

Achieving early and affordable greenhouse gas reductions in Queensland

Strategies for voluntary household and lifestyle changes



A Premier's Council on Climate Change report

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Published by the Queensland Government, June 2008

EPA 00691_June08

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Dear Premier

Please find attached the Premier's Council on Climate Change working group report, *Achieving early and affordable greenhouse gas reductions in Queensland: Strategies for voluntary household and lifestyle changes*.

The report seeks to build on the success that Queenslanders have already achieved in reducing water use and implementing water and energy conservation strategies in their households.

With this success in mind, the government needs now to focus on achieving rapid change—through partnerships with the community—to extend awareness and build the capacity of Queensland households to modify their lifestyles in ways that achieve major reductions in greenhouse gas emissions. The report details household initiatives that will benefit the individual, the community and the environment.

Projections identified in this paper clearly show that public awareness and active participation in reducing greenhouse gas emissions at the personal and household level can achieve tangible and significant outcomes.

As the report's findings suggest:

If only 15 per cent of Queensland householders adopted a range of small and reasonably affordable lifestyle changes, the greenhouse gas reductions could be as much as 4 million tonnes each year. More importantly, such savings would be cumulative as changed behaviours become normalised and could expand as others follow the early adopter participants in the program.

I commend this report to you.

Yours sincerely

Molly Harriss Olson
Premier's Council on Climate Change and
Founder and Convenor of National Business Leaders
Forum on Sustainable Development

Premier's Council on Climate Change

The Premier's Council on Climate Change provides the Queensland Government with high-level, strategic advice on climate change issues and actions.

The council first met in March 2008 and was commissioned by the Premier to advise the government on a long term climate change strategy for Queensland that:

- is informed by the best available knowledge about measures Queenslanders can take collectively and individually to address climate change
- provides practical solutions to the problems posed by climate change for Queensland communities, industries and the environment
- maintains and enhances, where possible, Queensland's economic competitiveness
- generates new growth opportunities through innovation.

Specifically, the council was asked to provide high-level advice about:

- priorities for Queensland Government action to reduce Queensland's greenhouse gas emissions, including sectoral responses such as sustainable energy options, transport strategies and built environment energy efficiency
- mitigation and adaptation measures relevant to Queensland, to assist communities and industries address the inevitable results of climate change
- opportunities for innovation arising from climate change for communities and the private sector
- priority areas for investment from the Queensland Climate Change Fund
- major implementation issues with regard to any related measures
- Queensland's position in contributing to national policy settings and international negotiations.

The work program of the Premier's Council on Climate Change is facilitated by a number of working groups comprised of council members. This paper was prepared by the Community Engagement and Education Working Group, with the assistance of Dr John Cole and other staff of the Environmental Protection Agency. The paper does not represent Queensland Government policy.

Executive summary

The current drought has shown that south-east Queenslanders are remarkably adaptive; they have been able to save vast amounts of water by changing their household practices.

Similarly, Queenslanders have opportunities to make changes that will reduce the energy and consequent greenhouse gas intensity of their households. These changes to energy consumption are often small, cost little and can save the householder money.

The Queensland Government's ClimateSmart Living campaign, launched in June 2007, has informed Queenslanders about ways they can make changes to their lifestyles to reduce greenhouse gas emissions. Follow-up research by AC Nielsen has shown that people want to know more and are interested in further government assistance to empower them to make a difference by adapting their homes and lifestyles.

With the average Queensland household carbon footprint exceeding 17 tonnes of CO₂-e per year¹, cost abatement analysis indicates that there is great scope for the Queensland community to take a major step in the short-term toward state and national greenhouse gas reduction targets. If only 15 per cent of the state's householders adopted a range of small and affordable lifestyle changes, the greenhouse gas reductions could be as much as 2.7 million tonnes each year.² The savings will continue to increase as each household makes low carbon lifestyle changes.

The first stage of the ClimateSmart Living campaign has confirmed international marketing results, indicating that information and education by themselves do not result in broad behavioural change. Research points to the importance of ongoing government assistance programs delivered locally and in partnership with community groups. Behavioural change resulting in a long-term reduction in greenhouse gas emissions is most likely to be achieved through training, tools and interpersonal support along with community-based social marketing strategies that anchor programs with local leaders.

The effectiveness of a voluntary household low carbon program could be optimised through partnerships with community groups, local government, state agencies, energy retailers, and the home retail sector. Any program should be sufficiently flexible to encourage local communities and individual households to extend the possibilities with their own initiatives. Recognising the outstanding achievements and innovation of Queenslanders will further consolidate the change process and extend its effect across the state.

Purpose of this working paper

The Premier's Council on Climate Change first met in March 2008. At this meeting, the council recommended that the Queensland Government implement a range of community engagement strategies to secure broad public participation in achieving targets for reducing emissions and to support the government's broader climate agenda.

The council recommended, as a priority, a focused, community strategy to enable Queenslanders to be proactive in controlling their emissions and in preparing for climate change.

The council further recommended that the strategy be communicated in plain, non-scientific language. It should enable Queenslanders to make informed decisions about climate change, encourage their participation, and result in tangible actions that will reduce their personal and household carbon footprints.

This working paper explores the opportunities available for achieving early and affordable reductions in greenhouse gas emissions at a household level.

The working paper is consistent with council's mandate to support a long-term climate change strategy for Queensland that:

- is informed by the best available knowledge about measures Queenslanders can take collectively and individually to address climate change
- provides practical solutions to the problems posed by climate change for Queensland communities, industries and the environment
- maintains and enhances, where possible, Queensland's economic competitiveness
- generates new growth opportunities through innovation.

Background

A local precedent for achieving rapid change through partnerships

Five years ago in south-east Queensland, the average daily water consumption was 320 litres per person. With severe drought and a rapid population increase, the region—one of the fastest growing in the world—was running out of water.

To ensure long-term water security for a growing population and expanding economy, the Queensland Government launched a major development program designed to optimise water storage and supply infrastructure in the region. This has involved finding new sources of water as well as constructing an integrated water grid connecting centres spread across major catchments.

While supply challenges were being addressed through new infrastructure, the community—households and businesses—was enlisted as the key partner in reducing water wastage and finding more efficient ways of managing existing water resources. Broad compliance with water restrictions saw household consumption reduced from 320 litres per person to well under the targeted 140 litres per person.

As the residential sector accounts for about 80 per cent of south-east Queensland water use, this reduction reflected a major transformation in community behaviour that accounted for a massive saving of 21,785 megalitres under the Target 140 campaign.³

While there are regulatory restrictions in place, the enormous savings of water have come about largely through the willingness of average householders in south-east Queensland to make changes. Currently at 127 litres per person a day, household water consumption is now well below the official target of 140 litres.⁴

A range of government measures, including rebates for the installation of rainwater tanks and water-efficient appliances, has supported the adoption of 'water wise' behaviour across south-east Queensland communities. A proactive information strategy and constructive media involvement in promoting public awareness about supply and consumption have provided invaluable feedback to people wanting to change their behaviour.

South-east Queensland is now one of the most water-efficient regions in the western world. In comparison, consumption in the USA averages 380 litres per person per day and Britons use an average of 150 litres per person per day. Even Israel uses more water per person per day than south-east Queensland.⁵ The contribution made by the south-east Queensland community to securing its own water supply is evidence of what can be achieved through significant behavioural change.

The challenge now is to encourage Queenslanders to extend their commitment to change other aspects of their lifestyles. These initiatives by householders will benefit individuals, the community and the environment. There is no more important challenge for the community than to understand and address the causes of climate change.

Queensland households and greenhouse gas emissions

At 41 tonnes per year⁶, Queensland's per capita greenhouse emissions are among the highest in the world and are much higher than the Australian average of 28 tonnes. Queensland's electricity use has more than doubled over the period 1990–2005. While Queensland's electricity use reflects, and to some extent drives, economic prosperity it is also the dominant cause of the state's high greenhouse gas emissions (Table 1).

Table 1

Queensland greenhouse gas emissions in 1990 and 2005⁷

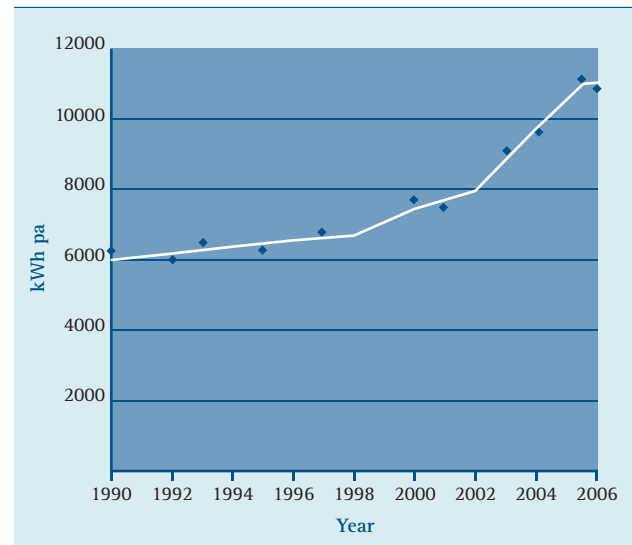
Sector/subsector	1990 (MT*)	2005 (MT)	Increase (MT)
Electricity	22.8	47.6	24.8
Other stationary energy	12.7	17.0	4.3
Transport	11.9	18.7	6.8
Fugitive fuels	3.5	8.6	5.1
Industrial processes	2.5	5.6	3.1
Agriculture	24.1	25.8	1.7
Land use and forestry	82.4	30.2	-52.2
Waste	3.9	3.4	-0.5
Total	163.8	156.9	-6.9

*MT = megatonne

While a large proportion of Queensland's electricity is used by energy-intensive industries, household electricity use is also significant, accounting for 28 per cent of the total. Average household electricity use in south-east Queensland has grown from 17 kilowatt hours (kWh) per day in 1990 to 30 kWh per day in 2005–06 (Figure 1).⁸ This is high by Australian standards with the national average in 2001 being 13.7 kWh per day.⁹ A snapshot of more recent data from some states shows average household electricity use of 15 kWh per day in Perth¹⁰ and 16.4 kWh per day in South Australia¹¹.

