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Carbon mitigation actions by Queensland councils

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ABSTRACT

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 mitigate its carbon emissions. In Australia, this includes compliance with greenhouse gas emissions thresholds of 25,000tCO_2-e under the federal government's *National Greenhouse Energy Reporting (NGER) Act 2007* and *Clean Energy Act 2011.* The implementation of a federal carbon tax from 1 July 2012 will also increase the cost of electricity, fuel and materials for councils. This paper reviews carbon mitigation measures implemented by Queensland councils (n=32) at the City, Regional and Shire level, based on a climate change survey completed in 2012. The survey 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. The results from this survey of Queensland councils highlights their climate change responses, carbon mitigation measures, carbon emissions reporting, motives for emissions reduction, and internal or external barriers to implementing carbon mitigation actions. This survey found metropolitan, larger and/or coastal councils are more 'carbon-ready' (i.e. consolidating or mainstreaming carbon actions) than smaller, inland, rural Queensland councils (i.e. latent or emerging actions) (LGAQ, 2009). Climate change plans and associated carbon actions are mainly implemented by larger councils (>30,000 resident population). Carbon mitigation actions correlated with institutional size and capacity, coastal location, and assessment of carbon emissions from council operations. In this study, Queensland councils were largely minimalistic or opportunistic in climate change mitigation while a few progressively integrated low carbon actions in council operations. The paper identifies key challenges for local government in moving to a low carbon future.

KEYWORDS: climate change, carbon mitigation, sustainability, local government

1. INTRODUCTION

Climate change impacts and carbon mitigation initiatives are key issues for local government (ACELG, 2011; Pillora, 2011; 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: 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_2-

e, mainly from landfill, under the *National Greenhouse Energy Reporting (NGERS) Act 2007*, and the *Clean Energy Act 2011.* To date, 12 Queensland councils have been listed as liable entities: 10 larger councils from landfills, while two inland councils are natural gas suppliers. The implementation of a carbon price of AUD$23t$CO_2$-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 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. This includes compliance and reporting of greenhouse gas emissions over a threshold of 25,000tCO_2-e to the Clean Energy Regulator under the *Clean Energy Act 2011.* In that context, this paper reviews climate change responses by Queensland local councils at the City, Regional, and Shire levels (Zeppel and 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 and James-Overheu, 2012b) to a state-wide carbon survey of Queensland local government authorities.

There are 73 local government areas (LGAs) in Queensland, including 7 city councils, 30 regional councils, 24 shire councils, and 12 Aboriginal shire councils. These councils range in size from 5 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 locations 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 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). Queensland local government elections in April 2012 also resulted in 60% new mayors and councillors (Passmore, 2102), with limited knowledge of climate change or carbon mitigation.

2. 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 and 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; Zeppel and James-Overheu, 2012b).

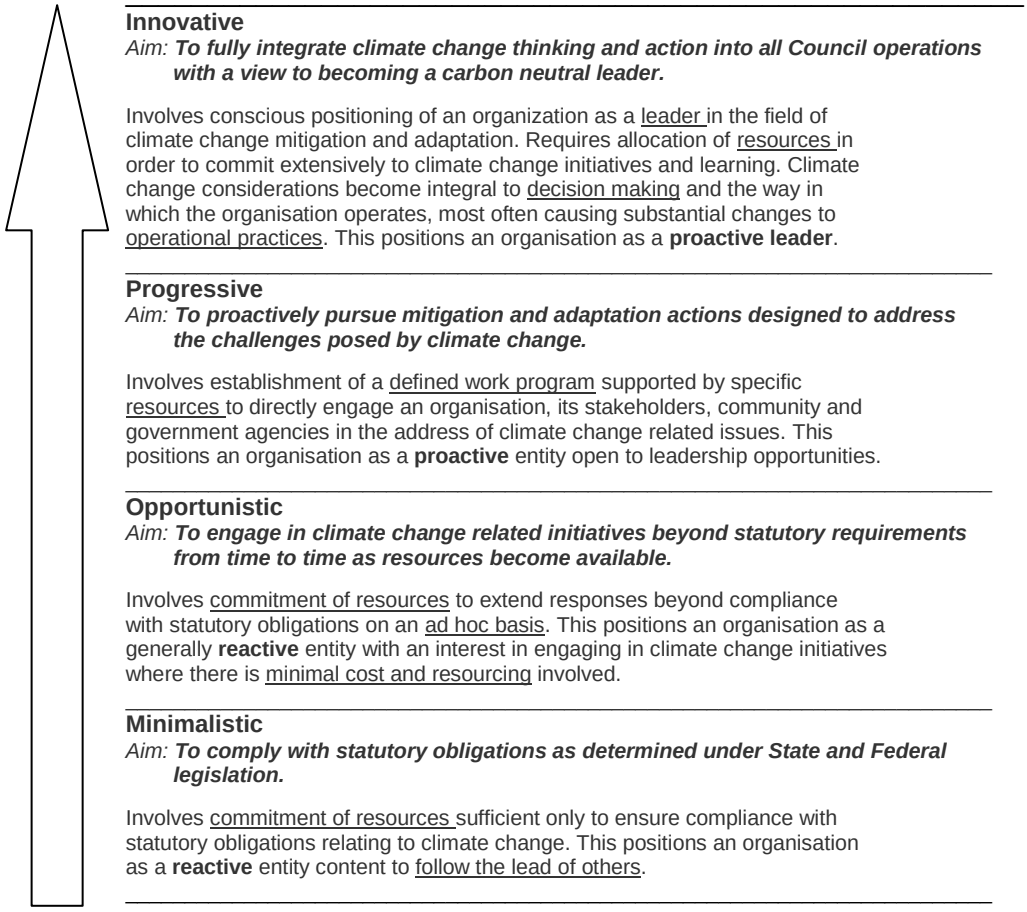
A review of climate change action plans by 20 U.S. cities found they were largely based on land-use and transportation solutions and favoured mitigation actions that were highly visible or produced immediate results from energy or cost savings (Bassett and Shandas, 2010). In California, local governments 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 and Lynch, 2011). This paper assesses the carbon mitigation actions adopted by Queensland councils against a framework assessing level of commitment to climate action (Wood and McNamara, 2011).

