

Redland CITY COUNCIL

Confronting Our Climate Future

A strategy to 2030 for Redland City to:
reduce greenhouse gas emissions
respond to climate change
achieve energy transition

August 2010

Acknowledgements

Disclaimer

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Executive Summary

Climate change is caused by greenhouse gas emissions from human activity and its impacts are real, measurable and of great concern. Redland City Council recognises climate change as a key challenge and has previously led the way forward by reducing greenhouse gas emissions from its fleet, buildings, activities and services under the *Local Greenhouse Action Plan 2004 – 2010*. Council's new strategy, *Confronting Our Climate Future*, supersedes the former plan to outline our approach to future climate change management to 2030 for City, Council and community.



With a 20 year planning horizon and 5 year rolling action plans, this strategy brings together for the first time, actions for 'mitigation', 'adaptation' and 'energy transition'; into a comprehensive approach to address the impacts of climate change.

It is widely accepted in the scientific community that even significant measures taken now, to reduce greenhouse gas emissions, will not stop some degree of global warming in the future. Inevitably, the impacts of future climate change resulting from greenhouse gas emissions will have economic, social and environmental ramifications across the globe.

This means that climate change will impact on the way we live and work in the Redlands. Scientific evidence suggests that we can expect our future climate to be hotter and drier with more frequent and severe drought. We will experience more intense rainfall events, associated flooding and increased intensity of storms and winds. These changes, combined with rising sea levels, may result in more frequent and extreme storm tides and a greater potential for coastal flooding affecting homes, businesses and essential services.

Our mix of coastal villages, island communities, shallow bays and open coastline makes our exposure to climate change complex. We need to understand how to protect our natural assets; how to strengthen our economy and how to build sustainable communities in the face of these climate change challenges.

Our greatest need is to quickly reduce our greenhouse gas emissions, which are among the highest per-capita in the world. There is also the need for our community to move to cleaner and greener energy sources. 'Energy transition', or the move to greener energy sources, will reduce consumption of oil-based products and is therefore considered a priority in tandem with greenhouse gas emission reduction in this strategy. 'Peak oil', an event which forecasts the declining supply of fossil fuel production worldwide, will result in rising and volatile oil prices, the effects of which will be felt during the timeframe of this strategy.

Confronting Our Climate Future provides a solid framework for Council and the Redlands community to become more resilient to the impacts of climate change and energy transition. The focus is on Council actions and outcomes. We will build on our understanding of how these changes affect our own operations and extend awareness, advice, and support to the Redlands community over the next two decades.

Our first priority for action must be to reduce our carbon footprint. Our increasing population and planned developments are a considerable challenge for reducing, or mitigating, greenhouse gas emissions. Experience tells us that mitigation is a demanding task. Although committed and proactive, Council's approach to reducing greenhouse gas emissions under the *Local Greenhouse Action Plan 2004 – 2010* achieved only 50% of the set emissions target. In *Confronting Our Climate Future*, we have reset our corporate target to a 75% reduction on 1998 emissions by 2050. The first 5 year plan (2010 to 2015) continues our focus on early (and low cost) mitigation across Council and continues Council programs to assist the community to do the same.



Our second priority for action is to plan for how we will adapt to actual and predicted climate change. Adaptation requires a coordinated and collaborative approach, integrating responsibility within all areas of Council decision making and governance. The first 5 year plan continues the risk management approach already adopted by Council and extends this to incorporate energy transition. It focuses on research and understanding about where in the Redlands climate change impacts will first be felt; how significant they will be; and about what can realistically be done to avoid, manage or adapt to them.

The first 5 year plan also contains early strategies to increase community awareness and preparedness, and to encourage local businesses to start their own planning. Subsequent 5 year plans will increasingly move toward putting our adaptation plans into place.

Confronting Our Climate Future includes a 'Corporate Climate Change Policy' that supports the goals of the *Redlands 2030 Community Plan*, Council's *Corporate Plan 2010 – 2015* and *Corporate Environment Policy POL 2644*.

The policy translates into the eight goals of *Confronting Our Climate Future*, with strategic outcomes for each to guide implementation:

1. The life, health and safety of Council and the community are protected from the impacts of a changing climate and energy transition.
2. Council property and assets and the infrastructure it provides to the community are protected from the impacts of a changing climate and energy transition.
3. The essential services that Council provides to the community meet delivery expectations in a changing climate and energy transition.
4. Council and community greenhouse gas emissions are reduced to achieve or exceed national targets by 2050.
5. The Council's management provides the best possible buffering of the Redland natural environment and cultural heritage from the impacts of a changing climate.
6. Development in Redland City is planned, sited and designed to prevent or mitigate the adverse effects of a changing climate and energy transition.
7. The community is resilient, well informed, resourced and able to make decisions to respond to the adverse effects and potential opportunities of a changing climate and energy transition.
8. Council develops robust, monitoring, evaluation, reporting and improvement systems to track performance of strategic outcomes and actions of this strategy.

The *Climate and Energy Action Plan* 2010 to 2015 implements these strategic outcomes through defined actions in the next five years. *Confronting Our Climate Future* and the *Climate and Energy Action Plan* 2010 to 2015 take effect once endorsed by Council.

There has been a long genesis in the approach of this strategy – mitigation actions stem from the previous action plan and the findings of an audit by ARUP in 2008. Adaptation actions were first foreshadowed in the *Redlands Climate Change Adaptation Action Plan* 2009 and are currently included and managed under the Council's risk register.

The significant role of this strategy is to consolidate and coordinate these previously separate initiatives and provide policy and strategic direction to future *Climate and Energy Action Plans*.

The strategy and action plan will be reviewed after six months. Comments from Council and the public are welcome and will be considered in the review to Council by June 2011.



Science and the reality of increasingly severe climate events in Australia and around the world, emphasise the need for all of us in the Redland community to act now to reduce our use of energy and to think more about what climate change will mean for us as a city.

That means we all have to do our bit to reduce greenhouse gas emissions, get used to and plan for a changing climate and start moving to alternative fuels and energy sources. The action plan includes programs to assist the community to reduce emissions and strategies to increase community awareness and preparedness for climate change.

Melva E Hobson

Melva E Hobson PSM
Mayor



Council is making prudent decisions and investments to become more resilient to the impacts of climate change and energy transition. This strategy and the first 5 year action plan positions Council to continue our focus on early (and low cost) mitigation across Council to help deliver a 75% reduction on 1998 emissions by 2050 and maintain a risk management approach to adaptation and energy transition.

Gary Stevenson PSM
Chief Executive Officer

Part 1



Introduction

Consensus within the Australian and international scientific community is that climate change is real, measurable and of great concern. The CSIRO (Commonwealth Scientific and Industrial Research Organisation) and the Bureau of Meteorology have recently stepped up their campaign to raise awareness among Australians to the changes already taking place and those yet to come. Scientific evidence indicates that these changes are caused by increasing greenhouse gas emissions – mainly from human activity.

It is also widely accepted that even significant measures to reduce greenhouse gas emissions now, will not stop some degree of global warming and inevitably, climate change that will have economic, social and environmental impacts. Whether or not we personally accept these findings, the weight of evidence is such that Redland City Council must act decisively on climate change and take leadership on behalf of the local community.

Through the *Redlands 2030 Community Plan*, the community has identified climate change as a key challenge. The community vision for 'green living' choices recognises the need for energy efficient use of resources and a community that is well informed and prepared for risks such as climate change.

Redland City Council is responding to climate change challenges by working in partnership with the community to become more resilient to climate change and energy transition impacts. Council also recognises the importance of working with the Queensland and Australian governments to address climate change and energy transition challenges.

DID YOU KNOW?

There is greater than 90% certainty that increases in greenhouse gas emissions have caused most of the global warming since the mid-20th century. International research shows that it is extremely unlikely that the observed warming could be explained by natural causes alone. Evidence of human influence has been detected in ocean warming, sea-level rise, continental-average temperatures, temperature extremes and wind patterns. CSIRO research has shown that higher greenhouse gas levels are likely to have caused about half of the winter rainfall reduction in south-west Western Australia.

State of the Climate 2010,
CSIRO and Bureau of Meteorology

In taking the lead on climate change, Council has developed *Confronting Our Climate Future* to:

- provide a comprehensive approach to climate change and energy transition for Council, covering all its assets, operations and services to the community;
- provide a single strategic document that brings together mitigation, adaptation and energy transition planning for the first time;
- replace the *Redland City Council Local Greenhouse Action Plan 2004 – 2010*;



- provide strategic directions that implement the *Corporate Plan 2010 – 2015* 'green living' outcomes;
- provide leadership to the Redland City community to build resilience to climate and energy risks.

Confronting Our Climate Future is presented in two parts.

Part One:
- background information;
- introduction to the three broad platforms to address climate change – adaptation, mitigation and energy transition;
- an outline of the rational for Council's commitment to climate change; and
- a summary of current and predicted climate change in the Redlands.

Part Two:
- *Climate Change and Energy Transition Policy* with objectives and strategic outcomes to 2030;
- five year rolling action plans that align with Council's corporate planning cycle and the *Climate Change and Energy Action Plan 2010 – 2015*.

The strategy is based on nationally accepted science and understanding of climate change impacts and is also underpinned by a strong emphasis on risk management and adaptive management.

1.1
Mitigation, adaptation and energy transition

Our priorities for action involve '*mitigation*', '*adaptation*' and '*energy transition*' strategies that aim to reduce future changes to the global climate, improve our ability to deal with climate change and contribute to a more sustainable Redlands community. (**Table 1**)

Mitigation actions are urgent and are our first priority to address climate change. Relative to the rest of Australia and the world, CO_2e emissions in Redlands are high. In 2005, Queensland had per capita emissions that were more than triple the recognised international average (**Figure 1**). Queensland currently has the highest per capita emissions of all Australian states (**Figure 2**). These high emissions do not include consumption of lifestyle resources (clothing, cars, appliances and

TABLE 1
Defining mitigation, adaptation and energy transition

	What is it?	What does it mean for us?
Mitigation	Action to reduce the amount of greenhouse gases emitted into the atmosphere.	■ Taking proactive steps to reduce atmospheric concentrations of carbon dioxide equivalents (CO_2e). ■ Reducing CO_2e to prevent global temperatures increasing by more than 2°C. ■ Decreasing the rate and magnitude of climate change impacts, thereby decreasing the need for 'adaptation' in the future.
Adaptation	Action in response to actual or projected changes in climate and their impacts, leading to a reduction in risks or a realisation of benefits.	■ Improving our ability to cope with climate change. ■ Anticipating and planning for the impacts (risk management) of climate change and extreme weather events. ■ Focussing on how current disaster and emergency management plans need to change in order to plan for the additional impacts that are likely from these events under changing climate scenarios.
Energy transition	Moving to low or no-carbon fuels, 'green' energy technologies and 'green' behaviours and lifestyle choices that reduce consumption of resources and energy.	■ Reducing our dependence on fossil fuels. ■ Moving toward renewable energy options.

electronics) that are produced in other countries, where that production contributes to those countries' emissions.

Planning ahead is vitally important for how Council and the Redlands community will adapt to actual and predicted changes in climate. 'Adaptation' requires that we anticipate and plan for the impacts of climate change and extreme weather events. Redland City Council already operates disaster and emergency management plans that respond to bushfires, cyclones, and other extreme weather events. Adaptation focuses on how these plans need to change in order to manage the additional impacts likely from these events under changing climate scenarios. Adaptation avoids unplanned and reactive outcomes or responses.

'*Energy transition*' actions are also significant for mitigation of greenhouse gases and contribute to a more sustainable Redlands community. Energy transition responds to forecast oil shortages as well as increased and volatile pricing associated with 'peak oil'.

Australian oil production is known to have peaked in the year 2000. The peak date for world-wide oil production is a point of debate, but may indeed have already occurred. What is clear is that while the timing of peak oil is an issue, what is more important is our need to forward plan to reduce our dependence on fossil fuels (oil) to reduce consumption.

Peak oil is the point at which about half of the world's oil supplies have been consumed – i.e. the rate of oil production is equal to its consumption.
(McNamara, 2007).

