BRIGHT IDEAS: LOCAL GOVERNMENT ACTION AND BARRIERS TO CLIMATE CHANGE RESPONSES
Climate change is real. Australia has the highest per capita level of greenhouse gas emission in the developed world. Responsibility needs to be taken by governments and individuals to reduce our carbon footprint combined with adaptation strategies that address the impacts of climate change. This thesis discusses how climate change can be addressed at a grassroots level. Whilst some critiques may be quick to dismiss councils as key players in the climate change arena, the considerable autonomy they possess allows them to exert influence over land development and energy efficiency.

Local governments have a responsibility to their constituents to address the impacts that climate change will have on the natural and built environments, as well as how to reduce their carbon footprints. This thesis explores the adaptation and mitigation responses of two councils, one in New South Wales and the other in Victoria, with an analysis of the barriers to climate change initiatives and stakeholder responsibility. The case studies are developed in the context of current national policy directions and state legislation. Recommendations are made to assist the feasible implementation of best practice climate change initiatives at the local level.
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INTRODUCTION
“Governance is no longer ordered or hierarchical. In response to global change, active agents in local communities seek partnerships and coordinated programmes of action through various levels of government form local to multinational. The fluidity of governance offers opportunities and threats to various social groups, depending on their access to resources and support, and on their collective capacity to identify and accommodate change” (O’Riordan and Church in Bulkeley, 2001, p. 29)

Research Agenda

Climate change is real. On a worldwide scale, climate variability has resulted in a number of effects which have implications for human settlements and natural environments. These include increases in temperature, changing rainfall patterns, sea level rise and increased frequency of extreme weather events. The IPCC Fourth Assessment Report (IPCC, 2007) states that global atmospheric concentrations of carbon dioxide have increased from a pre-industrial value of approximately 280ppm to 379ppm in 2005. This is far beyond the natural increase that is to be expected over this period, as derived from ice cores. The primary source of this carbon dioxide is fossil fuel use with land-use change making a smaller yet still significant contribution. Eleven of the last 12 years (1995-2006) are amongst the warmest 11 years in the record of global surface temperatures since 1850. Global average sea level rose at an average rate of 1.8mm per year from the period 1961 to 2003, with the fastest increase occurring between 1993 and 2003.

Widespread warming of the atmosphere and ocean, coupled with ice mass loss, support the conclusion that it is extremely unlikely that these variations in climate can be attributed to natural processes alone. If no action is taken, the above statistics are very likely to worsen. However, governments and the community can work together to provide a range of responses which address both the reduction of greenhouse gas emissions, and the adaptation to the impacts of climate change which have already begun to occur.

Whilst climate change is a global problem, it still needs to be addressed by local governments. Local governments are the closest to the people, and thus play a vital role in the education, mobilizing, and response rate of the public in the promotion of adaptation to climate change effects and mitigation policies. This thesis will explore initiatives which local governments can implement to address climate change, through an analysis of the common barriers and drivers of local action, stakeholder responsibility and practical examples. It is also important to recognise the policy role of federal and state governments, and the implications for councils throughout Australia.
The purpose of this thesis is to therefore answer the following problem statements:

- What are the main barriers to the effective development and implementation of climate change initiatives at the local government level?
- How can federal and state policy provide a clear direction and policy position for local government?
- What are some examples of ‘best practice’ initiatives that local governments can undertake to reduce their carbon footprint and better adapt to climate variability?

Research Context

This thesis does not aim to provide a scientific understanding of climate change, nor to investigate the evidence for and against the reality of climate change. Society has, by in large, accepted that climate change is real. Whilst there is still speculation surrounding the exact science, there is little doubt that human settlement and industrialisation has resulted in climate variability, caused by increased emissions of greenhouse gasses in the atmosphere. How to reduce future emissions, and ways to adapt to changes which are likely to occur as a result of present climate variability, is what is of interest.

Although some may debate the effectiveness of these strategies at a local level in the overall global picture, there are scholars who have presented the benefits of addressing climate change at a local level. Not only is the local setting seen as an important part of the climate change arena, local governments as institutions have a responsibility to their constituents to address climate change, which is seen as an important issue on the environmental agenda.

Climate change strategies need to be developed from two perspectives – those which allow human settlements to adapt to the effects which are taking place as a result of climatic change, and those which aim to mitigate, or reduce, greenhouse gas emissions that are being produced by all sectors of human activity. Wilson (2006) notes that, because of delays in the policy system, even if effective programs are implemented at present, there are likely to be unavoidable changes up to the middle of this century. Local governments need to manage the impacts of climate change, which include damage to local infrastructure, coastal settlements subject to sea level rise, bushfire impacts on human settlements and loss of local biodiversity values.
The federal government has clearly indicated that, whilst climate change responses need to be developed and integrated at a legislative and strategic level, Australia must not forsake its competitive advantage for global emissions reductions which, in the global picture, are insignificant. (Commonwealth of Australia, 2007). State and local governments have begun to operate independently of federal policy direction, with the establishment of state action plans on climate change, and an identification of the need to integrate local government as a key player in responses to climate change.

Whilst the federal and state climate change policies are an important driver of local government action, this thesis presents a focus on how climate change can be addressed at the grass roots level. Whilst some critiques, such as Marvin and Guy (1997), may be quick to dismiss local government as a key player in the climate change arena, the considerable authority which they have over land-use planning, zoning regulation and building permits enables them to exert considerable influence over land development and energy efficiency. Further, local governments have a responsibility to their constituents to address the impacts that climate change will have on the natural and built environments, as well as evaluating their own emissions as a local contributor to the carbon footprint.

Research Aims and Objectives

In view of the above, this thesis aims to investigate ways that local governments can effectively contribute to climate change action, both on a local scale, and cooperatively, on a global scale. However, local government actions cannot be analysed in isolation. Initiatives are tempered by policy direction at a state, federal and international scale. The current policy situation, and the implications for local actions, will be brought to the forefront in the following chapters. Further, a number of important theoretical constructs which will form the basis of further primary research, such as environmentally responsible behaviour, stakeholder responsibility, and barriers to local action will be discussed.

Adaptation and mitigation responses of two local government areas (LGAs) in New South Wales and Victoria form the central core of this thesis. These case studies will be developed in the context of state legislation, and Australia’s overall policy direction at present. However, the main analysis will involve a deconstruction of the climate change initiatives which have been implemented at each council, the barriers to these climate change responses, and the degree of success to which a culture shift has occurred within
to each organisation. To support these case studies, empirical data obtained from a nationwide survey of local councils in Australia will be used to present (1) current trends in local council policy on climate change, (2) how climate change is being integrated into existing approvals and policy systems, and (3) levels of stakeholder awareness and concern. Finally, recommendations will be provided to assist the implementation of initiatives - best practice approaches that are responsive to the needs of the organisation and the community at wide.

The objectives for this thesis are therefore as follows:

- To analyse the current trends in local council policy on climate change, how climate change is being integrated into existing approvals and policy systems, and levels of stakeholder awareness and concern.

- To provide a contextual analysis of federal and state climate change policy within Australia, and to understand the degree this is driving climate change action at a local scale.

- To investigate the main barriers which exist to the diffusion of climate change initiatives at local councils.

- To develop, using case studies, practical examples of how adaptation and mitigation responses can be effectively implemented at the local level.

- To provide recommendations for the effective implementation of climate change initiatives at the local level and determine its overall contribution to Australia’s climate change action.
Chapter 1 - Introduction

Chapter 1 introduces the research agenda and objectives, outlines the research context and gives an overview of thesis structure.

Chapter 2 provides the theoretical framework which forms the basis of this thesis. Special attention will be paid to the role of the organisation and the individual in climate change, policy directives and governance structures.

Chapter 3 establishes the research method and its design, provides a rationale for the case study selection and provides explanatory notes for the nationwide survey.

Chapter 4 provides a contextual background to the international, federal and state policy context, and its implications for local councils, with a particular focus on NSW and Victoria.

Chapter 5 outlines the results of a nationwide survey on local government and climate change. A focus is presented on the predictors of council interest on climate change, environmental issues facing local government, environmental action and government responsibility.

Chapter 6 draws upon the previous nationwide trends to provide real-life examples of climate change within local government in NSW and Victoria. A focus is provided on the drivers and barriers to climate change.

Chapter 7 provides a summary of the research findings and establishes recommendations for the successful development and implementation of climate change initiatives for local government.

Figure 1-1. Thesis structure.
LITERATURE REVIEW

INTRODUCTION
LITERATURE REVIEW
METHODOLOGY
GOVERNMENT POLICY CONTEXT
AUSTRALIAN LOCAL GOVERNMENT CLIMATE CHANGE TRENDS
CLIMATE CHANGE DRIVERS AND BARRIERS
RECOMMENDATIONS & CONCLUSION
This chapter provides the theoretical framework for the constructs which form the basis of this thesis. Each subsequent chapter will draw upon the current concepts and theories in the scholarly literature, along with the use of case studies that will be analysed in the discussion chapter. This chapter has been structured in two sections. Part 1, entitled **Local Government Organisations and the Individual**, will provide theoretical concepts which have important implications for policy, including individual action, behavioural theories and climate change ‘framing’. Further, organisational theory and barriers to local government initiatives will be presented, with a focus on the diffusion of climate change within organisational structures.

Part 2 of this chapter, entitled **Governance Structures** introduces the important concept of multilevel governance and transnational networks. These concepts are creating new avenues for local government to become actors on national and global scales. A focus on the Cities for Climate Protection (CCP) program has been presented, as it is becoming one of the main mitigation drivers for local governments.

**Part 1 – Local Government Organisations and the Individual**

**Environmentally Responsible Behaviour**

Attitude-behaviour models have been used in recent years to subscribe to the social and constructed nature of environmental values and how these have been integrated within policy debates and environmental initiatives. Research, according to Blake (1999), suggests that the relationship between attitudes and behaviour is moderated by two variables - the structure of personal attitudes, and external or situational constraints. Attitudes are likely to be better predictors of behaviour if relative to one another, coined by Eagley and Kulesa (1997) as being developed on an intra-attitudinal or intra-attitudinal basis. A study by O’Connor, Bord and Fisher (1999) on a willingness to address climate change found that a willingness to act is predicted by knowing causes and implications.

However, their study looked at the ways in which risks are conceptualised, as opposed to the consequences of those perceptions for actual behaviour. As explained by Azjen (1991), these individuals must also bear an intention to carry out a specific action, and have made a reasoned evaluation of the likely consequences of that action.
Whilst the above approaches are useful in exploring the relationship between action, attitude and value, they fail to take into account structural and institutional factors, as explored by Blake (1999). Power to make significant difference at the global or even local scale is unevenly distributed, and is used to shift stakeholder responsibility where “… people do not see that acting on their own would make any difference; their actions would lack efficacy” (Blake, 1999, pp. 265)

Further, Eagley and Kulesa (1997) draw upon research that shows that it is difficult to change attitudes when they are strong, that is, embedded in a knowledge structure. Even when new information is presented, knowledgeable message recipients tend to process this information to fit within existing attitudes and values. Blake (1999) compels us to move beyond the information deficit model, which dictates that the main barrier between environmental concern and action is a lack of appropriate information. Complexities in the relationship between attitudes and actions need further exploration, with a focus on variables such as intent, responsibility, and structural/institutional factors.

The implications for climate change policy at the local level are therefore immense. A need is highlighted within current literature, to allow individuals to feel a sense of collective power. Climate change is often perceived as a ‘remote’ issue, where, for example, the link between driving to work and global climate fluctuations are perceived as remote (Dilling and Moser, 2007). Actions need to be directed towards attainable outcomes, and results need to be visible, such as reductions in localised climate variability. However, obtaining local data is often costly and beyond the reach of small local governments, as will be further outlined in later chapters.

One of the important derivatives of the theoretical link between attitudes and behaviour is a need for policymakers to provide opportunities for individuals to act, rather than just the provision of information and education. Whilst there may be an intention to act, other factors contribute to how an individual and collectively as an organisation, governments may act. Drivers need to be identified to allow policymakers to implement initiatives that are successfully adopted by individuals and the community.

**Stakeholder Responsibility**

Local government has a responsibility to its constituents to protect the environmental and social well-being of the community, and should therefore be responsible for addressing climate change at a level which impacts upon the local community.
Stakeholder participation and their political interaction are of vital importance to effective climate change policy. A study undertaken by Wilson (2006) on the integration of climate change policy with strategic planning at the local level in the United Kingdom revealed that planning officers were familiar with the issue of climate change. However, those responsible for policy development and implementation lay with the council’s environmental or climate change policy officer, and not with development planning. Shackley and Wynne (1996) further emphasise that locating the onus of responsibility for ‘tackling’ the issue of climate change can be difficult, especially within the context of scientist and policymaker.

Marshall et al. (1999) argues that local government reforms of the 1990s provided elements which enhanced the self-governing status of local authorities. Their representative duties meant that there needed to be a greater openness and public involvement in decision making. Further, management principles now mean that:

“Councils must adopt corporate management frameworks and strategic planning practices, develop a client-focused organisation culture and specify performance measures” (Marshall, 1999, pp. 67).

**Local Government Barriers**

There exist a number of barriers to climate change initiatives for local government, as revealed by research undertaken by Wilson (2006). Despite local authorities participation in transnational and national networks in implementing climate change policy, barriers including a lack of professional, technical or political support, lack of power or other resources and the dominance of other conventional policy objectives were all encountered.

For any organisational change, there are internal and external factors which support change and elements which push against it. The integration of climate change policy requires a modification to not only council policy – such as building codes and planning structures, but a whole-of-council approach which involves changes to council practices. The mitigation of council’s own emissions involves the cooperation of all departments, from traffic to maintenance services. However, James et al. (in Dilling & Moser, 2007) notes than resistance can be healthy, forcing innovators to think carefully through a proposed change and to address legitimate concerns. The model below provides an
example of the change towards sustainability, and the factors required for the successful implementation of change.

![Wheel of change toward sustainability](image)

**Figure 2.1 - Wheel of change toward sustainability.**  
*Source: Doppelt, 2003, in Dilling and Moser, 2007)*.

The effects of climate change on local government areas will vary according to certain factors, including geography, the natural environment, socio-economic considerations and demographic characteristics. Whilst most councils feel confident in their ability to implement mitigation policies, some feel they are not adequately prepared to implement adaptation policies to combat the effects of climatic change on local systems. There also needs to be a focus on the impact of climate change upon council operations, the local community and the environment.

The most notable barriers to the implementation and development of policy include level of awareness and understanding of climate change by councillors and staff, access to resources (such as localised information) and finance, and confidence to incorporate climate change into land use planning and strategic plans (Municipal Association of Victoria, 2007). The most vital role of local government is leadership. Through setting an example via council’s own operations and developments, the local community is given
the opportunity to view how climate change can be incorporated into the design of the built environment and how simple behavioural change which can effectively contribute towards the mitigation and reduction of greenhouse gases at a local scale.

The following table presents a list of barriers to effective climate change policy, as identified in a study conducted by the Municipal Association of Victoria on local government and climate change using case studies in Victoria.

<table>
<thead>
<tr>
<th>Barrier 1</th>
<th>Lack of leadership and strategic policy development by the Federal Government</th>
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<tbody>
<tr>
<td>Barrier 2</td>
<td>Inadequacy of local government resources for funding of staff to implement greenhouse programs</td>
</tr>
<tr>
<td>Barrier 3</td>
<td>Lack of understanding of the localised impacts of climate change of specific local government areas</td>
</tr>
<tr>
<td>Barrier 4</td>
<td>Absence of incentives for private environmental initiatives</td>
</tr>
<tr>
<td>Barrier 5</td>
<td>Ineffective education programs / inadequate awareness and raising campaigns</td>
</tr>
</tbody>
</table>

Source: MAV, 2007

Wilson (2006) explains that for local government initiatives to be successful, links need to be established at the local, national and international level in order to

"provide information, the understanding and the shared experience to both professional and politicians at the local level to push the issue within their authority" (Wilson, 2006, p. 619).

For climate change policy to therefore be effective, there also needs to be a shift in the organisational culture of any authority, including local government. Strengers (2004) defines environmental culture change as the process of influencing and changing ways of living in human society. However, this process is further exacerbated by organisational change, which involves a review of the basic values and principles of an institution. The development and implementation of climate change initiatives hence needs to be
instigated on two levels – environmental culture change within the wider community and organisational change at a local government level.

The ‘Framing’ of Climate Change

References made to ‘framing’ climate change suggest that it is not just a scientific issue, but one which is socially constructed and translated through various channels, such as the media, policy arenas and local communities, each with their own agendas. According to Lindseth (2004), framing means that some aspects of a perceived reality are selected and made more salient so as to promote specific facets of a particular problem, casual interpretation, moral evaluation and/or recommended treatment of an issue. We see climate change framed in numerous forms, whether it be to highlight its environmental or economic importance, its need for action or for its use as a political tool. In this context, framing is essential as it provides an explanation for why climate change is important and showing how cities can work with the issue. It therefore defines the boundaries of the discourse and categorises relevant stakeholders based upon established social classifications (Lindseth, 2004, p. 327). It also creates a forum within the community to discuss issues relating to the concept, and provides a social construction from which policy can be related and legitimised.

Shackley and Deanwood (2002) draw upon a systems frames of reference for climate change policy which dictate that the uptake of climate change agenda will depend on how well the issue slots into an existing set of institutions and processes in place to manage resources and associated programmes. This policy framework allows for climate change initiatives to be adopted at a much faster rate by the community, as procedures which are already value-driven are in place. Blake (1999) also makes the point that unless policies tackle individual, social and institutional barriers, their effectiveness in existing contexts are largely diminished.

Policy Implications

Scientific uncertainty is a problem for environmental policy. Shackley and Wynne (1996) attribute policy conflict or lack of authority and political commitment in science-led domains, to scientific uncertainty. The relationship between scientific agreement and evidence is best relayed in the diagram below (Figure 6-2). This is particularly prevalent when investigating climate change. Whilst uncertainty surrounds the establishment of
direct links between current climatic events and human activity, recent trends in climate variables such as temperature and precipitation have evolved into a consensus that something needs to be done. However, in a highly contested and politicized environment, what should be done, and by whom, remains questionable (Bulkeley and Betsill, 2003).

The uncertainty of climate change equates to its inability to forecast long-term impacts. Keeney and McDaniels (2001) have derived a policy framework for climate change that is based on a list of concerns from which objectives can be formulated, as opposed to utility models that concern scientific datum. This ‘learning by doing’ approach, based on the need to develop future costs and new technologies, however, does not present a strong basis for policy outcomes. Planning is very much viewed as outcome-based, with concrete results that can be reviewed and placed back into policy goals in a cyclic fashion. In order for local communities to become active about climate change, it is imperative they are able to see the outcomes of policy decisions made, in real-world benefits.
Part 2 – Governance Structures

Multilevel Governance

Environmental governance has evolved from the development of international regimes which peaked in 1992 with the Rio Earth Summit. Since then, rather than a shift back towards nation states, we see a move toward supra-national units, such as the EU, with nation states, inter and non-governmental organisations as well as sub-national governments. Increasingly we are also seeing the division between public and private sectors blur as the community demands responsibility be accepted from both sides. Traditional ways of viewing governments as top-down are seen as outdated by academics where, according to Eckerberg and Joas (2004), we are witnessing a shift in the institutional position of the nation state. Sue Goss (2001, p. 1) as quoted by Eckerberg and Joas (2004), states that ‘the change from traditional local government to a more complex network of agencies involving ‘local governance’ is no longer a theory. It has become practice” (2004, p. 406).

In the social science realm, the basis of the term ‘governance’ has been in the erosion of traditional bases of political power. This process has occurred due to the deregulation of financial markets, changes in the interaction between political actors and the strengthening of local and regional stakeholders. Power is moving upwards to transnational levels of government and down to local authorities, in a coordinated manner. However, what remains imperative, is the ability of federal governments to retain a leading role and, to some degree, steer development. This means that whilst local governments are gaining power, both within a national setting and international context, they are influenced by a greater number of stakeholders (Eckerberg and Joas, 2004). The importance of federal and state leadership is to be explored in further chapters of this thesis.

Difficulty subsequently begins to emerge with locating the onus of responsibility, both at a government and institutional level. As stated by Wilson (2006), formal links between climate change strategies and planning departments within local governments were not strong. As such, changes in organisational structure to facilitate such networks can be difficult. Further, as stated by Bulkeley and Bestill (2003), traditional distinctions between state and non-state, local, national and global, are distorted by the challenges of climate change. We are seeing a nexus develop between federal and local governments with direct government funding that by-passes traditional state bureaucratic functions and
gives renewed autonomy to local governments. Whilst legitimisation of climate change may lie with the state, sources of risk can be identified and mitigated locally. Partnerships with non-government organisations, private enterprise and other government bodies allow local governments to branch out from traditional state delegated functions and investigate new initiatives to tackle global problems from a local perspective.