Figure 1

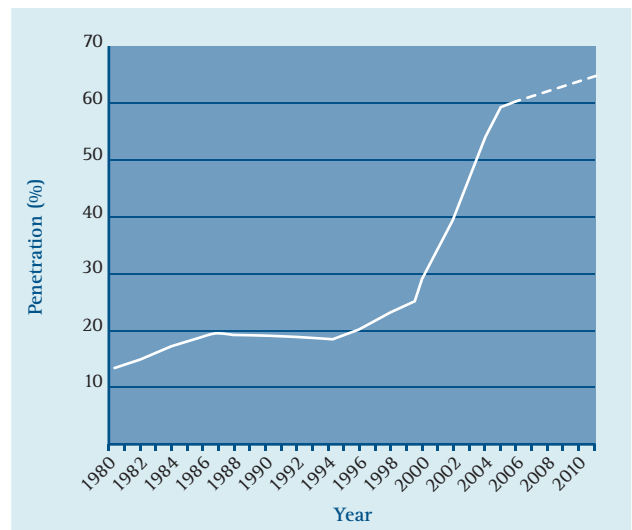
Average annual electricity use per household in south-east Queensland¹²



The increasing levels of electricity used in Queensland houses can be attributed to the increasing use of more power hungry appliances such as large televisions, computers and, most importantly, air conditioners (Figure 2).

Figure 2

Trends in air conditioner ownership (Queensland)¹³



Housing design and site orientation, the carbon intensity of materials, and appliance performance standards are crucial elements in determining the energy and related greenhouse gas performance of the average Queensland home. Add to that a motor vehicle-based lifestyle and increasing use of power-hungry electrical appliances, and the carbon footprint of the ordinary Queensland household soon exceeds 17 tonnes each year.¹⁴

Table 2

Greenhouse gas generation from household electricity consumption – indicative spectrum¹⁵

User category	Average annual electricity use (kWh)	Average annual CO2 emissions (kg CO2-e)	Description of customer category
Low	4500	4680	A low-use customer may use similar appliances as a medium household but may have fewer occupants.
Medium	5544	5766	An medium customer may use appliances such as dishwasher, top loading washing machine, clothes dryer, 500 litre fridge, desktop computer, television, electric cook-top and oven, and some electric heating and fans.
High	7980	8299	A high user may have similar consumption patterns to an average user but may also use one or two air conditioners.
Very high	11,040	11,482	A very high use customer may have an above average sized house with air conditioning and a pool.

Why voluntary reductions in household emissions are affordable

In February 2008 McKinsey & Company published its Australian cost curve for greenhouse gas reduction. While the study's abatement costing is the subject of public debate, McKinsey offers a strong argument for governments to work with the community to secure early affordable cuts in carbon emissions by householders.¹⁶

A marginal abatement cost curve reflects the range of additional costs involved in reducing each additional unit (tonne) of carbon emissions across the entire economy. The McKinsey study showed clearly that significant quantities of 'negative cost' options (that is less than \$0 per tonne to the economy) are available for Australia to make savings, particularly at the level of household efficiency changes, and in building design and operation.

McKinsey concluded that reducing emissions 'is affordable—with an average annual cost of A\$290 per household to reduce emissions by 2020 to 30 per cent below 1990 levels'.¹⁷ This could be achieved provided efficiencies aim to meet a strong national target and Australia participates in international strategies. This average annual cost incorporates a range of costs to the Australian householder, which also includes broader adjustments in the national economy.

When the focus is narrowed to the home and personal lifestyle level, the economic reasons for action become even clearer. Householders can actually save money by making efficiency changes.

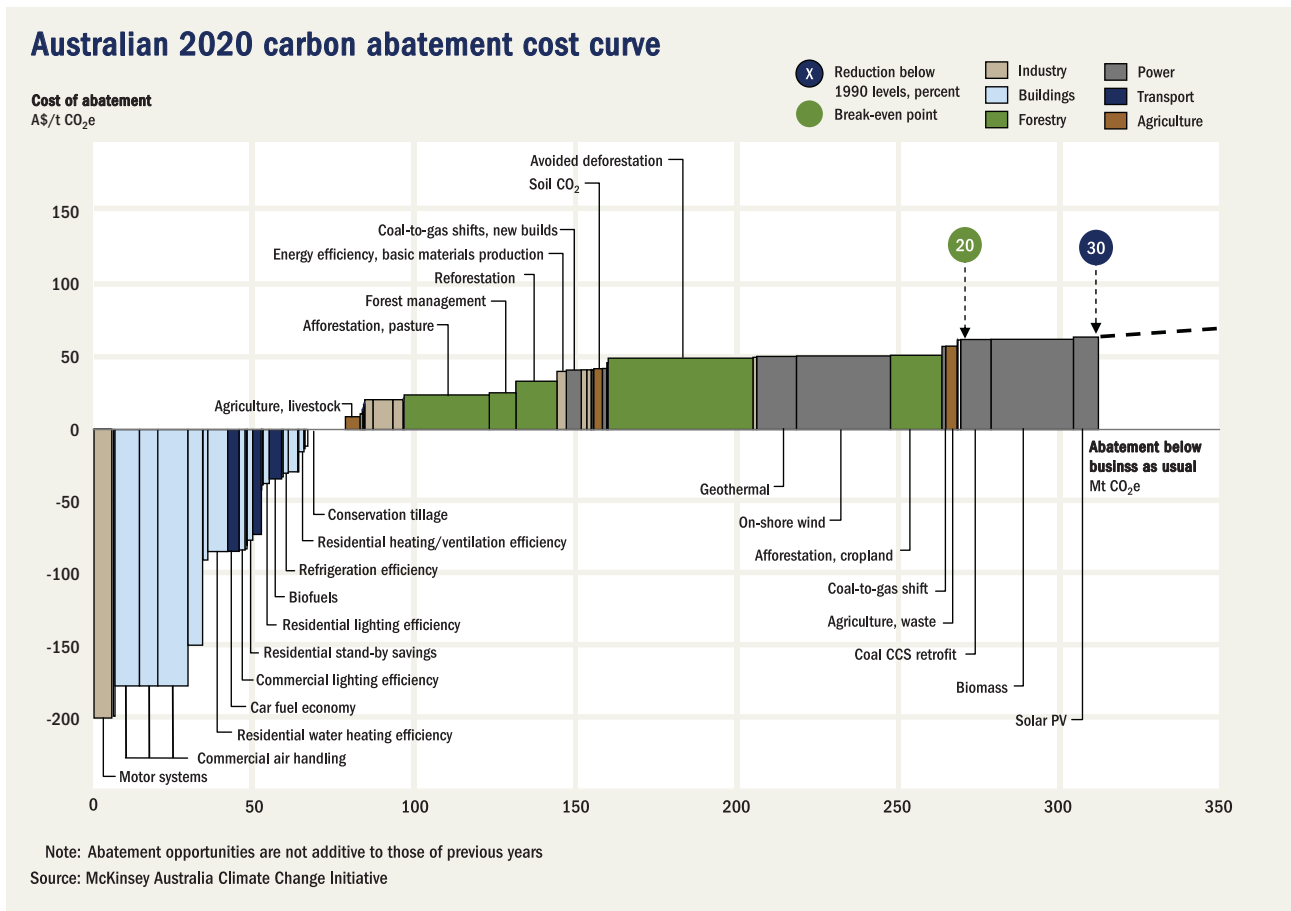
McKinsey found that of the 11 areas of abatement initiative that actually brought efficiency savings to the economy, over half were in the domestic sector (see Figure 3). Major energy efficiency savings could be achieved with better motor systems in appliances, efficient residential water heating, car fuel economy, residential stand-by energy, and efficiencies in lighting, refrigeration, heating and ventilation.

With so much to be gained by implementing better technology and more efficient systems, goods and services, the obvious question can be asked: if it is so financially compelling, why aren't more people making the changes? The answer to this question can be found in a range of psychological, sociological and economic factors that act to influence our tendency to accept change or innovation.¹⁸

To achieve the abatement options identified by McKinsey, governments can either mandate change through law and regulation or they can work with the community through a voluntary process encouraging behavioural change with the support of incentives and rewards. Either approach has its challenges and complexities.

Figure 3

McKinsey's Australia 2020 carbon abatement cost curve¹⁹



Greenhouse gas emissions savings from specific household actions

Queensland householders can take many simple actions that have the potential to contribute to significant emissions savings.

Hot water systems and air conditioners are the largest household energy users (Figure 4). Queensland has a much higher proportion of electric hot water systems than other states and territories, and these have high greenhouse gas emissions compared with other hot water systems (Figure 5).

