Climate change governance by local councils: Carbon mitigation by Greater Adelaide councils

Heather Zeppel (heather.zeppel@usq.edu.au)
Australian Centre for Sustainable Business and Development
University of Southern Queensland

ABSTRACT
There is growing concern about climate change impacts on local government areas (ALGA, 2009). The pending carbon tax (from 1 July 2012) will also increase costs for local councils. This paper profiles a research project about climate change mitigation by local councils. It evaluates what mitigation (i.e. energy, water, & waste management) actions have been implemented by local councils and why (or why not). Council governance of climate change actions is also assessed. This paper specifically reports on carbon mitigation actions adopted by Greater Adelaide councils (n=14) in South Australia. A survey of environmental officers profiled carbon mitigation actions, emissions auditing, and motives for emissions reduction by Adelaide councils. The main reasons for adopting carbon actions were a climate change plan, climate leadership, and cost savings. Crucial issues for climate governance include council policies, funding, and staff resources for carbon programs.

Keywords: carbon mitigation, climate governance, local government, Adelaide, South Australia

INTRODUCTION

Climate change impacts and carbon mitigation initiatives are key issues for local government (ALGA 2010a, b). *Mitigation involves taking actions to reduce greenhouse gas emissions being emitted to minimise the impact from climate change* (QLGA 2009, p. 58). Larger local governments are legally required to report their emissions under the *National Greenhouse and Energy Reporting Act 2007*. From 1 July 2012 all councils will be liable for fugitive emissions from uncapped landfills and from stationary energy under the *Clean Energy Future Act 2011* (Tax Ed 2011). The associated carbon tax will also increase council costs for electricity, gas, fuel and materials. Local councils are thus implementing eco-efficiency measures in energy, water and waste management to reduce operating costs, meet state government targets, and address liability for carbon emissions. This paper reports on carbon mitigation actions adopted by Greater Adelaide councils (n=14), in the wider metropolitan region of Adelaide and adjacent Adelaide Hills in South Australia. It first reviews carbon programs implemented by the Local Government Association of South Australia (LGASA). The paper then presents survey results profiling carbon mitigation actions, emissions auditing, climate governance, and motives for emissions reduction by Greater Adelaide councils.

Climate change and carbon mitigation is a growing issue for Australian local government authorities (Nursey-Bray 2010; Pillora 2011). Local government strategies and reports include advice and case studies on greenhouse gas mitigation for local councils (ICLEI 2008; QLGA 2009; ALGA 2010a, b, 2011). From 1997 to 2009, some 238 Australian councils participated in the ICLEI Local Governments for Sustainability *Cities for Climate Protection* (CCP) program, by recording emissions data and analysing the carbon footprint of council operations and local communities. However, there is limited research on climate change mitigation by councils, apart from case studies of greenhouse gas reduction initiatives by CCP participants and other councils (Atkinson, Brait, Murphy & Rogers 2007; ALGA 2009; Hoff 2010; ACELG 2011; Pillora 2011). In Queensland, one report has reviewed mitigation actions by selected south eastern councils, prior to council amalgamations in 2008 (Burton 2005, 2007), while a local government manual outlines mitigation actions for councils (LGAQ 2009). Research about carbon mitigation by local councils includes climate change law and liability (England 2008); community carbon emissions (Hamilton 2009); and an evaluation of carbon actions implemented by Australian councils in the CCP program (Hoff 2010).

Hoff's 2010 study of carbon mitigation actions by CCP councils in Australia and New Zealand found:

- 47% of councils have a climate change action plan and 36% have a cross-departmental plan,
- 94% of councils incorporated their climate change plan into a long term strategic plan,
- 76% of councils prioritised reductions of greenhouse gas emissions in their action plans,
- 68% of councils provided climate change education programs for schools and citizen groups,
- 63% of councils created positions such as a climate change officer or energy manager, and
- 21% of councils have a specific division responsible for climate change actions (Hoff 2010).

