

University of Southern Queensland  
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# **Local Government Greenhouse Gas Abatement Reporting**

A dissertation submitted by

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In fulfilment of the requirements of

**Bachelor of Environmental Engineering**

**November 2011**



# ABSTRACT

This research project investigates current and previous local government greenhouse gas emission reporting frameworks both internationally and within Australia. In addition a comparison of the affordability of reporting for three case study Councils of varying sizes is discussed.

The debate within the scientific community has shifted from the existence of anthropogenic climate change to the ways in which society can reduce the causes and adapt to the impacts of climatic changes. Local Government in Australia are at the forefront of mitigating and adapting to climate change and as a result requires sound data for decision making.

The aim of this research project is to investigate the possible features of establishing a national reporting system of local government greenhouse gas abatement for Australia and determine the affordability of reporting such abatement actions. This will include clarifying the point at which reporting becomes financially viable for a local government.

The key objectives of this research project are to:

- Research national reporting systems in operation internationally and any current and previous systems in Australia.
- Critically evaluate the features of existing reporting systems and determine key reporting metrics.
- Identify the minimum reporting standards necessary to comply with Australian reporting legislation.
- Research existing literature with regards to local government information sharing.
- Undertake three case studies of local governments and quantify potential costs of reporting for local government (both voluntary and compulsory).
- Identify possible support mechanisms to minimize the cost of reporting for local governments from both government and non government sources.

This critical analysis of reporting requirements for Local Government will help to show that any future national reporting system of greenhouse gas abatement activities will need to strike a balance. The balance will be between the following:

- The value of information shared between local governments,
- The value of information collated and provided to federal policy makers , and
- The affordability to conduct such reporting.

As a result of this research, best practice criteria for local government abatement reporting has been developed and is recommended. This report also details the research undertaken to estimate the costs for Local Government to report greenhouse gas abatement actions.

**University of Southern Queensland**  
**Faculty of Engineering and Surveying**

<b>ENG4111 Research Project Part 1 &amp; ENG4112 Research Project Part 2</b>
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# CERTIFICATION

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I further certify that the work is original and has not been previously submitted for assessment in any other course or institution, except where specifically stated.

**Kim Graham**  
**Student Number: 0050009124**

A handwritten signature in black ink, appearing to read 'Kim Graham', written over a horizontal line.

Signature

19 October 2011

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# Chapter 1 - Introduction

## 1.1 Outline of the study

This research aims to investigate the possible features of a national reporting system of local government greenhouse gas abatement for Australia and determine the affordability of reporting such abatement actions. This will include clarifying the point at which reporting becomes financially viable for a local government. The scope of this research is outlined in section 1.4 Research Objectives.

## 1.2 Introduction

The debate within the scientific community has shifted from the existence of anthropogenic climate change to the ways in which society can reduce the causes and adapt to the impacts of climatic changes. Internationally there are examples of commitments towards transitioning economies to a low carbon functionality and it is the monitoring and reporting of this transition at a local level that this paper is concerned.

Local governments around Australia are taking measures to reduce greenhouse gas emissions in their jurisdiction. Pillora (2010) notes that there is increasing recognition by the Federal Government that local government is on the frontline in dealing with the impact of climate change on communities, and that a whole of government response is required to manage this challenge. Despite the lack of national leadership on climate change in Australia, local governments are aware of the potential impacts climate change will have on their communities. Local governments recognise the impacts such as more frequent storms, greater bush fire risk, more intense rain fall events and longer periods of dry weather will directly affect their residents, infrastructure and their ability to provide services. It is the recognition of these impacts that is providing motivation for taking action to mitigate and adapt.

In 2008, 184 Councils participated in the *Cities for Climate Protection* program measures reporting initiative and documented 3000 actions taken in the 07/08 financial year. This abatement activity reduced 4.7 million tonnes of carbon dioxide and was achieved across a variety of local government services (International Council for Local Environmental Initiatives 2008). Fleming and Webber (2004) identify local authorities as being able to influence greenhouse gas emissions via the management of Council properties, vehicle fleet, transport management, building control, land use planning, economic development, street lighting and education.

Many Councils in Australia manage a similar portfolio of infrastructure types and functions and provide a similar range of services to their residents. The collective knowledge on mitigation strategies is expanding as more initiatives are implemented in local government and the success and failures of projects are witnessed. The success of a project will depend on its ability to permanently reduce carbon emissions for the organisation and is often coupled with the cost effectiveness of the project. Local governments often look for precedents and examples of success when planning new strategies and the potential for knowledge sharing between Councils is high. Fleming & Webber (2004) note that the local approach can be effective at reducing greenhouse gas emissions and targets could be achieved through partnerships with key stakeholders and more effective exchange of experience between the successful and less successful local authorities. It is important to note that the targets set by local government for their own operations are frequently more aggressive than the Australian Federal Government's reduction target for the nation as a whole (International Council for Local Environmental Initiatives 2008).

## 1.3 The problem

Up until 2009, the International Council for Local Environmental Initiatives (ICLEI), in conjunction with the Australian Federal Government managed the *Cities for Climate Protection* program. This program delivered a framework approach to climate mitigation for local government. As part of the program, each Council would provide an annual report of their greenhouse gas emission abatement activities. The program ended due to the cessation of Federal Government support in 2009, at a time when the program members represented 84 percent of the Australian population (International Council for Local Environmental

Initiatives 2008). The closure of this program has created a large gap in climate mitigation management in local government (Pillora 2010).

Any future national reporting system of greenhouse gas abatement activities for local government will need to strike a balance. The balance will be between the following:

- The value of information shared between local governments,
- The value of information collated and provided to federal policy makers , and
- The affordability to conduct such reporting.

It is difficult to manage what is not being measured, however measurement and reporting has associated costs. Care must be taken to ensure that funding and resources allocated to implementing greenhouse gas abatement action is not unnecessarily spent on reporting. The affordability of reporting on greenhouse gas abatement for local government activity needs investigation to ensure that reporting abatement is viable at all levels of local government.

## **1.4 Research Objectives**

The specific objectives of this research project are to:

- Research national reporting systems in operation internationally and any current or previous systems in Australia.
- Critically evaluate the features of existing reporting systems and determine key reporting criteria.
- Identify the minimum reporting standards necessary to comply with Australian reporting legislation.
- Determine the potential use of an Australian reporting system and subsequent impact of recommended reporting criteria.
- Research existing literature with regards to local government information sharing.
- Determine the need or otherwise for a national reporting system for local government greenhouse gas abatement in Australia.
- Undertake three case studies of local governments and quantify costs of reporting for local government (both voluntary and compulsory).
- Identify possible support mechanisms to minimise the cost of reporting for local governments.

## **1.5 Summary**

A thorough investigation into how Australia can effectively report abatement activity at a local government level is needed to maximise the success of greenhouse gas mitigation efforts. The gap left after the cessation of the *Cities for Climate Protection* program and the changing nature of the climate industry has left local governments with little direction on the subject. This research condenses the body of knowledge on greenhouse gas abatement reporting for local government and aims to recommend key reporting criteria that are practical at a local level whilst still being useful at a national level.

# Chapter 2 - Literature Review

## 2.1 Introduction

At the commencement of this research project, it was anticipated that there would be international examples of local government greenhouse gas abatement reporting to which the previous Australian model managed by ICLEI and the National Greenhouse and Energy Reporting (NGER) guidelines could be compared and reviewed. After a lengthy investigation a handful of examples of local government emissions reporting schemes were identified. Only one example of a local government abatement reporting scheme was found outside of Australia. It is important at this stage to distinguish between emissions reporting and abatement reporting. Emissions reporting documents the amount of greenhouse gas produced by an entity. Alternatively, abatement reporting documents the ways, costs and savings of how the emissions were reduced. The apparent lack of activity in the abatement reporting area highlights the gap in information internationally.

## 2.2 Review Topics

### 2.2.1 Examples of national reporting systems from overseas

Under the Kyoto protocol many nations around the world have completed national greenhouse gas emission inventories and implemented systems for annually updating greenhouse gas emission data. The types of information gathered for this purpose come from a variety of sectors including agriculture, transport, energy, waste, forestry and industrial processes (Fleming & Webber 2004; Ministry for the Environment 2009). As the emissions and reductions for local government are not required to be reported on at an international level, few countries have had the impetus to create a national reporting system of local government initiatives.

At the time of this research, no mandatory or voluntary reporting schemes reporting local government greenhouse gas emissions at a national level were identified in Canada and New Zealand. Further investigation is needed to establish if there are such systems in Germany, France and Italy. The United Kingdom, through its Department of Energy and Climate Change, issued a request to its local governments to commence greenhouse gas emission reporting as of July 2011 for the previous two financial years (Barker 2011)(See Appendix A). This statement was issued as recently as the 13<sup>th</sup> of April 2011 and shows the emerging nature of this type of reporting.

The United Kingdom's Department of Energy and Climate Change (DECC) has decided to implement its national reporting system by utilising an existing greenhouse gas measuring and reporting document. The document was designed for business and the public sector and known as the *Guidance on how to measure and report your greenhouse gas emissions*. The DECC has tried to minimise the reporting burden on local government by aligning with the existing *Carbon Reduction Commitment (CRC) Energy Efficiency Scheme* whilst simultaneously aligning with international reporting guidelines. In addition, DECC has requested that local governments publish their greenhouse gas emissions on their own websites and notify the Department at completion. The Department then proposes to gather the necessary information and publish the results at a national level (Department of Energy and Climate Change 2011).

The reporting requirements for the DECC are as follows:

- A Greenhouse Gas report which contains totals for Scope 1, Scope 2 and Scope 3 emissions in carbon dioxide equivalent (CO<sub>2</sub>e).<sup>1</sup>

<sup>1</sup> - Scope 1 emissions are direct emissions released from an activity the organisation conducts, e.g. burning of fossil fuels. Scope 2 emissions are indirect emissions associated with the purchase and use of electricity, heat or steam. Scope 3 emissions are other indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities not covered in Scope 2, outsourced activities and waste disposal (World Business Council for Sustainable Development & World Resources Institute 2004).

- A contact email address so that visitors to the DECC website can easily contact local authorities if they choose to enquire further about the figures.
- A short description detailing what is within the scope of the report and any specific exclusions – so that this description can be published on the DECC website alongside the data (Department of Energy and Climate Change 2011).