Transnational Networks (Cities for Climate Protection Program)

The International Council for Local Government Initiatives (ICLEI) was established in 1990 to build a support movement for local governments to achieve sustainable improvements through the cumulative impact of local actions (Bulkeley & Betsill, 2003). Their involvement in climate change dates back to 1991, with the Urban CO2 Reduction Project, founded by the US EPA, the City of Toronto and several private foundations. From this success, the CCP program was launched in 1993 and today has 687 participants in 31 countries worldwide (ICLEI, 2007).

The ICLEI have identified a number of goals, which are outlined by Bulkeley and Bestill (2003), including recruiting local governments, enhancement of local government capacity to mitigate climate change, and a specific emphasis on the creation and exchange of technical information, through best-practice, workshop and case studies (see Table 2-2 below). This focus on capacity building and information sharing is firmly grounded in the theories of ‘new localism’. Marvin and Guy (1997) explain that in this model of urban sustainability, desired goals can be achieved through the monitoring of resource flows and the implementation of behavioral changes to reduce resource consumption.

Table 2-2. Goals of the Cities for Climate Protection Program.

<table>
<thead>
<tr>
<th>Goals of the CCP</th>
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<tbody>
<tr>
<td>Strengthening local communities reduce urban emissions of greenhouse gases</td>
</tr>
<tr>
<td>Disseminating planning and management tools to reduce urban emissions of</td>
</tr>
<tr>
<td>greenhouse gases</td>
</tr>
<tr>
<td>Research and development of best practices, and development of model</td>
</tr>
<tr>
<td>municipalities that lead by example</td>
</tr>
<tr>
<td>Enhancing national and international ties so that municipal-level actions are</td>
</tr>
<tr>
<td>included in national action plans, and international deliberations.</td>
</tr>
</tbody>
</table>

SOURCE: ICLEI, 1993b in Lindseth, 2004
Members must pass through ‘milestones’ which track their progress, from a formal declaration of their intention to address climate change, to the development of a local action plan and emissions target. The milestones are a methodology that provide local councils with an understanding of how municipal decisions affect energy use, and how, through a reduction in energy use, global climate change can be mitigated whilst improving municipalities financially and environmentally (Lindseth, 2004, p. 326).

The enhancement of local accountability for greenhouse gas emission reductions through the quantification of initiatives by local authorities is an important goal of the CCP program. Through the establishment of targets, “the process of quantifying emissions savings is seen as an important component of creating an on-going management structure for climate protection” (Bulkeley & Betsill, 2003, pp. 53).

Emissions targets provide a perspective on the linkage between global issues like climate change and local issues such as energy conservation, land use planning and air quality. The fourth objective of the CCP program is to represent local departments within national, international and regional policy arenas. This creates a showcase of the achievements of local authorities and provides a basis from which to lobby for support from national governments for local climate protection.

**Conclusion**

Difficulty begins to emerge with locating the onus of responsibility, both at a government and institutional level. We are seeing a nexus develop between federal and local governments with direct government funding which by-passes traditional state bureaucratic functions and gives renewed autonomy to local governments. Whilst legitimisation of climate change may lie with the state, sources of risk can be identified and mitigated locally. Partnerships with non-government organisations, private enterprise and other government bodies allow local government to branch out from traditional state delegated functions and investigate new initiatives to tackle global problems from a local perspective.
From the literature, then, it is clear that rather than being a technical issue requiring the need for more information or better practice, climate protection locally is a political issue, where different actors and groups seek to have their understandings of the problem, and its solutions, acted upon. Drivers and barriers of climate change will be analysed in the following chapters. It is essential to discuss the policy directive of state and federal governments. This can be used as a precursor to discuss the role of local government as a delivery mechanism and how this role is challenged by a lack of direction from higher levels of government.
METHODOLOGY
The previous chapter provided this thesis with a conceptual foundation upon which further study and analysis can be undertaken. In order to build on this foundation and provide new information and research from which conclusions and recommendations can be drawn, it was considered necessary for primary research and empirical research from existing data to be undertaken. The empirical data which was obtained from a secondary source provides national trends on local government and climate change action. The primary research will be used to highlight case study examples that showcase climate change initiatives which have been implemented at the local level, and types of drivers and barriers to this implementation.

This thesis uses both in-depth interviews and findings from a nationwide survey to provide recommendations for local government climate change initiatives. The results of this research, along with the concepts outlined in the literature review, will be used to establish recommendations for the effective implementation of climate change policy at the local level. Secondary literature research was derived from scholarly journals, books, newspaper articles and government documents.

The purpose of this chapter is to establish the research method and its design. This involves providing a rationale developed for the selection of case studies and the provision of explanatory notes outlining the methodology that was adopted to collate the quantitative data. Further, this chapter seeks to explore the ethical and political considerations that have been taken into account as a part of this research process. The borders and limitations of this thesis will also be discussed.

Case Study Selection Process

Case studies were chosen as a method of presenting in-depth analysis of climate change within a local government area. They provide the opportunity to analyse drivers and barriers to implementation and discuss factors such as demographics, organisational structure, skills base and managerial/Councillor support within a real life context. Whilst trends were established using the empirical data, the case studies provided an avenue to discuss those trends and showcase responses from local government.

Given the limitations of this thesis, it was considered appropriate to investigate two case studies. The local government areas selected were Penrith City Council and City of Casey Council. These case studies were selected from two different states on the eastern seaboard of Australia – New South Wales and Victoria. This was undertaken to
allow a point of comparison and establish how differing state contexts play a role in the leadership and establishment of climate change action at a local level. Further, these two councils are located on the periphery of the metropolitan regions in the capital cities of Sydney and Melbourne. This provided similar geographical make-up in terms of their distances from their respective central business districts. Further, whilst these two local government areas are urban in nature, they also contain some rural land, which is important when considering climate change. Also, these two case studies are in areas of residential growth, where opportunities still exist for the implementation of climate change on new human settlements, where energy efficiency in homes and travel patterns can be used to respond to climate change.

Secondary Empirical Data

The survey data discussed in this thesis come from 'A study of climate and local planning', a nationwide mail questionnaire survey carried out during August-October 2006. Questionnaires were addressed to the 'Chief Town Planner' in all of the 682 LGAs in Australia at that time. The 2006 project is the third in a series (1989, 2000, 2006) carried out under the direction of Associate Professor Robert Zehner, Planning and Urban Development Program, University of New South Wales. The surveys have been concerned with climate change, possible greenhouse effects, and policies implemented at local councils. Although addressed to the 'Chief Town Planner', in larger councils it is likely that filling in questionnaires was frequently delegated to another member of the planning staff. Three reminder letters were sent to each Council to prompt responses. In 2006 352 responses were ascertained from the 682 LGAs, a response rate of 52 per cent. Of these, 63 per cent arrived from rural or mostly rural councils (Zehner, 2007). Permission has been granted to use the data collected for the purpose of this thesis.

In-depth Interviews

Formal in-depth interviews were undertaken with three participants from NSW and four from Victoria, with a total of seven interviews conducted in total. A participant was selected from the respective department in each state government agency responsible for climate change, the collective local government organisation in each state and a officer from each of the two Council’s who are responsible, either wholly or in part, for the development of climate change initiatives at their organisation. A fourth participant was interviewed from Victoria, whom is responsible for the joint strategy on climate change
with neighboring councils (Western Port Greenhouse Alliance). The persons interviewed and their positions are outlined in the table below. The state government representative from NSW (Interviewee A) requested that they remain anonymous for the purposes of this thesis.

**Table 3-1. Interviewee Organisational and Employment Details.**

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Organisation</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jennifer Kane</td>
<td>Victorian Department of Environment and Sustainability (DSE)</td>
<td>Strategic Policy Officer in Climate Change Adaptation Unit</td>
</tr>
<tr>
<td>Luke Murphy</td>
<td>Municipal Association of Victoria (MAV)</td>
<td>Local Government NRM Facilitator</td>
</tr>
<tr>
<td>Greg Hunt</td>
<td>Western Port Greenhouse Alliance (WPGA)</td>
<td>Executive Officer</td>
</tr>
<tr>
<td>David Westlake</td>
<td>Environmental Projects Officer</td>
<td>City of Casey Council</td>
</tr>
<tr>
<td>Interviewee A*</td>
<td>NSW State Government</td>
<td>NSW State Government</td>
</tr>
<tr>
<td>Bridget Dwyer</td>
<td>Local Government and Shires Association (LGSA)</td>
<td>Climate Change Adaptation and Mitigation Project Officer</td>
</tr>
<tr>
<td>Paul Mulley</td>
<td>Penrith City Council</td>
<td>Senior Sustainability Planner</td>
</tr>
</tbody>
</table>

Source: Author

Initial contact with each participant was made by phone and email in August to introduce the objectives of this research, establish rapport and to ascertain whether there was any interest to contribution to this field of study. The interviews were subsequently conducted in person throughout August and September in 2007. Each interview was structured with the same content and design for comparative purposes with additional probing to maximise the benefits of the responses. A range of questions were developed which covered issues as outlined in the table below.

* Interviewee A requested to remain anonymous for the purpose of this thesis.
Research Limitations

The volume of material which has been included in the research design is limited by the scope of this thesis. More specifically, the number of case studies chosen has been constricted by the time and word limitations under which this thesis has been developed. There is further opportunity for a matrix of case studies to be developed, both within NSW and Victoria, and other states in Australia. Research has also been limited to local government studies undertaken in developed countries, mainly Europe and the US. There is scope for research to be undertaken in the less developed world, where aspects such as energy efficiency have a larger scope to be introduced at a time when energy consumption patterns and modern human settlements are being established.

Climate change is an issue which is currently developing both in the social conscience and the political world. It is ever-evolving and, despite the efforts of this thesis to frame climate change within a current framework, this is limited by the scope of the research. Given the recent establishments in policy both at a local, state and federal level, the policy and initiatives outlined in this report are recent until October of 2007. Due to the federal election, the climate change platform of the government may shift, providing further opportunity to realign the findings of this thesis with the current political climate.

Ethical and Political Considerations

Babbie (2004) notes that research projects are shaped by both ethical and political considerations. Whilst there are established protocols for conducting research, the maintenance of political and ethical behaviour can prove difficult in a climate where standards of conduct are challenged and redefined. To ensure that these concerns, such as voluntary participation, confidentiality, anonymity and objectivity were addressed, the following measures were:

- A formal letter outlining the project description and purpose was sent to each participant;
- A project information statement was sent to each participant, requesting their approval to take part in the research,
- An understanding was conveyed through a formal agreement that, for the purpose of this thesis, their name and position would be revealed, and
- Participants were provided with the option to withdraw from the research at any stage.
Ethics approval was obtained from the Human Research Ethics Advisory Panel of the Faculty of the Built Environment to select participants for the qualitative research process and conduct the in-depth interviews (See Appendix A). Details and methodology of the research were approved, and adhered to throughout the course of the project.
Chapter 4: Government Policy Context

The previous chapter provided an overview of the theoretical constructs and previous research that has been conducted on climate change and local government. The literature which has been drawn upon provides a solid foundation to the Victorian and NSW local government case studies which will be explored later in this thesis. More specifically, the exploration of climate change as local phenomena, its barriers to diffusion and the roles and responsibilities of stakeholders, including government, have been brought to the forefront.

It is important to recognise that local government initiatives cannot be analysed in isolation from the federal and state contexts from which they are derived. Local government initiatives are tempered by two main discourses within an Australian context – (1) the influence of policy and climate change direction at the state and federal levels, and (2) drivers and barriers to climate change within any given local government area (LGA). Whilst there are also internal and external forces which can either foster or constrain an individual’s actions, how federal and state legislation and policy is driving climate change responses at a local level needs to be discussed.

This chapter provides a brief outline of the current legislative and policy directives of climate change, with a focus on federal direction and its influence on NSW and Victorian climate change policy. The results of the in-depth interviews have been introduced to provide an introduction to the case studies and how state and federal policy directives, or lack thereof, have driven or hampered climate change responses. The international scale also needs to be discussed to provide a context to the global problem of climate change.

International Policy Context

Public and private sector responsibility for climate change is increasingly becoming framed in a manner that promotes the reduction of climate change footprints. A number of recent reports have resulted in climate change being broadcast at a global level for governments and the private sector. The Stern Review Report entitled Economic of Climate Change, being one of the most significant reports, has reduced uncertainty within the larger community, confirming that there is a scientific consensus that greenhouse gas levels in the atmosphere are indeed rising and are largely human induced (Lyster, 2007). More importantly the Stern report raises concern regarding the economic impacts of climate change, leaving little doubt that climate change will result in “the greatest and widest-ranging market failure ever seen” (Lyster, 2007, p.282). It clearly highlights the
cost of inaction greatly outweighs the cost of acting on climate change at present, and sets clear goals for governments and the private sector in regards to the establishment of emissions targets and the need for multilateral coordination towards a more sustainable future.

The Intergovernmental Panel on Climate Change (IPCC) have also released three reports as part of its Fourth Assessment Report that present scientific, social and economic evidence on climate change. The most relevant to this thesis is the report of Working Group III, which reports on the scientific, environmental, technological and social aspects of mitigating climate change. Whilst it has found that the largest emissions growth have come from the energy sector, the bottom-up and top-down approaches have found that there is also significant financial capacity to mitigate global greenhouse emissions locally (Lyster, 2007). Further, emissions growth can be offset by lifestyle and behavioural changes that “promote resource conservation [and] can contribute to the development of a low-carbon economy that is equitable and sustainable” (Lyster, 2007, p. 284).

Federal Mitigation Response

There is a clear indication from the Victorian state government, as revealed through the in-depth interview with Jennifer Kane, that there has been a policy vacuum provided at the federal level that has inspired state and local governments to fill this lack of strategic response. Despite recent efforts by the federal government to provide local governments with adaptation support, their overriding concern with the economic effects of large reductions in greenhouse gas emissions have tempered legislative reform. Whilst the revised 1997 National Greenhouse Strategy introduces measures which strengthen the attainability of reduction targets (Kyoto target), there is a divergence between the practicalities of current initiatives and its ability to meet set targets. Initiatives have been “largely shaped by the narrow economic interests of the fossil fuel and energy-intensive industries as opposed to the precepts on international climate change law” (McCrossin, 2007, p. 232). The resource-rich environment and resource dependent economy have subsequently limited the federal response to climate change. With energy generation continuing to be the highest source of emissions, any real mitigation response needs to address this source.

Existing federal climate change legislation and its limitations have been outlined in the following table. In the lead-up to the federal election, a growing concern for climate
change amongst the voting public has seen a “transformation in Commonwealth rhetoric from climate change skeptic to believer” (McCrossin, 2007, p. 232), with the establishment of the Prime Ministerial Task Group on emissions trading, the provision of a $75 million grant for a solar power plant in regional Victoria, and a number of projects under the Asia-Pacific Partnership on Clean Development and Climate. However, McCrossin (2007) argues that the influence of the energy lobby group, and the perception that economic health is key to the Commonwealth’s electoral success, will see climate change initiatives taking a back seat to the health of the economy.
Table 4-1. Federal climate change legislation.

<table>
<thead>
<tr>
<th>Legislation</th>
<th>Objective</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewable Energy (Electricity) Act 2000</td>
<td>Establishes a scheme whereby wholesale purchasers of electricity are required to source an amount from renewable generation facilities.</td>
<td>The failure of the federal government to extend the scheme beyond the mandatory renewable energy targets (MRET) that have been met, and refusal to guarantee the existence of the scheme beyond 2020, has meant that electricity wholesalers are reluctant to invest in renewable energy contracts and infrastructure.</td>
</tr>
<tr>
<td>Energy Grants (Cleaner Fuels) Scheme Act 2004</td>
<td>Utilises an incentive/ market-based system to encourage the use and manufacture of environmentally friendly fossil fuels.</td>
<td>Given its small scale, the scheme does not have the capacity to contribute significantly to achieving Australia’s emissions target.</td>
</tr>
<tr>
<td>Environment Protection and Biodiversity Conservation Act 1999</td>
<td>Draft amendments were proposed to provide a ‘greenhouse trigger’ into the federal environmental impact assessment legislation.</td>
<td>Has failed to introduce a climate change trigger in line with international climate change law.</td>
</tr>
<tr>
<td>Policy Initiatives</td>
<td>Number of policies based upon voluntarism and incentives, with few mandatory stipulations, such as Greenhouse Challenge Plus and Low Emissions Technology Demonstration Fund.</td>
<td>The form and character of these policies has been shaped by economic considerations. Generally no net benefits or costs, with the exception of limiting greenhouse emissions or conserving greenhouse gas sinks as ‘no regrets’ policies.</td>
</tr>
<tr>
<td>Contradictory Legislation and Policy</td>
<td>Commonwealth has introduced policies and initiatives which are inconsistent with the principles and objectives of international climate change instruments.</td>
<td>Examples include heavily subsidised coal-fired power generators, and violation of obligations under World Heritage Convention through inaction on the effects of climate change on the Great Barrier Reef.</td>
</tr>
</tbody>
</table>

Recently there has been an announcement that a domestic emissions trading scheme will be developed. The *National Greenhouse and Energy Reporting Action 2007* establishes the foundation for a domestic emissions trading scheme, and provides a mechanism for the reporting of abatement and offsets. It requires companies who exceed emissions or energy consumption thresholds to register and report their emissions, as seen in the diagram below. The regulations commence from the 1 July 2008 (please see Figure 4-1 below). Whilst it is too early to ascertain the relative possibilities of the introduction of the national trading scheme, Peel (2007) feels that this has been overshadowed by the federal governments decision that it will not ratify the Kyoto Protocol, despite agreeing to achieve the target set by Kyoto which limits 1990 level emissions to 108 percent between 2008 and 2012.

**Figure 4-1. The *National Greenhouse and Energy Reporting Action 2007* reporting timeline.**

Source: AGO, 2007b.

**Federal Adaptation Response**

The federal government has recently published a document entitled ‘Climate Change Adaptation and Actions for Local Government’ (AGO, 2007a). The guide on climate change adaptation actions outlines the potential impacts of climate change on local government
functions, and provides a tool kit of responses including information on their benefits and costs. Further, the Council of Australian Governments (COAG) announced, on 17 April 2007 that it would endorse a National Adaptation Framework as the basis for jurisdictional action on adaptation over the next five to seven years, including responses to vulnerable areas such as agriculture, biodiversity, fisheries, forestry, settlements and infrastructure, coastal, water resources, tourism and health. The federal government has also committed $26 million to establish the Australian Centre for Climate Change Adaptation and a further $100 million to fund its research. $44 million has also been granted to the CSIRO for an Adaptation Flagship, to develop responses to climate change (COAG, 2007a).

This National Adaptation Framework (COAG, 2007b) has identified local government as a key player in the climate change response. As such, an implementation plan is to be developed from the framework which outlines the differing roles and responsibilities of government. It has been established that local government should be directly responsible for education and planning to address localised impacts. It also established the need for the tool kit, which has been prepared by SMEC, as noted above (AGO, 2007a).

Whilst we are starting to see a response from the federal government in regards to climate change adaptation, there is an overwhelming indication from the in-depth interviews with the Victorian state government that there is a clear lack of policy direction and, more particularly, support when it comes to adaptation. Localised data are required to first ascertain what the likely impacts of climate change are prior to the implementation of policy to address those issues. However, it is beyond the scope of council to obtain this type of regional information due to financing and skill constraints. This will be elaborated further in Chapter 6, where lack of finance and skills resources have been identified as a main barrier to the effective implementation of climate change initiatives.

State Policy Context

Climate change legislation has begun to be introduced by the respective states, particularly from the energy sectors. Each state has developed their own respective policy documents on climate change that present both mitigation and adaptation policies to respond to the impacts of long-term climate change. These are generally strategic plans which outline the vision, directing principles and actions which are driving state government policy in sectors including the environment, energy, transport, rural industries, built environment and land
development and stakeholder involvement. Peel (2007) notes that, in the absence of commonwealth regulation and policy direction, many of the states and territories have introduced more far reaching initiatives, such as the establishment of schemes to facilitate the uptake of energy technologies or lower emitting energy resources, requirements for climate change to be considered in environmental assessment, and the provision of carbon rights separate from land.

The Victorian government has recently announced a $14.8 million adaptation initiative that improve the responsiveness of Victoria’s built and natural environment to cope with climate change impacts and increase understanding for individual communities. The initiative is part of the government’s environmental sustainability action statement *Our Environment, Our Future* (DSE, 2007a). Further, there are plans to introduce legislation that will provide a renewable energy target (ERT) to increase levels of renewable energy from 4 percent to 10 percent by 2016. Environment and Resource Efficiency Plans are also to be introduced for the state’s 250 largest energy and water users. Support for sustainable energy projects has also been provided for the housing, retail and commercial projects. A Biodiversity White Paper has been prepared which takes a comprehensive approach to sustaining biodiversity across Victoria. Climate change has been addressed by this report (DSE, 2007b). Whilst the Victorian government has numerous initiatives and projects, with an emphasis on adaptation which is lacking by the NSW government, their legislative response to climate change is yet to be brought to the forefront.