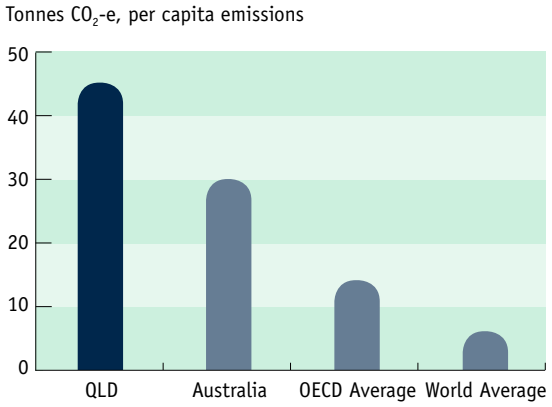
DID YOU KNOW?

There is an emerging consensus among prominent scientists that anything above a 2°C increase in global temperatures above pre-industrial levels will be dangerous and irreversible with potentially catastrophic global impacts

Bali Climate Declaration by Scientists, 2007

Figure 1

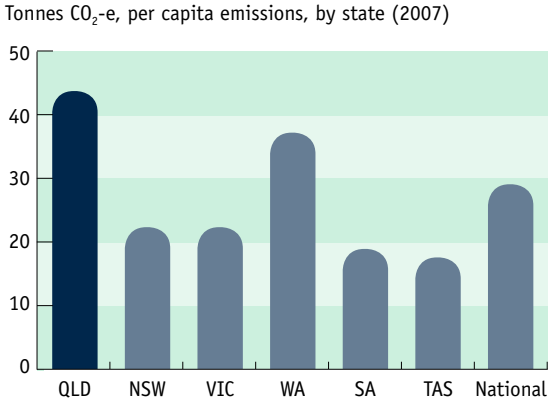
Per capita greenhouse gas emissions in 2005



Source: DERM, 2009

Figure 2

Australia's per capita greenhouse gas emissions



Source: DERM, 2009



When the peak of the earth's oil production is reached, a steep decline in oil supply can be expected, particularly as demand continues to increase. Where decreased oil supply is coupled with continued increase in consumption, price volatility and price increases are the likely result. This scenario is real and predicted to occur within the timeframe of this strategy.

In February 2007, the Australian Government's Standing Committee on Rural and Regional Affairs and Transport released its report *Australia's Future Oil Supply and Alternative Transport Fuels*. In April 2007, the Queensland Government also released a report acknowledging our vulnerability to peak oil (McNamara, 2007). Both reports called for early planning on energy transition strategies of at least 20 years prior to reaching peak oil. Given known oil production levels in our region, it's highly possible that planning is already well behind this timeframe.

1.2

Government response

Response to climate change and energy transition is a rapidly evolving area of public policy and the policy drivers for this strategy are changing as government comes to grips with the issues. Rather than provide specific policy detail, the following section focuses on the different responsibilities and roles of the three levels of government in relation to climate change and, to a lesser extent, energy transition.

Confronting Our Climate Future aims to align with state and federal legislation and policy and the response of other local governments in south-east Queensland.

The background context for mitigation was compiled for Council in February 2009 (ARUP, 2009) and for adaptation (Marsden Jacobs and

Greenhouse gas emission targets were first established by Council in 2002 when there were no federal or state targets set and few if any government programs or rebate schemes in existence.

Associates) in June 2009. Although Council keeps up to date with these changes, a further detailed background review for Redlands was not considered necessary in producing this strategy. Many excellent reviews of the changing legislation, policies, and programs related to climate change are available and listed in the box below.

The evolving national and state climate change policy landscape is becoming target-rich and increasingly regulatory. With regard to mitigation, the emerging intent is that local governments, businesses, organisations, households and individuals now need only meet the requirements of the legislation for Australia to meet its national targets. Government abatement programs and rebate schemes are in place and more are foreshadowed. These schemes return cost savings to the consumer for the up-take of certain practices, behaviours and technologies (e.g. solar rebates). They also promote, advise and assist with cost free strategies for saving on heating, cooling, fuel and power use. Such schemes have a substantial influence on energy transition, channelling community effort toward renewable energy options and greater energy efficiency.

1.2.1.

Government roles and responsibilities

The Australian Government is responsible for coordinating and leading national research and reform to position virtually every sector of the Australian economy and society to become more energy efficient, better adapt to climate change and energy transition impacts.

State governments manage assets and are responsible for legislation that regulates areas such as development, mining, building, transport and land use planning decisions; while local governments manage local assets and program delivery. Local governments implement much of the state's legislation and regulation, as well as local laws and policies made under the Local Government Act.

TABLE 2

Government responsibilities (DCCEE, 2010)

Australian Government (DCCEE, 2010)	Queensland Government
■ Leading and coordinating national reform; ■ promoting Australia's interests internationally; ■ generating national research to inform climate change planning; ■ coordination of climate change policy; ■ measuring and reporting national greenhouse gas emissions toward national targets; ■ energy efficiency; ■ administration of renewable energy targets; ■ international reporting commitments; ■ administration of the clean energy initiatives including renewable energy and low emissions technology. ■ *National Greenhouse and Energy Reporting (NGER) Act* ■ *National Strategy on Energy Efficiency (NSEE), 2009* ■ *Proposed NSEE legislation on disclosure of energy efficiency in commercial buildings at sale/lease.* ■ *Carbon Pollution Reduction Scheme* ■ *Kyoto Protocol.*	■ Legislating for regulation of development, mining, building, transport and land use planning. ■ Delivering multi-million dollar programs to promote and support greenhouse gas emissions reduction in industry, business and the community. ■ Implementing climate change responses/initiatives in energy, industry, community, planning and building, primary industry, transport, adaptation and government leadership. ■ *ClimateSmart 2050* ■ *ClimateQ.*

Local government has been the leading government sector nationally on the response to climate change and Redland City has been at the forefront of this response. The priority for Council is to continue progress on climate change, moving its focus from early reduction of greenhouse gas emissions (mitigation) to a focus on adaptation and energy transition – both planning and action.

As part of our responsibility, Redland City Council has committed to:

- reduce greenhouse gas emissions from Council's corporate activities
- reduce the community's greenhouse gas emissions through support, advice and awareness raising initiatives
- plan for climate change through risk management and local adaptation.

Council adopted a new corporate emissions target in February 2010 of 75% reduction of 1998 levels by 2050.

Council has already adopted a *Local Greenhouse Action Plan 2004 – 2010* to outline the actions it would undertake to meet the voluntary emission reduction goals established under the Cities for Climate Protection (CCP) Program. Council adopted a new corporate emissions target in February 2010 of 75% reduction of 1998 levels by 2050.

Council has already adopted a *Climate Change Risk Assessment and Adaptation Plan*.

Box 1

Follow government initiatives

Australian Government initiatives

The Government has committed to reduce Australia's carbon pollution to 25 per cent below 2000 levels by 2020. It has also committed to a long-term emissions reduction target of at least 60 per cent below 2000 levels by 2050. The Australian Government also expanded its Renewable Energy Target to 20 per cent by 2020.

The Renewable Energy Future Fund was announced in the 2010 budget as part of the Government's expanded $5.1 billion Clean Energy Initiative. This initiative includes the $2 billion Carbon Capture and Storage Flagships Program and the $1.5 billion Solar Flagships Program.

The Government's total investment in renewable and clean energy and energy efficiency is now in excess of $10 billion.

Key web site:
http://www.climatechange.gov.au

Queensland Government initiatives

The Queensland Government Government has committed to (DERM 2009)

- a 60% cut in greenhouse gas emissions in Queensland by 2050. ClimateQ also aims to reduce Queensland's carbon footprint by one third by 2020
- a key focus on integration of Commonwealth, state, and local government efforts to avoid duplication and ensure a comprehensive response
- working with local governments and communities to develop local adaptation measures, build capacity and resilience and reduce our vulnerability to climate change
- continuing to provide information on the projected impacts of climate change; and raising awareness and improving understanding of climate change

Key web site:
http://www.derm.qld.gov.au/climatechange



Federal and state government legislation currently does not trigger onerous reporting or mitigation requirements by Council. It is still up to Council to determine its carbon footprint however, regulatory requirements are emerging and Council recognises that early action on mitigation will reduce costs in the long run.

Council is not responsible for reporting emissions from Energex street lighting or water and waste water services now controlled by Allconnex and other water utility services. Vehicle fleet, buildings and facilities (such as halls, toilets, parks and infrastructure) are the only areas where Council has operational control and usable data trends.

Redland City population is increasing and Council can expect constant pressure to expand services, resulting in rising net greenhouse gas emissions. Despite this pressure, Council must achieve substantially lower net emissions than those measured in 1998. This also means much lower per capita emissions, such as emissions per vehicle and emissions per staff member.

DID YOU KNOW?

Achieving meaningful greenhouse gas reductions in Queensland is a difficult task. The state has an energy-intensive economy that is reliant on fossil fuel energy sources and a rapidly growing, dispersed population. Queensland's average greenhouse gas emissions per person are among the highest in the world. Queensland is responsible for around 30 per cent of Australia's annual emissions, in spite of having just approximately 20 per cent of the population. On current trends (business as usual), Queensland's greenhouse gas emissions are projected to increase by nearly 50 per cent to almost 250 million tonnes by 2050. ClimateQ presents a range of initiatives and policies to reduce the state's emissions, prepare for the impacts of climate change and support the transition to a carbon-constrained 'green' economy.

DERM, 2009

CHAPTER 2

Our climate is changing

2.1 Our climate has changed already

In '*State of the Climate 2010*', the CSIRO and Bureau of Meteorology indicate that:

- all of Australia has experienced warming over the past 50 years;
- the number of days with record hot temperatures has increased each decade over the past 50 years, with fewer record cold days each decade;
- the period 2000 to 2009 was Australia's warmest decade on record;
- the trend over the past 50 years has been for decreasing annual rainfall across much of southern and eastern Australia;
- the rate of sea level rise increased during the 20th century;
- during 1993 to 2009 sea level rise was 1.5 to 3mm per year in the south and east of Australia and 7 to 10mm per year in the north and west;
- sea surface temperatures around Australia have increased by about 0.4°C in the past 50 years.

DID YOU KNOW?

Some things about Australian's future climate are fairly certain: it will be hotter, sea levels will rise, extremes such as heat waves, droughts, and storm surge will become more frequent and intense. Other things are less certain: the rate and magnitude of change depends on how sensitive the climate system is to greenhouse gases.

DCCEE, 2010

Our observations clearly demonstrate that climate change is real.

CSIRO & BOM, 2010

The same studies indicate that:

- Redland City has experienced warming of up to 0.2°C per decade since 1960, resulting in total warming over the five decades of 1°C;
- Redland City annual average rainfall has decreased 50mm since 1960.

2.2 What will our future climate be like?

Scientists stress that whilst there is some uncertainty about precisely how much climate variables will change, particularly for changes beyond 2070, the direction of change is quite clear.

The future climate of Redland is expected to:

- be hotter than the present day;
- have higher average temperatures;
- have more hot days; and
- experience more frequent and severe droughts.



At the same time, there are likely to be **more intense rainfall events** and associated flooding.

It is possible that **storms and winds** also will increase in intensity.

These changes, combined with **rising sea level**, are likely to result in more frequent and **extreme storm tides** and a greater potential for **coastal flooding**.

Climate change projections for Redland City in 2030 and 2070 are given in **Table 4**. These projections will be reviewed regularly to include research findings and alignment with Australian Government advice.

DID YOU KNOW?

Much of Australia will be drier in coming decades. In Australia compared to the period 1981-2000, decreases in rainfall are likely in the decades to come in southern areas of Australia during winter, in southern and eastern areas during spring, and in south-west Western Australia during autumn. An increase in the number of dry days is expected across the country, but it is likely that there will be an increase in intense rainfall events in many areas'.

