

# Reducing energy demand: the imperative for behavioural change

*By Peta Ashworth*

## Key messages

- \* The Australian public will have a powerful influence over the pace and extent of climate change mitigation and adaptation strategies and actions adopted by the nation. Deep cuts in Australia's greenhouse gas emissions will depend on a combination of technological innovation, economic reform, and societal change, achieved with public consent.
- \* There is considerable scope for individuals to reduce their own carbon footprint, and there is growing public support for a transition to a 'green economy'.
- \* Face-to-face communication and knowledge sharing to overcome the gaps in knowledge are critical.

Mitigation is not an activity for the agriculture, forestry, energy, and transport sectors alone. The Australian public will have a powerful influence over the pace and extent of national climate change mitigation strategies. Deep cuts in Australia's greenhouse gas emissions will only emerge through a combination of technological innovation, economic reform, and societal change: all achieved with public consent. This applies especially to two areas. First, there are the many things individuals can do, in their own lives and work, to reduce the burden of greenhouse gas emissions that future Australians will have to bear. To date, however, the actions of the majority of Australians to reduce their personal greenhouse gas emissions have been minimal. To achieve a significantly greater rate of change will require a major alteration in public attitudes. The second calls for broad public understanding, not only of the issues surrounding climate change itself, but especially of the range of low-emission energy technologies and smart energy-saving methods that will emerge over the coming years. It is here that public preference, consumer choice, and community sanction will play a critical role in determining the eventual mix of technologies adopted by Australia. This mix

will cover the full spectrum, ranging from low-emission coal-fired electricity to solar thermal and photovoltaic, wind, geothermal, nuclear, hydroelectricity, biofuels, cogeneration, and demand management, through to energy efficiency and other energy approaches.<sup>1</sup> Public familiarity with these alternatives, their technical pros and cons, and their associated costs, will have an important bearing on the national debate and the extent to which politicians feel empowered to make far-reaching decisions for Australia to transition to a low carbon economy.



Chris Taylor/CSIRO

## Australian attitudes to energy technologies

Recognising that knowledge and understanding will be critical to support the transition to a low carbon economy, CSIRO has been researching public attitudes to climate change and energy technologies for several years.<sup>2-5</sup> This has established that the Australian public:

- \* agrees that climate change is an important issue to Australia, particularly the 18–25 age group (82% of respondents agreed that global warming has been established as a serious problem and immediate action is necessary, or that there is enough evidence that global warming is taking place and some action should be taken<sup>6</sup>)
- \* still has limited knowledge about the causes of climate change and what can be done to mitigate it (in a survey of more than 2000 Australians, the average response to a quiz on energy and environmental issues was *equivalent to guessing*, and many people didn't see the link between their own energy consumption and greenhouse gas emissions<sup>7</sup>)
- \* can be quite concerned and depressed about the enormity of the problem
- \* recognises there is a role for government, industry, and themselves in responding to climate change
- \* is willing to pay for necessary changes.



Nick Pitsas/CSIRO

CSIRO research<sup>8</sup> has found that the highest level of public support was for solar and wind technologies, followed by other renewable forms of energy. When asked to rank the priority they would give to funding for the deployment of various energy options, participants ranked solar highest, followed by wind, wave/tidal then geothermal. Carbon dioxide capture and storage (CCS) ranked marginally better than coal-fired power, but it remains the technology least familiar to the general public. Opinion on nuclear power, although it has warmed somewhat, remains sharply polarised.

The public is also realistic in appreciating that new technologies mean higher energy costs. Most participants in the study indicated that they would be prepared to pay up to AU\$50 more a quarter for electricity. A significant number already subscribe to green power, ranging from 49% in Brisbane to 13% in Perth. Participants were also quick to identify the need for transparency in pricing and support for low-income families if electricity prices were to increase.