The methods outlined in the *Guidance on how to measure and report your greenhouse gas emissions* are used to calculate the emissions values. This request for information by the United Kingdom DECC requires local governments to provide emissions data but does not request information on the organisations abatement activities.

Another example of an emissions reporting scheme for local government is the Local Government Operations Protocol (2010). This Protocol was developed as a collaboration between the California Air Resources Board, California Climate Action Registry, ICLEI - Local Governments for Sustainability and The Climate Registry. The Protocol is designed to assist U.S. local governments in preparing accurate, transparent and complete greenhouse gas inventories of their own operations. The protocol outlines in detail the methods to be used to calculate rigorous inventories in order to track emission reductions over time. The protocol does not provide details on how to calculate emission reductions from specific abatement actions nor does it provide a mechanism to collect and report the inventories nationally (The Climate Registry 2010).

The only local government greenhouse gas abatement reporting scheme identified outside of Australia by this research was the *Cities* program managed by the Carbon Disclosure Project. The Carbon Disclosure Project (CDP) is a not-for-profit organisation based in the United Kingdom. Established in 2003, the CDP encourages very large corporations from around the world to calculate, report and disclose their greenhouse gas emissions data. Their philosophy is that by creating an impetus for corporations to report greenhouse gas emissions that will simultaneously provide a motivation to manage and reduce their greenhouse gas emissions. Since 2003 the project has grown from 235 reporting organisations to 3050 in 2010 and in 2011 the CDP expanded to include city governments of the world (Carbon Disclosure Project 2011a).

In early 2011 the CDP's *Cities* program issued a request for information from the World's 40 largest cities (See Appendix B for participating counties/cities). The request sought information on a variety of climate change related data and was specifically tailored for local governments of very large cities. Of particular interest to this research was the section regarding greenhouse gas abatement reporting. Although minor in the context of other information requested by the CDP, this collation of abatement information creates a very unique situation where local government actions can be reported at an international level. The reporting scheme is discussed in detail in section 5.2.3 of this report.

### **2.2.2 Examples of previous and current reporting systems in Australia**

Although a national reporting system for local government greenhouse gas abatement does not currently exist in Australia, there has been such a system in the past. The International Council for Local Environmental Initiatives (ICLEI) in conjunction with the Federal Government, successfully ran the *Cities for Climate Protection* program (CCP Program) in Australia from 1997 to 2009. Under this program, Councils were supported through a five milestone framework towards reducing their greenhouse gas emissions. A component of this of this program required the participating Councils to compile comprehensive emission inventories at commencement of Milestone 1 and Milestone 5. The Councils would then report annually on the measures taken to reduce greenhouse gas emissions. This meant that although inventories were compiled in detail there could be many years between the first and the second inventory and without any impetus to complete the inventories on an ongoing basis. In addition, because the CCP Program was initiated before the National Greenhouse and Energy Reporting (NGER) legislation was implemented, the reporting framework did not align with the legislation.

The annually measures reporting focused on the actions Councils were taking to reduce greenhouse gas emissions. ICLEI would provide a template for reporting on standard actions such as lighting retrofitting, solar installations, computer monitor upgrades and the distribution of energy efficient light globes and water efficient shower heads to the community at no or low cost. This meant that reliable consistent data was collected for standard actions that occurred at each Council but also meant that some actions that did not fit this standard reporting system were not reported as easily.

The *Cities for Climate Protection* program, upon its cessation in 2009, had 233 participating Councils which represented 84% of Australia's population. Over the course of the program, 18 million tonnes of greenhouse gas emissions were reduced and reported. In its final year of reporting (2007/2008) the CCP program had 184 Councils report on their emission abatement efforts which represented 79% of the participants (International Council for Local Environmental Initiatives 2008).

Another example of an Australian abatement reporting scheme is the service offered by a company known as Planet Footprint. This private company operates as a subscription service to predominately local government clients. The company provides a range of services, one of which is the ongoing collection and reporting of abatement measures (actions). Although not yet publishing data nationally the company does have the potential to collect measures from across Australia due to their high subscription rate. Further details on the abatement reporting service are provided in section 5.2.4.

### **2.2.3 Information sharing between Councils**

Although every local government in Australia is slightly different in terms of political motivation, size and infrastructure, there are many similarities in the way that the organisations function, the types of services provided and the challenges that faced. These similarities create an opportunity to share information in relation to problem solving and innovation. The effective sharing of information and knowledge between Councils surely improves efficiencies and shared solutions are more likely to be enacted, there by saving considerable time and money.

Although local government in Australia has been criticised for its lack of sharing of information even between departments of the same organisation, otherwise known as the silo effect (Local Government and Shires Association 2005), local government in Australia generally has a culture of openly sharing information between organisations. Frequently, local government will share information and work collaboratively at a regional scale. This is evident by the 59 active Regional Organisations of Councils currently working throughout Australia (Australian Local Government Association 2011). It is this openness and capacity to work together that, if harnessed at a national level, could provide even greater capacity for climate change mitigation success.

At a national level, local government already shares information on biodiversity conservation by way of *The Biodiversity Toolbox for Local Government*. *The Biodiversity Toolbox* aims to give local government the tools, resources and contacts to enhance biodiversity conservation at the local scale. In addition, it creates a system for biodiversity benchmarking and information exchange by way of case studies. Since biodiversity is an issue for every Council regardless of their location, there are lessons to be learnt from around the country (Department of the Environment Water Heritage and the Arts 2009).

Internationally, local governments are searching for best practice precedence in order to give their communities the very best services and solutions available. The UK government is striving for best practice through the adoption of some of the basic principles for local governance and delivery of municipal services found internationally, in particular the USA and Australia. The International Federation of Municipal Engineers provides a means to look beyond the typical resources for solutions generally utilised by municipal engineers. It offers an opportunity to exchange best practice at the global level, creating opportunities to improve their contributions to society by understanding solutions employed by other Countries (Champion et al. 2008).

## **2.3 Summary**

The literature review identified a lack of examples of local government abatement reporting systems internationally which highlights the gap in knowledge of what is being done to reduce greenhouse gas emissions at a local level. The limited examples of emissions reporting schemes for local government identified in this report, represent the leading edge of climate change related reporting. However this has not progressed to holistically include both emissions reporting and abatement reporting in the same scheme. The now defunct reporting model operated by ICLEI served Australian local governments well in a time when little other action was being taken on climate change. As a result its lack of alignment to the NGER act 2007 may have been a contributing factor to its closure.

The potential for information sharing between Councils in the form of an abatement reporting scheme is high due to the precedence of information sharing as identified. The similar structure of local governments around Australia, along with a culture of openness has allowed for mutually beneficial collaboration and information sharing in a range of fields.

# Chapter 3 - Conceptual framework

## 3.1 Introduction

Greenhouse gas emission reporting has come a long way both internationally and in Australia over the past 10 years. A range of international treaties and domestic legislation are interconnecting in an attempt to accurately calculate and report emissions. Much work has been done across the globe to unify and align reporting principles. The increased momentum for action stimulates the need to document and share the successes and failures of solutions.

## 3.2 Legislative requirements

The United Nations Framework Convention on Climate Change is a treaty established to encourage Countries to reduce greenhouse gas emissions and work towards adapting to the impacts of climate change. From this convention a binding agreement known as the Kyoto Protocol was developed and implemented to commit parties to achieve their agreed targets. Currently there are 193 international parties to the Kyoto Protocol making it the principle guiding agreement on climate change internationally (United Nations 2011a).

The reporting guidelines outlined in the Kyoto Protocol (United Nations 2011a) require nations to report on key contributing greenhouse gas emissions across five sectors:

- Energy
- Industrial Processes and Product Use
- Agriculture, Forestry and Other Land Use
- Waste
- Other

Under the Kyoto protocol parties are required to provide an annual report and a periodic national communication. The annual report must include the party's national greenhouse gas emission inventory along with information on the transactions and holdings of Kyoto Units (a form of carbon credits), information on the activities taken to meet their Kyoto agreements and information on their national reporting system and registry (United Nations 2011b).

In 2004 the *Greenhouse Gas Protocol* (GHG Protocol) was produced by the World Business Council for Sustainable Development (WBCSD) and the World Resources Institute (WRI) to provide an international method for identifying, measuring and reporting greenhouse gas emissions at an organisational level (World Business Council for Sustainable Development & World Resources Institute 2004). Since 2004 many countries around the world have utilised the GHG Protocol's principles and made reference to it in their respective national emissions reporting legislation or guidelines. In 2006 the International Standardisation Organisation produced the standard ISO 14064 which features many of the key concepts of the Greenhouse Gas Protocol (Standards Australia 2006).

In the domestic arena, the Australian Government introduced the National Greenhouse and Energy Reporting Act in 2007 to create a single national reporting framework of greenhouse gas emissions. The introduction of this legislation was also used to underpin any future emissions trading scheme and meet Australia's international commitments. Furthermore the NGER Act 2007 aimed to prevent duplication of similar legislation in the states and territories (National Greenhouse and Energy Reporting Act 2007). Subsequent guidelines were produced by the Australian Department of Climate Change to provide details on how organisations are to meet the requirements of the NGER Act 2007, to incorporate the principles of the *GHG Protocol* and ISO 14064 whilst simultaneously addressing the requirements of the Kyoto Protocol (Commonwealth Government of Australia 2008).

In summary, the Kyoto Protocol requires parties to report their greenhouse gas emissions activities at a national level and the *GHG Protocol* and the ISO 14064 provide guidelines for reporting emissions at an organisational level. The NGER Act 2007 requires some organisations in Australia to report their emissions activities if they exceed a designated threshold. The information is then aggregated at the national level. Unless a local government organisation triggers the designated reporting threshold or volunteers to report under the NGER Act 2007, their emissions are neither captured nor required under the Australian reporting system.

Any national abatement reporting system that is implemented in Australia would first and foremost need to meet the requirements of the NGER Guidelines and in doing so would fall into line with the other international reporting requirements.

### **3.3 The need for a national reporting system**

As shown by the former CCP program, Councils contribute significantly to greenhouse gas emission reduction. Over the 2007/2008 CCP reporting period, the 184 Councils which participated in the program reported over 3000 abatement measures which equated to 4.7million tonnes of equivalent carbon dioxide emissions (International Council for Local Environmental Initiatives 2008). This level of activity on climate mitigation is worthy of documentation and has the potential to contribute to the national solution on climate change.

