



Community EmPOWERment

Final Research Report

Prepared by

Institute for Sustainable Futures

For

Moreland Energy Foundation Ltd



Institute for Sustainable Futures

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ABBREVIATIONS

ABS	Australian Bureau of Statistics
AGL	Australian Gas Light Company
AGO	Australian Greenhouse Office
BRANZ	Building Research Association of New Zealand
CAM	Cent-A-Meter™
CANA	Climate Action Network Australia
CFL	Compact fluorescent light
COAG	Council of Australian Governments
COTA	Council on the Ageing
CUAC	Consumer Utilities Advocacy Centre
DEUS	Department of Energy, Utilities and Sustainability
DOH	Department of Housing
DPMC	Department of Prime Minister and Cabinet
ECI	Energy consumption indicators
EOI	Expression of Interest
EWON	Energy and Water Ombudsman NSW
GFCV	Gas and Fuel Corporation of Victoria
GHG	Greenhouse gas emissions
HEEP	Household Energy End-use Project
HWP	<i>Householder Workshop Plan</i>
IHSS	Integrated Humanitarian Settlement Strategy
IPART	Independent Pricing and Regulatory Tribunal of NSW
IPCC	Intergovernmental Panel on Climate Change
Institute, the	Institute for Sustainable Futures
MCE	Ministerial Council on Energy
MEFL	Moreland Energy Foundation Ltd

MEPS	Minimum energy performance standards
NAEEEC	National Appliance and Equipment Energy Efficiency Committee
NAEEEP	National Appliance and Equipment Energy Efficiency Program
NCEAP	National Consumers Electricity Advocacy Panel
n.d.	not dated
NEC	National Electricity Code
NECA	National Electricity Code Administrator
NEL	National Electricity Law
NEM	National Electricity Market
NFEE	National Framework for Energy Efficiency
NGO	Non-government organisation
NSW	New South Wales
PEM	Personal Energy Management
PIAC	Public Interest Advocacy Centre
PSE	Puget Sound Energy
RRG	Research Reference Group
SACOSS	South Australian Council of Social Services
SEAV	Sustainable Energy Authority Victoria
SEDA	Sustainable Energy Development Authority (NSW)
SMUD	Sacramento Municipal Utility District
UTS	University of Technology, Sydney
VCOSS	Victorian Council of Social Services
WREAG	Western Region Energy Action Group

EXECUTIVE SUMMARY

Background

This is the Final Research Report of the *Community EmPOWERment* project conducted by the Moreland Energy Foundation Limited (MEFL) and the Institute for Sustainable Futures (the Institute). The full title of the project is *Improving Demand Management Choices for Small Customers in the National Electricity Market (NEM)*. The National Consumers Electricity Advocacy Panel (NCEAP) and the Consumer Utilities Advocacy Centre (CUAC) funded the research.

The primary objectives of the research were to investigate the social influences on household electricity consumption, improve understanding of barriers to demand management at the household level and identify promising policy actions to allow householders to better manage their electricity use. A secondary objective was to educate householders on practical actions that they can take to reduce their electricity bills.

The research sought to address five specific research questions:

1. What are consumers' expectations about comfort, convenience, security and other concerns that impact upon electricity use? What are the implications for patterns of electricity use and service provision?
2. What are therefore the most effective approaches to products/services to respond to the needs of small consumers to help them understand and manage their overall consumption and peak demand for electricity?
3. What are the particular issues around these products/services for disadvantaged consumers and what can be done to minimise the disadvantage?
4. What are the existing rules and regulations, industry structures, government policies etc that may impede the implementation of effectiveness of these approaches?
5. What changes are required to the National Electricity Code, or jurisdictional laws, regulations and policies so as to remove "roadblocks" that inhibit the development of a demand side response by small consumers?

This Research Report is intended as a resource document for subsequent advocacy work, coordinated by MEFL. That is, the research will be used to recommend and advocate changes to legislation, regulations, codes, policies and regulatory and industry structures.

Literature Review

The project commenced with a literature review, the results of which are presented as an annotated bibliography in Section 2. The review encompassed international and Australian literature that investigated the drivers for household electricity use and strategies for helping householders to manage electricity use. An important finding from the literature review was the growing consensus that effective electricity demand management strategies must be sensitive to the social and cultural context of the individual. In addition, the literature stressed that people demand energy services, such as comfort, cleanliness, convenience and security, rather than energy itself.

Research Design

The literature review informed the research design. The theoretical framework for the research emphasised the social construction of demand for energy services, the influence of social relations, culture and infrastructure on this demand and the value of community-based approaches in creating the support structures that can help people to reduce their energy use. Consistent with this theoretical framework, the research team adopted participatory action research as the guiding methodological approach. In a participatory action research project, both participants and researchers are actively involved in processes of social change. This approach is group-focused, flexible and responsive to the needs of participants.

Three specific research methods were employed during the research:

- Unstructured interviews with stakeholders from consumer advocacy groups, a regulator (the Essential Services Commission in Victoria), an electricity retailer and an electricity ombudsman (the Energy and Water Ombudsman NSW)
- A series of twelve participatory workshops in New South Wales (NSW) and Victoria, involving 106 householders
- A small-scale trial of a particular product, the Clipsal Cent-A-Meter™, using semi-structured interviews to record participants' experiences.

Workshop Design

The householder workshops were the primary research method employed during the project. The sampling strategy for the workshops was purposive, rather than representative. The intention was to ensure that diverse categories of householder were included in the sample. Thus, the research team sought to establish workshops with the general public, low-income households, people from non-English speaking backgrounds, people from regional areas, elderly householders and Indigenous householders, among others. The full list of workshops is provided in Section 3.4.2.

To access these diverse householder groups, the research team used a network approach, collaborating with community organisations, neighbourhood centres and non-government organisations to establish workshops with their clients or existing participants. To best meet the needs of participants, workshops were designed to include an educational session, providing information on ways to reduce energy bills, tailored to the specific concerns raised in each workshop. A second workshop session focused more strongly on policy options that could help participants to better manage their electricity demand.

Policy options were developed in six categories, drawing on the literature review and the knowledge and experience of the research team. Table E1 lists the policy options discussed during the workshops. More detailed descriptions are provided in Section 4.4.

Limitations of the Research

The research findings are subject to some limitations. First, compared to Australian averages, the sample of research participants was skewed towards low-income households, renters and people from non-English speaking backgrounds. This is a consequence of the recruitment strategy and the higher priority placed on energy saving by low-income groups. Second, for some complex or technical policy options, including cost-reflective tariffs, interval metering and remote load control, it is difficult to provide sufficient detail in a brief workshop to support informed discussion. Participants may have misunderstood some of these options. Third, the popularity of policy options involving incentives may be very sensitive to the magnitude of that incentive. Again, time did not allow discussion of different incentive levels and this may influence participant understanding of these options.

Table E1: List of policy options discussed during the workshops

Policy Options for Managing Household Electricity Demand
<i>Better Information</i>
Better information on energy efficient appliances (e.g. printed booklets at the point of sale)
Newsletters with information on demand management products and services
Information in different languages
Information available at social venues
Energy audits (professional, Internet-based or self-administered)
Installation of a Cent-A-Meter
<i>Billing and Pricing</i>
Inclining block tariffs
Interval meters with cost-reflective tariffs
Pre-payment meters (this option was later omitted from the workshops due to equity concerns)
More frequent bills
More retail choice (e.g. retail offerings that include a retrofit)
Disaggregated bills that show the cost of running each appliance
<i>Incentives</i>
Rebates or discounts for energy efficient appliances and products
Penalties for inefficient appliances
Energy bill discounts for allowing remote load control (e.g. interruption of air conditioning)
Rebates or discounts for energy supply options (e.g. solar hot water or photovoltaic cells)
Appliance buy-back schemes
<i>Disclosure</i>
Disclosure of home energy ratings at the point of sale or rent
Extending the Energy Rating (star rating) scheme to more appliances
Advertising the hourly running cost of appliances on Energy Rating labels
Providing benchmarking on bills
<i>Regulation</i>
Mandatory installation of natural gas where available (in new properties)
Minimum energy efficiency standards for rental housing
Minimum energy efficiency standards for new homes and renovations
Extending minimum energy performance standards for appliances to a wider range of appliances
<i>Community Support</i>
Join or start a community support group to pursue demand management
Community fundraising for local greenhouse gas abatement measures

Workshop Findings

Bearing in mind the research limitations discussed above, the main workshop findings are discussed below. Summaries of the matters discussed at each workshop are provided in Section 5.2.

Workshop participants described numerous social and cultural factors influencing their use of, and attitudes to, electricity. Factors that emerged as important for particular cultural groups included:

- The cultural value placed on hospitality by certain groups. The desire to be hospitable influences energy used for cooking, storage of food, heating and cooling.
- The use of heating as a focus for social interaction in some cultures. Some participants expressed a preference for sitting around a source of radiant heat, even if other heating sources were available.
- Participants from diverse cultural groups valued warmth as an indicator of well-being, comfort, security and quality of life, and as a way of maintaining health.
- Some participants, especially migrants, strongly valued new appliances. For them, Australia offered a plethora of white goods, all representing success and security in their new life.
- Alternately, other cultural groups valued cheap, value for money and second hand goods, placing emphasis on the importance of a bargain.
- Participants from countries with little experience of electricity, or market provision of electricity, often had high initial bills due to their lack of knowledge about electricity use in Australia.
- Peak energy demand frequently reflects social and cultural factors, such as the need to get children bathed after work or to cook large meals for guests at the weekend.

The above social and cultural factors can inhibit or facilitate demand management. Other factors were more obviously barriers to demand management, including:

- Poor insulation and design of existing housing stock, and poor efficiency of existing appliances.
- A general lack of knowledge about appliance functioning, existing demand management programs, energy saving behaviours and the electricity market. Participants felt that available information was non-specific and needed to be tailored for their specific situation.
- Competition between the desire to save energy and other values, including water saving, health, safety and quality of life.
- A widespread belief that the shift from public to market provision of electricity had eroded householder rights. Participants believed that electricity is an essential service, not a commodity, and required stronger government regulation and protection.
- Cost was perceived as a major barrier to saving energy, as few participants had funds available to pay the higher initial cost for appliances, insulation and other products that would save money in the long-term.
- Participants felt disempowered in their dealings with landlords and utilities. They suffered from poor quality housing but had little power to force landlords to make necessary

improvements. In dealing with utilities, many participants reported unsatisfactory handling of queries and complaints.

In general, these barriers were most severe for disadvantaged households. Disadvantaged households experienced some additional barriers, including the poor quality of public housing and appliances provided through various support schemes. Some participants had clearly experienced hardship as a result of fuel poverty. One positive finding was the value of flexible payment mechanisms, such as EasyPay and Centrepay. These systems were highly valued by participants.

In six of the twelve workshops, participants were allocated two votes and asked to assign these votes to their preferred options from the list in Table E1. The five most popular policy options in voting were:

1. Rebates or discounts for energy efficient products
2. Standards for rental housing
3. Energy standards for new homes, appliances, lighting
4. Bills that separate costs
5. Information in different languages.

Policy options in all categories received some degree of support, either in voting or in workshop discussions.

Interview Findings

Five research interviews were conducted as part of the project to provide additional data on specific issues. Relevant findings are summarised in Section 5.6 and inform the responses to each of the research questions below.

Results of Cent-A-Meter Trial

A Cent-A-Meter is an electronic display that shows instantaneous electricity use and cost in cents per hour. During the research project, three Cent-A-Meters were installed in participating households and participants were interviewed to record their experiences with using the device. In general, participants found the information interesting, and were surprised by how much or how little particular appliances cost to run. However, they also found that the novelty of the extra information quickly wore off and that information in cents per hour was difficult to relate to quarterly energy bills. None was willing to pay the full cost of having a Cent-A-Meter installed (\$199) and none believed it would encourage them to reduce energy use.

Responses to Research Questions

Drawing on the findings summarised above and additional material from the main body of the report, the responses to each of the research questions are summarised below.

1. *What are consumers' expectations about comfort, convenience, security and other concerns that impact upon electricity use? What are the implications for patterns of electricity use and service provision?*

The research confirms that consumers' expectations around electricity use and their understandings of comfort, convenience, security and other values can be understood as socially and culturally constructed. The main social and cultural influences on electricity use identified in this research include:

- Hospitality (and communal eating)

- The use of heating as a focus for social interaction
- Strong valuation of comfort, security and quality of life
- Preferences for new appliances as markers of success
- Preference for second hand or cheap appliances linked to values around saving money
- The inconvenience of some energy reduction strategies
- Inability to afford up-front cost of energy saving measures
- Social relations with family, friends, utilities, landlords, electricians and government.

These factors reflect the interaction between past experiences, socially established norms and expectations, present living conditions and social contexts. They represent long standing and deeply held convictions and understandings that play out in behaviour. It was evident from this research that participants would not easily modify strongly embedded socio-cultural behaviour. Participants appeared to extract those strategies from the education component of the workshops that were consistent with, or could be modified to fit with, their social and cultural contexts. Therefore, to maximise potential effectiveness, demand management strategies need to be adapted to socio-cultural context.

Participants characterised relationships with other family members, landlords, utilities and government as constraints on efforts to reduce electricity use. Parents in workshops frequently referred to issues with managing electricity use by children and teenagers. Older participants commented on changing life stages and the effect on electricity use. For example, as children grew up and moved away, parents were left living alone with appliances (especially fridges) designed for larger families. Some participants reported wanting to 'look good' in front of visitors in terms of the number of white goods they owned.

