* – "a strategy of seeking to 'externalise' risks associated with climate impacts through insurance and collaboration."

If the Berkhout et al (2006) and Berkhout (2012) typologies are applied to the MASS cases investigated in this study, the range of organisational responses become clearer. A summary of the range of responses by MASS organisations expressed in Berkhout et al's (2006), and Berkhout's (2012) terms is presented in Table 26 below.

Table 26: Responses by MASS organisations expressed in Berkhout et al's (2006), and Berkhout's (2012) terms

MASS ADAPTATION STRATEGIES (BERKHOUT, 2012)	MASS ADAPTATION STRATEGIES (BERKHOUT ET AL., 2006)	MASS CASES
1. Do nothing	Wait and see	G
2. Assess	Risk assessment and options appraisal	B, E & J[66]
3. Reduce risk	Bearing and managing risks	A, B, C, D, E, F, H, I, J, K & L
4. Share risk	Sharing and shifting risks	Nil
5. Diversify		Nil

Firstly, *"wait and see"* is suitable for only one MASS organisation: Case G. This was the only MASS organisation to have no almost awareness of the actual or potential impacts of climate change on their organisation or their stadium – whether direct or indirect – and showed no real interest in the possibility of strategic, commercial or technological adaptation. This may be partly explained by their lack of resources: of all the MASS organisations, theirs had probably the smallest resources available for stadium management. Another reason why may be that their stadium was scheduled for closure at the end of 2013, and replaced by a new stadium managed in partnership with Case H beginning in 2014, and so stadium management had simply stopped being a priority. Translated into Berkhout's (2012) more recent terms, Case G is an example of a "do nothing" approach.

[66] Cases B, E and J are interpreted as the only cases that "reduce risk"/"bear and manage risks" – *and* – "assess" risk/ do "risk assessment and options appraisal."

However for eleven of the MASS cases (A, B, C, D, E, F, H, I, J, K & L) *"bearing and managing risks"* would best describe how they respond. Nevertheless, it must be understood that they do so mainly by using existing organisational strategies, rather than ones specifically prepared to directly address climate change. They do this because they are mostly uncertain about climate change policy and legislation, uncertain about the potential for competitive advantage and disadvantage arising from climate change, and – outside of cost-reduction strategies associated with water, energy and waste – unsure or even unaware of how an integrated climate change-strategy might be implemented to benefit their organisations. While they report climate change issues, they are largely indirect ones. To the extent that they respond at all, they do so cautiously and within their existing non-climate change specific strategy frameworks. They are mostly not engaged in any conscious, coordinated or comprehensive direct response to climate change because they do not perceive the need to. This highlights the importance of sensemaking as a concept for understanding how MASS organisations respond to climate change. It also goes some way to answering Research Question 2 of this study ("*How* are the organisations that manage MASS responding to climate change?"), and, Research Question 3 ("*Why* are the organisations that manage MASS responding to climate change in the way they do?"). Translated into Berkhout's (2012) terms, these cases "reduce risk" by applying existing commercial and environmental strategies.

However for three of these eleven cases (B, E & J), cautious moves to adapt to climate change indicate that they were moving beyond merely "bearing and managing risk", and that they were also undertaking what Berkhout et al (2006) call *"risk assessment and options appraisal."* For Case B, although they did not have an integrated plan of climate change strategies, they acknowledged some climate change vulnerability to water and energy issues, and made genuine efforts to enquire into what climate change might mean to them because they perceived climate change as a potential risk. Expressed in Berkhout et al's (2006) terms, they were "bearing and managing risks" pertaining to climate change through their water and energy management measures, by conducting their stadium *Sustainability Assessment*, a stadium *Energy Review*, and their internal presentation to staff on energy monitoring. In addition, evidence of "risk assessment and options appraisal" was in their development of their *Climate Change Adaptation Strategy*, which was informed by published state government analysis of the impacts of climate change for sport within their geographic region. From this data, as well as data from the focused (in-depth) interviews, it was clear that Case B was aware of risks posed by climate change and its associated regulatory changes, and they did consider them seriously. It was also clear that they were contemplating options for more extensive modification to their business in the future.

Similarly, Case J's cautious actions to adapt to climate change are also consistent with Berkhout et al's (2006) *"risk assessment and options appraisal"* category. Like Case B, despite not having an

integrated plan of climate change strategies, Case J was aware of basic elements of climate change such as GHG emissions, and where possible, the need to mitigate them. They had also discussed it as a management issue and they also saw it largely as a question of costs associated with three key climate change issues: water, energy and waste. However, after the extended "millennium" drought of the late 1990's to the mid-2000's, they adopted an *"aggressive"* approach to water management centred on water harvesting and recycling and, the use of drought-tolerant grass types for their playing surface. These later actions are consistent with Berkhout et al's (2006) notion of *bearing and managing risks*, which in Berkhout's (2012) terms, equates to *reduc[ing] risk.*

The actions of Case E are also consistent with both of Berkhout et al's (2006) categories of *bearing and managing risks*, and, *risk assessment and options appraisal*. As mentioned previously, Case E had the most sophisticated understanding of climate change and its associated implications for regulatory changes such as the *NGER Act* and the likely impact of the carbon tax or emissions trading scheme (ETS) on their operating costs. They were also the best informed and most confident case in understanding that climate change posed some risks that were worth addressing. As a result, they were well positioned for "bearing and managing" these risks which they did mainly through their existing water management, energy efficiency and waste management measures. However, as also the most proactive MASS case, there is evidence of "risk assessment and options appraisal." They were the only one to have anticipated, and considered in detail, the likely financial risk of the carbon tax on them and as a result, they were the only case to have quantified its likely impact (*"At $20 a tonne, it would cost us about $600,000 a year"*). Furthermore, while they were not the only case to have identified climate change-related water, energy and waste issues – or report extensive climate change resilience – they were the only one with a comprehensive plan for and investment in a Class-A water treatment plant. Prior to building this plant, a "business case" had to be prepared by management that contemplated other options. In addition, they were very clear about the cost risks of the *NGER Act* for stadia like theirs, and they were very certain of their annual GHG emissions that they already knew was in excess of the reporting thresholds of that legislation. They were aware that if they stayed above the twenty-five kilo-tonne reporting threshold of the *NGER Act*, they knew they would owe a carbon tax liability to the Australian Government for these emissions. In anticipation of their looming carbon tax liability, they had identified that improved energy efficiency was the means for addressing this risk to their competitive position. Overall then, when translated into Berkhout's (2012) terms, Cases B, E and J had acted to "assess" and "reduce" the direct and indirect risks posed by climate change but within their existing strategic plans.

Despite the insights afforded by Berkhout et al's and Berkhout's typologies, there is nothing in the actions of MASS organisations that is consistent with either of the "share risks"/"sharing and shifting risks", or with the "diversify" risks adaptation strategies. This is probably because the understandings

of climate change by MASS organisations are in their early stages, and so such strategies have not yet been contemplated.

Two of Berkhout et al.'s (2006) four *factors* underlying their four adaptation strategies also offer some insights into how and why MASS organisations responded to climate change. First, it is arguable that most adopted adaptation measures in areas that matched their *core competencies*. Whilst for most cases this was not conscious adaptation to climate change – as might occur under a specific climate change plan – efficiency of water, energy and waste management were core capabilities of these organisations. Second, it is debatable whether climate change was having a "significant physical impact on the[ir] *core business[es]*", and therefore they tended to "engage with the issue on a technical level." Again, most MASS organisations did not see their management activities as direct and specific responses to physical impacts of climate change on their core business (to provide sport entertainment experiences) such as lower rainfall, higher temperatures and associated evaporation. However, whilst it is possible that the *organisational culture* at each MASS organisation shaped their responses, there is little evidence to show this. Aside from the consistent theme that these organisations embraced a CSR ethos, it remains unclear to what extent their organisational cultures shaped how climate change was prioritised amongst a range of issues.

These two factors underlying Berkhout et al.'s (2006) four adaptation strategies highlight an important point about why MASS organisations responded to climate change – and its associated issues – within their existing strategic plans. That is, it appears that *internal* factors shaped their responses as much as *external* factors like direct physical impacts, the carbon tax, the *NGER Act*, or state-based water and energy efficiency requirements. Berkhout (2012, p. 92) notes that to understand what climate change means for organisations, analysis needs to start with:

> *"the complex reality of organizations themselves, rather than starting with the climate signal and then seeking to trace its presumed influence on organizational behaviour. The analysis needs to be done inside-out, rather than outside-in."*

By "signal", Berkhout means the direct or indirect signs "about a change in the conditions" (Berkhout et al., 2006, p. 146) that organisations face. Accordingly, organisations must be alert to such signals, and understand what they mean. Climate change creates "direct signals" to adapt, such as the physical impacts of extreme weather, as well as "indirect signals" like regulatory change and market change. Yet, internal organisational factors like their strategic goals, culture, and how they perceive external issues – such as climate change – mean that organisational adaptation to climate change "is not explained by assuming a simple stimulus-response relationship." As Berkhout (2012, p. 94) notes, "most organizations will not translate in any straightforward way a 'climate signal' into an adaptive response' ." Rather, organisational climate change adaptation is a function of the interplay between multiple complex internal and external factors.

The complexity of such organisational adaptation generally points to why MASS organisations responded to climate change within their existing strategic plans specifically. As Berkhout (2012) notes, there are a range of reasons why organisational adaptation might not be direct, straightforward and simple. First, organisational adaptation to climate change needs to be "understood from the perspective of the goals and perceptions of the organization itself, rather than from climate signal" to adapt. Organisational change occurs in response to "many stimuli, with climate risk and opportunity being but one." MASS organisations are a good example of this; climate change was a priority, but it was only one of a range of issues to be managed, and it was largely secondary to their operational imperatives. Second, adapting to climate change involves a "complex set of processes" of perceiving (making sense of), evaluating, enacting and learning. For MASS organisations, it is simpler to interpret and respond to climate change through existing strategies and "frame of reference" than to re-order them specifically to face climate problems. Third, "few changes made by organizations will be a response to a climate signal alone." Climate change is but one of a range of simultaneously-occurring technological, regulatory and market changes that organisations – including MASS ones – must make decisions about. Fourth, organisational adaptation is influenced by the interplay of internal and external factors that form the institutional context of the organisation. For MASS organisations, there are internal factors such as emerging perceptions of – and capabilities for managing – climate change that interact with changing national climate policy, ongoing changes in water and energy markets, state-government requirements for water and energy efficiency, a stadia industry trend toward "greener" technologies, and contrasting public opinion about the nature and importance of climate change itself. This institutional context offers mixed messages to MASS organisations as to how they should respond. Finally, the internal leadership, resources and culture of organisations are important factors that either enable or constrain how and when they adapt. For MASS organisations, while existing plans, staff and capabilities enabled some largely effective measures for addressing climate change and its associated impacts, some internal barriers also prevented more holistic and integrated management responses.

In summary, most MASS organisations responded cautiously – and largely indirectly – to the overarching issue of climate change and this is consistent with their general uncertainty about its implications. Using Berkhout et al's (2012) adaptation framework, their collective responses involved "do[ing] nothing", "assess[ing risk]", and "reduc[ing] risk."

Responses to climate change and documents

As indicated earlier in this chapter, climate change is discussed by some MASS organisations, and not by others: fifty-eight per cent of the MASS cases (A, B, C, E, F, J & L) discussed it while the remaining forty-two per cent of cases (D, G, H, I & K) did not. Even for those cases that actively

discussed climate change, this did not generally flow through to their formal documentation. Key MASS documents that do not mention climate change include all annual reports, policies and strategic plans. Others that do not include Water Efficiency Management Plans (WEMPs) (Cases B & D), Environmental Management Plans, a "Master Plan" (Case E), a "Sustainability Plan" (Case D), an "Asset Management Plan" (Case A), a "Safety Plan" & "Quality Plan" (Case C), and ISO certification (Case C). Furthermore, no cases had formal climate change plans that are now common to airlines, banks or mining companies in Australia.

For some MASS documents, this might be partly explained by government regulation. Given that government is such a strong influence over what these organisations do – either as formal stakeholders who own these stadia and/or fund their capital improvements, or through government regulation of their activities such as water and energy efficiency – their influence likely extends to some of these documents. For example, WEMP's were a statutory requirement for some MASS cases and so how they are phrased is likely shaped by the language used in the legislation. However, as none of these document types refer to climate change, this suggests that it is an issue that hasn't yet become one of their highest priorities anyway. Even for the organisation with the most sophisticated understanding and response to climate change (Case E), Manager E1 explained that he had only recently been able to persuade their governance level (the "Trust") to invest in their $22 million water treatment plant. The almost complete absence of discussion of climate change in the official documents of MASS organisations is *consistent* with interview data that identifies climate change as a second-order issue, and is *inconsistent* with interview data that identifies climate change as a high priority.

Nevertheless, for CF1, the balance of evidence discussed here suggests that inclusion of climate change "adaptation" in the conceptual framework is justified.

Green? Or greenwash?

Amidst this discussion of how and why the MASS organisations responded to climate change, the possibility that in participating in this study, some of them were engaging in a manipulation of their public image – a practice frequently referred to as "greenwashing" – ought to be considered. Greenwashing, a concept whose history dates back to the "mid-to-late 1960's" (Karliner, 2001) has been defined in different but similar ways. For example, it can refer to "public relations efforts to portray an organization, activity or product as environmentally friendly" (Beder, 2001; Newlands, 2012, p. 154), and can extend to "trying to cover up environmentally and/or socially damaging activities" (Beder, 2001; Newlands, 2012). Similarly, it has been described as "disinformation" disseminated to "present an environmentally responsible public image" (Ramus & Montiel, 2005, p. 377). Greenwashing has also been defined as organisations presenting themselves as "green" because

it is “easier and cheaper” than “reducing their environmental impacts with expensive and risky investments in new equipment and processes” (Bansal & Kistruck, 2006, p. 168; D. L. Levy, 1997). Greenwashing involves deceptive organisational statements that are “not credible” (Belz, 2006; Chard et al., 2013, p. 46; Saha & Darnton, 2005), “false, unsubstantiated, or exaggerated” (Chard et al., 2013, p. 46; Prakash, 2002, p. 293), inconsistent with their management practice (Chard et al., 2013; Polonsky & Rosenberger, 2001), or “directly deceitful” (Chard et al., 2013, p. 46; Thøgersen, 2006). Laufer (2003, pp. 256-257) categorises these sorts of practices as “confusion”, “fronting” and “posturing”. Whilst academic work on greenwashing has focused on non-sport contexts, it also has a history in sport including at the Olympics (Newlands, 2012) and at ski resort contexts (Spector et al., 2012).

Although there was no obvious reason to think greenwashing was occurring in the comments of the participants of these MASS organisations – all seemed credible and honest in their interviews – if greenwash was occurring, it was inconsistent. Notably, in eight of the twelve cases (A, B, C, D, E, I, K & L), their stadium websites proclaimed their “environment” or “sustainability” policies, arguably a form of greenwash. The greatest potential for greenwash should have been in Cases B and F. For Case B – the only one with a climate change adaptation plan – its “real-time energy monitoring system” was reported publically on two websites[67] as being a “green” initiative. For Case F, it reported its desire to develop a reputation as a “green venue”, and wanted to prevent “negative public perceptions” about their “environmental management”. Yet, no public statements about its stadium being “green” were found.

Overall, there is little evidence that greenwash was a priority for MASS organisations – for different reasons. Firstly, the Chief Executives of all Cases delegated the request to participate in the study to senior managers, but not to public relations staff. If greenwash was a priority, then every case missed the opportunity to leave this to their official “spin doctors”. Secondly, as all organisations and their staff representatives were participating on the basis of anonymity, there was less reason for them to be greenwashing. Thirdly, the researcher’s observation of each interviewee was that they were giving honest responses, and not ones calculated for reputation management (Laufer, 2003). Finally, whilst there was the potential for greenwashing amongst MASS organisations, their investment in water, energy and waste management infrastructure suggests they had at least some environmental management credentials.

[67] The names of these websites have been withheld to protect the anonymity of this MASS organisation.