Local government is, and will continue to be, at the forefront of dealing with the impacts of climate change on the community. Attempting to minimise these impacts through abatement measures is an imperative of local government and will require a whole of government response (Pillora 2010). Without accurate data and information on the activities of local governments, the ability for state and federal government to respond with meaningful policy is hindered. Furthermore, detailed information on mitigation actions, the ability to permanently reduce carbon emissions and the cost and efficiencies of these actions could be of great value to the Federal Government. The Federal Government could utilise this information when designing funding regimes or household rebate schemes for national climate action.

Stefanie Pillora (2010) notes in her paper *Australian Local Government and Climate Change* that following the closure of the ICLEI Cities for Climate Protection (CCP) program due to loss of federal funding, some state-based local government associations have been assisting Councils with emissions reporting to replace the inventory function formerly provided by CCP. However, it is noted that the loss of this program has left a large gap. In addition, Pillora (2010) notes that Councils identified that the need for specialist localised information on effects, impacts and responses for Councils is a high priority. Progress is being made in some regions, but much more work is needed. Consistent messages from all key sources will also assist in enabling decisive action by local authorities.

### **3.4 Summary**

The international requirement for emissions reporting generated by the Kyoto Protocol has stimulated emissions reporting schemes in many countries. As local government emissions are not specifically required under the international reporting requirements the impetus to collect this information has not flowed on nor has there been any legislative stimulus for abatement reporting in this area. Despite the lack of legislative motivation the need for local government abatement reporting and information sharing is identified by Pillora (2010) and ICLEI (2008).



# Chapter 4 – Methodology

## 4.1 Introduction

This research project can be divided into two parts:

- Firstly, the identification and evaluation of key criteria for greenhouse gas abatement reporting, and
- Secondly, the assessment of affordability of greenhouse gas abatement reporting for local governments.

As shown by the literature review, very few national level schemes for local government greenhouse gas abatement reporting currently exist internationally, Appendix C shows a list of resources scrutinised in this process. To establish the key criteria for greenhouse gas abatement reporting, a comparison of the Carbon Disclosure Project, the Planet Footprint model, the ICLEI framework and the governing NGER legislation in Australia was conducted.

To gain insight into the current expenditure on climate change activities and any associated reporting, three case studies were conducted. The three participating local governments were Richmond Valley Council (NSW), Tweed Shire Council (NSW) and Gold Coast City Council (QLD).

## 4.2 Critical evaluation of reporting systems and key reporting criteria

A critical evaluation of four reporting systems and their respective key reporting criteria was undertaken to try to establish the effectiveness and usability for local government. The four reporting systems were:

- ICLEI – CCP Measures Reporting
- NGER Action Plan Guidelines
- Carbon Disclosure Project
- Planet Footprint – Measures and Abatement Reporting

Each scheme was investigated to determine its relevance to local government, its current status and the reporting criteria. The abatement reporting criteria were isolated from other reporting requirements defined within each scheme and listed in Table 2 (section 5.2.5). The details of each scheme were thoroughly researched to gain an understanding of the intent, audience and purpose of the scheme. The comparison was made difficult due to inconsistent language used across all schemes. This is a common complaint of reporting frameworks.

With an understanding of the key reporting criteria, this research project then sought to complete three case studies of local government greenhouse gas reporting activity and related costs.

## 4.3 Case study - affordability of reporting for local government

Case studies were used as a purposeful research technique to gather information specific to local government abatement reporting. In order to gain insight on this topic, Councils with a known record of implementing abatement actions were approached. As outlined by Patton (1990), purposeful sampling helps to elaborate and deepen initial analysis, seek exceptions and test variation (Patton 1990). A case study, in the context of this research project, is an in-depth investigation of a particular local government, its current method of greenhouse gas emissions reporting (if one exists) and the costs associated with this reporting.

Case studies were chosen as a way to add on-ground and real life information to this research project. Through discussions with Council staff the case studies aimed to identify the needs, barriers, incentives and

affordability of greenhouse gas emission reporting. Due to the time constraints on Council staff in the climate change area it was also reasoned that an interview arranged for a specific time would yield higher value information with a faster turn around time than requesting the completion of a written survey. A qualitative research approach also allowed for capture of information beyond the initial scope of the research that might come out in the course of the interview.

The affordability of greenhouse gas reporting for local government is defined in this research as the ratio between the cost of conducting the reporting and the funding dedicated towards the mitigation action taken. Related to this definition of affordability is also the amount of time taken to conduct reporting versus the amount of time available to conduct mitigation projects.

In order to establish the affordability of reporting, case studies were conducted for three local governments who are actively seeking to reduce greenhouse gas emissions. The selected local governments are:

	Size	Type	State
1. Gold Coast City Council	Large (pop. 515,157)	Metropolitan	QLD
2. Tweed Shire Council	Medium (pop. 82,955)	Urban/rural	NSW
3. Richmond Valley Council	Small (pop. 22,395)	Rural	NSW

The above three local governments have been selected due to their various size, type and location. For the purpose of this report “type” has been defined by the dominate land use of the local government area. Councils of varying sizes were chosen in an effort to investigate organisations with differing operating budgets. Like wise, it is anticipated that the actions taken to reduce greenhouse gas emissions will be different for Councils of different types (metropolitan, urban and rural) and that this will result in different choices of reporting. Lastly, by selecting local governments in different states a first hand understanding of both New South Wales and Queensland state level reporting requirements can be established.

In order to determine the affordability of reporting on greenhouse gas abatement activities the case studies will seek to answer the following questions via personal communication with the responsible staff at each Council and information gathered from publicly available documents:

- What is the total operating budget of Council?
- How much funding is currently allocated to greenhouse gas abatement annually?
- What are the associated financial savings from the abatement activities?
- How much funding is currently allocated to greenhouse gas abatement reporting annually?
- How much staff time is spent annually reporting on greenhouse gas emissions and abatement activities?
- Is reporting done externally? If so, how much does it cost and does it involve staff time?
- What is the ratio of action expenditure to reporting expenditure for each of the three sized Councils?

From these questions the following algorithm was made possible:

$$\text{cost of action on climate change} / \text{cost of reporting} = \text{affordability ratio}$$

This quantitative analysis will be coupled with a qualitative analysis of the value of information produced from reporting and its usefulness for local government.

The information gathered from the three case studies does not provide a generalisation of actions for all Councils in Australia. Despite this, the information gathered can provide an indicative insight into the greenhouse gas reporting activities and costs of local government. This is possible due to the selection of cases chosen. Each of the Councils differ from each other in the above mentioned ways but they are ultimately typical of Australian local governments and thus exist as relevant examples.

#### **4.4 Summary**

The coupling of purposeful sampling of local government with the critical evaluation of reporting criteria help to shed light on an under researched area. Due to the emerging nature of abatement reporting it is important to gather and interrogate the best possible practices for Australia. Appropriately matching the best practices of reporting with the needs of key stakeholders is facilitated by meeting and listening to the Councils involved. Sound information on Australia's climate change action is needed for a robust discussion to lead innovation.

# Chapter 5 - Results

## 5.1 Introduction

The results from this research are divided into two parts. Section 5.2 outlines the features of four reporting schemes and their usability for local government. Secondly, the results from three local government case studies on the costs of reporting are presented. The results from this research are divided into two parts to effectively distinguish between international and national reporting schemes, and the experiences and needs of local government. Despite the differences, these two key areas are fundamentally linked due to the potential for one to influence the other.

As discussed previously, the noticeable lack of information on local government abatement reporting schemes limited the number of schemes that were able to be compared and interrogated. This research identified one international scheme known as the Carbon Disclosure Project, one domestic scheme run by a private company known as Planet Footprint as well as some suggested guidelines from the National Greenhouse and Energy Reporting Act 2007 supplementary material. In addition to the above three reporting schemes, the former *Cities for Climate Protection Measures Reporting program* was also compared to gain insight into a scheme that previously operated in Australia. A summary of the reporting criteria for each scheme is provided in Table 2.

## 5.2 Comparison of reporting schemes

### 5.2.1 ICLEI – Cities for Climate Protection: Annual Measures Reporting

The Cities for Climate Protection program operated in Australia from 1997 to 2009. The program was voluntary but did involve some membership fees. The program used a five milestone approach to assist local governments in mitigating greenhouse gas emissions. The five milestones were as follows:

1. Conduct a baseline emissions inventory and forecast
2. Adopt an emissions reduction target for the forecast year
3. Develop a Local Climate Action Plan
4. Implement policies and measures
5. Monitor and verify results

Local governments were required to create inventories of greenhouse gas emissions during *Milestone 1* and *Milestone 5* of the program as well report abatement measures (actions) annually once *Milestone 3* was achieved. This model of emissions and abatement reporting meant that there could be many years between emissions inventories and the annual abatement reporting was often completed without an up to date emissions report accompanying it. The reason for this approach could be explained by the high labour intensity needed to collate a local government emissions inventory at a time where creditor information (invoices) was not yet digitised. Council staff would often enlist external help to manually collate electricity and fuel usage data from hundreds of paper invoices.

As this model of reporting was designed specifically for local governments it took into consideration the types of operations typically managed by local government. The purpose built nature of the program is a testament to its applicability to local government and is shown by the level of uptake across Australia with 233 Councils participating in 2008 (International Council for Local Environmental Initiatives 2008). The program was divided into two sectors, corporate (local government's own operations) and the community. Each of these sectors was then divided into five subsectors as follows:

#### **Corporate**

- Buildings
- Vehicle fleet
- Water/sewer
- Street lighting
- Waste

#### **Community**

- Residential
- Commercial
- Industrial
- Transport
- Waste
- Other

The information collected annually in regard to abatement activities was collated nationally and reported as the "Measures Evaluation Report" for the financial year just finished. To capture the information from member Councils ICLEI would provide a pro-forma spreadsheet which outlined 19 standard measures (actions). If the particular measure was taken in the financial year in question the Council would fill in the required fields. The 19 standard measures for the 2007-2008 reporting period were as follows:

- |                                   |  |
|-----------------------------------|--|
| • Lighting Efficiency - Buildings | • Transport - Council or Private Fleet |
| • Energy Efficient                | • Shuttle Buses                        |
| • Computer Equipment              | • Organic Waste Divergence             |
| • Green Power                     | • Landfill Gas Recovery                |
| • Hot Water Efficiency            | • Offsets                              |
| • Solar Power Installation        | • Bio-sequestration                    |
| • Public Lighting Efficiency      | • General Measures                     |
| • Community Default               | • Qualitative Measures                 |
| • Biofuels                        | • Human Resources                      |
| • Walking School Bus              |  |

The technique of using standard measures created a system that was accurate, easily collectable and able to be verified. Alternatively what was gained by standardisation was lost in the flexibility for local governments to report their specific differences. The Cities for Climate Protection program was ahead of its time, commencing 10 years before the NGER legislation was introduced at a time when the general public and government was not acting on climate change. Perhaps a contributing factor to its closure was its inability to shift towards the NGER guidelines and international standards in its maturity.

