

# Climate change mitigation survey of Queensland councils: Carbon footprint management

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## ABSTRACT

Climate change impacts and carbon mitigation initiatives are key issues for local government (ACELG, 2011; Pillora, 2011; Storey et al, 2012). This research evaluates carbon mitigation actions by 32 local councils in Queensland. A 2012 survey profiled climate change responses, carbon mitigation actions, and council motives for emissions reduction. The study found carbon actions related to council size and capacity, coastal location, and climate change strategies. Carbon actions were mainly implemented by City, then Regional, and lastly Shire councils. Carbon leadership was mainly evident among coastal councils and larger inland councils (>30,000 resident population) that assessed their emissions. Larger metropolitan and coastal councils were more 'carbon-ready' (i.e. consolidating or mainstreaming carbon actions) than smaller inland rural councils (i.e. latent or emerging actions) (LGAQ, 2009). Some 13 Queensland councils had completed an assessment of carbon emissions, while five councils planned to assess emissions. Just three surveyed councils purchased Green Power from renewable energy while four councils had a green purchasing program. Key motives for adopting carbon actions were: cost savings; environmental regulations; council climate strategy; council resolutions on climate change; and to demonstrate climate leadership. The main barriers to carbon actions were: cost and lack of funding; reliance on the operating budget; lack of council policies; indifference to climate change by some councillors and managers; lack of staff to implement climate action; and environmental regulations. Most Queensland local councils were minimalistic or opportunistic in adopting carbon actions, while a few progressively integrated lower carbon measures in council operations. The study identifies key challenges for Queensland local government in moving to a low carbon future.

Keywords: climate change mitigation, carbon management, local government, Queensland

## INTRODUCTION

Climate change impacts and carbon mitigation initiatives are key issues for local government (ACELG 2011; Pillora 2011; Steffen et al 2012; Storey et al 2012). In this context, "Mitigation involves taking actions to reduce greenhouse gas emissions being emitted to minimise the impact from climate change" (QLGA 2009, p. 58). Local government strategies and reports include advice and case studies on greenhouse gas mitigation actions for local councils (QLGA 2009). In Australia, local governments are required to report their carbon emissions over 25,000tCO<sub>2</sub>-e from a single facility, mainly from landfill, under the *National Greenhouse Energy Reporting (NGERS) Act 2007*, and the *Clean Energy Act 2011*. The implementation of a carbon price of AUD\$23tCO<sub>2</sub>-e from 1 July 2012 will also impact on council operations through the increased cost of energy, water, fuel, transport and raw materials (ALGA 2011; LGAQ 2012). Local councils are thus adopting eco-efficiency measures in energy, water and waste management to reduce operating costs and address carbon liability. This paper evaluates carbon mitigation actions implemented by Queensland local councils.

As part of the broader national response to global warming, local government in Queensland faces the challenge of implementing policy, organisational and technical initiatives to both mitigate its greenhouse gas emissions and adapt to the impacts of climate change (LGAQ 2009; Steffen et al 2012). This includes compliance and reporting of greenhouse gas emissions over a threshold of 25,000tCO<sub>2</sub>-e to the Clean Energy Regulator under the *Clean Energy Act 2011*. To date, 12 Queensland councils have been listed as liable entities by the Clean Energy Regulator: 10 larger councils from landfills (i.e. Brisbane, Gold Coast, Logan, Townsville, Gladstone, Mackay, Moreton Bay, Rockhampton, Sunshine Coast & Toowoomba) while two regional councils are liable as natural gas suppliers (i.e. Maranoa & Western Downs). In that context, this paper reviews climate change responses by Queensland local councils at the City, Regional, and Shire levels (Zeppel & James-Overheu 2012a). It thus considers the varied size and capacity of Queensland councils to implement carbon mitigation actions. It also extends a pilot climate change survey of Greater Adelaide councils (Zeppel, 2012; Zeppel & James-Overheu 2012b) to a state-wide carbon survey of Queensland local government.