CSIRO and BOM, 2007

TABLE 4

Climate change scenarios for Redland City

Climate Variable	Current		Indicative Change (relative to 1990)	
	Redland mainland	North Stradbroke Island	2030	2070
Average annual maximum temperature	25	25	↑1.5°C	↑3.0°C
Days per year above 35°C	1	1		↑6
Annual potential evapo-transpiration			↑3%	↑8%
Average Annual rainfall	1276mm	1425mm	↓2%	↓5%
Spring	223mm	318mm	↓3%	↓8%
Summer	459mm	361mm	no change	no change
Autumn	381mm	416mm	↓2%	↓5%
Winter	213mm	329mm	↓3%	↓8%
24 hr rainfall intensity (max)	266mm	104mm	↑10%	↑30%
Number of rainy days	117	155	↓	↓
Annual stream flows			↓5-10%	↓10-30%
Droughts			↑frequency and severity	
Sea level rise (max)			0.17m	0.5m
Storm tide – max. height, 1:100 year ARI (Wellington Point)	1.47m		~1.67m	~2.09m
Storm tide – change to 1:100 year ARI (worst case)	1:100		↓to <1:20	↓to <1:10
Average and extreme wind speeds			↑	↑
Solar radiation			unclear	unclear
Humidity			unclear	unclear
Number of high and extreme forest fire danger days	4	4	↑to 5	↑to 8

Box 2

Follow the science

Climate change science is rapidly evolving and a great deal of research has been published since the last *Intergovernmental Panel on Climate Change* (IPCC) Fourth Assessment Report, released in 2007. A huge range of resource material is available about climate change science and related impacts. Listed below are some key Australian organisations, resources and websites.

The National Climate Change Adaptation Research Facility (NCCARF) is the leading national interdisciplinary research community, seeking to generate information needed by decision-makers in government and in vulnerable sectors and communities. NCCARF is a partnership between the Department of Climate Change (DCC), Griffith University, and eight other university partners. For further information, visit: **www.nccarf.edu.au**.

Recent CSIRO and the Bureau of Meteorology summaries, with special reference to impacts in Australia, were published by the Australian Government Department of Climate Change and Energy Efficiency (DCCEE) and are available at **www.climatechangeinaustralia.gov.au**:

- *Climate Change in Australia: Technical Report (2007);*
- *Catchment Climate Change Scenarios (2009);*
- *State of the Climate Snapshot (March 2010).*

DCCEE resources may be found at **http://www.climatechange.gov.au/science**

- *Q & A – Climate Change: Science Fact and Fiction;*
- *Data on Australia's Emissions and Australia's National Greenhouse Accounts;*
- *Climate Change 2009; Faster Change and More Serious Risks, by Will Steffen;*
- *Australia's Biodiversity and Climate Change: Summary for Policy Makers by the Climate Change Expert Advisory Group.*

The Climate Institute reports **www.climateinstitute.org.au**:

- *Bushfire Weather in Southeast Australia;*
- *Recent Trends and Projected Climate Change Impacts (2007).*

Garnaut Climate Change Review Final report - addressing likely impacts of climate change on Australia's economy, environment and resources, and the costs and benefits of a range of possible policy interventions – available at **www.garnautreview.org.au**.



Risks and impacts for Redlands

3.1. Mitigation risks

The Redland community faces risks if it does not reduce greenhouse gas emissions in line with national and state expectations. Based on Australian Bureau of Statistics Census figures, the community emissions profile indicates a significant increase in emissions between 1996 and 2006. Our increasing population drives substantial net increase in the Redlands community emissions.

We all share in the direct risk that global concentration of CO2e (equivalents) in the atmosphere exceed safe levels. However, there are also indirect risks should the Redland community (collectively, or any local business or organisation) not meet mitigation targets. These risks are:

- viewed as being one of the highest emitting and least responsible communities on the planet;
- higher energy costs every year;
- legislative changes enforcing mandatory emission levels that cannot be met without substantial investment;
- •'locking in' future emissions that cannot be avoided.

3.2. Adaptation risks

3.2.1. Loss of life and health impacts

Climate change may impact on human health in many ways, varying in complexity, scale, timing and directness. Although the frequency, intensity and location are uncertain, the more direct impacts on health include:

- those caused by changes in exposure to weather extremes (heatwaves, winter cold);
- those caused by increases in other extreme weather events (floods, cyclones, storm-surges, droughts);
- those due to a rise in production of some air pollutants and aeroallergens (spores and moulds).

In the future we will manage risk to life much as we do now, but it is likely that:

- the severity and frequency of life threatening events will be greater;
- there will be more summer deaths due to the increased frequency of heatwaves (decreased winter mortality due to milder winters is likely to be less significant in sub-tropical areas such as Redland City).



Community health and the safety of infants and children and the large elderly community in Redland are at risk from less direct mechanisms that may impact on human health, such as:

- changes in the transmission of many infectious diseases – especially water-borne, food-borne and vector-borne diseases;
- altered incidence of mosquito-borne infectious diseases (e.g. Dengue fever, Ross River virus disease) in areas with active mosquito populations;
- the potential for increases in the number of extreme temperature days.

3.2.2.

Damage to property

There are climate change risks to infrastructure, property, buildings and structures. Although the frequency, intensity and location are uncertain, the more direct impacts on property include:

- those caused by changes in sea levels;
- those caused by increased frequency and extent of flooding due to storm tides;
- those due to increases in other extreme weather events (floods, cyclones, storm-surges, droughts, bushfires, hail and high winds).

Canal estates and coastal buildings are at higher risk from increased storms, storm tides and winds and increased frequency and extent of flooding. Coastal roads, roads with poor drainage and low lying roads are also at risk from this increased flooding. Extreme rainfall events may lead to increased flash flooding and overwhelm stormwater drains. Areas of high and medium bushfire risk may potentially be impacted by increased frequency and severity of bushfires.

3.2.3.

Social disruption

Climate change impacts, as they are currently understood, have strong social and economic dimensions. Over time climate change may affect every part of the community, including:

- our financial well-being, land values and prosperity;

Box 3

Reading about the risks

Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report released in 2007. The IPCC has started work on the preparation of the fifth assessment report: **www.climatechange.gov.au**

Climate Change Background Study 2009 and *Peak Oil Background Study*. Sunshine Coast Regional Council **www.sunshinecoast.qld.gov.au**

Climate Change and Energy Taskforce Final Report: A Call for Action (2007). Maunsell / AECOM for Brisbane City Council **www.brisbane.qld.gov.au**

Climate Change Health Impacts in Australia: Effects of Dramatic CO2 Emission Reductions. Woodruff R, Hales S, Butler C, McMichael A. Sydney: Australian Conservation Foundation and Australian Medical Association, 2005. **www.acfonline.org.au**

Climate Change Risks to Australia's Coasts: A First Pass National Assessment **www.climatechange.gov.au**

Climate Change Impacts on Clarence Coastal Areas 2008. Clarence City Council **www.ccc.tas.gov.au**

Managing Our Coastal Zone in a Changing Climate: The Time to Act is Now (2009) House of Representatives Standing Committee on Climate Change, Water, Environment and the Arts: see **www.aph.gov.au.**

Climate Change Impacts & Risk Management – A Guide for Business and Government **www.climatechange.gov.au**

- social connectivity;
- legal and insurance systems;
- liveability, health and lifestyle;
- decision making and leadership.

The social disruption currently experienced throughout Queensland due to floods and cyclones is expected to increase as the severity and frequency of extreme weather events increases.

Businesses dependent on secure water supplies, including agricultural, horticultural and poultry industries may potentially be impacted by reduced water availability and increasing restrictions due to increased frequency and severity of drought.

Ferry and barge services as well as ferry terminal infrastructure to the islands may potentially be impacted to a greater extent than at present by an increase in the frequency and severity of storms.

3.2.4.

Damage to the environment

Redland's natural areas and wildlife have already adapted to a progressively changing climate for thousands of years. The difference now is the rate and magnitude of predicted changes and the extent to which humans can and will intervene. In the short term (the next few decades) however, there may be dramatic impacts including the loss of some species, areas and ecosystems in the Redlands.

Although little is known, the more direct impacts likely on ecosystems, habitats and species in Redland City (e.g. Moreton Bay, beaches, reserves, parks and waterways) include:

- those caused by changes in rainfall and temperature;
- those caused by increased sea levels, sea water acidity and sea water temperatures;
- those caused by the increased frequency and extent of extreme weather events (floods, cyclones, storm-surges, droughts, bushfires, hail and high winds).

Less direct impacts may include:

- increased frequency and severity of erosion;
- habitat change and altered species distribution that gives rise to increased predation competition or pest and weed invasions;
- increased stress on already vulnerable bushland and vegetation (and dependent wildlife).

There may be impacts for people from these direct and indirect mechanisms, such as:

- increased algal bloom problems, adversely affecting Moreton Bay and beaches;
- increased toxic or dangerous species (box jellyfish, crocodiles and insects);
- changes that make important areas inaccessible;
- loss of recreation areas;
- changes to the character of the environment that alter our sense of place.





3.3.

Energy transition risks

The Redland community faces risks if it does not transition away from the use of fossil fuels and plan for expensive fuel, volatile prices and fuel scarcity. These risks are not currently well understood and they differ depending on factors such as location, social profile, transport infrastructure and employment. In general terms, we face direct risks from:

- our dependence on road and rail connections to the Brisbane metropolis;
- our dependence on sea transport between islands and the mainland;
- greater future competition among satellite communities in Brisbane for affordable and adequate transport services;
- rising costs associated with businesses and services that rely heavily on oil based products;
- current building codes, development practices and transport patterns developed in times of easier oil supply;
- the effects of limited and irregular supply of food relating to food transport or production issues.



In short, we face the ever increasing costs of energy transition if we delay rather than act early.

An oil vulnerability and energy transition study of Redland City will be undertaken to identify in more detail the risks and opportunities to Council, businesses and community.

Box 4

Raising awareness of energy transition

Awareness of the need for energy transition is rapidly evolving. Relevant research and planning has been published since the Oil Depletion Protocol was released in 2003 – **www.oildepletionprotocol.org**.

Peaking of World Oil Production: Impacts, Mitigation & Risk Management; Robert L. Hirsch, Roger Bezdek, Robert Wendling, February 2005. US Department of Energy (The Hirsch Report) – see **www.netl.doe.gov.**

Reviews and summaries

Some reviews and summaries of the need for energy transition with special reference to Australia and SEQ have been published:

- Brisbane City Council (2005), Future Energy and Peak Oil: *Discussion Paper*, 2-Sept-2005;
- *Sunshine Coast Regional Council Peak Oil Background Study*, October 2009 – **www.sunshinecoast.qld.gov.au**
- Commonwealth of Australia The Senate Standing Committee on Rural and Regional Affairs and Transport: *Australia's Future Oil Supply and Alternative Transport Fuels, Final report*. February 2007 – see **www.aph.gov.au**
- *Queensland's vulnerability to rising oil prices taskforce report*. Andrew McNamara MP, April 2007 – see **www.transport.qld.gov.au**

CHAPTER 4

Risks and impacts for Council

Many of the climate change risks identified require further investigation and for some, the science is simply not yet available to support rigorous analysis. Some climate change risks require priority action now, while others are unlikely to be significant until later in this century.

The focus of this strategy is on identifying the risks that need early action now and to make these the main subject of the first five year action plan. However, risks that become serious beyond 2030 or 2070 might be affected substantially by Council's actions and decisions in the next few years – in regard, for example, to development and provision of coastal infrastructure and asset management.

Council must be satisfied that it has taken all necessary action to manage the risks and impacts of climate change and energy shortage on the city. There is clear potential for our exposure to be costly and difficult to manage in the future, impacting on residents and the city's reputation and sustainability.

Council's corporate risk management framework will be used to identify risks to Council and ensure that actions are taken to lower risk ratings. Risks are given a priority and rated based on the likelihood of that risk occurring, the consequences to Council should it occur and the time horizon over which it occurs (see Climate Change Risk Register – **Appendix 1**).

Ultimately, mitigation seeks to achieve a 'safe' atmospheric concentration of greenhouse gases and is best achieved with the use of targets.

4.1 Mitigation risks

Ultimately, mitigation seeks to achieve a 'safe' atmospheric concentration of greenhouse gases and is best achieved with the use of targets. Council has been a member of the Cities for Climate Protection Program (CCP) since 1999 and established mitigation targets under the *Local Greenhouse Action Plan 2004 – 2010* to:

- reduce corporate emissions by 25% of 1998 emissions levels by 2010
- reduce community emissions by 15% of 1996 emissions levels by 2010.



In 2007, *the CCP Milestone 5 Report* showed Council's net emissions had actually increased – despite substantial per-capita reductions (22% since 1998). Community emissions were similarly increasing from the 1996 base year.

In 2009, the *Redland City Council Greenhouse Gas Emissions: Detailed Audit of Council Greenhouse Gas Emissions* February (ARUP Report) confirmed that neither Council nor the community would meet the respective *Local Greenhouse Action Plan* targets by 2010.