#### **5.2.2 NGER – Action Plan Guidelines**

A range of supplementary material was published by the Australian Department of Climate Change in the years that followed the implementation of the NGER Act 2007. One such document was the National Greenhouse and Energy Reporting Streamlining Protocol which was produced in 2009. The Streamlining Protocol was developed to provide guidance on greenhouse gas accounting and reporting in a unified way which incorporated the range of existing legislation and guidelines in Australia. In an effort to reduce confusion and reporting burden for industry the Streamlining Protocol was designed primarily for policy makers and program managers (Commonwealth Government of Australia 2009) .

One portion of the Streamlining Protocol provides guidance on how to develop and report on an emissions reduction action plan (See Appendix D). Unlike other reporting schemes analysed in this research, the NGER

Action Plan Guidelines are not a functioning reporting scheme. Neither mandatory nor voluntary the guidelines provide a recommendation to program developers of the types of reporting criteria needed in abatement reporting.

As with the NGER legislation itself the action plan guidelines were not designed specifically for local government. For example, the Action Plan Guidelines do not require a reporting field for the quantity of resources (electricity (kilo watt hours) or fuel (Litres)) reduced. Instead, the criteria of “Energy” is reported as a converted standardised unit in Giga Joules (GJ). Although this creates an effective way of summing all actions, the unit of GJ has little meaning to local government managers. This is just one example of the gap between the needs of national policy makers and the needs of local government.

Another example of a criteria required under the NGER Action Plan Guidelines that is primarily useful for policy makers is the field “Action Category”. This criterion asks the user to categorise the action type as per the nine categories defined by the Energy Efficiency Opportunities Program (see Table 1 below).

Opp ID	Action Category
A.	Changes in the staff operation of equipment e.g. turning off equipment when not in use, better communication with site services about timing and delivery of energy services
B.	Changes in maintenance practices
C.	Changes in management systems e.g. procurement, development of staff KPIs, evaluation methods of energy efficiency opportunities, energy management policy
D.	Improvement in energy measurement and monitoring e.g. metering upgrade, improved energy data analysis and frequency, new database
E.	Improvement in process control e.g. better temperature control, the use of higher quality production inputs
F.	Investment in the same but more efficient technologies e.g. retro-fitting an old motor with a newer, higher efficiency motor e.g.
G.	Investment in new technologies or new configurations of technologies not used before e.g. a process such as heating / evaporating a liquid to leave a solid product in certain instances can be replaced with a mechanical filtration process
H.	Investment in research and development, testing and trialling.
I.	Other – please specify

**Table 1: Action Categories as defined by the Energy Efficiency Opportunities program (EEO)(Department of Resources Energy and Tourism 2011)**

This categorisation helps policy makers track trends in the success and failure of different action types. Additionally, statistical information would be able to be gathered in relation to the costs and savings related to each category. If this criterion was applied to a national abatement reporting system for local government it could help provide federal policy makers with valuable base line information on abatement actions. Although the results of this categorisation would be of less value at the individual local government level, the categorisation would not be overly burdensome on the reporter and the national collation of this information could help make local action planning decisions.

Unlike the ICLEI Measures Reporting scheme, the NGER Action Guidelines report action by action. There is not a standard list of actions to report against and any action can be reported with the data relating to its completion. This allows greater flexibility in the types of actions that can be reported and also allows for specific information relating the action to be documented.

Another unique feature of the NGER Action Plan Guidelines is the documentation of both projected and actual energy and cost savings. This feature, if incorporated into a functioning abatement reporting scheme would encourage the monitoring and verification of abatement actions which would lead to greater certainty of the emissions reductions. This extra dimension of reporting could challenge local governments due to the limited resources and tools available for action monitoring and verification.

### **5.2.3 Carbon Disclosure Project**

The Carbon Disclosure Project commenced collecting emissions information in 2003. The project sought information from very large corporations from around the world such as Pepsi and Wal-Mart. The Carbon Disclosure Project's philosophy is that by publicly disclosing greenhouse gas emissions the corporations would be encouraged to manage their emissions and ultimately reduce. The project is voluntary and is espoused as showing transparency and good corporate citizenship.

At the beginning of 2011 the Carbon Disclosure Project expanded its reporting net to invite the 40 largest cities in the world to report their emissions. A request for information was sent to each of the city local governments which outlined the criteria to be reported (See Appendix E). The entire request for information was quite comprehensive covering emissions from local government operations and the community, climate adaptation, master planning and mitigation strategies for both local government operations and the community. Although the information request was comprehensive the section allocated to abatement action reporting was minimal. This section only requires; the action to be described, its emission savings and estimated cost savings. Although this is adequate information to be collected and collated at an international level, further criteria would need to be added to this abatement reporting section to be useful on a day to day basis for local government.

The request for information was designed specifically with local government in mind and as such took into account the types of operations undertaken by local government. The information gathered by the Carbon Disclosure Project was collated at an international level and reported in the 'CDP Cities 2011 Global Report on C40 Cities'. This created a very unique situation where local government action on climate change was shared in the international arena without being fed up through state/provincial and federal governments.

The CDP Cities 2011 Global Report on C40 Cities outlines significant action taken by local governments of the largest cities from around the world. The report reiterates that local governments are in a unique position by being responsible for large quantities of greenhouse gas emissions, have numerous and highly valuable assets vulnerable to the impacts of climate change, and, have the greatest ability to act quickly to the complexities of their local environments and communities. Of the cities that were approached 72% responded to the request for information. The report also identifies that two out of three cities from their sample are already measuring and reporting on greenhouse gas emissions, thus showing the leading nature of local government (Carbon Disclosure Project 2011b).

### **5.2.4 Planet Footprint - Measures and Abatement Reporting**

Planet Footprint is an Australian based company specialising in environmental data management, benchmarking and reporting. A Council client pays an annual subscription to have the company collect utility information on the Council's behalf. Planet footprint then collates the information into a useable format and benchmarks the performance of individual assets based on a variety of indicators.

The Planet Footprint Measures and Abatement Reporting is an example of a market based response to a foreseeable need. Upon cessation of the ICLEI Cities for Climate Protection Program, Planet Footprint developed a product for local government greenhouse gas abatement reporting in an effort to fill the perceived gap in reporting. The Planet Footprint model was designed with local government specifically in mind and aims to improve flexibility of reporting compared to the ICLEI model whilst taking into consideration the NGER legislation.

The Planet Footprint reporting model is again voluntary and is reported action by action for any abatement activity undertaken by the client Council. For example if the action was to increase the efficiency of waste

water pumping then the action could be named and described, with costs and savings detailed. The 13 reporting criteria used by Planet Footprint are as follows:

- Measure name
- Key Area
- Associated property (if applicable)
- Status
- Implementation date or
- Contact Person
- Cost of measure
- Life of Savings (years)
- Financial saving (\$/p.a)
- GHG tonnes of CO<sub>2</sub> p.a.
- Annual Resource Saving (kWh,
- Calculation Data Source
- Measure Description

Although the information has the potential to be collated nationally (due to the large number of Councils subscribed to Planet Footprint), a report of this nature is yet to be made public. This could be due to the primary focus of the service being to deliver a reporting scheme that is useful for the client as opposed to a tool for national government. One element missing from the Planet Footprint criteria that could help to align the scheme to the NGER guidelines and whilst increasing its usefulness to policy makers, is the field defined as “Action Category”. By including this field policy makers could analyse the success and failure of different types of actions as defined by the Energy Efficiency Opportunities program.

### **5.2.5 Summary**

Each of the discussed reporting schemes has been designed for a different purpose. The criteria and delivery highlights these differences. Table 2 shows the reporting criteria which have been listed under the respective reporting scheme. Quite quickly it can be seen that the schemes are so different that they cannot be compared directly. The NGER, Planet Footprint and CDP schemes show similarities due to their reporting “action by action” structure. Conversely, the ICLEI scheme appears unique due to its reporting technique against standardised measures. The briefness of detail required from the CDP scheme is evident with only eight reporting fields compared to the 13 in the Planet Footprint scheme and 28 fields outlined by the NGER guidelines. This briefness of this detail could be attributed to the fact that the information is intended to be aggregated across countries at an international level. This provides yet another example of how the reporting scheme dictates its own needs that can be separate from that at local government. It is also interesting to note that the CDP scheme differentiates between local governments own operations and that of the community. It is likely that this is due to the number of community actions/projects managed by local governments that do not have a direct impact on their own assets or operations. This option was also available as part of the ICLEI measures and abatement reporting scheme.