Theme 4: Barriers to effective responses to climate change

For MASS organisations, there were barriers that hindered more integrated and effective responses to climate change, and that help to explain the largely cautious nature of these responses. These barriers are important because they help to explain *how* they responded to climate change and *why*. All MASS cases identified at least one barrier to effective climate change responses, and it was clear from the interview data that these barriers included limited management understanding of climate change regulation (Cases B, C, D, F, G, H, I, J, K & L), poor understanding of climate change by board directors or stakeholders (Cases E, H & I), lack of a long-term view (Case E), inappropriate governance structure (Case G), inadequate stadium design (Cases B & H), and lack of information and technology (Case L). Although such findings have not been reported before in sport literature, they are consistent with some non-sport literature. For example, Robinson identified three types of barriers for local government: (1) priority; (2) capacity, and; (3) information. On the other hand, Okereke (2007) reported barriers such as the lack of strong climate change policy framework, "uncertainty about government's action", and "uncertainty about the marketplace." Policy uncertainty was also identified by Pinkse & Kolk (2010).

Hoffman (2010, pp. 296-297) also identified "social and psychological barriers" to cultural and behavioural change for addressing climate change. At the individual level, such barriers include "simplifying strategies" in the form of "cognitive heuristics or habitual routines" that are useful for managing daily organisational tasks but which can be an obstacle to changing organisations when issues such as climate change arise. Institutional/organisational culture is another barrier identified by Hoffman, and supported by Bazerman (2006). Hoffman argues that organisational understandings shape the way the external world and information are "interpreted, disseminated, and acted upon." Together, such "biases" can cause "individual managers and employees" to "resist a growing emphasis on climate change as it pertains to how they do their jobs and why." Other barriers identified by Hoffman include: "environmental ignorance" of staff; an organisational assumption that "if you protect the environment, it must reduce the economic competitiveness of the firm"; organisational values and terminology that don't reflect the congruence between financial "performance" and environmental sustainability; lack of support for climate change initiatives by senior management; short-term measurements like "return on investment" that fail to account for the economic benefits of addressing climate change, and; "sub-optimal" laws that discourage "creative" organisational solutions. Significantly, several of these barriers were present in MASS organisations such as: uncertainty about national climate change policy, uncertainty about the competitive implications, lack of understanding of the environment/climate change (especially cases D, G, I & L), interpreting climate change as an issue of cost, and senior management showing little or no support for climate change initiatives while the governance/director level of most cases showed no interest in climate change. These barriers help to explain why more comprehensive responses were not evident.

However, the key barrier to responding to climate change more effectively was an internal *resource* issue, in particular the lack of financial resources. Nine of the twelve cases (A, B, C, D, F, I, J, K & L) – or seventy-five per cent – reported that a lack of financial resources prevented them from addressing climate change the way they wanted to. This is consistent with some literature. Jeswani et al. (2008) emphasised the importance of not having enough financial resources to respond to climate change while Robinson & Gore (2005) also identified lack of money as a significant "capacity" barrier for local government. Implicit in MASS organisation's concern that they don't have the financial resources to address climate change is an assumption that it would be costly to do so – a concern that is documented in some management literature (Kolk et al., 2008; Kolk & Pinkse, 2004, 2007a; Lash & Wellington, 2007).

However, a potential barrier to responding to climate change – that of lack of organisational *capability* – was not a widespread concern. Only Case L alluded to a lack of organisational capability in the form of limited staff skills and experience. Despite some of the complexities posed by climate change such as identifying, measuring and mitigating their direct or indirect GHG emissions, most cases thought they had the capabilities to manage such issues.

Overall, the barriers to climate change responses discussed above suggest two things for CF1. First, such barriers were a significant omission from the initial conceptual framework. Whilst barriers were canvassed in the interviews, they were not included in CF1 because it was not anticipated that they would be so important. In hindsight, this was clearly wrong. Second, that the resources component of CF1 was justified and confirms that RBV/RBT offers some insights into MASS responses, although failing to specifically mention *capabilities* was an error. For the forty-two per cent of cases that did not discuss climate change (D, G, H, I & K), it appeared to be an issue that was either not worth allocating resources to, or one that they had not fully appreciated how much it was related to operational the activities they were already managing, such as water management infrastructure and energy efficiency programs. If the former is true, this suggests that *vulnerability* and *resilience* are concepts from the scientific and management literature that were appropriate to include in CF1. If the latter is true and some of these MASS organisations have failed to understand the depth of the relationship between existing management activities such as water and energy management – *and* – climate change, this suggests that capabilities were a factor worth including in CF1 and reinforces the value of RBV/RBT for understanding how and why these organisations respond to climate change. Taken together, these findings alone suggest that a second iteration of the conceptual framework (CF2) is warranted.

Theme 5: Influences on how and why MASS cases responded to climate change

In this study, seven different factors were identified as influences on MASS organisation's responses to climate issues. These influences included government, corporate social responsibility (CSR), stakeholders/corporate partners, organisational values, public opinion, the views of staff, and the actions of other stadia. Of these, *government* was the strongest influence being nominated by eight out of twelve cases (seventy-five per cent). That government was such a strong influence has not been reported in sport literature before in relation to climate change however, it is consistent with some non-sport literature. A range of literature cites government as a critical influence on how organisations respond to climate change (Berkhout et al., 2006; Dunn, 2002; Hertin et al., 2003; Kolk & Levy, 2001; Kolk & Pinkse, 2004, 2007a, 2007b). For example, Kolk & Pinkse (2007b, p. 373) illustrate the influence of government climate change regulation: "While governments and NGOs are stakeholders that both lay an urgent and legitimate claim on companies to combat climate change, government regulation is more salient because it contains power as well" (Mitchell et al., 1997). This quote illustrates the power of government regulation to force organisations to respond to climate change and current Australian examples of this include the carbon tax, the planned but soon-to-be-abandoned ETS, and the GHG emissions and energy reporting requirements of the *NGER Act*. Within government-as-an-influence, policy is another factor that shapes how organisations respond (Berkhout, 2012; Berkhout et al., 2006) and the measures listed above are tangible aspects of current national climate change policy. Significantly, the importance of government identified in this study is consistent with Berkhout's (2012) conclusion that governments both build "societal awareness" of climate change, and intervene in organisational responses by way of regulation. However, such emphasis on the influence of external stakeholders is inconsistent with other literature emphasising internal or "institutional" influence on corporate responses to climate change (Levy & Kolk, 2002; Levy & Rothenberg, 2002). These authors cite Oliver's (1997a) argument that conditions of uncertainty – such as that over climate change science, and technological, market and corporate responses to it – increases the influence of internal factors because "managerial discretion is higher when the economic consequences of actions are unclear." On balance though, data from this study allied with literature highlighting the importance of government in shaping corporate responses to climate change suggest that it was appropriate to include this factor in CF1.

CSR was the next most important influence on how these organisations responded to climate change with five out of twelve cases (forty-two per cent) citing this. This aligns with another finding reported in Chapter Five of this thesis, that nine out of the twelve cases (seventy-five per cent) identified CSR as an important influence on their responses to climate change-related energy issues. Furthermore, that CSR was reflected in the corporate values of MASS organisations underlined its influence. Together, this underlines what a strong theme CSR was in the interview data. Whilst CSR has previously been identified in sport literature as a significant influence on the general "greening" of

sport (Babiak & Trendafilova, 2011; Trendafilova, Babiak, et al., 2013), the role of CSR in shaping corporate responses to climate change has not been reported before in this body of work. However the influence of CSR is consistent with non-sport management literature on climate change, and is also broadly consistent with both sport and non-sport literature that highlights the role of CSR in shaping how organisations act. Examples of how CSR influences corporate responses to climate change include disclosure of corporate "carbon risks, opportunities, strategies, and emission levels" (Reid & Toffel, 2009; Stanny & Ely, 2008), corporate governance (Kolk & Pinkse, 2010), emissions trading (Paulsson & von Malmborg, 2004), and management of GHG mitigation (Sullivan, 2009). For CF1, the combination of interview data pointing to the role of CSR in shaping MASS responses to climate change and this literature discussing the same confirms the appropriateness of including this factor in Part Two of the initial conceptual framework.

Public opinion was also cited by one-third of MASS cases (A, J, K & F) as an important influence on their response to climate change. MASS organisations were mindful of public perceptions of their behaviour, and this extended to climate change. As they were so consistently concerned with doing the right thing by the communities in which they operate, this is perhaps not surprising. Whilst public opinion is not yet reported in sport literature as an influence, some management literature does indicate it is a factor (Kolk & Levy, 2001; Kolk & Pinkse, 2007a; Levy & Rothenberg, 2002), whilst others report significant corporate efforts to shape public opinion (Kolk & Levy, 2001; Pulver, 2007). Equally, *staff* were also cited by one-third of MASS cases (A, B, E & J) as an important influence on their response to climate change, particularly the most senior Executive Manager or Chief Executive Officer (CEO). Whilst this factor was not uniformly reported, staff are cited as an example of internal stakeholders who have the capacity to shape organisational behaviour generally. However, there is little literature reporting the influence of staff on corporate responses to climate change with Kolk & Levy (2001) being a rare exception. Nevertheless, as staff are the people who either do – or do not – respond to climate change on behalf of an organisation, this influence is considered to be sufficiently justified to be retained in CF1. This justification will be elaborated in the section to follow (Theme 6) where the importance of individual staff members in shaping their MASS organisation's responses to climate change will be discussed.

Finally, the *actions of other stadia* were an influence reported by two MASS organisations (Cases H & F). Whilst these cases represent only sixteen per cent of the total study population, it confirms that other stadium operators do influence the response of some of their peers to climate change. Given the similarity of MASS in terms of spectator capacity (all are 25,000 or over), product (major football codes, cricket and musical events) and services (public and athlete amenities, media broadcasting, catering and corporate services), this is not surprising. In the extant literature, responses to climate change by major sport stadia have not been reported in scholarly publications although, in recent

years they have in some industry ones. For example, since 2007 the European stadium industry journal – *Panstadia International* – has published a number of articles highlighting examples of how major sport stadia address climate change. These include the use of solar panels to create electricity at Pocono Raceway in Pennsylvania, Kaohsiung National Stadium in Taiwan, and AT&T Park in San Francisco (Rittenberry, 2010); Chelsea Football Club's Stamford Bridge Stadium and Arsenal Football Club's Emirates Stadium use of "carbon mentors" to reduce energy consumption and GHG emissions under the "Green 500 Initiative" (Oldenkotte, 2009a); Wembley Stadium in London completing an energy audit to identify opportunities for GHG emissions reductions (Coxeter-Smith, 2008); Croke Park in Ireland purchasing electricity sourced from renewable energy (Coxeter-Smith, 2008); stadiums in the United States reducing their energy consumption and indirect GHG emissions through energy-efficient lighting (McIntyre, 2007); and; Leadership in Energy and Environmental Design (LEED) certification at Target Field in Minnesota and National's Park in Washington (Menary, 2009). Interestingly, LEED certification – which requires buildings to produce less GHG emissions – is evident at other major sport stadia in the United States including Apogee Stadium at the University of North Texas (Meinhold, 2012) and in Brazil at the Estadio Nacional de Brasilia Stadium, a key venue for the 2014 World Cup Finals (Dugan, 2012).

Furthermore, a recent study by Otto & Heath (2010) exploring the potential contribution of the 2010 Soccer World Cup finals to climate change highlights the critical role of stadia in producing GHG emissions, especially indirectly. This study of the event held in South Africa reported that because of their significant energy consumption, stadia were major sites for producing, and potentially for mitigating, GHG emissions. Given that this relationship between stadia, energy and GHG emissions is recognised by some MASS organisations *and* in industry literature – and that MASS organisations have similar spectator capacity, products and services – , it is logical that stadium operators would look to the example of similar organisations to shape their response(s) to climate change. This is consistent with Berkhout et al. (2006, p. 136) and Hertin et al. (2003, p. 288) who cite the actions or changes of other organisations in the marketplace as a significant influence on corporate responses to climate change. For CF1, this suggests that the actions of other organisations in the same market should be a factor worth including in a revised conceptual framework.

Theme 6: The role of individual manager agency in explaining how and why MASS organisations respond to climate change

Whilst there were a range of internal and external influences that shaped how and why MASS organisations responded to climate change, the role of individual managers within some cases should not be underestimated. *Why* this managerial agency was important was made clear from the interview data for the senior-to-middle-level managers at MASS cases B, C, E, H & J where they were individually responsible for most of the management responses to climate change issues. *How* these

managers were important was also clear. The *agency* of these managers was critical to the development of adaptation strategies to lower rainfall, and energy and waste strategies that mitigated their organisation's direct or indirect GHG emissions. The small number of initiatives that were clearly conscious of – and specific to – climate change were developed at this management level and proposed to the Chief Executives and their boards of directors for approval. In every case, boards ratified such proposals, even those that required significant financial investment such as the water treatment plant of Case E. This means that any climate change-related initiatives came from this senior-to-middle-level of management rather than the Chief Executives and boards who supervised them – a case of *middle-up* and *middle-down*, rather than a top-down approach. Examples of such agency included personally deciding that climate change was an important issue for the organisation (Managers B1, C1, E1, H1 & J1); developing a climate change adaption strategy (Manager B1); researching and proposing a Class-A water treatment plant (Manager E1); hiring an energy consultant to determine energy use and GHG emissions (Managers B1 & H1), and; introducing a green ticketing proposal (Manager F1).

The literature of managerial agency dates back to at least the 1970's and is well developed. The idea of managerial agency stems from agency theory (Eisenhardt, 1988, 1989a; Heracleous & Lan, 2012; Hill & Jones, 1992; Jensen & Meckling, 1976; Nyberg, Fulmer, Gerhart, & Carpenter, 2010; S. Ross, 1973) which is based on the idea of owners ("principals") delegating decision-making authority to managers ("agents") within an organisational hierarchy and contractual relationship. Agency theory however focuses on the potential for "managerial mischief" that may result when the interests of these two parties diverge. Whilst the idea of managerial agency emerges from this theoretical perspective, the value of this perspective to this study is restricted to the concept of agency – that is, managerial freedom to act – , and does not extend to the notion of "managerial mischief." This is because there is nothing in any of the data to suggest that the managers exercising such managerial discretion in relation to climate change and other environmental matters are in any way diverging from the interests of the Chief Executives or boards that they report to. On the contrary, the aforementioned proposals were intended to benefit their organisations and stakeholders.

In the extant literature of organisational responses to climate change, there is no discussion of managerial agency, however there is of the role of managerial "discretion." Kolk & Pinkse (2005) note that various "market mechanisms" facilitate considerable managerial discretion in companies to "choose different approaches" to climate change strategy. Similarly, Williams & Schaefer (2012) assert that small business owners frequently "build firms that are in line with their personal aspirations and philosophies" and have "greater strategic and operational discretion" to shape climate change responses than managers of large firms. It is also worth noting that the role of individual managers in organisations acting in "ecologically responsible" ways is present in some empirical management

literature that is not specific to climate change. Bansal & Roth (2000), in their study of 53 firms in Japan and the United Kingdom, point out that the ecological responses of many firms was driven by internally-powerful individual "champions", a finding that is consistent with Lawrence & Morell (1995) and Winn (1995) who both found that the senior management of firms were responsible for their environmental management leadership.

This literature is consistent with the agency/discretion displayed by the senior managers in this study, and reinforces the value of including such a factor in my conceptual framework. For CF1, such individual agency was not anticipated and this is perhaps a weakness of it. However, as such agency was not evident in any more than one-third of the entire study population, for CF2 it should be sufficient to incorporate managerial agency/discretion into the "influence of internal stakeholders" factor alongside staff. For CF2, given the absence of any initiatives from MASS board directors in climate change responses, managerial agency/discretion could replace board directors as an influence of internal stakeholders on climate change responses.

Theme 7: Relevance of theoretical categories to climate impacts, and responses to, climate change

As explained in Chapter Five, none of the cases reported being significantly influenced by their ownership structure or organisational purpose as to *how* or *why* they were impacted by – or responded to – climate change. Therefore, in relation to impacts of climate change on the stadia, there was no discernible difference between MASS organisations based on whether they were: (1) *publically-owned, not-for-profit* (Category 1); (2) *privately-owned, not-for-profit* (Category 2), or; (3) *privately-owned, for-profit* (Category 3) entities. That MASS organisations were <u>impacted</u> by climate change in the same way regardless of their ownership type or purpose – that is, no matter what their theoretical Category – and also <u>responded</u> to climate change regardless of their ownership type/theoretical category is a critically important finding of this study. However, this also means that there is no justification for including the three theoretical categories in CF1.