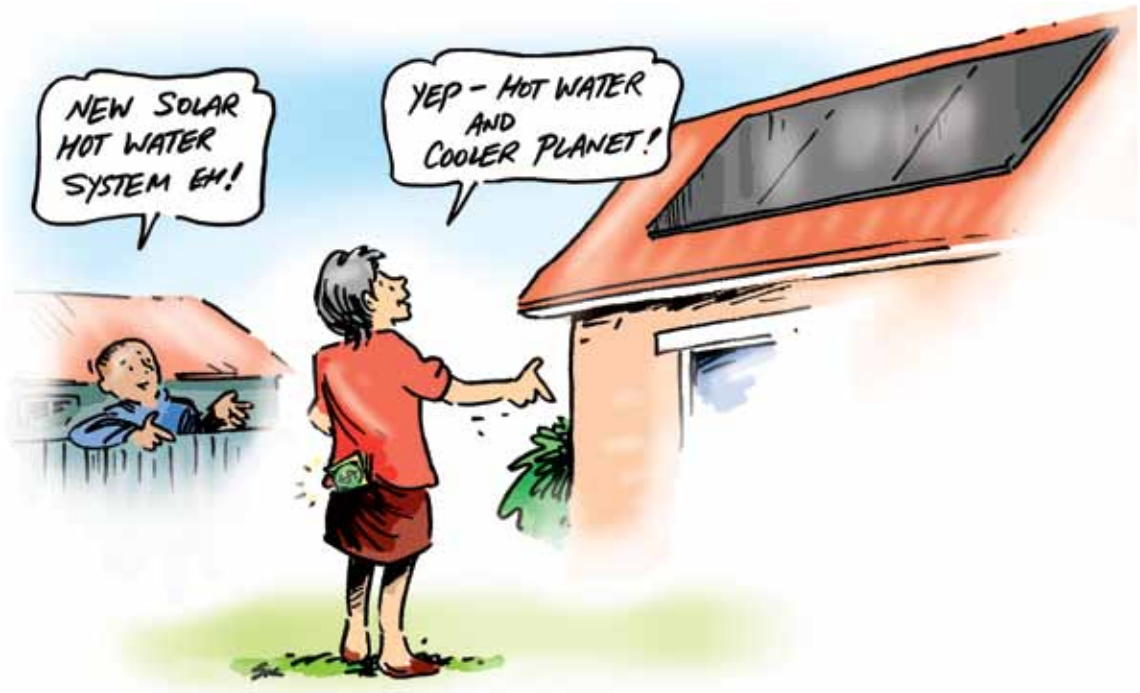
Indications were that the Council's emissions for buildings, facilities and vehicle fleet had actually increased over the 10 years since 1998, up from approximately 6,789 to 7,527 CO_2e. When landfill (and water and wastewater) was excluded from carbon accounting, Council had a 30% increase in corporate emissions between 1998 and 2007/08 (ARUP, 2009), again despite significant per-capita reductions in emissions. On a per staff (per capita) basis, building and facility emissions had decreased by 14% and fleet emissions had decreased by 15% overall and by 45% per passenger vehicle.

Based on the data, our position in 2008 was some 25% higher than our 1998 levels. A disappointing outcome despite our best efforts, but one through which we have learned many valuable lessons. Council can now approach mitigation more confidently and build on this experience.

In 2010, indications are that a rapid decline in emissions has been achieved through substantially increased investment between 2008 and 2010. Current data suggests that emissions are now only approximately 15% higher than 1998 levels, with continuing increases in net emissions stemming from rapid population growth and the additional buildings, staff and services provided by Council.

Council knows from experience that reducing corporate emissions is not simple or easy and that the risks are real and significant. The risks, should Council not meet the targets in this strategy, are much the same as those for the community (see 3.2 above). There are similar risks to Council should the community not meet its targets for mitigation as established by the Queensland state government. These include:

- higher cost to Council and the community through missed emission reduction opportunities now;





- higher energy costs every year;
- questions about Council's ability to demonstrate leadership on mitigation;
- not meeting the requirements of the south-east Queensland Climate Change Management Plan;
- legislative changes on mandatory emission levels unable to be met without substantial Council investment.

4.2

Adaptation risks

Climate change adaptation risks have been identified and are now included on Council's risk register. A summarized version of the risk register, *Climate Change Risks* is included at **Appendix 1**.

This process began in 2008 following the Redlands *Climate Change Risks Assessment* report produced by Marsden Jacob Associates and Broadleaf Capital International for Redland City Council. The report was partly funded by the Australian Government's Department of Climate Change under the Local Adaptation Pathways Program.

The risk assessment used the approach described in the Australian Greenhouse Office publication, *Climate Change Impacts and Risk Management: A Guide for Business and Government*, which is based on the *Australian Standard for Risk Management AS/NZS4360* (2004).

This risk assessment model is also consistent with Council's corporate risk framework (adapted from the *Risk Management Guidelines Companion to AS/NZS 4360:2004)*.

The report identified 48 climate change risks to Council assets and services, analysing and rating each risk. Since that time all 48 risks have been incorporated into Councils risk register and risk management system and 21 'priority risks' have been identified.

The report did not examine the risks relating to mitigation or energy transition, nor did it look more widely at the risks to the Redland community and how Council may be involved in managing these. These risks are addressed under this strategy and the accompanying action plan.

Many Council risks are also community risks and so planning already has something of a 'whole-of-community' perspective. The risk of coastal roads being inundated by storm tides for example, or the risk of storm damage to community halls and other buildings owned by Council, is a shared Council and community risk.

4.3

Energy transition risks

In general terms, the risks to Council are currently identified as:

- volatile oil prices and fuel availability impacting on the vehicle fleet;
- volatile oil prices and fuel availability impacting on water transport links to the islands;
- rising costs for asphalt used in road building and maintenance operations;
- rising costs of heating, cooling, oil, gas and electricity use in all Councils buildings;
- higher purchasing prices for goods and services;
- rising staff commute costs and the adaptation of the surrounding transport networks.

Box 5

21 priority adaptation risks

Coastal infrastructures, transport and buildings

1. Council buildings (coastal damaged through wind, hail or flooding).
2. Low lying public infrastructure damaged by flooding.
3. Low lying roads (flood, inundation, storm surge, coastal erosion).
4. Increased damage to pontoons, marinas, jetties, piles, sea walls, etc. through storm tide.
5. Increased damage to sea walls (armouring) through storm tide.
6. Barge inoperable in rough weather.
7. Ferry inoperable in rough weather.

Stormwater and wastewater

8. Stormwater drains overwhelmed by intense rainfall.
9. Stormwater drains blocked through reduced average rainfall or drought.
10. Stormwater treatment systems overwhelmed.
11. Inundation of low lying septic systems (STPs).

Biodiversity, parks and coastal management

12. Significant escalation of the distribution of acid sulphate soils.
13. Significant harm to animal or plant populations, habitat or ecosystem health through coastal inundation.
14. Significant harm to animal or plant populations, habitat or ecosystem health through storm and flooding.
15. Significant degradation of beaches and foreshores through coastal inundation.
16. Significantly increased algal blooms *(Lyngbya majuscula)*.

Corporate services

17. Council liability for loss of life and property thrugh bushfires where hazard increases over time, especially through RCC vegetation management, and road design.
18. Council liability for developments threatened by flooding or sea leve rise.
19. Public safety threatened through altered incidence of mosquito-borne infections diseases.
20. Recreation areas threatened by coastal inundation.
21. Closed landfills inundated (for eroded) through storm surge.

Confronting climate change

Redland City Council is confronting these climate change and energy challenges, leading our community and working in partnership with other levels of government. Together we will increase our awareness, preparedness and response, making Redland more resilient to these impacts.

Confronting Our Climate Future provides a comprehensive approach to climate change and energy transition for Council, covering all its assets, operations and services to the community.

The strategy uses current understanding as a basis for immediate action and progressively builds on our understanding of how these changes impact on us to extend awareness raising, advice and support to the Redland community. While Council can support, inform and encourage local residents, business and organisations to plan for their adaptation to climate change and energy transition, it can't force them, nor can it do their planning for them. The same is true of reducing greenhouse gas emissions in the community.

Confronting Our Climate Future implements the *Redlands 2030 Community Plan* vision and goals:
"Our green living choices will improve our quality of life and our children's lives, through our sustainable and energy efficient use of resources, transport and infrastructure, and well informed responses to risks such as climate change.

Redland 2030 Community Plan goals:

- *A culture of sustainability: Redlands' citizens, communities, business and government are world leaders in understanding and committing to positive action to protect the future of the planet.*
- *A community prepared for climate change: our community understands and manages the impacts of climate change such as risks to coastal infrastructure, community health and extreme weather events; and decisions made daily in homes, businesses, schools, industry and government reduce the risk of adverse consequences on people and the environment.*
- *Energy conservation, energy efficiency, renewable energy use and alternative energy generation activities are the norm in private, public, commercial and industrial settings."*

Confronting Our Climate Future also implements the *Corporate Environment Policy POL-2644,* which commits Council to:

- *Ensure that the consequences of climate change for Redland City are understood and planning minimises the potential adverse impacts on natural ecosystems and the community';*
- *Reduce the greenhouse gases emitted by Council and the community to levels and within a time acceptable to the wider community.*



Confronting Our Climate Future also implements the *Corporate Plan 2010 – 2015* outcome and strategies related to 'green living'. The strategy brings together for the first time, Council's high level planning for mitigation and adaptation to climate change, replacing the *Local Greenhouse Action Plan 2004 – 2010*.

Council's strategic objectives under the strategy are likely to change little over the time to 2030, however our actions will. Under this strategy, we will develop 5 year rolling action plans that will follow the 5 year planning cycle of Council's *Corporate Plan*.

5.1

Council's approach to mitigation

5.1.1

Community mitigation targets

The Queensland state government's target is for 60% reduction of year 2000 levels by 2050. This is also the national target. Council recognises this target for community greenhouse gas reduction and the Queensland and federal government's responsibility for achieving this target. Through *Confronting Our Climate Future*, Council commits to a partnership approach with all levels of government and will lead and support the Redlands

Box 6

Follow the law and policy

Climate change legislation and policy is rapidly evolving. It's hard to keep up with the changes, but if you are interested, try the following recent summaries:

Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report released in 2007

Managing Our Coastal Zone in a Changing Climate: The Time to Act is Now (2009). House of Representative Standing Committee on Climate Change, Water, Environment and the Arts. Commonwealth of Australia

Sunshine Coast Regional Council Climate Change Background Study October, 2009 – see **www.sunshinecoast.qld.gov.au**

Queensland Renewable Energy Plan

ClimateQ: Toward a Greener Queensland, the revised strategy for Queensland's response to climate change

SEQ Climate Change Management Plan public consultation draft

SEQ Regional Plan 2009 – 2031; Climate change principles, policies and programs on climate change relevant to local government

Oil Vulnerability Mitigation Strategy and Action Plan, continuing the work of the Queensland Oil Vulnerability Taskforce

Adapting to Climate Change: A Queensland Local Government Guide 2007; Local Government Association of Queensland, Brisbane

The Garnaut Climate Change Review: Final Report. Garnaut, R 2008, Cambridge University Press, Melbourne

Australia's Fifth National Communication on Climate Change, released by Department of Climate Change (March 2010) **www.climatechange.gov.au/~/media/publications/greenhouse-gas/Australia-fifth-national-communication.ashx**

National Greenhouse and Energy Reporting Guidelines, Department of Climate Change, Canberra, 2008

Commonwealth Renewable Energy Target

www.climatechange.gov.au/government/initiatives/renewable-target.aspx

community in reducing its emissions in order to meet state and federal targets.

Our increasing population and planned development are a considerable challenge for reducing greenhouse gas emissions in Redlands City. Indications are that the Redlands community's net emissions have actually doubled since 2000 (from approximately 1.2 million to 2.2 million tCO_2e). Our starting position is already one million tonnes higher than our levels in 2000. This means that we need to cut our current emissions in half by 2030 (to 1.1 million tCO_2e) if we are to have any hope of reaching the 60% reduction (to 0.6 million tCO_2e) by 2050.