Figure 4

Typical Queensland household electricity use²⁰

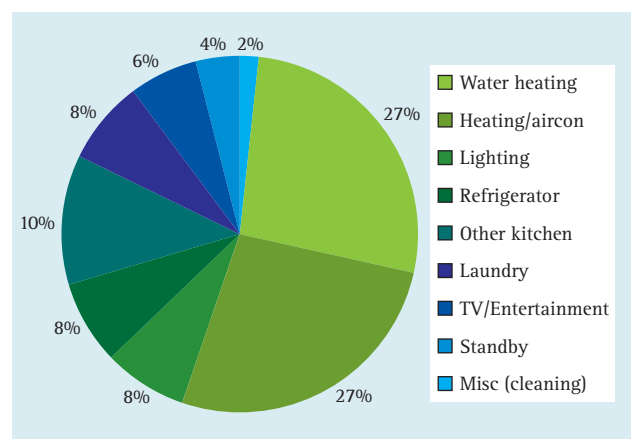
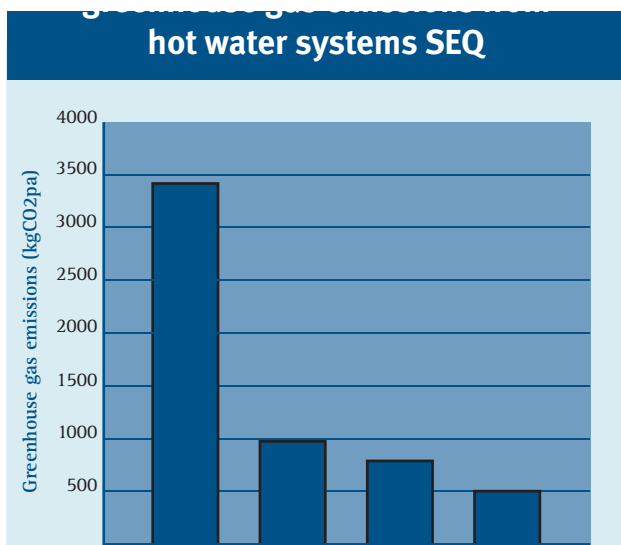


Figure 5

Average annual household greenhouse gas emissions from hot water systems in south-east Queensland²¹



Replacing an electric hot water system with a greenhouse efficient system (5 star gas, heat pump or solar) could reduce household greenhouse gas emissions by 2.45 tonnes each year. The Queensland Government has announced plans to phase out electric hot water systems.

If 15 per cent of Queensland households replace their electric hot water systems with greenhouse efficient systems, 590,000 tonnes of CO₂-e could be saved each year.

Solar hot water systems have around half the greenhouse gas emissions of 5 star and instantaneous gas systems. Solar hot water systems are not suitable for buildings that are heavily shaded and they are more expensive to have installed. However, with much lower running costs and typical life spans of around 20 years, they are generally the cheapest hot water option.

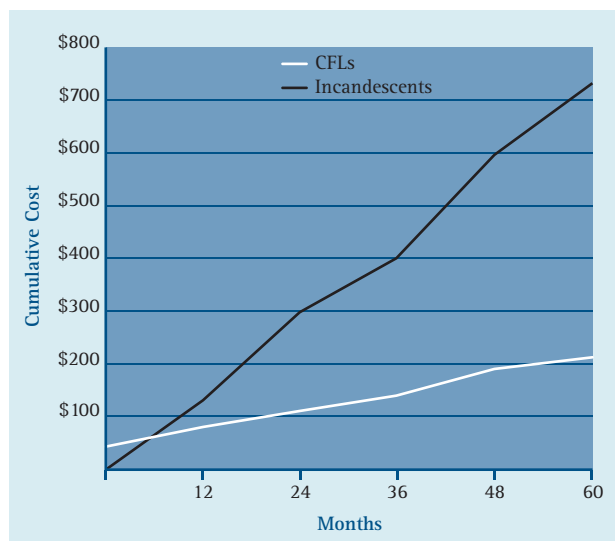
If 15 per cent of Queensland households purchased solar hot water systems in preference to heat pump or gas systems, an additional 120,000 tonnes of CO₂-e could be saved each year.

Compact fluorescent lights (CFLs) provide another cost-effective option for reducing greenhouse gas emissions. An average house uses 12 incandescent light bulbs. If these were replaced with CFLs, each household would save \$500 over a five-year period (Figure 6).

If 15 per cent of Queensland households replaced 12 incandescent bulbs with CFLs, an additional 160,000 tonnes of CO₂-e could be saved each year.

Figure 6

Comparison of lighting costs for incandescent and compact fluorescent lights.²²



Many electrical appliances waste power when they are not being used. Power used in standby mode can account for as much as 10 per cent of household energy use. By turning appliances such as TVs, computers and home theatres off at the main switch or the power point rather than with a remote control, householders can achieve significant savings.

If 15 per cent of Queensland households turned off all appliances when not in use, 100,000 tonnes of CO₂-e could be saved each year.

The operation of high-energy-using appliances, such as swimming pool pumps, can be managed more closely to achieve savings.

If 15 per cent of Queensland households reduced their pool pump running time by one hour per day, 70,000 tonnes of CO₂-e could be saved each year.

How appliances are used can have a greater impact on energy use than the efficiency of the appliances themselves. For example, in purchasing appliances with high star ratings householders can reduce energy use in washing and drying clothes. Even greater savings can be achieved by washing in cold water rather than hot water and hanging out clothes to dry rather than using a dryer.

If 15 per cent of Queensland households reduced hot water washing by one load per week, 20,000 tonnes of CO₂-e could be saved each year.

If 15 per cent of Queensland households hung out one load of washing each week on a clothes line instead of using a dryer, a further 50,000 tonnes of CO₂-e could be saved each year.

Greenhouse gas emissions from electricity can be reduced to almost zero through the use of renewable energy. The most affordable way for households to use renewable energy is through GreenPower. This is a government accredited program that provides guarantees for consumer purchases of renewable energy through their electricity provider. An average householder could purchase 100 per cent of their electricity from renewable energy for prices ranging from \$4.40 per week to \$8.55 per week, depending on the supplier.²³

If 15 per cent of Queensland households purchased 100 per cent GreenPower, 2.7 million tonnes of CO₂-e could be saved each year.

Queenslanders can achieve the goal of zero carbon emissions for their house energy use at little cost by combining energy efficiency with GreenPower. For an investment of less than \$50, a household could install CFLs and, with a few changes to how they use energy, could save enough money on their energy bills to cover the cost of purchasing 100 per cent GreenPower.²⁴

A stronger commitment to reducing greenhouse gas emissions, through the use of solar hot water, installation of insulation and reducing motor vehicle use, would lead to even greater energy and greenhouse savings and, even after GreenPower purchases, could cut household bills by several hundred dollars.²⁵

Table 3**Cumulative greenhouse gas emission reductions by changes at the household level
— sample projections**

Annual tonnes of CO ₂ -e reduction Queensland (million) ²⁶				
Household and lifestyle change <i>1.6 million households = 100%</i>	Adopted by 15% of Qld households	Adopted by 35% of Qld households	Adopted by 50% of Qld households	Adopted by 85% of Qld households
Run the dishwasher one less time a week	0.01	0.03	0.04	0.06
Increase recycled portion of household waste by 10%	0.02	0.04	0.06	0.09
Eliminate one weekly hot water clothes wash	0.02	0.04	0.05	0.09
Raise air conditioner temperature by one degree Celcius in summer	0.05	0.12	0.17	0.29
Hang one load of washing on line each week instead of using dryer	0.05	0.12	0.17	0.3
Reduce pool pump running time by one hour per day	0.07	0.16	0.23	0.39
Turn off standby power	0.1	0.24	0.34	0.58
Install insulation in ceiling cavity	0.14	0.33	0.48	0.81
Replace 12 incandescent lights with CFLs	0.16	0.38	0.54	0.92
Reduce motor vehicle use by 20%	0.21	0.48	0.69	1.18
Replace electric hot water system with greenhouse efficient system	0.59	1.37	1.96	3.33
Purchase 100% GreenPower	2.72	6.34	9.06	15.4
Total	4.14	9.65	13.79	23.45

The calculations and projections in Table 3 are consistent with the household carbon reduction tips promoted on the ClimateSmart Queensland website²⁷ and in a book to be released in Australia entitled *Low Carbon Diet: a 30 day program to lose 2000 kilos*.²⁸ This manual provides a range of suggestions on how households and individuals can reduce their carbon impact by as much as 20 per cent in just one month.

Issues

Current public knowledge and commitment to climate change in Queensland

A range of resources is currently available to Queensland householders to support them in making voluntary household and lifestyle changes to reduce their emissions. These resources include financial support and an extensive range of information and home auditing tools provided by all levels of government. Many non-government organisations also provide information and behaviour-change tools specifically tailored for household level action.²⁹

There have been significant levels of investment by both the state and federal governments in providing households with financial support and incentives to retrofit appliances for improved energy and water efficiency, and to improve their ability to meet their own water and energy needs (e.g. through rainwater tanks and photovoltaic systems).

For example, the Queensland Government will invest up to \$60 million in the recently announced ClimateSmart Home Service for the installation of energy-saving and monitoring devices in Queensland homes connected to the ENERGEX and Ergon energy grids. An additional \$7.35 million is available to homes in remote areas of the state through the ClimateSmart Homes rebate program. Over \$230 million has been invested in assisting households to improve water efficiencies through the Home WaterWise Rebate Scheme and Home WaterWise Service.

These resources have been provided in response to the rapid growth in community concern about global warming. During Earth Hour on 29 March this year, thousands of Queenslanders demonstrated their belief that ordinary people can make a difference to greenhouse gas emissions simply by switching off their lights for an hour.

Polling by AMR Interactive for the World Wildlife Fund showed that 58 per cent of Australian adults in participating capital cities took part in the lights-off campaign. Respondents who participated in Earth Hour evidently did so in a number of ways, including turning off the lights at home (56 per cent), and turning off some household appliances (46 per cent).³⁰

In March 2008 the CSIRO's Energy Transformed Flagship reported on a survey of more than 2000 households in Queensland, Victoria, New South Wales and South Australia. The survey revealed that more than 75 per cent of Australians want to reduce energy consumption in the home and implement a rapid response to climate change. According to the CSIRO, younger, more educated, higher income householders were willing to integrate technology into their home to manage their own household energy requirements.³¹

The Australian pattern is consistent with international data. A 2007 global survey of 7500 consumers by Accenture 'shows that consumers across the globe are not just aware of global warming as an issue, but are adopting a new mindset that will change the basis on which they make buying decisions'.³²

In Queensland, research conducted in 2006 by AC Nielsen on behalf of the Environmental Protection Agency (EPA) found 83 per cent of Queenslanders were concerned about climate change and its impacts. However, over a third of the community (34 per cent) lacked detailed knowledge of what to do to reduce greenhouse emissions or deal with climate change.³³

EPA-commissioned research over the past two years has confirmed that Queenslanders want to make a difference, and they want practical and convenient tips for reducing the environmental impact of their lifestyles.