Evaluation of CF1

The previous sections of this chapter – the "Discussion of results" beginning with "Theme 1"and concluding with "Theme 6" – aimed to respond to the principal research questions (RQ) outlined in Chapter 1 of this thesis. That is: (RQ1) "*What*, if any, issues are posed by climate change for major Australian sport stadia and the organisations that manage them?"; (RQ2) "*How* are the organisations that manage major Australian sport stadia responding to climate change?", and; (RQ3) "*Why* are the organisations that manage major Australian sport stadia responding to climate change in the way they do?" The discussion also aimed to respond to the four specifying questions (SQ) outlined in Chapter 1 of this thesis. That is: (SQ1) "How do organisations that manage major Australian sport stadia

interpret climate change?"; (SQ2) "What, if any, GHG mitigation and/or climate change adaptation responses are being employed at major Australian sport stadia?"; (SQ3) "How do such responses compare to those of other organisations managing major Australian sport stadia?", and; (SQ4) "What, if any, factors are barriers to these responses?" As advocated by Cepeda & Martin (2005, p. 860), the *outcomes of the analysis were evaluated* by identifying emergent themes and seeking disconfirming evidence for tentative findings. In reflecting on the results, the details of each case were reviewed, as suggested by Cepeda & Martin (2005, p. 860). As the "inputs to the conceptual framework", the structure of the cases presented earlier in this chapter were reconsidered and interview transcripts were re-read to check that they supported the initial interpretations of them. As advocated by Cepeda & Martin (2005), the discussion aimed to *"look beyond [the] data to build theory"* by reflecting on the meaning of each of the findings, how they compared to existing theory, and the implications for my initial conceptual framework (CF1). The current section of the thesis aims to build on the findings outlined in the previous section, and to reflect on the effectiveness of CF1 in explaining the issues posed by climate change for MASS organisations, and how and why they responded.

After evaluating the results presented in Chapter Five of this thesis in light of extant literature, it was clear that while CF1 had a number of strengths, it also had weaknesses that required revision. Whilst some of the assumptions made in CF1 were confirmed by the data, it was also clear that some of them were either unjustified, or in other instances, needing expansion. Beginning with Part One (climate change issues [external factors]), the strengths of CF1 were that it correctly anticipated that the *physical impacts of climate change* (hotter, drier climate) would be an issue for MASS; it correctly anticipated the *legislative and regulatory* changes that materialised in the form of the *NGER Act* and the carbon tax, and; it correctly anticipated that external *stakeholder factors* would be an influence on how and why they responded to climate change. In Part Two of CF1 (MASS organisations [internal factors]), it correctly anticipated that MASS organisations are large users of carbon-intensive *energy*; the *resources* factor accounted for the acquisition of extra resources by MASS organisations such as energy monitoring systems and the expertise of energy consultants, and; CF1 correctly anticipated that how they *made sense* of climate change would be an internal factor in determining how MASS organisations responded to climate change. It also correctly anticipated that MASS organisations could be either *vulnerable* or *resilient* to climate change; that *internal stakeholders* such as staff were a factor shaping climate change responses, and; it correctly anticipated that *CSR* would influence organisational behaviour in relation to climate change.

Part Three of CF1 also correctly anticipated that they might have *strategy responses* to climate change; it was right to suggest that *GHG mitigation* was a potential climate change response and that MASS organisations could be either direct or indirect GHG polluters. It also correctly anticipated that

some *climate change adaptation* would occur, and; correctly anticipated that one response to climate change might be to *do nothing (business-as-usual)* as was evident in Cases G and L particularly.

If as expected climate change continues in Australia, and issues such water, energy and waste management grow as causes of adaptation, the development of *capabilities* for decarbonising the inputs of MASS organisations may become more important. If this occurs, the *resource* factors of the framework will grow in importance. However to be confirmed, this will require further research.

On the other hand, CF1 had a number of weaknesses. These were as follows: Part One of CF1 incorrectly assumed that the *physical impacts of climate change* would be an issue for all MASS. This was not supported by the data in every case. Whilst Australia's climate is hotter and drier, most MASS were resilient to such impacts through a combination of financial and infrastructure resources, and ground management capabilities that enabled their stadia to adapt to a hotter and drier climate. It also incorrectly assumed that a hotter and drier climate would result in harder playing surfaces for MASS. There is no evidence that this occurred. Instead, MASS ground staffs were able to avoid this by adjusting their use of natural resources – they used more water and/or switched to more water-efficient grass types. Both measures represent climate change adaptation even if using more water proves unsustainable if the predicted long-term decline in rainfall in Australia occurs.

CF1 also had other weaknesses. It failed to anticipate that increased evaporation of water from the playing surface of some MASS would be a climate change issue. Furthermore, CF1 failed to anticipate the extent to which MASS organisations perceived climate change through the lens of extra operating costs. CF1 assumed that costs may increase, but did not account for the primary perception of climate change as a cost problem. In all but one example – a proposal for green ticketing at Case F – these cases did not think that climate change was an opportunity to earn revenue. On the contrary, it would result in additional costs to their water and energy inputs, and waste outputs. CF1 also failed to anticipate that because of climate change's nexus with cost, some cases would see the three key climate change issues – water, energy and waste management – as catalysts for seeking to lower those costs by increasing their efficiencies in these areas. As a result, CF1 did not anticipate the emphasis of MASS organisations towards an *outside-in* perspective over an *inside-out* perspective. That is, although they shared an ethos of CSR, their concerns for operational management – and in particular for minimising operating costs – overrode their genuine concern for minimising their carbon footprint and other environmental impacts.

Another weakness of CF1 was how it categorised the increased costs that it anticipated. Although Part One of CF1 correctly anticipated increased "supplier costs" as an external factor shaping how they responded to climate change – that eventuated mainly in the form of higher water and energy charges

– it attributed these to *"market changes."* CF1 also anticipated some costs as part of the *"financial implications of climate change"* factor. In hindsight, "market changes" and "financial implications of climate change" are covering essentially the same issues and so for the second iteration of the conceptual framework (CF2), it would be better to conflate these into a single factor called market changes. However, for CF2 it may help to be explicit about the markets in which MASS organisations operate. MASS organisations compete in two types of markets: first, a business-to-business (BTB) market where they compete for the right to stage major sport or entertainment events that are sold to these stadium operators by National Sport Organisations; second, they compete in a consumer market (CM) where they compete with other entertainment sellers to attract spectators who buy the experience of enjoying elite-level cricket, rugby league, rugby union, soccer and AFL football. For CF2 then, specific examples of BTB and CM changes may be beneficial.

CF1 also failed to anticipate that one of the *resources* that MASS organisations use are natural resources like water from rainfall. Part Two of CF1 identified human, financial & physical resources but overlooked natural resources that are critical to growing the grass playing surfaces to all MASS; it failed to anticipate their uncertainty about the detail of climate change and the policy and legislative responses by federal and state governments, and; it failed to anticipate that climate change would be a secondary issue for them. Although CF1 anticipated that MASS organisations would make sense of climate change, it failed to anticipate how much the media shaped their understanding of it. CF1 also failed to anticipate their uncertainty about climate change, especially about government policy and legislation to address the issue. CF1 also failed to anticipate that climate change – despite its strongly perceived nexus with costs – would be a secondary issue relative to other daily operational matters. In addition, although CF1 anticipated the importance of water and energy issues, it failed to anticipate the link between waste from MASS and GHG emissions. CF1 also failed to anticipate that any *strategy* responses to climate change would exclude specific and integrated climate change plans. It was assumed that as probable large users of water and energy with sophisticated management, they would have climate change plans similar to those that are common to banks, airlines, mining companies and insurance companies. This assumption was wrong in all cases.

CF1 also failed to anticipate the following: that water efficiency and infrastructure, and water-efficient grass types would be common responses to climate change; the role of *managerial agency* in initiating responses to climate change, and; barriers to climate change responses such as lack financial resources, limited management understanding of climate change regulation, poor understanding of climate change by board directors or stakeholders, and poor stadium design. A minor improvement to CF1 would be the inclusion of measures addressing climate change by other stadia, especially those overseas, as an influence on how MASS respond. Although there was limited evidence that stadia

overseas influenced how MASS organisations responded, industry publications that report climate change-specific water and energy initiatives are being read by MASS managers.

Furthermore, Part Three of CF1 had the three significant weaknesses. First, it failed to correctly anticipate the nature of "strategy responses" to climate change by MASS organisations. Whilst these organisations did have strategies for addressing the main climate change issues – particularly water, energy and waste management – these responses were not evidence of the simple climate signal-response/adaptation that was assumed in CF1. Rather, these organisations mostly responded to/adapted to climate change within their existing strategic plans. They were also mostly responding to "indirect signals" to adapt, like regulatory change and market change, rather than "direct signals" like the physical impacts of a hotter and more extreme climate. Second, whilst there was evidence of mitigation of GHG emissions by MASS organisations through cost-focused energy efficiency measures, this was a largely secondary consideration. As a result, CF1 failed to anticipate where GHG mitigation was situated within the strategic priorities of these organisations. Mitigation occurred, but is best understood within the climate change adaptation frameworks of Berkhout et al. (2006) and Berkhout (2012). That is, GHG mitigation happened within adaptation strategies whereby GHG emissions were *assessed* as an organisational risk, and/or as a second-order priority to *reducing* cost-risks. Accordingly, the third weakness of Part Three of CF1 was the assumption of "climate change adaptation (adapted to a hotter climate)." Instead, the adaptive responses of MASS organisations to climate change are best understood within the adaptation frameworks of Berkhout et al. (2006) and Berkhout (2012). A summary of the strengths and weaknesses of CF1 is illustrated in Table 27 below.

Table 27: Summary of strengths and weaknesses of Conceptual Framework 1 (CF1)

STRENGTHS OF CONCEPTUAL FRAMEWORK 1 (CF1)	WEAKNESSES OF CONCEPTUAL FRAMEWORK 1 (CF1)
1. Physical impacts of climate change were an issue. 2. Legislative & regulatory changes. 3. Role of external stakeholders. 4. Role of internal stakeholders. 5. MASS as large users of carbon-intensive energy. 6. Accounted for extra resource acquisition. 7. Anticipated role of sense making (interpretation of climate change) in shaping responses. 8. Anticipated potential for vulnerability and resilience. 9. CSR influences. 10. Importance of adaptation. 11. Anticipated do nothing (business-as-usual) response. 12. Potential importance of capabilities in decarbonising economy.	1. Did not anticipate media – including industry publications – as a key influence in how MASS make sense of climate change. 2. Did not anticipate widespread resilience to the physical impacts of climate change. 3. Did not anticipate greater evaporation as physical impact issue of climate change. 4. Did not anticipate extent of perception of climate change as a cost issue. 5. Did not anticipate focus of MASS on outside-in perspective over inside-out perspective. 6. Did not anticipate climate change as a secondary issue for MASS. 7. Incorrectly assumed harder playing surfaces for MASS. 8. Did not anticipate waste as a climate change issue 9. Unnecessary overlap of market changes and financial implications of climate change. 10. Did not anticipate water as a critical natural resource for MASS. 11. Did not anticipate uncertainty of MASS about climate change. 12. Did not anticipate absence of integrated strategy responses to climate change. 13. Did not anticipate water efficiency, water infrastructure and substitute grass varieties as climate change adaptation responses. 14. Did not anticipate the role of managerial agency in initiating climate change responses by MASS. 15. Did not anticipate barriers to climate change responses. 16. Incorrectly assumed a simple climate change signal-response. Did not anticipate strategy responses within existing strategic plans. 17. Incorrectly assumed GHG mitigation as a direct adaptive response to climate change. Did not anticipate mitigation within existing strategic plans. 18. Incorrectly assumed adaptation to direct climate change signal. Did not anticipate adaptation within existing strategic plans.

The second iteration of the conceptual framework - CF2

While CF1 had twelve distinct strengths, it was clear from its eighteen distinct weaknesses that a second iteration of the initial conceptual framework (herein referred to as CF2) was needed. To ensure CF2 was an improvement on CF1, it was thought necessary to allocate each of the factors discussed above into appropriate categories. After contemplating CF1, it was clear that multiple groups of factors had emerged from the data for this study. These factors were: (1) *physical impact factors*; (2) *resource factors*; (3) *stakeholder factors*; (4) *CSR factors*, and; (5) *cost factors*. As a result, it was clear that a multi-factor framework of climate change impacts, interpretation, and responses by MASS organisations had emerged. Multi-factor theoretical frameworks are not new to academic literature,

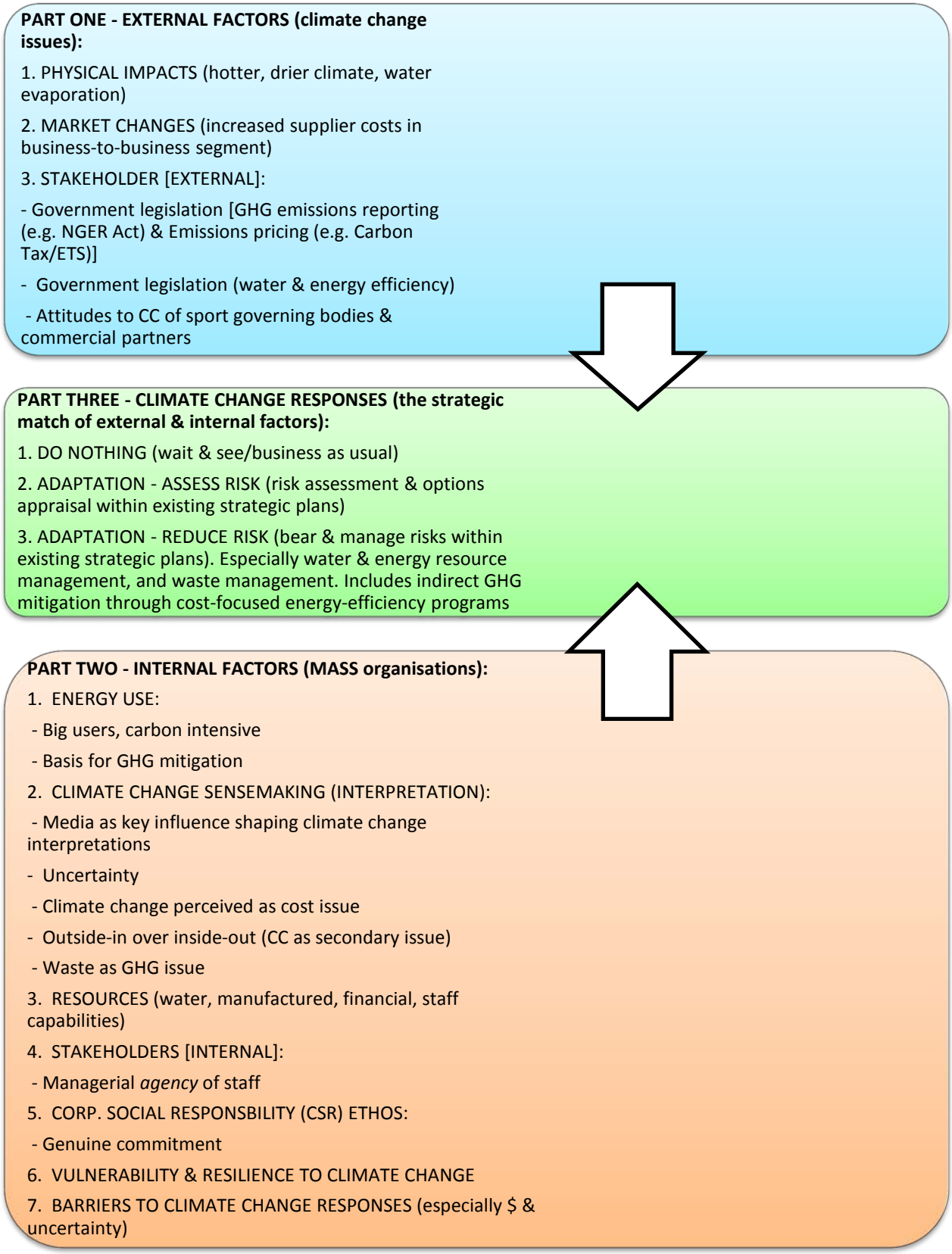
and in fact have a number of precedents in a range of disciplines including statistics (Graßhoff, Großmann, Holling, & Schwabe, 2007), economics (R. R. Chen & Scott, 2003), finance (Driessen, Klaassen, & Melenberg, 2003), and medicine (Loewenstein et al., 2001). The management discipline has also used them for explaining the financial performance of Fortune 500 companies (J. Zhu, 2000), although perhaps the most famous example is Porter's "Five Forces Model" (Porter, 1979, 1991b) of competitive advantage that combines the factors of: (1) inter-firm rivalry; (2) availability of substitute products; (3) threat of new entrants; (4) power of buyers, and; (5) the power of suppliers. In complex situations where multiple factors account for organisational behaviour, multi-factor frameworks have an important history and are appropriate. A multi-factor framework is also consistent with Kolk & Pinkse's (2007b, p. 370) assertion that a range of theoretical perspectives are "are all important to characterize and understand corporate strategic responses" to climate change.