Prior research examines carbon reduction initiatives adopted by one council, or reports on the outcomes of specific carbon programs (e.g. CCP). There has been limited comparison of specific carbon mitigation actions or critical evaluation of climate governance in councils. This paper evaluates carbon mitigation by 14 urban councils across the wider metropolitan region of Adelaide.

The main aims of this research about carbon mitigation by local councils (ACSBD 2011) are to:

- review and benchmark greenhouse gas mitigation measures implemented by local councils;
- evaluate motives for carbon emissions measures adopted by different local councils;
- identify key council staff and divisions responsible for climate change mitigation; and to
- assess opportunities for local councils in sustainable technologies and renewable energy use.

This paper explores the premise that similar to greening businesses, key motivations for ecological responsiveness by local councils are competitiveness, legitimacy, and social responsibility (Bansal & Roth 2000). The next section reviews carbon mitigation programs by the Local Government Association of South Australia (LGASA) to provide a context for the survey of Adelaide councils.

Local Government Association of South Australia

The Local Government Association of South Australia (LGASA) has proactively led carbon mitigation measures for SA councils, with a climate change survey (2007); climate change summit (2008); a renewable energy forum (2009); update on NGERS reporting (2009); a Mutual Liability Scheme Climate Change Adaptation Program for SA councils to assess their climate risks (2009); briefing papers on carbon offsets for local government (2009/10); an emissions measurement and management course (2010); discussion paper on sustainable public lighting (2010); and an Energymark trial report on household energy use (Mendham, Carr-Cornish & Dowd 2010). Key policy guidelines on mitigation actions by SA councils are outlined in the *LGASA climate change strategy 2008-2012* (LGASA 2008a), and the *South Australian local government sector agreement – climate change* (LGASA 2008b). These LGASA mitigation programs address the climate change and carbon reduction actions in *South Australia's greenhouse strategy 2007-2020* (Government of SA 2007); State government targets for climate action in *South Australia's strategic plan 2011* updated from 2007 (SA Plan 2011), and *A renewable energy plan for South Australia* (Government of SA 2011).

These greenhouse gas mitigation goals for the State of SA include:

- greenhouse gas emissions reduction: limiting the state's GHG emissions to 108% of 1990 levels during 2008-2012;
- renewable energy: comprises 20% of the state's electricity production and consumption by 2014, and 33% by 2020:
- GreenPower: buy renewable energy for 50% of the government's electricity needs by 2014;
- energy efficiency: improve government buildings by 30% and dwellings by 15% by 2020:, and
- zero waste: reduce waste to landfill by 35% by 2020 (SA Plan 2011).

The LGASA has set a target for SA local councils to purchase at least 20% GreenPower. Carbon reduction goals are also included in: *The 30-year plan for Greater Adelaide*, and Adelaide Green City Sector Agreement (Government of SA 2009, 2010). Seven Adelaide councils have climate change strategies (e.g. Adelaide City, Norwood, Payneham & St Peters, Onkaparinga, Port Adelaide Enfield, Salisbury, Tea Tree Gully, & Unley) with five included in this current study.

METHODOLOGY

Queensland and South Australian local council websites were reviewed for information on climate change strategies, carbon mitigation and offsetting measures (Zeppel 2011a, b). Other mitigation actions by local councils were identified from news articles, reports by CCP partners, and the climate change programs of local government associations (e.g. ALGA, ICLEI, QLGA, and LGASA). Carbon mitigation actions in the Cities for Climate Protection program were also assessed. These provided the basis for the types of carbon mitigation actions listed in the council survey, along with questions about council motives for emissions reduction actions. The final survey included 28 questions in four sections: your local council; climate change; climate change mitigation; and carbon offsetting. The questions included check lists of climate change actions, open-ended questions on issues or reasons for climate responses, and rating of motives for carbon reduction actions by councils. A checklist of 56 mitigation actions covered energy, water, wastewater, vehicles, and other council climate change initiatives. Two sustainability officers at Queensland local councils with climate change programs provided feedback on a draft of this climate mitigation survey, with questions about constraints on climate actions by councils added. A survey of carbon actions by Greater Adelaide councils (n=14) was conducted, with information added about LGASA carbon programs and SA government agencies (Zeppel 2011b). Key results from the survey of 14 Adelaide councils are presented in this paper.