NGER	Carbon Disclosure Project	Planet Footprint	ICLEI
Action category (type of action)	<b>Operational Emission Reduction Activities -</b>	Measure name	Lighting Efficiency - Buildings
Description	Emission reduction activity	Key Area	Energy Efficient Equipment
Source	Technology used (if Applicable)	Associated property (if applicable)	Computer Equipment
Status	Achieved emissions reduction (tCO <sub>2</sub> -e)	Status	Green Power
Start Date	Anticipated emission reduction over lifetime (tCO <sub>2</sub> -e)	Implementation date or year	Hot Water Efficiency
Completion Date	Estimated total financial savings over lifetime(\$)	Contact Person	Solar Power Installation
Responsibility	Comment	Cost of measure	Public Lighting Efficiency
Implementation Cost		Life of Savings (years)	Community Default Actions (give away of shower heads and light globes)
Projected Energy Savings (GJ)	<b>Community Emission Reduction Activities -</b>	Financial saving (\$/p.a)	Transport - Council or Private Fleet
Projected Energy Savings (AUD)	Activity	GHG tonnes of CO <sub>2</sub> p.a.	Biofuels
Projected Peak Demand Savings (winter)	Comment	Annual Resource Saving (kWh, KL etc)	Walking School Bus
Projected Peak Demand Savings (summer)		Calculation Data Source	Shuttle Buses
Projected GHG emission reductions (tCO <sub>2</sub> -e)		Measure Description	Organic Waste Divergence
Projected Calculation Method			Landfill Gas Recovery
Projected Other Savings (AUD)			Offsets
Payback Period (years)			Bio-sequestration
Monitoring Method			General Measures
Achieved Energy Savings (GJ)			Qualitative Measures
Achieved Energy Savings (AUD)			Human Resources (Employed to manage ghg at council)
Achieved Peak Demand Savings (winter)			
Achieved Peak Demand Savings (summer)			
Achieved GHG emission reductions (tCO <sub>2</sub> -e)			
Achieved Calculation Method			
Achieved Other Savings (AUD)			
Difference in projected and achieved energy savings (GJ)			
Reason for Above Difference			
Difference in projected and achieved GHG emissions reductions (tCO <sub>2</sub> -e)			
Reason for Above Difference			

**Table 2: Comparison of abatement reporting criteria for each of the examined four reporting schemes compared**

### 5.3 Case study results

Case studies of local government greenhouse gas reporting costs were conducted at Richmond Valley Council, Tweed Shire Council and Gold Coast City Council. Discussions with Council staff showed very different approaches to greenhouse gas management and reporting. The amount of time and resources allocated to reporting was directly related to size of the Council and hence its budget allocation to this area. Details of the costs related to climate action and reporting are outlined in Table 3.

Council	Total Budget (2010/2011)	Spend on Climate Action	Spend on monitoring and reporting	Ratio (Climate Action : Reporting)
Richmond Valley Council	\$56,300,000	\$67,200	0	0
Tweed Shire Council	\$204,000,000	\$200,000	\$1000	200:1
Gold Coast City Council	\$920,000,000	\$1,100,000	\$100,000	11:1

**Table 3: Spending on climate action at case study Councils.**

Cost savings information from abatement actions was not available at the case study Councils. This was due to the organisations not proactively capturing or measuring the savings information of the actions that were being implemented. Tweed Shire Council commented that they had not done so since the closure of the CCP program.

#### 5.3.1 Richmond Valley Council

Richmond Valley Council is located in the Northern Rivers Region of the Far North Coast of NSW. The Council area includes coastal areas, agricultural areas and rangelands. The population of the local government area is considered small with approximately 22,400 residents (Richmond Valley Council 2011). Casino, Kyogle and Evans Head make up the major towns of the predominantly rural and agricultural shire.

Climate change has only recently (over the past two years) appeared on the agenda at Richmond Valley Council. The small operating budget of the Council and limited staff resources lead to the hiring of a casual sustainability officer three days per week. This role, among other things, is to investigate the impacts of climate change and implement emissions reductions measures.

Richmond Valley Council is not required under the NGER legislation to report emissions to the Federal Government as none of its facilities breach the reporting threshold. Furthermore, reporting of emissions or abatement activities is not conducted internally as the limited available resources are prioritised towards actually taking the abatement or adaptation actions.

Small Councils such as Richmond Valley Council would benefit greatly by the information sharing created by a national abatement reporting scheme. For such a Council to participate, the reporting scheme would need to be both practical and easy to use to keep the reporting time to a minimum.

#### 5.3.2 Tweed Shire Council

Tweed Shire Council is also located in the Northern Rivers Region of the Far North Coast of NSW. With a population of approximately 83,000 people the shire is considered a medium sized Council. Tweed Shire Council covers 1303 square kilometres and has 37 km of coast line as its eastern boundary (Tweed Shire Council 2011). The shire is made up of urban town centres of Murwillumbah and Tweed Heads as well as many coastal and rural towns and villages.

Tweed Shire Council was previously a member of the Cities for Climate Protection program and completed all five milestones. Through its participation in the program Tweed Shire Council conducted abatement reporting up until the program's cessation in 2009. Since then no internal abatement or emissions reporting has been conducted and the Council recognises the gap in reporting that has resulted.

In July 2011 Tweed Shire Council engaged Planet Footprint to initiate its Measures and Abatement Reporting program in an effort to meet this perceived gap in reporting. At the time of this research the results from participation were too early to comment.

In 2008 Tweed Shire Council in anticipation of reaching the reporting threshold for its landfill and possibly other facilities, registered to report under the NGER Act 2007 using the Online System for Comprehensive Activity Reporting (OSCAR) tool. The Council then engaged a consultant to calculate the emission liability of the Council and assist with the first year of reporting. Since that first year the emissions factors specified by NGER have changed and as a result Tweed Shire Council does not breach the reporting threshold. Despite this, the Council will need to report for a further three years to prove its emissions remain below the threshold.

Feedback from Tweed Shire Council on the useability of the OSCAR tool was negative. Dissatisfaction included functionality of the interface, inconsistent terminology and a lack of usefulness in the types of information collected. When asked if the information gathered to report under the NGER Act 2007 was used for other purposes in Council the response was nil, the information was solely collect for the Federal Government and in its specified form was not useful for the Council.

This OSCAR experience gives insight into the importance of useability and usefulness of a reporting scheme. Although the needs of a Federal Government differ from that of the local government, a reporting scheme that aims to balance these needs is surely worth investigating.

### **5.3.3 Gold Coast City Council**

Gold Coast City Council is located at the most south east corner of the state of Queensland. The Gold Coast is Australia's 6<sup>th</sup> largest city and hence considered a large Council. The local government area covers approximately 1400 square kilometres and includes high density metropolitan areas as well as large urban areas. In addition the Gold Coast local government area also include some rural and hinterland area which stretch west up to the Mount Tamborine and the Lamington and Darlington Ranges (Gold Coast City Council 2011).

Gold Coast City Council has a population of over 500,000 people and employs approximately 3000 staff. This is equivalent to the size of the Tasmanian state government and as such has a very different approach to climate action. The Council has a team of four staff working on climate change one of which is employed entirely to monitor, calculate and report greenhouse gas emissions. Detailed fuel and energy data is collected internally and an annual emissions inventory for scopes one and two is currently included in their annual reports with plans to include scope three in the near future.

Gold Coast City Council participated in the Cities for Climate Protection Program until its closure. As yet no abatement reporting system has been instigated to fill this area despite many mitigation actions being implemented. Interestingly, when questioned about the number of actions implemented in the past 12 months only three were listed. However, as the discussion continued other actions and programs were identified. Gold Coast City Council also outlined their participation in regional information sharing with other Councils. Individual environmental staff from neighbouring Councils meet quarterly to discuss projects and share results from trials in their own jurisdictions. The staff recognise this as greatly improving efficiency and quality of the projects that they implement.

#### **5.3.4 Summary**

Of the Councils that previously reported abatement actions under the CCP program a noticeable gap in reporting has emerged since its closure. Regardless of the size all councils were undertaking some form of action to reduce carbon emissions and the success and failure of these programs could be shared if an appropriate abatement reporting scheme was implemented. The range and number of actions undertaken at Gold Coast City Council could provide valuable information for a Council such as Richmond Valley Council which has limited resources to research the feasibility of some actions.

When questioned about the number of abatement actions the Councils claimed that there were only a handful of projects happening despite multiple programs being mentioned throughout the discussion. One possible reason for this is the tendency to remember primarily the larger ongoing projects and forget the smaller projects. In addition, often the sustainability/climate change officer is not aware of all actions being taken across the entire suite of local government operations and a stimulus such as external reporting is required to capture this information.

# Chapter 6 - Recommendations and further work

## 6.1 Introduction

The aim of this research was to investigate the possible features of a national reporting system of local government greenhouse gas abatement for Australia and to determine the affordability of reporting such abatement actions. This aim was achieved through the review of existing and previous abatement reporting systems and the three case studies conducted. The recommended features of a national abatement reporting system are outlined below and are accompanied by a costing estimate.

## 6.2 Conclusions

This research has highlighted the lack of local government abatement reporting systems internationally and the need for documenting and reporting local government abatement actions in Australia. A national reporting system of local government abatement actions has the potential to provide valuable information for both federal and local governments alike. A reporting system that is user friendly, easy to understand, is not too onerous on the reporter but gathers meaningful data for both parties has great potential in Australia. The sharing of information on what works and doesn't work in the field of abatement action creates a basis of knowledge from which funding can be better prioritised. In addition, this could allow for the replication of solutions to be fast tracked in other locations. Such a reporting scheme would provide networking connections for Councils embarking on similar projects.

The participation in an abatement reporting scheme creates an external motivation for a Council to better manage its abatement information. Councils may find when commencing reporting that not all fields are able to be reported against as the information was simply not captured when the action was implemented. Although the introduction of any reporting scheme can seem daunting for a Council to commence, the systems and processes needed to capture the required information would become part of everyday project management over time. The actions taken towards climate mitigation are often described as simply needing to "work smarter" and the introduction of an abatement reporting scheme is an accurate example of this.

The defunct ICLEI model of reporting served as an excellent reporting system for Australia at a time when there was little guidance on the methods for monitoring and reporting greenhouse gas emissions. Since its closure in Australia local governments have been seeking alternative ways to document their abatement activities which meet domestic legislation and international guidelines whilst simultaneously providing meaningful data at a local level. Having validated and usable data is important for local government strategic decision making. Furthermore, the ICLEI model has created a precedent for abatement reporting in Australia which would ease the way for a future reporting system as long as the strengths of the ICLEI model are maintained whilst the weaknesses are addressed.

This research recommends that a combination of reporting criteria outlined by the Planet Footprint Model and the suggested NGER Action Plan Guidelines be used as future reporting framework for local government abatement reporting. The recommended criteria are listed and described in Table 4 below with accompanying descriptions in subsequent sections.

### 6.2.1 *Recommended Reporting Scheme*

The reporting scheme would need to draw on the strengths of the Cities for Climate Protection program by accompanying the scheme with a team of support staff available to assist in the calculation and estimation of greenhouse gas emission savings from individual abatement actions. It is also recommended that the implementation of a future local government abatement reporting scheme begin as a voluntary scheme before transitioning to a mandatory scheme. The already perceived need within the local government community would mean that early adopters would use the scheme on a voluntary basis ahead of less progressive Councils. Furthermore this staged approach would allow for the reporting body to adjust any processes or criteria from feedback before rolling the scheme out to the 700 plus local governments in Australia (Australian Local Government Association 2007).