This research indicated a strong public expectation that the Queensland Government would be involved in addressing the issue of climate change. This research also found that 84 per cent of Queenslanders believed that the government should ensure that people make changes to avoid climate change impacts.

Other key items of feedback from the survey suggested that:

- communication should be focused on practical tips for promoting low carbon behaviours
- information should be locally focused to increase community engagement and increase interest in the opportunities of environmentally friendly behaviour
- in order to secure sustained change, behavioural change strategies should be convenient, cost-competitive and effective
- people would like to see the Queensland Government assisting community groups with more information.³⁴

If households were to adopt a range of affordable low carbon behaviours, we could cut our state's greenhouse gas emissions substantially. The more households that make changes, the greater the reduction in greenhouse emissions will be—from 4 million tonnes a year (15 per cent of households) to 22 million tonnes (85 per cent of households).³⁵

Lessons from ClimateSmart Living Stage 1

In June 2007 the Queensland Government released *ClimateSmart 2050*, a climate change strategy that included a specific community awareness initiative, the ClimateSmart Living campaign³⁶, a whole-of-government program to:

- raise the profile of climate-smart living activities within the community
- ensure that consistent messages were communicated to households
- promote integrated thinking on sustainable housing.

The ClimateSmart Living campaign was based on the assumption that the government would use strategies and tools to engage Queenslanders and encourage them to adopt low carbon behaviours.

These strategies and tools included:

- information strategies to create awareness
- educational initiatives that promote understanding of the issues
- empowerment initiatives to secure cooperation and commitment
- partnerships with the community and industry to build behavioural change and reduce carbon footprints.

It was recognised that an integrated and comprehensive approach was required, so that as each level of the climate change strategy reached the limit of its cost-benefit utility, it generated impetus for the next level.

Exploring the concept 'It's the little things we do that make the world of difference', the campaign focused on individual actions and how the cumulative effect of such actions could achieve a significant change at the broader state level.

Throughout late 2007 and early 2008, the EPA commissioned AC Nielsen to survey Queenslanders, checking their response to the ClimateSmart Living campaign to assess its impact on public attitudes and behaviour. Findings point to the campaign being successful in broadcasting information about the household and lifestyle changes people can make to reduce carbon emissions. Research also revealed the limitations of trying to change behaviour simply by running an information or education campaign.

With varying frequency and commitment, many Queenslanders are already doing a range of things to reduce their environmental impact. According to the AC Nielsen survey:

- 92 per cent turn off unnecessary lights
- 79 per cent re-use or recycle something instead of throwing it away
- 74 per cent take shorter than average showers
- 65 per cent have replaced incandescent light bulbs with compact fluorescent bulbs
- 61 per cent check or have adjusted the air pressure of their car tyres
- 60 per cent have reduced their air conditioner or heater use
- 59 per cent avoid using plastic bags or packaging
- 59 per cent turn appliances off at the wall
- 51 per cent have turned down their air conditioner or heater temperature
- 43 per cent have encouraged someone else to take one or more of these actions
- 42 per cent check the temperature in their fridge
- 41 per cent have bought a more energy-efficient version of an appliance
- 36 per cent take public transport, walk or cycle instead of using the car
- 29 per cent buy ethanol blended fuel.

The findings point to the opportunity for continued government leadership in the field, with many Queenslanders now better disposed to making household and lifestyle changes to reduce their carbon footprint.

Key findings from stage 1 of the ClimateSmart Living campaign (September 2007–May 2008)³⁷:

1. People are responding to information about climate change and to issues such as drought, but the public knowledge of the climate change issue is not yet well developed.

- Fewer Queenslanders (81 per cent, down from 90 per cent in 2006) require evidence that climate change is happening.
- Queenslanders are becoming increasingly concerned about climate change and its impacts—61 per cent are 'somewhat more concerned' about climate change and its impacts than they were a year ago; and 28 per cent are 'much more concerned' about climate change and its impacts than they were a year ago.
- Most Queenslanders believe they know about climate change—73 per cent consider themselves as 'somewhat knowledgeable' about climate change; only 10 per cent consider themselves 'very knowledgeable'.
- Knowledge of climate change issues is growing—73 per cent of Queenslanders consider their knowledge of climate change issues 'somewhat better' than a year ago; and 24 per cent consider their knowledge to be 'much better' than a year ago.
- Despite this increased level of knowledge, Queenslanders remain misinformed—76 per cent of Queenslanders still incorrectly believe that the hole in the ozone layer has a very high or high impact on climate change.

2. People want government to help with technical advice, subsidies, rewards and recognition.

- Well over 90 per cent of Queenslanders still want help when determining what information about climate change is true and what is false.
- More than three quarters of Queenslanders (81 per cent) see the EPA as a reliable source of information, second only to scientists (87 per cent).
- 96 per cent believe that government subsidies for environmentally friendly technologies and appliances would assist.

- 94 per cent believe that rewards from government or councils for behaving in an environmentally friendly way would help.

3. Mass media and the internet remain essential in community-focused campaigns.

Television remains the main medium through which Queenslanders obtain information on climate change and environmental issues—42 per cent rate television as their main source, with the internet coming in second at 17 per cent and newspapers third at 15 per cent.

4. Community engagement strategies to secure actual change and participation have to do more than offer information.

Just knowing about climate change and what to do to reduce greenhouse gas emissions or energy and water consumption in itself does not result in changed behaviour. AC Nielsen's research follow-up to the ClimateSmart Living information campaign found that 22 per cent of Queenslanders still wanted more information to justify any action.

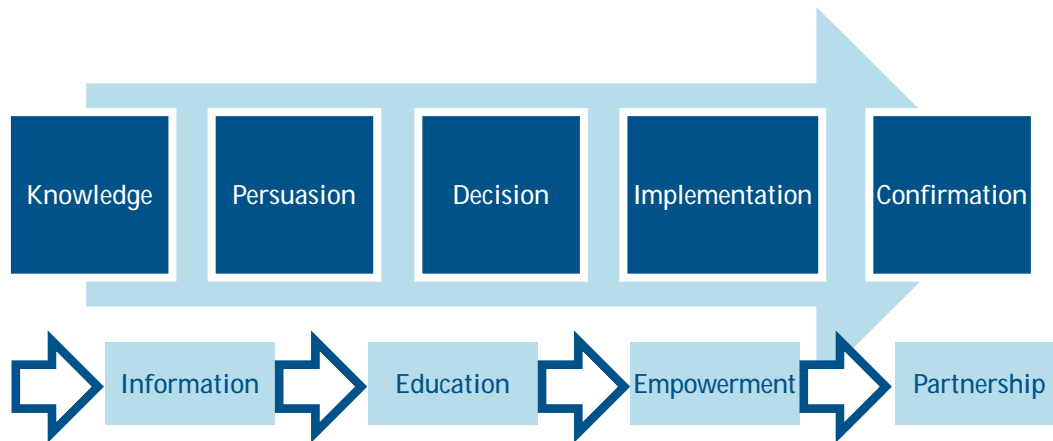
5. People know more about relative costs but have a fairly tight margin on how much extra they will spend to be 'green'.

The number of Queenslanders who believe that environmentally friendly actions are too expensive has nearly halved over the past year from 35 per cent to 19 per cent. However, there remains quite limited elasticity in how Queenslanders express environmental concerns through consumer choices. In survey work undertaken by the CSIRO for the Centre for Low Emissions Technology in 2005 and 2006, two-thirds of Queenslanders indicated they would be willing to pay up to five per cent more for their electricity if it reduced the effects of climate change; just over half would pay up to 10 per cent; and just under a quarter would be willing to pay as much as 20 per cent.³⁸

6. The overwhelming instinct when dealing with information by itself is to rationalise not to change.

When considering making changes, many people default to the status quo (that is doing nothing) because they conclude that individual actions do not make any difference in addressing a global issue of the magnitude of climate change. People look to the United States or China, not to themselves as consumers, to make the difference. Emerging scientific advice on the need to impose higher, longer term reductions targets may contribute to this widespread view.

Figure 7

The 'change' decision-making process and the components of social marketing³⁹

7. Voluntary behavioural changes have to be seen to be feasible and occur in a lifestyle context that is inclined to give them a chance of being adopted.

The shape and layout of our physical infrastructure, as reflected in regional planning and urban design, can constrain the lifestyle options to be considered by a community. ClimateSmart Living research this year shows that, despite record petrol prices, 52 per cent of Queenslanders consider their motor vehicle more essential than ever.

8. An individual's decision about new information or a proposed change is not instantaneous, but is a process made over time involving a range of decisions and actions.

Community response to the ClimateSmart Living 'It's the little things' campaign confirmed that for behavioural change to occur through an engagement strategy, program sponsors will need to be involved at the various stages of the 'change' decision-making process being promoted (Figure 7). An effective strategy will account for vastly different states of knowledge, different motivations and attitudes. It will also manage conflicting messages and provide reassurance to people making the changes.