As advocated by Cepeda & Martin (2005, p. 860), it was appropriate to *"change the conceptual framework to incorporate accumulated knowledge and built theory."* In other words, for CF2, the task for the researcher was to retain the strengths of CF1 whilst addressing its weaknesses. Beginning with the similarities, the three part framework was retained to ensure clarity. Part One identifies climate change issues created by *external* factors (both direct physical impacts and indirect ones) including legislative and regulatory ones. Part Two identifies *internal* factors including resources, stakeholders, CSR and costs. Stakeholders are considered to be both internal and external factors because they exist both internally (e.g. staff) and externally (e.g. government, NSO's, and suppliers). Part Three then identifies the *strategic match between internal and external factors* where four climate change response factors exist: (1) mitigation; (2) adaptation; (3) cost reduction, or; (4) do nothing (business-as-usual). Finally, CF2 retains the twelve strengths of CF1 reported in the table above because they reflect the actual climate change impacts and responses for MASS organisations.

In order to address the eighteen weaknesses of CF1, CF2 differs in the following eighteen ways. First, it incorporates media influences on how MASS make sense of climate change. Second, it allows for the fact that MASS organisations are largely resilient to the physical impacts of climate change through a combination of design and resource and capability factors. Third, it recognises that greater evaporation on the grass playing surface occurs in a hotter and drier climate. Fourth, it recognises that although Australia's climate is generally hotter and drier, harder playing surfaces for MASS do not result because their organisations have adapted their use of water and grass resources. Fifth, unlike CF1, CF2 recognises that climate change is perceived mainly as a cost issue by MASS. Sixth, it recognises that despite genuine commitment to a CSR ethos, MASS organisation's perspective of climate change is more *outside-in* than *inside-out*. Seventh, it assumes that climate change is nevertheless a secondary issue to daily operational concerns, and; eighth, it assumes that waste is a climate change issue.

CF2 also differs from CF1 in other ways. The ninth difference is that the overlap between the *"market changes"* and *"financial implications"* factors is removed by using only "market changes." Tenth, CF2 recognises that water is a critical natural resource for MASS. Eleventh, it recognises that MASS organisations will be uncertain about the precise details of climate change science, but more so about the policy and legislative responses to climate change by government. Twelfth, it recognises that MASS organisations do not have integrated climate change plans but will instead rely on cost reduction and resource efficiency strategies especially for water, energy and waste as their key measures for mitigating GHG emissions, and adapting to climate change. Thirteenth, CF2 recognises that in a hotter and drier climate, adaptation to climate change occurs – particularly in the operational management of the playing surface of MASS – in the form of water efficiency, installation of water infrastructure, and use of water-efficient grass varieties. Fourteenth, CF2 recognises that managerial agency will be a factor shaping the climate change responses of MASS. Fifteenth, it recognises that barriers exist for MASS organisations to respond to climate change including a lack of internal financial resources for absorbing climate change costs, and organisational uncertainty about competitive implications of climate change and national climate change policy. Sixteenth, Part Three of CF2 recognises that MASS organisations mostly respond to/adapt to climate change within their existing strategic plans. Seventeenth, Part Three of CF2 recognises that mitigation is mostly not a direct response by MASS organisations to climate change; rather, it occurs within existing cost-focused strategic plans. Eighteenth, Part Three of CF2 recognises that the adaptive responses of MASS organisations to climate change are best understood within the adaptation frameworks of Berkhout et al. (2006) and Berkhout (2012). CF2 is illustrated in Figure 8 below.

Figure 8: The second and final conceptual framework (CF2): A 10-factor, 3-response climate change framework for MASS organisations (subsequently referred to by its short title: the "10/3 Climate Change Framework")



Revision of CF2

CF2 is based on five assumptions. First, it assumes that MASS – and the organisations that manage them – have a relationship with the natural world in the form of reliance on the valuable natural resources of water and climate. Second, it assumes that the complex and inter-related issues posed by climate change for major sport stadia and the organisations that manage them – and *how* and *why* these organisations respond to such issues – are explained more completely by drawing upon insights from multiple theoretical perspectives, than by existing theoretical perspectives applied in isolation. Third, it assumes that climate change is perceived by MASS organisations mainly as a cost issue. Fourth, it assumes that despite widespread and genuine commitment to CSR by MASS organisations, climate change is nevertheless a secondary issue to daily operational concerns. Finally, the framework assumes that organisations managing MASS will respond to the complex issues posed by climate change in one or more of four ways: (1) mitigate their GHG emissions; (2) adapt their operation to a changed climate; (3) reduce their operating costs and introduce resource efficiency strategies, or; (4) do nothing.

CF2 is also based on a number of concepts. First, from climate change science literature the concepts of *physical impacts* of climate change, *vulnerability* and *resilience* are applied to help explain how MASS are affected by – or resistant to – climate change. Second, Daft & Weick's (1984) concept of sensemaking is used to offer insights into how MASS organisations interpret climate change. Third, the concept of internal and external *stakeholders* is incorporated from stakeholder theory literature to help explain how these organisations respond to climate change. Fourth, the concept of internal organisational *resources* is drawn from RBV/RBT literature to explain climate change responses. Fifth, the concept of CSR is borrowed from CSR theory to help explain its role in shaping such responses. Finally, the concepts of, GHG *mitigation* and climate change *adaptation* are drawn from climate change science and management literature to offer insights into how MASS organisations respond to climate change. These concepts have been highly valuable in understanding how and why these organisations are impacted by, and respond to, climate change. As they are drawn from a range of academic literature, they are supported by a wide body of existing knowledge. However, another key concept used in CF2 – that of *cost* – is based on the data collected for this study rather than the literature. To enhance the value of this concept to the framework, as advocated by Cepeda & Martin (2005, p. 861), it needs to be grounded in the data of this study and, compared to existing literature. A *"re-examining [of] the literature of the emergent theory"* – Cepeda & Martin's final step in the case studies theory building process – is therefore required.

Literature-based scrutiny of the developed theory

Beginning with the concept of *cost*, it emerges principally from the discipline of economics. While in basic terms a cost may be defined as the monetary value of creating good and services (E-conomic, 2012), in economics literature, costs are divided into various types including: "fixed" (those that remain constant), "variable" (those that change), "average" (the average of fixed and variable), "marginal" (extra costs from producing an additional item of output), "operating" (recurring, day-to-day costs including fixed and variable), and "capital" (the cost of acquiring assets) (Downward, Dawson, & Dejonghe, 2009; Stewart, 2007).

Alternatively, some management literature offers insight into the importance of costs, particularly the work of Michael Porter (1979, 1991b) and his "Five Forces" model of competition, advantage and strategy. Porter's discussion of competitive forces in the model highlighted the importance of "cost advantage", "cost leadership" and "economies of scale" for achieving competitive advantage for either existing or new competitors in a market. Building upon Porter's model, other management researchers have identified the significance of costs as a central concern of managers for achieving competitive advantage. Starik & Marcus (2000) note that a number of researchers (Barrett, 1991; Gladwin, 1993; Hart, 1995; Shrivastava, 1995) have documented the use of cost leadership strategy by companies to achieve competitive advantage through corporate environmental efficiency measures that minimised pollution. This historical link between the natural environment and financial cost reinforces the significance of the cost factor in the CF2.

Porter's five forces model also emphasised the "bargaining power" of "buyers" or "suppliers" as critical competitive forces that enable or prevent competitive advantage for a particular business. Although Porter's five forces work was published long before climate change became a management issue, his later work (Porter & Reinhardt, 2007) does highlight the importance of managing climate change-related costs in order to maintain, or create, competitive advantage. For example, Porter & Reinhardt argue the importance for firms to understand their "[GHG] emissions costs", that "regulatory responses to climate change will raise the costs of energy", that carbon pricing is a cost risk that will impact profits, and that every company must "mitigate climate-related costs and risks in its value chain."

Furthermore, economics literature also confirms the importance of the cost concept to the theory proposed in this thesis. Firstly, theorising about costs in the economics literature has a long history with Robbins (1934) and Marshall (1952) being key examples. However, the climate change costs identified by MASS organisations in this study are best understood as both *operating costs* and *capital costs* incurred as a result of the factors identified in CF2. For example, in terms of "operating" costs associated with climate change, MASS managers were referring to higher water supply costs, higher

energy supply costs, and higher costs associated with disposing of solid waste to landfill. For "capital" costs, MASS managers were mainly referring to the cost of installing water infrastructure such as water harvesting equipment, water storage tanks, water-efficient appliances (e.g. low-flow taps, showers and toilets) and for Case E, even the development of their $22 million Class-A water treatment plant.

Such costs were incurred as a result of the combination of factors identified in CF2. They are additional costs not previously borne by MASS organisations simply because they did not exist. They are not associated with an increase in the supply of the services MASS organisations provide (sports entertainment experiences to their business-to-business and consumer markets) as MASS are restricted in their capacity to increase the supply of sport experiences they stage by the control of scheduling resting with sport governing bodies. As Stewart & Smith note (2010; 1999), a key feature of sport is that its supply is fixed. The additional operating and capital costs associated with climate change now being paid by MASS organisations reflect changes in the external operating environment such as the following: a changing climate; new government policy for GHG emission mitigation including a national renewable energy target, and the introduction of the carbon tax and ETS; the basing of such measures on the Polluter Pays Principle (PPP) (Ward & Hicks, 2014); the financial impact of these measures on MASS's electrical energy suppliers; the introduction of state government water & energy efficiency legislation, and; increasing costs from local government for solid waste disposal. With very limited scope for raising revenue from climate change and associated regulatory and market changes, it is not surprising that MASS organisations see climate change as a cost issue.

The introduction of the PPP is significant because it reflects the fact that both individuals and organisations directly and indirectly create GHG emissions. MASS organisations are no different as they create GHG emissions directly from the use of machinery and vehicles – even though relatively small in volume – and in larger quantities by directly purchasing electrical energy for stadium operations from carbon-intensive electricity generators. The contribution of such "Scope 1" and "Scope 2" emissions (DCCEE, 2008), while relatively small compared to airlines and mining companies, is now costed according to the PPP embedded in the supply chain of MASS as a result of the carbon pricing legislation. The externalising of the climate impact of such emissions up until now may be understood as a *negative externality* (Cornes & Sandler, 1996; Stern & Treasury, 2006) whereby their environmental and/or social impact is not accounted for by the firm. Now however, MASS organisations are *internalising* the costs of GHG emissions that they are responsible for. To the extent that the state government legislation that required some MASS to become more water efficient is linked to hotter and drier climates, they are also internalising the costs of the water infrastructure installed in recent years. The internalisation of previously externalised climate change costs – based on Pigou's (1920) argument that market failure requires state intervention – is consistent

with the practice of the International Olympic Committee since 1996, and international sport federations (Gouget & Barget, 2006) such as the Fédération Internationale de l'Automobile (FIA) who have embraced the idea of environmental sustainability (Dingle, 2009, p. 89). The topic of climate change however is new to the literature of negative externalities and sport, with topics such as hooliganism among spectators (Downward et al., 2009; Gouget & Barget, 2006), drug abuse (Downward et al., 2009; Gouget & Barget, 2006) government debt after investment in major sport events (Gouget & Barget, 2006), and franchise relocation costs (Carlton, Frankel, & Landes, 2004).

Whilst there is agreement in non-sport economics literature about the externalising of climate change impacts (B. Andrew, 2008; Busch, Lehmann, & Hoffmann, 2012; Ostrom, 2012; Stern & Treasury, 2006), there is no specific reportage of the externalisation of climate change costs in sport literature. However, of the literature canvassing the relationship between sport and climate change, the issue of climate change-associated costs is consistent with Moen & Fredman (2007) who refer to climate change costs across the sport tourism sector, and the costs of adapting to climate change by investing in extra ski-lifts, snowmaking equipment and new marketing campaigns. Interestingly, whilst Moen & Fredman do not use the term "externalities" as a result of climate change, they do report that ski resorts do not pay the environmental costs of water-intensive artificial snowmaking that depletes water supplies and fish stocks. Muscatello & Knight (2010) also effectively argue that horse racing organisations will increasingly *internalise* the cost of climate change impacts such as insect-borne and wildlife-borne diseases, heat stress and training days lost due to excessive temperatures. Similarly, Tranter & Lowes (2009) offer implicit recognition of the externalising of climate change impacts from GHG emissions in motorsport. Furthermore, another example of the internalising of climate change costs in sport is the development of "3rd generation" artificial turf (Twomey et al., 2008) suitable for Australian Rules football, cricket, soccer and both forms of rugby. Both the AFL (2007), a key stakeholder in this product, and its licensed manufacturers (TEAMSports, 2012; TigerTurf.com, 2012) recognise that this product was developed to address "the ongoing impact of climate change and drought conditions." Overall, these works indicate that the internalising of climate change costs is an issue for sport, and suggests that CF2 – the emergent theory developed in this study – both consolidates and extends existing literature.

It is also worth noting the absence of *pricing* as an alternative response to climate change costs for MASS organisations. If a price is the monetary value of a good or service (Pindyck & Rubinfeld, 2013), and there are a "multitude of ways to price a sport product" (Stewart, 2007, p. 150), it is worth asking: *"Why did MASS organisations not use pricing to address climate change costs?."* The answer is in both the data of this study, and relevant literature. First, as indicated earlier in this chapter, it is clear from the data that climate change and its various implications are currently not translated by MASS into services they can sell. Although Case F seriously considered the idea of "green ticketing"

as a means of selling carbon credits to spectators as a means to offset GHG emissions associated with travelling to and visiting their stadium, selling climate change-related services is not yet viable. Second, an examination of sports economics and finance literature reveals that while climate change is yet to be addressed as an issue, there are significant barriers for stadium operators to using price to recover any kind of cost. Although pricing strategies in sport can include "cost-plus", "equity pricing", "demand-based pricing", prestige pricing", and "competition pricing" (Stewart, 2007, pp. 150-155), the pricing options for major stadia are limited by the nature of sport itself, and the market structures in which they operate. Smith & Stewart (2010), Stewart & Smith (1999) and Szymanski & Ross (2007) note that "collaborative behaviour" in the form of cartel-like relationships between clubs in sport leagues can limit competition or fix prices at the expense of consumers. In the United States, such anti-competitive behaviour is facilitated by exemptions to anti-trust laws (Brinkman, 2005). This collaborative behaviour applies to admission pricing and game scheduling (A. Smith & Stewart, 2010) which prevents MASS from applying pricing strategies at their discretion. Further complicating the potential for MASS to recover climate change costs at their discretion is the practice of the AFL – a key stakeholder in nine of the eleven MASS investigated in this study – of using revenue from media broadcast agreements, merchandising income and sponsorships to subsidise entry fees (Stewart, 2007, p. 158). In this context, it is easy to see why climate change is perceived by MASS as a cost issue rather than one of price.