### **Queensland Local Government**

There are 73 local government areas (LGAs) in Queensland, including seven city councils, 30 regional councils, 24 shire councils, and 12 Aboriginal shire councils. These councils range in size from five of the 10 largest LGA for Australia in the high urban growth region of South East Queensland (i.e. Brisbane, Gold Coast, Moreton Bay, Sunshine Coast, & Logan); mid-size regional centres in coastal and inland areas; and small rural or Aboriginal shires with less than 1,000 residents. These LGAs operate under the *Queensland Local Government Act 2009*. The *City of Brisbane Act 2010* covers Brisbane City Council as a corporation managing the largest local council area in Australia. The Local Government Association of Queensland (LGAQ) advocates and represents the interests of these 73 LGAs. The LGAQ has published a *Climate Change Mitigation* guide (LGAQ 2009), and analysis of carbon price impacts on Queensland councils (LGAQ 2012). There is no state-wide climate change strategy for Queensland LGAs and no renewable energy, Green Power or other carbon mitigation targets for local government have been set by the State government. There is one regional carbon plan by LGAs for Far North Queensland, where five local councils completed a greenhouse gas inventory and carbon mitigation action plan (FNQROC 2011). Recent Federal government grants awarded to Queensland councils for carbon reduction and management measures include the Community Energy Efficiency Program for upgrading facility and street lighting (Brisbane, Cairns, Townsville), and the Biodiversity Fund (South Burnett). Queensland local government elections in April 2012 also resulted in 60% new mayors and councillors (Passmore 2102), many with limited knowledge of carbon mitigation measures. LGAs in Queensland are still recovering from state-wide flooding and cyclones in 2011, with the Lord Mayor's Sustainability Grants in Brisbane diverted to flood recovery (BCC, 2011).

### **LITERATURE REVIEW**

Research about carbon management and mitigation by local government in Australia includes: climate change mitigation strategies of local councils in South East Queensland (Burton 2007); climate change law and liability (England 2008); assessing local carbon emissions (Hamilton, Kellett & Yuan 2008); and the Cities for Climate Protection program (Hoff 2010). A survey evaluated carbon mitigation actions by 14 Greater Adelaide councils in South Australia, where the main reasons to reduce emissions were climate change plans;

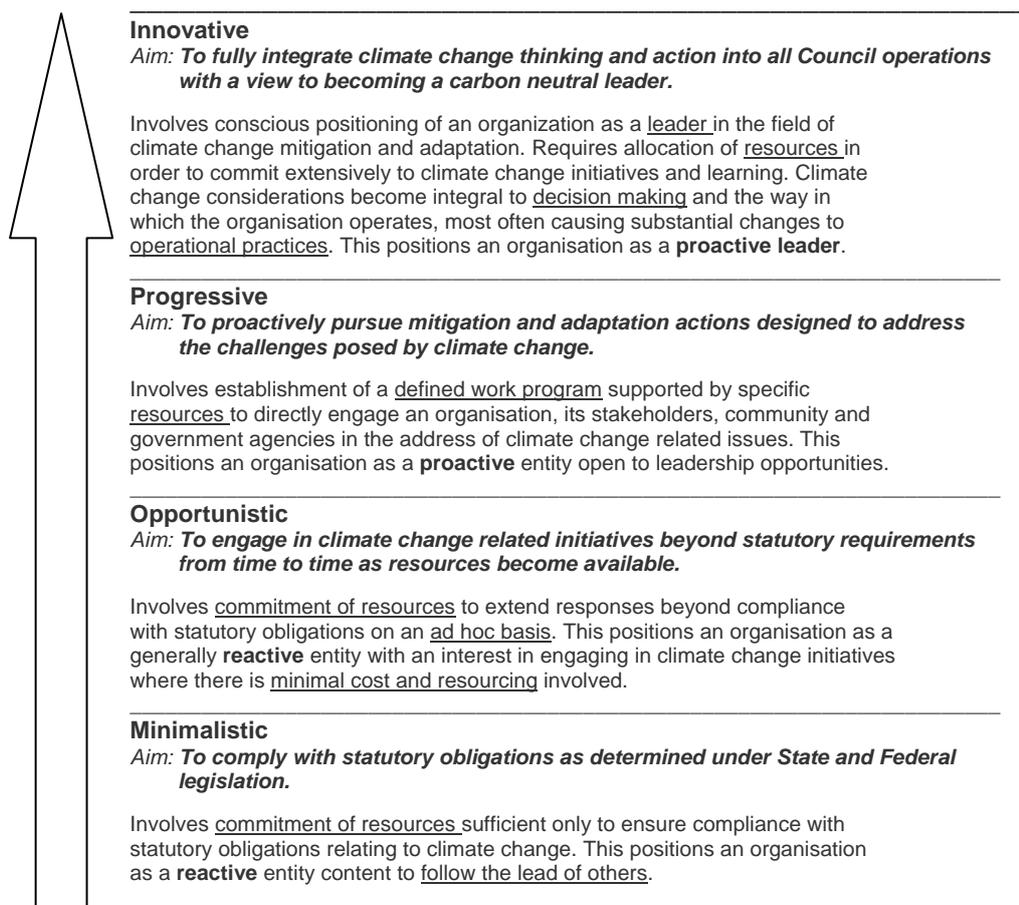
demonstrating climate leadership; cost savings; being a 'climate friendly' region; and other carbon resolutions adopted by council (Zeppel 2011a, 2012; Zeppel & James-Overheu 2012b). A report, *Local Action for a Low Carbon Future* (Storey et al 2012), reviewed local government strengths in achieving carbon reduction, based on collaboration, community engagement, investment capital, and local data. It included 14 case studies of carbon mitigation by LGAs in Australia, including Townsville Solar City and the Living Smart Homes program of Moreton Bay and Sunshine Coast Regional Councils. Another report reviewed innovation in Australian local government (Howard 2012), including the area of climate change and sustainability with five case studies of councils reducing their carbon footprint.