Overwhelmingly, participants felt constrained by their social relations with landlords (public and private) in terms of taking action to reduce electricity consumption. Landlords were perceived to be uncaring about the energy efficiency of their housing stock. Participants strongly felt the need for regulatory reform in this area, as without this the social relation was one of considerable inequity, which inhibited their ability to reduce consumption.

Most participants held a high degree of scepticism about their electricity company. It was felt that the social relation should be one of service by the utility company (consistent with the notion of electricity as an essential service). Instead, deregulation was transforming the social relation to a market relationship in which, according to participants, their rights were diminished. In this transformed social relation, it appeared (to participants) that the utility company had no obligation to provide a socially responsible service and that issues of economic return would always take precedence over social obligations.

Participants were also conscious of the regulatory role of government and felt that governments could do much more in this regard, particularly in the area of mandatory standards for rental housing and regulation of energy efficiency in the electrical appliance market. Further, participants felt governments should be more active in offering incentives and rebates to assist and encourage uptake of energy efficient products. In general, householders felt they were bearing a disproportionate responsibility for energy reduction in a social relation where government should be leading and resourcing social and environmental reform.

2. *What are therefore the most effective approaches to products/services to respond to the needs of small consumers to help them understand and manage their overall consumption and peak demand for electricity?*

The products and services referred to in the research question have been interpreted in this research as different policy options to help householders manage their electricity use. The following policy options received the most support from research participants:

- Overwhelmingly, householders sought context-relevant information, presented in appropriate, accessible language. Face-to-face delivery of information was preferred, possibly because this was linked to a high level of customisation and detailed responses to individual contexts and questions. Home visits by energy experts were particularly favoured. Various participants felt that community organisations could be resourced to undertake this role. This implies working with community organisations and cultural groups that are already part of the cultural context of participants.
- Research participants emphasised the need to take cultural issues into account when developing information, so that energy saving information does not recommend actions that are unacceptable to particular cultures. The provision of information in different languages was one of the most popular strategies amongst participants (ranked fifth), with participants suggesting the use of ethnic media, including ethnic radio and newspapers, as well as bill inserts in different languages.
- Some workshops raised the idea of training community agencies and their workers to deliver energy efficiency education and audits. Community workers who have regular contact with householders could be trained in strategies for sustainable living, as part of a broader educational campaign that integrates energy, greenhouse, water, waste, transport and health issues.
- In general, participants welcomed the idea of instantaneous or rapid feedback on their daily electricity use. To provide feedback on daily electricity use, it is necessary to install an interval meter. The research findings generally support the rollout of interval meters to residential customers as a means of providing feedback on electricity use. Rollout of interval meters needs to be supported by provision of accessible, interactive displays and online tools for householders with Internet access.
- Participants were particularly interested in feedback that disaggregates electricity use according to different appliances or end uses. This was the fourth most popular policy option overall, with 7.6 votes. Interval meters do not provide this information. Energy audits can deliver this feedback. Professional energy audits provide the most detailed and accurate information to help a householder reduce their energy bills, but are relatively expensive. Self-administered audits are a cheaper alternative, although they will not be suitable for all householders.
- Participants were resistant to the idea of cost-reflective tariffs. Discussion during workshops tended to focus on higher prices during peak times rather than the possibility of lower prices at other times. Most participants, especially low-income participants, did not feel that their consumption during peak periods was discretionary and were dubious about their ability to respond to higher prices at those times by changing their practices. Some participants felt that cost-reflective tariffs would unfairly penalise those who had no choice but to consume energy at peak times, including families and people in poorly-designed housing.
- The type of tariff structure that received the most support was an inclining block tariff with a low access to service charge. Some participants wanted to abolish fixed charges entirely and pay a higher consumption charge. Others suggested that the fixed fee should be proportional

to usage. Both of these suggestions would provide a stronger price signal to consumers to reduce electricity use. Participants recognised the need to take household size into account when establishing block tariffs.

- Rebates and incentives for installing energy efficient products, equipment and appliances were very popular with research participants. Participants felt that they should be rewarded for doing the right thing and that the government should provide assistance with the high initial capital costs of some demand management actions to capture the ongoing economic and environmental benefits. The provision of rebates and incentives was the most popular policy option in voting, with 11 votes. Proposals for Demand Management Funds, funded by a small levy on each unit of electricity sold, are an attractive way of providing the type of rebates and incentives desired by participants.
 - Many families discussed dinnertime and the time of arrival home from work or school as a period of peak energy use. These times are used for bathing children, making dinner and heating rooms prior to bathing and sleeping. Given the context of these activities, and the social and cultural needs attending them, most participants felt that they could not make a significant reduction in electricity use at these times. However, given the weighting of the sample towards low-income households this finding should not be assumed representative of the wider public.
3. *What are the particular issues around these products/services for disadvantaged consumers and what can be done to minimise the disadvantage?*

The research findings suggest that work to support electricity reduction among disadvantaged consumers needs to focus on overcoming structural barriers to energy access and efficiency. Specific strategies against these broad needs are described below. It would be appropriate to implement these strategies as part of an integrated Fuel Poverty Strategy to address the energy needs of low-income households.

- Existing concessions for low-income and disadvantaged households should be expanded, complemented by retrofit programs and better publicised.
- Flexible payment mechanisms, such as EasyPay, should be expanded. Some suggestions were introduction of incentives for early bill payment instead of penalties for late payment, payment matching for households experiencing financial crisis, targeting retrofit programs to households experiencing financial difficulties and big bills and suspending payment requirements in the lead up to holiday periods (e.g. December).
- A significant proportion of low income and disadvantaged householders reside in public housing supplied by the Department of Housing or Aboriginal Housing Board in each State. According to participants, this housing is often poorly designed from the perspective of energy efficiency (especially heating and cooling requirements), stocked with inefficient appliances and lacking in insulation, including window and door seals and drapes. One of the most popular policy options during the workshops was the establishment of an energy efficiency standard for rental housing; this option was particularly popular with public housing tenants.
- At present, the Residential Tenancies Acts in Queensland, NSW, Victoria and South Australia offer no regulation in regard to energy efficiency. In the ACT, landlords must advertise any previous energy efficiency rating in the advertisement for lease, but do not need to obtain a new energy efficiency rating. Research participants sought the establishment of minimum energy efficiency standards for rental accommodation and requirements for capital improvements to bring housing stock up to these standards. The establishment of such

standards is cautiously endorsed. The main reason for caution is the possibility of rent increases that would worsen the overall financial situation of low-income households. As a first step in moving to energy efficiency standards for rental housing, mandatory disclosure of energy efficiency ratings in lease advertisements should be strongly pursued.

- Programs that provide humanitarian support for migrants and refugees and emergency relief for other householders need to prioritise energy efficiency when providing appliances and equipment. Further, newly-arrived migrants should be educated about electricity use in Australia so that they are not caught with unexpected high bills.
- Low income and disadvantaged householders reported increasing difficulty in accessing cheap second hand goods due to the withdrawal from the market of many charitable organisations. Without access to cheap energy efficient alternatives to existing poor quality, old or oversized appliances householders have no choice but to continue use of inefficient appliances. The involvement of charitable organisations in the second-hand appliance market should be supported and protected through appropriate policy and regulatory changes.

4. *What are the existing rules and regulations, industry structures, government policies etc that may impede the implementation of effectiveness of these approaches?*

Policies, legislation, rules, regulations and other institutions that potentially impact on the ability of householders to manage their electricity use include:

- National energy policy
- The National Framework for Energy Efficiency
- The National Appliance and Equipment Energy Efficiency Program
- The Productivity Commission Inquiry into the Economic and Environmental Potential Offered by Energy Efficiency
- National Electricity Law
- The National Electricity Code
- State legislation and State regulatory arrangements
- The structure of the deregulated energy sector
- Housing legislation in each State
- The system of electricity concessions
- The Integrated Humanitarian Settlement Strategy.

These institutions can act to impede or facilitate management of electricity use by householders, depending on the context and the specifics of their implementation.

5. *What changes are required to the National Electricity Code, or jurisdictional laws, regulations and policies so as to remove “roadblocks” that inhibit the development of a demand side response by small consumers?*

The response to this question comprises the main recommendations to emerge from this research project. Changes to some of the existing institutions listed above are recommended, and some new demand management programs are proposed.

- **National Framework for Energy Efficiency (NFEE):** The NFEE includes recently announced policy packages that take forward some of the policy options supported by participants, including national energy efficiency standards for new homes and major renovations, mandatory disclosure of the energy performance of homes at the time of sale or lease, broadening the scope of minimum energy performance standards (MEPS) and labelling for appliances and strategies for improving consumer awareness. These policy packages are strongly endorsed. The following points should be advocated:
 - Any national standards should adopt current best practice.
 - Mandatory disclosure programs should include a provision for an energy rating audit after the tenant moves and require ratings to be clearly visible in advertisements.
 - Consideration should be given to expansion of MEPS to cover electric space heaters. While there are barriers to be overcome, MEPS could possibly be developed based on heat transfer to the room rather than electric efficiency.
 - Any consumer awareness or education programs should be responsive to cultural contexts, provide information in different languages and in tailored forms that meet householders’ specific requirements, prioritise face-to-face delivery of information and hands-on demonstration of options for energy efficiency improvement and pursue cooperative delivery of information programs with community organisations and cultural groups.
- **National Appliance and Equipment Energy Efficiency Program:** Consideration should be given to the inclusion of average running costs on Energy Rating labels. It is recognised that the inclusion of running costs on Energy Rating labels is problematic given the variation in tariffs and tariff structures across Australia. However, the value that householders place on this information warrants consideration of ways in which these problems might be overcome, such as adopting an average Australian tariff for cost calculation or providing several figures based on different tariffs.
- **The National Electricity Law:** This research endorses the amendments to the National Electricity Law proposed by TEC et al (2004). In particular, the proposed addition of a new clause to Part 2 of the NEL requiring that the NEC include provisions for the development of demand management is consistent with the research findings. Until demand management is supported by national legislation, the low prioritisation of demand management by utilities, landlords and other organisations is likely to continue.
- **Concessions:** Amendment of Retail Codes in Victoria and South Australia is recommended to specifically require itemisation of concessions on bills.
- **Payment flexibility:** Payment flexibility options discussed above (Research Question 3) could potentially be incorporated into the Retail Codes in Victoria and South Australia and the Electricity Supply (General) Regulation in NSW. For example, disconnection could be

disallowed unless the utility has worked with the customer and perhaps the relevant Ombudsman to develop a flexible payment option for that customer.

- **Metering requirements:** The Electricity Metering Codes in Victoria and South Australia and the NSW Rules for Electricity Metering, or a consolidated national equivalent, would be an appropriate location to capture feedback requirements relating to interval metering, such as provision of accessible, interactive displays and online tools for householders with Internet access.
- **Energy efficiency audits:** Retail Codes and regulations could be modified to *require* retailers to offer an energy efficiency audit to customers experiencing payment difficulties and/or customers with large bills. The audits could be delivered cooperatively with community workers trained in energy auditing.
- **Least cost planning:** Several participants felt that utilities should be required, encouraged or rewarded for undertaking least cost planning. Encouraging the least cost solution for provision of network services is generally the role of the independent economic regulators in each State, achieved primarily through network price determinations. However, a specific requirement in the Electricity Distribution Codes in Victoria and South Australia and Electricity Supply (General) Regulation in NSW for distribution businesses to apply least cost planning in network investment decisions would provide a much stronger signal to distribution businesses.
- **Tariff structures:** The research advocates that Governments in each jurisdiction ban declining block tariffs and investigate the feasibility of implementing inclining block tariffs (at distribution and retail levels), linked to community service obligations. Further, regulators should consider the merit of reducing the proportion of fixed charges in total residential bills and increasing the proportion of consumption-related charges as a way of providing a stronger demand management price signal (as well as reducing bills for very small consumers, including many low-income households).
- **Delivery of concessions:** Some participants suggested that concessions would be more useful if supplied as vouchers that they could use when required, in times of financial hardship. Investigation of the delivery of concessions through a voucher system is recommended.
- **Public housing policy:** The Department of Housing or equivalent in each State should adopt a progressive energy efficiency standard for all new public housing developments and embark on an ongoing retrofit program to bring existing public housing stock up to a suitable energy efficiency standard. Further, government procurement policies applying to public housing should be revised to require minimum energy efficiency standards are met for all appliances and equipment installed in public housing and for any other building services provided by contractors.
- **Housing legislation:** As a first step in moving towards energy efficiency standards for rental housing, this research recommends the adoption of mandatory disclosure of energy efficiency ratings at the point of sale or lease for all residential properties. For rental properties, this could be implemented through amendments to the Residential Tenancies Act in each state. In conjunction with these disclosure requirements, consideration should be given to the implementation of taxation incentives for landlords making certain improvements to rental properties that improve the energy efficiency of those properties. After evaluation of the impact of disclosure and taxation incentives on energy efficiency of housing stock, particularly the least efficient stock, consideration should be given to the adoption of minimum energy performance standards for rental housing.
- **Integrated Humanitarian Settlement Strategy:** It is evident that aspects of the IHSS, specifically the Accommodation Support program and the Household Formation Support

program, would be of greater value to humanitarian entrants if they prioritised energy efficiency. The necessary changes should be implemented through policy change, with appropriate funding support and education for the humanitarian organisations that deliver the IHSS. Further, education on electricity use is a clear priority for inclusion in the IHSS.