In New South Wales, however, legislation has been a strong part of their climate change response. The Greenhouse Gas Abatement Scheme (GGAS) was established in 2003 under part 8A of the *Electricity Supply Act 1995*. The Act established a ‘baseline and credit’ trading scheme which requires participants to achieve a benchmark of 7.27 tonnes of greenhouse gas emission per head of state population by 2007. This remains a benchmark until 2012. Participants include large electricity users, electricity retailers and projects of State Significance. In addition, legislation exits in NSW which recognises carbon sequestration (absorption and storage) by forests and allows the ownership, sale and management of those carbon rights (NSW Greenhouse Office, 2005). Further, the *Electricity Supply (General) Regulation 2001* requires energy retailers to offer a 10 per cent green power component to new or moving electricity customers.

The three main objectives of the NSW state plan are to raise awareness, set NSW on an emissions reduction target and begin the adaptation project. The interviewee* from the
NSW state government has commented that the first two objectives have been achieved, with projects in the pipeline for adaptation. Whilst the Victorian government has not been as strong on regulation as NSW, their state plan contains a section on working with local governments to implement policies on climate change. There is thus a recognition that implementation of regional climate change initiatives need to take place at the local as well as at the state and federal level. There has been recognition from the Victorian state government from the in-depth interview that local councils should be used as a delivery mechanism for policy set by higher levels of government. The support which has been provided from the Victorian government for climate change initiatives, particularly for adaptation, has allowed councils in Victoria to show case successful initiatives in this field. Luke Murphy, from the Municipal Association of Victoria notes:

“In terms of climate change I think that has initially driven by the state. So the state government established the greenhouse alliances which the main proportion of membership is local government.”

Both these state plans also present a focus on the efficiency of buildings and the development of appropriate systems for rating the sustainability of residential and commercial buildings (DSE, 2007c). The integration of climate change initiatives within planning policy and building standards to facilitate energy efficiency have been identified within state strategic policies. In NSW, the Building Sustainability Index (BASIX) has provided a reduction in greenhouse gas emission reduction of 25 per cent, with an increased reduction of 60 per cent in 2006, compared to the average residential home in NSW. The Australian Building Greenhouse Rating Scheme has been introduced as a NSW-led initiative, which allows the benchmarking and improvement of greenhouse performance on a national scale. 29 per cent of NSW commercial buildings had been rated by 2005 (NSW Greenhouse Office, 2005).

The interviewee from the NSW state government has clearly stated that climate change is not an environmental issue, but has to be considered in terms of the economy. They noted that governments and administrations need to deal with climate change in terms of economic restructuring, using emission reduction targets and the like to provide certainty for investors. This is in line with the federal government overriding concern with the economic ramifications of climate change policy, which has limited policy direction at a national level. This has

* Interviewee A requested to remain anonymous for the purpose of this thesis.
limited the potential of NSW local governments to respond to climate change, as the level of support – both financially and in terms of resourcing has not been as great as its Victorian counterpart. Whilst the Department of Environment and Climate Change (DECC) have funded projects such as the LGSA toolkit on climate change, programs such as the greenhouse alliances that have been funded by the Victorian Department of Sustainability and Environment do not exist in NSW. The importance of these regional partnerships is analysed in the following chapters, particularly for adaptation projects.

Conclusion

The above analysis provides a context for the actions of local governments in NSW and Victoria. Whilst there are strengths and weaknesses to the strategic responses from both states, there has been a predominant legislative response from NSW. However, the Victorian response has generally been more supportive of local governments, particularly for adaptation strategies. The in-depth interviews revealed a clear response from the Victorian government which recognises the role of local government, and their importance as a delivery mechanism for strategic policy set by higher levels of government. Both states establish the need for clearer guidance from the federal government, which is essential for the establishment of a consistent approach to climate change. The following chapters will draw upon this contextual setting to investigate two local government case studies in NSW and Victoria. To support the analysis provided for these case studies, it was considered necessary to establish trends in local government policy on climate change. These trends, provided in the following chapter, will be used to support the case study analysis, and provide a national picture on local climate change actions.
AUSTRALIAN LOCAL GOVERNMENT CLIMATE CHANGE TRENDS

INTRODUCTION
LITERATURE REVIEW
METHODOLOGY
GOVERNMENT POLICY CONTEXT
AUSTRALIAN LOCAL GOVERNMENT CLIMATE CHANGE TRENDS
CLIMATE CHANGE DRIVERS AND BARRIERS
RECOMMENDATIONS & CONCLUSION
The previous chapter provided a policy framework for the analysis of the two local government case studies from NSW and Victoria. However, it was also seen as imperative to create a national picture of local government action of climate change, and derive trends which outline factors influencing the development of initiatives at the local level. This chapter summarises the results of a nationwide study and evaluation of climate change and local government in Australia.

The data collected can be used to determine the level of concern for climate change within local government departments and communities, nationwide. The grass roots survey provides this thesis with a developed understanding of the national climate change picture and local government. The framing of climate change as an environmental issue, with growing cause for concern amongst stakeholders in the local community is best relayed in this chapter. Further, the uptake of policy and climate change initiatives can be attributed to a number of factors, including the geography of the region, local support from residents, Councillors and the community, the ‘real threat’ of climate change, and council organisational attributes.

This chapter presents the perspective of the ‘Chief Town Planner’ in each local government area (LGA) and how the local response has been framed through policy and stakeholder participation at local councils across Australia. What factors, such as the size of the council, previous implementation of environmental policy, its geography and climate, predominant land uses and stakeholder concern, affect the overall interest in climate change initiatives?

To what degree does the local response vary across Australia, and what factors can we attribute to this variance? This analysis will provide a framework of analysis for the NSW and Victorian local government case studies, and trends which will support state variance. Practical examples of initiatives will also be explored in later chapters of thesis, with a specific focus on not only the drivers, or predictors, of interest in climate change initiatives, but also the barriers to climate change responses.

Environmental Issues Facing Local Government

Planners were asked to indicate which environmental issues were considered as ‘important’ in their local government area. The results which can be derived from this are two-fold - an indication of which issues are affecting local government areas according to ‘state’ and the implications for the direction of environmental policy dependent upon (a) the issues noted...
and (b) the severity of those issues. As seen in the table below (Table 5-1) air quality was considered important in NSW (40.9 per cent), whereas LGAs in other states did not consider it to be an important issue. Surprisingly, coastal erosion did not rank as highly as other issues. Only a high number of LGAs in Tasmania considered it to be an issue, with 61.9 per cent. However, this is to be expected as not all LGAs contain within them portions of coastal land. Drought was considered to be an important issue across most states, with responses from NSW (77.3 per cent), Victoria (67.7 per cent) and Queensland (72.7 per cent) all ranking highly. Drainage and water runoff and storm water re-use were noted as issues in most states, which has important implications for the protection of council assets and infrastructure from climate change which will be explored further in the following chapter.

Flooding was an issue for a number of respondents from NSW (61.4 per cent), Victoria (54.8 per cent) and South Australia (60.6 per cent). Habitat preservation was an issue for a vast majority of councils in Victoria (74.2 per cent) and Tasmania (66.7 per cent). Despite legislation in NSW for carbon rights – law which recognises carbon sequestration (absorption and storage) by forests and allows the ownership, sale and management of those carbon rights (NSW Greenhouse Office, 2005), responses which indicated land clearing and deforestation as important were not as high as in other states. NSW ranked fifth (38.6 per cent), with Tasmania (71.4 per cent) and Victoria (45.2 per cent) showing the most concern. Water quality and supply was an issue across all states, particularly water quality in NSW (67.0 per cent) and water supply in Queensland (74.5 per cent).
Table 5-1. Summary of environmental issues selected as 'Important' (percentage of respondents whom 'ticked' environmental issues)

<table>
<thead>
<tr>
<th>Environmental Issues</th>
<th>NSW</th>
<th>VIC</th>
<th>QLD</th>
<th>WA</th>
<th>SA</th>
<th>TAS</th>
<th>NT</th>
<th>Total % within issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water supply</td>
<td>60.2</td>
<td>71.0</td>
<td>74.5</td>
<td>53.1</td>
<td>72.7</td>
<td>47.6</td>
<td>40.0</td>
<td>61.9</td>
</tr>
<tr>
<td>Drainage &amp; water runoff</td>
<td>64.8</td>
<td>51.6</td>
<td>52.7</td>
<td>59.4</td>
<td>78.8</td>
<td>66.7</td>
<td>40.0</td>
<td>60.6</td>
</tr>
<tr>
<td>Water quality</td>
<td>67.0</td>
<td>58.1</td>
<td>65.5</td>
<td>50.0</td>
<td>60.6</td>
<td>52.4</td>
<td>53.3</td>
<td>59.9</td>
</tr>
<tr>
<td>Tropical storms and cyclones</td>
<td>4.5</td>
<td>3.2</td>
<td>38.2</td>
<td>12.5</td>
<td>0.0</td>
<td>0.0</td>
<td>53.3</td>
<td>13.7</td>
</tr>
<tr>
<td>Drought</td>
<td>77.3</td>
<td>67.7</td>
<td>72.7</td>
<td>42.2</td>
<td>33.3</td>
<td>19.0</td>
<td>6.7</td>
<td>56.0</td>
</tr>
<tr>
<td>Flooding</td>
<td>61.4</td>
<td>54.8</td>
<td>52.7</td>
<td>32.8</td>
<td>60.6</td>
<td>38.1</td>
<td>53.3</td>
<td>51.1</td>
</tr>
<tr>
<td>Habitat preservation</td>
<td>59.1</td>
<td>74.2</td>
<td>45.5</td>
<td>40.6</td>
<td>51.5</td>
<td>66.7</td>
<td>13.3</td>
<td>51.8</td>
</tr>
<tr>
<td>Water reuse</td>
<td>46.6</td>
<td>64.5</td>
<td>60.0</td>
<td>45.3</td>
<td>63.6</td>
<td>14.3</td>
<td>6.7</td>
<td>48.2</td>
</tr>
<tr>
<td>Stormwater reuse</td>
<td>54.5</td>
<td>54.8</td>
<td>27.3</td>
<td>39.1</td>
<td>69.7</td>
<td>23.8</td>
<td>20.0</td>
<td>44.3</td>
</tr>
<tr>
<td>Soil erosion</td>
<td>56.8</td>
<td>45.2</td>
<td>47.3</td>
<td>32.8</td>
<td>24.4</td>
<td>33.3</td>
<td>40.0</td>
<td>43.0</td>
</tr>
<tr>
<td>Land clearing/deforestation</td>
<td>38.6</td>
<td>45.2</td>
<td>43.6</td>
<td>40.6</td>
<td>21.2</td>
<td>71.4</td>
<td>6.7</td>
<td>39.4</td>
</tr>
<tr>
<td>Soil salinisation</td>
<td>37.5</td>
<td>51.6</td>
<td>30.9</td>
<td>50.0</td>
<td>33.3</td>
<td>28.6</td>
<td>0.0</td>
<td>37.5</td>
</tr>
<tr>
<td>Air quality</td>
<td>40.9</td>
<td>19.4</td>
<td>25.5</td>
<td>26.6</td>
<td>39.4</td>
<td>28.6</td>
<td>13.3</td>
<td>30.6</td>
</tr>
<tr>
<td>Coastal erosion</td>
<td>17.0</td>
<td>22.6</td>
<td>38.2</td>
<td>29.7</td>
<td>39.4</td>
<td>61.9</td>
<td>26.7</td>
<td>30.0</td>
</tr>
<tr>
<td>Sedimentation of lakes/waterways</td>
<td>44.3</td>
<td>22.8</td>
<td>27.3</td>
<td>26.6</td>
<td>21.2</td>
<td>23.8</td>
<td>0.0</td>
<td>29.3</td>
</tr>
<tr>
<td>Rising water table</td>
<td>20.5</td>
<td>22.6</td>
<td>12.7</td>
<td>34.4</td>
<td>27.3</td>
<td>33.3</td>
<td>6.7</td>
<td>23.1</td>
</tr>
<tr>
<td>Falling water table</td>
<td>13.6</td>
<td>19.4</td>
<td>18.2</td>
<td>15.6</td>
<td>18.2</td>
<td>9.5</td>
<td>13.3</td>
<td>15.6</td>
</tr>
<tr>
<td>Other</td>
<td>12.5</td>
<td>12.9</td>
<td>12.7</td>
<td>10.9</td>
<td>3.0</td>
<td>9.5</td>
<td>0.0</td>
<td>10.4</td>
</tr>
<tr>
<td>Desertification</td>
<td>2.3</td>
<td>0.0</td>
<td>3.6</td>
<td>0.0</td>
<td>9.1</td>
<td>0.0</td>
<td>0.0</td>
<td>2.3</td>
</tr>
<tr>
<td>No. of cases (n)</td>
<td>686</td>
<td>236</td>
<td>411</td>
<td>411</td>
<td>240</td>
<td>142</td>
<td>59</td>
<td>2176</td>
</tr>
</tbody>
</table>

1. Independent - state
2. Dependent - Q2 Are any of the following important issues in your local government area?
Predictors of Council Interest in Climate Change

Data presented in this section provide an overall measure of interest in climate change initiatives, stakeholder concern with climate change and state variability. Given these characteristics, it is possible to determine statistically which factors were most related to a council’s interest in climate change initiatives. The previous section evaluated the issues which were prevalent in a local government area. Their implications for adaptation responses will be explored in later chapters. It is important to recognise climate change as a separate environment issue that needs to be analysed independently of the above. Whilst climate change may affect existing environment issues, concern for climate variability is an issue in its own right, and as such is discussed below.

Stakeholder Responses to Climate Change

Table 5-2. Correlation coefficients of stakeholder concern and interest in climate change

<table>
<thead>
<tr>
<th></th>
<th>Council interest in climate change</th>
<th>% of residents very concerned</th>
<th>% of councillors very concerned</th>
<th>% of planners very concerned</th>
<th>% of local business very concerned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Council interest in</td>
<td>1</td>
<td>.202**</td>
<td>.302**</td>
<td>.225**</td>
<td>.118*</td>
</tr>
<tr>
<td>climate change n=</td>
<td>323</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.041</td>
</tr>
<tr>
<td>% of residents very</td>
<td>202**</td>
<td>.814**</td>
<td>.527**</td>
<td>.824**</td>
<td></td>
</tr>
<tr>
<td>concerned n=</td>
<td>305</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>% of councillors very</td>
<td>.302**</td>
<td></td>
<td>.616**</td>
<td>.784**</td>
<td></td>
</tr>
<tr>
<td>concerned n=</td>
<td>303</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>% of planners very</td>
<td>.225**</td>
<td>.527**</td>
<td>.000</td>
<td>.1</td>
<td></td>
</tr>
<tr>
<td>concerned n=</td>
<td>299</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.595**</td>
</tr>
<tr>
<td>% of local business</td>
<td>.118*</td>
<td>.824**</td>
<td>.784**</td>
<td>.595**</td>
<td></td>
</tr>
<tr>
<td>very concerned n=</td>
<td>302</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.303</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

---

Table 5-2: Correlation coefficients of stakeholder concern and interest in climate change

Q13 What propositions of the following groups of people would you say are very concerned about long term changes in climate? (a) Residents, (b) Councillors, (c) Planners, (d) Local Businesses
Q10 Has there been any interest within your council about the possible long term changes in climate on planning in your LGA?
Stakeholder responsibility was outlined as a key issue for local government action on climate change in the literature review. Stakeholder participation and their political interaction are of vital importance to climate change policy, where different actors seek to have their sources of authority legitimised. Further, local governments have a responsibility to address the concerns of their constituents, such as residents and local businesses. However, as seen by Wilson’s (2006), climate change can also be driven internally, from staff members, managers and elected representatives. The organisational structure of councils allow for a number of power struggles to operate internally, between staff and management, elected representatives and different departments. It is thus of interest to ascertain the effect of stakeholder concern on overall council interest in climate change initiatives. The extent to which different stakeholders impact upon council interest has implications for the drivers and barriers of climate change policy within local governments.

Correlation coefficients provide one of the most direct ways to determine the size of the relationships between stakeholder concern and overall interest in climate change initiatives. The four stakeholders identified in the survey were residents, Councillors, planning officers and local businesses. All stakeholder variables were positively related to interest in climate change. The results, as seen in the above table (Table 5-2) ranged from businesses being concerned ($r = .118$) to Councillors very concerned ($r = .302$). Surprisingly, resident’s concern ($r = .202$) followed local business, with planners providing the third largest relationship ($r = .225$). However, it should be noted that local business concern is not statistically significant at the (0.05) level. Whilst Councillor concern provided the strongest relationship out of the four above variables with interest in climate change, the correlation coefficient was relatively weak. Therefore, stakeholders simply being concerned do not produce greater interest in climate change initiatives.
Table 5-3. Levels of stakeholder concern influencing council interest in climate change initiatives

<table>
<thead>
<tr>
<th>Variables</th>
<th>Simple Correlation of Stakeholder Concern with Council Interest in Climate Change</th>
<th>Multivariate Analysis Beta</th>
<th>Multivariate Analysis Cumulative $R^2$</th>
<th>Multivariate Analysis Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I. All States (n = 295)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of local businesses very concerned</td>
<td>.118**</td>
<td>-.380</td>
<td>.138</td>
<td>.000</td>
</tr>
<tr>
<td>% of residents very concerned</td>
<td>.202</td>
<td>.070</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>% of councillors very concerned</td>
<td>.302**</td>
<td>.464</td>
<td></td>
<td>.523</td>
</tr>
<tr>
<td>% of planners very concerned</td>
<td>.225**</td>
<td>.128</td>
<td></td>
<td>.073</td>
</tr>
<tr>
<td>II. NSW (n = 80)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of local businesses very concerned</td>
<td>.109</td>
<td>-.225</td>
<td>.089</td>
<td>.221</td>
</tr>
<tr>
<td>% of residents very concerned</td>
<td>.137</td>
<td>.112</td>
<td></td>
<td>.420</td>
</tr>
<tr>
<td>% of councillors very concerned</td>
<td>.249*</td>
<td>.411</td>
<td></td>
<td>.028</td>
</tr>
<tr>
<td>% of planners very concerned</td>
<td>.086</td>
<td>-.083</td>
<td></td>
<td>.559</td>
</tr>
<tr>
<td>III. Victoria (n = 30)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of local businesses very concerned</td>
<td>-.004</td>
<td>-.529</td>
<td>.322</td>
<td>.057</td>
</tr>
<tr>
<td>% of residents very concerned</td>
<td>.129</td>
<td>.129</td>
<td></td>
<td>.466</td>
</tr>
<tr>
<td>% of councillors very concerned</td>
<td>.241</td>
<td>.241</td>
<td></td>
<td>.386</td>
</tr>
<tr>
<td>% of planners very concerned</td>
<td>.407*</td>
<td>-.004</td>
<td></td>
<td>.057</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

3. a. predictors - Q13 What propositions of the following groups of people would you say are very concerned about long term changes in climate? [(a) Residents, (b) Councillors, (c) Planners, (d) Local Businesses]
b. dependent - Q10 Has there been any interest within your council about the possible long term changes in climate on planning in your LGA?
A 'select cases' option was executed for NSW and Victorian cases.
A multivariate analysis with each of the four stakeholders and interest in climate change is shown in Table 5-3 above. When all variables are entered into the equation, Councillors being concerned is the best predictor of whether a Council shows interest in climate change initiatives ($B = -0.464$), followed by local business concern ($B = -0.380$) and planners ($B = 0.128$). Surprisingly, residents concern provided little relationship as a predictor ($B = 0.070$), and was statistically insignificant. From the relationship, we can account for 14 per cent of the explained variance ($R^2 = 0.138$). This is a poor result, with 86 per cent of the variance left unexplained by stakeholder concern. NSW cases provided a similar result, with residents having a slightly more important role than on an Australia-wide basis. In Victoria, local business as a stakeholder was the best predictor, and therefore has a more significant impact on the interest exhibited by councils on climate change. However, these results are not statistically significant at the 0.05 level.