A review of climate change action plans by 20 U.S. cities found they were largely based on land-use and transportation solutions and favoured mitigation actions that were highly visible or produced immediate results from energy or cost savings (Bassett & Shandas 2010). In California, local governments with climate action plans have more green buildings, diverted more waste from landfill and spent more on bicycle and pedestrian infrastructure, with these actions mainly driven by citizens' environmental preferences (Millard-Ball 2012). A survey of 255 U.S. municipalities, however, found the greatest impact on the adoption of climate mitigation policy and planning was their interaction with neighbouring jurisdictions, staff members responsible for energy or climate planning, and the level of community environmental activism and engagement (Pitt 2010a, 2010b). In Scotland, though, carbon mitigation actions by local government were driven by compliance aspects and carbon reduction targets in the *Climate Change (Scotland) Act 2009* (Jackson & Lynch 2011). This paper assesses the carbon mitigation actions adopted by Queensland councils against a framework assessing level of commitment to climate action (Wood & McNamara 2011).

### **Framework for Climate Action**

Wood and McNamara (2011) developed a framework for assessing the level and type of climate change planning and responses by Ballina Shire Council in northern New South Wales (Australia). Their 'Philosophy for Climate Action' assessed the level of organisational (and community) understanding and commitment to climate change planning (Figure 1). It assessed leadership, engagement, policy, funding and resources, operations, and organisational culture in regard to municipal thinking, action and learning on climate change. This analysis developed a continuum or sequence of climate change responses by local government, ranging from minimalistic and opportunistic, to progressive and innovative. Reactionary responses were councils complying with statutory obligations on climate change (i.e. minimalistic) or implementing other additional climate change initiatives as resources allowed (i.e. opportunistic). Proactive responses were councils actively pursuing mitigation and adaptation actions addressing climate change (i.e. progressive) or integrating climate change thinking across all council operations (i.e. innovative) (Wood and McNamara 2011). This paper assesses the climate change and carbon actions adopted by Queensland councils against this framework for climate action.

**Figure 1 Philosophy of Climate Action (Wood & McNamara 2011)**



## METHODOLOGY

The climate change mitigation survey for Queensland councils was based on carbon mitigation actions recommended in the Cities for Climate Protection (CCP) program, and a desktop review of climate change plans and carbon actions listed on Queensland council websites (Zeppel 2011b). The survey also adopted some questions from ICLEI's review of Australian (and New Zealand) councils in the CCP program (Hoff 2010), and previous climate change surveys of New South Wales local councils (LGS, 2010; Urbis 2010). Sustainability officers at two large Queensland councils with climate change programs provided feedback on questions in the draft survey. A pilot climate change survey was also conducted of 14 Greater Adelaide Councils in 2011 to assess their carbon mitigation actions (Zeppel 2011b, 2012; Zeppel & James-Overheu 2012b).

The Queensland council survey included 36 main questions organised in five sections: A: Your Local Council; B: Climate Change; C: Climate Change Mitigation; D: Carbon Offsetting; and E: Preparing for the Carbon Price. The survey included climate change responses, a checklist of 64 carbon mitigation actions, ranking of council motives for carbon actions, and open-ended questions on reasons for climate change actions by councils. This survey was circulated to all 73 Queensland councils, by email, post and follow-up telephone calls, during January to May 2012. A total of five (of 7) City Councils (CC), 18 (of 30) Regional Councils (RC), eight (of 24) Shire Councils (SC), and one (of 12) Aboriginal Shire Councils (ASC) completed the survey. Excluding the Aboriginal Shire Councils, the response rate for

this carbon survey among all other Queensland councils (31 of 61) was 51%. In the results, councils are referred to by type (i.e. City, Regional, or Shire), and geographic location (i.e. coastal or inland). Of the 41 Queensland local councils that did not complete the survey, some advised they lacked climate change policies, had limited staff or resources or other priorities, or were unsure about their carbon emissions.