- **A sustainable living program:** Given the evidence for competing values around energy saving, water saving, health and safety, it would be advantageous to develop and deliver integrated householder education programs that consider the interactions between these values. A sustainable living program, covering energy, greenhouse, water, waste, health and transport issues, could provide integration as well as being more in tune with the way householders understand their lives. A key element of such a program would be community involvement in, and delivery of, information and education. The program could include a train-the-trainer program to improve access to different cultural groups and disadvantaged households. Existing community groups and organisations could be resourced to deliver workshops and in-home education.
- **A National Demand Management Fund:** A National Demand Management Fund, funded by a small levy on each unit of electricity sold, would be an appropriate way to provide the energy efficiency incentives and rebates desired by research participants. There is an opportunity to establish a National Demand Management Fund as part of the ongoing electricity market reform process overseen by the MCE. The rules for the Fund could be included as rules under the NEL. Utilities, community organisations and others could apply for funds to implement a range of innovative demand management initiatives.
- **Fuel Poverty Strategy:** An integrated Fuel Poverty Strategy would address the specific needs of low-income households in relation to energy. The objective should be to eliminate fuel poverty in Australia by a target year and indicators should be developed to measure progress. The Fuel Poverty Strategy would contain a mix of existing and new programs, including:
 - Electricity concessions and/or payment vouchers for households experiencing fuel poverty
 - Access to flexible payment mechanisms and dispute resolution schemes
 - Socially responsible tariff structures
 - Subsidised retrofits for public housing and low-income households
 - Energy-efficient procurement policies for new public housing
 - Energy efficiency standards for rental housing.

Further Research

Recommendations for further research include:

- Further research with households that have higher incomes and higher energy use than those participating in this research, particularly households that have significant discretionary energy use
- Detailed householder research on specific options to address the issues of complexity and the appropriate level of incentives
- An interval meter trial using dummy cost-reflective tariffs

- Research on possible improvements to the existing electricity concessions schemes.

1 INTRODUCTION

1.1 Background

The Moreland Energy Foundation Ltd (MEFL), established by the Moreland City Council, is the first independent, locally based organisation devoted entirely to reducing community greenhouse emissions. MEFL works with the Moreland community, located in the northern suburbs of Melbourne, to reduce energy consumption and greenhouse gas (GHG) emissions. As part of this work, MEFL undertakes research to understand community needs and inform the design of community GHG emission reduction programs.

MEFL has been a partner with the Cities of Darebin, Melbourne and Yarra in an electricity aggregation group called Community Power. Community Power has designed a triple bottom line energy product that is provided to residents within the four municipalities by an energy retailer (currently the Australian Gas Light Company, AGL). As an aggregator, Community Power is keen to understand how to assist customers to minimise their energy use, whilst meeting social objectives. Community Power works with the retailer to provide energy management programs and services to customers.

In early 2004, MEFL engaged the Institute for Sustainable Futures (the Institute) to conduct social research on *Improving Demand Management Choices for Small Customers in the National Electricity Market* (NEM). The primary objectives of the research were to investigate the social influences on household electricity consumption, improve understanding of barriers to demand management at the household level and identify promising policy actions to allow householders to better manage their electricity use. A secondary objective was to educate householders on practical actions that they can take to reduce their electricity bills.

The research sought to address five specific research questions:

1. What are consumers' expectations about comfort, convenience, security and other concerns that impact upon electricity use? What are the implications for patterns of electricity use and service provision?
2. What are therefore the most effective approaches to products/services to respond to the needs of small consumers to help them understand and manage their overall consumption and peak demand for electricity?
3. What are the particular issues around these products/services for disadvantaged consumers and what can be done to minimise the disadvantage?
4. What are the existing rules and regulations, industry structures, government policies etc that may impede the implementation of effectiveness of these approaches?
5. What changes are required to the National Electricity Code, or jurisdictional laws, regulations and policies so as to remove "roadblocks" that inhibit the development of a demand side response by small consumers?

The National Consumers Electricity Advocacy Panel (NCEAP) provided core funding for the research. NCEAP provides funds for advocacy by representatives of business and domestic electricity customers affected by the National Electricity Code (NEC) or the NEM. The funds are drawn from NEM participation fees.

The Consumer Utilities Advocacy Centre (CUAC) provided additional funding for the research. Established with Victorian State Government funding, CUAC is an independent not-for-profit

company set up to enhance the input of Victorian electricity, gas and water consumers, particularly low-income, disadvantaged and rural consumers, into the regulatory debate.

In keeping with the advocacy focus of the two funding partners, this Research Report is intended as a resource document for subsequent advocacy work, coordinated by MEFL. That is, the research will be used to recommend and advocate changes to legislation, policy, the NEC and/or the operation of the NEM.

Consistent with the priorities of the funding partners, the research focused on small consumers within the current NEM jurisdictions, i.e. Queensland, New South Wales, Australian Capital Territory, Victoria and South Australia. Due to resource constraints, the interviews and workshops conducted during the research concentrated on New South Wales and Victoria. However, most of the findings should be generally relevant within the NEM, and most will be relevant Australia-wide.

The official title of the research project is 'Improving Demand Management Choices for Small Customers in the National Electricity Market'. However, given the desire to involve householders in the research, a more user-friendly title was required. The title 'Community EmPOWERment' was chosen to reflect both the focus on electricity and the desire to empower consumers by providing them with practical education and a chance to have their say on electricity policy.

1.2 Report structure

The structure of this Research Report reflects the stages undertaken during the research. The first stage of the research comprised a review of relevant Australian and international research on the social dimension of household energy consumption. The literature review had three main objectives:

- Identify the social influences on energy consumption at the small consumer (household) level
- Guide the research design by identifying theoretical perspectives and research methods used to address similar research questions in Australia or elsewhere
- Identify products and services (i.e. demand management programs and policy options) that might help householders to understand and manage their electricity use.

The literature review is discussed in more detail in Section 2, which describes the methods used to identify and evaluate the literature and provides an annotated bibliography.

As noted above, one of the objectives of the literature review was to guide the research design for the project. The purpose of a research design is to provide a plan for the research execution that builds on previous research and is appropriate to address the research questions. The research design for this project is described in Section 3. The discussion covers the theoretical framework for the research, clarification of the research questions, research methods employed in the literature and the choice of research methods for this project. In summary, the authors adopted participatory action research as the methodological approach and used a series of facilitated workshops, unstructured or semi-structured interviews and a small metering trial as the primary research methods.

Section 4 outlines the workshop design. It defines the critical reference group for the research and the adoption of a purposive sampling strategy to recruit workshop participants. The workshop structure and materials are described, with a particular focus on the choice of conceptual policy options for discussion in the workshops. This section also describes the recruitment of participants and data collection strategies.

Section 5 describes the research findings in detail. It includes summaries of each of the twelve research workshops, outlining the issues raised by participants. Participant reactions to different policy options are discussed, including the results of voting on preferred options. A thematic analysis of the

workshop data draws out the important issues for further consideration. This section also includes a demographic summary and findings from the interviews and metering trial.

Section 6 reviews laws, regulations, industry structures and government policies that are relevant to the issues raised by research participants. The purpose is to identify institutions that could potentially be changed to address the concerns raised by research participants. Finally, Section 7 discusses responses to each of the research questions, implications and recommendations.

2 LITERATURE REVIEW

This section reports on a literature review undertaken as the first research task. Section 2.1 describes the methodology adopted for the literature review, including literature sources searched and criteria for selecting and evaluating literature. The results of the literature review are presented in the form of an annotated bibliography, in Section 2.2.

2.1 Methodology

2.1.1 Sources of literature

The Institute used the following primary sources to identify literature relevant to this project:

- The sections of the Intergovernmental Panel on Climate Change's (IPCC's) *Third Assessment Report* (2001, p.120) dealing with social, cultural and behavioural issues (mainly Section 5.3.8 on social, cultural and behavioural norms and aspirations)
- Existing reference databases compiled by Institute researchers for postgraduate or project research
- Direct searches (web-based and physical) of prominent journals covering energy and consumption issues, including *Energy and Buildings*, *Energy Policy*, *Energy*, *Journal of Consumer Research*, *Journal of Environmental Psychology* and *Environment and Behaviour*
- Web and database searches (primarily UTS *SuperSearch* and ISI Web of Science) on relevant authors identified through the first three sources
- Citation searches to locate other articles referenced by relevant authors
- Specific articles recommended by colleagues in Australia and overseas and by MEFL.

2.1.2 Literature selection criteria

From the above sources, articles were selected for further evaluation if they met one or more of the following criteria:

1. The study developed theoretical or empirical understanding of energy use at the household level.
2. The study used or described social research methods that were, or could potentially be, applied to an investigation of energy use at the household level (including studies that focused more broadly on environmentally-motivated behaviour, or on other resources).
3. The study evaluated or reported on demand management products, services, programs or strategies at the household level.
4. The study used or described social research methods to evaluate the uptake or effectiveness of demand management products, services, programs or strategies at the household level.

2.1.3 Literature evaluation criteria

For literature that met the initial selection criteria, further critical evaluation was conducted to assess its specific relevance for this project. The Institute applied the following evaluation criteria:

1. Is the study location sufficiently similar to Australia (e.g. in culture, utility service and regulatory regimes) to make the results and/or methods transferable to Australia? Can anything be said about the robustness of the results across locations?
2. Would it be feasible to replicate the study, or any demand management programs it describes, in Australia, i.e. are there any barriers to replication here in method of recruitment, ethics etc?
3. Does the study help to identify the research questions that are considered to be a high priority by social researchers focusing on energy use at the household level? Or, does the study simply replicate research that has already been done in Australia?
4. Does the study provide guidance on theoretical perspectives, research design and/or specific methods that may be applicable for this project?

Some of the literature that passed the initial selection criteria was discarded, as a brief evaluation indicated that it performed poorly against the evaluation criteria. The remaining literature was used to compile the annotated bibliography provided in Section 2.2.

2.2 Annotated bibliography

The annotated bibliography provided in this section lists relevant references, provides a brief abstract or summary of the content of each reference and includes comments on the relevance to this project. The literature is presented in three categories:

- Australian literature (Section 2.2.1)
- International literature (Section 2.2.2)
- Australian or international literature that focuses specifically on disadvantaged households (Section 2.2.3).

2.2.1 Australian literature

ABS (2002), Environmental Issues: People's Views and Practices

This report by the Australian Bureau of Statistics (ABS 2002) provides some Australian survey results on why people adopt or do not adopt particular energy conservation measures. According to this survey, 84% of Australian households that install insulation do so for reasons of comfort. Only 10% are primarily interested in saving money and about 3% are primarily interested in reducing energy use. Of those that have not installed insulation, reasons cited include cost (24%), procrastination (19%), lack of interest (15%), lack of need (i.e. climate, 15%), constraints posed by dwelling design (12%) and other reasons (15%). These data indicate that policies and education campaigns focusing on the comfort provided by energy efficiency measures may be more attractive than those that focus on energy savings.

The factors considered in replacing or buying white goods included cost (49%), energy (40%), capacity (30%), features (26%), dimensions (25%), brand (22%), reliability (17%), appearance (10%), serviceability (8%), environment (7%), availability (5%) and other (11%). These data indicate that life

cycle cost and convenience (i.e. features, reliability, serviceability, availability, dimensions and capacity) are important influences on the choice of white goods.

Factors considered in choosing a heater included already installed (38%), cost (27%), environment (4%), appearance (3%), recommended by friend/expert (3%), financial incentive/subsidy (0.6%) and other (25%). The high proportion of heaters already installed when the householder first occupied the dwelling indicates the constraints faced by householders.

AGO (2002), Cool Communities: Household Research

Household research by the Australian Greenhouse Office (AGO 2002) used a national telephone survey and 28 focus groups to explore public awareness of climate change issues and household action. The focus groups suggested that actual understanding of climate change was much poorer than self-reported understanding. Very few people understood the contribution of households to climate change. Most people lacked knowledge of the priority actions they could take to reduce their greenhouse impact. Over 90% of participants believed they were already taking action to conserve energy, however most actions were minor. The desire to save money was the primary motivation for demand management.

The principal barrier to demand management was seen as the lack of focused motivation, rather than the lack of information. However, lack of knowledge was also a barrier, as was financial cost and a lack of feedback.

AGO (2003), Community Perceptions of Climate Change: A Report on Benchmark Research

AGO (2003) reports on community perceptions of climate change. The report is based on a national survey involving 1,713 completed telephone interviews (with 6,563 refusals). There were 37 questions, covering environmental issues, climate change, energy use and so on. Many of the findings are not directly relevant, however there are some useful findings on energy consumption attitudes and behaviour. For example, many people spontaneously mentioned financial benefits and incentives as most likely to encourage them to reduce their energy consumption. Two thirds of participants said that following the example of others would encourage them to reduce their energy use.

Community Power (not dated), Community Power Market Research Survey

Community Power (not dated) undertook a market research survey of 638 existing Community Power customers and 3,561 potential customers from their database of householders who had expressed an interest in Community Power. Results indicated that the main reasons for not taking up a Community Power contract were price (overwhelmingly), reluctance to sign contracts, lack of clear information and past negative experience with the AGL.

GFCV (1991), Review of Customer Response to Domestic Tariff Issues - A Qualitative Study

The Gas and Fuel Corporation of Victoria (GFCV 1991) conducted a qualitative study of customer response to domestic gas tariff issues. While the findings are not directly applicable, the methodology is potentially relevant. It involved three separate group discussions with participants that were recruited and grouped to meet specific demographic characteristics. A pre-arranged discussion outline was used to guide the discussions. Participants were asked to discuss their opinion and knowledge of gas tariffs and structures, the impact of tariff structures on their consumption, issues of seasonal variation and cross-subsidisation and their opinions on some proposed changes to tariff structures. One interesting finding was that the inverted tariff structure employed by the GFCV was not effective because customers did not understand it and did not see the tariff structure as relevant – they trusted the GFCV not to ‘rip them off’.