Market structures are the other key restriction on MASS organisations capacity to respond to climate change through price. A range of sport literature recognises that "most professional sport leagues operate as cartels" (A. Smith & Stewart, 2010; Stewart, Nicholson, & Dickson, 2005; Stewart & Smith, 1999) whereby a collective of firms act as a single supplier to a market. Smith & Stewart (2010, p. 7) note this point is supported by Downward & Dawson (2000), Sandy, Sloane & Rosentraub (2004), Dabscheck & Opie (2003), Macdonald & Booth (2007) and Stewart & Dickson (2007). From a consumer perspective, such cartels wield *monopoly* power (Stewart et al., 2005) however from the perspective of major sport stadia – a key point of elite-level sport distribution – they also wield *monopsonistic* power as essentially the single buyer of a stadium's services in a single winter or summer season. That is, a major sport league in Australia is the sole buyer of stadium's services to stage their particular sport. This is significant because monopsony is associated with lower prices than would occur in competitive markets (Pindyck & Rubinfeld, 2013). While the literature of monopsony in sport is centred on labour (Downward et al., 2009; Garcia-del-Barrio & Pujol, 2007), monopsony power of owners of teams in professional sports leagues in the "stadium market" is recognised by Brinkman (2005, p. 6) and Ross (2003, p. 328).

In summary therefore, the literature-based review of the developed theory – CF2 – strongly suggests four things. First, it confirmed that *costs* associated with climate change are an appropriate inclusion

in the final conceptual framework proposed in this thesis. This factor is a valid one given its prevalence in sport and non-sport economics literature. Second, economics literature on pricing reinforces the validity of the cost factor in CF2. Third, the concept of climate change adaptation is consistent with Berkhout et al's (2006) and Berkhout's (2012) frameworks for categorising such adaptation. Finally, the sport and non-sport economics literature validates the "market structures" factor in CF2.

CF2 - a theory of climate change impacts and responses for MASS organisations

CF2 is a multiple factor, multiple response climate change framework for major Australian sport stadia organisations. CF2 addresses the multiple factors for these organisations (ten in total) and multiple responses (3) identified in this study. For the sake of brevity, CF2 is herein referred to by its formal short title: the "10/3 Climate Change Framework." This short-title is an appropriate abbreviation of the framework's long title because it simplifies expression of its ten internal & external climate change factors, and its three organisational responses[68]. It represents a conceptualisation of what climate change means for these organisations: of *how* they are directly and indirectly impacted, *how* they interpret climate change and its associated impacts, and *how* and *why* they respond to it. It also represents the development of theory that was intended as a consequence of using Cepeda & Martin's (2005) method of theory development from case studies. The experience so far of organisations managing MASS with the phenomenon of anthropogenic climate change supports the view that they are complex entities that are subject to a complex combination of multiple external and internal factors, and that their strategy responses to these factors are themselves complex and multi-factorial. The empirical evidence gathered during this study strongly suggests that none of the theoretical perspectives contemplated for this study – RBV/RBT, IT, ST, SCM or CSR – are *by themselves* adequate for explaining the complex set of impacts posed by climate change on MASS organisations, or their complex responses. However, in combination these theoretical perspectives – as proposed in the 10/3 Climate Change Framework developed in this thesis – enabled the identification of multiple factors that offer a much more complete explanation of what is happening in the study population of MASS organisations. These multiple factors can be tested in future research and are an important contribution of this study. These factors are summarised in Table 28 below.

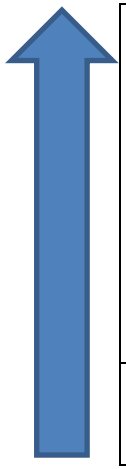
[68] Readers should note that the "multiple impact factor, varying interpretation, multiple response climate change framework for MASS organisations" phrase does not lend itself to abbreviation to acronym form.

Table 28: Summary table of climate change impact & response factors for MASS

CLIMATE CHANGE IMPACT-RESPONSE FACTORS	SUMMARY EXPLANATION OF FACTOR	CONTRIBUTION
PART ONE - EXTERNAL FACTORS (CLIMATE CHANGE ISSUES):		
1. PHYSICAL IMPACTS (Hotter, drier climate, water evaporation)	A hotter, drier climate causing greater water evaporation of moisture held in grass playing surfaces – can cause greater use of natural resources like water resulting in higher operating costs to major stadia. Empirical evidence of anthropogenic climate change, and the enhanced greenhouse effect, explains the impacts of hotter, drier climate.	Recognition of this relationship between human activities and complex natural *resources* – such as the rainfall and humidity elements of climate - enables RBV/RBT to account for changes in the natural environment - such as climate change and its physical impacts - upon the organisations managing major sport stadia. These impacts illustrate the value of RBV/RBT especially Hart's (1995) Natural Resource-Based View (NRBV) thesis.
2. MARKET CHANGES (Increased supplier costs in B2B segment)	As a consequence of climate change and the complex industrial and regulatory responses to it, some costs for organisations managing major sport stadia can increase, especially energy and water costs.	Recognition of this relationship between suppliers and users in a business-to-business (B2B) market may enable organisations to better adapt to climate change.
3. STAKEHOLDERS [EXTERNAL]: - Government legislation [GHG emissions reporting. E.g. NGER Act & GHG emissions pricing E.g. Carbon Tax/ETS] - Government legislation (water & energy efficiency) - Attitudes to CC of sport governing bodies & commercial partners	External stakeholders of organisations managing major sport stadia create differing impacts as a consequence of climate change. Government stakeholders can introduce legislation for GHG reporting and carbon/GHG pricing. Sport governing bodies & commercial partner stakeholders influence the response to climate change of organisations managing major sport stadia.	Recognition of the influence of stakeholders on the responses to climate change by organisations managing major sport stadia validates the use of stakeholder theory in other research where climate change is an important issue.

PART THREE - CLIMATE CHANGE RESPONSES (THE STRATEGIC MATCH OF EXTERNAL & INTERNAL FACTORS):		
1. DO NOTHING **(Wait and see/business as usual)**	Despite the issues posed by climate change – in Berkhout et al's (2006) terms, a "signal" to adapt – some organisations managing major sport stadia might be unaware of the direct and indirect impacts. Or they might ignore the issue because they don't have the internal resources to allocate to a managed response.	Recognition of this strategic option enables management theories to account for the lack of strategic responses to climate change by some organisations managing major sport stadia.
2. ADAPTATION – ASSESS RISK **(Risk assessment & options appraisal - within existing strategic plans)**	Some organisations managing major sport stadia adapt to climate change and its related issues by assessing the risks (direct and indirect). Most organisational risk assessment occurs in relation to managing water and energy resources. For this group of organisations, such risk assessment typically matches their core capabilities, and occurs within existing strategic plans.	Recognition of this relationship between climate change and the management of water & energy resources enables RBV/RBT's application in sport settings to guide better organisational adaptation to climate change. Also extends Berkhout's (2012) & Berkhout et al's (2006) climate change adaptation frameworks to the sport industry.
3. ADAPTATION – REDUCE RISK **(Bear & manage risks – within existing strategic plans):** - Cost reduction & resource efficiency strategies - especially water & energy costs - Mitigation of GHG's (direct & indirect)	Organisations managing major sport stadia typically understand the value of water & energy resources to operating their stadia. Critically, organisations managing major sport stadia have few opportunities to sell climate change-related services for which they can charge a fee in either the business-to-business or consumer markets they operate in. As a consequence, these organisations perceive climate change as a *cost* issue. Organisations managing major sport stadia are restricted by market structures – especially the *monopsonistic* power wielded by sport governing bodies who purchase stadia services – from using pricing strategies to recover additional costs resulting from climate change and associated regulatory and market changes. As a consequence, these organisation's only strategic options are existing water, energy and waste efficiency strategies that allow them to adapt to/bear & manage cost pressures associated with climate change by reducing supplier costs.	Recognition of the perception of climate change as a cost issue – rather than as a revenue opportunity – enables economic theories as they are applied to sport settings to account for the financially problematic nature of climate change.
	Operating major sport stadia typically results in the creation of GHG emissions. A small proportion of these emissions are created *directly* (i.e. at the venues), but most are created *indirectly* because of the carbon-intensive nature of external electrical energy generation systems. These GHG emissions pose *risks* for the organisations managing major stadia: to a limited degree, there are reputational risks. To a much greater degree, there is a financial cost risk associated with these emissions when the national government introduces carbon pricing resulting in higher production costs for electrical energy generators, that result in higher electricity prices for major stadia. However, some organisations managing these stadia are aware of their indirect GHG emissions and seek to reduce them through energy efficiency because they feel this is the "right thing to do." This reflects an ethos of corporate social responsibility. These organisations adapt to/bear & manage external pressures to mitigate their direct & indirect GHG emissions within existing energy efficiency and cost-reduction strategies.	Recognition of the perception of GHG emissions as a cost issue enables economic theories as they are applied to sport settings to account for the financially problematic nature of indirect GHG emissions. Recognition of this relationship between organisations managing major sport stadia and direct & indirect GHG emissions enables CSR theory to explain the motivations behind mitigation at organisations managing major sport stadia.

PART TWO - INTERNAL FACTORS (MASS ORGANISATIONS):		
1. ENERGY USE: - Big users, carbon-intensive - Basis for GHG mitigation	Organisations managing major sport stadia are typically big users of electrical energy that is may be produced through carbon-intensive energy processes. This creates the indirect relationship with GHG emissions. However, organisations managing major sport stadia are typically aware of their direct and indirect relationship with GHG emissions and so seek to reduce these emissions wherever possible to reduce costs. They also do this because they wish to be good corporate citizens.	Recognition of the relationship between organisations managing major sport stadia and their large and typically carbon-intensive electrical energy use enables RBV/RBT as it is applied to sport settings to account for efforts to reduce electrical energy use. Recognition of the relationship also enables CSR theory as it is applied to sport settings to account for the ethical dimension to management efforts to reduce indirect GHG emissions associated with their stadia operation.
2. CLIMATE CHANGE SENSEMAKING (INTERPRETATION)	Most organisations managing major sport stadia interpret (make sense of) climate change at some level although not all do. For most, it is interpreted as a second-order priority to daily operating imperatives. For some, it is interpreted as a top priority because of the perceived risks it poses leading to a proactive strategic response being taken. Staff in these organisations typically learn about climate change through the media, and in some cases are uncertain about some its implications for their organisation. The contested media reportage of climate change helps to shape the uncertainty of some of these organisations about climate change and their cautious responses to it. Governments are the other key source of information about climate change for these organisations.	Sensemaking theory enables insights into how staff in organisations managing major sport stadia makes sense of – and therefore respond to - climate change. Recognition of how this happens enables sensemaking theory to account for how and why organisations in sport settings respond to climate change.
3. RESOURCES (Financial, water, manufactured, staff capabilities)	Organisations managing major sport stadia use a range of natural and other resources to operate. The availability of resources, especially financial ones, is critical to managing their response to climate change and its associated issues. For some of these organisations, climate change is a higher priority because they perceive it poses risks. These ones may seek to acquire extra resources to manage these risks. They may also do so out of their perceived obligation to community as responsible corporate citizens. They also show evidence of the beginnings of climate change capabilities.	The internal resources available to organisations managing major sport stadia are critical to the nature and extent of their response to climate change. This is an extension of RBV/RBT to a population of sport organisations not examined before for climate change impacts and responses. Recognition of the relationship between resources and a CSR ethos confirms the linkages between RBV/RBT and CSR theory for understanding how responses to climate change.
4. STAKEHOLDERS [INTERNAL]: - Managerial agency of staff	Some organisations managing major sport stadia will have internal stakeholders in the guise of individual staff who will significantly shape their organisation's response to climate change and associated issues through the managerial agency of their own actions. They interpret climate change as an important issue that cannot be ignored by their organisation.	Recognition of the activities of these staff enables stakeholder theory to account for their role of internal stakeholders in shaping organisational responses to climate change. This also extends the value of stakeholder theory in sport industry settings.
5. CSR ETHOS: - Genuine CSR commitment	Organisations managing major sport stadia typically have a corporate social responsibility (CSR) ethos. They want to "do the right thing" by the community in which they operate, and this extends to their response to climate change and its associated issues.	Recognition of the consistent reporting of a CSR ethos by organisations managing major sport stadia enables CSR theory to offer insights into the motivations behind responses to climate change in sport industry settings.



6. CLIMATE CHANGE VULNERABILITY OR RESILIENCE	The grass playing surfaces of organisations managing major sport stadia in hot, dry climates typically have some vulnerability to the higher temperatures, lower rainfall, higher evaporation, lower humidity and higher water costs associated with climate change. However, these organisations are typically able to generate resilience to such problems through a combination of resources such as water management infrastructure, drought-tolerant grass varieties, and organisational capabilities. Government regulations requiring increased water efficiency may play a role in the acquisition of such resources. The quality of building design of major sport stadia typically affords resilience to other weather extremes associated with climate change such as storm events. However, greater energy efficiency is needed to address vulnerability to higher electrical energy costs associated with government-mandated GHG mitigation measures.	Recognition of the vulnerability of the grass playing surfaces of major sport stadia located in hot, dry climates to increasingly extreme weather events allows the organisations that manage these facilities to better adapt to climate change, and to plan for resilience in future stadia. Incorporating concepts of vulnerability and resilience, which have emerged from the scientific literature of climate change, into RBV/RBT enables it to better account for the physical risks of climate change for major sport stadia.
7. BARRIERS (Especially financial barriers & uncertainty)	Organisations managing major sport stadia face barriers to responding optimally to climate change. The major barrier is extra financial cost. Uncertainty about the science of climate change, and regulatory regimes is another barrier.	Recognition of this relationship between the barriers faced by organisations managing major sport stadia to optimal climate change responses, and enables RBV/RBT to partly explain these barriers.

The 10/3 Climate Change Framework for MASS organisations has been inductively developed through application of Cepeda & Martin's (2005) method of theory development from twelve organisational case studies. The framework integrates four existing theories: RBV/RBT, stakeholder theory, CSR, sensemaking, while also drawing on economic theory pertaining to cost and externalities. It is a theory that applies to the variety of cases investigated in this study, and as such, it is a "formal theory" rather than a "substantive" one that is specific to a particular case (Cepeda & Martin, 2005, p. 861; B. Glaser & Strauss, 1967).

To clearly understand the 10/3 Climate Change Framework, it is helpful to apply Whetten's (1989) four "essential elements" test for any theory. As explained in Chapter Three of this thesis, Whetten – drawing on Dubin (1978) – argued that any "complete theory" must have four elements: (1) *what* (factors, variables & constructs); (2) *how* (relationships between factors); (3) *why* (a rationale for including factors & relationships), and; (4) *who, where & when* (limitations to the generalisability of the proposed theory)." Whetten notes that the "what" and "how" provide a "framework for interpreting patterns, or discrepancies, in our empirical observations." In short, "what and how describe; only why explains." Therefore, the 10/3 Climate Change Framework may be understood in the following terms:

The "what" of the 10/3 framework

Factors & variables

Whetten (1989, p. 490) argues that theorists should ask themselves, "Which factors (variables, constructs, concepts) logically should be considered as part of the explanation of the social or individual phenomena of interest?." The 10/3 framework comprises ten factors. These factors were present both *internally* and *externally* to MASS organisations. The three types of *external* factors are: (1) physical impacts of climate change; (2) market changes (increased supplier costs), and; (3) external stakeholders. The seven types of *internal* factors are: (1) energy use; (2) climate change sensemaking (interpretation); (3) resources; (4) stakeholders; (5) CSR ethos; (6) vulnerability & resilience to the physical impacts of climate change, and; (7) barriers to climate change responses.

These factors highlight the multi-faceted nature of what climate change means for these organisations and why no single theoretical perspective is able to fully account for this phenomenon. The interaction of these internal and external factors shape how these organisations respond to climate change. These responses are variables that fall into three types: (1) *do nothing (wait and see/business-as-usual);* (2) *adaptation – assess risk (risk assessment & options appraisal)*, and; (3) *adaptation – reduce risk (bear & manage risk)*. Major stadia organisations are likely to respond to the internal and external climate change factors in varying ways, and to varying degrees. For example, while most will

respond with "cost reduction and resource efficiency", only some will respond with deliberate mitigation of GHG's. Alternatively, some major stadia organisations will respond by doing nothing (business as usual).

Constructs (concepts)

The "10/3 framework" proposes a combination of concepts. The fundamental concept is that of "climate change" itself. However, tied to this are the related concepts of "vulnerability", "resilience", "mitigation" and "adaptation." Building upon this conceptual platform are the concepts drawn from existing theories including "stakeholders", "sensemaking", "resources", and "corporate social responsibility." Additionally, the 10/3 framework proposes that "market changes (increased supplier costs)", and "barriers" to climate change responses are key concepts.