Councillor concern, as the greatest predictor on a national scale, has important implications for the role of advocacy and lack of support from a management and Councillor level within local governments, which will be explored later in this thesis through the use of the case studies. It is important to note that whilst the literature emphasizes the role of an active community for climate change initiatives, particularly in relation to environmentally responsible behaviour; there are other significant factors which have an impact on interest in climate change within local governments.
### Council Demographics as an Explanatory Factor

Table 5.4. Levels of council characteristics influencing council interest in climate change

<table>
<thead>
<tr>
<th>Variables</th>
<th>Simple Correlation of Stakeholder Concern with Council Interest in Climate Change</th>
<th>Multivariate Analysis Beta</th>
<th>Multivariate Analysis Cumulative R²</th>
<th>Multivariate Analysis Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I. All States (n = 265)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban-rural land classification</td>
<td>-.404**</td>
<td>-.269</td>
<td>.251</td>
<td>.000</td>
</tr>
<tr>
<td>Present population</td>
<td>.367**</td>
<td>.108</td>
<td>.302</td>
<td>.127</td>
</tr>
<tr>
<td>LGA area (in sq km)</td>
<td>-.179**</td>
<td>-.067</td>
<td>.091</td>
<td>.302</td>
</tr>
<tr>
<td>Presence of coastal land</td>
<td>-.203**</td>
<td>-.094</td>
<td>.091</td>
<td>.302</td>
</tr>
<tr>
<td>No. of DAs received last year</td>
<td>.420**</td>
<td>.228</td>
<td>.002</td>
<td>.302</td>
</tr>
<tr>
<td><strong>II. NSW (n = 73)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban-rural land classification</td>
<td>-</td>
<td>-.118</td>
<td>.240</td>
<td>.001</td>
</tr>
<tr>
<td>Present population</td>
<td>-</td>
<td>.040</td>
<td>.487</td>
<td>.802</td>
</tr>
<tr>
<td>LGA area (in sq km)</td>
<td>-</td>
<td>-.103</td>
<td>.008</td>
<td>.510</td>
</tr>
<tr>
<td>Presence of coastal land</td>
<td>-</td>
<td>-.311</td>
<td>.510</td>
<td>.008</td>
</tr>
<tr>
<td>No. of DAs received last year</td>
<td>-</td>
<td>.102</td>
<td></td>
<td>.510</td>
</tr>
<tr>
<td><strong>III. Victoria (n = 25)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban-rural land classification</td>
<td>-</td>
<td>-.310</td>
<td>.367</td>
<td>.793</td>
</tr>
<tr>
<td>Present population</td>
<td>-</td>
<td>.083</td>
<td>.689</td>
<td>.793</td>
</tr>
<tr>
<td>LGA area (in sq km)</td>
<td>-</td>
<td>.142</td>
<td>.739</td>
<td>.739</td>
</tr>
<tr>
<td>Presence of coastal land</td>
<td>-</td>
<td>-.082</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of DAs received last year</td>
<td>-</td>
<td>.104</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level (2-tailed).**

*Correlation is significant at the 0.05 level (2-tailed).**

---

4 a. predictors - Q34 Urban-Rural land classification, Q34a Present population, Q34b Area in sq km, Q43c Do you have any coastal land in your LGA?, Q35 Approximately how many DAs have been received at your council in the last year?

b. dependent - Q10 Has there been any interest within your council about the possible long term changes in climate planning within your LGA?

A 'select cases' option was executed for NSW and Victorian cases.
An analysis was undertaken between council interest in climate change and the physical characteristics of councils to show that these were of little importance to the climate change policies adopted by councils. This is shown in the above table (Table 5-4). However, the explanatory ability of council characteristics ($R^2 = .251$) was stronger than that of stakeholder concern for climate change. This multivariate analysis included present population of the LGA, area (in sq km), urban-rural land classification, the presence of any coastal land and the number of development applications received. The amount of variance explained by these characteristics was 25 per cent ($R^2 = .251$). Results were varied in NSW and Victoria, with higher significance of the size of the LGA in NSW ($B = -.103$). Presence of coastal land rating poorly in Victoria ($B = -.082$) with greater emphasis was placed on the rural-urban land classification ($B = -.310$). With the exception of urban-rural land classification and presence of coastal land in NSW, results were not statistically significant at the 0.05 level for the state analysis.

Characteristics such as population and numbers of development applications (DAs) processed give an indication of the ability and skills which councils may possess that would contribute to their responsiveness to environmental issues such as climate change. Larger councils have greater access to finance, skills and resources, and therefore have a greater ability to respond to climate change. The importance of joint strategies and collaborative projects with neighbouring councils can therefore be highlighted from the analysis.

Interestingly, the best predictor of interest in climate change from the characteristic variables was urban-rural land classification. Characteristics such as presence of coastal and rural land act as drivers for climate change, where the direct effects of climate variability on farming activities, fisheries and coastal protection can be felt. These demographics are explored further in the following chapter with attention to drivers and barriers of climate change.
Environmental Framing of Climate Change

Table 5-5. Multivariate analysis of existing green policies influencing council interest in climate change

<table>
<thead>
<tr>
<th>Variables</th>
<th>Multivariate Analysis</th>
<th>Multivariate Analysis</th>
<th>Multivariate Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beta</td>
<td>Cumulative R²</td>
<td>Significance</td>
</tr>
<tr>
<td>I. All States (n = 313)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESD policies implemented</td>
<td>-.323</td>
<td>.263</td>
<td>.000</td>
</tr>
<tr>
<td>WSUD policies implemented</td>
<td>-.218</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>‘Green’ DA condition</td>
<td>-.046</td>
<td></td>
<td>.389</td>
</tr>
<tr>
<td>Developer incentives for ESD</td>
<td>-.108</td>
<td></td>
<td>.040</td>
</tr>
<tr>
<td>II. NSW (n = 84)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESD policies implemented</td>
<td>-.291</td>
<td>.232</td>
<td>.009</td>
</tr>
<tr>
<td>WSUD policies implemented</td>
<td>-.198</td>
<td></td>
<td>.075</td>
</tr>
<tr>
<td>‘Green’ DA condition</td>
<td>-.145</td>
<td></td>
<td>.155</td>
</tr>
<tr>
<td>Developer incentives for ESD</td>
<td>-.082</td>
<td></td>
<td>.428</td>
</tr>
<tr>
<td>III. Victoria (n = 31)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESD policies implemented</td>
<td>-.209</td>
<td>.274</td>
<td>.260</td>
</tr>
<tr>
<td>WSUD policies implemented</td>
<td>-.378</td>
<td></td>
<td>.037</td>
</tr>
<tr>
<td>‘Green’ DA condition</td>
<td>.279</td>
<td></td>
<td>.128</td>
</tr>
<tr>
<td>Developer incentives for ESD</td>
<td>-.295</td>
<td></td>
<td>.119</td>
</tr>
</tbody>
</table>

A third multivariate regression analysis was run between interest in climate change initiatives and variables which focused on existing council policy, as seen above (Table 5-5). This analysis provides an indication as to whether climate change initiatives may be more successful, or more interest shown, if there are existing ‘green’ policies and a focus on sustainability within the organisation. As reiterated in the literature review, Shackley and Deanwood (2002) draw upon a systems frames of reference for climate change policy, which dictates that the uptake of climate change agenda will depend on how well the issue slots into an existing set of institutions and processes to manage resources and associated

---

5 a. predictors - Q22 Within your council, have policies on ESD been discussed and/or implemented?, Q23 Does your council have any policies related to WSUD?, Q24 Does your council set conditions for DAs to address ‘green design’ issues?, Q25 How willing is your council to provide incentives to developers who incorporate ESD principles into design?

b. dependent - Q10 Has there been any interest within your council about the possible long term changes in climate planning in you LGA?

A ‘select cases’ option was executed for NSW and Victorian cases.
programmes. This policy framework allows for climate change initiatives to be adopted at a much faster rate by the community and the organisation, as procedures that are value-driven are already in place.

The multivariate regression analysis involved questions regarding environmentally sustainable development (ESD), water sensitive urban design (WSUD) policies and ‘green’ conditions for development applications. A fourth variable which was entered into the equation asked respondents if the council was willing to provide incentives for the incorporation of ESD principles.

The explanatory ability of the ‘green’ policy variables was not much stronger than council characteristics, with 26 per cent of the variance being explained (R² = .263). The best predictor was ‘policies implemented on ESD’ (B = -.323), followed by ‘policies implemented on WSUD (B = -.218). Results were not varied greatly between the states, with the exception of WSUD initiatives in Victoria (B = -.378). Greater emphasis on water conservation in Victoria may explain the variable results shown in this state. However, WSUD can still provide an environmental framework for climate change to be introduced.

The above results suggest that those councils with existing environmental policy frameworks may show greater interest in climate change initiatives. This will be further discussed in the case study analysis, where existing environmental policy was found to be a key driver at an organisational level for the development and implementation of climate change policy.
Cities for Climate Protection Program (CCPP)

Table 5-6. Bivariate analysis of CCP program participation influencing council interest in climate change initiatives

<table>
<thead>
<tr>
<th>Variables</th>
<th>Beta</th>
<th>Cumulative R²</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. All States (n = 319)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member of CCP program</td>
<td>-.418</td>
<td>.175</td>
<td>.000</td>
</tr>
<tr>
<td>II. NSW (n = 88)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member of CCP program</td>
<td>-.446</td>
<td>.199</td>
<td>.000</td>
</tr>
<tr>
<td>III. Victoria (n = 29)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member of CCP program</td>
<td>-.120</td>
<td>.014</td>
<td>.536</td>
</tr>
</tbody>
</table>

Bivariate regression analysis was undertaken with climate change interest in local Council and member of CCP program as the predictor variable. It was hypothesised that a Council being a member of a CCP program provides a large amount of interest in climate change initiatives. This is supported by Bulkeley, who states that:

“…the CCP program serves as a means of creating new discourses about the nature of (local) climate protection, and offers legitimacy and authority to those who draw on it by virtue of its claims to “scientific” knowledge and global representation” (2004, p. 486).

A ‘select cases’ option was executed with three separate analyses undertaken - one with all cases, and the other two with only NSW and Victorian cases selected respectively. The results proved interesting, as seen in the above table (Table 5-6). Whilst the overall value \( r = -.418 \) proved a relatively strong relationship, with a slightly stronger result for NSW \( r = -.446 \), the Victorian analysis showed a weak relationship between interest in climate change initiatives and \( r = -.120 \). Reasons for this variable relationship between CCP programs and interest in climate change initiatives will be highlighted in the following chapter. One explanation provided by the empirical data, and supported by the Victorian case study, is the greenhouse alliances which have been established with the support of the state government.

---

6 a. predictor - Q26 Is your council a member of the CCP program?  
   b. dependent - Q10 Has there been any interest within your council about the possible long term changes in climate on planning in you LGA?  
   A ‘select cases’ option was executed for NSW and Victorian cases.
that combines the efforts of local councils within a given geographical area to address climate change on a regional level. As shown in the table below (Table 5-7), 49.1 per cent of Victorian councils have prepared or had discussions involving joint strategies with adjoining LGAs, in comparison to 12.6 per cent in NSW, 12 per cent in South Australia and 9.3 per cent in Queensland. The support networks that these member councils provide, and the greenhouse alliance strategy that is operating in Victoria, has proven to be an important element of success for Victorian councils. This will be explored further in the chapters to follow.
Table 5-7. Respondents With joint collaboration strategies with adjoining councils (percentage of respondents)  

<table>
<thead>
<tr>
<th>Council participation in joint strategies</th>
<th>New South Wales</th>
<th>Victoria</th>
<th>Queensland</th>
<th>Western Australia</th>
<th>South Australia</th>
<th>Tasmania</th>
<th>Northern Territory</th>
<th>Total % within issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>12.6</td>
<td>41.9</td>
<td>9.3</td>
<td>14.1</td>
<td>12.1</td>
<td>5.0</td>
<td>.0</td>
<td>14.1</td>
</tr>
<tr>
<td>No</td>
<td>87.4</td>
<td>58.1</td>
<td>90.7</td>
<td>85.9</td>
<td>87.9</td>
<td>95.0</td>
<td>100.0</td>
<td>85.9</td>
</tr>
<tr>
<td>No. of cases (n)</td>
<td>87</td>
<td>31</td>
<td>54</td>
<td>64</td>
<td>33</td>
<td>20</td>
<td>15</td>
<td>304</td>
</tr>
</tbody>
</table>

---

7 a. independent - state  
7 b. dependent -Q21 Has your council prepared ‘joint’ strategies or had discussion with adjoining local councils on the most appropriate ways to address climate change?
Overall Results

Table 5-8. Stepwise regression analysis of best predictor variables influencing council interest in climate change initiatives 8

<table>
<thead>
<tr>
<th>Variables</th>
<th>Beta</th>
<th>Cumulative R²</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Model 1 (n = 295)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESD policies implemented</td>
<td>-.445</td>
<td>.198</td>
<td>.000</td>
</tr>
<tr>
<td>II. Model 2 (n = 295)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESD policies implemented</td>
<td>-.330</td>
<td>.266</td>
<td>.000</td>
</tr>
<tr>
<td>Member of CCP program</td>
<td>-.285</td>
<td>.266</td>
<td>.000</td>
</tr>
<tr>
<td>III. Model 3 (n = 295)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESD policies implemented</td>
<td>-.307</td>
<td>.328</td>
<td>.000</td>
</tr>
<tr>
<td>Member of CCP program</td>
<td>-.277</td>
<td>.328</td>
<td>.000</td>
</tr>
<tr>
<td>% of councillors very concerned</td>
<td>.250</td>
<td>.328</td>
<td>.000</td>
</tr>
<tr>
<td>IV. Model 4 (n = 295)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESD policies implemented</td>
<td>-.268</td>
<td>.350</td>
<td>.000</td>
</tr>
<tr>
<td>Member of CCP program</td>
<td>-.196</td>
<td>.350</td>
<td>.001</td>
</tr>
<tr>
<td>% of councillors very concerned</td>
<td>.251</td>
<td>.350</td>
<td>.000</td>
</tr>
<tr>
<td>Urban-rural land classification</td>
<td>-.181</td>
<td>.350</td>
<td>.002</td>
</tr>
</tbody>
</table>

To confirm the above, a stepwise regression was undertaken with the four best predictors of climate change interest at local councils as derived from the multivariate and bivariate analyses (see Table 5-8). This was done to ascertain the amount of variance explained in total by the four best predictors. At each stage of the analysis, a predictor variable is entered into the equation to ascertain if a further proportion of the unexplained variance can be accounted for by another predictor variable. It is worth noting that the negative relationship occurring between some predictors and interest in climate change is a result of the nature in which the variables were coded, and is not an indication of a decreasing interest in climate change. The predictor variables entered were Councillor concern, urban-rural land classification, implementation of ESD policies and Council being a member of CCP program. The best predictor of climate change interest was implementation of ESD policies ($B = -.445$), followed by member of CCP program, urban-rural land classification, and finally local

---

8 a. predictors - Q22 Within your council, have policies on ESD been discussed and/or implemented? Q26 Is your council a member of the CCP program? Q13 What propositions of the following groups of people would you say are very concerned about long term changes in climate? (b) Councillors. Q34 Urban-Rural land classification. b. dependent - Q10 Has there been any interest within your council about the possible long term changes in climate on planning in you LGA?
business concern. ESD policies accounted for 20 per cent of the explained variance, with the remaining predictors increasing this explained variance by 15 per cent, to 35 per cent ($R^2 = .35$). All results were statistically significant at the 0.01 level.

State as a Predictor of Climate Change Initiatives

Table 5-9. Polychotomous logistic regression (state) with ESD policies and council interest in climate change initiatives

<table>
<thead>
<tr>
<th>Variables</th>
<th>Beta</th>
<th>Cumulative $R^2$</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Coefficients (n= 299)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESD policies implemented</td>
<td>-.419</td>
<td>.227</td>
<td>.000</td>
</tr>
<tr>
<td>NSW</td>
<td>.174</td>
<td></td>
<td>.143</td>
</tr>
<tr>
<td>VIC</td>
<td>.224</td>
<td></td>
<td>.011</td>
</tr>
<tr>
<td>QLD</td>
<td>.089</td>
<td></td>
<td>.387</td>
</tr>
<tr>
<td>WA</td>
<td>.139</td>
<td></td>
<td>.193</td>
</tr>
<tr>
<td>SA</td>
<td>.130</td>
<td></td>
<td>.145</td>
</tr>
<tr>
<td>TAS</td>
<td>.022</td>
<td></td>
<td>.785</td>
</tr>
</tbody>
</table>

Table 5-10. Bivariate analysis of ESD policies and council interest in climate change

<table>
<thead>
<tr>
<th>Variables</th>
<th>Beta</th>
<th>Cumulative $R^2$</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Coefficients (n= 319)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESD Policies Implemented</td>
<td>-.445</td>
<td>.198</td>
<td>.000</td>
</tr>
</tbody>
</table>

The Australian state of respondents was also seen as a factor which may have an effect on council interest in climate change. ‘State’ was entered as a polychotomous variable in the above regression (Table 5-9), where, for the purposes of regression analysis, each state was

---

9. a. predictor - Q22 Within your council, have policies on ESD been discussed and/or implemented?, state - NSW, VIC, QLD, WA, SA, TAS
   b. dependent - Interest in Climate Change Initiatives.
   c. Binary codes 0 and 1 were assigned to ‘State’ variable to create predictor ‘state’ variables as shown above.
   d. ACT was identified as ‘missing’ or is constant. It was deleted from the analysis.

10. a. predictor - Q22 Within your council, have policies on ESD been discussed and/or implemented?
    b. dependent - Interest in Climate Change Initiatives.
coded as a separate binary variable (i.e. 0 = ‘not selected’, 1 = ‘selected’). The explained variance with each new state variable can then be compared to the bivariate regression containing the best predictor variable and ‘interest in climate change initiatives’. With ‘state’ entered as a predictor, 22.7 per cent ($R^2 = .227$) explained variance was achieved, compared to 19.8 per cent with ($R^2 = .198$) without ‘state’ (see Table 5-10). ‘State’, as a predictor of interest in climate change initiatives, accounts for 2.9 per cent of the explained variance. It is interesting to note that Victoria ($B = .224$) makes a statistically significant contribution to explaining the variance in the ‘council interested in climate change’ variable. However, it should be noted that there is variation in the initiatives provided in each state, based on climate and other contributing factors, including policy set at a state level. The purpose of the above analysis is to take into account “state” as a predictor of interest in climate change, distinctly separate to the other predictor variables that have been used in the multivariate analyses above.

Environmental Action on Climate Change

**Table 5-11. Summary of environmental issues selected as ‘Important’** (percentage of respondents whom ‘ticked’ environmental issues)

<table>
<thead>
<tr>
<th>Council Workshops</th>
<th>Yes</th>
<th>No</th>
<th>Not yet, but scheduled</th>
<th>Total % within interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residents active on environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Little or no activity/interest</td>
<td>4.5</td>
<td>15.6</td>
<td>0.0</td>
<td>10.4</td>
</tr>
<tr>
<td>Few active, no wide interest</td>
<td>36.8</td>
<td>59.2</td>
<td>57.1</td>
<td>50.0</td>
</tr>
<tr>
<td>Few active, wide interest</td>
<td>39.1</td>
<td>17.3</td>
<td>28.6</td>
<td>26.7</td>
</tr>
<tr>
<td>Number active, wide interest</td>
<td>19.5</td>
<td>7.8</td>
<td>14.3</td>
<td>12.9</td>
</tr>
<tr>
<td>No. of cases (n)</td>
<td>133</td>
<td>179</td>
<td>14</td>
<td>326</td>
</tr>
</tbody>
</table>

Education and community workshops are often seen as the centrepiece of sound environmental initiatives. Whilst some support the notion that the provision of education will result in a community whom is active on climate change issues, others, such as Blake

---

11 a. dependent - Q27 How active on ‘environmental issues’ are residents in your local government area?  
b. independent - Q29 Has your council conducted any community workshops regarding environmental issues in your local government area?
(1999), disagree. He compels us to move beyond the information deficit model, which dictates that the main barrier between environmental concern and action is a lack of appropriate information. The above table (Table 5-11) provides a succinct overview of the trends between residents whom are active on environmental issues, and whether workshops have been conducted at local councils. The largest proportions of local councils are mainly clustered around ‘few active with no wide interest’ residents, with almost 80 per cent of respondents falling into this category. Interestingly, those councils who have held workshops have a higher proportion of active residents, (19.5 per cent). 59.2 per cent of councils who have not held workshops only have few active residents, with no wide interest. However, the results are too varied to draw any definitive conclusions. Trends do suggest that, despite being of importance, education is only part of engaging an active citizenry.

Government Responsibility for Climate Change

Table 5-12. Summary of Levels of Government Responsibility Across NSW & Victoria
(percentage of respondents ranking government levels)\(^{12}\)

<table>
<thead>
<tr>
<th></th>
<th>NSW</th>
<th>Victoria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local government responsibility ranked first</td>
<td>7.5</td>
<td>10.0</td>
</tr>
<tr>
<td>State government responsibility ranked first</td>
<td>11.3</td>
<td>26.7</td>
</tr>
<tr>
<td>Federal government responsibility ranked first</td>
<td>85.4</td>
<td>71.0</td>
</tr>
<tr>
<td>No. of cases (n)</td>
<td>85</td>
<td>33</td>
</tr>
</tbody>
</table>

\(^{12}\) a. dependent - Q20 How would you rank who you think should be responsible for deciding on long term planning policies to deal with possible greenhouse effects?  
 b. independent - state  
 c. The total of the above results is greater than 100 per cent. Respondents were provided with the opportunity to rank more than one level as first.
Trends in perceived government responsibility were analysed across NSW and Victoria, to indicate which level of government councils felt should be the most responsible for the long term planning for climate change. The results between the two states, as seen in the above table (Table 5-12) are relatively consistent, with local government ranked as third, state as second, and federal as first. In Victoria, we see a slightly higher percentage of respondents indicating state government should be the most responsible (26.7 per cent) compared to NSW (11.3 per cent).