The climate mitigation survey of Greater Adelaide councils (n=14) was conducted during June to October 2011. Councils were contacted via contact details on their corporate website. The target group for this survey was environmental or sustainability officers at these SA councils. The survey was forwarded by email and by post to 20 Greater Adelaide councils, with follow-up phone calls to check that the survey was received and to speak with environmental staff. An email about this survey was also sent to the network for sustainability officers at SA councils. A total of 14 councils (70%) completed this carbon mitigation survey, by email or by post, with one survey completed via telephone interview. Three councils declined to participate, while three councils did not respond to emails or phone calls. The next section presents results from the survey of 14 Adelaide councils.

RESULTS

The 14 councils completing the survey covered coastal, inner city and suburban councils, across the southern and northern regions of the Greater Adelaide region, into the Adelaide Hills. Of the 14 Adelaide councils completing the survey, ten had participated in Earth Hour 2011. The council staff completing the survey were sustainability officers (n=8), including a sustainable energy coordinator; environmental officers (n=4); and sustainability planners (n=2). The number of council staff ranged from 89 to 250 (7 councils); 300-395 (3 councils); 400-465 (3 councils), and one council with over 600 staff. The size of the regional population served by the council ranged from 20,000 to 52,000 people (8 councils), 80,000 to 133,000 people (5 councils), and one council with 160,000 people (10% of state population). The main sources of cash revenue for these Adelaide councils was council rates (n=14, 100%); state or federal government grants (n=7, 50%); other council fees (n=6, 43%); and bank interest, or external contracting (n=2). The annual operating budget of the responding councils ranged from $15 to $38 million (5 councils), $62 to $72 million (4 councils), and $90 to $106 million (3 councils). The councils also reported damage from extreme weather events due to drought (n=10); heat waves (n=9); flash floods (n=8); bushfires (n=6); river floods and wind storms (n=5), and coastal erosion or storm surges (n=5). In regard to council insurance for damage to assets, eight said yes (*but not sea related*) while five were not sure or thought it could be in a mutual liability scheme.

Climate Change and Greater Adelaide Councils

All of the surveyed councils (n=14, 100%) agreed that climate change was an important issue for local councils. Comments about climate change impacts referred to natural hazards, risk management, legal liability, service delivery and community safety, damage to infrastructure, cost, and council leadership on climate change. One coastal council mentioned increasing sea water rise and greater risk of flooding, with a climate change adaptation plan being prepared for western Adelaide. One environmental officer thought climate change was important *however it is rarely on the radar of senior management or elected members who are more interested in roads, rates & rubbish.* Another respondent noted the need for planning and holistic strategies by councils since *climate change/variability has implications for roads, waterways, open space and buildings.*

The council strategies or policies that included climate change were an: Environmental policy (n=9), Water cycle management plan (n=7), or Waste management plan (n=7). Other specific climate change documents were: Climate change risk assessment (n=6); Climate change strategy (n=6) with one adopted in March 2011; Greenhouse gas or carbon neutral action plan (n=5); Climate change adaptation plan (n=4); Climate change policy (n=3); and Carbon emissions policy (n=3). Energy documents were: Sustainable energy action plan (n=3); Renewable energy policy (n=2); and Peak oil/energy transition plan or strategy (n=1). Other climate change strategies were in environment plans (n=4), including a *Healthy Environment Plan, Biodiversity Action Plan*, and an *Energy and Water Efficiency Management Plan* that included *energy, GHG and water objectives and targets.* The areas dealt with in council climate change plans included: Energy efficiency/conservation (n=13); Renewable energy (n=12); Waste reduction (n=10); Water conservation/water recycling (n=8); More sustainable living (residents) (n=8); Sustainable transport (n=8); and Sustainable business (industry) (n=3). One council included carbon actions for residents and businesses in their *Community Wellbeing Plan,* and *Economic Development Plan,* with another council reviewing climate change issues in their environmental plan for 2011/12. Other climate change areas (n=6) in council plans were community engagement, public lighting, adaptation planning, and carbon reduction targets.