## **RESULTS**

The climate change survey was completed mainly by council staff with roles related to environmental, sustainability, and climate change areas. At inland RC, and small SC, the survey was completed by environmental services officers; by environmental health officers, or the CEO; and by building or engineering staff. Planning staff (n=19), environmental managers (n=17), sustainability officers (n=13), the CEO (n=13), and water and waste managers (n=11) were identified as the key people responsible for climate change issues. Only six councils indicated their Finance Manager had responsibility for climate change matters. Other council staff responsible for climate change issues included the Infrastructure Manager (CC), Fleet and Hydrology Managers (RC), and Engineer (SC). Just two CC, and two larger RC, had a dedicated Energy and Carbon Manager (n=4), or a Climate Change Officer (n=2). Four rural councils had no one delegated to climate change issues.

The Planning and Environmental Sustainability divisions of councils (n=19) were identified as most responsible for climate change issues, along with the Environmental Services (water, waste) (n=9) and Corporate/Finance areas (n=9). Only 14 Queensland councils identified their Manager/CEO (n=10), or their Mayor and Councillors (n=5), as responsible for climate change issues. Other designated areas for climate change actions were Policy and Planning (n=5), and Infrastructure Services (n=5), followed by Assets and Environment (n=3), and Community Development (n=2). Other council areas reported as responsible for climate change included environmental planning and compliance, environmental health, building services, and regulatory services. Just two CC (Logan & Townsville) and two coastal RC (Sunshine Coast) had a dedicated sustainability unit/division to implement climate actions.

### **Climate Change Responses by Queensland Councils**

Two thirds of surveyed Queensland councils (n=21) considered that climate change was an important issue for local government. This included all five CC, and three quarters of RC (13 of 18), but only two SC. Climate change was considered important because of the potential impacts on council infrastructure, service delivery, risk minimisation, community safety, biodiversity, and economic development. Two-thirds of SC (n=5) and three inland RC reported that climate change possibly was an important issue, but could also be the result of natural weather variability. One SC reported it was an *'important [issue] but only state and federal agencies have resources to implement change'*. Three small councils were not sure whether climate change was an important issue, because they considered there was limited evidence, or because council did not have a formal perspective on the issue.

The main climate-related initiatives undertaken by half of surveyed Queensland councils included participation in the Cities for Climate Protection (CCP) program (n=16) and the annual Earth Hour Event held in March (n=15). Other council measures included carbon footprinting (n=14), holding climate seminars (n=8) and environmental certification (ISO 14001) (n=8), followed by the ecoBiz program (n=7), Water Week (n=7), the Low Carbon Diet (n=6),

sustainable street lighting (n=5), climate change workshops (n=5) and Climate Smart business (n=4). Overall, the average number of climate initiatives implemented per council was: City Councils (9.2), Regional Councils (3.5), and Shire Councils (1.3). For Regional Councils, there was a difference in the average (2.6) for nine inland councils, with 16 of 24 climate actions implemented by Toowoomba and Tablelands Councils, versus 36 climate actions adopted by nine coastal councils (average = 4). Overall, the range of climate actions implemented were City Councils (7-11), Regional Councils (0-10), and Shire Councils (0-3).

In terms of council response to climate change action (Table 1), around one-third are either complying with statutory obligations on climate change (n=13), or implementing other additional climate initiatives beyond legal requirements as resources allow (n=13). Nine of the RC (7 inland), and three inland SC are basically complying with their statutory obligations on climate change (i.e. minimalistic). Three CC, six RC, and four SC engaged in climate change initiatives beyond statutory requirements as resources allowed (i.e. opportunistic). Only six Queensland councils, including five coastal councils with climate strategies (Cairns, Gold Coast, Sunshine Coast, Townsville, & 1 remote RC), and one inland Shire involved in the CCP program, were proactively pursuing climate change actions (i.e. progressive). Only Cairns Regional Council was integrating climate change thinking and carbon actions into all areas of council operations (i.e. innovative), aiming to be carbon neutral by 2020.

**Table 1 Council Response to Climate Change Action**

Climate Change Response	Ab. Shire Council (coastal/inland)	Shire Council (coastal/inland)	Regional Council (coastal/inland)	City Council (coastal/inland)	Total
<b>Statutory</b>	1/0	0/3	2/7	0/0	13
<b>Additional</b>	0/0	2/2	3/3	1/2	13
<b>Proactive</b>	0/0	0/1	3/0	2/0	6
<b>Integrated</b>	0/0	0/0	1/0	0/0	1

Note: Response categories based on 'Philosophy for Climate Action' (Wood & McNamara, 2011)  
 Statutory=*Minimalistic*; Additional=*Opportunistic*; Proactive=*Progressive*; Integrated=*Innovative*

Only a few CC and larger RC have developed official policies on climate change (n=3), or on renewable energy, carbon emissions, or sustainability (n=2 each). A few metropolitan councils have devised action plans for sustainable energy (n=4), energy transition (n=2), and peak oil (n=2). Logan City Council had a draft combined climate change strategy and peak oil plan. The climate change plans of four Queensland councils set a goal of being carbon neutral by 2020 in council operations (i.e. Brisbane, Cairns, Gold Coast, & Sunshine Coast). Climate change strategies were also in preparation (2011/12) for Logan City Council, Moreton Bay Regional Council and Whitsunday Regional Council. South Burnett Regional Council also reported it was developing a biodiversity and climate change strategy.