2.1 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. 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 32 Queensland councils.

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



3. 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 the CCP program (Hoff, 2010), and previous climate change surveys of New South Wales local councils (LGSA, 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; Zeppel and 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 (ACS) 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, and geographic location (coastal or inland). Of the 41 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.

4. 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 small 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 and Townsville) and two coastal RC (Sunshine Coast) had a dedicated sustainability unit or division to implement climate actions.

4.1 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 climate change 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 foot printing (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 (6 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, and one 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
Statutory	1/0	0/3	2/7	0/0	13
Additional	0/0	2/2	3/3	1/2	13
Proactive	0/0	0/1	3/0	2/0	6
Integrated	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*

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, and 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.'*

Only a few CC and larger RC have developed official policies on climate change (n=3), or 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, and Sunshine Coast). Climate change strategies were also in preparation (2011/12) for Moreton Bay Regional Council and Whitsunday Regional Council. South Burnett Regional Council also reported it was developing a biodiversity and climate change strategy.

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. Only 13 councils (5 CC, 6 RC, & 2 SC) had completed an assessment of carbon emissions, while five councils planned to assess emissions (4RC, 1 SC). Some 18 councils reported reduction of carbon emissions was either a low priority or not a priority at all, while 23 councils did not consider carbon mitigation guidelines for renewable energy or energy efficiency in planning decisions. Sunshine Coast, Townsville and one inland SC set renewable energy guidelines in planning.

4.2 Carbon Mitigation Actions by Queensland Councils

With carbon mitigation actions, 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 (235), Water efficiency actions (75), Waste efficiency actions (57), and Behaviour Change actions (55). Less than 3% related to

Carbon Offsetting actions (11). Just three surveyed councils purchased GreenPower renewable energy (i.e. Tablelands RC, Townsville CC, and Redland CC). However, Brisbane City Council "bought 100 per cent green power" to offset transport use (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. The main behaviour change actions (Table 2) 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 taking actions to reduce carbon emissions.

Table 2 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
	Total: 55

Overall, emissions reduction initiatives are correlated with the type, size and geographic location of Queensland councils (Table 3). 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.

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. 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.

Table 3 Carbon Mitigation Initiatives Implemented by Queensland Councils

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

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

The main barriers cited by council participants as impediments to implementing 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 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).' Hence there were a range of internal or external barriers to implementing carbon mitigation actions.

5. CONCLUSIONS

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. Overall, 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 both Queensland and New South Wales, coastal and metropolitan councils with larger populations have implemented more climate change actions than smaller inland councils (Urbis, 2010).

Most Queensland councils consider climate change an important issue that will have some impact on council operations. However, they mainly comply with statutory obligations on climate change (i.e. minimalistic) or implement other additional climate change initiatives as

resources allow (i.e. opportunistic), rather than be proactive (Wood & McNamara, 2011). Progressive or proactive climate actions were implemented by five coastal councils with climate strategies, and one inland Shire Council involved in the CCP program. Only Cairns Council integrated climate change thinking and actions into all areas of operations. 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 GreenPower, and limited use of reclaimed water (Zeppel 2011a; 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 neglected opportunities in this area.

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. In mid-2012, the LNP Queensland state government ended 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.' All of these factors influence the capacity of Queensland councils to implement climate change responses, resulting in largely opportunistic approaches to carbon mitigation actions. 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. This will assist climate responsive cities and regions in transitioning to lower carbon futures.

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