Keys Young (2002), Australian Householders' Attitudes to Greenhouse Issues - A Literature Review

Keys Young (2002) report on a review of the literature on Australian householders' attitudes to greenhouse issues. The report points out that energy use is not tangible, that many Australians have a poor understanding of the source and impact of their electricity, and that industry is perceived to be the main offender, rather than households.

Keys Young uses a social marketing approach to categorise householders as:

- **Unconvinced conservers**, who save energy because there are practical benefits, such as cost savings or convenience
- **Committed conservers**, who save energy due to concern about climate change, as well as to capture cost benefits
- **Non believers**, who don't see climate change as an issue, don't believe their actions can make a difference and see saving energy as reducing lifestyle
- **Convenience choosers** who are concerned about the environment and greenhouse but will only take action if it is convenient.

Keys Young then suggest a behaviour change pathway, from indifference, to awareness, to readiness, to action. The authors identify appropriate strategies for each stage.

MCE (2004), Improving User Participation in the Australian Energy Market: Discussion Paper

The Ministerial Council on Energy (MCE 2004a) has released a discussion paper on improving user participation in the NEM. The paper considers several strategies that can improve demand-side participation, some of which are relevant to small customers. For example, it discusses demand side aggregation facilities that broker 'the demand side response from a number of end users and [sell] this package of response in either the financial or physical market' (MCE 2004a, p.1). The paper also discusses interval metering and time-of-use tariffs, remote activated load control and measurement technology and information products such as electricity price comparison websites. Some of these strategies could be suitable for further discussion as part of this research.

Mullaly (1998), Home energy use behaviour

Mullaly (1998) emphasises the important role of variable behaviour in the design of local government energy conservation programs in Australia and argues that behaviour modification elements should be incorporated into such programs, alongside technical elements. She recommends an experimental approach, due to the dearth of research on behaviour in Australia. She particularly recommends 'self- or intrinsically motivated behaviour modification strategies, such as those involving personal commitments' (Mullaly 1998, p.1050).

Nancarrow, Smith & Syme (1996), The Ways People Think About Water'

This article (Nancarrow, Smith & Syme 1996) focuses on the ways people think about water, however its methods are of possible relevance to social research on energy. The authors use a household survey, delivered via an interview, to explore the ways people think about 14 different aspects of water. Respondents were provided with a five-point scale for their answers, from 'I always think this way' to 'I never think this way'. Topics covered included water scarcity, the right to water, health, religious significance, aesthetics and the like. The authors used the survey responses and subsequent statistical analyses to identify four clusters that seemed to represent different thought structures with respect to water:

- **Self-interested** people did not think strongly about water, except in terms of their right to water
- **Earthy** people thought about water in terms of aesthetics, conservation and utility contexts, but not in terms of additives or water rights
- **Environmentalists** were primarily concerned about aesthetics and conservation rather than utility or water rights
- **Service oriented** people thought about water in all its contexts, but more so in terms of rights, additives and utility and least in terms of conservation.

A similar clustering approach could potentially be applied to the current project.

Nance (2004), Riverland Energy and Water Friends Project

Nance (2004) reports on the Riverland Energy and Water Friends Project in South Australia. This project was a community-based energy efficiency and retrofit project that provided home energy and water audits and distributed energy and water conserving devices to Riverland households. The project trained members of local community service organisations to conduct effective home energy audits. The project used focus groups as part of its evaluation. Key observations from the project were:

- Existing community networks and ‘word of mouth’ were invaluable for engaging households
- ‘Discovering’ the running costs of appliances was a key ‘trigger’ for action
- Trust in auditors enhanced the experience of householders
- A multiplier effect was evident for the incentives provided.

Next Energy (2003), Demand Management and the National Electricity Market

The Next Energy (2003) report on demand management in the NEM provides useful context on the barriers to demand management and potential strategies to overcome those barriers. However, its consideration of small customers is limited, focusing primarily on pricing issues. It argues that demand management is a low priority for customers, but does not refer to any empirical research to support this argument. It provides four specific recommendations for strategies to encourage demand management; these are a useful model for advocacy, but are not particularly relevant for this project.

Oliphant (1999), Energy Consumption in Small Households

Oliphant (1999) describes a project that monitored small households in Adelaide to identify potential energy savings. The project provided households in the study group with energy efficient appliances, information and education. The study group was compared to two control groups; one was exposed to an education and feedback program but did not receive efficient appliances and the other received neither education nor appliances. The project focused mainly on monitoring of end use energy consumption, through data logging.

The most interesting aspect for the current project is the behavioural program, which found that feedback did not always reduce energy consumption; in some cases, it led to an increase in consumption when households realised how little they were paying to operate certain appliances, compared to other household costs. Interestingly, the households that did not receive feedback had a greater tendency to be unhappy about the size of their bills than those that did receive feedback. Short-term feedback was most effective when end use figures were presented as proportions of total

consumption that did not show actual cost. This indicates the importance of considering the format of feedback when designing feedback programs to reduce energy consumption.

Oliphant (1999, p.27) outlines an education program delivered to one of the control groups:

The residents were given an information package about how to save energy and we talked to each householder individually. They were offered an information evening and also a 'Watt Minder' in their kitchen that would have told them how much energy was being used and how much it cost. However, although a few showed interest, the majority did not and so this form of education program was not pursued. We did, however, send the residents two pie charts every month showing them how much electricity was used, by end use, together with costs.

Oliphant also describes an energy information evening arranged for the study group, with prizes.

The impact of the education program was difficult to evaluate due to a lack of duplication in the survey questions asked of participants at the start and finish of the program. Oliphant (1999) indicates that the education program was poorly resourced compared to original intentions, which may have contributed to its relatively low impact. The research raised questions about the ideal timeframe for feedback (e.g. instantaneous, monthly, quarterly). However, the relatively low cost of energy meant that feedback on the short-term cost of operating particular appliances did not provide any real incentive to reduce energy consumption. Oliphant argues that technical energy saving measures are much easier to justify than measures aimed at behavioural modification.

Oliphant found that the following energy saving actions were the most effective in Adelaide's temperate climate (for houses with roof insulation):

- Install a solar water heater
- Add an insulating blanket to an existing electric storage water heater and reduce the thermostat setting to 60°C or use a gas water heater with electronic ignition rather than a continuously operating pilot light
- Purchase energy efficient appliances, in particular an efficient refrigerator and air-conditioner
- Be able to zone the home for heating and cooling.

Pears (1998), Strategic Study of Household Energy and Greenhouse Issues

Pears (1998) reports on a strategic study of household energy and greenhouse issues that provides a wealth of useful data. Pears does not specifically address the social and cultural influences on household energy use, focusing instead on demographics and technology. Nevertheless, the data provided is very useful for context.

Quay Connection (1999), Community Awareness Research - National Greenhouse Strategy

The Quay Connection (1999) research was undertaken for the Australian Greenhouse Office to inform a national community awareness strategy as part of the National Greenhouse Strategy. It employed a social marketing approach and included a literature review on national and international research on attitudes to climate change. The study included stakeholder interviews, as well as focus groups with representatives of the general community. The Quay Connection research emphasised the need to identify different market segments and to tailor demand management strategies to those market segments.

Barriers to behavioural change identified by Quay Connection included low levels of motivation, time scarcity, scepticism about the commitment of government and industry, lack of relevant, tailored

information, poor access to alternatives or sources of support and guidance and cost of change (time and capital).

Roy Morgan Research (2002), Victorian Utility Consumption Survey 2001

This survey by Roy Morgan Research (2002) comprised 2,006 interviews with Victorian households. There is some information on what people think causes high energy bills, as well as some information on energy saving actions taken by householders. The survey indicates that knowledge of the best actions to take is relatively scarce. It also indicates that the main sources of information that householders use to learn about energy conservation are energy suppliers, followed by SEAV and local government.

Shipworth (2000), Motivating Home Energy Action: A handbook of what works

Shipworth (2000) provides valuable context on the social and cultural dimensions of household energy consumption. She provides a useful checklist on marketing and delivering conservation programs, based on social and behavioural research in the United States:

- Marketing conservation
 1. Vivid information. Use concrete examples and demonstrations.
 2. Personalized information. Use individually tailored recommendations.
 3. Personal appeals. Use face-to-face interactions.
 4. Credible sources. Use local organizations and individuals.
 5. Observability. Use highly visible local demonstrations.
 6. Social diffusion. Make use of friends and neighbours.
 7. Market segmentation. Target information to specific clients.
 8. Market penetration. Use door-to-door canvassing.
 9. Equity concerns. Reach the renting sector, those on low incomes, minorities and the elderly.
- Delivering conservation
 1. Convenience. Offer simple and easy sign-up procedures.
 2. Flexibility. Give consumer a choice of actions.
 3. Hard interventions. Install inexpensive conservation hardware.
 4. Quick results. Focus on rapid recognition of programme benefits.
 5. Active participation. Encourage do-it-yourself actions.
 6. Financial incentives. Offer loans, grants, rebates [under some circumstances].
 7. Mix of services. Coordinate various energy programme offerings.
 8. Quality control. Conduct follow-up inspections.

9. Programme evaluation. Include evaluation in initial programme design.
10. Consumption data. Use metering or utility bills in evaluation.

Shipworth discusses information strategies in considerable detail, including media campaigns, energy efficiency labels, energy efficiency displays, energy/greenhouse audits, the provision of feedback on energy use, workshops, demonstrations and use of community groups and social networks.

Shipworth notes that Australian research on motivating home energy action is limited. She emphasises the habitual nature of energy consuming activities and identifies money, self-esteem, choice, control, and environmental concerns as motivations for saving energy. She identifies the personal benefits derived from energy use as comfort, convenience, high-tech enthusiasm and appearance.

Shipworth draws on US research to identify six market segments for residential electricity consumers, based on differing concerns and needs:

- **Pleasure Seekers**, who want the benefits of energy consumption (comfort, convenience, high tech appearance), are concerned with safety, personal control, cost and conservation and use energy in a task-specific way
- **Appearance Conscious**, who want appearance and safety, are less concerned with cost or conservation and do not use energy in a task-specific way
- **Lifestyle Simplifiers**, who have less desire for the benefits of energy consumption, are less concerned with personal control and monitoring of energy use and include low-income students and renters
- **Resource Conservers**, who are less concerned with personal control, more concerned with costs and environment, will readily compare appliances and use energy in a task-specific way
- **Hassle Avoiders**, who want to minimise appliance searches, are concerned with personal control and are less concerned with safety or costs
- **Value Seekers**, who have less desire for appearance, less concern for safety, will readily compare appliances, are committed to conservation measures and do not use energy in a task-specific way.

Shipworth summarises different methodological approaches to social research and evaluation that are relevant for an investigation of household energy consumption, including detailed interviews, group discussion, surveys, small-scale controlled experiments and computer models.

Strahan Research (2002), Community Awareness and Behaviour Re Energy Use and Greenhouse Gas Emissions

Strahan Research (2003a), Community Awareness and Behaviour Toward Energy Use and Greenhouse Gas Emission

Strahan Research (2003b), Home Energy Star Program: An Evaluation Report for Moreland Energy Foundation Ltd

Strahan Research has undertaken several surveys for the Moreland Energy Foundation (Strahan Research 2002, 2003a, 2003b). Strahan Research (2002) surveyed community awareness and behaviour regarding energy use and greenhouse gas emissions in the Moreland area. Later, Strahan Research (2003a) conducted a second survey to compare against the benchmark established in the

first. The residential component of each survey comprised a telephone survey of 400 Moreland households. The survey rated the environmental concern of respondents and their awareness of global warming and ways to reduce greenhouse gas emissions and electricity consumption. It identified actions they had taken to reduce energy use and described various aspects of behaviour relevant to energy consumption.

The survey results are broadly consistent with those in wider surveys by the AGO and international surveys. Greenhouse issues are not 'top of mind' for most people. Concern about climate change exists but understanding of the issues is often fragmented and people want more information, particularly:

- Simple and clear information about the link between energy use and greenhouse gas emission
- Ways to reduce energy consumption
- Reassurance that their contribution will help
- Simple, low cost suggestions.

Strahan Research undertook an evaluation of Moreland Energy Foundation's Home Energy Star Program, which 'seeks to assist householders to reduce their energy use and their greenhouse gas emissions by analysing household structure and behaviour and recommending changes to energy efficiency' (Strahan Research 2003b, p.3). The evaluation was based on interviews with 45 participants in the program. Participants were generally very happy with the program, particularly with the energy audit, report and personalised service. Less effective aspects were the certificates and plaques indicating the household's commitment to the program; relatively few people were willing to display these. The evaluation emphasises the importance of tailoring information to the circumstances of the participants (e.g. renovator, about to buy new appliance, financially constrained) and providing follow up and feedback.

Syme, Fenton and Coakes (2001), Lot size, garden satisfaction and local park and wetland visitation

Geoffrey Syme, from the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in Perth, has conducted a great deal of social scientific research on water conservation in Australia (e.g. Syme, Fenton & Coakes 2001). This work is methodologically relevant, although the content is not directly relevant. This particular study used a questionnaire, which was dropped off at households and later picked up. Participants were recruited through initial door-to-door visits. Questions used a five-point scale, from 'Strongly Disagree' to 'Strongly Agree', to assess household attitudes.

Williamson et al (1989), Thermal Comfort and Preferences in Housing: South and Central Australia

Williamson et al (1989) used group discussion sessions, a mail survey and comfort vote loggers installed in households to investigate householders' thermal preferences. The focus was primarily on obtaining thermal design data, however the methods could be applicable for the current research project.