### Climate Change Planning

In terms of strategic planning, climate change actions were included in waste, water, climate change, environment, and energy plans prepared by Queensland councils. The councils were mainly integrating climate change actions into their waste (n=20) and water (n=16) management plans, due to increased state government charges for bulk water services and a waste levy. Dedicated climate change plans (n=11), a climate change risk assessment

(n=10), and climate change adaptation plans (n=8) have mainly been prepared by CC and larger RC. Three SC had no climate policies or plans. Some eight councils had prepared a greenhouse gas plan (3 CC, 3 RC, & 2 SC). Nine councils included climate change actions within an environmental policy, or healthy environment/environmental management plans. Moreton Bay RC noted their *'Community plan has targets on emissions reduction and (a) Sustainability Policy'*, while Cairns RC had an overarching *'Corporate Sustainability Policy.'*

The climate change strategies prepared by Queensland councils covered key topics such as waste reduction (n=15), community education (n=15), and energy efficiency (n=14), water conservation (n=12), sustainable living (n=11) and sustainable transport (n=10) programs, followed by sustainable business (n=8), and renewable energy initiatives (n=5). Other areas covered in climate strategies by nine larger mainly coastal councils included climate change adaptation, risk assessment, energy transition, strategic/land use planning, infrastructure, and nature conservation. One remote northern island council considered *'climate change migration'* as an issue in its plan. Just two coastal Shire Councils had climate change plans, covering energy, water and waste. Only a few larger coastal or urban councils incorporated clean energy business opportunities within their climate change plans (n=5). Most climate change plans regarded carbon mitigation as a cost for councils rather than an opportunity.

Households (n=15), community groups (n=12), schools/youth groups (n=12), and businesses (n=9) are the main groups that Queensland councils work with on climate change actions. There was only a minor focus by councils on advising developers and landholders of climate change actions (n=4 each). Townsville City Council implemented climate actions with *'NGO's – Conservation Volunteers Australia, Reef Check'*, while Sunshine Coast Regional Council utilised Advisory Panels for advice on climate change actions. Three councils stated they did not currently work with any community sectors to implement climate change actions.

Only half of surveyed Queensland councils (n=16), mainly larger RC (n=10) and CC (n=4), stated that climate change actions were incorporated into their corporate or strategic plans. Among smaller Shire and Regional Councils (n=6) climate actions were not included in their corporate plans. Eight respondents (1 CC, 5 RC, & 2 SC) indicated uncertainty about whether climate actions were incorporated into their council's strategic plan. Some 23 councils did not consider carbon mitigation guidelines for renewable energy or energy efficiency in their planning decisions (only Sunshine Coast, Townsville and one inland SC set these guidelines).

### **Assessing Greenhouse Gas Emissions**

Only 13 Queensland councils (5 CC, 6 RC, & 2 SC) had completed an assessment of carbon emissions, while five councils planned to assess emissions (4 RC, & 1 SC). Some 18 councils reported reduction of carbon emissions was either a low priority or not a priority at all, mainly due to their size or being below the NGERs threshold. The NGERs (or OSCAR) online calculator was used by ten Councils (3 City, 6 Regional & 1 Shire) to calculate their emissions. Four City Councils and three Regional Councils used internal Excel spreadsheets to assess their carbon emissions. Another three larger Regional Councils employed Planet Footprint to calculate their carbon emissions. Sunshine Coast Council used the ecoBiz calculator: *'Council ecoBized its top 10 emission generating sites.'* Other carbon calculators used by Queensland councils were based on *'National Greenhouse Accounts Factors'* (Redland CC); *'Bespoke system for TCC and DCEE calculators'* (Townsville CC); and *'Finance*

*One'* (Sunshine Coast RC). Toowoomba Regional Council used a *'Custom designed (by staff) suite of Excel spreadsheets from 2007/08 onwards'* to assess emissions. Cairns Regional Council had *'developed an Energy and Emissions System which is an intranet based system for entering all emissions data and is able to be used by all staff to generate energy and emissions reports. Reports are from high level down to specific facilities/assets.'* One Aboriginal Shire Council used Queensland Department of Public Works spreadsheets to assess emissions. One City Council also used an energy audit standard (AS/NZS 3598:2000). Eight Regional Councils and seven Shire Councils had no response on their greenhouse gas reporting. One Regional Council was unsure of their greenhouse reporting method, while Logan City Council reported *'no reporting standard used, but beyond NGERs – rated every appliance and included building features.'* South Burnett Regional Council used NGERs and stated *'Technology One Carbon accounting software recommended for future data capture.'*