The council staff identified as being responsible for climate change issues included: Environmental or Sustainability Officer (n=11); Environmental Manager (n=6); Water and Waste Manager (n=1); Energy Manager (n=1); Sustainability Planner (n=1), and Infrastructure (n=1). One respondent noted climate change projects were assigned to relevant council units but the *Sustainability Unit has responsibility for coordinating response.* Respondents identified the council sections responsible for climate change issues as: Planning and Environment/Sustainability (n=5); Environment team (n=3); Policy and Planning (n=3); Water and Waste (n=3); Infrastructure Services/Engineering (n=2); and Corporate Services (n=1). Two councils had a specific Sustainability Unit, or Sustainable Futures Department *responsible for strategic planning and policy and coordination of Council's overall response to climate change; other departments are responsible for operational activities and initiatives (i.e. implementing the Plan).* The climate initiatives that councils participated in were: Cities for Climate Protection (CCP) (n=13); Earth Hour (n=11); Climate change workshop (n=8); Solar City or other solar scheme (n=6); Sustainable street lighting program (n=6); National Water Initiative/Water Week (n=5); and NGERS report on emissions (n=4). Other council actions for climate change (n=4) were: Emission reports (not NGERS); ZWSA Resource Efficiency Assistance Program; and the LGASA Mutual Liability Scheme Climate Change Adaptation Program.

The sectors targeted by councils for climate change actions were: Households (n=11); Community organisations (n=9); Businesses (n=8); Schools (n=7); Developers (n=4); Youth groups (n=3), and Landholders (n=2). One peri-urban council noted: *we have tried to develop climate change activities with residents, but response rates are low,* with *limited active engagement external to the activities of Council (concentration on getting our own house in order).* Climate change initiatives were mainly funded by: Council operating budget (n=11); and State or Federal government grants (n=7). A few

councils funded carbon actions with: Council climate change action fund (n=2), one with a climate change response fund established in 2008; or Savings generated by CO_2 reductions (n=1) with a revolving climate action plan fund since 2005; and a Council environmental levy or trust fund (n=1). The four councils with carbon action funds had also adopted climate change or energy strategies.

Carbon Mitigation by Greater Adelaide Councils

The respondents all strongly agreed (n=10, 71%) or agreed (n=4, 29%) that it was important to reduce the carbon emissions of their local council. Eight councils employed a consultant to assess council emissions, with council staff internally assessing carbon emissions at six other councils. Three councils outsourced their emissions data collection and assessment to Planet Footprint, Balance Carbon and Energy Analytics. The main source of council carbon emissions was energy consumption from electricity used for office buildings, council facilities, and wastewater plants (32%, 43%, 45%, 45%, 51%, 54%); street lighting (19%, 32%, 33%, 49%, 57%, 59%, 60%); water storage and pumping (24%); the council vehicle fleet (14%, 14%, 16%, 16%, 24%); and other emissions from fugitive sources, business travel, corporate waste, paper consumption (8.5%). Respondents stated the Electricity Trust of SA charged councils more to install and service energy efficient bulbs in public lighting, while future emissions reporting for all street lighting could be taken over by ETSA. One council noted their 2005/06 CCP emisssion data was out of date with *questions about their accuracy*. The carbon calculators used to assess council emissions were: NGERS (n=5); council spreadsheet (n=4) using National Greenhouse Accounts factors; and ICLEI Greenhouse Gas Application (n=3). One council previously used CCP software to *complete inventories of energy & GHG emissions* but was *now looking at an alternative that will align with NGERS reporting requirements even though we will not trigger mandatory reporting.* Key issues for councils in assessing carbon emissions were staff resources, reconciling accounts, formats, and data analysis. To manage accounts, one council had developed *shared spreadsheets that are used to manage and track payment and energy/water use.*