Figure 3 shows current community greenhouse gas emissions. **This can be achieved if, starting now, every business and household in the Redlands reduces emissions by 5% per year, every year, for the next twenty years.**

That equates to every one of the anticipated 70,000 households in Redland City (which the state government calculates now emit approximately 14 tCO_2e) **emitting no more than 7 tonnes CO2e by 2030.**

Figure 3

Community's current greenhouse emissions profile

Redland City Council's GHG emissions



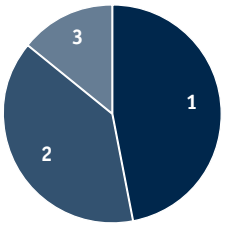
		%	Tonnes
1	Commercial	13.61%	231,373
2	Industrial	27.68%	470,772
3	Residential	25.44%	432,670
4	Transportation	24.64%	419,105
5	Waste	8.63%	146,694

Redland City Council, 2007.

Figure 4

Council's current greenhouse emissions profile

Redland City Council's GHG emissions



		%	Tonnes
1	Buildings and Facilities	47%	5,851
2	Street lights	39%	4,887
3	Vehicle Fleet	14%	1,676

ARUP, 2009.

5.1.2

Council mitigation targets

Confronting Our Climate Future **includes a new corporate emissions target of 75% reduction of 1998 levels by 2050.** This is to be achieved through:

- 25% reduction over 1998 emissions by 2020 and a further 25% reduction on 1998 levels by 2030; and
- a further 25% reduction on 1998 levels by 2050.

Our campaign to achieve this will be developed under the banner of "*75 by 50*".

Council must reduce its emissions by 15% to reach 1998 levels, and then further reduce emissions by 25% by 2030 under these new targets (40% by 2030). This will be difficult with Council operations and services growing in response to the approximate 2% population growth in Redland city each year.

Council's target can be achieved by 2030 if, starting now, emissions are reduced by a minimum of 5% per year, every year, for the next twenty years. Figure 4 shows the profile of current Council greenhouse gas emissions.

The first *5 Year Action Plan (2010 to 2015)* continues our focus on early and low cost mitigation across Council, aiming to achieve most of these reductions in the first few years. It includes programs that assist the community to do the same.

Our approach to corporate mitigation (Council's own emissions) focuses on:

- setting corporate emissions targets;

- routine, regular carbon audits and development of monitoring, evaluation, reporting and improvement systems to track performance on greenhouse gas emissions reduction;
- reducing greenhouse gas emissions through: conservation and efficiency; using less carbon intensive and renewable energy sources and purchasing or developing cost effective offsets (registered and accredited) that lead to real greenhouse gas reductions;
- measurement and management of waste through the Waste Management Strategy;
- leadership and support to the community to reduce emissions;
- working cooperatively with all levels of government, local business and the community.

5.2

Council's approach to adaptation

Adaptation must be planned and fortunately, Redland City Council already has significant capacity for adaptation. The *Redland City Disaster Management Plan 2010* is a good example, aiming to minimise the effects of, coordinate the response to, and lead the recovery from, a disaster or major emergency affecting the region. The plan embodies our community's resilience to and ability to manage, the existing threat of cyclones and severe coastal storms, floods, fluctuating sea levels, storm tides, bush fires, acid sulphate soils, toxic algal blooms and extreme summer weather. It will continue to be the focus of disaster management under a changed climate.

Wherever possible, we need to understand how the Redlands is vulnerable to the additional impacts of climate change and then plan and act in ways that avoid or lessen these impacts. There are a broad range of options (policies, programs and measures) that Council could potentially utilise to adapt to the impacts of climate change. Some of these options will have the effect of averting or mitigating an impact that gives rise to a particular risk or group of risks. Others will have the effect of increasing the capacity of the Council or community to respond to a risk should it eventuate (i.e. increase adaptive capacity). Structural works, design changes and statutory planning measures generally fall into the former category; while research, education and insurance fall into the latter.

Climate change may also present opportunities to Council and the community that should be pursued.

Redland City is less exposed to extreme heat, cold and drought than many parts of Australia and



south-east Queensland. In addition, many of Redland's foreshores are relatively high and steep, the estuaries and creek systems small and limited. Most development has occurred fairly recently and has been better designed and situated to take account of current coastal hazards.

This current capacity provides a foundation to focus on the greater hazards and impacts predicted from climate change. Current capacity and forward planning will continue to be important tools, however some events may be outside our past experience and some adaptations will require new ways of thinking and doing things.

Confronting Our Climate Future provides clear direction for adaptation to strengthen the Redland's resilience to change. It describes how adaptation is now an integral part of Council's business, sharing responsibility across all areas of Council's decision making and governance.

The first *Climate and Energy Action Plan 2010-2015* plan focuses on:

- researching and understanding climate change scenarios to identify where in the Redlands these impacts will be first felt and how significant they will be;
- understanding what can realistically be done to avoid, manage or adapt to these conditions;
- developing detailed plans based on the research found;
- continuing the risk management approach already adopted by Council;
- providing leadership and support to the community to promote understanding and planning for adaptation;
- working cooperatively with all levels of government, local business and the community.

Subsequent 5 year plans will increasingly switch to putting adaptation strategies into place. Three principles further characterise the approach:

- a focus on the priority climate change risks;
- recognition that adaptive management approaches build on existing measures and management systems (a new requirement to imbed into our existing management structures and systems, not a new requirement on its own);
- the use of criteria to assess existing controls in place for climate change risks and recommend new adaptation measures where they are needed.

The strategy's effectiveness will be monitored, evaluated and reviewed to ensure it is meeting Council and community expectations; is up to date with developments in climate change science and technology; and delivers on Council's statutory responsibilities.

5.3. Council's approach to energy transition

The study to identify energy transition risks will identify and recommend specific actions. Council will approach energy transition and greenhouse gas mitigation in tandem. Many actions that we can make are solutions to both climate change and energy transition, as both require transition to a low carbon economy. Many of the previous mitigation options in Council's previous strategy have already placed Council and the Redland community on a pathway to energy transition.

While Council will demonstrate leadership in preparing for oil vulnerability and energy transition, the federal and state governments are currently developing their oil vulnerability and energy transition plans and policies.

Confronting Our Climate Future provides clear direction for adaptation to strengthen the Redland's resilience to change. It describes how adaptation is now an integral part of Council's business, sharing responsibility across all areas of Council's decision making and governance.

5.3.1.

Community energy transition

Confronting Our Climate Future focuses on:

- promoting greater understanding and awareness of the need for transitioning away from fossil fuels;
- supporting and developing partnerships with various sections of the community to achieve energy transition;
- encouraging local businesses, organisations and residents to reduce greenhouse gas emissions;
- encouraging local businesses, organisations and residents to use or generate renewable energy;
- facilitating local, relevant research and advocating to other levels of government on matters of regional importance.

The community plan, *Redlands 2030*, commits our community to a more sustainable way of life. There are complex social issues to navigate on this journey. Energy transition may not be as easy for low income households, those with mobility issues and those in areas away from public transport and cycling facilities.

5.3.2.

Council energy transition

As much of the risk in energy transition for Council is transport related, early action and long term (20 year) planning is needed. Council will be undertaking easy, 'low hanging fruit' options to reduce the reliance on petrol, diesel and LPG powered vehicles, while considering the long term ramifications of these choices.

Council's *Renewable Energy Incentives Policy Statement (POL-3067)* commits to support, promote and provide incentives for, renewable energy. However Council recognises that only certain types of large scale renewable energy infrastructure may be suited to, or feasible for Redland city.

In addition, Council has established that it is not currently cost effective for it to own and maintain significant renewable energy infrastructure. In principle, Council views acquisition of solar power as a minor strategy that is far from cost effective but may be useful for internal operations (e.g. walkway lighting, community halls) and to feed energy into the power grid.

It is likely that renewable energy generation may be more appropriate in locations outside of Redland City. If this is the case, Council commits to supporting, promoting, or providing incentives to develop appropriate, large scale renewable energy infrastructure both within and outside of the city boundaries.



Part 2



Corporate Climate Change Policy (POL 3090)

6.1 Head of power

The *Corporate Climate Change Policy* supports the Council's *Corporate Plan 2010* outcome:
'Our green living choices will improve our quality of life and our children's lives, through our sustainable and energy efficient use of resources, transport and infrastructure, and our well informed responses to risks such as climate change'.

This policy is strongly aligned with Council's *Corporate Environment Policy POL 2644*.

6.2 Policy objective

Council's policy objective is:
'To reduce the greenhouse gases emitted by Council and the community to levels and within a time acceptable to the wider community; and to ensure that the consequences of climate change and energy transition for Redland City are understood and planning minimises the potential adverse impacts on natural ecosystems and the community.'

6.3 Policy statements

Council's position is to ensure that:

1. the life, health and safety of staff and the community are protected from the impacts of a changing climate and energy transition;
2. Council property and assets and the infrastructure it provides to the community are protected from the impacts of a changing climate and energy transition;
3. the essential services that Council provides to the community meet delivery expectations in a changing climate and energy transition;
4. Council and community greenhouse gas emissions are reduced to achieve at least national targets by 2050;
5. Council management provides the best possible buffering of the Redland natural environment and cultural heritage from the impacts of a changing climate;
6. development in the Redlands is planned, sited and designed to prevent or mitigate the adverse effects of a changing climate and energy transition;
7. the community is resilient, well informed, resourced, empowered and able to make decisions and take action to respond to the adverse effects and potential opportunities of a changing climate and energy transition;
8. Council develops robust, monitoring, evaluation, reporting and improvement systems to track performance of strategic outcomes and actions of this strategy.

CHAPTER 7

Strategic outcomes to 2030

In the next two decades, Council will need to ensure that certain outcomes are achieved by successive action plans in order to give effect to the *Corporate Climate Change Policy (POL 3090)*. These strategic outcomes often require coordinated action by several stakeholders across government, industry, the professions and the community over a sustained period of time. It may be that the solutions put in place today will not be appreciated for another generation. The following strategic outcomes guide the current and future action plans.

Council's strategic outcomes to 2030

Policy Statement	Strategic Outcomes
The life, health and safety of the staff and the community are protected from the impacts of a changing climate and energy transition.	**1.** Council manages the additional hazards to life, health and safety of the community and Council staff arising from climate change and energy transition, by identifying, understanding and including them in the coverage of: **1.1.** Council's community support programs; **1.2.** Council's emergency and disaster management planning; **1.3.** workplace and community health and safety planning; **1.4.** open space infrastructure and management.
Council property and assets and the infrastructure it provides to the community are protected from the impacts of a changing climate and energy transition.	**2.** The vulnerability of Council infrastructure, property and assets to the impacts of a changing climate and energy transition are minimised, through: **2.1.** understanding climate changes and the actual and potential impacts (sea level rise, storm tides, and more extreme weather) and how these give rise to vulnerabilities; **2.2.** understanding the impacts of energy transition on Council assets and planning for the response to these impacts; **2.3.** planning, locating and designing new assets to increase resilience to these impacts over their life; **2.4.** cost effective protection measures, retrofit, or relocation of existing assets; **2.5.** maintaining desired open space provision by acquiring land including that buffering existing coastal open spaces.
The essential services that Council provides to the community meet delivery expectations in a changing climate and energy transition.	**3.** The levels and standards of essential services to the community are maintained in a changing climate, through: **3.1.** understanding climate changes and their impacts on service provision; **3.2.** understanding the impacts energy transition may have on essential services and planning resilience of services to these impacts; **3.3.** planning and cost effective measures to increase the resilience of services to these impacts; **3.4.** ensuring that Council continues to meet its legislative obligations.