Key data management issues for Queensland Councils in assessing carbon emissions were tracking and reconciling energy and fuel accounts; coordinating data entry; lack of data for calculating landfill emissions; managing and sharing emissions data across Council areas; and relevant software to generate reports on carbon emissions. South Burnett Regional Council reported: *'No historical landfill records available, therefore unable to calculate quantities disposed during landfill life or accurately project future fuel or waste emissions.'* Changing federal government guidelines and greenhouse reporting standards were other key data issues. Larger Queensland councils mainly utilise internal databases and spreadsheets, based on NGERs, to track carbon emissions, while mid-range Queensland councils tend to employ consultants or software to report on energy and water accounts.

### **Carbon Mitigation Actions by Queensland Councils**

With carbon mitigation (Table 2), 30 Queensland councils implemented a total of 433 carbon reduction actions, with the average number of carbon actions adopted per council at 14. The five City Councils implemented 162 carbon actions (average=32.4), the 18 Regional Councils employed 231 carbon actions (average=12.8), while eight Shire Councils implemented 32 carbon actions (average=4). Wujal Wujal Aboriginal Shire Council listed eight carbon actions. One inland Shire Council and one small coastal Regional Council did not list any carbon reduction actions. Overall, the main types of emissions reduction initiatives implemented by Queensland councils included Energy efficiency actions (n=235), Water efficiency actions (n=75), Waste efficiency actions (n=57), and Behaviour Change actions (n=55). Less than 3% related to Carbon Offsetting actions (n=11). Just three surveyed councils purchased Green Power renewable energy (i.e. Tablelands RC, Townsville CC, and Redland CC). However, Brisbane City Council "bought 100 per cent green power" to offset their council vehicle fleet and public transport use on buses and ferries (Hepworth, 2012).

The top 20 carbon mitigation actions implemented by at least one quarter or more of surveyed Queensland councils related to energy efficiency initiatives in council buildings, waste reduction, water conservation and recycling, fuel efficient vehicles, and behaviour change action such as information on reducing emissions. The main energy reduction actions at council buildings and facilities were buying energy efficient appliances, installing energy saving lights and light sensors, energy efficient computers, roofing insulation, solar or heat pump hot water heaters, solar powered public lighting, variable speed pumps at water plants and public pools, and solar power. The main water efficiency actions were

installing water efficient technology, using recycled water, collecting rainwater, other water initiatives (i.e leakage control), water purification, and stormwater harvesting. The main waste efficiency actions were recycling, waste reduction, composting organic waste, and other waste initiatives such as using recycled paper, gas flaring, and recycling bio-solids. Six larger councils captured gas from landfills to generate power while another five councils were interested in landfill emission avoidance through methane gas flaring or electricity generation. The main behaviour change actions (Table 3) related to council information on reducing emissions, training staff, marketing carbon mitigation actions, setting emissions reduction targets, choosing suppliers reducing emissions, and providing community rebates. Out of the eight Shires, just one listed four behaviour change actions related to emissions information and community rebates. Logan, Mackay, Toowoomba and Townsville Councils had implemented a green purchasing program, choosing suppliers that reduced emissions.

**Table 2 Carbon Mitigation Initiatives by Queensland Councils**

Type of Council	Energy	Water	Waste	Behaviour	Offsetting	Total	Average
<b>City-Coastal (3)</b>	55	15	14	12	4	100	33.3
<b>City-Inland (2)</b>	31	10	8	12	1	62	31.0
<b>City – Total (5)</b>	<b>86</b>	<b>25</b>	<b>22</b>	<b>24</b>	<b>5</b>	<b>162</b>	
<b>Regional-Coastal (9)</b>	78	27	19	22	5	151	16.7
<b>Regional-Inland (9)</b>	47	17	11	4	1	80	8.8
<b>Regional-Total (18)</b>	<b>125</b>	<b>44</b>	<b>30</b>	<b>26</b>	<b>6</b>	<b>231</b>	
<b>Shire-Coastal (2)</b>	7	2	2	1	0	12	6.0
<b>Shire-Inland (6)</b>	12	1	3	4	0	20	3.3
<b>Shire-Total (8)</b>	<b>19</b>	<b>3</b>	<b>5</b>	<b>5</b>	<b>0</b>	<b>32</b>	
<b>Ab. Shire-Coastal (1)</b>	<b>5</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>8</b>
<b>Total-All Councils</b>	<b>235</b>	<b>75</b>	<b>57</b>	<b>55</b>	<b>11</b>	<b>433</b>	

Note: One inland Shire Council and one coastal Regional Council did not list any carbon reduction actions.