The Greater Adelaide councils adopted a wide range of emissions reduction actions (Table 1). These actions mainly related to energy efficiency, water conservation, and fostering behavioural change by residents (n=12), neighbouring councils, businesses and suppliers (n=8 each) in reducing emissions. Other mitigation measures by councils were solar or heat pump hot water heaters, roofing insulation, aquifer storage and recovery of reclaimed water (n=7 each), and capturing methane gas from landfills for power (n=5). Other carbon actions related to fuel efficient/LPG/hybrid electric vehicles (n=7/6/5), but few used biofuels (n=2). One council *made smaller, energy efficient cars more financially viable in work packages but some staff still preferred larger cars*, while *waste services no longer had to use E10 in council vehicles* (as) *green waste bins cost extra to pick up.*

Only one council in each case had installed a cogeneration or trigeneration power plant; used reverse osmosis to produce recycled water; or installed mini hydroelectric systems in water facilities. The carbon actions not implemented by Adelaide councils related to water and wastewater treatment as these services are mainly managed by SA Water. Overall, a total of 272 carbon actions were adopted by 14 Greater Adelaide councils (av. 19.4 measures out of 45 actions implemented).

The top five reasons for councils adopting emissions reduction actions (ranked 1 to 5) were:

- council climate change strategy/action plan (1.8);
- demonstrate climate leadership to local businesses/residents (2.4);
- cost savings (2.5);
- differentiate your council as a ‘climate friendly’ region (3); and
- council resolutions on climate change/energy efficiency (3.2).

TABLE 1. Top 30 emissions reduction initiatives by Greater Adelaide councils (n=14).

Install solar photovoltaic (PV) power on council buildings (n=14)
Purchase GreenPower electricity from renewable energy for council facilities (n=13)
Practise rainwater harvesting (i.e. capture roof water from council buildings) (n=13)
Install energy saving CFL bulbs or LED lights in council buildings (n=12)
Provide information to residents on reducing their emissions (n=12)
Include emissions reduction targets in council corporate plans (n=11)
Install energy efficient computers in council offices/council libraries (n=11)
Install energy & water efficient technology in council amenities blocks (n=10)
Solar powered public lighting (e.g. walkways) (n=10)
Practise stormwater harvesting & filter through wetlands or bioretention system (n=10)
Install timers, daylight sensors or motion detectors on council building lights (n=9)
Purchase energy efficient appliances (e.g. fridges) (n=9)
Produce or use recycled water – Class A+, Class A, Class B, Class C (n=9)
Install council-owned renewable energy generation systems (n=9)
Practise recycling and minimise amount of solid waste (n=8)
Share information with neighbouring councils on emissions reduction (n=8)
Provide information to businesses on reducing their emissions (n=8)
Choose suppliers taking actions to reduce their emissions (i.e. green purchasing) (n=8)
Practise aquifer storage and recovery (ASR) of reclaimed water (n=7)
Install solar or heat pump hot water heaters in council buildings & facilities (n=7)
Install roofing insulation in council buildings & facilities (n=7)
Operate new fuel efficient council vehicles or vessels (n=7)
Market the emissions reduction initiatives of your council (n=6)
Drive electric cars or hybrid-electric council vehicles (n=6)
Use of dedicated LPG fuelled vehicles as part of council fleet (n=5)
Capture methane gas from council landfills to generate power (n=5)
Train staff or volunteers on your emissions reduction actions (n=4)
Switch off council appliances at the wall to reduce standby power (n=4)
Implemented any other energy initiatives (n=4)
Install energy saving fluorescent or LED lights in street lighting (n=3)

Other lower-ranked reasons were certification (e.g. CCP) (4.3), attracting low carbon industry investment (4.5), *SA's Greenhouse Strategy* or *Act*, and the *LGASA climate change strategy* (5). The main reasons for councils not adopting carbon actions were cost; staff resources; funding; asset ownership; measurement tools, and *when payback periods are excessive (e.g. more than 15 years).* One council noted *missed opportunities by staff/work areas not seeing this as a priority.*

The main opportunities for Adelaide councils in reducing carbon emissions were identified as: waste management (n=7); green building design (n=7); renewable energy-solar, wind, cogeneration (n=7); sustainable technologies (n=6); water management (n=5); eco-efficiency measures (n=4); landfills (n=3); and carbon offset markets (n=2). Future carbon mitigation goals included recovery of waste for ethanol, aquifer recharge projects, and methane gas generation from landfills. One council aimed to *maximise sustainable design and integration of appropriate technologies* at all developments.