2.2.2 International literature

Barr, Gilg & Ford (in press), The household energy gap

Barr, Gilg & Ford (in press) make a useful distinction between habitual energy saving behaviour and purchase-related actions. They examine the demographic characteristics of energy savers, the influence of environmental values and the role of personal characteristics and perceptions. Based on a

survey in Devon, they use cluster analysis to identify four lifestyle types: committed environmentalists, mainstream environmentalists, occasional environmentalists and non-environmentalists. The authors argue that energy saving behaviour must be seen in the broader context of these lifestyle commitments. They argue for policies that target specific behaviour types (e.g. habitual behaviour) and specific lifestyle types (e.g. non-environmentalists).

Brandon & Lewis (1999), Reducing Household Energy Consumption: A Qualitative and Quantitative Field Study

Brandon & Lewis (1999, p.75): 'One hundred and twenty households in Bath, U.K., had their energy consumption monitored over a 9-month period and compared (weather-corrected) to the previous year's consumption. Participants (with the exception of the control group) received feedback in various forms, i.e. consumption compared to previous consumption or to similar others; energy saving tips in leaflets or on a computer; or feedback relating to financial or environmental costs. Respondents were interviewed after the start of the study to establish their income, socio-demographic status, environmental attitudes and the extent to which they already engaged in conserving activities. Participants took part in focus groups after the final meter readings were taken. Overall, the results indicated that income and demographic features predicted historic energy consumption but not change in consumption during the field study, where environmental attitudes and feedback were influential. Of all the feedback groups, the installation of computers helped reduce consumption most markedly. Furthermore, people with positive environmental attitudes, but who had not previously been engaged in many conservation actions, were more likely to change their consumption subsequent to the feedback period'.

The authors emphasise the important role of feedback and advice in situations where people already have positive attitudes towards the environment. They note that information needs to be customised or particular and that computer programs are an effective way to deliver such information.

BRANZ (2003), Energy Use in New Zealand Households

BRANZ (2003) and similar reports outline the annual results of the Household Energy End-use Project (HEEP) in New Zealand. The reports focus on end use analysis from a technical perspective. Isaacs (2004, pers.comm., 15 April) indicates that an associated occupant survey includes some questions on householder attitudes, but not specifically on areas of interest for this project.

Clark, Kotchen & Moore (2003), Internal and external influences on pro-environmental behavior: Participation in a green electricity program

Clark, Kotchen & Moore (2003, p.237): 'This paper integrates themes from psychology and economics to analyze pro-environmental behavior. Increasingly, both disciplines share an interest in understanding internal and external influences on behavior. In this study, we analyze data from a mail survey of participants and non-participants in a premium-priced, green electricity program. Internal variables consist of a newly developed scale for altruistic attitudes based on the Schwartz norm-activation model, and a modified version of the New Ecological Paradigm scale to measure environmental attitudes. External variables consist of household income and standard socio-demographic characteristics. The two internal variables and two external variables are significant in a logit model of the decision to participate in the program. We then focus on participants in the program and analyze their specific motives for participating. These include motives relating to several concerns: ecosystem health, personal health, environmental quality for residents in southeastern Michigan, global warming and warm-glow (or intrinsic) satisfaction. In a statistical ranking of the importance of each motive, a biocentric motive ranks first, an altruistic motive ranks second and an egoistic motive ranks third'.

Dake and Thompson (1999), Making ends meet, in the household and on the planet

Dake and Thompson (1999) use grid-group cultural theory to identify five socially viable ways that a household can 'make ends meet', which translate to five different consumption styles:

- The *isolated* style of the fatalist
- The *traditionalist* style of the hierarchist
- The *cosmopolitan* style of the individualist
- The *naturalist* style of the egalitarian
- The *conviviality without coercion* style of the hermit.

The authors used questionnaires and anthropological interviews to assign 220 households in the UK to each of these consumption styles. They found that all the positions were well occupied, at least in Britain in the 1990s.

Darby (1999), Energy advice - what is it worth?

Darby (1999) considers the value of energy advice, concluding that advice is most effective when it is opportunistic (given at a time of change for the client) or client-led (when the client contacts the advisor and is already motivated to act). Darby recommends tailoring of advice and establishment of trust between advisor and client.

Darby (2001), Making it obvious: designing feedback into energy consumption

Darby (2001) reviews the literature on the effectiveness of three types of feedback to domestic energy consumers: direct feedback in the home, indirect feedback via billing and 'inadvertent' feedback (a by-product of technical, household or social changes). Darby uses a constructivist educational model to hypothesise that feedback is most effective when it is user-directed and immediate or frequent. Feedback is particularly important after a householder has taken some action to reduce energy consumption, such as purchase of an efficient appliance. Darby lists possible forms of feedback and identifies in-house displays, prepayment metering, self-meter-reading and meter reading with an adviser as the forms most likely to reduce energy consumption. She points to the importance of informative billing and audits for raising awareness.

Dulleck & Kaufmann (2004), Do customer information programs reduce household electricity demand?--the Irish program

Dulleck & Kaufmann (2004) provide support for an information deficit model of energy consumption behaviour by demonstrating empirically that a particular DSM information program (in Ireland) resulted in an average energy consumption reduction of 7%.

Gullekson (2002), AMR, Price Signals and Demand Response

Gullekson (2002) reports on the installation of automated interval meters for 1.3 million customers in the Puget sound area, by Puget Sound Energy (PSE). The program has experienced very high customer satisfaction ratings and average peak reduction in winter of 4.7% per residence. Gullekson outlines PSE's Personal Energy Management (PEM) system that includes additional information on bills, access to online energy use information and time of use tariff structures. Some relevant findings:

- Customer reaction to Personal Energy Management is overwhelmingly positive
- Customers understand how the program works and understand their bill information

- Over 90% of PEM pricing customers have taken actions to alter their energy use
- 91% of customers are satisfied with the program and nearly all would recommend it to others.

However, the TOU tariff was abandoned in late 2002 due to revenue losses and customer complaints that the program actually increased their bills. Daily usage figures online and Personal Energy Profiles are still available to assist with identifying energy conservation potential.

IPCC (2001), Third Assessment Report, Volume III

The most relevant section of the IPCC's Third Assessment Report is Section 5.3.8 in the contribution of Working Group III (IPCC 2001), which specifically addresses social, cultural and behavioural norms and aspirations. The IPCC (2001, p.367) notes that consumer behaviour is rarely rational in the strict economic sense, that there is a gap between professed values and action, that much of energy consumption is habitual or routine and that energy consumption and climate change mitigation is a low priority for most people. Further, it notes that motivation, habit, need, compulsion, social structures, identities, discourse and symbols all play a role in shaping consumption patterns (IPCC 2001, p.368).

The IPCC (2001, p.368) points out that: 'What was once luxury rapidly becomes habit and then need'. This progression is at the heart of growth in energy consumption. Individual wants and needs are shaped by the social and cultural context of the individual, the discourses in which they participate and the norms to which they conform. Different discourses approach energy consumption and demand management differently. The IPCC (2001) examines specific barriers in the buildings sector, including traditional customs, lack of skills, behaviour and style, misplaced incentives, lack of financing, market structure, administratively set prices and imperfect information.

The IPCC report is a useful high-level summary of theoretical approaches to energy consumption and demand management at the consumer level, and a valuable source of additional references, but provides relatively little guidance on research design.

Jaeger et al (1993), Determinants of environmental action with regard to climate change

Jaeger et al (1993) use standardised questionnaires, distributed to a random sample of the population, to test determinants of environmental action with regard to climate change. They compare three models of environmental action, including a knowledge-focused model, a model focused on socio-demographic characteristics and a socio-cultural model. The socio-cultural model performs significantly better, indicating that shared social and cultural value orientations and networks are more important in prompting action to address climate change than availability of information or demographic factors.

Kempton and Layne (1994), The consumer's energy analysis environment

Kempton and Layne (1994, p.857): 'This article describes how residential energy consumers measure and analyse their own energy consumption and energy costs. Using in-depth interviews, we find more extensive data collection and analysis by residential energy consumers than has been previously documented in the energy literature. However, the conclusions consumers can draw from their analytical efforts are restricted by both the form in which they receive price and consumption data and by their limited analytic capabilities. The relative information processing strengths of consumers are compared with those of institutions such as energy utilities, leading to the conclusion that many of the analytic tasks are currently assigned to the less efficient parties, degrading decision quality and creating a market barrier to energy conservation. We suggest a more efficient allocation of data collection and analysis between the consumer and energy utility'.

Kempton and Layne (1994, p.857) argue for 'a method of billing per end use rather than aggregating all energy uses in the household and a method for reporting the results of prior conservation efforts'. They conducted interviews with a sample of 56 all-electric households in central New Jersey, including 13 who had participated in a utility energy conservation program. The first 10 interviews were in homes, the final 46 by telephone. Kempton and Layne used a combination of semi-structured interviewing and fixed questions. They looked in detail at how bills are treated as part of the mail stream, how they are used, how inserts are treated, whether people read their own meters and the time spent analysing energy consumption. Both their findings and their methods are potentially relevant for this project.

Lutzenhiser (1993), Social and Behavioral Aspects of Energy Use

Lutzenhiser (1993) reviews, at length, research on social and behavioural aspects of energy use at the household level, to 1993. In particular, he discusses: 'behavior and variability in consumption; public opinion and conservation attitudes; price and information; billing and rates; consumer knowledge and the social contexts of consumption; micro-behavioural studies of actor-building-technology systems; and the macro-social organization of energy use' (Lutzenhiser 1993, p.248). The article has not been reviewed in detail, as much of the material is covered elsewhere in more recent articles.

McMakin, Malone & Lundgren (2002), Motivating Residents to Conserve Energy Without Financial Incentives

McMakin, Malone & Lundgren (2002, p.848): 'Given the aim to motivate people to conserve energy in homes, we need to understand what drives people's energy use behavior and how it can be influenced. This article describes applied energy conservation campaigns at two U.S. military installations where residents do not pay their own utility bills. Customized approaches were designed for each installation based on a broad social-psychological model. Before-and-after energy use was measured and residents were surveyed about end use behaviors. Residents said they were motivated by the desire to do the right thing, set good examples for their children and have comfortable homes. For sustained change, respondents recommended continued awareness and education, disincentives and incentives. Findings support some aspects of a social-psychological model, with emphasis on altruistic and egoistic motives for behavioral change. These studies may have implications for situations where residents are not billed for individual energy use, including other government-subsidized facilities, master-metered apartments and university dormitories'.

Michaelis (2003), Sustainable consumption and greenhouse gas mitigation

Michaelis (2003, p.S135) provides a broad overview of sustainable consumption and greenhouse gas mitigation, arguing that existing government 'policies that seek to manage or control consumption, or persuade consumers to change their behaviour, are important but unlikely to be sufficient to bring about sustainable consumption'. Michaelis (2003, p.S135) proposes a 'complementary strategy [that] would establish partnerships with the public and stakeholders, developing shared visions and approaches, supporting innovation and experimentation and learning from outcomes'. Michaelis notes that consumption is at least partly a way of establishing identity and group membership, so it is crucial to establish groups and partnerships that support sustainable patterns of consumption; some models include the US *Simplicity Circles*, the Global Action Plan and green consumer groups.

Moisander (2000), Group Identity, Personal Ethics and Sustainable Development

Moisander (2000) critiques existing social marketing research for its individualistic, rationalist and experimentalist assumptions. She argues that 'it would be useful to investigate green consumerism as a social and cultural phenomenon... This would seem to require a truly descriptive approach, focusing on culturally shared ideas, meanings and signifying practices that constitute the dominant discourses on green consumerism' (Moisander 2000, pp.144-145). That is, Moisander argues for a constructionist

approach that recognises the multiplicity of personal identity and the diverse ways in which meaning is formed through different discourses.

Pyrko and Norén (1998), Can we change residential customers' energy attitudes using information and knowledge?

Pyrko and Norén (1998) identify different perspectives for examining the interactions between behaviour and energy use. The **technological** perspective treats individuals as physical units, or part of a technological system, and has little to say about human dynamics and bounded rationality. The **economic** perspective assumes that producers and consumers are rational decision makers. The **psychological attitude model** assumes that energy efficient behaviour automatically follows from changed attitudes towards energy efficiency; this model has performed poorly in practice. The **sociological** perspective is concerned with individual interactions with social groups and uses sociological variables to explain differing levels of energy use. It employs the concept of 'social load'. The **cultural** perspective argues that an 'individual always acts according to the social and cultural context' (Pyrko & Norén 1998, p.4).

Pyrko and Norén highlight the importance of feedback to show that energy efficiency measures have been successful. They raise the possibility of free energy auditing as a way to engage customers. They advocate conceptual 'clustering' of individual customers into market segments to allow tailoring of offers and information.

Reddy and Painuly (2004), Diffusion of renewable energy technologies - barriers and stakeholders' perspectives

While Reddy and Painuly (2004) focus on renewable energy, rather than demand management, their survey-based approach to the identification of barriers to diffusion is potentially relevant. Stakeholders, including households, were involved throughout the study, from questionnaire development onwards. A sample of 80 residential households was surveyed. The respondents were asked to identify and rank barriers to the diffusion of renewable energy on a number scale; the rankings were later normalised and used to determine a weighted ranking for each barrier. Their approach is useful for identifying the barriers that are the highest priority for policy development.

An earlier paper (Painuly 2001) provides guidance on identification of barriers for further consideration in the survey.