Recommended Key Reporting Criteria	
1	Action Title
2	Action Description
3	Action Category (as defined by EEO)
4	Key Reporting Area
5	Associated property (if applicable)
6	Status
7	Implementation date
8	Responsibility
9	Implementation Cost
10	Life of Project/Savings (years)
11	Financial saving (\$/p.a)
12	Source of emissions
13	GHG tonnes of CO <sub>2</sub> p.a.
14	Annual Resource Saving (kWh, KL etc)
15	Calculation Method
16	Monitoring and Verification Method
	<b>Automatic generation of :</b>
17	Pay back period
18	Energy in GJ

**Table 4: Recommended Reporting Criteria**

#### **6.2.1.1 Action Title**

A short name for the action taken (two to five words)

#### **6.2.1.2 Action Description**

A short description outlining unique details of the action (less than 100 words)

#### **6.2.1.3 Action Category (as defined by EEO)**

An action category is assigned which best describes the type of action being taken. Categories are selected from the table outlined by the Energy Efficiency Opportunities program. See Table 1 page 14 of this document.

#### **6.2.1.4 Key Reporting Area**

A key reporting area is selected from either Energy, Waste, Wastewater, Street lighting or Fleet. This helps to divide and allocate responsibilities within Council. Management from different sectors can see the abatement actions for which they are responsible and report on this. Assigning a key area also helps to identify priorities within Councils operations.

#### **6.2.1.5 Associated property (if applicable)**

If the action occurred at a specific Council asset (eg lighting retrofit at the public library), name the associated property. By specifying the associated property the performance of the asset can be tracked from the energy and fuel usage data. It also helps to assign responsibility with in Council, especially if the asset is leased out or managed externally (eg aquatic centres, community centres)

#### **6.2.1.6 Status**

The current status of the action

### **6.2.1.7 Implementation date**

The date the action was implemented (dd/mm/yyyy)

### **6.2.1.8 Responsibility**

The responsible, person, position or department of Council for the action is identified. This is used to ensure that each action is completed and the relevant data monitored and reported.

### **6.2.1.9 Implementation cost**

Cost of implementing the action (AUD)

### **6.2.1.10 Life of project/savings (years)**

The time period (in years) that the action is expected to function or deliver greenhouse gas savings.

### **6.2.1.11 Financial saving (\$/p.a)**

The financial savings incurred as a result of having implemented the action. Often when an action is taken to reduce greenhouse gas emissions the associated reduction in energy or fuel consumption saves money.

### **6.2.1.12 Source of emissions**

The fuel source consumed that produced the emissions that were reduced as a result of the action. (eg. Diesel, LPG or Electricity from Coal Fired Generation)

### **6.2.1.13 GHG tonnes of CO<sub>2</sub> p.a.**

Quantity of greenhouse gas emissions saved as a result of having taken the action (tonnes of equivalent CO<sub>2</sub>/annum)

### **6.2.1.14 Annual resource saving (kWh, KL etc)**

Quantity of resource saved as a result of having taken the action. For example the kWh of energy reduced, the KL of fuel saved. This field is predominantly useful to local government management rather than federal government policy makers.

### **6.2.1.15 Calculation method**

A brief description of how the greenhouse gas emissions savings were calculated for the particular action. This will need to include any unit conversion factors and their source.

### **6.2.1.16 Monitoring and verification method**

Method used to monitor and verify the stated greenhouse gas emissions savings for the action.

### **6.2.1.17 Pay back period**

The pay back period is the time (in years) taken to re-coup the value of the implementation cost from the financial savings. This criterion would not need to be reported directly by the organisation as it can be calculated automatically from the implementation cost and action life time information already documented above. The payback period of an action is often used by local government to determine the feasibility and prioritization of actions.

### **6.2.1.18 Energy in GJ**

As stated earlier the unit of GJ is a useful unit for comparing actions from various fuel types and is often listed as the required unit of measure for national and international reporting schemes. The unit of GJ is of little value to the day to day decisions of local government but can be easily included in a reporting scheme as an automatic unit conversion from the "Resource Quantity Saved" field already specified in section 6.2.1.14.

### **6.2.2 Cost estimate of reporting scheme**

The cost of reporting the recommended criteria has been estimated at approximately 4.5 hours per five measures taken by Council. This estimation rests on the following assumptions:

- That the staff members doing the reporting are familiar with the reporting criteria and meanings
- That the data for each measure (although this may not be readily available to all staff), is actually available. That is, that the information has been documented in some way (eg. quote documents, feasibility studies or invoices) during the implementation of the action but not yet collated.

For a typical small to medium Council that may report up to 20 measures per year, this would equate to approximately \$950 cost in staff time (assuming \$50/hour (figure includes on costs for staff ) and an additional hour for checking the reporting). Obviously if a Council reports more than 20 measures per year the costs would increase. Furthermore, in the initial stages of reporting, staff would not be accustomed to the procedures and time taken to report would be longer.

### **6.3 Further Research Recommended**

Further research into local government abatement reporting is recommended in the following areas:

1. An investigation into the useability and satisfaction of the Planet Footprint reporting scheme with client Councils.
2. A review of the carbon disclosure project experienced by Sydney and Melbourne Councils which reported to the scheme in 2011.
3. Further investigation into local government abatement reporting schemes internationally especially in France and Germany
4. Research into how a future abatement reporting scheme could be coupled with an emissions reporting scheme for all local government



## Chapter 7 - List of References

Australian Local Government Association 2007, *Facts and figures about local government in Australia*, Australian Local Government Association, viewed 5 May, <<http://www.alga.asn.au/newsroom/facts/>>.

Australian Local Government Association 2011, *Regional Organisations of Councils* Australian Local Government Association, viewed 13 May 2011, <[http://www.alga.asn.au/links/regionalOrgs\\_removed.php#a4](http://www.alga.asn.au/links/regionalOrgs_removed.php#a4)>.

Barker, G 2011, *Sharing information on greenhouse gas emissions from local authority own estate and operations*, Department of Energy and Climate Change, London, 13 April 2011, Letter.

Carbon Disclosure Project 2011a, *Carbon Disclosure Project*, Carbon Disclosure Project, viewed 1 September, <<https://www.cdproject.net/en-US/Pages/HomePage.aspx>>.

Carbon Disclosure Project *CDP Cities 2011 Global Report on C40 Cities*, 2011b, Carbon Disclosure Project, Carbon Disclosure Project,, London.

Champion, C, Robinson, M & Buchan, N 2008, 'Global issues in public works and municipal engineering', *Proceedings of the Institution of Civil Engineers: Municipal Engineer*, vol. 161, no. Compendex, pp. 215-21

Commonwealth Government of Australia, *National Greenhouse and Energy Reporting Guidelines*, 2008, Department of Climate Change, Australian Government, Canberra.

Commonwealth Government of Australia, *National Greenhouse and Energy Reporting Streamlining Protocol*, 2009, Department of Climate Change, Commonwealth Government of Australia, Canberra.

Department of Energy and Climate Change 2011, *Sharing information on greenhouse gas emissions from Local Authority own estate and operations (the successor to National Indicator 185)*, Department of Energy and Climate Change, viewed 5 May 2011, <<http://www.decc.gov.uk/en/content/cms/statistics/indicators/ni185/ni185.aspx>>.

Department of Resources Energy and Tourism, *Government report template* 2011, Energy Efficiency Opportunities, Commonwealth Governemnt of Australia, Canberra

Department of the Environment Water Heritage and the Arts 2009, *The Biodiversity Toolbox for Local Government*, Department of the Environment, Water, Heritage and the Arts, viewed 25 April 2011, <<http://www.environment.gov.au/archive/biodiversity/toolbox/index.html>>.

Fleming, PD & Webber, PH 2004, 'Local and regional greenhouse gas management', *Energy Policy*, vol. 32, no. Compendex, pp. 761-71

Gold Coast City Council 2011, *Gold Coast City Council*, Gold Coast City Council, viewed 8 October, <<http://www.goldcoast.qld.gov.au/>>.

International Council for Local Environmental Initiatives 2008, *Measures Evaluation Report*, International Council for Local Environmental Initiatives, Melbourne.

Local Government and Shires Association, *Building Stronger Regions, Stronger Local Governments*, 2005, Regional Economic Development Associates, Local Government and Shires Association.

Ministry for the Environment, *New Zealand's Fifth National Communication under the United Nations Framework Convention on Climate Change*, 2009, Ministry for the Environment, Ministry for the Environment, Wellington.

National Greenhouse and Energy Reporting Act 2007 Australia (Australian Government ComLaw)

Patton (ed.) 1990, *Qualitative evaluation and research methods* 2nd edn, Sage Publications, Newbury Park, <<http://www.gifted.uconn.edu/siegle/research/Samples/purposivesampling.htm>>.

Pillora, S 2010, *Australian Local Government and Climate Change*, Australian Centre of Excellence for Local Government.

Richmond Valley Council 2011, *Richmond Valley Council*, Richmond Valley Council, viewed 8 October, <<http://www.richmondvalley.nsw.gov.au/>>.

Standards Australia 2006, Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals, Standards Australia.

The Climate Registry, *Local Government Operations Protocol For the quantification and reporting of greenhouse gas emissions inventories*, 2010, The Climate Registry

Tweed Shire Council 2011, *Tweed Shire Council*, Tweed Shire Council, viewed 8 October, <<http://www.tweed.nsw.gov.au/>>.

United Nations 2011a, *United Nations Framework Convention on Climate Change*, United Nations, viewed 11 May 2011, <[http://unfccc.int/kyoto\\_protocol/items/2830.php](http://unfccc.int/kyoto_protocol/items/2830.php)>.

United Nations 2011b, *Existing Requirements for Reporting and Review for Annex I Parties under the Convention and the Kyoto Protocol*, United Nations, viewed 11 May 2011, <[http://unfccc.int/national\\_reports/reporting\\_and\\_review\\_for\\_annex\\_i\\_parties/items/5689.php](http://unfccc.int/national_reports/reporting_and_review_for_annex_i_parties/items/5689.php)>.

World Business Council for Sustainable Development & World Resources Institute, *The Greenhouse Gas Protocol*, 2004, World Business Council for Sustainable Development & World Resources Institute, Washington.