The "how" of the 10/3 framework

Whetten (1989, p. 491) also argues that the relationships between factors should be made clear. In broad terms, there are relationships between "external" factors, relationships between "internal" factors, and relationships between both "external" and "internal" factors. Beginning with external factors, a relationship exists between the "physical impacts" of climate change (i.e. a hotter, drier climate and increased water evaporation) and "external stakeholders" in the form of national and state governments, who introduce legislation to price GHG emissions and to require increased water and energy efficiency. Such action is aimed to cause "market changes" such as increased energy and water "supplier costs" that are aimed at mitigating GHG emissions and maximising water availability at a national level.

For "internal" factors, organisations managing major stadia interpret the external factors that they are confronted with. This "sensemaking" – influenced mainly by media and industry influences – shapes how such organisations respond to the external factors. First, they interpret the "physical impacts" of climate change as reducing the amount of critical natural "resources" – such as water – that are available to their stadia. These organisations also interpret their level of vulnerability of their stadia and organisation to such impacts. Second, major stadia organisations interpret the combined impact of government legislation requiring increased water and energy efficiency – and the associated market changes of increased water and energy supply "costs" – as needing internal strategy responses. This causes water and energy efficiency responses, and coincides with direct or indirect GHG "mitigation."

There are also other relationships between the 10/3 framework's "internal factors." The acquisition of manufactured resources such as water and energy management infrastructure are related to the external "physical", "market" and "stakeholder" factors. These internal responses are also typically related to the CSR ethos of organisations managing major stadia – who want to "do the right thing" –

but they are also in some cases related to internal stakeholder factor of managerial agency. Put simply, water and energy management resources are acquired – in part – because senior middle-level managers believe it to be societally and organisationally appropriate. Finally, internal "barriers" to more effective and holistic organisational responses to external climate change factors are related to both sensemaking and resource factors. That is, internal "uncertainty" about government climate change policy causes major stadia organisations to typically respond in a "cautious" rather than integrated manner. Furthermore, the typically cautious organisational response is also related to managerial interpretation that there are simply insufficient internal "financial resources" to do so.

The "why" of the 10/3 framework

Whetten (1989, p. 491) argues that theorists should explain the "whys underlying the reconstituted whats and hows" – that is, the underlying assumptions. The 10/3 framework is based on five assumptions. First, the framework assumes that major sport stadia – and the organisations that manage them – have a relationship with the natural world in the form of reliance on the valuable natural resources of water, and a stable climate. Second, the framework assumes that current climate change is a complex, global and ongoing problem whose scale and urgency poses complex problems for organisations generally. Third, the framework assumes that the complex and inter-related issues posed by climate change for major sport stadia and the organisations that manage them – and *how* and *why* these organisations respond to such issues – are explained more completely by drawing upon insights from multiple theoretical perspectives, than by existing theoretical perspectives applied in isolation. Fourth, as the framework draws upon the theoretical perspectives of resource-based view/theory, stakeholder theory, CSR theory and sensemaking theory, it assumes that the resources, stakeholders, sensemaking and CSR ethos of organisations managing major sport stadia are critical factors that shape how and why they respond to climate change. Finally, the framework assumes that organisations managing major stadia will respond to the complex issues posed by climate change in one or more of three basic ways: (1) do nothing (wait and see/business-as-usual); (2) adapt – assess risk (risk assessment & options appraisal), and; (3) adapt – reduce risk (bear & manage risk).

The "who, where and when" of the 10/3 framework

Whetten (1989, p. 492) argues that theorists should explain the "temporal and contextual" conditions within which the generalisability of the proposed theory is limited. The 10/3 framework is limited to the following conditions. First, "who": the 10/3 framework is limited to major sport stadia that stage professional sport events, and the organisations that manage such stadia; it is not generalisable to other sport or non-sport organisations. Equally, it does not apply to organisations managing smaller stadia; as the framework is based on major sport stadia with a seating capacity of 25,000 spectators or more, it should not apply to stadia with a lower seating capacity. Second, "where": the 10/3 framework is limited to the same industry elsewhere – that is, a major sport stadia industry that stages

professional sport events – and the organisations that manage such stadia; it is not generalisable to other industries. Furthermore, the 10/3 framework would not apply to major sport stadia organisations in countries where their electrical energy is generated from entirely renewable inputs (i.e. GHG pollution-free energy). The framework is also most relevant to major sport stadia organisations where external stakeholders in the form of governments have implemented policies for GHG mitigation. Third, "when": the 10/3 framework is limited to a period when anthropogenic climate change was not only occurring, but when national governments have been implementing policies for GHG mitigation – *and* – when industries and organisations might reasonably be expected to be aware of climate change and government efforts to mitigate GHG emissions. For these reasons, it is proposed that the framework ought not to apply to any major sport stadia and their organisations prior to 2007 – the year in which the IPCC and Al Gore were awarded the "Nobel Peace Prize" for their efforts to build knowledge about "man-made climate change, and to lay the foundations for the measures that are needed to counteract such change" (Nobel-Foundation, 2007) – a point when it might reasonably be said that climate change arrived as an issue of global awareness.

At this juncture, it is also worth reflecting back to the arguments of Cunningham (2013), Doherty (2013) and Fink (2013) – that were raised in Chapter Three of this thesis – about the importance of theory development for research rather than just conventional theory testing. It is clear from the results obtained, and the insights afforded by the 10/3 Climate Change Framework proposed here, that the theory development approach *has* – as Cunningham (2013) suggested was possible – enabled insights that may not otherwise have been possible had a conventional testing of a single theory been adopted.

That is, the multiple factors identified in this study as being important implications of climate change for MASS organisations were able to be identified essentially because the researcher was not restricted to a single theoretical lens as is usually the case in a Ph.D. study. Being open to the theoretical possibilities of this study, as the theory development approach required, enabled a wider view of what climate change means in various ways to MASS organisations, and therefore enabled the various factors that emerged from the data to be identified. As such it is a strength of the study, and this thesis. However in conclusion, one final comment should be made about the final conceptual framework/theory – the aforementioned "10/3 Climate Change Framework": it has evolved out of existing theories and the linkages between them in response to the dynamic phenomena of climate change. As a result, it is intended to be a dynamic theory that will likely evolve as the dynamic problem of climate change unfolds over the years to come.

Conclusion

This chapter discussed the results of the study, and outlined an emergent theory that takes into account a range of factors that shape the impacts of and responses to climate change. The 10/3 Climate Change Framework for MASS organisations that emerged from the discussion responds to Cepeda & Martin's (2005) call for theory development from case studies within an interpretive epistemology. It also responds to Chalip's (2006) call for "sport-specific theories" that take into account factors that are unique to sport. This thesis now turns to the final part of Section D, Chapter Seven, which outlines the key conclusions and contributions of the study.

Chapter Seven: Conclusions

Chapter Seven is the second and final part of Section D of this thesis, which outlines the key conclusions and contributions of the study. This thesis has presented the results of the study in which I investigated the impacts of anthropogenic climate change on major Australian sport stadia (MASS) and the organisations that manage them, and their responses to these impacts. The research questions were: (1) "*What*, if any, issues are posed by climate change for MASS and the organisations that manage them?"; (2) "*How* are the organisations that manage MASS responding to climate change?", and; (3) "*Why* are the organisations that manage MASS responding to climate change in the way they do?." Accompanying these three research questions were four specifying questions (SQ): (SQ1) "How do organisations that manage MASS *interpret* climate change?"; (SQ2) "What, if any, greenhouse gas (GHG) mitigation and/or climate change *adaptation responses*, are being employed at MASS?"; (SQ3) "How do such responses *compare* to those of other organisations managing MASS?", and; (SQ4) "What, if any, factors are *barriers* to these responses?." These questions have not been addressed in sport management literature before and therefore highlight an important knowledge gap.

In addressing these research questions, and to develop some theoretical insights into the research problem, literature from climate change science, climate change policy, economics and organisational management were reviewed. The initial literature review also identified various existing theories with potential for generating insights into research problems involving organisations impacted by, or responding to, the complex phenomenon of climate change. Those of greatest relevance were RBV/RBT, stakeholder theory, corporate social responsibility theory, and sensemaking theory. In doing so, various limitations of these theoretical perspectives were identified. Furthermore, a key limitation of all theories is their scope: as Gerrard (2003, p. 143) points out, "theoretical frameworks provide a sort of intellectual searchlight that only ever illuminate part of reality." These theories therefore have limitations for explaining the issues posed by the magnitude and unpredictability of climate change for sport organisations – in isolation. However, these perspectives clearly have some linkages that suggested potential for explaining complex research problems like climate change in sport contexts – in combination. When calls by sport management scholars for the development of "sport-specific" theories were also considered, it was clear a theory development approach was appropriate for this study.

As a result, the theory development approach used for this study resulted in the conceptual framework that is drawn from and extends RBV/RBT, stakeholder, CSR and sensemaking theories. It also draws on economic theory to account for the cost implications of climate change for MASS organisations. The framework – a multiple impact factor, multiple-response climate change framework with the short title, "10/3 Climate Change Framework" – was developed inductively from twelve cases studies

of major Australian sport stadia organisations using a qualitative methodology situated within the constructivist paradigm. The cases were chosen using a two-stage "purposeful sampling" approach involving both selective and theoretical samples, while the data for these cases were collected from documents, focused/in-depth interviews, and a limited amount of observations. The study employed both within-case and cross-case analysis to derive the themes that informed the development of the final conceptual framework – the 10/3 Climate Change Framework.

Conclusions about climate change issues

In answer to Research Question 1 – "*What,* if any, issues are posed by climate change for major Australian sport stadia and the organisations that manage them?" – the results show that climate change does pose some issues for MASS. Three primary climate change issues were identified by the majority of MASS organisations: (1) the management of water and (2) energy resource inputs, and (3) waste outputs. Restrictions on water supply, higher evaporation, government requirements for increased water efficiency, and increasing water supply costs as a consequence of climate change were points of vulnerability repeatedly identified. Energy resource inputs were another issue with MASS organisations repeatedly identifying the need to reduce electrical energy consumption, indirect GHG emissions, and energy costs. Given the size of these stadia and their relatively high levels of consumption of energy produced from fossil fuel-intensive industrial processes, a small proportion were indirectly responsible for sufficient GHG emissions to require these be reported to the national government. Waste outputs were the other key climate change issue as these organisations typically understood the relationship between the disposal of their solid waste to solid waste disposal sites, the GHG emissions that result at these sites, and national laws that place a "carbon price"/cost on these sites for such emissions above certain thresholds. Together, these water, energy and waste issues result in the fourth major issue: climate change and its attendant regulatory and commercial implications create financial costs for MASS organisations. Other minor issues were the vulnerability of some stadia to the physical impacts of climate change, and the reluctance of some key stadium stakeholders to address climate change. Nevertheless, climate change was a "second-order" issue compared with the financial objectives of MASS organisations, their financial constraints and their strong operational focus.

Conclusions about responses to climate change

In answer to Research Question 2 – "*How* are the organisations that manage major Australian sport stadia responding to climate change?" – the results show that these organisations responded to the primary issues of water, energy and waste with a combination of strategies, but without systematic climate change plans. First, these organisations responded to water issues with water management strategies that involved the installation of infrastructure that variously captured, stored, used, reused and/or filtered water in order to use this natural resource as efficiently as possible and to reduce its

cost. Second, these organisations responded to energy issues with energy management strategies that involved the most efficient use possible of this manufactured resource in order to primarily to reduce its cost, but also to meet government efficiency requirements. Tactics employed within these energy management strategies included energy and GHG emissions monitoring, installing the most energy efficient equipment, and using either external consultants or creating an internal "green team" for identifying opportunities for energy savings. Third, these organisations responded to waste issues by using waste management strategies and especially waste recycling processes where solid wastes are sorted on site, and diverted from disposal to landfill. However, the general nature of these responses was cautious rather than proactive or ambitious.

Conclusions about greenhouse gas (GHG) mitigation and adaptation responses

In answer to Specifying Question 2 (SQ2) – "What, if any, GHG mitigation and/or climate change *adaptation responses,* are being employed at major Australian sport stadia?" – there is evidence of mitigation of GHG emissions by MASS organisations. However, this was mostly as a second-order priority that coincided with existing strategic plans and measures for reducing energy inputs in order to achieve the more important commercial imperative of lower energy costs. Most organisations had at least a basic understanding of the scientific basis for GHG mitigation – whether directly or indirectly – and most clearly understood that by reducing their electrical energy consumption, they would also be mitigating indirect GHG emissions. There was also evidence of risk reduction adaptation to climate change in the form of significant investment in, and installation of, water saving infrastructure. Other evidence suggested there was risk assessment adaptation in the form of reporting and restricting water and energy use as required by government. MASS organisations are also reducing climate change risks by adapting their playing surfaces with more water-efficient grass varieties. Only one case – Case G – showed no evidence of any adaptation.

Conclusions about how MASS organisations compare

In answer to Specifying Question 3 (SQ3) – "How do such responses *compare* to those of other organisations managing major Australian sport stadia?" – the results show that none of these organisations had formal climate change management plans. Nevertheless, their responses are consistent with three of the types of organisational climate change adaptation identified by Berkhout et al. (2006) and Berkhout (2012). Firstly, only one MASS organisation – Case G – could be regarded as having a "wait and see"/"do nothing" response. Secondly, the cautious approaches of eleven of the twelve cases (A, B, C, D, E, F, H, I, J, K & L) are consistent with a "risk assess[ment]"/"bear and manage" risks response. However, they do so mainly by using existing organisational strategies, rather than ones specifically prepared to directly address climate change. They are mostly uncertain about climate change policy and legislation, uncertain about the potential for competitive advantage and disadvantage arising from climate change, and – outside of cost-reduction strategies associated

with water, energy and waste – unsure how an integrated climate change-plan might be used to benefit their organisations. For three of these eleven cases (B, E & J), cautious moves to adapt to climate change indicate that they were moving beyond merely "bearing and managing risk", and that they were also undertaking what Berkhout et al. (2006) call *"risk assessment and options appraisal."* Finally, none of actions these organisations were consistent with "shar[ing]", "shifting", or "diversify[ing]" their climate change risks.

Conclusions about why MASS organisations respond to climate change

In answer to Research Question 3 – "*Why* are the organisations that manage major Australian sport stadia responding to climate change?" – the results show that the simple climate signal-response/adaptation that was assumed in the initial conceptual framework for this study (CF1) was largely non-existent. Rather, climate change represents one further bundle of risks that must be managed/adapted to/responded to within their existing strategic plans. Their existing strategic plans were generally perceived to be adequate for managing most climate change risks, and this is a reasonable assessment. MASS organisations are mostly responding to "indirect signals" to adapt, like regulatory change and market change, rather than "direct signals" like the physical impacts of a hotter and more extreme climate. However, within this context, the responses of MASS organisations are for three key reasons: (1) primarily to reduce financial costs; (2) because government legislation either required them to reduce water and energy consumption, or gave them financial incentive to reduce the volume of waste created, and; (3) because of their sense of corporate social responsibility. This generally cautious response to climate change is also explained by a number of factors acting as barriers to a more comprehensive, systematic, proactive and ambitious one. Whilst these organisations are to be commended for recognising the ethical reasons for acting as good corporate citizens, the results also show in answer to Specifying Question 4 (SQ4) – "*What*, if any, factors are barriers to these responses?" – that barriers to better responses include lack of financial resources to implement climate change initiatives, a poor understanding of climate change, problems with stakeholders, and inadequate stadium design.

Explaining why MASS organisations respond to climate change the way they do begins with how they interpret this issue, and the internal and external influences that shape their interpretation. In answer to Specifying Question 1 (SQ1) – "How do organisations that manage major Australian sport stadia *interpret* climate change?" – the results show that these organisations generally "make sense" of climate change as an important issue to the world, and Australia. Most have a basic grasp of the science underpinning public debate about the issue, and for most, media reportage of climate change was the most significant influence on this understanding. Information obtained from government sources was the next most important influence on how they understood the issue while other influences included energy consultants, other industry publications, and industry partners such as

contractors. As a result, most MASS organisations understand that the way they use water and energy resources and manage waste outputs has implications for GHG emissions and their financial costs. The latter point is crucial: these organisations interpret climate change primarily as a *cost* issue, where previously externalised costs tend to be absorbed by them rather than be passed on to their customers. This places added pressure on their financial position, and explains the need to find further efficiencies to pay for savings to offset these costs that are now being internalised.