Shove (2003), Comfort, Cleanliness and Convenience: The Social Organization of Normality

Shove (2003) applies a sociological perspective to consumption, everyday life and sustainability. Shove focuses on the concepts of comfort, cleanliness and convenience and how the evolution of these concepts affects consumption. She draws attention to the role of increasing time pressures in establishing new routines and habits and redefining the concept of normal service. Shove (2003, p.199) concludes that:

Rather than promoting energy and resource-efficient versions of products and technologies that inadvertently sustain unsustainable concepts of service, environmentalists should argue for social and cultural diversity. They should do all that can be done to engender multiple meanings of comfort, diverse conventions of cleanliness and forms of social order less reliant on individual modes of co-ordination.

Wilhite (2000), Cross Cultural Perspectives from India and Norway on consumption, sociocultural change and sustainability

Wilhite (2000): 'Theories of consumption which inform sustainability policy are largely based on economic, technical and/or psychological models which make simplifying assumptions about the role of socio-cultural factors. The project's goal is to contribute to the development of a theory that accounts for social and cultural dynamics of change. The method will use a cross-cultural research

design with a focus on India and Norway. Consumption and culture in India are in rapid change. This provides an excellent opportunity to observe the changes in a rapidly growing middle-class. An ethnographic method will be used to draw out important determinants of consumption such as comfort, identity and conceptions of the good life, looking not only at the end consumer, but also at often-neglected institutions such as media and commercial organisations that contribute to the formation and change of consumption. The Indian results will be compared and contrasted with consumption in Norway, drawing attention to cultural differences. Problematic energy consumption domains such as appliances, space comfort and mobility will be highlighted in the analysis. The implications will be drawn for sustainable consumption policy in both countries and for the transfer of knowledge and technology (in both directions) surrounding sustainable consumption practices'.

The cultural context of Wilhite's (2000) study is not transferable to Australia, however his methods and research questions are potentially transferable. Wilhite uses ethnographic fieldwork, specifically a participant-observer approach, to explore everyday energy consumption patterns and habits. This method requires the researcher to live with the research subjects and get to know their culture and values. Wilhite uses informal and formal interviews to complement this approach.

Relevant research questions listed by Wilhite (2000) include:

- What are the material content of the house and the household's means of transportation and how have they changed over time?
- How do people use appliances and how has acquisition of appliances affected daily life patterns?
- What are notions of the 'good life', where do they come from and how are they changing?
- What are the notions of a comfortable indoor climate (both summer and winter) and how have they changed?
- How do people use their time and how have experiences of time and the way it should be used changed?
- What are the notions of hygiene and are they changing?
- How do people use their income and how has that changed?
- How are Western-based notions of 'the modern household' (i.e. appliance intensive) affecting the culture of the home and changes in consumption?
- In what ways are existing values (such as frugality) impeding or accelerating changes in consumption?
- How important to consumption is identification with one's own caste, class and gender and how important is establishing differences to other classes and castes?
- How do gender roles differ in consumption practices and how does changing consumption affect gender?
- What are the connections between changing consumption and developments in local media, international media and advertising?
- What do people know about environmental impacts of consumption? Is the environment an issue in consumption choice? Are people recycling, buying organic products, avoiding throwaway products, etc.?

- How much do people know about their energy consumption? Are they interested in reducing consumption? Why (or why not)?

Wilhite & Ling (1995), Measured energy savings from a more informative energy bill

Wilhite & Ling (1995, p.145): 'In this paper, we present the results of a three-year investigation of the relationship between billing information and household energy consumption in Oslo, Norway. The hypothesis tested in the study is that a more informative energy bill will result in more efficient energy use in the home. The consumption data from the third and final year of the experiment confirm the hypothesis in a resounding way: more informative bills resulted in energy savings of about 10%. Questionnaire and interview data show that those who received experimental bills paid more attention to the bills, were more likely to discuss bills with other members of the household and were positive to continuing with the experimental billing system. There are greater costs associated with the more frequent and informative bill, which was tested, but we have estimated that costs are minimal in relation to savings. Each kWh of saved energy has a cost of only about 0.07 Nkr (\$0.01). Since the techniques which were tested do not require extensive training or major technical innovations, they can be easily put into practice. These results on energy savings and consumer response to better billing feedback should be of interest to the many utilities around the world which have billing systems similar to the one in Oslo'.

Wilhite & Lutzenhiser (1999), Social Loading and Sustainable Consumption

Wilhite & Lutzenhiser (1999) use the concept of 'social load', analogous to the concept of load in energy supply systems, to explore the sustainability of consumption. They define 'social base load' as the demand for energy produced by ordinary, routine, regular activities, such as cooking, cleaning, washing, heating, cooling, and commuting. While this load fluctuates on a diurnal and seasonal basis, it produces a fairly steady demand on energy supply. 'Social peak load' refers to increases in consumption due to certain social events and activities that are driven by cultural or social requirements, rather than material necessity. The purchase of a large, inefficient car to establish status is an example of social peak load. The authors note that there is a continual redefinition of what is social base load and what is social peak load, as new activities become habits.

The dynamics affecting social load include the use of consumption to establish and display status, to establish membership and compliance to the conventions of society and to provide greater security and convenience. Further, social loads are embedded in systems and structures. The important point for policy and research is that all energy consumption ultimately serves a social purpose; so changing patterns of energy consumption requires attention to these social purposes. The authors encourage research that draws attention to the social life of things, identifies meanings and values associated with particular types of consumption and asks questions about alternatives to conspicuous consumption.

Wilhite et al (1996), A cross-cultural analysis of household energy use behaviour in Japan and Norway

Based on ethnographic research in Norway and Japan, Wilhite et al (1996) draw attention to cultural differences in patterns of energy consumption, related to the differing cultural significance of particular activities in each country. This is a reminder that research for the current project should not rely too heavily on results from other countries. Rather, it should explore energy consumption from a uniquely Australian cultural perspective. The cultural background of participants is therefore an important consideration for the research design.

Wilhite et al (2000), The Legacy of Twenty Years of Energy Demand Management: we know more about Individual Behaviour but next to Nothing about Demand

Wilhite et al (2000) provide a history of energy demand management, arguing that social research in this area has focused primarily on 'behaviour', which has diverted attention away from the social

norms and networks of social institutions that shape demand for energy services. They reposition the energy demand debate by 'asking how conventions of social life come to be established and what this means for energy demand' (Wilhite et al. 2000, p.118). They point out that 'the escalation of energy demand and the evolution of consumer expectations [are problems] to be explained and understood in social, cultural and collective, rather than individualistic terms' (Wilhite et al. 2000, p.118). In addition, they argue for research that seeks to determine how particular energy consuming practices came to be valued. They point out that 'energy is not a meaningful term when it comes to understanding consumption and demand' and that a focus on the services provided by energy is more appropriate (Wilhite et al. 2000, p.118).

Wilhite et al outline the research questions that they believe are important. Research needs to focus on 'changing conventions of comfort, cleanliness and convenience' and on the network of relationships with 'builders, utilities, estate agents, government regulators, retailers and engineers' that shapes energy consumption at the residential level (Wilhite et al. 2000, pp.119-120). These institutional and social relationships can create opportunities for demand management, but often impose constraints. Wilhite et al suggest that sociology, anthropology and social history offer promising research approaches.

Wood & Newborough (2003), Dynamic energy-consumption indicators for domestic appliances: environment, behaviour and design

Wood & Newborough (2003, p.821) review literature 'concerning the application of information-feedback methods for saving energy in the home'. Particular attention is given to electronic feedback via smart meters and displays, or 'energy-consumption indicators' (ECI). The authors find significant reductions in energy consumption for households employing an ECI compared to those provided with antecedent information and therefore emphasise the importance of regular feedback on energy consumption.

2.2.3 Specific research on disadvantaged households

Boardman & Darby (2000), Effective advice: Energy efficiency and the disadvantaged

Boardman & Darby (2000, p.iii) seek to 'provide a better understanding of how disadvantaged householders can be encouraged to seek and act on energy efficiency advice; how they prefer to access advice; and the relative effectiveness of different modes of giving advice'. They define advice as part of a process with three stages: raising awareness, provision of advice by experts and confirmation and reinforcement by the advisers and feedback to the householder. The report emphasises the role of the householder in defining the appropriate form of advice.

For Boardman & Darby, effective advice to the disadvantaged has some or all of the following characteristics:

- Seeking out potential clients and offering a Freephone service
- Offering home visits where needed
- Having information on grants from all sources and assisting customers in applying for them
- Having well-trained and experienced staff
- Using bills as a source of information and feedback
- Viewing advice as an interactive process between householder and adviser, in which dialogue is necessary and productive

- Networking with trusted agencies who are responsible for visiting people in their homes and giving assistance and training to such frontline workers
- Providing follow-up visits or phone calls as needed
- Taking into account the fact that many customers have difficulty with seeing, hearing, mobility, literacy and numeracy.

Lawrence (2002), Electricity, It's Just Essential: Low Income Electricity Consumers Project Report

Lawrence (2002) reports on research into the impacts of electricity reform on low income electricity customers in South Australia. The research used a variety of methods, including phone and mail surveys of households, consumer focus groups and establishment of Community Energy Action Groups. The report emphasises the need to engage low-income households through targeted advice and support, combining behavioural change with simple efficient technologies. Social marketing is recommended as a way of reaching particular social groups. The report provides some discussion and recommendations on the types of action needed to encourage demand management in low-income households.

Wadsworth (1997), Everyday evaluation on the run

While not specifically focused on electricity customers, Wadsworth's (1997) discussion of the 'critical reference group' is useful for identifying ways to work with disadvantaged households. For Wadsworth, the critical reference group is the group of people that the research is *for*. Taking a critical reference group perspective demands that the researcher cultivates certain qualities:

- A capacity to identify the interests of those who are meant to be served by the research and how they might currently be disadvantaged
- A capacity to identify with those interests
- A profound respect for those who belong to the critical reference group and a deep recognition of the legitimacy of their/our viewpoint
- Such respect requires direct personal experience of, or empathy for, the critical reference group's situation
- A sharply felt dissatisfaction with any conditions impinging on the critical reference group which are identifiably detrimental to the meeting of their/our growth or development
- A consequent commitment and determination to work in relation to the critical reference group towards the best way of overcoming these conditions
- The adoption of a collaborative question-raising problem-solving style involving working in or with the critical reference group
- The adoption of effective theory and thoughtful practice which focuses on those groups who benefit from existing conditions which may hurt critical reference groups
- The courage to retain a critical reference group perspective in the face of pressure to abandon it.

These qualities should be central to any research with disadvantaged households.

WREAG (2004), Powering Poverty

This report by the Western Region Energy Action Group (WREAG 2004) investigates the impact of the 2002-2003 electricity price rises on 12 low-income households in South Australia. It uses cases studies on each household as its main research method. The report identified some barriers to improving energy efficiency that may be relevant to this project, including:

- Lack of energy efficiency of public housing
- Lack of affordability or interest as a tenant to invest in substantial home modifications to increase energy efficiency
- Lack of affordability to purchase more expensive energy efficient appliances.

The report makes several policy recommendations, including:

- Introduction of socially responsible tariff structures, implemented as inclining block tariffs in the 'standing contract'
- Improving housing stock through retrofits, simple, low-cost actions and no-interest loans for energy-efficient appliances
- Subsidisation of energy bills for people who must have heating or cooling to prevent serious illness
- Establish independent advocacy for energy consumers.

3 RESEARCH DESIGN

The literature review, discussed in Section 2, informs and justifies the choice of research design for the project. A good research design must start with the adoption of an appropriate theoretical framework. The choice of theoretical framework is discussed in Section 3.1. The theoretical framework guides the choice of research questions, discussed in Section 3.2. Section 3.3 discusses research methods identified during the literature review and Section 3.4 outlines the specific methods adopted for this project.

3.1 *Theoretical framework*

3.1.1 Individual behaviour or social construction of demand?

Wilhite et al (2000), in their discussion of the history of energy demand management programs, distinguish between literature focusing on individual behaviour and literature focusing on the social construction of demand. This theoretical distinction was evident in the literature reviewed in Section 2 and is worth considering in more detail here.

Wilhite et al argue that the role of social science in energy demand management programs has historically been limited to understanding or accounting for variations in end-user behaviour as an input to other technological or economic energy demand models. This **behavioural** research focuses on the individual ‘as the locus of control and change’ (Wilhite et al. 2000, p.114). It uses psychological rather than social theories to explain why individual behaviour differs from the rational, utility-maximising behaviour assumed by economic theory. One such theory is the information-deficit model, discussed by Jaeger et al (1993), that assumes failure to adopt rational demand management strategies is explained by a lack of information or knowledge.

According to Wilhite et al (2000, p.118), behavioural approaches focus on consumer choice, assume that ‘choices are driven by economics’ and invoke ‘a distinction between needs and wants, and assume that the latter are subject to individual preference’. Much of the survey work reviewed in Section 2 adopts a behavioural approach, seeking to understand individual behaviour without much reference to the social context for, and constraints on, that behaviour.

The behavioural approach has some important limitations. First, individual behaviour is not motivated by a desire to consume energy, but by demand for the services that energy can provide. These energy services (e.g. comfort, cleanliness and convenience) are socially and culturally influenced. So, to focus on individual behaviour in isolation from the social and cultural context is to ignore many of the factors that shape energy demand. A comprehensive understanding of energy demand recognises that the individual is embedded in social networks with particular cultural commitments.

Second, there is a great deal of evidence that human behaviour is not always economically rational. Behaviour is influenced by the particular value commitments of the individual, the circumstances or context in which they find themselves and institutional constraints that place boundaries on possible behaviours. Again, a complete understanding of energy consumption is not possible without attention to these varying factors, most of which are linked to social and cultural context.