## Chapter 8 - List of Acronyms

ICLEI	–	International Council for Local Environmental Initiatives
NGER	–	National Greenhouse Gas and Energy Reporting
DECC	–	Department of Energy and Climate Change (United Kingdom)
DECC	–	Department of Environment and Climate Change (Australia)
CDP	–	Carbon Disclosure Project
CRC	–	Carbon Reduction Commitment (United Kingdom)
CO <sub>2-e</sub>	–	Carbon Dioxide Equivalent (a standard measure of greenhouse gas emissions)
GHG	–	Greenhouse Gas
WBCSD	–	World Business Council for Sustainable Development
WRI	–	World Resource Institute
ISO	–	International Organization for Standardization
EEO	–	Energy Efficiency Opportunity program (Australia)
OSCAR	–	Online System for Comprehensive Activity Reporting (Australia)

# Appendix A – DECC Letter to Local Authorities



**Gregory Barker MP**  
**Minister of State**  
Department of Energy & Climate Change  
3 Whitehall Place  
London  
SW1A 2AW  
[www.decc.gov.uk](http://www.decc.gov.uk)

13 April 2011

Dear Chief Executives of Councils in England,

## **SHARING INFORMATION ON GREENHOUSE GAS EMISSIONS FROM LOCAL AUTHORITY OWN ESTATE AND OPERATIONS**

On 9 March 2011 Chris Huhne, Secretary of State for Energy and Climate Change, signed a Memorandum of Understanding (MOU) with the Local Government Group that recognised the pivotal role that local councils have in tackling climate change. The MOU, available at [http://www.decc.gov.uk/en/content/cms/what\\_we\\_do/lc\\_uk/local/local.aspx](http://www.decc.gov.uk/en/content/cms/what_we_do/lc_uk/local/local.aspx) outlines how my Department and the LG Group want to work together to help councils reduce greenhouse gas emissions

- on their own estate and operations;
- in their areas within local council control and influence; and
- through participating in national carbon reduction initiatives such as the Green Deal and renewable energy deployment.

To support the principles of the MOU, I would request that local councils measure and report their greenhouse gas emissions from their own estate and operations in accordance with the joint DECC-Defra guidance that was published in September 2009 and available at <http://www.defra.gov.uk/environment/economy/business-efficiency/reporting/> by the end of July each year.

Data on area emissions and fuel poverty (formally covered by NI 186 and NI 187 respectively) will continue to be collated and modelled centrally by my department with no burden on councils.

A handwritten signature in black ink, appearing to read 'Gregory Barker', with a horizontal line underneath.




**GREGORY BARKER**

## Appendix B – CDP Participating Cities



Fig. 01: C40 cities response rate, by region

City	City	City	City
1 Addis Ababa	16 Copenhagen	31 London	46 Rotterdam
2 Amsterdam*	17 Curitiba	32 Los Angeles	47 San Francisco*
3 Athens	18 Delhi	33 Madrid	48 Santiago de Chile*
4 Austin	19 Dhaka	34 Melbourne	49 São Paulo
5 Bangkok	20 Hanoi	35 Mexico City	50 Seattle
6 Barcelona	21 Heidelberg	36 Milan	51 Seoul
7 Basel	22 Ho Chi Minh*	37 Moscow	52 Shanghai
8 Beijing	23 Hong Kong	38 Mumbai	53 Stockholm
9 Berlin	24 Houston	39 New Orleans	54 Sydney
10 Bogota	25 Istanbul	40 New York	55 Tokyo
11 Buenos Aires	26 Jakarta	41 Paris	56 Toronto
12 Cairo	27 Johannesburg	42 Philadelphia	57 Warsaw
13 Caracas	28 Karachi	43 Portland	58 Yokohama
14 Changwon	29 Lagos	44 Rio de Janeiro	
15 Chicago	30 Lima	45 Rome	

 disclosing city  
 non-disclosing city  
 percentage of disclosing cities  
 \*Cities which reported privately

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## Appendix C – List of Resources Interrogated

Australian Local Government Association 2007, *Facts and figures about local government in Australia*, Australian Local Government Association, viewed 5 May, <<http://www.alga.asn.au/newsroom/facts/>>.

Australian Local Government Association, *2010-2011 Budget Submission*, 2010, ALG Association, Australian Local Government Association.

Australian Local Government Association 2011, *Regional Organisations of Councils* Australian Local Government Association, viewed 13 May 2011, <[http://www.alga.asn.au/links/regionalOrgs\\_removed.php#a4](http://www.alga.asn.au/links/regionalOrgs_removed.php#a4)>.

Bardzki, B & Reid, V 2004, 'Knowledge sharing and creation: The bricks and mortar of intra-organisational co-operation within a Scottish local authority', paper presented to 5th IFIP International Working Conference, KMGov 2004, May 17, 2004 - May 19, 2004, Krems, Austria.

Barker, G 2011, *Sharing information on greenhouse gas emissions from local authority own estate and operations*, Department of Energy and Climate Change, London, 13 April 2011, Letter.

Bemrose, C, MacKeith, J & Joseph Rowntree Foundation. 1996, *Partnerships for progress : good practice in the relationship between local government and voluntary organisations*, The Policy Press, Bristol.

Bulkeley, H & Betsill, M 2003, *Cities and climate change : urban sustainability and global environmental governance*, Routledge, New York.

Byrne, J, Hughes, K, Rickerson, W & Kurdgelashvili, L 2007, 'American policy conflict in the greenhouse: Divergent trends in federal, regional, state, and local green energy and climate change policy', *Energy Policy*, vol. 35, no. Compendex, pp. 4555-73

Carbon Disclosure Project 2011a, *Carbon Disclosure Project*, Carbon Disclosure Project, viewed 1 September, <<https://www.cdproject.net/en-US/Pages/HomePage.aspx>>.

Carbon Disclosure Project *CDP Cities 2011 Global Report on C40 Cities*, 2011b, Carbon Disclosure Project, Carbon Disclosure Project,, London.

Carbon Disclosure Project, *CDP Cities Information Request*, 2011c, Carbon Disclosure Project, Carbon Disclosure Project, London.

Champion, C, Robinson, M & Buchan, N 2008, 'Global issues in public works and municipal engineering', *Proceedings of the Institution of Civil Engineers: Municipal Engineer*, vol. 161, no. Compendex, pp. 215-21

Commonwealth Government of Australia, *National Greenhouse and Energy Reporting Guidelines*, 2008, Department of Climate Change, Australian Government, Canberra.

Commonwealth Government of Australia, *National Greenhouse and Energy Reporting Streamlining Protocol*, 2009, Department of Climate Change, Commonwealth Government of Australia, Canberra.

Commonwealth Government of Australia, *OSCAR Training Workshop Sessions For NGER Reporting 09/10 Training Workbook*, 2010, Department of Climate Change and Energy Efficiency, Australian Government, Canberra.

Department for Environment Food and Rural Affairs, *Guidance on how to measure and report your greenhouse gas emissions*, 2009, Department for Environment Food and Rural Affairs, Department for Environment, Food and Rural Affairs, London.

Department of Energy and Climate Change 2011, *Sharing information on greenhouse gas emissions from Local Authority own estate and operations (the successor to National Indicator 185)*, Department of Energy and Climate Change, viewed 5 May 2011, <<http://www.decc.gov.uk/en/content/cms/statistics/indicators/ni185/ni185.aspx>>.

Department of Resources Energy and Tourism, *Government report template* 2011, Energy Efficiency Opportunities, Commonwealth Government of Australia, Canberra

Department of the Environment Water Heritage and the Arts 2009, *The Biodiversity Toolbox for Local Government*, Department of the Environment, Water, Heritage and the Arts, viewed 25 April 2011, <<http://www.environment.gov.au/archive/biodiversity/toolbox/index.html>>.

England, P 2008, *Climate change law for planners, developers, local government and greenies: A quick stock take and some ideas for the future*, Griffith University, Brisbane.

Evans, B 2005, *Governing sustainable cities*, Earthscan, London ; Sterling, VA. <<http://ezproxy.usq.edu.au/login?url=http://site.ebrary.com/lib/unisouthernqld/Doc?id=10128955>>.

Fleming, PD & Webber, PH 2004, 'Local and regional greenhouse gas management', *Energy Policy*, vol. 32, no. Compendex, pp. 761-71

Gianakis, GA, McCue, CP & ebrary Inc. 1999, *Local government budgeting a managerial approach*, Quorum, Westport, Conn. <<http://ezproxy.usq.edu.au/login?url=http://site.ebrary.com/lib/unisouthernqld/Doc?id=5004446>>.

Gold Coast City Council 2011, *Gold Coast City Council*, Gold Coast City Council, viewed 8 October, <<http://www.goldcoast.qld.gov.au/>>.

Government of Canada, *Annual Report on Emissions Reductions From Federal Operations* 2004, Government of Canada, Government of Canada, Gatineau.

International Council for Local Environmental Initiatives 2008a, *Measures Evaluation Report*, International Council for Local Environmental Initiatives, Melbourne.

International Council for Local Environmental Initiatives 2008b, *International Local Government Greenhouse Gas Emissions Analysis Protocol (IEAP)*, International Council for Local Environmental Initiatives,, viewed 29 April 2011, <<http://www.iclei.org/index.php?id=ghgprotocol>>.

Jemison, JBaC 2011, *Local government emissions reporting*, Northern Alliance for Greenhouse Action, Melbourne.

Larsen, HN & Hertwich, EG 2010, 'Implementing Carbon-Footprint-Based Calculation Tools in Municipal Greenhouse Gas Inventories: The Case of Norway', *Journal of Industrial Ecology*, vol. 14, no. Compendex, pp. 965-77

Li, H, Wang, Y, Ding, F & Ma, T 2006, 'Research and realization of information exchange and share platform for municipal government', paper presented to 2006 IEEE International Conference on Service Operations and Logistics, and Informatics, SOLI 2006, June 21, 2006 - June 23, 2006, Shanghai, China.

Li, J & Colombier, M 2010, 'Economic instruments for mitigating carbon emissions: scaling up carbon finance in China's buildings sector', *Climatic Change*, pp. 1-25

Local Government and Shires Association, *Building Stronger Regions, Stronger Local Governments*, 2005, Regional Economic Development Associates, Local Government and Shires Association.