Several influences also help to explain why MASS organisations respond the way they do to climate change. Seven different factors were identified as influences on the responses to climate issues. These mostly external influences include government stakeholders and their information on climate change, their ethos of corporate social responsibility, stakeholders/corporate partners, organisational values, public opinion, the views of staff, and the action of other stadia. Of these seven influences, government stakeholders and their information on climate change were the strongest. However, literature around the concept of risk helps to explain why MASS organisations responded the way they did to climate change. The water, energy and waste issues identified in this study are all forms of risk. The costs associated with these issues are another form of risk. Berkhout's (2012) and Berkhout et al's (2006) climate change adaptation typologies offer insights in how organisations can react to climate change risks: risks can be *ignored* (do nothing/wait and see); risks can be *assessed* as a precursor to action; risks can be *reduced*/*managed*, and; risks can be *shared*/*shifted* or *diversified*. Of these five possibilities – ignoring, assessing, and reducing/managing climate change risks – were best matched to the suite of internal and external factors facing MASS organisations, and therein lies much of the explanation behind the responses of these organisations.

Contributions arising from this study

Seven aspects of this study are contributions to the management literature.

The first contribution is a theoretical one with the development of the multiple impact factor, multiple-response climate change framework for MASS organisations – that for brevity's sake has been given the short title of "10/3 Climate Change Framework." The 10/3 Climate Change Framework is generalisable to the entire study population of MASS organisations. Significantly however, this framework should also be generalisable to organisations managing major sport stadiums in other countries. That is, in short, it is has the potential to be a "10/3 Climate Change Framework for Major Stadia." Whilst this study was limited to a single industry, and therefore some of the findings here might be context specific to some extent, at this point there are few reasons to suggest that the same industry in other national settings would be impacted by climate change in vastly different ways, or adopt a wildly different range of climate change response strategies. Although climate varies enormously around the world – and physical climate change impacts may vary – climate change-

related water, energy and waste issues may be common in many countries where major sport stadiums operate. The 10/3 Climate Change Framework addresses the scarcity of literature about climate change in sport contexts, responds to Chalip's (2006) call for sport-specific theory, and calls for theory development in sport by Cunningham (2013), Doherty (2013) and Fink (2013). The 10/3 Climate Change Framework is an original and important contribution to theoretical understanding of what climate change means for sport, and future researchers are urged to test it in other national contexts.

The second contribution was the identification of ten factors and three climate change organisational responses that are the basis of the 10/3 Climate Change Framework. These factors – both internal and external to MASS organisations – were identified through the process of within-case and cross-case analysis. The three types of external factors are: (1) *physical impacts*; (2) *market changes (increased supplier costs), and*; (3) *external stakeholders.* The seven types of internal factors are: (1) *energy use;* (2) *climate change sensemaking (interpretation);* (3) *resources;* (4) *stakeholders;* (5) *CSR ethos;* (6) *vulnerability & resilience to climate change,* and; (7) *barriers to climate change responses.* The three types of organisational climate change responses are: (1) do nothing (wait and see/business-as-usual); (2) adapt – assess risk (risk assessment & options appraisal), and; (3) adapt – reduce risk (bear & manage risk). These factors and responses have not previously been identified in sport management literature. They also highlight the multi-faceted nature of what climate change means for major sport organisations: these internal and external factors interact to shape how these organisations respond. These factors also highlight where opportunities lie in making improvements to how these organisations respond, and to management education for the major sport stadia sector.

The third contribution of this study is an empirical one with the identification of three primary climate change issues for the majority of MASS organisations: (1) the management of water and (2) energy resource inputs, and (3) waste outputs. Despite the three different theoretical categories that lead to the selection of cases for this study (1 – publically-owned, not-for-profit; 2 – privately-owned, not-for-profit, and; 3 – privately-owned, for-profit), the climate change issues of water, energy and waste management were constants across the study population. These issues informed the inductive development of the 10/3 Climate Change Framework, and have not previously been identified in sport management literature. These issues also identify important foci for future research on climate change in sport contexts.

The fourth contribution of this study is that for only the second time, sport organisations have been the *unit of analysis* in research relating to climate change issues for sport. Only Chard & Mallen's (2013) study has previously identified sport organisations as an important site for understanding the implications of climate change for sport. Organisations are an important unit of analysis for

researchers concerned with issues of sport management and climate change because it is these organisations that have relationships with the natural environment in which climate change is occurring. These organisations, like those outside of the sport industry, contribute to climate change in direct and indirect ways – something that Porter & Kramer (2006) and Porter & Rienhardt (2007) might call an "inside-out" impact on the natural environment. Sport organisations however also are impacted by the natural environment, sometimes in damaging ways, and climate change is a good example of such impacts. In addition, the "outside-in" impact of climate change on organisations has not been previously reported in sport management literature, and this study is the first to contemplate the relationship of sport organisations with the natural environment in such a holistic way.

The fifth contribution of this study is a conceptual one. For the first time, this study has applied the crucial climate change concepts of vulnerability, resilience, mitigation and adaptation to sport organisations. These four inter-related concepts originated in climate change science literature, and have in recent years been extended to management and literature for other disciplines. However, building on organisations as a new unit of analysis for sport management research, this study contributes for the first time insights into (1) what makes a sport organisation *vulnerable* to the physical, market or regulatory impacts of climate change; (2) what makes a sport organisation *resilient* to such impacts of climate change; (3) how sport organisations *mitigate* their direct or indirect GHG emissions that contribute to climate change, and; (4) in what ways sport organisations are – or could – *adapt* to the complex impacts of climate change. With these four concepts, this study goes beyond all previous work that has contemplated climate change as it pertains to sport and sport organisations.

The sixth contribution of this study to management literature is that it is the first to investigate the implications of government climate change mitigation policy for sport organisations, and this enabled actual responses to such policy to be observed and analysed. Australia has been contemplating measures for reducing Australia's GHG emissions since the Howard government in 2007, and in every government since. Whilst the literature review presented in Chapter Two of this thesis demonstrates that Australian climate change policy has changed direction with the election of the Abbott government in September 2013, the so-called "three pillars" of Australian policy – mitigation of GHG emissions, adaptation to the physical impacts of climate change, and seeking a global agreement for mitigation and adaptation – nevertheless remain constants. Only the means by which mitigation is achieved has changed significantly. The introduction of the "carbon tax" in 2011 as a prelude to the introduction of the floating carbon price envisaged for the ETS occurred during the data analysis phase of this study. Two of the organisations investigated for this study had carbon tax liabilities to pay to the Australian government. Despite the new government, the carbon tax still exists and will do so until any legislation repealing it can pass both houses of the Australian parliament.

Being able to observe and analyse how organisations managing major sport stadia interpreted and complied with national climate change policy has never been done before, and we now have some insights into what such policy means for this type of sport organisation.

The seventh and final contribution of this study to management literature is one of method. Whilst case study method has been a regular feature of management – and sport management – literature, there a few examples in either body of work that offer *theory development* from case studies. This is particularly so in sport management literature although Eisenhardt (1989b, 2002; 2007) and others are important exceptions in mainstream work. Consistent with calls by Cunningham (2013), Doherty (2013), and Fink (2013) for theory development for the discipline of sport management, this study has sought to develop theory from organisational cases but with a method not previously used for sport organisations. This study has used Cepeda & Martin's (2005) iterative method that is suited to interpretivist research. Their method consists of three elements (1 – a *conceptual framework*; 2 – the *research cycle*, and; 3 – *theory building*). Crucially, the research cycle consists of four phases (1 – *planning*; 2 – *data collection*; 3 – *data analysis*, and; 4 – *critical analysis*). The use of this method is significant because it contributes a new yet systematic method for sport management researchers to undertake qualitative research.

Limitations of this study

This study has five limitations that ought to be acknowledged. First, the study is limited to *research questions* concerned with the "impacts" of climate change on MASS and the organisations that manage them, and to *how* and *why* such organisations respond to climate change. As a result, the study was less concerned with quantitative questions such as "how much?" or "how often?", and as a consequence, opportunities remain for researchers to explore such questions for major sport stadia in Australia and beyond. Second, this study is also limited *geographically* to Australian cities where the organisations operating these major sport stadia are located. It was beyond the scope of this study to examine organisational responses to climate change in geographic areas outside of Australia, or institutional contexts such as other non-sport industries, as a consequence, the findings of this study do not apply to major sport stadia outside Australia, or extend to minor sport venues within Australia. Third, the study is limited to *stadia* that are mainly concerned with staging elite-level cricket and football including Australian Rules, Rugby Union and Rugby League and soccer. It was beyond the scope of this study to consider climate change impacts or responses of organisations managing sport facilities at recreational/community-sport level. The study also does not extend to stadia used for significant sports such as swimming, tennis, motor racing or horse racing, as a consequence, the findings and final conceptual framework – the 10/3 Climate Change Framework – may not generalisable to such facilities.

Fourth, this study is limited to the *industrial context* of the major sport stadia sector of the Australian sport industry. As a consequence, the findings and final conceptual framework – the 10/3 Climate Change Framework – are not generalisable to other industrial settings. I acknowledge that in limiting the choice of organisations to those concerned with the management of major sport stadia, this study has produced – as Haigh & Griffiths (2012, p. 110) noted about their study – "context-specific knowledge" that is not generalisable to "other industries." However, as Sharma et al. (1999, pp. 105-106) have noted about their study, "there are few reasons to suggest that the same industry in other national settings would adopt a wildly different range of environmental responsiveness strategies." So although the stadia chosen for this study frequently stage elite-level cricket in summer and Australian Rules football in winter – a combination of sports that is unique to Australia – such a combination is not radically different to stadia elsewhere in the world that offer winter and summer sports. Therefore, the 10/3 Climate Change Framework developed from this study may apply to the same industry in other countries.

Finally, the *human participants* to the study were limited to the population of company executives and senior to middle-level managers at the twelve MASS organisations. While these participants, as senior organisational leaders, were best placed to explain the organisational impacts and responses to climate change, it must be acknowledged that the human participants of this study are limited to this group.

In conclusion, this study has responded to calls by management scholars for more research on what climate change means for organisations (Kolk & Pinkse, 2007b; Linnenluecke et al., 2013; Winn et al., 2011), and by sport management scholars for sport-specific theory (Chalip, 2006) and theory development (Cunningham, 2013; Doherty, 2013; Fink, 2013). This study presents climate change as a phenomenon that poses a range of issues for organisations managing major sport stadia, one that challenges the existing sport management literature that typically overlooks this problem. Accordingly, sport management scholars need to revise their understanding of what the natural environment means for sport organisations. Finally, the findings of this study have challenged the adequacy of existing organisational theories for explaining the implications of climate change – in isolation – and have been used to inductively and iteratively develop a conceptual framework – the "10/3 Climate Change Framework" – that has emerged as an extension of existing theoretical perspectives of RBV/RBT, stakeholder theory, CSR theory and sensemaking theory.

Opportunities for further research

These contributions and other findings noted throughout the study indicate possibilities for further research into what climate change means for sport in Australia, and beyond these shores. This study is a basis for future research examining the implications of climate change for the sport industry, and how and why other sport organisations respond to this issue. As indicated in Chapter One of this

thesis, this study was limited to only organisations that manage major Australian sport stadia. Whilst this study is an important starting point for answering the fundamental question – *"What does climate change mean for sport in Australia?"* – a comprehensive answer to this question needs further research in other sectors of the Australian sport industry, and using other units of analysis in sport. This study therefore offers clues to future research in terms of literature, study populations, methodology and method.

As a result, for future research, it is suggested that scholars begin by contemplating the different types of sport and what climate change might mean for them. Sport is a large institution that can never been entirely captured in a single study. Therefore, researchers should first consider the typology of sport presented in Chapter Four of this thesis that divides the broad institution of sport into three categories: (1) elite/professional/national level sport; (2) semi-professional sport, and; (3) recreational or community-level sport. Each of these levels has different purposes, resources, and facilities that may be impacted by and respond to climate change in different ways. Within each of these broad categories, there is scope for investigating different organisational units of analysis: governing bodies, sport clubs, sport facilities, and leagues/competitions. Each category presents opportunities for looking at study populations that have not previously been studied for their climate change implications. Potential research questions include: (1) "Which sports are most *vulnerable* to the physical, regulatory and economic impacts of climate change?"; (2) "Which *levels of sport* are most vulnerable?", and; (3) "Which levels of sport are most *resilient*?." Furthermore, (4) "Which levels of sport are creating the most *GHG emissions*, whether directly, or indirectly?"; (5) "Where sport events are responsible for GHG emissions, whether directly or indirectly, what *mitigation strategies* are most appropriate?", and; (6) "What – if any – *differences* are there between sport events in relation to GHG emissions?." Given that at least one recent study (Chard & Mallen, 2012) has identified the linkages between transportation of sport teams, GHG emissions and strategies for mitigating those emissions, scholars may wish to continue investigating these linkages with the sport organisations that travel the greatest distances and most often: professional sport teams.

Second, given the results of this study, scholars should look at what climate change means for *facilities* beyond the population of major Australian sport stadia, to major sport stadia overseas. In addition to gathering data on what climate change does – or does not – mean for such facilities, it would enable international comparisons to be developed. It would also offer the opportunity to test the efficacy of the 10/3 Climate Change Framework presented in this thesis. In addition, given the scarcity of literature in this field, scholars should consider the implications of climate change for other types of facilities such as: (1) state/regional/semi-professional stadia; (2) training facilities, and; (3) multi-purpose exercise/fitness/rehabilitation facilities. Any of these might offer scope for examining the issues, impact factors, organisational interpretations and responses identified in this study.

Furthermore, scholars could seek to elucidate possible differences between winter and summer seasons within a context of global climate change. Potential research questions include: (1) "What type of sport facilities are most vulnerable to the physical, regulatory and economic impacts of climate change?"; (2) "Where climate change vulnerability exists, what sport facilities need adaptation strategies?", and; (3) "Where adaptation is needed, what type of adaptation is best suited to these facilities?." Finally, researchers should consider asking, (4) "How do the organisations that manage sport facilities interpret climate change?", and; (5) "How do such organisational interpretations of climate change compare to those in different national contexts?." This would enable clarification of whether local cultural factors significantly influence how such sport organisations understand, and respond to, climate change.

Third, given the sampling approach of this study, scholars could look at applying the three *theoretical categories* into which organisations for this study were designated as a means for understanding any subtle differences that might exist between different types of organisations managing sport facilities. That is: (1) publically-owned, not-for-profit sport organisations; (2) privately-owned, not-for-profit organisations, and; (3) privately-owned, for-profit organisations. Whilst these theoretical categories did not reveal any significant differences between them in this study, this might be so in different national contexts.

Finally, scholars should investigate what climate change means for different *units of analysis* beyond organisations. For example, sport management researchers might look at the physical impacts of extreme weather events for associated with climate change for athletes at professional, semi-professional or community levels. In addition, opportunities exist for research into opportunities for participation at any of these levels, and what difference – if any – sport-specific climate change policy and education might make for individual impacts and/or opportunities for participation. For some of these populations, research foci might include issues and the application of some of the key concepts applied in this study such as vulnerability, resilience, mitigation and adaptation. Lastly, all scholars are encouraged to adopt a holistic approach to such research by looking "inside-out" and "outside-in." That is, what contributions do sports participants, their organisations and their facilities make – if any – towards climate change? And what impacts does climate change have on sports participants, their organisations and their facilities?

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Appendices

Appendix 1: Letter of invitation to join the study

VICTORIA UNIVERSITY | A NEW SCHOOL OF THOUGHT

School of Sport and Exercise Science

Footscray Park Campus
Ballarat Road Footscray
PO Box 14428
Melbourne City Vic 8001
Phone +61 3 9919 4000
www.vu.edu.au

Friday, 05 November 2010

Mr. Greg Dingle
School of Sport and Exercise Science
Victoria University
Footscray Park Campus
PO Box 14428
Melbourne VIC 8001
Tel. 9919 4428
Email: greg.dingle@vu.edu.au

Addressee & title
Job title
Organization name
Address
Suburb State Postcode

Dear [title] [surname],

Re: Invitation to Participate in Ph.D. Research Project involving Sport Stadia and Climate change

My name is Greg Dingle. I am a Ph.D. student in the School of Sport and Exercise Science at Victoria University and I write to you to invite [organisation name & acronym] to participate in a research study.