When considered in conjunction with the government policy context provided in Chapter 4 of this thesis, the above analysis has important implications for the drivers and barriers to climate change initiatives at the local level. The lack of guidance and strategic policy setting from the federal government has implications for local government, in terms of the need to set their own policy direction, and their role as a delivery mechanism for federal policy. This lack of support for local government will be discussed in the following chapter, in light of the above analysis.

**Conclusion**

The above results have provided this thesis with key national and state trends on climate change and local government in Australia. An analysis has been provided of the current trends in local council policy on climate change, how climate change is being integrated into existing approvals and policy systems, and levels of stakeholder awareness and concern. The following chapter will use these key trends, along with the policy context established in Chapter 4, to provide real-life examples of how climate change is operating at a local level. A focus will be presented on the drivers and barriers of climate change, and how these are affecting the actions of local governments.
CLIMATE CHANGE DRIVERS AND BARRIERS
“My personal response would be they [levels of government] are all equally responsible. They each have different roles to play, so local government, as the level closest to the community is responsible for a lot of the daily stuff.... But if you’re not getting the leadership you’re after, you devise your own strategy”. Greg Hunt, WPGA

One of the intentions of this thesis is to analyse the current trends in Australian local council policy on climate change, and to identify the drivers for interest in climate change initiatives. This has been provided in the previous chapter. The following sections will apply those trends identified to two local council case studies, from Victoria and NSW. The first portion of this chapter will provide an overview of two case studies: City of Casey Council in Victoria and Penrith City Council in NSW. An introduction to the setting in which these councils operate will be provided, followed by a brief outline of their climate change initiatives to date.

The main focus of this chapter is to investigate barriers to the diffusion of climate change initiatives. A number of key concepts from the literature will also be used to strengthen the analysis provided in the sections below. Also, the policy framework established in Chapter 4 provides an important context for the direction of strategic climate change action at the local level. This chapter will draw upon seven in-depth interviews conducted with state government, local government and municipal organisations. The case studies explored will provide a practical understanding of the complexities of climate change at the local level, barriers to the successful implementation of mitigation and adaptation strategies, and how the local setting can be used to effectively address the global problem of climate change.
Local Setting

Penrith City Council (NSW)

Figure 6-1. Penrith City Council location map.
Source: PCC, 2007a

Penrith City Council is located on the fringe of Sydney, approximately 54 kilometers west of Sydney. It covers an area of approximately 407sqm on the flats of the Cumberland Plain, bounded by the Nepean River and Blue Mountains to the west. At the 2001 Census, the Penrith LGA contained 172,397 people, which is a 5.7 per cent increase from 1996. It is one of the third largest LGAs in terms of population in Western Sydney, and the sixth largest in NSW. Penrith is an agricultural centre as well as containing service industries such as transport, storage, commerce and education. Penrith Council exhibits a strong sustainability culture that is guided by need to integrate economic, environmental and social considerations into decision-making, balancing short-term with long-term goals and engaging with stakeholders and the local community (PCC, 2007a). Their climate change program is mainly centred on mitigation, and is driven by the Sustainable Penrith Action Plan. Their main initiatives are summarised in the following table:
Table 6-1. Climate Change initiatives at Penrith City Council.

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Description/Objectives</th>
</tr>
</thead>
</table>
| Sustainable Penrith Action Plan                 | Includes a number of initiatives to improve sustainability of Council as an organisation and the City as whole. Two major tasks have been an internal review conducted in 2001 and an independent review conducted in 2002. From these, Council is now looking at a range of issues, such as reducing greenhouse emissions, and water use. It is used as a platform to improve performance as an organisation and achieving sustainable outcomes. Objectives include:  
  - Creating sense of ownership that will encourage commitment to sustainability throughout the organisation’s culture;  
  - Improving connectivity of Council’s activities  
  - Enabling Council to respond effectively and efficiently to its legislative requirements  
  - Improving the coordination of Council’s information base to facilitate the capture and management of data  
  - Guiding Council’s decision-making and daily activities within a sustainable framework  
  - Developing a framework for monitoring Council’s implementation of sustainability principles in its process and activities; and  
  - Involving all sectors of the community and building partnerships. |
| Carbon Neutral - Greenhouse Gas Reduction Plan 2005 | The plan is a means for monitoring and reviewing progress towards Council’s reduction goal, including indicating areas where abatement potential is greatest. A community reduction goal of 25 per cent below 1995 levels has been mandated by 2010. Council’s own emissions will similarly be reduced to 25 per cent below 1996 levels by 2010. Penrith is currently at milestone plus in the CCP program. |
| Sustainability Revolving Fund                   | The program is a financial mechanism whereby a proportion of savings made as a result of sustainability initiatives is diverted into an established fund for future initiatives. A statement has been developed to identify key sustainability priorities relevant to a particular period. |
| Sustainability Blueprint for Urban Release Areas | An approach to new release areas which aims to integrate social economic and environmental concerns. The aims of the initiative are:  
  - To provide a framework for delivering quality urban environments and sustainable outcomes in release area planning;  
  - To reflect the triple bottom line approach demonstrating best practice in economic, social and environmental sustainability for not only current communities but future generations; and  
  - To apply to all new release areas, including employment, residential or a mix. Principles include water sensitive urban design, (WSUD), saving energy and greenhouse gas emissions, reductions in water consumption and waste minimisation. |

Source: PCC, 2005a; PCC, undated a; PCC, 2005b; PCC, undated b
City of Casey Council (Victoria)

Figure 6-2. City of Casey Council locational map.
Source: CCC, 2006

Casey City Council is Australia’s third largest growing municipality. It had a population of 223,000+ at the 2006 Census, and is located 35 kilometers south east of the Melbourne CBD. High biodiversity values exist in Casey, with wetlands of international significance at Western Port. The area has one of Victoria’s widest variety of habitat types, from deep
channels, through to seagrass flats, mangrove thickets and saltmarsh vegetation (CCC, 2006). The Casey LGA contains five main geographic regions, as seen in Figure 6-2 above:

- Foothills of the Dandenong Ranges
- Residential and commercial heart
- Urban growth areas
- Farm belt
- Coastal villages of Western Port

City of Casey Council is a member of the Westernport Greenhouse Alliance. The WPGA was established via funding by the Department of Sustainability and Environment (DSE) where a WPGA coordinator is employed to coordinate joint initiatives between 2 or more member councils. The development of the WPGA has allowed the member councils of City of Casey, Cardinia Shire Council, Bass Coast Shire Council, Frankston City Council and Mornington Peninsula Shire Council to establish joint climate change initiatives, one of the most successful being the Western Port Adaptation Project (WPGA, undated). The main initiatives undertaken by Casey Council as part of the WPGA are outlined in the table below (Table 6-2):
Table 6-2. Climate change initiatives at Casey City Council.

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Description/Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon Sink Project: Bunyip Sanctuary</td>
<td>Carbon Sinks have been identified in the Western Port Greenhouse Alliance (WPGA) Strategic Plan as a key element of a comprehensive greenhouse response. The WPGA in 2005 established a coordinated, regional program to offset greenhouse gas emissions through the development of multiple-benefit carbon sinks. The WPGA has since successfully created the Bunyip Sanctuary Project which presents very high value carbon at a competitive price of approximately $10.26t/CO2e.</td>
</tr>
</tbody>
</table>
| Agricultural Greenhouse Emissions Project: Recovering Lost Production in Western Port | Dairy and beef farms in the Western Port region were a high source of greenhouse gas emissions, chiefly enteric methane (burps) and nitrous oxide losses from animal excreta and carbon dioxide from energy use. The project was established to show farmers how to alter practices to reduce these gas emissions and what can they do to offset the carbon dioxide from their energy use. The phasing of the project involves:  
  o Establishing a fully representative project committee;  
  o Finding 50 landholders to be involved over the 3 years of the project;  
  o Providing ongoing support and training through the local Landcare Networks to achieve these targets; and  
  o Careful evaluation of the success, effectiveness and transferability of the model/process to other regions. |
| Impacts of Climate Change on Human Settlements in the Western Port Region: An Integrated Assessment | The Western Port Greenhouse Alliance, together with Marsden Jacob Associates, CSIRO Marine and Atmospheric Division, Broadleaf Capital International and the Regional Development Company, is undertaking an ‘Integrated Assessment of Climate Change Impacts on Human Settlements in the Western Port region’. This two year pilot project, to be completed by July 2008, is funded by the Australian Greenhouse Office and the Victorian Department of Sustainability and Environment. The objectives of the project are to:  
  o Build the capacity and knowledge of local government, state government and other decision makers in the Western Port region to prepare for and adapt to climate change.  
  o Develop an approach to climate change assessment and adaptation that has transferability to other regions in Australia. |
| Sustainable Public Lighting Action Plan: A Local and Regional Approach in Western Port | Public lighting is an enormous cost for WPGA councils and greenhouse gas emissions from public lighting make up a large part of each councils total emissions. A number of measures for reducing energy use and greenhouse emissions in road lighting, while maintaining recommended lighting levels include:  
  o Reducing the number and hours of operation of lamps  
  o Changes to the type of energy and lamps used.  
  o Changes to the associated switching equipment |

Source: Exerts from WPGA, 2007a; WPGA, 2007b; WPGA, 2007c, WPGA, 2007d; WPGA, 2007e
Drivers of Climate Change Initiatives

Role of Advocacy

Advocacy has been highlighted as a driver of climate change initiatives at a local government level. A number of key stakeholders have been identified, mainly council staff such as environmental officers, Councillors, a General Manager or Mayor of an LGA. The nationwide survey results showed that Councillor concern for climate change was the largest predictor of interest shown in climate change initiatives. At both Penrith and Casey Councils, the role of advocacy and leadership were interchanged when referring to diffusion of climate change within the organisation. Paul Mulley from Penrith City Council notes that advocating programs developed by the sustainability unit influenced the decision makers to notice their efforts and helped the diffusion of the issue within the organisation.

“.. And it also helps because it conveys the message…If you’ve got somebody out there who is really advocating these various programs then it also helps educate the people who make the decisions.”

Hunt also mentioned, as a member of the Western Port Greenhouse Alliance (WPGA), that he had the unique perspective of watching climate change operate within 5 distinct LGAs. Whilst the mechanisms for great leadership existed at Casey Council, what was missing was the advocacy role which propelled Mornington Peninsula Shire Council as the most successful of the 5 member councils. He went on to say:

“….they have a Chief Executive Officer there who is really pushing the boundaries….so he would be seen, I think, reasonable broadly within the community, as one of the leading contributors to the environmental debate within this region….he’s infusing all of the senior staff at Mornington Peninsula Shire with that same kind of commitment, and I think that shows in the way that they’re being perceived, certainly in the ways that they’re going out and doing things.”

There is therefore a role for advocacy within local government on climate change. Often when there is a member of the organisation pushing the agenda and infusing this culture within the organisation. The leadership role which this individual often assumes has been identified as a quality which delineates councils which have successfully developed and
implemented climate change initiatives from those which have not been as successful. However, this success is also dependent upon a number of different factors, including the position of the individual, the capacity of the council to accept change, and the methods used to diffuse climate change within the organisation. In addition, advocacy roles are also not limited to individuals, and can include departments and collective responses to climate change, such as community activism. This will be explored further in the following sections.

Environmental Framing of Climate Change

Lindseth (2004) defines ‘environment framing’ as some aspects of a perceived reality which are selected and made more salient so as to promote specific facets of a particular problem, casual interpretation, moral evaluation and/or recommended treatment of an issue. Councils which have a strong environmental policy focus are likely to be more successful with the introduction of climate change initiatives. This was certainly derived from the national survey, where it was found that the best predictor of interest in climate change initiatives was existing policies on ESD being in place. Penrith Council is in the unique position of being located at the foothills of the Blue Mountains, which acts as a driver for protection of biodiversity as a direct climate change impact. The protection of the environment and biodiversity is highly valued by the local residents and council staff, as reiterated by Paul Mulley:

“..you know, it’s very handy having the Nepean River running right through and Cumberland Plain Woodland and there is a huge amount of biodiversity. And also, because our Councillors and quite a few of our staff…. are fairly passionate about protecting the environment…”

Further, Mulley notes that climate change should not be isolated from any other environmental issue at this point in time, but used as a mechanism to make the community generally more aware and environmentally conscious. Certainly the presentation of climate change within existing environmental frameworks has been well documented in the literature, where Shakeley and Deanwood (2002) state that the perceived importance of climate change will depend upon whether climate change fits into an existing frame of reference. This includes knowledge, practices and contemporary pragmatic concerns, such as those associated with existing environmental problems. Many environmental solutions to climate
change, such as reduction on car dependency, are already operating through planning ideologies such as ‘walkable neighbourhoods’ and increased access to public transport.

Bulkeley (2004), in her study on the Cities for Climate Protection (CCP) program found that:

“… the CCP program had been one factor that has aided the reframing of existing concerns for energy and the environment in terms of climate change, creating knowledge about the local possibilities for addressing climate change, and generating norms about the value of doing so.” (p. 480)

The above point provides a link to Casey Council, where the CCP program allowed climate change to be framed within existing environmental initiatives, diffusing some barriers which had previously existed. One common barriers was the notions such as ‘Why should we be doing it when no one else is?’ The CCP program provided political support and brought climate change into the norm for Councillors and executive management at Casey Council.

Political and Community Responsibility

The roles and responsibilities of the different levels of government are difficult to define when dealing with climate change. Traditional constitutional arrangements can become blurred when concepts such as multilevel governance are introduced. Further, the delineation of responsibility is exacerbated by transnational networks such as the CCP program, which allow councils to function within a global network, independent of state and federal support. Through the research undertaken it was discovered that one of the largest drivers of climate change action was the responsibility of local governments to take action. The source of this ‘responsibility’ is varied, and ranges from the protection of council’s own assets, the need to respond to the demands of their constituents, and the increasing threat of liability. Councils also have a responsibility to take a lead-by-example approach, which has particularly been encountered through the mitigation of emissions from their own council buildings and operations.
Protection of Council Infrastructure

The Australian Greenhouse Office (2007a) in their Climate Change Adaptation for Actions for Local Governments toolkit identified a number of areas of responsibility which councils need to address in response to climate change, including infrastructure, planning, health, and natural resource management. Protection of infrastructure is a particularly prevalent issue. Local government is a significant owner of infrastructure such as buildings and road assets, and therefore has a responsibility for its maintenance. They also have a role in assisting businesses and the community with their infrastructure. Heating and cooling demand, drainage and structural standards are all affected by climate change.

Garcia (2007) notes that buildings and infrastructure constructed today will have a projected life until 2050, highlighting the need for climate change to be considered in the design of infrastructure and buildings. The results of the nationwide survey reported in the previous chapter showed that some of the environmental issues which were most prevalent in Australian councils in 2006 were drainage and water runoff, tropical storms, drought, water quality and water supply. These issues are linked to the maintenance of council infrastructure, particularly drainage infrastructure and roads, with fluctuations in heat and predicted rainfall.

Adaptation has been considered in Penrith Council in terms of their responsibility for integration of sustainability into new buildings. However, no assessment is yet to be undertaken of the impacts of a changing climate on existing infrastructure. As part of Casey Council’s adaptation project, an assessment has been undertaken of the likely impacts of climate change on council’s assets:

“The CSIRO have done the research to quantify the likely biophysical impacts we can expect. We’re now going to our Councils to say ‘OK, so if these are the changes, what infrastructure have you got in the vulnerable areas’ and then we’ll go into a risk assessment process to say ‘OK, this is what you’ve got, this is the most likely impact upon it, and then, what are you going to do about that’.

The federal and state policy context provided in earlier in this thesis noted the lack of support from the NSW state government for adaptation projects such as those occurring Victoria.
Whilst Interviewee A\textsuperscript{*} from the NSW state government noted that adaptation strategies were in the pipeline, there is currently a clear lack of support for NSW councils to address the impacts of climate change.

\textit{Community Responsibility}

Councils, particularly elected representatives, have a responsibility to respond to the demands of their constituents. Neither Penrith nor Casey Council felt that there was a strong push from the community to respond to climate change. Drivers were generally internal, particularly at Penrith Council, where the community was generally responsive and encouraging once initiatives had been implemented.

Greg Hunt, from the WPGA explains that whilst the socio-demographics of a community are important, the results are varied in climate change as other factors determine a community’s reaction. Particularly in rural areas, due to drought and economic issues, generally conservative demographics that are widely unspoken on environmental issues are demanding a response due to the nature of climate change. Whilst it has therefore been established that local governments have a responsibility to respond to the demands of their constituents, it is not as large a driver as first anticipated. Further, the demographics of communities as an indication of community activism, particularly where one encounters the educated and articulate, do not apply to climate change where the complexity of the issue demands a varied response from the LGA.

\textit{Council Liability}

There are a number of legal pathways which can be adopted when addressing climate change. In America, there have been a number of cases where industrial polluters have been sued on the basis of negligence or nuisance. In Australia, there are two main avenues that are pursued when dealing with climate change. The first is the challenging of government decision–making on the basis that environmental impact studies have inadequately considered climate change impacts. The second involves challenging the adequacy of environmental impact assessment undertaken for projects likely to contribute

\textsuperscript{*} Interviewee A requested to remain anonymous for the purpose of this thesis
significant quantities of greenhouse emissions. Two cases that have been brought to NSW and Victoria include proposals for coal mines and coal-fired power stations (Peel, 2007).

Paul Mulley from Penrith Council indicated that litigation wasn’t a particularly large concern, stating that:

“It hasn’t necessarily been the main driver in developing the various programs but it’s probably somewhere in the background. It is there, but I wouldn’t consider it to be an important driver.”

Casey Council, on the other hand, indicated that it was an important driver for climate change initiatives. Increasingly councils are being exposed to litigation and liability, particularly for a council such as Casey that has flood-vulnerable land and coastal areas. One driver for the adaptation project was to ascertain areas at risk, which council would then need to address, in terms of their responsibilities and what they are legally liable for in reference to climate change impacts.

England (2007) notes that local governments need to be vigilant to ensure that policies and programs reflect a reasonable response to the risks of climate change, including service, planning and development activities. The decision of Gray v the Minister for Planning where a proposed coal mine failed to take into account the climate change impact, resulted in the NSW Planning Minister in December 2006 issuing a statement that when considering any development application climate change must be considered. Local government therefore needs to assess the risks involved if they unreasonably fail to take into account the effects of climate change, particularly those that contribute to harm against individuals or their property. High risk areas involve those that are subject to sea level rise, flooding and extreme weather events (England, 2007). Councils need to ensure that they respond in a responsible manner and protect themselves from risks associated with legal liability and insurance.

*Delivery Mechanism of Council*

Council’s role as a delivery mechanism for policy has been acknowledged by state and federal levels of government. Certainly Jennifer Kane from the Victorian state government noted the importance of council as a delivery agent with a strong strategic policy setting.
occurring at both these levels of government, even though this strong policy setting has often been lacking at a federal level. Councils have thus been required to implement their own strategies with the assistance of state governments to fill this policy vacuum. Paul Mulley from Penrith Council notes the importance of an integrated climate change response from all levels of government, with the council’s role established from a grass-roots perspective with the ability to deliver training programs, develop local sustainability projects and establish programs which address legislative requirements and policies set at higher levels of government.

Membership to Transnational Networks and Regional Partnerships

Arguments both for and against the success of programs such as the CCP program has been presented in Chapter 2 of this thesis. The nationwide survey results support the need for transnational networks and regional partnerships, such as the greenhouse alliances in Victoria, as a driver for climate change at the local level. In the survey analysis membership to the CCP program was ascertained as the second best predictor of interest shown in climate change initiatives, following policy framing. Further, more than half of the councils in Victoria are members of a joint partnership with neighbouring councils.

The relative success of climate change initiatives at the local level in Victoria can be attributed to the support network provided by the greenhouse alliances, which goes beyond the CCP program. Whilst the development of transnational networks such as the CCP program has been an essential driver in mitigation activities through the provision of knowledge and methodologies, partnerships with neighbouring councils allows local government to look at climate change regionally.