Other comments about the role of local councils in carbon mitigation were:

- *Local Government is a leader in this space. More **support from Commonwealth and State governments through partnerships** are needed;*

- ***Council should be focusing on avoiding or reducing their emissions*** *as the offset side of things does not sit well with me;* and

- *Our Environmental Advisory Committee has decided to* ***prioritise our funds into emission reduction and alternative energy generation*** *for the current year.*

These comments and survey results indicate the main focus of Adelaide councils is on reducing greenhouse gas emissions through a range of carbon mitigation and renewable energy measures.

RECOMMENDATIONS FOR POLICY AND PRACTICE

This study of emissions reduction actions by Greater Adelaide councils compares and highlights responses to climate change mitigation across one metropolitan region. LGASA programs and SA state government targets influence the carbon actions adopted by Greater Adelaide councils, with mitigation measures demonstrating leadership on climate issues to ratepayers and related agencies. Council responsibility for climate change issues was mainly delegated to environmental services, sustainability, and planning areas, rather than infrastructure, finance, or community development. The opinions of sustainability officers in regard to climate change issues may well differ from CEOS, other council managers or elected councillors (Nursey-Bray 2011). Respondents noted the legal liability of councils for climate change actions, but some felt it wasn't a priority for funding or that staff missed opportunities to address climate change issues across council. Nursey-Bray (2010, p. 173) also found Tasmanian councils were concerned about dealing 'with the uncertainty surrounding climate change impacts and how to incorporate climate change into day-to-day management or 'governance structures'. Council managers also felt climate change management needed to be incorporated within 'governance regimes in more permanent and sustainable ways' (p. 174). Local government associations thus need to provide information on how climate change and carbon mitigation measures should be included in decision making by all sectors and divisions of councils.

This study found key motivations for ecological responsiveness by Adelaide local councils in reducing carbon emissions are legitimacy, social responsibility and competitiveness (Bansal & Roth 2000). Climate actions were mainly funded from council rates. Four Adelaide councils with carbon action funds had adopted climate change or energy strategies, while smaller councils lacked climate strategies or staff. Hoff (2010) found 45% of CCP councils altered their council organisation to include positions or departments responsible for climate change actions. Two Adelaide councils had sustainability units. Further support and funding is needed to assist local councils in developing climate change plans; auditing carbon emissions; and installing energy or water efficiency devices (e.g. cogeneration). This will enable councils to meet their legal and community liability to reduce carbon emissions. Climate governance by local councils will become more important with the *Clean Energy Future Act 2011* and the requirement for councils to audit and report their NGERS emissions.

CONCLUSIONS

This study of carbon mitigation actions by metropolitan local councils highlights climate governance issues and motives of both councils and environmental staff for reducing carbon emissions. The main reasons for Greater Adelaide councils to reduce greenhouse gas emissions were climate change plans; demonstrating climate leadership, cost savings, being a 'climate friendly' region, and carbon resolutions. Key motivations for local councils in reducing their carbon emissions are legitimacy (i.e. rules, targets), social responsibility, and competitiveness (i.e. cost savings, leadership). More research is needed on how local councils are addressing climate change governance and adopting carbon mitigation actions. This includes policies, funding, and staff resources for carbon initiatives. The next stage of this research will survey Queensland local councils (n=74) about carbon actions. Constraints to carbon mitigation and offsetting actions by local councils will also be reviewed. This

will highlight the impact of climate change practices on the organisational behaviour and governance of local councils, along with environmental, social, and business benefits from greening councils.

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Author Biography

Associate Professor Heather Zeppel is a Mid Career Research Fellow at the Australian Centre for Sustainable Business and Development, University of Southern Queensland. Her research interests include environmental sustainability and carbon mitigation by local councils and tourism operators.