Continues on page 37



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Policy Statement	Strategic Outcomes
Council and community greenhouse gas emissions are reduced to achieve at least national targets by 2050.	**4.** Council's corporate greenhouse gas emissions are reduced by 75% of 1998 levels by 2050 through: **4.1.** conservation and efficiency; **4.2.** using less carbon intensive and renewable energy sources; **4.3.** purchasing or developing cost effective offsets that lead to real GHG reductions; **4.4.** routine, regular carbon audit and tracking systems; **4.5.** sustainable waste management. **5.** The community reduces its greenhouse gas emissions through: **5.1.** conservation and efficiency; **5.2.** using less carbon intensive and renewable energy sources; **5.3.** offsetting; **5.4.** sustainable waste management.
Council management provides the best possible buffering of the Redland's natural environment and cultural heritage from the impacts of a changing climate.	**6.** Council management of the threats to natural areas and cultural heritage evolves to overcome the additional impacts of a changing climate, through: **6.1.** understanding climate changes and the actual and potential impacts (sea level rise, storm tides, and more extreme weather), and how these make natural areas and cultural heritage more vulnerable: **6.2.** managing increasing threats (fire, pests, erosion, acid sulphate soils, etc) tomaintain the resilience of species at risk, ecosystems, habitats and coastal processes; **6.3.** managing increasing threats to cultural heritage.
Development in Redland City is planned, sited and designed to prevent or mitigate the adverse effects of a changing climate and energy transition.	**7.** Council's control of development and human activities in Redlands quickly evolves to ensure it addresses the additional impacts of a changing climate and energy transition, through: **7.1.** understanding climate changes and energy transition, and the actual and potential impacts (sea level rise, storm tides, and more extreme weather), andhow these make development more vulnerable; **7.2.** timely amendments to the *Redland Planning Scheme* and local laws; **7.3.** advocacy at political, planning and intergovernmental forums.
The community is resilient, well informed, resourced, empowered and able to make decisions and take action to respond to the adverse effects and potential opportunities of a changing climate and energy transition.	**8.** The Redlands community evolves to ensure that it addresses the additional impacts of energy transition and a changing climate, through: **8.1.** understanding and acting on climate changes, the actual and potential impacts (sea level rise, storm tides, extreme weather), and how these make communities more vulnerable; **8.2.** understanding and acting on energy transition and the actual and potential impacts (oil vulnerability, access to energy or security of supply), and how thesemake communities more vulnerable; **8.3.** increased community awareness, education and information programs; **8.4.** community advocacy at planning and intergovernmental forums; **8.5.** reducing dependence on fossil fuels.
Council develops robust, monitoring, evaluation, reporting and improvement systems to track performance of strategic outcomes and actions of this strategy.	**9.** Council develops robust monitoring, evaluation, reporting and improvement systems to track performance of strategic outcomes and actions of this strategy, through: **9.1.** corporate reporting; **9.2.** tracking and auditing implementation.

CHAPTER 8

Climate and Energy Action Plan 2010 – 2015

All actions are to be delivered in the short term 2010 – 2015. Many of these actions are already included and committed to under Council's risk register. Council is responsible for prioritizing and scoping actions for consideration in annual budget processes. A review in 12 months time will incorporate this information on priorities, staging and timing. Subsequent reviews will be at regular intervals.

The life, health and safety of the staff and the community are protected from the impacts of a changing climate and energy transition

Strategic Outcomes	Actions	Responsible Group
1. Council manages the additional hazards to life, health and safety of the community and Council staff arising from climate change and energy transition, by identifying, understanding and including them in the coverage of:		
1.1. Council's community support programs	Continue health promotion campaigns in association with Queensland Health (in relation to anxiety about climate change particularly elderly and heat stress).	Community & Social Planning
	Determine the extent of increased need for home assisted and respite care as a result of temperature changes and increased storm intensity and frequency.	Community & Social Planning
1.2. Council's emergency and disaster management planning	Ensure that the Disaster Management Plan is reviewed and amended to meet the longer term demands for emergency services arising from climate change.	Emergency Management
	Investigate options to ensure shelter is available for island communities stranded on mainland and/or islands during severe weather events and amend Disaster Management Plan.	Emergency Management
	Increase the resources allocated to implementation of the Disaster Management Plan to enable faster and more effective emergency response. This includes training, conduct of drill(s) and exercises and to ensure plans, procedures and contacts are kept current for emergency management response.	Emergency Management
	Resource and maintain the Emergency Coordination Centre with the capacity to effectively respond to increasing demand for response.	Emergency Management
	Increase on-the-ground resources to control weeds, woody vegetation and fuel hazard reduction (with QFRS) on Council lands.	Operations & Maintenance
	Review and update Bushfire Management Plans and Bushfire Hazard Risk Mapping every 5 years.	Environmental Management

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Strategic Outcomes	Actions	Responsible Group
1.3. workplace and community health and safety planning	Conduct risk analysis of sites across the Redlands that are potentially vulnerable to different types of mosquitoes and update/develop a new mosquito management/environment health strategy.	Community & Social Planning
	Investigate the need to expand existing programs to deal with increase in severity and extent of freshwater mosquito populations.	Community & Social Planning
	Implement an educational 'response to threat' campaign via appropriate media channels; accompanied by punitive measures if possible.	Community & Social Planning
	Increase awareness in the community regarding harm to lifestyle and general wellbeing resulting from increased midge or mosquito density.	Community & Social Planning
1.4. open space infrastructure and management	Expand current Shade in Parks program to streetscapes e.g., tree planting/parks and footpaths.	Environmental Management

Council property and assets and the infrastructure it provides to the community are protected from the impacts of a changing climate and energy transition

Strategic Outcomes	Actions	Responsible Group
2. The vulnerability of Council infrastructure, property and assets to the impacts of a changing climate and energy transition are minimised, through:		
2.1. understanding climate changes and the actual and potential impacts (sea level rise, storm tides, and more extreme weather), and how these give rise to vulnerabilities	Determine location of at risk Council infrastructure and assets by comparing spatial data on storm tide and flooding, soil type and landslide risk (under future climate scenarios) with data on locations of roads, stormwater drainage, coastal structures (including sea walls) and Council building assets.	Information Management
	Determine location of at risk coastal and marine infrastructure (under future climate scenarios for storm tide/, flooding and sea level rise) through a joint study with the Department of Transport.	Infrastructure Planning
	Undertake a study of coastal processes in the city to develop a Coastal Processes Plan.	Infrastructure Planning
	Investigate options, develop strategies, costs and scenarios for defending or retreating from sea level rise impacts along foreshores and the coastline	Infrastructure Planning
	Install rainfall/runoff devices at several representative locations to obtain local and accurate rainfall/runoff data.	Infrastructure Planning
	Undertake a study to determine the location and extent of storm water backwash during storm tide/, flooding under future climate and sea level rise scenarios.	Infrastructure Planning
	Complete the registering of existing stormwater infrastructure on the asset register.	Infrastructure Planning
	Update the stormwater asset register to include soft infrastructure (e.g. wetlands).	Environmental Management
	Re-run catchment flood mitigation hydrologic models to identify wetlands treatment measures that may fail (coastal wetlands).	Infrastructure Planning

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Council property and assets and the infrastructure it provides to the community are protected from the impacts of a changing climate and energy transition (cont'd)

Strategic Outcomes	Actions	Responsible Group
2.2. understanding the impacts of energy transition on Council assets and planning for the response to these impacts;	Undertake a study of Energy Transition risks to Council and develop an Energy Transition Action Plan, following principles of the Oil Depletion Protocol.	Environmental Management
	Investigate options to ensure Council retains and attracts experienced staff (e.g. flexible hours, work from home and transport options).	People and Change
	Encourage understanding and acceptance of Energy Transition Action Plan in the workplace.	Environmental Management
	Undertake analysis of Council's future vehicle needs and the risks and opportunities for GHG emissions reduction, including 3% annual reduction in fuel use. Develop a plan to meet GHG emissions targets to 2030 while maintaining operational capacity of the vehicle fleet.	Environmental Management
	Investigate options for electric vehicles and alternative fuel use and infrastructure for Council operations, including triggers such as fuel or carbon price, community sentiment or changes in security of supply.	Environmental Management
	Investigate options for carpooling, staff buses and employee exchanges in adjacent Council areas.	Environmental Management
	Promote, encourage and assist staff to increase their bicycle use in commuting and at work, including through acquiring an electric scooter or bicycle fleet for Council operations and provision of end of trip facilities.	Environmental Management
2.3. planning, locating and designing new assets to increase resilience to these impacts over their life;	Conduct a cost-benefit analysis of major design criteria changes for new buildings as an initial step to ensure adaptability to climate change.	Customer & Community Services
	Develop a plan to identify new locations for replacement/new Council building assets when old at risk assets have reached end of life cycle and are in vulnerable locations.	Customer & Community Services
	Undertake and implement priority infrastructure planning to ensure Council has sufficient budget to redesign existing roads and drainage.	Infrastructure Planning
	Amend specifications and buildings codes to reflect design changes for future new buildings in response to changing climate.	Land Use Planning
	Amend specifications and buildings codes to reflect design changes for future new buildings to ensure they support an energy transition and are resilient to oil vulnerability, including sustainable energy and transport options.	Infrastructure Planning
2.4. Cost effective protection measures, retrofit, or relocation of existing assets	Develop a comprehensive asset register to identify at risk buildings and incorporate into Integrated Asset Management Plans (IAMPs).	Customer & Community Services
	Investigate retro-fitting at-risk buildings and utilise new locations for new assets in response to climate change risks.	Corporate Acquisition Fleet and Facilities
2.6. maintain desired open space provision by acquiring land including that buffering existing coastal open spaces.	Review Open Space Strategy to include impacts from a changing climate.	Environmental Management
	Identify extent of public open space (sport and recreation areas, parks, and reserves) vulnerable to climate change impacts (in particular to inundation by storm tide, flooding and sea level rise). Investigate land acquisition policy options for replacement these areas based on time-frames in which they may be lost to sea level rise and inundation.	Environmental Management
	Investigate options for defending (flood-proofing) public open space from climate change impacts.	Environmental Management
	Ensure that open space facilities incorporate cutting edge design and products to maximise their resilience to climate change impacts.	Environmental Management

The essential services that Council provides to the community meet delivery expectations in a changing climate and energy transition

Strategic Outcomes	Actions	Responsible Group
3. The levels and standards of essential services to the community are maintained in a changing climate, through:		
3.1. understanding climate changes and their impacts on service provision	Review Council's buildings without generators (or access points for a mobile generator).	Corporate Acquisition, Fleet & Facilities
	Identify extreme weather response options and incorporate into sport and recreation land management plans.	Environmental Management
	Develop and implement irrigation and water management plans with sporting clubs (where vulnerable to water supply and resulting quality of field playing surfaces).	Environmental Management
3.2. understanding the impacts energy transition may have on essential services and planning resilience of services to these impacts;	Undertake a study of energy transition risks to the Redlands and develop an *Energy Transition Action Plan* to maintain critical services.	Environmental Management
	Develop *Oil Depletion Contingency Plan* to maintain Council's ability to provide essential services in the face of either a short term supply crisis.	Environmental Management
3.3. planning and cost effective measures to increase the resilience of services to these impacts	Develop a plan with NSI water transport operators to determine weather conditions that make barges/ferries inoperable and identify alternative options for Council services (e.g. waste collection by ferry substitution).	Infrastructure Planning
	Review and plan for climate change impacts on waste transfer facilities on NSI and the SMBIs.	Infrastructure Planning
3.4. ensuring that Council continues to meet its legislative obligations.	Ensure that Council closed landfills management meets DERM's coastal management policies and requirements.	Operations & Maintenance
	Recalculate risk profile of closed and operating landfills based on storm surge scenarios and ensure that management plans incorporate flexibility to change infrastructure and remediation actions.	Operations & Maintenance
	Incorporate climate change risks and treatments into all current and future Council ERA licenses and all sites registered on Council's Integrated Environmental Management System for which Environmental Management Plans apply.	Community Standards
	Develop a Climate Change Risk Management Procedure in the IEMS.	Environmental Management
	Maintain Council insurance cover with insurance industry policy changes for flood cover.	Risk & Liability Corporate Performance Planning and Risk

Council and community greenhouse gas emissions are reduced to achieve at least national targets by 2050