The degree to which the changes can be made easy is particularly important in persuading people to change. In this respect, changes most likely to be readily adopted are those that have clear advantages for the target group, align with their values or previous experience, can be trialled, are not complex, and are clearly visible in how they operate and deliver benefit.⁴⁰

Stage 1 of the ClimateSmart Living campaign has confirmed these insights and paved the way for a

more comprehensive community-based action strategy to engage people in personal lifestyle reductions of greenhouse gas emissions. By promoting positive motivational strategies, the government can encourage the broader community to voluntarily reduce emissions in the household.

A further stage of the ClimateSmart Living program design could include the three main types of behavioural change programs⁴¹:

- intensive, individually focused programs involving one-on-one activity
- group-level programs involving discrete networks—geographic, social or cultural
- community-level strategies supported by mass media.

Program attributes should include both information and incentives. Information-based initiatives include written and web-based information products, training and information forums, demonstrations, case studies, marketing cues and publicity.

While powerful analogies are often necessary to enable the public to make sense of the issues of climate change, sociologists warn that the key cultural drivers for change are still emerging. For example, scare campaigns are unlikely to have any positive effect, particularly as people tend to 'turn off' when doom and gloom is presented as the essential proposition.⁴² By contrast, motivational material, such as rewards and recognition initiatives, alignment with rebate and subsidy programs being offered, commitment catalysts such as online or program pledges, meeting templates, and involvement of respected members of the community, will have a positive effect on people.

Using community-based social marketing to encourage behavioural change

A comprehensive engagement of Queensland householders is most likely to succeed if community-based social marketing strategies are used.⁴³ The effectiveness of a climate change information campaign is best confirmed in the actual extent of public engagement and participation with the issues. To achieve a higher level of public commitment, a participatory approach is required. Social marketing approaches that use personal and social networks afford the opportunity of support and reinforcement for the changes being promoted. Longstanding research points to behavioural change being more fundamental when it occurs as a shared learning experience with people working together and reinforcing each other.⁴⁴

The success of change programs involving social networks and discrete clusters such as workplaces, neighbourhood groups, and sport or recreation groups is confirmed in the work of Professor Doug McKenzie Mohr, a leading Canadian authority on promoting sustainability through community-based social marketing. He points to the lessons of social psychology research, which indicates that the most effective initiatives to promote behaviour change go beyond the media advertising to community projects involving 'direct contact with people'.⁴⁵

McKenzie Mohr concluded that programs that rely heavily or exclusively on media advertising can be effective in creating public awareness and understanding of issues related to sustainability, but are limited in their ability to foster behavioural change.

This perspective is also confirmed by the experience of another leading social behavioural change expert, David Gershon, founder of the Empowerment Institute in the United States and author of *Low Carbon Diet: a 30 day program to lose 5000 pounds*. This book has been circulated by Al Gore's Climate Group as a useful follow-up to the awareness raising film *An Inconvenient Truth*.

In 2006 Gershon produced an illustrated workbook that outlined climate friendly actions for householders and had been piloted earlier in Portland, Oregon. The publication built on community-based environmental behavioural programs developed over three decades, involving close to 300,000 people in 17 countries. It walked participants through every step of the change process, from calculating their personal current CO₂ footprint, to tracking progress and promoting the process in wider social networks. Social networking and participant-formed support groups are key attributes of the low carbon diet program.⁴⁶

The usefulness of social-based marketing for changing household carbon footprints has been tested in Australia. In 2001 the Australian Greenhouse Office provided \$800,000 for a Cool Communities program, conducted in partnership with a range of environmental organisations, to focus on household greenhouse gas reductions. During its three-year life, the program spawned a diverse set of initiatives in 22 selected communities representing a spectrum of socioeconomic, geographic and cultural demographics.

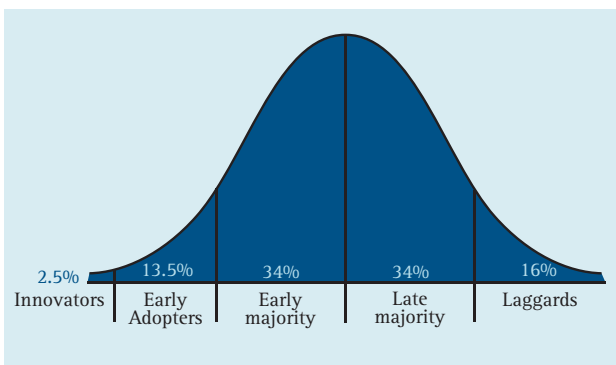
As a household behaviour change program operating at a national level with multiple communities, Cool Communities was a pioneering world first. The program involved paid facilitators, local action plans based on participating organisations, and recognition for achievements. The Cool Communities program demonstrated how social marketing could work with community engagement in greenhouse issues. However, limited investment and lack of strategic direction meant that the program failed to achieve the profile and critical mass required for successful diffusion of the behaviours being promoted. Cool Communities reinforced the notion that community-based marketing works best when delivered on the ground by organisations and levels of government close to the community.

Targeting a voluntary household low carbon program for maximum effectiveness

Sound social marketing recognises that not all members of the community view issues similarly, are equally motivated, or react in the same way to equivalent information. Socioeconomic status, gender, age, regional and other demographic variables will be important in defining the range of community perspectives that are important to any issue. When it comes to explaining change propensity in populations, most marketing studies point to a standard bell curve distribution when depicting the community's perception, communication and adoption of any innovation (Figure 8).

Figure 8

Standard community range adoption of innovation⁴⁷



There will be change agents and early adopters at the front end, comprising around 15 per cent of the population. These are the people now driving energy-efficient vehicles, making considered energy-efficient purchases and seeking to install solar energy at home. The next group comprises about 35 per cent of the population. They are sometimes called the 'pragmatists' – people who pick up on the experience of the early adopters and who, for example, have installed CFLs and purchase ethanol mixed fuel.

The next group also comprises about 35 per cent of the population. These people take their time with change, sometimes reluctantly adopting what seem to early adopters to be long proven ideas and practices. Finally, about 15 per cent of the population lag on any change index, requiring regulation or the coercion of the law to make behavioural adjustments.

The recent general experience of the south-east Queensland community in water conservation is consistent with this distribution of populations according to their propensity for change or innovation. A similar distribution is expected to be reflected at the state level in any broader program to secure voluntary reductions in household carbon footprints. It is important, therefore, that any government campaign take account of innovation propensities among different segments of the community in different parts of the state.

What should be included in a community engagement strategy aimed at changing Queensland household and lifestyle carbon impacts?

A community engagement program aimed at achieving greenhouse gas reductions in Queensland through voluntary household changes should have goals that reflect both the environmental imperative of reduced carbon emissions and the actual feasibility of overcoming barriers to change using voluntary measures.

To be fully effective, a government-sponsored, community-based social marketing program to promote affordable early reductions in household and personal lifestyle greenhouse gas emissions should:

- include measurable program goals such as tonnes of greenhouse gas emissions to be reduced, proportion of the population to be involved
- ensure the key partners necessary to build program critical mass are on board at the outset and are involved in implementation
- have a clear view of the target groups to be progressively involved to ensure the diffusion of the desired behaviours
- define the community as discrete populations according to established emissions behaviours (e.g. high-to-low energy users) and also by their propensity to adopt the kind of changes being promoted (i.e. early adopters to laggards)
- identify barriers to low carbon behaviours among different groups
- use behaviour change tools, particularly tools that enable active participation by households and individuals

- pilot specific strategies with smaller groups to determine their usefulness
- extend proven cost-effective strategies to the broader community
- evaluate program impacts.

Indicative targets for a voluntary household and lifestyle engagement campaign might include:

- a 20 per cent reduction in household greenhouse gas emissions over two years, as reflected in household electricity expenditures—delivers annual savings of 3.6 million tonnes of CO₂-e⁴⁸
- a 10 per cent reduction in non-commercial motor vehicle emissions over two years, as reflected in reduced household consumption of motor spirit and LPG—delivers annual savings of 1.4 million tonnes of CO₂-e.

If the greenhouse and financial dividends to the community apparent in the McKinsey cost abatement curve (Figure 3) were realised in Queensland, the initial focus of government action would be on the areas of least cost for most impact. This suggests a campaign emphasis on reducing the household and lifestyle carbon footprint. EPA analysis also points to a hierarchy of escalating benefits and costs accruing from a series of actions:

1. running the dishwasher one less time a week
2. eliminating one weekly hot water clothes wash
3. recycling an additional 10 per cent of household waste each week
4. setting air conditioner thermostats one degree higher in summer
5. hanging one load of washing on the line instead of using a dryer
6. reducing swimming pool pump running time by one hour per day
7. turning off stand-by power
8. installing insulation in the ceiling
9. replacing 12 incandescent lights with CFLs
10. reducing motor vehicle use by 20 per cent
11. replacing an electric hot water system with a greenhouse efficient system
12. purchasing 100 per cent GreenPower.

The first seven suggested actions do not involve actual expense on the part of householders.

By adopting affordable low carbon behaviours, Queensland households have the potential to cut several million tonnes of greenhouse gas emissions a year. This, along with the urgency of climate change, makes a compelling case for a major Queensland Government community engagement strategy to secure low carbon behaviours. The challenge is to engage as many people as possible by offering opportunities to make a positive environmental difference while, in many cases, saving money in the longer term.