In response to the limitations of behavioural approaches, Wilhite et al (2000) advocate an alternative focus on understanding the social construction of demand. **Constructionist** research focuses attention on the way that demand for energy services is socially and culturally constructed. According to Wilhite et al (2000, p.118), a constructionist approach differs from a behavioural approach in recognising that both producers and consumers are implicated in the evolution of demand, that there are social and cultural constraints on the choices they can make, that economics is relative and contextual and that both needs and wants are socially constructed so the distinction between the two is

not useful. Further, constructionist work focuses on 'changing conventions of comfort, cleanliness and convenience' (Wilhite et al. 2000, p.118).

Several of the articles reviewed in Section 2 advocate constructionist research as a promising way forward for social research on energy demand (e.g. Jaeger et al. 1993; McMakin, Malone & Lundgren 2002; Michaelis 2003; Moisaner 2000; Wilhite et al. 2000). In keeping with its focus on social groupings and relationships, constructionist research is typically conducted with groups, rather than individuals. A constructionist framework implies a qualitative and open-ended approach with a smaller group of people than is typical in survey-based approaches. Constructionist approaches emphasise social learning, community development, dialogue and participation.

One approach to constructionist work is to establish community partnerships that seek lasting change. For example, Michaelis (2003, p.S135) proposes a 'strategy [that] would establish partnerships with the public and stakeholders, developing shared visions and approaches, supporting innovation and experimentation and learning from outcomes'. Michaelis notes that consumption is at least partly a way of establishing identity and group membership, so it is crucial to establish groups and partnerships that support sustainable patterns of consumption; some models include the US *Simplicity Circles*, the Global Action Plan, green consumer groups and the Cool Communities program in Australia.

The literature reviewed in Section 2 generally supports the notion that research conducted within a constructionist theoretical framework, as opposed to a behavioural framework, is likely to provide new insights into household energy consumption. A constructionist framework allows the researcher to explore household energy consumption in greater depth, in terms that the householder is comfortable with. It allows development of community capacity for demand management, both during and after the research. Section 2.2.1 indicates that there has been relatively little recent research of this kind in Australia, so a constructionist approach has the potential to provide important new insights into the type of demand management programs that are likely to be most effective in the Australian cultural context. Further, the research questions listed in Section 1 are more amenable to a constructionist approach than a behavioural approach, as consumer expectations, concerns, needs and wants are all socially influenced. The Institute therefore adopted a constructionist, community-based theoretical framework as the first element of the research design for this project.

3.1.2 Participatory action research

There are numerous ways in which a constructionist research framework can be implemented. The Institute has adopted participatory action research as the guiding methodological approach for this project. Action research is:

...a participatory, democratic process concerned with developing practical knowing in the pursuit of worthwhile human purposes, grounded in a participatory worldview...It seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people and more generally the flourishing of individual persons and their communities (Reason & Bradbury 2001, p.1).

In a participatory action research approach, the researchers are actively and explicitly involved in creating change as part of the research process. This type of approach is consistent with the organisational objectives of MEFL and the Institute, both of which are committed to identifying and supporting practices that reduce household energy consumption.

Further, the intention of action research is to establish ongoing processes to support the critical reference group (to use Wadsworth's (1997) terminology). In this case, the critical reference group includes householders, particularly disadvantaged householders. The advocacy component of this project will provide an opportunity to establish ongoing processes to support householders. In addition, it is also important to design the research itself so that it assists participants with their

personal development. A participatory action research framework therefore points towards specific research methods that mix community education with social research.

An action research approach requires significant flexibility to respond to concerns raised by the critical reference group. It typically involves groups rather than individuals, however this does not rule out the use of individual interviews to explore particular issues. It may employ surveys to explore particular issues, however it does not try to replicate the kind of large-scale surveys conducted by ABS (2002) and AGO (2003). Participatory action research often seeks to promote deliberation. That is, it informs and challenges participants so that they can reach a considered understanding of their position on a particular issue.

3.2 Research questions

The research questions for the project were listed in Section 1 and are repeated below. The purpose of this section is to provide some clarification of each question, given the theoretical framework discussed in Section 3.1. The discussion here feeds into the choice of specific research methods, in Section 3.4. Each question is discussed in turn below.

1. What are consumers' expectations about comfort, convenience, security and other concerns that impact upon electricity use? What are the implications for patterns of electricity use and service provision?

The emphasis in Research Question 1 on 'comfort, convenience, security and other concerns' is intended to convey a focus on the energy services that people demand, rather than the actual quantity of energy consumed. A consistent theme in the literature is that people relate to the services that energy can provide, not to energy itself. Indeed, it is not unreasonable to argue that electricity use is only a by-product of demand for energy services. Theoretically, these services could be supplied in other ways, without using electricity.

Constructionist approaches, in particular, need to focus on the way that demand for energy services is socially and culturally constructed. In other words, research questions should focus more on the way that householders form and change their understanding of comfort, cleanliness, convenience, security and appearance than on their understanding of energy. ABS (2002) survey results provide support for the idea that comfort and convenience are of more interest to most people than energy consumption or cost savings. Further support is provided by Wilhite et al (2000) and Shove (2003).

As discussed in Section 3.1, the social and cultural context influences the expectations that people form about comfort, convenience, security and other energy services. Particularly important are the social relations in which individuals are embedded. Relationships with utilities, builders, electricians, landlords, estate agents, regulators, government departments, advertisers, media, friends, relatives and other actors all influence demand for energy services either facilitate or constrain the action that people can take to manage their demand. Research Question 1 draws attention to the importance of these social relations.

2. What are therefore the most effective approaches to products/services to respond to the needs of small consumers to help them understand and manage their overall consumption and peak demand for electricity?

Research Question 2 moves from the social influences on energy demand to practical actions that householders can use to better understand, manage or reduce their electricity demand. The intent is that this question will be informed by responses to the first question. There are some important distinctions within this question that require clarification.

The literature reviewed in Section 2 makes a distinction between purchase decisions and habitual behaviour. When a householder purchases or leases an energy-using product, like a house or an

appliance, a particular level of energy consumption tends to be locked in for long periods. For example, no matter how many energy saving tips a householder follows, an inefficient refrigerator will still consume much more energy over its lifetime than an efficient refrigerator. Many policy programmes seek to influence purchasing behaviour so that efficient products gradually replace inefficient products in the housing stock. This is an area where regulation has been reasonably successful internationally and in Australia, through minimum energy efficiency standards that force the least efficient appliances off the market and mandatory energy labelling standards that create market demand for the most efficient appliances.

Habitual behaviour is the way that people use their energy-using products in between purchase decisions and can also have a major influence on total energy consumption. It is more difficult to influence habitual behaviour through regulation, so policy makers rely on education, pricing mechanisms and incentives to encourage behavioural change. Both habitual behaviour and purchasing decisions are of interest for this project. Research Question 2 summarises this dual focus as 'products/services'.

A second important distinction is between overall energy demand and peak demand. If it is true that householders are primarily interested in energy services, then they are likely to have little interest in peak demand, as long as their total demand for services is met. However, peak demand is of particular interest to utilities and regulators concerned with ensuring that the electricity grid is capable of supplying this demand. Utilities and regulators are contemplating various ways of reducing peak demand, many of which will directly impact householders (e.g. time-of-use tariffs, embedded generation and remote-activated load control). It is important to test some of these ideas with householders to inform further policy development.

Many of the ideas currently being discussed as ways of encouraging reductions in overall and peak electricity demand use feedback mechanisms and price signals. An objective of the research is to test the effectiveness of these ideas with householders, either through hypothetical discussion or real product trials.

3. What are the particular issues around these products/services for disadvantaged consumers and what can be done to minimise the disadvantage?

The experiences of disadvantaged households will be different to those of other households. The social influences on their demand for energy services will be different, the products and services they prefer to manage their demand will be different and there may be additional products and services that can help to reduce disadvantage with respect to electricity demand. Research Question 3 draws attention to these differences and acts as a reminder that the research methods need to provide access to both typical and disadvantaged households and be sensitive to their different experiences.

4. What are the existing rules and regulations, industry structures, government policies etc that may impede the implementation of effectiveness of these approaches?

Research Question 4 links the findings from the first three research questions to social and political institutions. The intent is to identify those institutions that create problems identified by householders or impede solutions suggested by householders. Government departments and non-government organisations (NGOs) dealing with energy and consumer advocacy already have extensive knowledge of the institutional barriers to effective demand management. Consequently, the research methods need to draw on these experiences, as well as those of householders.

5. What changes are required to the National Electricity Code, or jurisdictional laws, regulations and policies so as to remove “roadblocks” that inhibit the development of a demand side response by small consumers?

Research Question 5 provides a link to the advocacy component of the research by identifying institutional changes that can improve demand management by householders. Again, the experiences of government departments and NGOs will be valuable here. Two significant challenges are to link the experiences of householders to specific institutional changes, and to identify institutional changes that are politically feasible.

3.3 Research methods in the literature

Having selected a theoretical perspective, and identified important elements of the research questions, the next step is to select a specific research method. As a starting point, this section briefly summarises the main categories of research method identified during the literature review. This is not an exhaustive survey of social research methods, but a list of those that were employed in the relevant literature on household energy demand.

3.3.1 Surveys

Survey or questionnaire-based approaches were very common in the literature (e.g. ABS 2002; AGO 2002, 2003; Clark, Kotchen & Moore 2003; Community Power n.d.; Jaeger et al. 1993; McMakin, Malone & Lundgren 2002; Nancarrow, Smith & Syme 1996; Reddy & Painuly 2004; Roy Morgan Research 2002; Strahan Research 2002, 2003a, 2003b; Syme, Fenton & Coakes 2001). Surveys were conducted primarily by mail or through telephone interviews.

Shipworth (2000) discusses survey design, issues of survey bias and other problems with surveys. While surveys are undoubtedly useful for obtaining a large sample that may be representative of a larger population, it is difficult to use surveys to draw out detailed information on the motivations for energy consumption and demand management. In addition, surveys tend to structure responses in ways that the respondents might not choose if a more open discussion were allowed. Further, surveys have been widely used to explore energy consumption at the household level for many years without achieving substantial reductions in householder energy consumption. There is a sense in the literature that current research priorities demand a deeper, context-specific analysis that surveys cannot provide.

3.3.2 Interviews

Several studies used detailed interviews, usually unstructured or semi-structured, to explore energy consumption issues (e.g. Brandon & Lewis 1999; Kempton & Layne 1994; Quay Connection 1999; Wilhite 2000). Kempton and Layne (1994) used a combination of semi-structured interviews and fixed questions that strikes a balance between comparability across respondents and sensitivity to individual context. Wilhite (2000) employed interviews in the context of a broader program of ethnographic research. Wilhite's method is less applicable for this project, as the researchers are already members of the culture of interest and the time available does not permit a long period of ethnographic study.

Compared to surveys, interviews allow a stronger focus on meaning and values, as the interviewer can pursue a line of questioning that draws out these elements in considerable detail. Interviews are useful for resolving conflicts between different answers given by interviewees and for drawing out unconscious or hidden meanings. Interviews help to reveal ways of thinking about an issue that might not have been immediately apparent to the researcher. They are therefore useful as an initial research method, which can later be supplemented with surveys once the important issues have been identified.

3.3.3 Group discussion (focus groups)

Shipworth (2000) identifies group discussion, or focus groups, as a rapid way to gather data that can encourage people to articulate their views in more detail than surveys. A group of people that is representative of the population of interest is gathered together to discuss issues that are relevant to the research. The effective application of a group discussion approach relies on expert facilitation. Several studies used focus groups in their research (e.g. AGO 2002; Brandon & Lewis 1999; GFCV 1991; Nance 2004; Quay Connection 1999). The GFCV (1991) lists some of the advantages of group discussion, including the stimulating atmosphere that triggers other thoughts and ideas, the lack of pressure to make up answers and the space to expand on and refine answers.

3.3.4 Market segmentation

Market segmentation, or clustering, is not so much a separate approach as a way of structuring data gathered through surveys, interviews, group discussion or other means. Based on theoretical and empirical analysis, householders are assigned to particular groups, or market segments, to facilitate tailoring of demand management programs. Several studies categorised householders in various ways (e.g. Barr, Gilg & Ford in press; Dake & Thompson 1999; Jaeger et al. 1993; Keys Young 2002; Nancarrow, Smith & Syme 1996; Quay Connection 1999; Shipworth 2000). Segmentation of this type is typical of social marketing approaches. There is no particular agreement in the literature on what type of categorisation or market segmentation is appropriate; different studies arrive at different conclusions, some of which were outlined in Section 2.2.

The particular categories used in different studies often lack sensitivity to the fact that householders will have different motivations at different times and in different circumstances. Nevertheless, there is little doubt that demographic characteristics, value commitments, group identity and involvement in social networks all have an important influence on household energy consumption. Demand management programs that recognise the multiplicity of perspectives with respect to energy consumption are certainly an improvement on those that treat householders as homogeneous rational actors.

Consequently, market segmentation may be useful in this project to the extent that it allows better tailoring of demand management programs. However, rather than imposing categories on householders prior to the research, it is important to allow any categories to emerge through the research. This allows sensitivity to different contexts, cultural commitments and personal values.

3.4 Research methods adopted for this project

Of the research methods discussed above, interviews and group discussion are most consistent with the theoretical perspective and research questions. Both have been used in this project. The specific methods are outlined in the sections below. Further detail on the workshop design is provided in Section 4.

3.4.1 Stakeholder interviews

Unstructured interviews with stakeholders were used to identify relevant literature and research and explore particular issues, such as regulation and pricing. These interviews were not the primary research method. Rather, they were used to clarify particular issues where it was felt that expert input would be more useful than householder input, including methodological issues and regulatory issues. The interviews were unstructured to allow the conversation to range widely and let important issues emerge over time. However, each interview had a particular purpose, which was used as necessary to guide the discussion.