Climate change affects an array of environmental issues, such as biodiversity, coastal erosion, water quality, soil erosion and salinisation, which need to be addressed at a regional scale (AGO, 2007a). Whilst aligning council policy positions can be difficult, the development of initiatives such as the Western Port Greenhouse Alliance (WPGA) allows the development of regional frameworks for local governments to work collaboratively on climate change. The WPGA, which Casey Council is a signatory member, was established via funding by the Department of Sustainability and Environment (DSE). A WPGA coordinator is employed to coordinate joint initiatives between 2 or more member councils. The development of the WPGA has allowed the member councils of City of Casey, Cardinia Shire...
Council, Bass Coast Shire Council, Frankston City Council and Mornington Peninsula Shire Council to establish joint climate change initiatives, one of the most successful being the Western Port Adaptation Project (WPGA, undated). Luke Murphy from the Municipal Association of Victoria (MAV) concurs that “councils also need to broaden their thinking regionally”.

Whilst providing credibility, Bulkeley (2004) argues that the influence on policy learning within any one Council within her study remains superficial at best. However, stakeholder credibility was established which allowed stakeholders to draw upon ideas, concepts and categories that have been well established within the climate change discourse. For councils that have perhaps not been leaders in climate change policy, the CCP program has provided a starting point for the concept of climate change to be introduced, with reliance on the support and best practice examples provided. The milestones allow councils to maintain momentum and provide justification for further resources to be provided for pilot projects. The CCP program has been identified by Casey City Council and Penrith City Council as an integral component of their climate change mitigation initiatives. Paul Mulley from Penrith Council explains that the Carbon Neutral Program was a direct result of the CCP program. David Westlake from Casey Council also notes:

“I think the CCP program is a good catalyst for Casey…. I think Casey did appear to be proactive with such in joining such a program with the milestones keeping you honest, keeps you nudging away a bit, you work through the milestones and we’ve now gotten to CCP plus.”

Wapner (1998) suggests that transnational environmental groups provide an alternative to traditional government networks that derive their authority from legislation. The case studies have revealed that, contrary to this, a supportive response from state and federal governments has occurred through the provision of finance for the CCP program and regional partnerships. Therefore, the separation between traditional governments and new transnational networks is not as distinct as Wapner (1998) suggests. Authority for these networks is not only derived from their success, but their legitimisation from state and federal governments through the provision of financial and political support. The Australian government contributes significant financial resources to the CCP program, which has been decentralized through national campaigns in Australia, Canada, Finland, India, Italy, Mexico, the Philippines, South Africa, the UK and the U.S. (Bulkeley 2004, p. 478). However, it is important to note that whilst they may contribute financially, the nation states themselves
have no say in defining the purposes for which the finance will be used, nor the development or monitoring of any program themselves. This allows the CCP program and councils to maintain some autonomy for mitigation practices in their respective localities.

Bulkeley (2004) also found in her CCP program study that the creation of emissions inventories or exposure to best practice examples did not necessarily lead to policy change within an LGA. There are a number of barriers to the diffusion of policy within local governments that are dependent upon the complex nature of councils themselves as political machines, with stakeholders acting to have their own sources of authority legitimised through council policy.

Community Activism

Local government has a direct responsibility to respond to the concerns of their constituents. An active citizenry on climate change can drive initiatives at the local level, particularly through community groups and collective action. However, the nationwide survey results showed that resident's concern was the lowest predictor of council interest in climate change, following the concerns of Councillors, local businesses and planners.

Tribbia (in Dilling & Moser, 2007) has identifies a number of factors affecting environmentally responsible behaviour (ERB), which are outlined in the table below:

Table 6-3. Factors affecting environmentally responsible behaviour.

<table>
<thead>
<tr>
<th>Factors Affecting ERB</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inclination</td>
<td>Characteristics which make an individual more or less likely to engage in ERB, including socio-demographic status, race, gender, age, values, attitudes and benefits.</td>
</tr>
<tr>
<td>Motivation</td>
<td>Factors which drive an individual's pro-environmental behaviour, including knowledge and information, feelings and emotions, identity fulfillment, desires and aspirations and personal needs.</td>
</tr>
<tr>
<td>Information process and behavioural intent</td>
<td>ERB is also influenced by how individuals perceive their surroundings, the actions of others and the impacts of their own. How a person processes information is contingent upon beliefs and mental models, affects behavioural intent and public commitment.</td>
</tr>
<tr>
<td>Ability and skill</td>
<td>Ability refers to whether an individual has the capacity to carry out a behavioural intent, and includes appropriate skills, a sense of perceived influence, and access to financial, technical and</td>
</tr>
</tbody>
</table>
Greg Hunt, from the WPGA, commented on an active community as a driver for climate change, noting that at one local government area in Melbourne’s northern suburbs:

“…people are fairly informed…..they have a very articulated, well-educated community, and I think the community demand they make a response”

However, he states that the response is varying, from politically inept, highly engaged areas with a number of active community groups to areas that are rural and generally very conservative demanding similar responses on climate change. He feels that climate change may transcend traditional definitions of political engagement where “the old paradigms [don’t] necessarily apply anymore”. Further, Paul Mulley from Penrith Council believes that although the community at his local council have been positive, council climate change initiatives have generally preceded community involvement.

Creating individual household change was acknowledged as important for mitigation strategies by Casey and Penrith Councils, which identify education and workshops as an integral component to the establishment of a community response to climate change. Targeting individuals was seen as essential to creating wholesale change within the community. Mulley states that a culture change is required before collective action can be taken:

“That’s obviously important for an individual household basis….there has to be a culture shift within the individual before there can be a community culture shift… So targeting individuals – and I guess that’s what Council was trying to achieve by developing campaigns such as Sustainability Street…”

Whilst it is outside the scope of this thesis to investigate how the above factors have attributed to the concern expressed by residents on climate change, it is important to acknowledge that they attribute to the community’s overall response to climate change. It is the challenge of institutions such as local governments to respond to the above factors.
through education, workshops and the promotion of climate change as an important environmental issue that needs to be addressed on both an institutional and individual level.

Positive Reinforcement

Positive reinforcement has been identified as an important driver for climate change initiatives at the local level. This has not only been supported by the Penrith and Casey Council case studies, but interviews conducted with the Local Government Shires Association (LGSA) and Municipal Association of Victoria (MAV). Showcasing the successful results of climate change initiatives allows staff to say ‘see what we are doing, isn’t it great’, which raises awareness both internally at a Councillor and upper management level, and within the wider community. David Westlake from Casey Council notes that the Councillors placed money aside to showcase the work that was undertaken on the Agricultural Greenhouse Emissions Project. Neighbours were provided the opportunity to view water tanks, solar power generation and retrofitting of buildings which not only raised awareness within the community but provided real-life examples of how climate change initiatives can be used within everyday activity and industry.

Bridget Dwyer from the LGSA notes the importance of quantifying emissions targets to provide clear goals to work towards, and measurable results which can be placed back into policy in a cyclic fashion.

“….I think quantifying, setting a reductions target is really good. And then it’s a goal to work for…. What that does is gives them a policy position which can then be adopted by Council and so then it becomes council policy, and something they have a greater chance of resourcing through the annual budget and developing actions which can go into all divisions work plans.”

The LGSA and MAV also explain the importance of the provision of successful case study examples. For councils who are unsure about pathways to initiatives, case study examples provide councils with management tools and methodologies. Another theme established from the in-depth interviews is a management attitude that denotes ‘Other councils aren’t doing it, why should we?’ The provision of case studies encourage councils who are not as active on climate change to take a lead-by-example approach and use other council activity as a source of legitimization for climate change within their own organisation.
Chapter 6: Climate Change Drivers and Barriers

Barriers to Climate Change Initiatives

Bulkeley (2000) points out issues concerning the scope of local governments to take on a global issue such as climate change. The ability of councils to co-ordinate between neighbouring LGAs, conflicts of interest and community involvement raise significant problems for a local approach. Whilst barriers to climate change initiatives at a local level have been identified in Chapter 2 of this thesis, their practical application will be explored through the City of Casey Council and Penrith City Council case studies.

Lack of Support from Management and Councillors

The nationwide survey results from the previous chapter showed that, of the four stakeholders identified in the survey – planners, residents, Councillors’ and local business that Councillors concern for climate change was the greatest predictor of interest shown in climate change initiatives. This demonstrates the importance of the role of elected representatives, along with management, when developing and implementing climate change initiatives at the local level. These results have been supported by the qualitative research undertaken.

Paul Mulley from Penrith City Council noted that, from his observations, the Councillors and upper levels of management were generally supportive, stemming from an overall council culture which embraces the concept of sustainability. Certainly Jennifer Kane from the Victorian state government, drawing upon her previous experience as a local government employee, noted:

“… and I also think it really needs leadership from the Council and the community. If you’re trying to change Council processes you need that senior level Council support. ….”

Casey Council has experienced greater difficulty with the management and Councillors at their organisation. Although becoming a signatory member of the WPGA and the CCP program have provided Casey with a clear policy position and acted as a driver for climate change initiatives, some resistance has still been encountered. David Westlake voiced his frustration at council processes, where, once a project has been rejected from a management level, it cannot proceed any further to be addressed at a Council meeting,
where it has the opportunity to be adopted. He outlines that the attitude of management can also act as a barrier to acceptance of climate change initiatives:

“I’d still say barriers exist at a management and director level to be honest… one doesn’t see Casey necessarily pro-active… at one stage we looked at things like the energy performance contracts…. the response that we got is they’re before their time for us, which is something that was seen by management”.

It is important to highlight that management and Councillors at a local government organisation must assess a number of other issues that are facing their council area, and prioritise initiatives based on a number of factors, including finance, skills base, resident activism and economic considerations. In addition, there are political factors that need to be considered, particularly with Councillors seeking re-election opportunities. Whilst the role of advocacy is important from staff, as seen at Casey, this can often be blocked at senior management and Councillor level if there is a lack of internal drive and organisational change, and lack of external concern from stakeholders such as residents and local businesses.

**Lack of Finance and Resources**

A large barrier which faces local governments with the development and implementation of climate change initiatives is the ability to obtain financial resources and skills within the organisation. Particularly with finance, smaller councils struggle to obtain resources due to budgetary constraints, and have difficulty processing the lag time between seeing the direct benefits or outcomes of climate change initiatives and their implementation. Dilling and Moser (2007) note that a lack of immediacy is created with climate change. Due to the difficulty in developing direct links between an action such as walking to work, and changes in climate, support for initiatives both internally and externally can deteriorate. This usually affects resource allocation within the organisation, particularly as a response to constituents within the community. Paul Mulley from Penrith Council notes:

“… resourcing, that is one of the main barriers encountered… when it comes to environmental initiatives where you often don’t see a payback for 10 to 20 years.”
The MAV Case Studies Report (2007) has found that councils identified a lack of resources to build the capacity of local government to respond to climate change as a main barrier, particularly adaptation and abatement. Federal and state funding are seen as integral to the support for climate change initiatives at the local level. Whilst there has been recognition by state governments that councils should provide a delivery role for climate change policy developed at higher levels of government, this delivery role cannot occur without state and federal funding. The WPGA has been directly funded by the Victorian DSE, who pays for external organisation staff and funds initiatives. Greg Hunt portrays some disillusionment with the review process, which creates doubt within the project. This further increases the difficulty of obtaining external funding, and limits the possibilities of long-term planning when the project itself could end within a year. Planning for such funding timelines and keeping track of any re-orientation of political proprieties is key to managing such barriers. He states:

“.. to be the subject of a review can be quite difficult when one outcome… may be the recommendation to put money elsewhere…. And yet we got a 3-year funded project from perhaps another level of government… so aligning those sorts of funding timelines, aligning current motivations… is very, very important.”

This is vital when implementing climate change initiatives, particularly for Resourcing. The ability to develop long-term initiatives are vital for environmental issues such as climate change were impacts progress well beyond the foreseeable future.

**Struggles with Adaptation (Lack of Localised Data)**

An emerging trend from the research conducted is the struggle that local governments have identified with responding, or adapting, to the impacts of climate change within their local government areas. This need has been recently addressed by the federal government, with a number of toolkits and funding grants to provide more localised information on the likely climate change impacts. Agriculture, biodiversity, fisheries, forestry, settlements and infrastructure, coastal, water resources, tourism and health have been identified as areas that will be affected by climate change.

Penrith City Council’s climate change initiatives, as with many other councils, have mainly focused around mitigation strategies to date. Paul Mulley noted that, with the exception of
building controls and planning which look at reducing carbon footprints, there are no initiatives currently in place to examine ways in which council is addressing the impacts of climate change. Interviewee A* from the NSW state government places particular emphasis on adaptation initiatives, explaining:

“… we’re locked in for 70 years to the impacts and the way we use energy today. We need to adapt to those impacts. We can mitigate emissions but whether that mitigates effects is almost impossible to measure.”

Casey Council is undertaking an impact on human settlements project, working with Marsden Jacob Associates, CSIRO Marine and Atmospheric Division, Broadleaf Capital International and the Regional Development Company to achieve a number of objectives. This includes increasing the knowledge and capacity of local and state governments to adapt to the impacts of climate change, and the development of an approach to climate change assessment and adaptation that is transferable to other regions across Australia (WPGA, 2007a). This project has been identified by Luke Murphy from the MAV as a leader in the field. Other councils and local governments struggle with the need to adapt. Bridget Dwyer from the LGSA feels that:

“…I think is really almost not there [adaptation]. There is just really hardly anything happening in adaptation and that’s a real struggle… a lot of people are waiting for some leadership from the state and federal governments.”

As such there is a large scope for local governments to adapt to climate change. The following table from the Australian Greenhouse Office (2007a) presents the potential impacts of climate change for local governments. Of particular concern are the impacts on infrastructure and property services, as councils have a direct responsibility to provide and maintain these services. Moreover, council autonomy over areas such as natural resources and planning and building services demands an adaptation response, yet local governments do not have the capacity to respond to issues. Support needs to come from federal and state governments. Greg Hunt notes, in regards to the capacity of Casey Council to respond to planning-related climate change responses in comparison to adaptation:

* Interviewee A requested to remain anonymous for the purpose of this thesis
“…. Now that is something which local government does, that’s their core business is to do planning schemes, so clearly that’s the bit they do. If there wasn’t the research capacity coming out of the federal government, CSIRO, doing their bit, we wouldn’t be developing these schemes at Casey...”

Table 6-4. Potential Impacts of Climate Change on Local Government Functions

<table>
<thead>
<tr>
<th>ASSETS/SERVICE DELIVERY</th>
<th>POSSIBLE CLIMATE CHANGE IMPACTS</th>
</tr>
</thead>
</table>
| Infrastructure and property services | • Changes in rates of deterioration - faster deterioration in wetter areas but potentially slower deterioration in areas where rainfall decreases. Deterioration may also result from higher temperatures and increased solar radiation.  
• Inundation of surface and/or underground roads in coastal areas, potentially resulting in destruction.  
• Changes in frequency of interruption of road traffic from extreme weather events and emergency transport routes disrupted. |
| Road/pavement construction and maintenance | • More intense rainfall resulting in inflow and infiltration into wastewater networks.  
• Exceedance of existing flood defences.  
• Exceedance of drainage capacity.  
• Reduction in drainage capacity due to sea level rise and storm surge.  
• Changes in mean and peak stream and river flows.  
• Lower levels of rainfall, reducing pressure on stormwater systems. |
| Stormwater/Drainage | • Changes in building heating/cooling costs (can be either negative or positive).  
• Increased risk of damage from bushfires.  
• Changes in frequency of wind, rain, hail, flood, storm events and damage, potentially resulting in destruction.  
• Cyclone damage and destruction due to changes in wind intensity.  
• Higher rates of building deterioration and associated maintenance costs. |
| Buildings | • Increased coastal erosion and inundation.  
• Increased frequency, or permanent inundation of, coastal infrastructure and utilities, e.g. water, sewerage, gas, telecommunications, electricity, transportation.  
• Destruction, damage and disturbance to council-managed marinas and boat ramps.  
• Increased erosion and/or exceedance of seawalls, jetties and other coastal defences. |
| Coastal infrastructure | • Impacts on coastal recreational infrastructure.  
• Loss of existing public space in coastal areas.  
• Impacts on tourism/recreation activities along the coast.  
• Increased costs associated with operation and maintenance costs of public amenities/recreational sites due to storm damage. |
| Provision and use of recreational facilities | • Reduced water quality and quantity resulting in less watering/irrigation of open space and sports grounds and closure of pools.  
• Limited water for swimming pools, etc.  
• Beach closures, e.g. due to E.coli levels after storms. |
<table>
<thead>
<tr>
<th>ASSETS/SERVICE DELIVERY</th>
<th>POSSIBLE CLIMATE CHANGE IMPACTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health services</td>
<td>• Milder winters improving communities’ comfort levels.</td>
</tr>
<tr>
<td></td>
<td>• Increase in geographical range and seasonality of vector-borne diseases and the possibility for an expansion of receptive zones.</td>
</tr>
<tr>
<td></td>
<td>• High temperatures increasing incidence of food and water-borne diseases.</td>
</tr>
<tr>
<td></td>
<td>• Risk of increased cryptosporidium infections during open water swimming in summer.</td>
</tr>
<tr>
<td></td>
<td>• Health impacts due to exposure to extreme weather, e.g., heatwaves.</td>
</tr>
<tr>
<td></td>
<td>• Excessive rainfall events transporting contaminants into waterways and drinking water supplies.</td>
</tr>
<tr>
<td></td>
<td>• Increased pressure on drinking water supplies.</td>
</tr>
<tr>
<td></td>
<td>• An increase in injuries due to increased intensity of extreme events, e.g., storm surge and coastal flooding in coastal regions of Australia due to changes in sea level rise and human settlement expansion into coastal catchments.</td>
</tr>
<tr>
<td>Emergency/bushfire management</td>
<td>• Increased emergency response and recovery operations.</td>
</tr>
<tr>
<td></td>
<td>• Risks to public safety and tourism and longer term impacts on regional economies.</td>
</tr>
<tr>
<td>Planning and development approvals</td>
<td>• Inappropriate location of urban expansion areas.</td>
</tr>
<tr>
<td></td>
<td>• Increased uncertainty in long-term land-use planning and infrastructure design, i.e., location of future developments, suitability of infrastructure designs to cope with changing climate, etc.</td>
</tr>
<tr>
<td></td>
<td>• Cost of retrofitting of systems.</td>
</tr>
<tr>
<td></td>
<td>• Loss of private property and community assets.</td>
</tr>
<tr>
<td></td>
<td>• Increase in insurance costs.</td>
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<tr>
<td></td>
<td>• Increased pressure on disaster management and response resources.</td>
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<tr>
<td></td>
<td>• Early retirement of capital infrastructure.</td>
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<tr>
<td>Natural resource management</td>
<td></td>
</tr>
<tr>
<td>Coastal management</td>
<td>• Increased coastal erosion and inundation.</td>
</tr>
<tr>
<td></td>
<td>• Loss of private property/community assets.</td>
</tr>
<tr>
<td></td>
<td>• Loss of beach width.</td>
</tr>
<tr>
<td></td>
<td>• Changes to wetlands due to sea level rise, shoreline erosion and saltwater intrusion.</td>
</tr>
<tr>
<td>Weed/pest management</td>
<td>• Changes in distribution of invasive species due to changes in climate and associated loss of biodiversity and changes to bushfire intensity.</td>
</tr>
<tr>
<td>Biodiversity</td>
<td>• Shifts in distributions of plant and animal species.</td>
</tr>
<tr>
<td></td>
<td>• Increased risk of population and species extinctions.</td>
</tr>
<tr>
<td></td>
<td>• Reduced ecosystem resilience to stress.</td>
</tr>
<tr>
<td></td>
<td>• Increased ecosystem and species heat stress.</td>
</tr>
<tr>
<td></td>
<td>• Increased pressure on dunal systems.</td>
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<tr>
<td></td>
<td>• Changes to mangrove habitats due to salt water intrusion.</td>
</tr>
<tr>
<td></td>
<td>• Increases in ecological disturbances.</td>
</tr>
</tbody>
</table>
Organisational Structure and Culture

Organisational change is not a coincidental effect of advocacy, but rather a result of a conscious process of reflection, adaptation and innovation that results in a diffusion of an issue through an organisation (Strengers, 2004). There is a distinct trend from the in-depth interviews that climate change cannot be isolated within one department. Climate change needs to be implemented by numerous local government departments. This was made clear at Casey Council with the street lighting project where, despite being an initiative developed by the environmental section, its implementation was dependent upon traffic, engineering and other sections of council. This whole-of-organisation approach was also encountered at a state government level, where climate change directives needed to be integrated within action plans and policies from departments such as primary industries, and was not limited to the DSE. Jennifer Kane from the VGO states that:

“.. the Department of Sustainability has coordinated the strategy which is a whole of government strategy.... I think we may have been one of the first to go down that path... we also tried to have a very open approach with other states and jurisdictions”.

Source: AGO, 2007a, pp. 9-11
From a local government perspective, both Penrith and Casey Councils acknowledged the need for a whole-of-organisation approach, and working collaboratively with other departments to successfully implement climate change initiatives. Paul Mulley from Penrith Council notes that a whole-of-organisation approach is required:

“There are responsibilities throughout the whole organisation... people are aware of what needs to occur..... they are aware of the various programs that exist and their responsibility to deliver these strategies.”