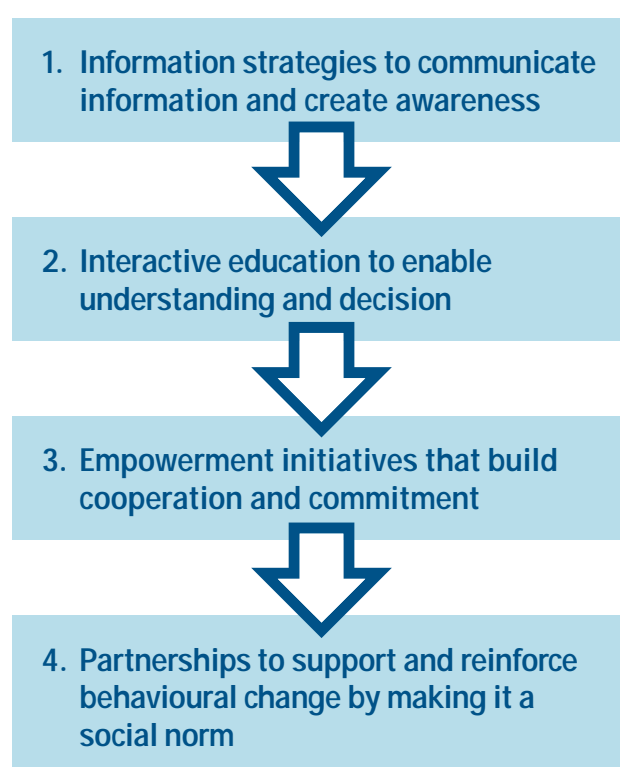
However, each proposed lifestyle change will come with perceived barriers and benefits. PricewaterhouseCoopers conducted workshops with the EPA and public and private sector stakeholders. A range of potential intervention points was identified for engaging the community in decisions about climate smart living. These included:

- influencing consumer purchasing decisions at the point of sale
- working in partnerships with industries to provide retail-level information
- using media campaigns to educate householders about sustainable living
- providing local governments with information and materials to design rebate schemes
- establishing accredited climate smart living advisory centres across the state
- providing rebates for climate smart technologies and appliances.⁴⁹

To accelerate the adoption of lower emission-intensive products and behaviours, the Queensland Government has developed a range of community engagement options through four main channels. Behavioural change for lower carbon footprints is more likely to occur through a community engagement strategy that delivers outputs in all four channels simultaneously—information, education, empowerment and partnership.

Figure 9

Community engagement channels for securing voluntary low carbon household behaviour change



Each approach builds on the others, and each level employs different resources and methods to achieve more complex, enduring and effective behavioural changes. Empowerment and partnership strategies are less likely to be prescriptive, enabling community members to find their own solutions and contribute their own ideas, knowledge and capacities to achieving the program goals.⁵⁰

Besides taking into account the general maxims of community-based social marketing research from the ClimateSmart Living campaign, Stage 1 points to seven key insights essential in framing a recommended strategy for voluntary initiatives to reduce the carbon footprint of Queensland households. These are:

1. people are responding to information about climate change but the public knowledge is not yet well developed nor technically informed
2. people want government to help with technical advice, subsidies, rewards and recognition
3. mass media and the internet remain essential in community-focused campaigns
4. community engagement strategies to secure actual change and participation have to do more than offer information
5. people know more about relative costs but have a fairly tight margin on how much extra they will spend to be 'green'
6. people, when dealing with information alone, may rationalise their current behaviour rather than change
7. voluntary behavioural changes have to be seen to be feasible and to occur in a lifestyle context.

Attachments

Attachment 1

Estimates of reduced greenhouse gas emission brought about by changes at the household and personal lifestyle level

Attachment 2

Support available for Queenslanders who make voluntary household and lifestyle changes to reduce emissions

Attachment 1

Estimates of reduced greenhouse gas emission brought about by changes at the household and personal lifestyle level

Emissions factor

Every one kilowatt hour (kWh) of electricity used produces 1.04 kg of CO₂-e.⁵¹

Air conditioning

A 2007 survey found that use of air conditioners in Queensland households increased from 61.9 per cent in 2006 to 63.6 per cent in 2007.⁵² The more detailed 2006 survey found 30.1 per cent of households set air conditioners at 24 degrees Celsius, 32 per cent set them below 24 degrees Celsius and 16.2 per cent set them higher than 24 degrees Celsius. The 2006 survey also found that around 57 per cent of households had one air conditioner. Neither survey provided information on how many months of the year air conditioners are used. However, the 2006 survey provided detailed information on use patterns by time of day during summer. This suggested normal use of air conditioning varies according to temperature and when people are at home.

Average household air conditioner energy use is estimated to be 2709 kWh per year.⁵³ Raising the thermostat setting by one degree Celsius could save between 135 kWh and 271 kWh per year, or between five and 10 per cent.⁵⁴ This equates to an average reduction in greenhouse gas emissions of around 211 kilograms of CO₂-e emissions each year per house.

Although the greenhouse savings from turning up air conditioning thermostats are modest, this measure can have a much more important impact on reducing electricity network costs, because air conditioners have a disproportionate impact on peak electricity demand. Unlike lights, hot water systems or refrigerators, air conditioners are not used throughout the entire year. They are used largely in summer, and many households only use them on very hot days.

Only a very small proportion of households (6.4 per cent) run their air conditioners constantly during summer. The use of air conditioning increased significantly on the hottest summer days, and around 30 per cent of households stated they never used air conditioning during normal summer days.

Clothes drying

An assessment of 205 clothes dryers listed on the Australian Government's energy labelling website⁵⁵ found the average electricity use to be 210 kWh each year for 52 uses. Replacing the use of clothes dryers once a week with a clothes line could save 210 kWh per year and reduce greenhouse gas emissions by 218 kilograms of CO₂-e per year.

Clothes washing machines

The Australian Government's energy labelling website⁵⁶ lists energy use for 294 washing machines. It provides data for both hot and cold washing performance for 133 of the machines, and the difference in electricity use for hot and cold washing was calculated for these machines. The average difference was 453 kWh for 365 uses.

This equates to 65 kWh for 52 uses. Replacing one hot wash per week with a cold wash would reduce greenhouse gas emissions by 67 kilograms of CO₂-e per year.

Dishwashers

An assessment of 457 dishwashers listed on the Australian Government's energy labelling website⁵⁷ found the average electricity use to be 321 kWh each year for 365 uses. This equates to an average energy use of 0.88 kWh per wash. Reducing use by one wash per week saves 46 kWh of electricity per year, and reduces greenhouse gas emissions by 48 kilograms of CO₂-e per year.

GreenPower

Average household electricity use was 10,887 kWh in 2005–06.⁵⁸ This equates to greenhouse gas emissions of 11,322 kilograms per year. In the absence of an emissions factor for GreenPower, zero emissions are assumed. An average household using 100 per cent GreenPower is estimated to save 11,322 kilograms of CO₂-e per year.

Hot water

Average greenhouse gas emissions for hot water systems are based on Zone 2 (south-east Queensland) data obtained from the Regulatory Impact Statement for the Queensland Sustainable Housing Code. Emissions are:

Hot water system	Average annual greenhouse gas emissions (CO ₂ -e)
Electric	3424
5 star/Instantaneous gas	976
Heat pump	809
Solar (electric boost)	480

Replacing an electric hot water system with one of the more greenhouse-efficient systems reduces greenhouse gas emissions in each house by an average of 2448 kilograms of CO₂-e for gas, 2615 kilograms of CO₂-e for heat pump, and 2944 kilograms of CO₂-e for solar.

Insulation

An analysis conducted for the Insulation Council of Australia and New Zealand suggests 62 per cent of Queensland homes are uninsulated. The cost of installing ceiling insulation for an average household is estimated to be \$816 if installed by the home owner, or \$1200 if installed by a contractor.

The assessment assumed use of air conditioning in 80 per cent of households and found an average saving of \$89 per household per year.⁵⁹ This equates to a reduction in electricity use of 574 kWh per year and a CO₂-e saving of 597 kilograms per year.

Lighting

Lighting accounts for eight per cent of household electricity use, and average household electricity use is 10,887 kWh per year.⁶⁰ Based on this data, an average household uses 871 kWh per year for lighting.

An average household uses 12 lights.⁶¹ CFLs use 75 per cent less energy than equivalent incandescent light bulbs. Therefore, 653 kWh is saved by replacing 12 incandescent lights with CFLs. This equates to 679 kilograms of CO₂-e emissions in an average household.

Motor vehicle use

Average vehicle fuel economy is estimated to be around 12 litres per 100 kilometres.⁶² This produces 4320 kilograms of CO₂-e per vehicle each year.⁶³ A 20 per cent reduction in vehicle use could reduce greenhouse gas emissions by 864 kilograms of CO₂-e per vehicle each year.

Pool pump

A typical one horsepower swimming pool pump uses 0.75 kW of electricity. Reducing the use of the pump by one hour per day saves 274 kWh of electricity each year. This equates to a CO₂-e saving of 285 kilograms per year.

Recycled household waste

Fourteen per cent (207,000 tonnes) of domestic waste was recycled in Queensland in 2005–06⁶⁴, saving about 134,000 tonnes of CO₂-e.⁶⁵ There were 1,391,635 households in Queensland according to the 2006 census.⁶⁶ By dividing total waste recycled by the number of households, waste recycling is estimated to have reduced greenhouse gas emissions by 96.3 kilograms of CO₂-e per household. Increasing the recycled component of household waste from 14 per cent to 24 per cent is estimated to save an additional 68.8 kilograms of CO₂-e per household.

Stand-by power

The average house uses 408 kWh for stand-by power.⁶⁷ This equates to 424 kilograms of CO₂-e emissions in an average household per year. Turning appliances off at the wall will reduce these emissions.

