

# CLIMATE CHANGE MITIGATION BY GREATER ADELAIDE COUNCILS

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## ABSTRACT

This paper 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 councils. The main reasons for carbon actions were a climate change plan, showing climate leadership, and cost savings.

Keywords: carbon mitigation, eco-efficiency, 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: 58). Larger local governments are required to report their emissions under the *National Greenhouse and Energy Reporting Act (2007)*, while from 1 July 2012 all councils will be liable for fugitive emissions from landfills and from stationary energy under the *Clean Energy Act 2011* (Tax Ed, 2011). Local councils are thus implementing eco-efficiency measures in energy, water and waste management to reduce operating costs 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 by the Local Government Association of South Australia (LGASA). The paper then presents survey results profiling carbon mitigation actions, emissions auditing, and key motives for emissions reduction by Greater Adelaide councils.

Climate change and carbon mitigation is a growing issue for Australian local government authorities (Pillora, 2011). Local government strategies and reports include advice and case studies on greenhouse gas mitigation for local councils (ALGA, 2010a, b; QLGA, 2009). Research about carbon reduction by local councils includes: carbon mitigation strategies (Burton, 2007); climate change law and liability (England, 2008); community carbon emissions (Hamilton, 2009); and council climate protection programs (Hoff, 2010). Prior research examines one area of carbon reduction by councils, or reports on carbon programs. This paper evaluates carbon mitigation actions by 14 councils across one metropolitan region.

### Local Government Association of South Australia and Carbon Mitigation

The LGASA has proactively led carbon mitigation measures for councils, with a climate change survey (2007); climate change summit (2008); a renewable energy forum (2009); update on NGERs reporting (2009); an emissions measurement and management course (2010); and report on sustainable public lighting. Key policy guidelines on mitigation actions

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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) and the state government targets for climate change, energy, and zero waste in *South Australia's strategic plan 2007*. Carbon reduction goals are also in *The 30-year plan for Greater Adelaide*, and Adelaide Green City Sector Agreement (Government of SA, 2010).

## METHODOLOGY

A climate change survey was developed based on a website review of carbon mitigation and sustainability practices at SA councils, the LGASA and government agencies (Zeppel, 2011a). 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 survey had 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, and rating of motives for carbon actions.

The climate change 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 the survey was received and speak with environmental staff. An email about this survey was 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. Three councils declined to participate, while three councils did not respond to emails or calls. Of the 14 councils completing the carbon survey, ten had participated in Earth Hour 2011. The next section presents results from the carbon mitigation survey of 14 Adelaide councils.

## RESULTS

The 14 councils completing the survey covered both coastal and inner city councils, across the southern and northern regions of the Greater Adelaide region, into the Adelaide Hills. 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 these councils 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 source of cash revenue for the councils was council rates (n=14, 100%), state or federal government grants (n=7, 50%), other council fees (n=6, 43%), 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 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 actions were mainly funded by: council budget (n=11), and government grants (n=7).

### 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, community safety, 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 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, since *climate change/variability has implications for roads, waterways, open space and buildings*.

The council strategies or policies that included climate change were: 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 documents were environment plans (n=4), including a *Healthy Environment Plan*, and an *Energy and Water Efficiency Management Plan*. 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 reviewing climate change issues in their environmental plan for 2011/12. Other climate change areas (n=6) were community engagement, public lighting, adaptation planning, and carbon reduction targets.

The council staff identified as being responsible for climate change issues included: Environmental/Sustainability Officer (n=11); Environmental Manager (n=6); Water and Waste or Energy Manager (n=1 each); Sustainability Planner (n=1), and Infrastructure (n=1). One officer noted climate projects were assigned to 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 a 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 Adaption 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). Three councils had funding for dedicated 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<sub>2</sub> reductions (n=1), with a revolving fund established in 2005; and a Council environmental levy or trust fund (n=1).

### **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 assessing carbon emissions at six other councils. 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%). One council noted their emissions data was from 2005/06 with questions about their accuracy. Another stated emissions reporting for all street lighting would be taken over by the Electricity Trust of SA. 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*. Three councils outsourced their emissions data collection and assessment. Key issues for councils were staff resources, reconciling accounts, formats, and data analysis. To manage accounts, one council had *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).

Three councils installed energy efficient street lighting while two supported carbon offsetting. Only one council had installed a cogeneration or trigeneration power plant, used reverse osmosis to produce recycled water, or installed mini hydroelectric systems in water facilities. Water and wastewater treatment is mainly managed by SA Water and not Adelaide councils. A total of 272 carbon actions were adopted by Adelaide councils (av. 19.4 out of 45 actions).

**Table 1: Top 15 Emissions Reduction Initiatives by Greater Adelaide Councils (n=14)**


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Install solar photovoltaic (PV) power on council buildings (n=14)
Purchase Green Power 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+, <u>Class A</u> , 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)

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The top five reasons for adopting emissions reduction actions (ranked 1 to 5) were: council climate change strategy (1.8); demonstrate climate leadership (2.4); cost savings (2.5); to differentiate council as a ‘climate friendly’ region (3), and council carbon resolutions (3.2). 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 *LGASA climate change strategy* (5). The main reasons for councils not adopting carbon actions were cost, staff resources, funding, asset ownership, 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 councils in reducing emissions were: 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). Options included producing ethanol from waste, aquifer recharge projects, and methane gas generation. One council aimed to *maximise sustainable design and integration of appropriate technologies* to reduce emissions at all developments.

### **CONCLUSIONS: Organisational Behaviour in Councils for Carbon Mitigation**

This study of carbon mitigation by local government highlights organisational behaviour and motives of both councils and environmental staff for reducing carbon emissions (Zeppel, 2011b). The main reasons for Greater Adelaide councils to reduce emissions were climate change plans; demonstrating climate leadership; cost savings; being a ‘climate friendly’ region, and carbon resolutions. Similar to businesses, key motivations for ecological responsiveness by local councils are competitiveness, legitimacy, and social responsibility (Bansal and Roth, 2000). The environmental/sustainability officers in this survey 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. More research is needed on how sustainable practices impact organisational behaviour, along with environmental, social, and business benefits from greening councils.

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