Local Government and Shires Associations of New South Wales 2010, *Local Government Needs in Responding to Climate Change in New South Wales*, Local Government and Shires Associations of New South Wales,, Sydney.

Local Government Association of South Australia, *Update on the National Greenhouse and Energy Reporting (NGER) Act and Applicability to Local Government 2009*, Local Government Association of South Australia.

Ministry for the Environment, *New Zealand's Fifth National Communication under the United Nations Framework Convention on Climate Change*, 2009, Ministry for the Environment, Ministry for the Environment, Wellington.

Ministry for the Environment 2011, *New Zealand's net position under the Kyoto Protocol*, Ministry for the Environment, viewed 29 April 2011, <<http://www.mfe.govt.nz/issues/climate/greenhouse-gas-emissions/net-position/index.html>>.

National Greenhouse and Energy Reporting (Measurement) Determination 2008 2008 Australia

National Greenhouse and Energy Reporting Act 2007 Australia (Australian Government ComLaw)

Painter, C, Isaac-Henry, K & McAnulla, S 2003, 'Modernising Local Government: Micro-Organisational Reform and Changing Local Structural Configurations', *Local Government Studies*, vol. 29, no. 4, pp. 31 - 53 viewed May 13, 2011,

Patton (ed.) 1990, *Qualitative evaluation and research methods* 2nd edn, Sage Publications, Newbury Park, <<http://www.gifted.uconn.edu/siegle/research/Samples/purposivesampling.htm>>.

Peter, S 1985, *National Inquiry into Local Government Finance*, A.G.P.S., Canberra.

Pillora, S 2010, *Australian Local Government and Climate Change*, Australian Centre of Excellence for Local Government.

Rezessy, S, Dimitrov, K, Urge-Vorsatz, D & Baruch, S 2006, 'Municipalities and energy efficiency in countries in transition: Review of factors that determine municipal involvement in the markets for energy services and energy efficient equipment, or how to augment the role of municipalities as market players', *Energy Policy*, vol. 34, no. 2, pp. 223-37

Richmond Valley Council 2011, *Richmond Valley Council*, Richmond Valley Council, viewed 8 October, <<http://www.richmondvalley.nsw.gov.au/>>.

Salon, D, Sperling, D, Meier, A, Murphy, S, Gorham, R & Barrett, J 2010, 'City carbon budgets: A proposal to align incentives for climate-friendly communities', *Energy Policy*, vol. 38, no. 4, pp. 2032-41

Sánchez, MJS 2006, *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, International Panel on Climate Change.

Standards Australia 2006a, Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals, Standards Australia.

Standards Australia 2006b, Part 2: Specification with guidance at the project level for quantification and reporting of greenhouse gas emission reductions and removal enhancements.

Standards Australia 2006c, Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions.

The Climate Registry 2009, *Local Government Operations Protocol*, The Climate Registry, viewed 1 May 2011, <<http://www.theclimateregistry.org/resources/protocols/local-government-operations-protocol/#hide>>.

The Climate Registry, *Local Government Operations Protocol For the quantification and reporting of greenhouse gas emissions inventories*, 2010, The Climate Registry

The Climate Registry, *Local Government Operations (LGO) Standard Inventory Report*, 2011, The Climate Registry, The Climate Registry.

The Local Government Association of South Australia, *Emissions Measurement and Management Course Workbook 2010*, 2010, The Local Government Association of South Australia, The Local Government Association of South Australia,, Adelaide.

Tweed Shire Council 2011, *Tweed Shire Council*, Tweed Shire Council, viewed 8 October, <<http://www.tweed.nsw.gov.au/>>.

United Nations, *Kyoto Protocol To The United Nations Framework Convention on Climate Change*, 1998, United Nations, United Nations, Kyoto.

United Nations 2006, *Updated UNFCCC reporting guidelines on annual inventories following incorporation of the provisions of decision 14/CP.11*, United Nations.

United Nations 2011a, *Existing Requirements for Reporting and Review for Annex I Parties under the Convention and the Kyoto Protocol*, United Nations, viewed 11 May 2011, <[http://unfccc.int/national\\_reports/reporting\\_and\\_review\\_for\\_annex\\_i\\_parties/items/5689.php](http://unfccc.int/national_reports/reporting_and_review_for_annex_i_parties/items/5689.php)>.

United Nations 2011b, *United Nations Framework Convention on Climate Change*, United Nations, viewed 11 May 2011, <[http://unfccc.int/kyoto\\_protocol/items/2830.php](http://unfccc.int/kyoto_protocol/items/2830.php)>.

World Business Council for Sustainable Development & World Resources Institute, *The Greenhouse Gas Protocol*, 2004, World Business Council for Sustainable Development & World Resources Institute, Washington.

You, Y & Henderson-Sellers, A 2010, *Climate alert : climate change monitoring and strategy*, Sydney University Press, Sydney.

Zhou, L-A 2010, *Incentives and governance China's local governments*, Cengage Learning Asia Pte. Ltd., Singapore.

# Appendix D – NGER Action Plan Guidelines

The following is an excerpt from the NGER Streamlining Protocol on Abatement Reporting

**Figure 12.1 Action plan reporting fields (showing proposed reporting fields, not functionality)**

Action Plan																						
Action	Action category	Action Description	Source	Status	Start Date	Completion Date	Responsibility	Implementation Cost (AUD)	Projected Savings and Reductions					Monitoring Method								
									Energy Savings		GHG emission reductions (tCO2-e)	Calculation Method	Other savings (AUD)		Payback Period (years)							
Peak Demand Savings		AUD	winter	summer	GJ	AUD	winter	summer	Reason for difference	Reason for difference												
1												source 1										
2			source 2																			
3																						
4																						
5																						
Total																						

Achieved Savings and Reductions												
Action	GJ	Energy Savings		GHG emission reductions (tCO2-e)	Calculation Method	Other savings	Difference in projected and achieved energy savings (GJ)	Reason for difference	Difference in projected and achieved GHG emissions reductions (tCO2-e)	Reason for difference	Reason for difference	
		Peak Demand Savings										
		winter	summer									
1												
2												
3												
4												
5												
Total												

# Appendix E – Carbon Disclosure Project: Information Request

The following is an excerpt of the CDP information request showing the portion on abatement reporting

CDP Cities 2011 Information Request

## Strategy

### GHG Emissions Reduction – Local Government Operations

4.0 Do you have a GHG emissions reduction target in place for your city government operations?  
[List of Values: Yes; No]

4.0a *If yes:* Please provide details of your reduction target.

Baseline year	Percentage reduction target	GHG sources to which the target applies	Target date	Comment
[Drop Down of years 1990 – 2011; Other]	[Numeric field]	[Text box]	[Drop down of years 2009 – 2020; Other]	[Text box]

4.0b *If no:* Please explain why you do not have an emissions reduction target. [Text box]

4.1 *If yes:* What financial investment has been or will be required to achieve the targets and over what time period? [Text box]

4.2 What activities are you undertaking to reduce your emissions?

Emissions reduction activity	Technology used (if applicable)	Achieved emissions reduction (metric tonnes CO2e)	Anticipated emissions reduction over lifetime (metric tonnes CO2e)	Estimated total financial savings over lifetime (\$ USD)	Comment
[Text box]	[Text box]	[Numeric field]	[Numeric field]	[Numeric field]	[Text box]

Add row

4.3 Have emission reduction targets been implemented for the city government supply chain?  
[List of Values: Yes; No]

4.3a *If yes:* Please provide details of your engagement with the city government's supply chain.  
[Text box]

# Strategy

## GHG Emissions Reduction – Community

4.4 Do you have a GHG emissions reduction target in place for your community?  
[List of Values: Yes; No]

4.4a *If yes:* Please provide details of your reduction target.

Baseline year	Percentage reduction target	GHG sources to which the target applies	Target date	Comment
[Drop Down of years 1990 – 2011; Other]	[Numeric field]	[Text box]	[Drop down of years 2009 – 2020; Other]	[Text box]

4.4b *If no:* Please explain why you do not have an emissions reduction target. [Text box]

4.5 *If yes:* What financial investment has been or will be required to achieve the targets and over what time period? [Text box]

4.6 What activities are you currently undertaking to encourage greenhouse gas reduction in your community? Please describe in detail.

Activity	Comment
[List of Values: Fiscal incentives; Grants and subsidies; Financing measures; Building standards; Permitting incentives; Other]	[Text box]

Add Row

4.7 What other public policies (not mentioned above) have you implemented or do you plan to implement to improve your city’s response to climate change? [Text box]

## Master Planning

4.8 Does your city incorporate desired GHG reductions into the master planning for the city?  
[List of Values: Yes; No]

4.8a *If yes:* Please describe the ways that the master plan is designed to reduce GHG emissions.  
[Text box]

4.9 Does your city require digital models or digital plans for infrastructure development to be submitted to the city for planning, permitting or other regulatory purposes?  
[List of Values: Yes; No; Don’t know]

4.9a *If yes:* Please describe how your city uses digital infrastructure data for planning or urban design purposes. [Text box]

# Appendix F – Project Specification

University of Southern Queensland

FACULTY OF ENGINEERING AND SURVEYING

ENG 4111 / 4112 Research Project

## PROJECT SPECIFICATION

FOR: Kim Graham

TOPIC: A national reporting system of Local Government greenhouse gas abatement for Australia – can small Local Governments afford to report?

SUPERVISORS: Ms Marita Basson

ENROLMENT: ENG 4111 – S1 2011  
ENG 4112 – S2 2011

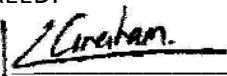
PROJECT AIM: The aim of this research project is to investigate the possible features of a national reporting system of local government greenhouse gas abatement for Australia and determine the affordability of reporting such abatement actions.

SPONSORSHIP: Planet Footprint Pty Ltd

PROGRAM: Issue A, 30<sup>th</sup> March 2011

1. Research existing literature with regards to local government information sharing.
2. Research national reporting systems in operation internationally and any previous systems in Australia.
3. Establish the need or otherwise for a national reporting system for greenhouse gas abatement.
4. Critically evaluate the features of reporting systems and determine key reporting metrics.
5. Perform three case studies of local governments of three different sizes and determine how much it would cost the organisation to report on the determined key metrics.
6. Determine recommendations
7. Prepare and submit the final dissertation.

AGREED:



(Student)

\_\_\_APPROVED\_\_\_ (Supervisor)