A sample plan for a low-cost 'zero-carbon' household (electricity component)

Original household annual electricity use = 10,887 kWh

Original household annual greenhouse gas emissions (from stationary energy) = 11.3 tonnes CO₂-e

Actions to reduce energy use	Electricity saved (kWh pa)	Money saved (\$ pa)
Raise air conditioner thermostat by one degree Celsius in summer	203*	31.37
Hang one load of washing on line instead of using dryer	210	32.46
Eliminate one weekly hot water clothes wash	65	10.05
Run the dishwasher one less time a week	46	7.11
Replace 12 incandescent lights with CFLs	653	100.92
Reduce pool pump running time by one hour per day	274	42.35
Turn off stand-by power	408	63.06
Total energy savings	1859	\$287.32

* Average of assumed saving

Household yearly electricity use after efficiency measures = 9028 kWh

Reductions in yearly household greenhouse gas emissions from energy savings = 1.9 tonnes

Cost of 100% GreenPower at 3.3 c/kWh⁶⁸ = \$297.92

Reductions in yearly household greenhouse gas emissions from GreenPower = 9.4 tonnes

Total yearly reductions in household greenhouse gas emissions = 11.3 tonnes CO₂-e

Net yearly cost of running a 'zero carbon' house = \$10.62

Attachment 2

Support available for Queenslanders to make voluntary household and lifestyle changes to reduce emissions

A range of resources is currently available to Queensland householders to support them in making voluntary household and lifestyle changes to reduce their greenhouse gas emissions. The following tables provide some examples of the type of support provided by various levels of government, and by some non-government organisations.

1. Queensland Government

Examples of Queensland Government information, education and engagement strategies aimed at Queensland households

Responsible agency	Initiative	Description	Geographic coverage
Environmental Protection Agency	ClimateSmart Living	ClimateSmart Living (CSL) is a \$2.5 million education campaign aimed at raising community awareness of climate change and highlighting actions that can be taken at a household level. CSL provides householders with a number of web-based tools (including emissions calculators) and information. It has included media campaigns aimed at specific everyday actions to reduce emissions.	Statewide
Department of Natural Resources and Water Queensland Water Commission (with local councils)	WaterWise/ Target 140	While focused on water conservation, these initiatives also achieve greenhouse gas abatement outcomes (e.g. through decreased use of energy for water heating, and reduced use of appliances such as clothes washing machines). WaterWise information resources include advertisements, web-based fact sheets, and educational programs for schools. Target 140 is a specific campaign focusing on south-east Queensland water catchments.	Statewide for information resources Target 140—south-east Queensland local government areas
Department of Mines and Energy Environmental Protection Agency	EnergyWise Queensland	The EnergyWise consumer program seeks to improve domestic energy efficiency through home auditing of energy use, education campaigns and practical consumer advice. It includes web-based information, a range of brochures and fact sheets, and an Energy Advisory Service that provides impartial, free advice on energy efficiency and renewable energy.	Statewide

Responsible agency	Initiative	Description	Geographic coverage
Queensland Transport	TravelSmart programs	<p>TravelSmart Communities programs work directly with households and local government to increase the use of environmentally friendly transport across the whole community.</p> <p>The programs have used a range of education and engagement techniques including tailored information and rewards for customers who respond to an initial call to action, practical assistance with journey planning, and advice on bike repairs and maintenance.</p> <p>The TravelSmart Schools program encourages school communities to consider environmentally friendly transport options as an alternative to motor vehicle use.</p>	Specific communities across Queensland – with a focus on communities experiencing traffic congestion
Department of Public Works	Smart Housing	The Smart Housing program provides web-based information to help consumers improve the energy performance and thermal comfort of their homes, including advice on energy-efficient housing design and building principles.	Statewide
Environmental Protection Agency	Solar Schools	The Solar Schools initiative has seen the installation of photovoltaic (PV) power systems at numerous educational facilities throughout Queensland. The PV system provides a valuable education resource to raise awareness of green energy technologies, as well as reducing overall electricity use costs. Students have access to the PV array and associated monitoring equipment, along with a wide range of computer-based educational support material.	Selected school sites in Queensland

In addition, the Queensland Government has funded a number of schemes aimed at providing material assistance to householders to reduce their greenhouse gas emissions through renewable energy generation and the installation of energy-efficient appliances.

Examples of financial assistance provided by Queensland Government to householders to support emissions reductions

Responsible agency	Initiative	Description	Geographic coverage
Environmental Protection Agency	ClimateSmart Home Service	The recently announced ClimateSmart Home Service will install energy-saving devices (such as CFLs and energy meters), provide customers with behaviour change tools, and offer detailed expert face-to-face advice to householders on ways to reduce water and energy use.	Statewide
Department of Mines and Energy	Solar Bonus Scheme	The Solar Bonus Scheme will pay domestic and other small energy customers for the surplus electricity generated from rooftop solar PV systems that is exported to the Queensland grid.	Statewide—homes that are connected to the Queensland electricity grid
Department of Mines and Energy	ClimateSmart Homes rebate program	The ClimateSmart Homes rebate program will provide financial incentives to households and small businesses located in isolated and remote areas of the state to undertake energy conservation measures. The program will provide rebates for installing greenhouse friendly hot water systems, replacing damaged refrigerator seals, decommissioning second energy-inefficient refrigerators, and installing insulation and CFLs.	Isolated and remote communities that will not get access to full retail competition for their electricity
Department of Mines and Energy	Residential Gas Installation Rebate Scheme	Under the Residential Gas Installation Rebate Scheme, rebates of up to \$500 are paid to householders (via arrangements with participating gas retailers) who install gas appliances in existing homes.	Statewide—for owners of detached houses, town houses, terrace houses and villa units that receive their gas supply through a participating gas retailer
Environmental Protection Agency	Solar Homes Program	The Queensland Government is underwriting the bulk purchase of 1000 solar power systems for 'on sale' to Queensland householders at a reduced cost. Householders have been selected through a ballot process.	South-east Queensland and the regional council areas of Cairns, Rockhampton, Toowoomba and Fraser Coast

2. Australian Government

The Australian Government provides assistance to householders to reduce their emissions in a number of ways, and some examples are listed below. The Budget announcements on 13 May 2008 included a number of new and additional initiatives, including the provision of low-interest loans of up to \$10,000 to assist families to invest in water and energy savings and landlords to install insulation in rental homes. Another initiative is the establishment of a one-stop-green-shop to link Australians with programs and financial assistance made available by all levels of government.

Australian Government community engagement, education and information initiatives

Responsible agency	Initiative	Description	Geographic coverage
Department of the Environment, Water, Heritage and the Arts	Your Home	Your Home is a suite of consumer and technical guide materials and tools developed to encourage the design, construction or renovation of homes to be comfortable, healthy and more environmentally sustainable. Your Home information products include fact sheets, an interactive DVD, a home buyers guide and magazine.	Nationwide Resources are also available for order or free download via the internet
Department of the Environment, Water, Heritage and the Arts	Global Warming Cool It	The Global Warming Cool It initiative provides a guide to reducing energy costs and greenhouse gases in the home. The guide includes a greenhouse gas emission calculator for individual household energy, transport and waste.	Nationwide
Department of the Environment, Water, Heritage and the Arts	Green Vehicle Guide	The Green Vehicle Guide provides information about the environmental performance of new light vehicles sold in Australia. The guide helps Australians to choose a cleaner car. Information provided for each vehicle helps car buyers compare the level of emissions of different vehicles and, consequently, their impact on the environment.	Nationwide
Department of the Environment, Water, Heritage and the Arts	Phase-out of inefficient light bulbs	Working with states and territories, the Australian Government will gradually phase out all inefficient light bulbs, aiming for full enforcement of new lighting standards by 2009–10. The Department of the Environment, Water, Heritage and the Arts has provided a list of FAQs on its website for individuals seeking further information.	Nationwide

Australian Government – material assistance

Responsible agency	Initiative	Description	Geographic coverage
Department of the Environment, Water, Heritage and the Arts	Solar Homes and Communities Plan	The Solar Homes and Communities Plan provides cash rebates of up to \$8000 for the installation of solar PV systems on homes, schools and community-use buildings. It is available to households with an annual taxable income of \$100,000 or less.	Nationwide
Department of the Environment, Water, Heritage and the Arts	Solar Hot Water Rebate Program	The Solar Hot Water Rebate Program assists households to install climate friendly hot water technologies. Rebates of \$1000 are available to eligible householders who install solar and heat pump hot water systems to replace electric storage hot water systems in their existing, privately owned homes.	Nationwide
The Office of the Renewable Energy Regulator	Renewable Energy Certificates	Renewable Energy Certificates (RECs) are an electronic form of 'currency' under the <i>Renewable Energy (Electricity) Act 2000</i> , which may be created on an internet-based registry system by eligible parties for each megawatt hour of eligible renewable electricity generated. Owners of eligible solar water heater installations have the option to claim RECs themselves or assign their right to claim RECs to an agent. Owners of eligible small generation unit installations including PV systems, wind systems and small hydro-electric systems are eligible for RECs.	Nationwide

3. Local government

Many councils across Queensland have recently developed, or are developing, plans for mitigating greenhouse gas emissions at a local government level, including under the Australian Government's Cities for Climate Protection program.

A number of local governments have taken specific action to encourage local residents to reduce their emissions. For example, the Brisbane City Council's CitySmart initiative provides residents with practical advice, information and tools to assist them to reduce their carbon emissions. These include a web-based carbon calculator, CitySmart vans, neighbourhood fairs and school activities.

The Townsville City Council's Solar City initiative, funded by the Australian Government, will see the installation of 500 solar panels and 2500 smart meters, the delivery of 1500 energy audits and the trialling of new approaches to electricity pricing in selected homes.

4. The media

Householders receive information about climate change and about individual actions they can take to reduce their emissions from a range of sources. Media organisations clearly play a key role in informing citizens about climate change. Some networks have initiated specific campaigns aimed at informing and influencing viewers to make a positive difference, and include online guides for personal action. Examples include Channel TEN's Making Your Mark campaign and News Limited's One Degree campaign.