## Changing individual behaviour

It is known from the remarkable shift in public behaviour towards water during the droughts of the early 21st century, that profound changes in individual attitudes and practices are possible in relatively short spans of time. The scope for individuals to reduce their carbon footprint is, if anything, even greater than is the case for water, owing to the array of opportunities available. These include electricity use, transport habits, food choices, waste disposal, consumption patterns, house design, home heating and cooling, and so on. However, one of the main challenges is to make the issue of energy consumption sufficiently potent so that individuals are motivated to implement personal strategies to reduce their own impact on the climate. The public claim to be put off taking action because of a lack of technical knowledge or understanding of climate science and the issues surrounding it.<sup>9</sup> Education would seem, therefore, to be an essential component of attitudinal change.



CSIRO

One of the most important findings from CSIRO's research with members of the public is the importance of face-to-face communication and knowledge sharing to overcome the gaps in knowledge about the issue and technologies. In response CSIRO has developed Energymark, a process based on the well-established Watermark (<http://www.watermark.org.au/>) concept for grassroots action on water saving.<sup>10</sup> Energymark works by engaging those citizens who are determined to do something to reduce their own personal carbon footprint, to work with CSIRO to convene a group of friends, family, or work colleagues to contemplate the topic of climate and energy over an 8- to 12-month period.

In the first 12-month trial carried out by CSIRO in the city of Newcastle, New South Wales, 172 citizens managed to reduce their collective greenhouse gas emissions by 27%. In the process, average household electricity consumption in the group fell from 14 420 to 9029 kilowatt hours, with participants managing to cut their power use by 35% through the use of energy-saving

appliances and the way they used appliances in the home. They also cut their transport emissions by 27% by using more public transport and walking rather than taking the car, their household waste by 16%, and their beef consumption by 28.5%. The Newcastle City Council has asked to become a world testing ground for the approach.<sup>11</sup>

Opportunities for the individual to save energy in daily life, such as those trialled in Newcastle, are set out in *The CSIRO Home Energy Saving Handbook*, which explains ‘how to save energy, save money and reduce your carbon footprint’.<sup>12</sup> The book explains that the first step is understanding your own carbon footprint. To help the public understand this, they are asked to think of it in terms of domestic garbage bags, each holding 100 g of CO<sub>2</sub> (or its equivalent). Thus a household of three typically fills 500 000 bags a year with CO<sub>2</sub> from all its activities: the aim is to eliminate as many of these ‘bags’ as possible by energy savings and other measures. The book provides examples of practical things that Australians can do in their daily lives to reduce their greenhouse emissions, rating the effectiveness of these actions by the number of ‘garbage bags of CO<sub>2</sub> avoided’ and according to ease and affordability. For example:

Small steps with a big impact:	<b>Bags avoided</b>
* Improve heating and cooling of home	up to 12 000
* Change to cold water clothes washing	8000
* Turn off spare fridge	4000
* Dry clothes on a line	3000
* Replace incandescent lights with low-energy bulbs	7000
* Eat foods with lower carbon content	10 000
* Reduce purchases by 10%	14 000
* Grow your own vegetables and compost waste	17 000
* Car pooling and cycling.	20 000
Smart investments:	<b>Bags avoided</b>
* Adopt passive heating and cooling	up to 24 000
* Replace electric heaters with natural gas	up to 80 000
* Use solar, gas, or heat pump for hot water	up to 34 000
* Buy an energy efficient fridge or washing machine	6000
* Go for low-wattage lighting	10 000
* 75% of your journeys by bike or public transport.	20 000
Giant leaps:	<b>Bags avoided</b>
* Base house design on the surrounding environment	up to 37 000
* Install solar, wind power, or micro-hydro for domestic electricity	50 000
* Buy a hybrid car.	19 000

## Target audiences and processes

CSIRO has developed a range of social processes for engaging communities on issues around climate mitigation. The choice of process depends on the audience and topic. With climate change mitigation, the four main audience groups are:

- \* influential stakeholders, such as politicians, media, NGOs, chief executives, and so on.
- \* the general community.
- \* the education sector – not only schools and universities, but also through museums, science centres, and so on.
- \* communities or groups affected by particular energy projects.<sup>13</sup>

In modern society there is little time to learn about and attend to issues, such as climate change, that seem to many as having little effect on their immediate day-to-day tasks. CSIRO's work to engage public groups through various processes, such as Energymark, underlines the importance of working face-to-face to create the interest, discussion, and dissonance that allow people to grow their understanding, change attitudes, and take action. People are strongly motivated by the idea of being good citizens and often enjoy working in groups of like-minded individuals. However, they are also looking for leadership and for reliable, objective information from trusted sources such as CSIRO and universities. Trust is a critical element, and having multiple sources of reliable advice can help to overcome the confusion that arises when competing arguments over climate change are aired.

Apart from the Energymark concept, another process for raising awareness and changing behaviour is 'Carbon Kids', an educational program developed by CSIRO Education to enable primary and secondary school classes to work together to achieve reductions in their carbon footprint.

Despite some limitations, citizens' panels provide an excellent framework for tackling complex issues that can be applied in various contexts at the local, national, or international level. CSIRO has found that the rich deliberation that participants enjoyed is well received and it is clear that shifts in attitudes take place as a result of the interactions with trusted experts, as well as from hearing the views of fellow citizens. This has led many participants to question the underlying assumptions they hold about the various technology solutions. This work provides a strong foundation for helping the Australian public to understand more about climate change and the range of energy technologies required to achieve a low-carbon economy.

## Conclusion

The next few years will be critical in deciding whether or not Australia – and the world – is successful in mitigating greenhouse gas emissions sufficiently to avoid ‘dangerous’ climate change as described in reports by the IPCC, Nicholas Stern, Ross Garnaut and others.<sup>14, 15</sup> However, effective mitigation will require the united forces of government, industry, and the community to make it happen. The public has made it clear in numerous polls that it wants action, but it is also looking to others in positions of influence to lead it in what to do and which technologies to support. At the same time, the public is an important driver in the whole process – and its expectations will have a powerful influence over the actions of government and industry. Studies concluding that the public is willing to pay for the changes strongly suggest Australia should be doing more. Many Australians are taking climate change seriously, as best evidenced by a range of personal mitigation actions: for example, through small steps such as changing light bulbs, cold water washing, and walking instead of driving the car, to installing various distributed energy options, including solar hot water systems, solar photovoltaic systems, or purchasing green power. Action on climate change will only be successful through the combined efforts of government, industry, and the public at large.

## Further reading

Ashworth P, Quezada G, Van Kasteren Y, Boughen N, Paxton G *et al.* (2009) *Perceptions of low emission energy technologies: results from an Adelaide large group workshop*. CSIRO, Brisbane, P2009/961.

Ashworth P, Littleboy A, Graham P and Niemeyer S (2010) Turning the heat on: public engagement in Australia’s energy future. In Devine-Wright P (ed.) *Renewable Energy and the Public: From NIMBY to Participation*, Earthscan, UK, (in press).

Ashworth P, Boughen N, Mayhew M and Millar F (2009) From research to action: now we have to move on CCS communication. *International Journal of Greenhouse Gas Control* (2009), doi:10.1016/j.ijggc.2009.

Gardner J and Ashworth P (2008) Towards the intelligent grid: a review of the literature. In Droege P (ed.) *Urban Energy Transition: From Fossil Fuels to Renewable Power*. Elsevier, Oxford, UK, pp. 283–308.

Dowd A and Ashworth P (2009) Investigating the effectiveness of Energymark: changing public perceptions and behaviours using a longitudinal kitchen table approach. In Jubb I, Holper P and Cai W (eds) *Managing Climate Change: Papers from the Greenhouse 2009 Conference*. CSIRO Publishing, Melbourne.

Wright J, Osman P and Ashworth P (2009) *The CSIRO Home Energy Saving Handbook*. Pan MacMillan, Sydney.