**Table 3 Behaviour Change Actions Implemented by Queensland Councils**

Behaviour change actions for carbon mitigation	Number
Share information with neighbouring Councils on emissions reduction	11
Provide information to residents on reducing their emissions	10
Train Council staff or volunteers on your emissions reduction actions	8
Provide information to businesses on reducing their emissions	7
Market the emissions reduction initiatives of your Council	6
Include emissions reduction targets in Council corporate plans	5
Choose suppliers taking actions to reduce their emissions	4
Provide community rebates for energy/water/waste efficiency products	4
<b>Total:</b>	<b>55</b>

Overall, emissions reduction initiatives are correlated with the type, size and geographic location of Queensland councils (Table 2). Coastal councils have implemented more emissions reduction actions than inland councils. With the number of carbon actions, the highest is by City, then Regional, and lastly Shire Councils. Larger councils had a mix of carbon reduction actions across all types (i.e. energy, water, waste efficiency and behaviour) while smaller councils focused on one key area such as energy efficiency, or waste actions.

### **Motives and Barriers to Reducing Emissions**

The major reasons for Queensland councils to implement carbon reduction actions, by rank order of responses from one (highest) to five (lowest) were: Cost Savings (1.8); Environmental Regulations (2.2); Council Climate Strategy (2.4); Council Resolutions on Climate Change (2.6); and to Demonstrate Climate Leadership (3). Cost savings was the main reason to reduce emissions for the majority of surveyed Queensland councils (88%), and was the only motive to reduce carbon emissions stated by five inland councils (3 SC, & 2 RC). Demonstrating climate leadership, complying with environmental regulations such as the *Queensland Government Waste Management Strategy*, or meeting targets in a climate change plan were also important reasons to reduce emissions for one third to half of surveyed councils. Other minor reasons to reduce council carbon emissions included climate certification (e.g. CCP); business reporting; the Queensland renewable energy plan; to attract low-carbon industry investment; preparing for carbon legislation; Queensland government Q2 carbon targets; and differentiating the council as a 'climate friendly' region. Other reasons to reduce council emissions were '*SEQ Regional Plan requirements*' (Logan CC, ranked 2); '*prolonged drought throughout 90's and 00's*' (Toowoomba RC, ranked 3); and to '*reduce climate change impact risk*' (Cairns RC, ranked 5).

The main barriers cited by council participants as impediments to carbon reduction actions were: cost and lack of funding; reliance on the operating budget; lack of council policies; indifference to climate change by some councillors and managers; lack of staff to implement climate action; and environmental regulations such as '*restrictive DERM licence conditions on WWTPs (waste water treatment plants)*', and '*uncertain RECs (renewable energy certificates) market over past 3 years.*' One City Council with a climate change plan reported a barrier was '*lack of funds for any mitigation even though demonstrated return is three to five years. Things are very tight.*' Shire Councils were also '*too small to qualify for most funding and grants*' or had a '*low return on investment in terms of impact (on climate change).*' Council waste practices that reduce emissions such as recycling, phytocapping, bio-covers, revegetation and organic waste diversion don't earn CFI carbon credits (Roberts, 2011). Thus there are a range of internal or external barriers to adopting carbon actions.

### **Council Opportunities to Reduce Carbon Emissions**

The main opportunities identified by Queensland councils to reduce their carbon emissions (Table 4) were through managing methane from landfills, including through '*MSW gasification (e.g. steam reformation or plasma, not methane generation)*', allied with waste management and recycling initiatives such as '*improved organic matter management*'. This was followed by planting trees on Council land for carbon offsetting, and green building design for new council buildings, focusing on sustainability and energy efficiency. These included '*New build to green Star level, retrofits to NABERS level,*' and a focus on '*tropical design and energy efficiency*'. Investment in renewable energy, mainly solar power, was also

listed. Logan City Council highlighted a *'Regional renewable energy station e.g. solar thermal; (and) working with State to generate commercial PV installation incentives.'* One Shire Council focused on renewable energy from geothermal power as a future opportunity. Other additional measures cited by Councils included water/wastewater management such as *'recent technologies that treat waste'*; behaviour change programs such as staff training on carbon reduction or *'ClimateSmart business clusters'*; utilising sustainable technologies (i.e. lighting, cooling, IT); and integrated projects such as electricity demand management.