Similarly, Greg Hunt from the WPGA states the importance of integrating climate change within the whole organisation, and the need to extend responsibility from the environmental department to other departments in order for implementation of initiatives to be successful:

“I’d certainly support the notion that these issues ought to be broadened across councils and not remain within the environmental department because clearly the capacity to implement these things if they’re taken on by other departments is probably going to be greater.”

Wilson’s (2006) study on climate change adaptation at the local level in the UK found that climate change was generally confined to the environmental department, and awareness of climate change within other areas, particularly planning, was lacking. This inability to diffuse climate change values throughout an organisation considerably hampers the ability of initiatives to be successfully implemented. It has been previously established that more than one department is needed to deliver the various programs which fall under the climate change umbrella. As such, pre-conceived notions of council procedure and bureaucratic red tape often act as a barrier to climate change initiatives. Often, once a council’s organisational culture has been established, it remains unchanged for years. In these circumstances it can be difficult to establish support from other departments. Jennifer Kane, drawing upon her previous experiences as a local government employee, notes:

“... in terms of the capacity of the organisation to be able to respond to change, then definitely. And I think the difficulty with local government is that it is constructed of silos. And the engineering department is the classic example of where engineers have been there for decades and they haven’t changed their outlook.”

Whilst Harris and Crane (2002) argue that culture change is largely limited to modest behavioural change and is at best an incorporation of environmental responsibility into
existing frameworks, Penrith Council’s adoption of sustainability as part of their organisational culture has provided a successful pathway for climate change initiatives. A clear policy directive and formalised procedures are required within councils to successfully overcome organisational barriers. Penrith Council is an outstanding example of how sustainability has been integrated as a whole-of-government approach. Whilst a separate sustainability unit exists within council (see Figure 6-4 below), a clear sustainability policy directive has been established in the overall council plan. Casey Council, however, has an environmental section which is combined with engineering (see Figure 6-3). This can hamper efforts to progress climate change initiatives with competing objectives and resourcing. Clear responsibilities and roles have been established at Penrith Council within each initiative as ‘Action Cards’ which set out the responsible departments and time frames which need to be adhered to in order for the initiative to be successfully completed. The use of formalised procedures such as these help set timeframes, establish clear roles and responsibilities and allow the diffusion of environmental issues to occur throughout the whole organisation.

![Figure 6-3. City of Casey Council organisational chart.](image)

Source: CCC, 2007
While the General Manager has overall accountability for the performance of all aspects of the organisation there are particular reporting relationships which need to be clearly confirmed.
Chapter 6: Climate Change Drivers and Barriers

6-4 Penrith City Council organisational chart

Source: PCC, 2007b
Lack of Support from State and Federal Governments

Wilson (2006) found, in her study on climate change adaptation at the local level, that most planning respondents saw clear national policy status as essential for the success of local climate change initiatives. National directives provide a firm policy direction for councils and help raise awareness of the profile of climate change to both planning staff and Councillors. The Case Studies Report by the MAV (2007) reported findings that the provision of greater guidance from external organisations would help support planning decisions, improve community and stakeholder awareness, and assist in priority setting.

The in-depth interviews revealed similar results, from both state organisations and the local council case studies. It was made clear by all respondents that responsibility for climate change should come from all levels of government. Jennifer Kane noted that there was a distinct policy vacuum from commonwealth government on adaptation issues, which has tried to be filled by the Victorian state government. She further elaborated that the role of local councils should be as a delivery agent, with a strategic policy setting that needs to be established at the state and commonwealth levels. This denotes the importance of not only guidance from state and federal governments, but a clear policy stance to provide local councils with certainty, and the ability to establish initiatives that are supported by state and federal strategic policy.

Kane also noted that trends which result in local governments extending further that minimum state and commonwealth policy such as building codes has provided a clear indication of the autonomy that councils can exert, and lack of guidance provided from higher levels of government. In this instance, concern has arisen from industry in regards to local governments administering controls beyond minimum state requirements. Kane states that:

“.. the best way.. is to take a two-pronged approach by looking at minimum standards but then also look at what we can do to encourage best practice and go beyond minimum standards”.

Each level of government has a different role in the climate change response that needs to be clearly vocalised in order to allow collaborative partnerships between all levels of government. Conflict occurs where these roles and responsibilities overlap and may result in policies that are conflicting. The role of local government as a delivery agent therefore needs clear direction from federal and state levels to allow them to develop their own strategic responses to climate change. We are increasingly seeing local governments
developing their own policies to climate change to fill the policy vacuum generated by state and particularly federal governments. Paul Mulley for Penrith Council states that:

“From a federal perspective I believe that as Australians, we need to have laws that align... so that we’re all working in the one direction... Then you have that pyramid effect... once those initiatives have been passed down from federal governments, then it’s state governments responsibility to work with local governments who then take it to the community....”

Whilst many perceive NSW as a leader in legislative requirements with the introduction of the Greenhouse Gas Abatement Scheme and carbon sequestration, the research results of this thesis show that Victoria has generally provided a more supportive and collaborative role for local governments when responding to climate change. This is evident from the greenhouse alliance program and similar initiatives. When questioned in regards to the need for more leadership for local government, Interviewee A* from the NSW state government noted:

“That would be nice, but we live in the real world, and governments by their nature are political, so in terms of planning adaptation and planning regulations their needs to be every level of government involved because every level has a role of play”.

The NSW state government has provided regulatory controls such as BASIX, which, despite its criticisms, provides a baseline standard for the development industry. This is currently lacking in Victoria. However, the financial support and collaboration provided in Victoria for local governments was found to be better than the NSW case studies, especially with the establishment of the greenhouse alliances, which over half the councils in Victoria are members. This has been essential in the provision of support and regional information for the development of climate change initiatives, particularly for adaptation responses. Luke Murphy, from the MAV, notes:

“In terms of climate change I think that has initially been driven by the state. So the state government established the greenhouse alliances which the main proportion of membership are local government.”

* Interviewee A requested to remain anonymous for the purpose of this thesis
Is Legislation the Answer?

As stated by Greg Hunt, “the best way to bring a lot of change very, very quickly would be some kind of legislative requirement to reduce carbon emissions”. Similarly, Paul Mulley from Penrith Council states:

“I think that it’s great to have education and an aware community, but when it comes down to it... legislation is probably the way to go, in that you are going to get a response from education because there are going to be those pro-active community members, pro-active staff... but at the end of the day you’re not going to get everyone.”

The practicalities of this type of wholesale regulatory framework for climate change are questionable, given competing economic interests that are an important policy directive at both the state and federal level. Kane notes that regulatory mechanisms can sometimes stifle innovation, particularly at the local level. This was further reiterated by Dwyer, drawing upon her experiences at Leichhardt Municipal Council as the Environmental Officer when the NSW Building Sustainability Index (BASIX) was introduced. She stated:

“BASIX looked good when it first came out, where it raised the bar and they actually had to do something. But for about the dozen or so Councils that were above the bar....they never actually took it to the next level......and it’s taking away the ability of local government to develop and legislate broad reaching controls to make really big differences, like the Solar DCP in Leichhardt.”

Litigation was seen as an important driver for Casey Council. The potential of councils to be held accountable for decisions made which do not take into account climate change has been perceived as a driver for initiatives. Particularly at the local government level, despite a lack of regulation, initiatives need to be developed in order to prevent possible council liability. Peel (2007) notes that despite opportunities for the courts to include climate change in environmental impact assessments, a strong national-level regulatory response is still required to generate behavioral change to produce reductions in emissions.

The implementation of regulation needs to be carefully monitored at the local level, particularly through community consultation. Legislative requirements need to be balanced with local council autonomy and their ability to assume responsibility for climate change impacts that affect their own organisation and constituents directly. However, not all local
governments are ‘best practice’ leaders in climate change initiatives, and certainly not all councils have the ability to do so. Kane notes the role of state government is to provide resourcing and encouragement of local government participation to meet minimum standards of expectation.

Conclusion

Difficulty begins to emerge with locating the onus of responsibility, both at a government and institutional level. As stated by Wilson (2006), formal links between climate change strategies and planning departments within local governments were not strong. This is no exception in the case studies explored in the above analysis. Whilst changes in organisational structure to facilitate networks can be difficult, methodologies need to be implemented which allow for the diffusion of climate change strategies that create a whole-of-government approach.

Despite a lack of support from federal and state governments, these two councils have taken a step beyond what is required by legislation and regulatory controls. Whilst there have been a number of barriers to climate change, there are also important drivers which have been investigated, including the need to respond to community and wider stakeholder concern, liability and protection of council infrastructure, membership to transnational networks and regional alliances, and the role of advocacy within organisations. With such institutional factors and structural limitations, it has been clearly established that local governments have a role to play in the climate change arena, which has been supported from the in-depth interviews. Whilst differing roles of local government have been presented, it is clear that they cannot operate without the support of neighbouring councils, transnational and regional networks, and federal and state support.

As stated by Bulkeley and Bestill (2003), traditional distinctions between state and non-state, local, national and global, are distorted by the challenges of climate change. We are seeing a nexus develop between federal and local governments with direct government funding that by-passes traditional state bureaucratic functions and gives renewed autonomy to local governments. Whilst legitimisation of climate change may lie with the state, sources of risk can be identified and mitigated locally. Partnerships with non-government organisations, private enterprise and other government bodies allow local government to branch out from
traditional state delegated functions and investigate new initiatives to tackle global problems from a local perspective.

The above drivers and barriers to climate change identified in this chapter will be used as the basis for a number of recommendations for policy makers presented in the following chapter. It is envisaged that the recommendations will provide policy makers with an indication of how to diffuse climate change within current organisational structures, and create pathways for its successful development and implementation.
Chapter 7: Recommendations and Conclusion

The purpose of this thesis has been to explore the capabilities of local government as an avenue to address climate change initiatives. In particular, focus has been placed on the relevance of local government as a key stakeholder, actions which they can take, responsibility which councils have to act and the development of key trends in current local government action in Australia. This has been undertaken in the context of federal and state policy, and its implications for local government. Penrith City Council (NSW) and Casey City Council (Vic) were used to show case how initiatives can be implemented at the local level and to identify the barriers and drivers for these action. This concluding chapter seeks to summarise the research findings, establish recommendations to allow the successful development and implementation of climate change initiatives and further research to be pursued.

Research Findings

The results of a nationwide survey of local government planners identified Councillors as the key stakeholders in identifying interest in climate change in councils. Further, councils which have existing ESD policies are more likely to show an interest in climate change. This has important implications for the framing of climate change, as theorised in the literature review. Trends identified in council membership of the CCP program and joint ventures with neighbouring councils support the notion that transnational networks and regional partnerships are integral to the successful establishment of climate change initiatives.

Following the survey results, drivers and barriers to climate change were identified from two case studies in NSW and Victoria, being Penrith City Council and Casey City Council respectively. They are outlined in the table below.
Table 7-1. Summary of research findings.

<table>
<thead>
<tr>
<th>Drivers</th>
<th>Implications for Council</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Role of advocacy</strong></td>
<td>If there is a member of the organisation pushing the agenda, climate change culture can be infused within the organisation. It is this leadership role which can delineate successful councils from those with struggle with climate change action.</td>
</tr>
<tr>
<td><strong>Environmental framing of climate change</strong></td>
<td>Councils which have a strong environmental policy focus are likely to be more successful with the introduction of climate change initiatives. It can be used as a mechanism to make the organisation and the community more aware.</td>
</tr>
<tr>
<td><strong>Political and Community Responsibility</strong></td>
<td></td>
</tr>
<tr>
<td>Protection of council infrastructure</td>
<td>Local government is a significant owner of infrastructure and therefore have a responsibility to maintain a significant amount of building and road assets. They also have a role in assisting businesses and the community with their infrastructure.</td>
</tr>
<tr>
<td>Community responsibility</td>
<td>Whilst the socio-demographics of communities are important, the results are varied in climate change responses as other factors determine a community’s reaction, such as the presence of rural and coastal land. Councils have a responsibility to respond to the needs of their constituents.</td>
</tr>
<tr>
<td>Council liability</td>
<td>Local governments need to be vigilant to ensure that policies and programs reflect a reasonable response to the risks of climate change, including service, planning and development activities.</td>
</tr>
<tr>
<td>Delivery mechanism of council</td>
<td>Council’s role should be one which focuses on the delivery of strategic policy provided from higher levels of government.</td>
</tr>
<tr>
<td>Membership to transnational networks and regional partnerships</td>
<td>Councils which are members of transnational networks such as the CCP program, and participate in joint partnerships with neighbouring councils benefit from financial support, shared knowledge and a greater skills base.</td>
</tr>
<tr>
<td><strong>Community Activism</strong></td>
<td>An active citizenry on climate change can drive initiatives at the local level, particularly through community groups and collective action.</td>
</tr>
<tr>
<td><strong>Positive Reinforcement</strong></td>
<td>Showcasing the successful results of climate change initiatives raises awareness both internally at a councillor and upper management level, and within the wider community.</td>
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</table>

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Implications for Council</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lack of support from management and Councillors</strong></td>
<td>Support from elected representatives and management is important for the development implementation of climate change initiatives. They provide pathways for the adoption of initiatives due to council processes and bureaucratic structure.</td>
</tr>
<tr>
<td><strong>Lack of finance and</strong></td>
<td>The ability to obtain financial resources and skills within the</td>
</tr>
</tbody>
</table>
resources
organisation is a large barrier for local governments. Smaller councils struggle to obtain resources due to budgetary constraints, and policy outcomes are difficult to obtain due to the lag time in seeing the direct benefits of initiatives.

Struggles with adaptation
Local governments do not have the capacity to respond to adaptation issues due to the research and tools involved. Councils also need to work regionally with neighbouring councils to respond to issues which cross council borders.

Organisational structure and culture
The responsibility for the implementation of initiatives falls to a number of different departments within council. Diffusion of climate change within organisations is essential to ensure initiatives are successful.

Lack of support from state and federal governments
National directives provide a firm policy direction for councils and helps raise awareness. Local governments require leadership and support from state and federal governments for initiatives to be successful. Many have indicated this is currently lacking.

It is clear from the initiatives outlined in Chapter 6 that local governments have a significant role to play in adaptation and mitigation responses to climate change. It is because of their grassroots capability that local governments have the capacity to serve as a delivery mechanism for policy set at a federal and state level. However, due to the policy vacuum that has been created, particularly by the federal government, councils have struggled to set their own policy positions amongst conflicting stakeholder concerns about climate change.

Greater support from federal and state governments is required councils to make significant contributions to reducing carbon footprints. Residents and local businesses alike require support from their local council, encouragement and formalised programs which offer incentives and the ability to reduce their greenhouse gas emissions. However, the ability of Council to develop and implement such initiatives is hampered by a lack of responsiveness from federal and state governments. This thesis found a differentiated result between the NSW and Victorian case studies, particularly with adaptation responses. It is the need for finance and localised information that provided a significant barrier for Penrith City Council. However, the legislative response from the NSW government has been significantly stronger than its Victorian counterpart. Whilst voluntary initiatives have proven successful at the local level, their ability to capture large numbers of people and create widespread change is limited. Legislation coupled with voluntary initiatives is key in changing behavioral patterns and providing solutions to climate change.
The need for networks and partnerships has been established for the provision of successful pathways to climate change initiatives. The CCP program and greenhouse alliances allowed the sharing of information and resources between member councils, and offered support when needed. Local governments cannot act alone when responding to climate change. They have a responsibility to act within the constitutional framework as an arm of their state counterpart, whilst ensuring that their policies and programs reflect a reasonable response to the risks of climate change. These two roles, although often conflicting, need to be addressed by local governments in a manner which is responsive to the needs of their constituents and provide balance for differing stakeholder concerns.

Planning is very much viewed as outcome-based, with concrete results that can be reviewed and placed back into policy goals in a cyclic fashion. In order for local communities to become active about climate change, it is imperative they are able to see the outcomes of policy decisions made, in real-world benefits. The current responses to climate change range from voluntary initiatives to regulation. Burton & Dredge (2007) conclude that due to delayed responses to climate change combined with increasing dire predictions, a new sense of emergency is emerging which may limit the ability of policy makers to ease the community into climate-related responses. This is perhaps where the importance of framing climate change, education and workshops come to the forefront of the debate. This cannot occur, however, without an acceptance of climate change and organisational change occurring from within local government.

**Recommendations**

On the basis of the research and analysis presented in the preceding chapters it is apparent that councils must deal with a number of challenges in order to respond effectively to climate change. Whilst some barriers are difficult to overcome, effective tools and strategies can be put in place to manage these barriers in order for climate change actions to be successful. Local governments cannot be seen in isolation when looking at climate change. There are a number of stakeholders, including federal and state governments, who through their action or inaction affect the direction of climate change policy at the local level. Below are a number of recommendations which seek to improve climate change initiatives at the local level, and guidelines for the diffusion of climate change within local organisations:
Chapter 7: Recommendations and Conclusion

- **Clearer policy direction and support is required from federal and state governments.**
  This provides councils with a clear policy platform from which to develop their own strategic responses to climate change. Whilst local governments do have established transnational networks to which they can become members, they do not have the capacity to respond to climate change independently of federal and state governments, nor should they be under current constitutional arrangements. Greater support is thus required from higher levels of government.

- **There needs to be recognition from all levels of government of council’s role as a delivery mechanism for federal and state policy on climate change.**
  The research findings support council’s role as a delivery mechanism for federal and state policy. In the absence of clear direction, local councils have devised their own policies in order to fill this policy vacuum and honour their responsibilities. Greater guidance and leadership would provide for a consistent approach from local governments and baseline standards to develop further.

- **Councils need to accept their own roles and responsibilities when responding to climate change.**
  Councils have a responsibility to address the needs within their own boundaries, especially as a response to the concern of stakeholders and protection of council assets. It is also vital that councils identify risks associated with climate change, whether they are tangible, such as environmental risks, and non-tangible, such as litigation, and ensure they have been addressed to the best of their capability.

- **Membership to the CCP program provides councils with successful pathways to mitigation strategies at the local level.**
  The CCP program is a vital resource which individuals and groups within local authorities can draw upon to advance a particular discourse of local environmental policy that has global consequences. The ability of the CCP program to provide methodologies, support networks, a policy position for council creates links to the global climate change debate which can overcome a lack of federal or state support.

- **Climate change needs to be addressed on a regional scale by local government to adapt to the impacts of climate change.**
  The importance of regional partnerships in adaptation strategies, needs to be recognised by local government, particularly in NSW. Victorian greenhouse alliances are an
example of the need to work regionally with neighbouring councils. Partnerships provide a support mechanism, efficient delivery and regional data collection. Financial support for these and similar programs should come from federal and state governments.

- **Fostering a culture of environmental sustainability increases the responsiveness of councils to address issues such as climate change.**
  As climate change is far-reaching and extends across many different environmental issues such as biodiversity, habitat preservation, water conservation and coastal erosion, local governments which have a strong environmental focus are more likely to have success with the development and implementation of climate change initiatives.

- **Councils should implement both mitigation and adaptation strategies to respond to climate change.**
  Councils need to identify and respond to the full range of risks which face their local government area, and ensure that their capacity to address climate change extends to both mitigation and adaptation.

- **Opportunities for advocacy roles and leadership should be fostered within local government organisations.**
  The case studies have shown the importance of advocacy and leadership for the development of climate change initiatives. This can come either internally from staff, management or Councillors, or from external stakeholders such as the community. An environment where advocacy is encouraged needs to established by local governments to foster innovation and standards which go beyond minimum requirements.

- **Formalised programs should be developed within councils on climate change initiatives.**
  Formalised programs allow councils to have a tangible goal which they can work toward, measure their progress and achieve outcomes. Formalised programs also provide a clear indication of each department’s roles and responsibilities which establishes a collaborative pathway to climate change initiatives.

- **The role of education should be recognised as integral to any climate change response from local government.**
  Education of the community is important to provide stakeholders with information and pathways to reducing their climate change footprint and responding to the effects of
climate change. It is also integral to educate individual decision makers and management to ensure their understanding translates to effective policy solutions.

- **Councils need to have a clear policy position that is integrated into an overall plan of management.**
  The establishment of a clear policy position drives change within councils. It allows for the delegation of roles and responsibilities and allocation of funding for projects to occur. It also sends a clear message to staff, external stakeholders and the community what councils objectives are, and how they are effectively responding to meet those objectives.

- **An assessment needs to be undertaken of the skills and resources available at Council to address climate change.**
  Councils need to ensure that they have the skills base and resources to properly develop and implement climate change strategies which will effectively address climate risk.

- **Councils need to set emission reduction targets to effectively mitigate greenhouse gas emissions.**
  Quantifying results are important. It provides clear goals which council can work towards, and measurable results. This is vital for the development of policy, which needs to be reviewed in a cyclic fashion.