5. Non-government organisations

Non-government organisations, particularly those with a specific environmental focus, have played a lead role in promoting community awareness about climate change and encouraging individuals to make changes to their lifestyles to reduce emissions. For example, the Australian Conservation Foundation's GreenHome program includes a climate action kit with tips for reducing emissions, and provides a consumers guide with information about carbon neutral products. Greenpeace offers an online clean energy guide, with information about energy saving and use of clean energy products.

Other organisations are also contributing to awareness raising and information for householders. One example is the Queensland Public Sector Union with its Climate Heroes campaign, which encourages its members to cut their personal climate impact.

Several private carbon offset providers offer support to households in some Queensland locations by, for example, retrofitting CFLs and water-efficient shower roses.

Footnotes

1. Per household emissions attributable to energy use (stationary and transport) are approximately 17 tonnes on average. Further per household greenhouse gas emissions due to food, waste and embedded energy are significant but have not been quantified.
2. Savings of 1.4 million tonnes CO₂-e could be achieved through energy saving measures outlined in the sample plan in Attachment One.
3. Figures from 27 July 2007 — when the region first adopted Target 140 — to 9 February 2008 when restrictions were lifted on the Gold Coast, Queensland Water Commission communication to EPA, 20 May 2008.
4. Queensland Water Commission 2008, viewed 17 May 2008, <www.qwc.qld.gov.au>.
5. Queensland Water Commission communication to EPA, 20 May 2008.
6. This is an economy-wide figure and is calculated by dividing the gross greenhouse emissions by the number of people. The residential sector component is lower, with per household emissions attributable to energy use (stationary and transport) at approximately 17 tonnes on average. Further per household greenhouse gas emissions due to food, waste and embedded energy are significant, but have not been quantified.
7. Australian Greenhouse Office, *State and Territory Greenhouse Gas Inventories, 2005*, Australian Government Publishing Service, Canberra, 2007.
8. Data supplied by ENERGEX to EPA and confirmed 2 June 2008. Information changed from calendar year prior to 2005 to the following financial year.
9. Rose, BJ 2006, *How to reduce greenhouse gas emissions, save money and maintain quality of life*, p.5, viewed 4 June 2008, <www.carbonneutral.com.au/32_p_booklet_how_to_reduce_household_ghg_emissions_2.pdf>.
10. Western Australian Government, *State of the Environment Report, 2007*.
11. Government of South Australia, 'South Australia's Feed-In Mechanism for Residential Small-Scale Solar Photovoltaic Installations: A Discussion Paper', Table A1, 2007.
12. Compiled from data supplied by ENERGEX and confirmed 2 June 2008. Average Queensland household electricity consumption from 1990 to 2004 compiled by ENERGEX 11 March 2005. This was updated with additional data sourced from the ENERGEX/Origin Energy Institute.
13. PricewaterhouseCoopers, 'Feasibility Study for ClimateSmart Living', p.18, 2006.
14. Greenhouse gas emissions from Queensland household use of electricity, gas and vehicle travel are around 17 tonnes per household each year. Further greenhouse gas emissions attributable to household consumption of food, generation of waste and the embedded energy in materials and appliances are not included in this estimate.
15. PricewaterhouseCoopers, 'Feasibility Study for ClimateSmart Living', p.16, 2006.
16. McKinsey & Company, *An Australian Cost Curve for Greenhouse Gas Reduction*, 2008, p14.
17. *ibid.* p. 6.
18. Everett M Rogers, *Diffusion of Innovations*, 4th edn, Free Press, New York, 1995, pp. 6–7.
19. McKinsey & Company, *op.cit.*
20. EPA analysis adapted from data supplied by ENERGEX/Origin, 2006.
21. Queensland Government, *Sustainable Housing Regulatory Impact Statement*, Queensland Government, Brisbane, 2005, p.33.
22. For an average household using 12 lights for an average of three hours and 20 minutes per light bulb. Variables used in calculations: Incandescent light bulbs = 60W; CFLs = 15W; lifetime for incandescent light bulbs = 750 hours; Lifetime for CFLs = 10,000 hours; Cost of incandescent light bulbs = \$0.49; Cost of CFLs = \$4.00.
23. For current prices and offerings, see the GreenPower price watch at <<http://greenpowerpricewatch.com.au/qld.html>>.
24. Energy saving actions including raising the air conditioner thermostat by one degree Celsius in summer, running the dishwasher one less time each week, eliminating one weekly hot water clothes wash, hanging one load of washing on the line instead of using a dryer, turning off standby power, reducing pool pump running time by one hour per day and replacing 12 incandescent lights with CFLs could save \$287 per year and reduce electricity use by 1859 kWh per year. The cost of purchasing the remaining 9028 kWh of electricity at \$3.30 per kWh would be \$298, resulting in a net cost of \$12 per year for a zero energy emissions house (refer to Attachment 1).
25. The use of insulation and solar water heating could reduce the amount of electricity used in a household to 5728 kWh each year, cutting green power costs to \$189 each year. Reducing motor vehicle use by 20 per cent could save \$540 each year if petrol cost \$1.50 per litre. When all the energy savings benefits described above are considered, and after subtracting the cost of green power, estimated savings of \$682 each year may be achieved.

- 26 These figures are intended to serve as a general guide to the cumulative impacts of individual actions when elevated to the state level. From time to time there will be a small amount of regional, seasonal and household variance from these figures. To see assumptions, sources and calculation methodology, refer to Attachment 1.
- 27 Queensland Government, 2008, ClimateSmart website, viewed 4 June 2008, <www.climatesmart.qld.gov.au>.
- 28 D Gershon, *Low Carbon Diet: a 30 day program to lose 5000 pounds*, Empowerment Institute, New York, 2008. Assistance provided by Environmental Protection Agency (Queensland).
- 29 For a more detailed description of assistance offered to households, refer to Attachment 2.
- 30 World Wildlife Fund Earth Hour e-newsletter, 7 May 2008.
- 31 CSIRO, *Australians want climate change solutions at home*, media release, Brisbane, 10 March 2008.
- 32 Accenture 'Consumers say to resource industries—pay attention to climate change or pay the price', *The Leadership Resource*, 2007.
- 33 AC Nielsen, 2006, Queensland Environment Community Research.
- 34 AC Nielsen, 2006 Queensland Environment Community Research.
- 35 Refer to Table 6.
- 36 See PricewaterhouseCoopers (May 2006) 'Feasibility study on ClimateSmart Living', final report for Environmental Protection Agency (Queensland).
- 37 AC Nielsen follow-up survey research for EPA 2007–08.
- 38 Peta Ashworth et al, *Understanding and incorporating stakeholder perspectives to low emissions technologies in Queensland*, Centre for Low Emission Technology, Brisbane, 2006.
- 39 Everett M Rogers, *The Diffusion of Innovations*, 4th edn, Free Press, New York, 1995, p.163.
- 40 Ibid.
- 41 Michael Sexton & Associates, *Review of behaviour change models to achieve sustainable environmental behaviours: Executive Report 2007*, viewed 12 May 2008, <www.environment.sa.gov.au/dehaa/pdfs/gns/behaviour_change_models.pdf>.
- 42 S. Ungar, 'Public scares: changing the issue culture', in Susanne C Moser and Lisa Dilling (eds), *Creating a Climate for Change: communicating climate change—facilitating social change*, Cambridge University Press, Melbourne, 2006.
- 43 Experience in Portland points to reductions of 22 per cent in carbon emissions after just one month among participating households when the project is undertaken at the neighbourhood social network level, backed up by social marketing techniques. See Sarah J Rabkin and David Gershon, 'Changing the world one household at a time: Portland's 30 day program to lose 5000 pounds', in Susanne C Moser and Lisa Dilling (eds) *Creating a Climate for Change: communicating climate change—facilitating social change*, Cambridge University Press, Melbourne, 2006.
- 44 Everett M Rogers, *Diffusion of Innovations*, 4th edn, Free press, New York, 1995.
- 45 Doug McKenzie-Mohr and William Smith, *Fostering sustainable behaviour: an introduction to community based social marketing*, New Society Publishers, Canada, 1999, pp. x–xi.
- 46 To assist in making the book available to Queenslanders, the EPA has assisted David Gershon to adapt the Low Carbon Diet to an Australian context. See David Gershon (forthcoming in 2008) *Low Carbon Diet: a 30 day program to lose 2000 kilos*, Empowerment Institute, New York, p. 88.
- 47 Everett M. Rogers, *Diffusion of Innovations*, 4th edn, 1995, p. 262.
- 48 Average household electricity use is 10,887 kWh per year, resulting in 11,322 kilograms of CO₂-e per house each year. If the average energy use of 1.6 million households was reduced by 20 per cent, this would save 3.6 million tonnes of CO₂-e each year.
- 49 PricewaterhouseCoopers, 'Feasibility study on ClimateSmart Living' 1995, p.35.
- 50 Examples of these programs include those conducted by Keep Australia Beautiful, such as The Clean Beach Challenge, Tidy Towns, and Green and Healthy Schools. All are judged against consistent program criteria, but projects reflect local differences, culture and initiative.
- 51 National Greenhouse Accounts (NGA) Factors, 2008.
- 52 Office of Economic and Statistical Research, *May 2006 Queensland Household Survey: Summary Report prepared for the Department of Energy*, Queensland Government, 2006, p.45. Also Office of Economic and Statistical Research, *May 2007 Queensland Household Survey: Summary Report prepared for the Department of Energy*, Queensland Government, 2007 p. 34.
- 53 ENERGEX Institute 2006, cited in S. Wardill, 'Climate change bites power', *Courier-Mail*, 13 February 2007, <www.news.com.au/couriermail/story/0,23739,21215465-3102,00.html>.
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- 68 Price for GreenPower based on the lowest cost GreenPower with a 'good' rating that is available in Queensland (Source: Green Electricity Watch for Homes, viewed 30 May 2008, <www.greenelectricitywatch.org.au/results.php?where=qld&sort=score>).