**Table 4 Council Opportunities to Reduce Carbon Emissions**

Emission Reduction Opportunities	Shire Council	Regional Council	City Council	Total
Waste Management & Recycling	3	9	4	16
Landfills	3	9	3	15
Plant Trees on Council Land	2	8	4	14
Green Building Design	0	8	4	12
Renewable energy	3	4	4	11
Water/Wastewater Management	1	4	4	9
Eco-efficiency Measures	0	4	4	8
Sustainable Technologies	1	3	3	7
Leasing Council Land for RE	3	3	0	6
Integrated Council Projects	0	3	2	5
Carbon Offset Markets	0	2	1	3
Other Business Opportunities	0	1	1	2

Only six councils identified leasing council land for renewable energy (RE) projects. Just two councils in SEQ (1 CC, 1RC) listed carbon offset markets as an opportunity, with Sunshine Coast building a *'portfolio of offsets'*. Other opportunities to reduce carbon emissions were through *'continued retrofit of facilities'* and *'joint ventures with other businesses and local community.'* Larger City and Regional councils focus on opportunities to reduce emissions through significant investments in renewable energy, green building, and managing landfills, while smaller Shire councils focus on recycling waste, and limited use of solar panels.

#### **RECOMMENDATIONS FOR POLICY AND PRACTICE**

This study found significant variations among the main types of Queensland councils in terms of their climate change responses, emissions assessment and carbon mitigation actions. With regard to the average number of climate change and carbon reduction actions, the highest is by City, then Regional, and lastly Shire Councils. Climate change leadership is mainly evident among coastal councils and some larger inland councils (>30,000 resident population), that have adopted climate change plans and actions. Carbon mitigation actions by Queensland councils are more likely to occur where climate change policies and targets are included in a corporate plan or a climate change strategy. This study found a positive correlation between institutional size and capacity, coastal location, and climate change strategies, for driving carbon actions. Mainly larger Queensland councils had already completed an assessment of carbon emissions, or planned to assess their emissions. However, reducing carbon emissions was also a low priority or not a priority at all, due to the smaller size of many councils or being below the NGERs threshold for landfill emissions.

Overall, in Queensland, larger metropolitan and/or coastal councils are more 'carbon-ready' (i.e. consolidating or mainstreaming climate actions) than smaller inland rural Councils (i.e. latent or emerging actions) (LGAQ 2009). In New South Wales, coastal and metropolitan councils with larger populations have also implemented more climate change actions than smaller inland councils (Urbis 2010). Larger councils are more likely to have staff and resources dedicated to climate change and carbon actions. Three Queensland councils have federal Community Energy Efficiency Program grants to upgrade their facility and street lighting and energy usage (Brisbane, Cairns & Townsville). A 2012 Local Government Energy Efficiency Program will allow all LGAs to apply for a one-off grant to install solar or heat pump hot water systems in community facilities (DCCEE 2012). However, liquid fuels and council fleet management aren't covered in federal energy efficiency grants (Reade 2011).

This study found Queensland councils mainly comply with statutory obligations on climate change (i.e. minimalistic) or implement other additional climate change initiatives as resources allow (i.e. opportunistic) (Wood & McNamara 2011). Five coastal councils with climate change strategies proactively implemented carbon actions. Only Cairns Council integrated climate change thinking and carbon actions into all areas of council operations. Key barriers to carbon actions were the lack of funding, staff, or policies, and environmental regulations. The carbon mitigation actions adopted by Queensland councils were similar to those of Greater Adelaide councils, except for minimal investment in Green Power, and limited use of reclaimed water (Zeppel 2011a, 2012; Zeppel & James-Overheu 2012b). Respondents in both studies noted the legal liability of local councils for climate change actions, but some stated it wasn't a priority for council action or funding, or that staff overlooked opportunities in this area. However, councils can still progress and support carbon mitigation measures by establishing carbon and energy targets in their asset management, procurement, and tenders, or in planning and development regulations. Strategic partnerships with energy providers (e.g. electricity demand management, solar PV, performance contracts, & bio-energy) could also help councils to reduce carbon emissions.

## **CONCLUSIONS**

In Australia's new carbon price regime, energy efficiency and cost savings will be key drivers for local government to reduce their emissions and carbon liability. Rate increases by local governments in 2012/13 budgets now include carbon price impacts from the higher cost of electricity and materials, waste management and landfill charges, or new levies. Mayors also want municipal waste and council landfills to be exempt from the carbon tax. By mid-2012, the LNP Queensland state government had repealed the industry waste levy, reduced solar power feed-in tariffs, and scaled back state-funded sustainability or carbon programs, stating these were the "responsibility of the Australian government." The Local Government Sustainable Future Fund and the Waste Avoidance and Resource Efficiency Fund were also cut in the 2012/13 state budget. These factors influence the capacity of Queensland councils to implement climate change responses, resulting in largely opportunistic approaches to carbon mitigation actions and stalled state progress in transitioning to lower carbon futures.

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