Strategic Outcomes	Actions	Responsible Group
4. Council's corporate greenhouse gas emissions are reduced by 75% of 1998 levels by 2050 through:		
4.1. conservation and efficiency	Invest in energy efficiency and energy conservation to achieve 5% reduction in GHG emissions per annum across all Council areas, focusing in particular on the Eco-Financial Efficiencies Program in the Fleet, and in the building and facilities areas of Council.	Corporate Acquisition, Fleet & Facilities
	Develop and implement procurement policies and procedures to improve sustainability outcomes for Council purchasing of goods and services.	Environmental Management
	Develop a Green Building Policy and Guidelines to implement a higher standard of sustainable design, function and use of Council buildings and structures.	Environmental Management
	Conduct driver behaviour training for Council vehicle operators to promote fuel efficient driving/ vehicle use.	Environmental Management
	Introduce intranet based car pool software to encourage staff to car pool at workshops, conferences, training, meetings and events.	Environmental Management
	Review and implement relevant findings of the South East Queensland Energy Efficiency Public Lighting Working Group (E2PLWG) and trial.	Council
	Use best practice eco-efficient lighting for all Council controlled community and landscape lighting (footpaths, car parks, etc).	Environmental Management
	Advocate for more effective state and federal policy, legislation and programs that promote energy conservation and efficiency by local government.	Council
4.2. using less carbon intensive and renewable energy sources	Develop a marginal abatement cost curve for Council providing specific guidance on investment in emissions reduction measures at Council.	Environmental Management
	Advocate for more effective state and federal policy, legislation and programs to promote uptake of low carbon energy sources by local government.	Council
	Purchase government accredited 'green power' where cost effective.	Environmental Management
	Generate our own power using renewable energy where cost effective.	Environmental Management
	Continue trialling solar power technologies for public lighting for which Council has operational control (footpaths, car parks etc).	Environmental Management
4.3. purchasing or developing cost effective offsets that lead to real GHG reductions	Purchase or develop cost effective offsets that lead to real emission reductions (registered and accredited carbon offsets from energy-efficiency and renewable sources in preference to those created through biosequestration and not to purchase offsets under voluntary schemes) where cost effective.	Environmental Management
4.4. routine, regular carbon audit and tracking systems	Report regularly on energy, fuel, water and waste consumption consistent with the Corporate Plan and state and Commonwealth government requirements.	Environmental Management
	Integrate carbon accounting tracking systems with the financial and other systems operated by Council to improve the ability to measure carbon emissions through energy, fuel, water and waste use.	Environmental Management
	Undertake energy and carbon audit to quantify emission reductions.	Environmental Management
4.5. sustainable waste management	Develop programs and options to reduce GHG emissions from Council waste under the Waste Management Strategy: through measures to avoid, reduce, reuse and recycle waste.	Infrastructure Planning

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Strategic Outcomes	Actions	Responsible Group
5. The community reduces its greenhouse gas emissions through:		
5.1. conservation and efficiency	Develop programs to facilitate Redland businesses, schools and households to become more energy efficient and sustainable and to promote 'green living'.	Environmental Management
	Develop and implement a program and 'brand' of community energy efficiency and conservation education and awareness (integrating this with a broader community sustainability education and awareness program) and support community groups and individuals acting on GHG emission reductions.	Environmental Management
	Promote a community that is well informed with respect to climate change and sustainable lifestyles and business practices through the development of locally focused internet based resources.	Environmental Management
	Form partnerships with, promote and support networks of local businesses, organisations and individuals working actively to reduce their energy use, such as ecoBiz.	Environmental Management
5.2. using less carbon intensive and renewable energy sources	Continue developing the walking and cycling pathway network and promote healthy lifestyles that encourage residents and visitors to use these facilities.	Environmental Management
	Develop priority parking program/policy for bicycles, car sharing and small, efficient vehicles.	Environmental Management
	Advocate for more effective state and federal programs that assist the community in living more sustainably, including participating in Inquiries and call for submissions on major government initiatives.	Environmental Management
	Plan for sustainable transport including mode shifts from the private motor vehicle, toward walking, cycling and public transport such as rail and bus.	Infrastructure Planning
5.3. sustainable waste management	Develop programs and options to reduce GHG emissions from community waste under the Waste Management Strategy: through measures to avoid, reduce, reuse and recycle waste.	Infrastructure Planning

Council management provides the best possible buffering of the Redland's natural environment and cultural heritage from the impacts of a changing climate

Strategic Outcomes	Actions	Responsible Group
6. Council's management of the threats to natural areas and cultural heritage evolves to overcome the additional impacts of a changing climate, through:		
6.1. understanding climate changes and the actual and potential impacts (sea level rise, storm tides, and more extreme weather), and how these make natural areas and cultural heritage more vulnerable	Conduct research into the impacts of coastal inundation on beaches and foreshores; and cost-effective options to better protect natural heritage.	Environmental Management
	Conduct research into the potential impacts on aquatic animal or plant populations and waterway ecosystem health through reduced stream flow and increasingly extreme events.	Environmental Management
	Conduct research to identify at risk habitats and species or 'hot spots' and develop cost-effective options and priorities for Council response.	Environmental Management
	Obtain and correlate spatial data on open space buffers and storm tides, flooding and coastal inundation with data on bushfire and regional ecosystems.	Environmental Management
6.2. managing increasing threats (fire, pests, erosion, acid sulphate soils, etc) to maintain the resilience of species at risk, ecosystems, habitats and coastal processes	Encourage local government collaboration and coordination on Lyngbya research and management, including cost sharing approaches in the long term.	Environmental Management
	Review corporate guidelines and procedures for the management of *Lyngbya algal* blooms to increase the scope of target area and include NSI and SMBI (including monitoring and response to *Lyngbya* blooms).	Environmental Management
	Ensure acid sulphate soils criteria are incorporated into IEMS/EMP procedures and PEAT (preliminary environmental assessment tool) and updated.	Environmental Management
	Advocate for the state government to assume a greater role in and responsibility for algal bloom management, with commensurate increase in resources.	Council
	Advocate for the state government and other councils to take a regional approach to researching climate change impacts on acid sulphate soils and animal or plant populations, habitat or ecosystems.	Council
	Advocate for the state government and other councils to take a regional approach to researching climate change impacts on animal or plant populations, habitat or ecosystems through persistent water stress.	Council
6.3. managing increasing threats to cultural heritage	Conduct research to identify the impacts of coastal inundation on cultural heritage sites and values. Develop priorities and cost-effective options to better protect cultural heritage sites and values.	Community & Social Planning



Development in Redland City is planned, sited and designed to prevent or mitigate the adverse effects of a changing climate and energy transition

Strategic Outcomes	Actions	Responsible Group
7. Our control of development and human activities in Redlands quickly evolves to ensure that it addresses the additional impacts of a changing climate and energy transition through:		
7.1. understanding climate changes and energy transition, the actual and potential impacts (sea level rise, storm tides, and more extreme weather), and how these make development more vulnerable	Compare spatial data on storm tide and flood inundation with: updated spatial data on sewered and unsewered (septic) areas; marine industry infrastructure.	Land Use Planning
	Complete storm tide hazard, sea level rise, flooding and inundation mapping of areas of the city not currently mapped including the Southern Moreton Bay Islands, Dunwich, Amity Point, and Tingalpa Creek and surrounding area.	Infrastructure Planning
	Undertake further site specific two dimensional modelling of specific areas to refine the storm tide extents, duration of inundation and hazard levels.	Infrastructure Planning
	Re-run catchment flood mitigation hydrologic models to incorporate increase in sea levels due to climate change.	Infrastructure Planning
	Install automatic wave/tide height devices so that current accurate data can be input to models.	Infrastructure Planning
	Undertake modelling of storm tides to determine impact of climate change on sea walls.	Infrastructure Planning
	Conduct wave-run up modelling of the Redland coastline to inform Council and emergency management of potential inundation risks for a given storm event.	Infrastructure Planning
	Complete Rural Futures Strategy incorporating known impacts of climate change on farming options in the Redlands area.	Land Use Planning
7.2. timely amendments to the Redland Planning Scheme and local laws	Investigate planning options (including amendment of Redland Planning Scheme by 2012) to reduce the impacts of sea level rise on future development, and incorporate the results of recent storm tide modelling and state government sea level rise planning requirements in the Coastal Plan.	Land Use Planning
	Review Redland Planning Scheme to incorporate planning for and costs of state government total water management requirements through Priority Infrastructure Planning.	Land Use Planning
	Develop community engagement mechanisms for planning responses to sea level rise along foreshores.	Land Use Planning
	Maintain up-to-date information on landslide overlay and development requirements to conduct geotechnical studies for site specific issues as required.	Land Use Planning
	Investigate planning options (including Redland Planning Scheme mechanisms) that reduce the impacts of sea level rise on existing development exposed to inundation risks.	Land Use Planning
	Promote urban planning that reduces the transport requirements, such as mixed use development in close proximity to services and to people who need them.	Land Use Planning
	Investigate planning options (including Redland Planning Scheme mechanisms) that promote local food production.	Land Use Planning
7.3. advocacy at political, planning and intergovernmental forums.	Advocate and gain clear direction from the Queensland state government on planning responses to sea level rise, public and environmental health issues arising from climate changes, including to improve planning scheme capacity for continual updating.	Council
	Advocate to state government regarding enabling legislation to provide Council with the mechanisms for land resumption or compensation in response to sea level rise predictions.	Council
	Conduct / renew dialogue with the DERM, and other relevant state agencies and other affected Councils regarding enforcement of coastal building lines, especially at Amity Point.	Land Use Planning
	Advocate for more frequent rail and services to Cleveland during times short term supply crunches and following oil depletion.	Council

The community is resilient, well informed, resourced, empowered and able to make decisions and take action to respond to the adverse effects and potential opportunities of a changing climate and energy transition

Strategic Outcomes	Actions	Responsible Group
8. The Redlands community evolves to ensure that it addresses the additional impacts of energy transition and a changing climate, through		
8.1. understanding and acting on climate changes and the actual and potential impacts (sea level rise, storm tides, extreme weather), and how these make communities more vulnerable;	Develop and implement a Communication, Engagement and Action Plan to provide forums where climate change impacts may be identified and discussed with a view to how community resilience to these impacts may be strengthened.	Environmental Management
	Undertake a study of priority climate change risks to the community.	Environmental Management
8.2. understanding and acting on energy transition and the actual and potential impacts (oil vulnerability, access to energy or security of supply), and how these make communities more vulnerable;	Establish an Energy Transition Work Group to provide advice to Council regarding oil vulnerability and prepare the Redlands community for increasing fuel prices and energy security.	Environmental Management
	Undertake a study of energy transition risks to the community and develop an Energy Transition Action Plan to manage priority risks in partnership with the community, identifying disadvantaged and vulnerable sections of the Redlands community.	Environmental Management
	Develop and implement a Communication, Engagement and Action Plan to encourage understanding and acceptance of energy transition action in the Redlands community and support community groups and individuals acting on oil depletion.	Environmental Management
8.3. evolving community awareness, education and information programs;	Provide regular and diverse forums for community education, behaviour change and an awareness program targeting climate mitigation (emissions reduction from all sectors), adaptation issues (climate change readiness and preparedness) and energy transition and to promote 'green living'.	Environmental Management
	Develop and implement a Communication, Engagement and Action Plan to promote education and awareness, explore opportunities arising from a changing climate, and include them in Council business strategies.	Environmental Management
8.4. advocacy in the community and at political, planning and intergovernmental forums	Advocate for greater regional risk assessment, coordination, and common policy and planning controls in response to climate change.	Council
	Advocate for greater access to state and federal government initiatives and funding.	Council
	Develop a marginal abatement cost options for residents based on specific conditions in Redlands to provide guidance to residents on best investment options for emissions reduction.	Environmental Management
	Provide support for non-local government initiatives.	Environmental Management

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Strategic Outcomes	Actions	Responsible Group
8.5. reducing dependence on fossil fuels.	Develop and implement a Communication and Engagement Plan to encourage understanding and acceptance of energy transition action in the Redlands community and the need to reduce use of fossil fuel powered transport.	Environmental Management
	Encourage localisation of industry, food production and transport, energy generation to meet community needs.	Environmental Management
	Identify food 'deserts' and start longer term planning and up-skilling for edible gardens, including developing skills and identifying potential locations.	Environmental Management
	Introduce and map food producing plants in public places, in advance of short term fuel shortage.	Environmental Management
	Promote home edible gardens through workshops, training, networks and exchanges.	Environmental Management
	Promote and support networks of local businesses, organisations and individuals working actively to reduce their fossil fuel use; and support community groups and individuals acting on oil depletion.	Economic Development
	Promote local employment opportunities to minimise the need for extended travel by residents for commuting purposes.	Economic Development

Council develops robust monitoring, evaluation, reporting and improvement systems to track performance of strategic outcomes and actions of this strategy

Strategic Outcomes	Actions	Responsible Group
9. Council develops robust monitoring, evaluation, reporting and improvement systems to track performance of strategic outcomes and actions of this strategy, through:		
9.1. corporate reporting	Use 'Green Living' performance indicators from the *Community Plan Redlands 2030* and Council Corporate Plan to measure Council performance on climate change and this strategy.	Corporate Planning, Performance & Risk
9.2. tracking and auditing implementation	Review and report on progress from this strategy at midway and at completion of the five year plan period.	Environmental Management

CHAPTER 9

Glossary

Adaptation – Adjustments made or actions taken in natural or human systems in response to actual or projected climatic changes and their effects, leading to a reduction in risks or a realisation of benefits.