I am undertaking this study in order to better understand the ways in which sport is responding to climate change. I am especially interested in Australia's major sport stadia and the ways they have responded to climate change in their planning processes and day-to-day operations.

I am seeking to design a number of detailed anonymous case studies across the sport stadia industry in Australia, and, as a first step in this process, I wish to interview you and other senior managers who have input into [organisation acronym]'s climate strategies for the [stadium name & acronym] and [stadium name & acronym]. I am particularly interested to interview managers whose responsibilities include operational responses to climate change.

With your permission, I would like to interview the relevant, senior [organisation acronym] staff responsible for the [stadium acronym] and [stadium acronym] in a one-on-one setting, and to use their responses as the foundation for my case study development. For every interview I will guarantee absolute confidentiality, and both individual respondents and the organisation will be treated anonymously. I have attached an information sheet that outlines what participation will be involved, and the research themes that will be addressed.

In return for your involvement in my study, I would be happy to provide you with a written case study detailing my aggregate findings for [organisation acronym], and a copy of my completed thesis which will not only examine the responses of the other stadia participating in the study, but also provide policy and strategy options for future climate change responses.

You and your colleagues will add a great deal of value to the study given your understanding of [organisation acronym]'s climate change strategies.

I therefore request a meeting with you to discuss this and [organisation acronym]'s possible involvement. In the interim, if you have any questions about this study, please contact myself, or my Research Supervisor, Associate Professor Bob Stewart (see our contact details below).

I look forward to your reply.

Yours sincerely,

Greg Dingle
Student Investigator
School of Sport and Exercise Science
Victoria University Tel. (03) 9919 4428 greg.dingle@vu.edu.au

Associate Professor Bob Stewart
Principal Investigator
School of Sport and Exercise Science
Victoria University
Tel. (03) 9919 4350
bob.stewart@vu.edu.au

climate change: - Associate Professor Bob Stewart, Principal Investigator, School of Sport and Exercise Science, Victoria University;

- Professor Andrew Griffiths, Co-Investigator, Business School, University of Queensland

Appendix 2: Information to participants

INFORMATION TO PARTICIPANTS INVOLVED IN RESEARCH

Title of Research Project:

Playing the Carbon Game: A Study of Organisational Responses of Major Australian Sport Stadia to Climate change

Aims of Research Project:

The purpose of this research project is to collect data from a sample of organisations managing major Australian sport stadia (MASS) about how they are responding to the issue of climate change, or the impediments to such organisational responses. The specific aim is to investigate the attitudes, decisions and strategies of key managers (i.e. board directors, senior managers, strategic planners) in such organisations in response to climate change. It is anticipated that over time, the data collected from this research will also inform industry practice, and government policy formulation, for sport organisations responding to climate change.

Methods employed in this research:

The data for this project will be collected in three ways: *in-depth interviews, public documents,* and *archival material*.

1) Examining *public documents* and *archival material*:

In stage 1, the researchers will examine any public *documents* and *archival material* that will provide information on the attitudes and actions of key managers and decision makers about adapting their organisation to a carbon-constrained operating environment.

2) In depth interviews:

In stage 2, additional and more detailed qualitative data on adapting sport organisations to a carbon-constrained operating environment will be obtained from key managers and decision makers in sport organisations. In this instance data will be collected via in-depth interviews with board directors, strategic planners and senior managers. The interview will range in duration between 30 and 60 minutes. To ensure accuracy, the interviews will be audio-taped.

Informants will be asked to their general views about climate change and carbon constraint; *how* their MASS is responding to climate change; how *effective* their MASS's responses are in reducing their GHG emissions; and finally, what factors are shaping their response?

Role of the Student Investigator:

The Student Investigator, Greg Dingle, will be the person who conducts the *in-depth interviews,* who examines any *public documents,* and who examines any *archival material.* As a student for this Doctor of Philosophy (Ph.D.) research project, Greg will be the person who will undertake *analysis* of any data collected, and who will write a *thesis* that discusses the results of this research project.

Managing risk and safeguarding confidentiality:

Although you, as an informant, may be asked to reveal attitudes and behaviours you consider to be private and personally sensitive, your contribution to the study will be voluntary. Moreover, the nature of all interview questions will be explained prior to any signing of consent forms. You will be given full opportunity to seek

clarification of planned questions, and choose to not proceed with the survey or interview if you feel any personal discomfort, or feel threatened or coerced in any way. You may choose to withdraw from the survey or interview at any time.

You will be asked about your organisation's current or future efforts to respond to climate change. For the interview, your organisation and job title will also be identified. However, the confidentiality of your responses will be ensured by only using any information that is approved by you for public discussion. As a result, the legal risks associated with your candid responses to the survey or interview questions will be minimal. The data you provide will be held only by the Principal Investigators, and will not be released to any external party or organisation.

If your require counselling as a result of your participation in this study, Dr. Harriet Speed of the School of Sport and Exercise Science at Victoria University is a registered psychologist in Victoria, and will be available to discuss any issues raised during, or resulting from the interview. Dr. Speed can be contacted on 9919 5412 or through email at: harriet.speed@vu.edu.au

If, having completed the interview, you have any queries or complaints about the way you have been treated, you may contact the Secretary, Victoria University Human Research Ethics Committee, Victoria University, PO Box 14428, Melbourne, VIC, 8001 or by phone on (03) 9919 4781.

[*Please note: Where the participant/s are aged under 18, separate parental consent is required; where the participant/s are unable to answer for themselves due to mental illness or disability, parental or guardian consent may be required.]

Further advice:
For further advice on this research project you should contact the following:

Associate Professor Bob Stewart Phone (03) 9919 4350 or, Greg Dingle Phone (03) 9919 5373

Professor Andrew Griffiths Phone (07) 3346 8172

Appendix 3: Consent form

CONSENT FORM FOR PARTICIPANTS INVOLVED IN RESEARCH

INFORMATION TO PARTICIPANTS:

We would like to invite you to be a part of a study into...A Study of Organisational Responses of Major Australian Sport Stadia to Climate change.

CERTIFICATION BY SUBJECT

I, (full name) ----------
of (name of suburb) ----------

certify that I am at least 18 years old* and that I am voluntarily giving my consent to participate in the study: *Playing the Carbon Game: A Study of Organisational Responses of Major Australian Sport Stadia to Climate change,* being conducted at Victoria University by: Associate Professor Bob Stewart and Professor Andrew Griffiths and Greg Dingle.

I certify that:

- the objectives of the study, together with any risks and safeguards associated with the procedures listed hereunder to be carried out in the research, have been fully explained to me by either Associate Professor Bob Stewart, the *Principal Investigator* for this project, or the *Student Investigator* for this project, Greg Dingle;
- I freely consent to participate in the following interview which will seek information on my attitudes to, and understanding of the responses of major Australian sport stadia to the issue of climate change;
- I have had the opportunity to ask any questions about the project;
- I have received satisfactory answers to my questions;
- I understand that I can withdraw from this study at any time, and that this withdrawal will not jeopardise my standing, or disadvantage me in any way;
- I also understand that if I withdraw while completing the interview, my incomplete responses will form part of the data set;
- I have been informed that the information I provide will be protected by de-identification protocols, kept secure and confidential, and will not be released to a third party;
- I have been informed that the interview will range in duration between 30 and 60 minutes;
- In addition to signing the hard copy consent form prior to undertaking the interview I will sight and check the consent form.

Signed: ----------

Witness (other than the Principal Investigator): ---------- Date: / /

Any queries about your participation in this project may be directed to either:

Associate Professor Bob Stewart	Phone (03) 9919 4350, or:
Professor Andrew Griffiths	Phone (07) 3346 8172
Greg Dingle	Phone (03) 9919 4428

If you have any queries or complaints about the way you have been treated, you may contact the Secretary, Victoria University Human Research Ethics Committee, Victoria University, PO Box 14428, Melbourne, VIC, 8001 phone (03) 9919 4781.

Appendix 4: Case study protocol

CASE STUDY PROTOCOL

Title of Research Project:

Playing the Carbon Game: A Study of Organisational Responses of Major Australian Sport Stadia to Climate change

A) OVERVIEW OF THE CASE STUDY RESEARCH PROJECT:

The purpose of this research project is to investigate how and why major Australian sport stadia (MASS) are responding to the issue of climate change. The specific aim is to investigate the attitudes, decisions and strategies of key managers (i.e. board directors, senior managers, strategic planners) in such organisations in response to climate change.

Methods employed in this research:
The data for this project will be collected in three ways: *focused interviews, public documents,* and *archival material*.

Role of the Student Investigator:
The Student Investigator, Greg Dingle, will be the person who conducts the *focused interviews,* who examines any *public documents,* and who examines any *archival material.* As a student for this Doctor of Philosophy (Ph.D.) research project, Greg will be the person who will undertake *analysis* of any data collected, and who will write a *thesis* that discusses the results of this research project.

B) FIELD PROCEDURES:

The researcher will address the following when entering the field each time:

Entry to Site

- Check before arriving:
  - Digital recorder (sufficient space, working batteries, battery back up)
  - Back up digital recorder
  - Copy of protocol
  - Participant Information Forms
  - Consent Forms
- Arrive & introduce self

Introduction to Interview

1.1 Thank you for agreeing to this interview, and your time today:

- The study - intended to help us understand what climate change means for MASS (see *Participant Information Form*)
- Intended to improve:
  1 Government sport policy
  2 Industry practice
  3 Sport management education.
  (NOTE: is about knowledge, not about money)
- Began with trying to understand what climate change means for sport
- Sport is a large institution so...divide it into manageable parts:
  - MAS Stadia

- Clubs & governing bodies
- Local government

1.2 No right or wrong answers

1.3 Ethics – need to DO NO HARM to you so...

- Risks (psychological) – but minimal
- Consent needed (see *Consent form*)
- Interview - can be stopped at any time
- You can withdraw consent at any time during the interview
- Interview to be taped (to ensure accuracy)
- Interview data – kept secure & confidential – not released to any 3rd parties.
- If you are harmed in anyway, you can make a complaint to Victoria University (see *Participant Information Form*) and I will be held accountable

1.4 You (and your organisation) will not be identified in my thesis, or any published research that follows

- In interview - I won't use your surname
- Published research:
  - Your organisation will be referred to as organisation A, B, C, etc.
  - You will be referred to as Manager A1, A2, A3...B1, B2, B3 etc.

1.5 If necessary - can interrupt the interview at any time and resume later.

1.6 Any questions?

CONCLUSION

1.7 Thank you again for agreeing to be interviewed, and your time today

1.8 If you would like I can provide you with...

- An audio copy of the interview
- A written transcript of the interview
- Research completed in approx. 18 months - a case report can be provided.

C) SCHEDULE OF CASE STUDY QUESTIONS:

1. INTERVIEW OPENING:

Thank you for agreeing to this interview, and for your time today.

1. What is your current job title?
2. Can you describe your current role in the organisation?
3. What do you do in your organisational role that relates to climate change?
4. What is your organisation's core product (or service)?

2. ORGANISATION'S UNDERSTANDING OF CLIMATE CHANGE (SENSEMAKING/INTERPRETING CLIMATE CHANGE):

2.1 What does this organisation understand climate change to mean?

2.2 Is anyone in your organisation responsible for leading its response to climate change? Why?

2.3 When did climate change first come to the attention of the organisation?

a. Which area of the organisation did it first come to the attention of?
b. Which area of the organisation handles the issue now?

2.4 What sources of information about climate change does this organisation rely upon to understand it?

2.5 To what extent does this organisation view climate change as a real and serious issue that demands a response?

   a. Is climate change a high or low priority for your organisation? Why?

2.6 Is the climate in the area where this stadium is located changing, or expected to change?

2.7 What are the major issues for this organisation relating to climate change?

   a. What climate issues is this organisation most concerned about? Why?
   b. What climate issues is this organisation least concerned about? Why?

3. THE STADIUM AND CLIMATE CHANGE:

3.1 Tell me about the STADIUM itself and climate change. Is it...

   a. Vulnerable to climate change? (risks) [if not, why not?]
   b. Or is it resilient to climate change? [if not, why not?]

3.2 Tell me about the stadium's contribution to climate change. Is it responsible for greenhouse gas emissions (directly or indirectly)?

   a. If yes, do you attempt to minimise (mitigate) these GHG emissions?

3.4 Is your organisation required to report under the *NGER Act* because the stadium meets NGER reporting thresholds?

   a. If yes, how much energy was used in the last reporting period?
   b. If yes, what were its emissions in the last reporting period?

4. ORGANISATIONAL IMPLICATIONS OF CLIMATE CHANGE:

4.1 What are the implications of a carbon price for the management of your stadium if it is introduced?

4.2 How does climate change affect your organisation's management of this stadium?

4.3 Does climate change affect your organisation (directly or indirectly)?

   a. If yes, what are the...
      i. Vulnerabilities? Or is it resilient to climate change?
      ii. Risks? (Competitive disadvantage?)
      iii. Opportunities? (Competitive advantage?)
   b. To what extent is climate change impacting on your organisational policies and planning? (Why?)
   c. Is climate change affecting your organisation's relationship with the sport clubs and/or governing bodies that use this stadium? (If yes, why?)

4.4 Who in your organisation responds to each issue?

4.5 What does climate change mean for the specific area(s) that you manage?

   a. Vulnerabilities?
   b. Risks? (Competitive disadvantage?)
   c. Opportunities? (Competitive advantage?)

4.6 Which climate change issues are likely to affect the organisation in the foreseeable future (either directly or indirectly)? Why?

5. ACTION (ORG. RESPONSES):

5.1 Does your organisation have specific strategies for responding to climate change? Why?

a. If yes, what are they?
b. If not, why not?

5.2 What is/are the purpose(s) of these strategies? Are they about:
   i. Mitigating your orgs. greenhouse emissions? (If yes, why is mitigation important?)
   ii. Adapting your organisation to climate change? (If yes, why is adaptation important?)

5.3 Were alternatives considered when developing these strategies? Why were they disregarded?

5.4 Who were the key people involved in deciding your organisation's climate strategies?

5.5 What specific strategies for responding to climate change has this organisation implemented?
   a. For each implemented climate strategy, tell me about the way it was played out ... tell me about the sequence of actions that took place.

5.6 How effective have your organisation's responses been to climate change? Why were they effective?
   a. Have any of your organisation's responses to climate change been ineffective?

5.7 Has your organisational structure changed in response to climate change? If yes, why?

5.8 Can you explain the key influences on your organisation's response(s) to climate change?
   a. Tell me about the influence of various internal influences:
      i. Board directors?
      ii. Shareholders (or members)?
      iii. Staff?
   b. Tell me about the influence of various external influences:
      i. Government(s) – policy and/or legislation?
      ii. Commercial partners?
      iii. Tenants/users, clubs, governing bodies?
      iv. Competitors?
      v. Suppliers?
      vi. Non-Government Organisations (NGOs)?
   c. Tell me about the influence of your organisation's key values. Have they influenced the way in which it has responded to climate change? If yes, how?
      i. Are your organisation's key values an advantage, or disadvantage, for responding to climate change?
      ii. If your organisation's key values are a disadvantage for responding to climate change, what about them needs to change?

5.9 What have been some of the barriers to acting on this issue? (internal or external)
   a. Were these barriers overcome?
   b. If so, why were these barriers overcome?

5.10 What are the costs of your organisation's response(s) to climate change?

5.11 What are the benefits of your organisation's response(s) to climate change?

5.12 For the foreseeable future, how might your organisation's responses to climate change be different?
   a. Why?

6 INTERVIEW ENDING:

6.1 Is there anything we haven't discussed you but that you would like to say on the topic?

6.2 Are there any important documents (publically available or otherwise) that you would recommend I read?

6.3 Are there any other people that you suggest I speak to about this research?

Thank you for your time – do you have any immediate comments or feedback on the interview?

D) GUIDE FOR THE CASE STUDY REPORT:

Describe the site & organisation:

- Name

Format for data:

- Interview transcripts

Other documents?

-

Bibliographic information:

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