**Conclusion**

Government involvement in climate change occurs on multiple levels, from the global to the local. There has been a growing awareness that any global response to climate change must involve local action, given that the human activities that lead to climate change occur at a grass roots level (Bulkeley and Betsill, 2003). Since greenhouse gas emissions originate from processes that are place-specific, it is often argued that the most appropriate governance level to implement strategic action on climate change is the local. Whilst local governments are restricted in a regulatory sense by state and federal legislation, they have a responsibility to create and implement actions on climate change.

From this thesis, it is clear that there are barriers to climate change responses that exist within local government organisations which need to be managed and coordinated to create avenues for climate change to be addressed. The policy vacuum created by the federal
government can be used as an opportunity for state and local governments to provide actions on climate change that are responsive to the unique issues and geography of regions. However, in order for an effective global response on climate change to occur, a consistent approach needs to be provided by all levels of governments. Legislation is needed to support voluntary action and local government policy needs to be placed within a contextual framework of strategic direction set by higher levels of government. The role of local government as a delivery mechanism needs to be recognised by all levels of government. Whilst climate change is a global issue, local government plays an important role in responding to the unique challenges which it presents. Through the establishment of networks and partnerships, councils can provide an effective means for responding to climate change that involve all stakeholders within the community.


37. Penrith City Council (2005a) *Sustainability Blueprint for Urban Release Areas* (Penrith, Penrith City Council).


40. Penrith City Council (undated b) Sustainability Revolving Fund Guidelines (Penrith, Penrith City Council).


46. Westernport Greenhouse Alliance (undated) *Background to the Greenhouse Alliance* (Melbourne, WPGA).


49. Western Port Greenhouse Alliance (2007c) *Sustainable Public Lighting Action Plan: A Local and Regional Approach in Western Port* (Melbourne, WPGA).


APPENDIX A
23 August 2007

Application No: 75072
Project Title: Climate change and local government
Attention: Fernandes Bianca
Student No: 3100098

Dear Fernandes,

Thank you for your application requesting approval to conduct research involving humans. The Panel has evaluated your application and upon their recommendation, has attached the decision below.

Please be aware that approval is for a period of twelve months from the date of this letter, unless otherwise stated below.

Decision

Approved with conditions

Your application is approved; however, there are certain things you must do, before you may conduct your research. Please see below for details, and your responses will assist us in completing your file.

<table>
<thead>
<tr>
<th>Item</th>
<th>Details</th>
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<tbody>
<tr>
<td>1. Items that must be completed before research can commence:</td>
<td>You will need to obtain a letter of support from the organisation’s management, especially when you intend to interview employees. This letter of support must conform with Form 6. Please forward all letters to HREAL to complete your file.</td>
</tr>
<tr>
<td>2.</td>
<td>The information provided in your application about the timing of your research is either too vague or implies that the research may have already started. We cannot approve your application retrospectively. Please confirm that your research involving interviews or questionnaires has not commenced. Also please provide your detailed timing schedule to the HREA panel.</td>
</tr>
<tr>
<td>Advisory comments:</td>
<td>Should you or your participants be making photographic, video or audio recordings that include people, please be aware that: • Recordings in public places do not generally require the permission of the people who are in those public places. However, this will depend upon the sensitivity of the subject matter and the situation • If you will be specifically identifying any person in photos or videos which you intend to publish, you will require their signed consent • Photographs or videos of identifiable people on private</td>
</tr>
</tbody>
</table>
property should not be made without their consent, even when taken from public property.

Any approval to conduct research given to the applicant Researcher is done so on the condition that the applicant Researcher is at the date of approval: (a) a Student undertaking an approved course of study in the FBE; or (b) a member of Academic Staff in the FBE. If, at any time subsequent to the date of approval and prior to completion of the research project the applicant Researcher ceases to be either of (a) and (b) above, then any prior approval given to the applicant Researcher to conduct will be deemed to be revoked forthwith. The applicant Researcher must inform the FBE HREA Panel immediately upon any change, or possible change, to the applicant’s status that may affect any prior approval given by the Panel to the applicant Researcher to conduct research.

Evaluation Authority:

Graham Fletcher (Convener)
FBE HREA Panel

Copy to: Robert Zehner, Supervisor

Approving Authority:

Jim Plume
Head of School
Faculty of the Built Environment
A study of climate and local planning

LOCAL GOVERNMENT AREA: ________________________________
STATE/TERRITORY: ________________________________

PLEASE CIRCLE APPROPRIATE RESPONSES IN EACH QUESTION

Q1 How would you describe the climate of your local government area?

(1) Arid  (4) Sub-tropical
(2) Semi-arid  (5) Tropical
(3) Temperate  (6) Other (What? __________________________)

Q2 Are any of the following important issues in your local government area?
(CIRCLE ALL THAT APPLY IN BOTH COLUMNS)

(a) Air Quality  (k) Sedimentation of lakes/waterways
(b) Coastal erosion  (l) Soil erosion
(c) Desertification  (m) Soil salination
(d) Drought  (n) Stormwater re-use
(e) Drainage and water runoff problems  (o) Tropical storms and cyclones
(f) Falling water table  (p) Water quality
(g) Flooding  (q) Water supply
(h) Habitats preservation  (r) Wastewater re-use
(i) Land clearing/deforestation  (s) Other climate-related issue (What? __________________________)
(j) Rising water table

Q3 Of those items selected in Question 2, please rank the ones you consider the four most important in your area
(if you have circled that many).

(0) None selected in Question 2
Most important: ________________________________
2nd importance: ________________________________
3rd importance: ________________________________
4th importance: ________________________________

Q4 Have there been any noticeable changes in climate in your area in the last 10 to 20 years?

(1) Yes  (2) No  (3) Don’t know

4a What changes have there been? ____________________________________________________________

Q5 Does your council have specific policies and/or regulations at the present time that deal with any of the issues
listed in Question 2?

(1) Yes  (2) No

5a For which ones? ____________________________________________________

Q6 Most scientists agree that the earth’s atmosphere is gradually warming due to the Greenhouse Effect. Possible
consequences of that in the next 30-50 years in Australia include warmer temperatures, changes in the amount of
rainfall (more in some areas, less in other areas), rising sea levels, and the movement of tropical storms and
cyclones further south. How likely is it that any of the changes would have an effect on your area? (PLEASE
CIRCLE YOUR RESPONSE)

Very likely ___ 5 ___ 4 ___ 3 ___ 2 ___ 1 ___ Not at all likely
(0) Don’t know

1
Q7 Which changes, beneficial or adverse, might affect your area?

(0) None

Q8 What are the main economic activities within your local government area at the present time?
(CIRCLE ALL THAT APPLY IN BOTH COLUMNS, AND ELABORATE WHERE SPECIFIED)

(a) Agriculture (What type(s)?________) (f) Mining (What type(s)?________)
(b) Commercial (What type(s)?________) (g) Retirement settlement
(c) Fishing (h) Tourism
(d) Forestry (i) Other (What?________)
(e) Industry/Manufacturing (What type(s)?________)

Q9 Would any of these activities be affected by changes in climate related to “greenhouse” effects?
(LEAVE BLANK WHERE ITEM NOT CIRCLED IN QUESTION 8)

<table>
<thead>
<tr>
<th>YES</th>
<th>No</th>
<th>Don't Know</th>
</tr>
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<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
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Q10 Has there been any interest within your council about the possible impacts of long term changes in climate on planning in your local government area? (PLEASE CHOOSE ONE)

(0) No real interest at the present time (Skip to Question 13)
(1) Some interest and some formal discussion (Skip to Question 13)
(2) Some interest and preparation of papers for discussion
(3) Discussion which has led to proposals for changes in council policies regarding planning and development
(4) Discussion which has led to actual changes in council policies regarding planning and development

Q11 Please elaborate on your response to Question 10

ACTUAL POLICY CHANGES: ____________________________________________

(OTHER) PROPOSED CHANGES: ________________________________________

(OTHER) TOPICS FOR DISCUSSION PAPERS: ____________________________

Q12 Are far as you know, have any developments in your local government area been influenced by the actual, proposed or discussed changes in council policy noted in Question 11?

(1) Yes  (2) No  (3) Don't know

↓ 12a In what way? ________________________________________________
Q13 What proportions of the following groups of people would you say are very concerned about long term changes in climate? (PLEASE CIRCLE YOUR ANSWERS)

a) Residents in your local government area
   None 10% 20% 30% 40% 50% 60% 70% 80% 90% All
b) Your council’s elected councillors/aldermen
   None 10% 20% 30% 40% 50% 60% 70% 80% 90% All
c) People responsible for planning matters in your council
   None 10% 20% 30% 40% 50% 60% 70% 80% 90% All
d) Local businesses in your local government area
   None 10% 20% 30% 40% 50% 60% 70% 80% 90% All

Q14 Similarly, what proportions of those groups would you say have a good understanding of issues related to the greenhouse effect? (PLEASE CIRCLE YOUR ANSWERS)

a) Residents in your local government area
   None 10% 20% 30% 40% 50% 60% 70% 80% 90% All
b) Your council’s elected councillors/aldermen
   None 10% 20% 30% 40% 50% 60% 70% 80% 90% All
c) People responsible for planning matters in your council
   None 10% 20% 30% 40% 50% 60% 70% 80% 90% All
d) Local businesses in your local government area
   None 10% 20% 30% 40% 50% 60% 70% 80% 90% All

Q15 How would you rate yourself in terms of your concern about long term climate change?
   Not at all concerned: 1 : 2 : 3 : 4 : 5 : Very concerned

Q16 And how would you rate your own understanding of issues related to the greenhouse effect?
   Very good understanding: 1 : 2 : 3 : 4 : 5 : Very limited understanding

Q17 What level of influence have the following sources had on your knowledge of greenhouse effect issues?
(LEAVE BLANK SOURCES THAT HAVE HAD NO INFLUENCE)

<table>
<thead>
<tr>
<th>Source</th>
<th>High Influence</th>
<th>Low Influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Newspapers, television, radio</td>
<td>(5) (4) (3) (2) (1)</td>
<td></td>
</tr>
<tr>
<td>(b) The Internet</td>
<td>(5) (4) (3) (2) (1)</td>
<td></td>
</tr>
<tr>
<td>(c) Scientific reports</td>
<td>(5) (4) (3) (2) (1)</td>
<td></td>
</tr>
<tr>
<td>(d) Government reports</td>
<td>(5) (4) (3) (2) (1)</td>
<td></td>
</tr>
<tr>
<td>(e) Seminars and conferences</td>
<td>(5) (4) (3) (2) (1)</td>
<td></td>
</tr>
<tr>
<td>(f) Discussions with colleagues and friends</td>
<td>(5) (4) (3) (2) (1)</td>
<td></td>
</tr>
<tr>
<td>(g) Other (What?)</td>
<td>(5) (4) (3) (2) (1)</td>
<td></td>
</tr>
</tbody>
</table>

Q18 Are you aware of any work within the state government department(s) in your state related to long term climate change and/or greenhouse effects?
   (1) Yes  (2) No  (3) Not sure

18a What have been the major initiatives pursued by state government in addressing this issue?

18b Have any of these initiatives been useful in planning for climate change in your local area?
Q19 Are you aware of any work within federal government department(s) related to long term climate change and/or greenhouse effects?

(1) Yes  (2) No  (3) Not sure

19a Are you aware of the Federal Government’s involvement in any international agreements regarding long-term climate change?

(1) Yes  (2) No  (3) Not sure

19b What specifically?

Q20 How would you rank who you think should be responsible for deciding on long-term planning policies to deal with possible greenhouse effects? (RANK 1-3, WHERE “1” REPRESENTS HIGHEST LEVEL OF RESPONSIBILITY, “3” REPRESENTS LOWEST LEVEL OF RESPONSIBILITY)

(a) Local Government  (b) Federal Government  (c) State Government

Q21 Has your council prepared ‘joint’ strategies or had discussions with adjoining local councils on the most appropriate way to address climate change?

(1) Yes  (2) No

21b Has your interaction with other councils improved your understanding of climate change?

(1) Yes  (2) No

Q22 Within your council, have policies on ecologically sustainable development (ESD) been discussed and/or implemented?

(1) Discussed and implemented  (2) Discussed, but not yet implemented  (3) Not yet discussed

27a What has been implemented?

Q23 Does your council have policies related to Water Sensitive Urban Design (WSUD)?

(1) Yes  (2) No

23a What are those policies?

Q24 Does your council set conditions for Development Applications (DAs) to address “green design” issues?

(1) Yes  (2) No

24a What are those conditions?

Q25 How willing is your council to provide incentives to developers who incorporate ESD principles into design?

(a) Willing and have already implemented  
(b) Willing, but haven’t yet done so 
(c) Not willing 
(d) Haven’t discussed it 
(e) Don’t know
Q26 Is your council a member of the Cities for Climate Protection (CCP) program?
   (1) Yes  (2) No  (3) Preparing to join

26a Has this had an impact on the management of climate change issues in your council?
   (1) Yes  (2) No

26b In what way?

Q27 How active are residents in your local government area?
   (1) Little or no public activity or interest
   (2) A few active people, but no widespread interest
   (3) A few active people and widespread interest
   (4) A number of active people and widespread interest

Q28 What are the main issues these people/groups have raised in the last twelve months?
   (6) No issues raised
   ISSUES RAISED: (a) ____________________________________________
   (b) ____________________________________________
   (c) ____________________________________________
   (d) ____________________________________________

Q29 Has your council conducted any community workshops regarding environmental issues in your local government area?
   (1) Yes  (2) No  (3) Not yet, but scheduled within next 12 months

29a What environmental issues have these workshops addressed?

Q30 During the past twelve months, in what proportion of the Development Applications (DAs) processed by your council has discussion about planning and development been clearly divided into environment issues opposed to economic/development issues?

   None 10% 20% 30% 40% 50% 60% 70% 80% 90% All

Q31 And in your opinion, when considering Development Applications (DAs) in the last twelve months, has a majority of the elected councillors tended to give priority to:
   (1) Economic issues
   (2) Environmental issues
   (3) Both economic and environmental issues fairly equally

Q32 The state of the environment appears to be an important issue in most of Australia, although responses vary from place to place. Are there programs for any of the following in your area that are administered by the council . . . or by another local group?

   (CIRCLE ALL THAT APPLY)

   (a) Recycling of:
      ＞ Aluminium (0) (1) (2)
      ＞ Glass (0) (1) (2)
      ＞ Paper (0) (1) (2)
      ＞ Plastics (0) (1) (2)

   (b) Collection of hazardous chemicals (0) (1) (2)

   (c) Tree planting/reforestation (0) (1) (2)

   (d) Other program (What? ) (0) (1) (2)
Q33 Over the last decade, what have been the trends in your local government area regarding the following issues?

(a) CO₂ emissions
(b) Methane emissions
(c) Industrial energy consumption
(d) Residential energy consumption
(e) Council Energy Consumption
(f) Landfill waste

<table>
<thead>
<tr>
<th>Decreased</th>
<th>Remained Same</th>
<th>Increased</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
</tbody>
</table>

Q34 To help us categorise your Local Government Area, would you say it is:

(1) Urban
(2) Mostly Urban
(3) Equally Urban/Rural
(4) Mostly Rural
(5) Rural

34a Present population (approx.). ____________

34b Area in sq. km. (approx.). ____________

34c Do you have any coastal land in your local government area?

(1) Yes
(2) No

Q35 Approximately how many development applications (DA) have been received at your council in the last 12 months?

<table>
<thead>
<tr>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
<th>(9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-49</td>
<td>50-99</td>
<td>100-199</td>
<td>200-399</td>
<td>400-599</td>
<td>600-799</td>
<td>800-999</td>
<td>1000-1499</td>
<td>1500 or more</td>
</tr>
</tbody>
</table>

Q36 Does your council have a department that is solely responsible for dealing with planning issues?

(1) Yes
(2) No → Which department deals with planning issues? ________________

Q37 How many planners are employed in your council? ________________

Q38 What proportion of these planners have exclusive access to a computer in the planning office?

None 10% 20% 30% 40% 50% 60% 70% 80% 90% All

Q39 How important are the following computer applications/services to planning staff in your local council?

<table>
<thead>
<tr>
<th>Not at all Important</th>
<th>Very Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Word processing</td>
<td>(1) (2) (3) (4) (5)</td>
</tr>
<tr>
<td>(b) Geographic/Land Information Systems (GIS/LIS)</td>
<td>(1) (2) (3) (4) (5)</td>
</tr>
<tr>
<td>(c) Databases (not including GIS/LIS)</td>
<td>(1) (2) (3) (4) (5)</td>
</tr>
<tr>
<td>(d) Spreadsheets</td>
<td>(1) (2) (3) (4) (5)</td>
</tr>
<tr>
<td>(e) Computer presentation packages</td>
<td>(1) (2) (3) (4) (5)</td>
</tr>
<tr>
<td>(f) Statistics and data analysis</td>
<td>(1) (2) (3) (4) (5)</td>
</tr>
<tr>
<td>(g) Computer Aided Design (CAD)</td>
<td>(1) (2) (3) (4) (5)</td>
</tr>
<tr>
<td>(h) Virtual Reality (VR) Mapping</td>
<td>(1) (2) (3) (4) (5)</td>
</tr>
<tr>
<td>(i) E-mail</td>
<td>(1) (2) (3) (4) (5)</td>
</tr>
<tr>
<td>(j) Internet</td>
<td>(1) (2) (3) (4) (5)</td>
</tr>
<tr>
<td>(k) Intranet (Internal Internet Service)</td>
<td>(1) (2) (3) (4) (5)</td>
</tr>
</tbody>
</table>
Q40 How long has a Geographic or Land Information System (GIS or LIS) been in use within your planning office?

(0) No GIS or LIS

____ Months

____ Years

40a Please list the four most important tasks a Geographic or Land Information System (GIS or LIS) is used for in your planning office. (LIST IN ORDER OF IMPORTANCE)

(1)

(2)

(3)

(4)

Q41 What proportion of planners in your council have exclusive access to the Internet?

None 10% 20% 30% 40% 50% 60% 70% 80% 90% All

Q42 What are the four most important work-related uses of the Internet by planners in your office? (LIST IN ORDER OF IMPORTANCE)

(1)

(2)

(3)

(4)

Q43 How often in the last month have you yourself used e-mail or made use of the Internet?

43a E-mail use at work (work-related or personal use)

(1) 5-7 days/week

(2) 1-4 days/week

(3) Less often

(4) Never

43b Other Internet use at work (work-related or personal)

(1) 5-7 days/week

(2) 1-4 days/week

(3) Less often

(4) Never

Q44 Does your council have its own web-site on the Internet?

(1) Yes

(2) No

44b What is your council’s Internet web-site address? http://

Q45 Has the implementation of information technology (IT) improved the efficiency of planning work in your council?

No improvement: 1 : 2 : 3 : 4 : 5 : Great improvement

Q46 How much impact do you believe the Internet will have on the following planning issues in your local government area in the next five years?

Large Impact

Little Impact

(a) Community consultation

(5) (3) (2) (1)

(b) Land use planning

(5) (3) (2) (1)

(c) Information sharing amongst government agencies

(5) (3) (2) (1)

(d) Online tracking of DAs

(5) (3) (2) (1)

(e) Online submission of DAs

(5) (3) (2) (1)

Q47 Do you expect innovation in information technology (IT) to significantly affect the way planning decisions will be made in your local council in the next five years?

(1) Yes

(2) No

47a In what way(s)?
Q48 What do you expect to be the four most important planning related issues/challenges that your council will have to face in the next 2-3 years?

(a) ________________________________
(b) ________________________________
(c) ________________________________
(d) ________________________________

Q49 In your opinion, how effective would you say planning has been when addressing issues that come up on a daily basis in your local government area?

Very effective: 5 · 4 · 3 · 2 · 1 · Not effective

Q50 And in your estimation, how effective do you think your council’s present strategic planning/forward planning will be to manage future changes in your area?

Very effective: 5 · 4 · 3 · 2 · 1 · Not effective

50a Why is that? ____________________________________________________________________

Q51 In a survey of this type, there is always a chance that the answers will not quite capture the things that make a council area distinctive. Is there anything you would like to add about your council’s approaches to climate or environmental issues and/or planning for future change that you think we should know about?

__________________________________________________________________________________

__________________________________________________________________________________

__________________________________________________________________________________

__________________________________________________________________________________

Thank you for your time. It is most appreciated.

If you would like to receive a summary of results from earlier nationwide surveys on Climate Change (2001, 1989) and Computer Use in Local Government (1987) carried out by UNSW School of Town Planning, please tick the box and provide your email address.

☐ Yes, please send a summary of the Climate Change results

☐ Yes, please send a summary of the Computer Use results

If you would like to receive a summary of results from the present survey, please tick the box below and provide your email address.

☐ Yes, please send a summary of the 2006 Climate Change results

Name (optional): ________________________________________________

Email Address: ________________________________________________