Carbon dioxide equivalency (CO_2e) – A quantity that describes, for a given mix and amount of greenhouse gas, the amount of CO_2 that would have the same global warming potential when measured over a specified timescale.

Climate – The general or typical atmospheric conditions for a place over a period of time, generally referring to the state of the weather in a particular region.

Climate change – A change of temperature and weather patterns producing short and long-term effects on the Earth's atmosphere, generally attributed directly or indirectly to human activities such as fossil fuel combustion and vegetation clearing and burning.

Emissions – Amount of substance (e.g. CO_2) released into the atmosphere by a specific source within a given timeframe.

Energy efficiency – A reduction in the amount of energy used to produce the same level of energy service.

Energy transition – Moving to low or no-carbon fuels, green energy technologies and behaviours and lifestyle choices that reduce consumption of resources and energy.

Fossil fuels – Carbon-rich deposits in the Earth, such as petroleum (oil), coal, or natural gas, derived from the remains of ancient plants and animals and used for fuel. These fuels produce carbon dioxide when burnt.

Green house gases – Natural gases in the Earth's atmosphere that absorb and emit radiation, causing the greenhouse effect. The main greenhouse gases in the atmosphere are water vapour, carbon dioxide, methane, nitrous oxide and ozone.

Mitigation – Actions taken to reduce the amount of greenhouse gases emitted into the atmosphere.

Peak Oil – Peak oil is the point in time when the maximum rate of global petroleum extraction is reached, after which the rate of production enters terminal decline.

Renewable energy – Energy generated from naturally renewable resources such as sunlight, wind, rain, tides and geo-thermal heat.

CHAPTER 10

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APPENDIX 1

Climate change risk register

Risk Register from Appendix 1 of *Redlands Climate Change Risk Assessment* 2008 report

Risk Name	Consequences	Likelihood (Current)	Priority (Current)	Likelihood (2030)	Priority (2030)	Likelihood (2070)	Priority (2070)
Infrastructure							
Council buildings damaged through subsidence and shifting foundations with increased intense rainfall	Insignificant	Rare	4	Rare	4	Rare	4
Council buildings (inland) damaged through wind, hail or flooding	Low	Unlikely	20	Unlikely	20	Unlikely	20
Council buildings (coastal) damaged through wind, hail or flooding	Low	Possible	28	Possible	28	Likely	44
Building fittings and retrofits required to accommodate temperature increases and storms	Insignificant	Likely	24	Rare	4		
Low-lying public infrastructure damaged by flooding	Low	Likely	44	Likely	44	Almost certain	48
Increased damage to pontoons, marina, jetties, piles through storm tide	Major	Unlikely	64	Unlikely	64	Rare	60
Increased damage to sea walls (armouring) through storm tide	Low	Possible	28	Possible	28	Likely	44
Increased damage to caravan parks through storm activity	Low	Unlikely	20	Unlikely	20	Rare	16
Damage to footings or timber structures through ocean acidity	Insignificant	Rare	4	Rare	4	Rare	4
Closed landfills inundated through storm surge	Low	Possible	28	Unlikely	20	Unlikely	20
Damage to microwave linkage to isolated and island communities	Insignificant	Rare	4	Unlikely	8	Possible	12
Loss of power as a result of overload	Low	Unlikely	20	Unlikely	20	Unlikely	20
Loss of power as a result of storms	Low	Unlikely	20	Unlikely	20	Unlikely	20
Stormwater drains overwhelmed by intense rainfall	Insignificant	Possible	12	Possible	12	Likely	24
Stormwater drains blocked through reduced average rainfall or drought	Insignificant	Possible	12	Possible	12	Likely	24
Stormwater treatment systems overwhelmed	Low	Possible	28	Likely	44	Almost certain	48
Infiltration of sewerage through illegal connections to stormwater	Low	Likely	44				
Road damage through drought	Insignificant	Rare	4	Rare	4	Rare	4
Barge inoperable in rough weather	Medium	Likely	56	Likely	56	Likely	56
Ferry inoperable in rough weather	Low	Likely	44	Likely	44	Almost certain	48

Low Medium High

Risk Name	Consequences	Likelihood (Current)	Priority (Current)	Likelihood (2030)	Priority (2030)	Likelihood (2070)	Priority (2070)
Planning and Development							
Increased need for shaded/cool facilities	Low	Possible	28				
Insufficient coastal open space as a result of rising sea level and coastal inundation	Low	Rare	16	Unlikely	20	Possible	28
Inadequate planning for the impact of rising sea level on marine industries	Insignificant	Rare	4	Rare	4	Unlikely	8
Inadequate planning for the impact of water restrictions, transport difficulties, rising temperatures and increased storm activity on tourism	Low	Rare	16	Unlikely	20	Possible	28
Inadequate planning for the impact of water stress, drought, storms and temperature on agricultural (poultry) and horticultural (flower farming and others) industries	Low	Unlikely	20	Possible	28	Rare	16
Environmental Management							
Significant harm to animal or plant populations, habitat or ecosystem health through storms and flooding	Medium	Unlikely	36	Possible	52	Likely	56
Significant harm to aquatic animal or plant populations or ecosystem health through ocean acidification	Insignificant	Rare	4	Unlikely	8	Possible	12
Significant harm to animal or plant populations, habitat or ecosystem health through coastal inundation	Low	Rare	16	Unlikely	20	Possible	28
Significant harm to animal or plant populations, habitat or ecosystem health through persistent water stress	Low	Rare	16	Unlikely	20	Possible	28
Significant harm to animal or plant species and ecosystem health through bushfires	Low	Rare	16	Unlikely	20	Possible	28
Significantly increased algal blooms (Lyngbya majuscula)	Low	Unlikely	20	Possible	28	Likely	44
Significant degradation of beaches and foreshores through coastal inundation	Low	Rare	16	Unlikely	20	Unlikely	20
Increased incidence and severity of landslide through intense rainfall	Insignificant	Rare	4	Rare	4	Unlikely	8
Significant escalation of the distribution of acid sulphate soils	Not rated	Not rated		Not rated		Not rated	
Increased pests and weeds through altered temperature and rainfall parameters	Insignificant	Rare	4	Unlikely	8	Unlikely	8
Degradation of creek ecosystems through reduce stream flow	Insignificant	Rare	4	Rare	4	Unlikely	8
Significantly increased pollution of waterways through storms and flooding	Insignificant	Rare	4	Rare	4	Unlikely	8

Low Medium High

Risk Name	Consequences	Likelihood (Current)	Priority (Current)	Likelihood (2030)	Priority (2030)	Likelihood (2070)	Priority (2070)
Community and Social Planning							
Anxiety (mental health and general wellbeing)about climate change – particularly elderly	Low	Rare	16	Unlikely	20	Possible	28
Increased incidence of heat stress through increased peak temperatures and heat waves	Insignificant	Rare	4	Rare	4	Unlikely	8
Increased need for home-assisted and respite care and associated funding, as a result of temperature changes and storms	Low	Rare	16	Unlikely	20	Possible	28
Demand for emergency services increased through increased storms and flooding	Low	Rare	16	Unlikely	20	Possible	28
Demand for recovery services increased through increased storms and flooding	Insignificant	Rare	4	Unlikely	8	Possible	12
Public safety threatened through increased storms or flooding	Low	Rare	16	Unlikely	20	Possible	28
Public safety threatened through altered incidence of mosquito-borne infectious diseases (e.g. dengue fever, Ross River virus disease)	Medium	Rare	32	Rare	32	Possible	52
Harm to lifestyle and general wellbeing as a result of increased midge or mosquito density	Low	Rare	16	Unlikely	20	Possible	28
Sporting or recreational areas threatened through lack of water	Low	Possible	28	Possible	28	Possible	28
Recreation areas threatened by coastal inundation	Low	Rare	16	Unlikely	20	Possible	28
Corporate Services							
Council liability for property damage through bushfires	Insignificant	Rare	4	Rare	4	Rare	4
Council liability for development threatened by flooding or sea level rise	Major	Rare	60	Rare	60	Rare	60

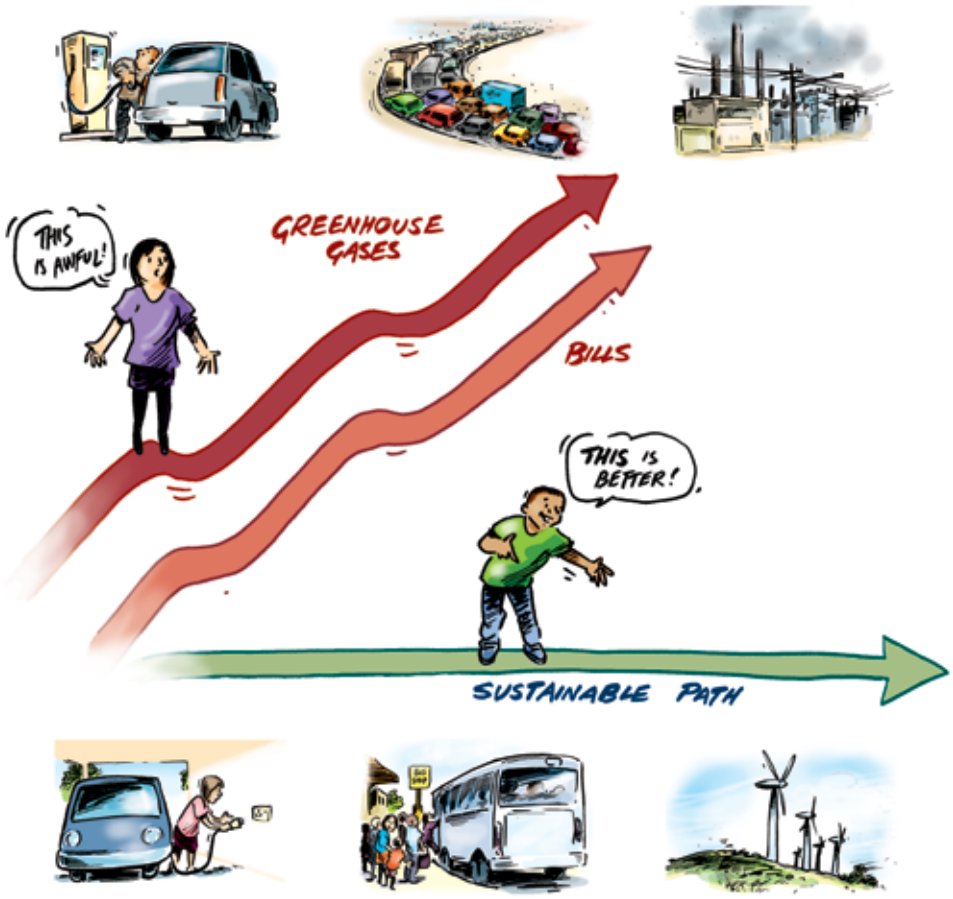
Low Medium High

Risk Name	Consequences	Likelihood (Current)	Priority (Current)	Likelihood (2030)	Priority (2030)	Likelihood (2070)	Priority (2070)
Mitigation Risks (these are risks that are yet to be rated and assessed for priority)							
Poorly viewed by other communities as being one of the highest emitting and least responsible communities on the planet;							
Missed opportunity to reduce emissions now is likely to cost more in the future for every tonne of carbon not abated;							
Energy costs are increasing and we will pay higher costs every year equal to the level of our emissions; and							
Legislative changes in coming years may bring mandatory emission levels that cannot be met without substantial investment.							
Poorly considered actions and planning or development without considering mitigation will 'lock in' further future emissions.							
Energy Transition Risks (these are risks that are yet to be rated and assessed for priority)							
Dependence on road and rail connections to the Brisbane metropolis and sea transport between islands and the mainland across Moreton Bay;							
Greater future competition among satellite communities in Brisbane for affordable and adequate transport services;							
Businesses and services that rely heavily on oil based products face significantly increased costs that will be passed onto consumers;							
Current building codes, development practices and transport patterns expose the community, including the business community, to volatile oil prices;							
Access to food, either in terms of food transport or production, will be vulnerable to volatile oil prices; and							
Higher future costs of energy transition if we delay action rather than act early.							

Low Medium High

Confronting Our Climate Future

- Reduce greenhouse gas emissions
- Adapt to climate change
- Move to sustainable energy and fuels



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