Table 1 lists the main research interviews conducted during the research. Some interview participants did not wish to be identified, so names of interviewees are not shown in Table 1, and some organisation names are also excluded. Recruitment of interviewees was purposive, aimed at organisations known to have expertise in the specific areas of interest. Where there was an intention to use interview findings in the research, interviewees were asked to complete and sign a participation agreement. A copy of the participation agreement is provided in Appendix A. Interviewees could choose to have direct quotes attributed to them or for the material to be used without identifying them in any way.

Table 1: List of research interviews.

Interviewee	Purpose of Interview	Date
Victorian Council of Social Services (VCOSS) – Energy Group	Understanding the specific issues faced by disadvantaged households and how to access this group in the research	13 Jul 2004
Essential Services Commission (Victoria)	Consultation with regulators about electricity pricing issues	13 Jul 2004
Representatives from VCOSS, CUAC, Council on the Ageing (COTA) and Victorian Greens	Discussion of proposed policy options for testing in householder workshops with consumer advocacy groups, focusing particularly on issues for disadvantaged households	24 Aug 2004
Electricity Retailer	Understanding electricity retailer perspective on pricing, tariff structures and drivers	26 Aug 2004
Energy and Water Ombudsman NSW	Understanding the role of the independent Ombudsman, their experiences with householders and their suggested policy priorities	1 Sep 2004

3.4.2 Householder workshops

The primary research method employed during this project was a series of twelve householder workshops held in NSW and Victoria. A workshop approach was adopted because it offered the following benefits:

- Direct contact with householders and their concerns
- The ability to combine an education component that would be attractive to participants with a research component that would be useful for the project
- Ability to deliver through existing community and peer support networks, thereby achieving wider participation and greater participant diversity
- Access to a greater number of participants than would have been possible with interviews.

Staff from the Institute and/or MEFL facilitated each workshop. Nine workshops were held in Victoria and three in NSW. A total of 106 householders attended a workshop and consented to participate in the research. Workshop sizes ranged from two to nineteen participants, with an average of nine participants. Most workshops were two hours in length, although some were shorter. Table 2 lists the twelve workshops, their identification code, their location and the workshop date and time.

The workshops included two main sessions. The first was an education session focusing on practical actions that householders can take to manage their electricity demand and discussion the social influences on electricity consumption. The second was a research session that sought householder

feedback on a range of conceptual policy options. Further details on the workshop design are provided in Section 4.

Table 2: List of research workshops.

Workshop Code	Participating Group	Location	Date and Time
V1	Northern Migrant Resource Centre	Coburg, Victoria	12 August 2004 10 am – 12 noon
V2	The Avenue Neighbourhood House	Blackburn, Victoria	13 August 2004 1.30 pm – 3.30 pm
V3	Chadstone Neighbourhood Renewal Project	Chadstone, Victoria	24 August 2004 6 pm – 8 pm
V4	Migrant Information Centre (Eastern Melbourne)	Mitcham, Victoria	25 August 2004 2.30 pm – 4.30 pm
V5	Public workshop	Coburg, Victoria	25 August 2004 7 pm – 9 pm
V6	Indigenous householders	Ringwood, Victoria	27 August 2004 11 am – 1 pm
V7	Public workshop	Ballarat, Victoria	31 August 2004 1 pm – 3 pm
V8	Arabic-speaking women's group	Fawkner, Victoria	6 September 2004
V9	Salvation Army	Brunswick, Victoria	8 September 2004 2 pm – 4 pm
N1	Bondi/Waverley ECHO Discussion Group	Waverley, NSW	30 August 2004 10.30 am – 12 noon
N2	Harris Community Centre (Chinese speakers)	Ultimo, NSW	31 August 2004 10.30 am – 12.30 pm
N3	Harris Community Centre (English speakers)	Ultimo, NSW	31 August 2004 1.30 pm – 3.30 pm

3.4.3 CENT-A-METER™ trials

To complement the conceptual testing of policy options in the householder workshops, a small trial of a particular technological option was conducted. The trial tested the value to householders of having a Clipsal CENT-A-METER™ installed. A Cent-A-Meter (CAM) provides an instantaneous display of the amount and cost of electricity used in a home, on a portable display. An electrician must install the device. AGL provided five of the devices for installation in four homes and one community centre in the Blackburn and Nunawading areas of Melbourne.

Participants were asked to sign a participation agreement; an example is provided in Appendix A. The meters were provided and installed free of charge by an electrician from AGL. Participants were asked to sign AGL's standard AGL Assist Tax Invoice to cover installation of the meter.

Each participant was given about ten days to experiment with the device and then interviewed about their experiences. The interviews were semi-structured, covering demographic information, background on the participant's energy use, any previous attempts to reduce energy use and any changes in their behaviour induced by the CAM. A copy of the interview questionnaire is provided in Appendix B.

4 WORKSHOP DESIGN

This section provides a detailed discussion of the workshop design. Section 4.1 defines the critical reference group for the workshop research and draws out issues for workshop design. Section 4.2 discusses the choice of workshop structure and how it relates to the intended audience. Section 4.3 outlines the materials developed to support delivery of the workshops. Section 4.4 discusses the selection and description of policy options for consideration during the workshops. Section 4.5 outlines the participant recruitment strategy. Finally, Section 4.6 discusses data collection.

4.1 Critical reference group and sampling strategy

The critical reference group for the workshop research included all householders served by the National Electricity Market. This is the group that the research was intended to serve and from which workshop participants would need to be drawn. An early decision for the workshop design was whether to attempt representative sampling across the critical reference group. It was felt that this was not feasible within time and budget constraints for the research, given the geographic breadth of the National Electricity Market and the large sample sizes required.

The preferred approach was purposive sampling to ensure that the perspectives of diverse categories of householders were included in the research. An advantage of the purposive sampling approach was that it allowed targeted recruitment of disadvantaged, culturally diverse and linguistically diverse households to address Research Question 3.

The research team and Research Reference Group (RRG) identified householder categories within the critical reference group that might have particular experiences of interest for the research. These categories included:

- The general public
- People living in regional areas
- Large households
- High energy-users
- Recently arrived migrants
- Young families
- Low-income households
- People from a non-English speaking background
- Indigenous people
- Elderly people
- Housing tenants
- People with disabilities, carers and workers with people with disabilities.

The research team pursued representation from all these categories in the final program of workshops.

Geographic distribution of workshops across the National Electricity Market was limited due to time and budget constraints. However, to provide insights into different issues that might apply in different states, the research team pursued workshops in NSW, Victoria and South Australia. The choice of states in which to pursue workshops was linked to the membership of the RRG. Members were located in Sydney, Melbourne and Adelaide, providing expert knowledge of relevant issues in each state.

4.2 Workshop structure

As noted above, the critical reference group included householders from various categories. The research team was very aware of the responsibility to provide householders with an educational experience that would assist their own personal development and make the experience of participation

a rewarding one. At the same time, it was crucial to balance this educative role with data collection for addressing each of the research questions.

These twin objectives shaped the workshop structure. The workshop was designed to include two main sessions. The first was primarily an education session, focusing on practical actions that householders could take to reduce or manage their electricity use at home. The second was primarily a research session, seeking input from householders on policy options that governments, businesses or other groups could pursue to help them to reduce or manage their electricity use. Although the first session was primarily education-focused and the second was primarily research-focused, there was significant overlap and both sessions ultimately contributed towards educative objectives and research outcomes.

A sample workshop agenda is provided in Table 3. Further details on the structure of each of the workshop sessions are provided below and in the *Householder Workshop Plan* in Appendix C.

Table 3: Sample agenda for a two-hour householder workshop.

Workshop Session	Time Allowed (120 minutes total)
Introduction	5 minutes
Action you can take to reduce electricity use at home	70 minutes
Your house – an overview	5 minutes
Room 1 discussion	20 minutes
Room 2 discussion	20 minutes
Room 3 discussion	20 minutes
Summary of action householders can take	5 minutes
Action others can take to help you reduce electricity use at home	40 minutes
Session on electricity bills	5 minutes
Session on policy options	30 minutes
Voting	5 minutes
Workshop evaluation and wrap-up	5 minutes

4.2.1 Introduction

The purpose of the introduction session was to introduce the workshop facilitators and participants, describe the project objectives and outline the way that workshop results would be used. This session was also used to discuss any concerns householders had about participation and to complete participation agreements and demographic data forms. A copy of the standard workshop participation agreement is provided in Appendix A. Section 4.3 discusses these workshop materials in more detail.

4.2.2 Practical education session

The purpose of the education session was to teach householders about practical actions they could pursue to reduce or manage their electricity use, while also collecting data on the social influences on household electricity use and the barriers to demand management. The education session was divided into several sub-sessions. The first sub-session started with a brief overview of electricity use in the home, covering the contribution of electricity to average residential energy use and the average contribution of different end uses to household electricity use. It continued by asking the following questions about living patterns and locations of electricity use:

- Thinking about your home, where do you or your family spend most time?
- Why? What sorts of reasons make you use this space the most?
- Where in your home do you think you use the most electricity (e.g. bathroom, kitchen, living room, bedroom)?

The responses to these questions were used to select three rooms to focus on in the subsequent sessions. The choice to structure the discussion around the different rooms in the home was made to facilitate a focus on the energy services that participants desired in that room. Further, the research team felt that participants would be more comfortable talking broadly about what they do in different rooms than specifically about particular end uses.

Having selected the three rooms to consider in more detail, the facilitators used the following generic three-stage process and questions to drive discussion about each room.

1. What electricity do you use in this room?
 - What types of electric appliances and services do you have in this space?
 - Why did you choose these appliances / products or did you inherit them?
 - What electric service or appliance do you use the most in this space?
 - What do you think uses the most electricity in this space?
2. Practical measures to reduce electricity use in this room
 - Do you do anything to try and cut back electricity in this space (e.g. block draughts, use compact fluorescent lights (CFLs), choose energy rated appliances, turn off appliances, keep to a lower temperature)?
 - How did you decide on these ideas for cutting back? Why these?
 - What are the barriers or things that stop you from reducing electricity here?
 - What incentives or aids to reducing electricity have you come across?
 - What would motivate or assist you to reduce electricity here?
3. Room case study
 - Discuss case study of this room showing typical costs of main appliances, practical actions that householders can take (which have not already been discussed), and bill reductions that are possible when changes are made.

In practice, the three stages were not usually linear. The discussion moved back and forth through the stages in reaction to issues raised by householders. The most important aspect of the process was to link practical case studies on potential energy and cost savings in a particular room to the actual behaviours discussed by participants.

A final sub-session summarised the energy-saving actions discussed during each of the room discussions and any other actions that had not already come up during the discussion. Participants were also given an opportunity to identify any additional options that were not covered.

The materials used to support this session included overhead slides, information sheets for participants and examples of energy-saving equipment (e.g. compact fluorescent light bulbs and AAA-rated showerheads). The workshop materials are discussed in Section 4.3.

4.2.3 Session on policy options

The session on policy options included two main sub-sessions. The first was a general discussion of electricity bills and any problems that participants had in understanding their bills. In some cases, this included a benchmarking exercise in which participants were invited to share the size of their bill and the facilitator asked questions to identify reasons for high or low bills. In other cases, the discussion explored broader responses to bills, payment issues and relations with the utility company.

The second sub-session ran through a series of 27 policy options, in six categories, that could potentially be implemented to help people manage their electricity use. The policy options were identified from the literature review and drew on the experiences of the research team and RRG. Each policy option was described and participants were given the opportunity to ask clarifying questions or comment on the options. At the end of the discussion, each participant was allocated two votes to assign to their two favourite policy options. The policy options are described in Section 4.3.

4.2.4 Workshop evaluation and wrap-up

In a brief final session, participants were asked to complete a workshop evaluation form and were given an opportunity to raise any further questions or issues that had not yet been addressed.

4.3 Workshop materials

This section describes the various materials developed to support the implementation and evaluation of the workshops, including participation agreements, demographic data forms, a facilitator's pack with overhead projector slides, a set of fact sheets for participants and an evaluation form.

4.3.1 Participation agreements

As noted previously, a copy of the standard participation agreement for the workshops is provided in Appendix C. The research was conducted according to ethical principles, as outlined in the Institute's *Code of Ethics* (available on request). Workshop facilitators explained the purpose of the research to all participants and gave them the option of signing a participation agreement if they wanted their input to be used in the research. When a participant did not provide consent, comments from that participant were not recorded though the participant was at liberty to attend the entire workshop and access resources.

4.3.2 Demographic data form

While the purpose of the research was not to link particular findings to the demographic characteristics of participants, the research team felt that it would be useful to have a general understanding of the

demographic profile of each workshop. A form was developed to collect demographic data from participants. A copy of the demographic data form is provided in Appendix D. Demographic data was stored and aggregated separately from the signed participation agreement forms. The following information was collected, using categories consistent with those used by the Australian Bureau of Statistics:

- Gender
- Age
- Weekly household income (before tax)
- Frequency of electricity bill
- Dwelling type
- Number of bedrooms
- Owner / renter status
- Disability (yes or no)
- Carer of person with disability (yes or no)
- Non-English speaking background (yes or no)
- Aboriginal or Torres Strait Islander (yes or no).

4.3.3 Workshop plan

A *Householder Workshop Plan* (HWP) was developed to guide facilitators through delivery of each workshop. A copy of the HWP is provided in Appendix C. The HWP included notes on workshop preparation, a detailed workshop agenda with notes on other supporting materials, a discussion of data collection practices for the workshops and a series of analytical questions to guide facilitators' thinking during workshop delivery. The HWP was designed so that workshops could potentially be delivered by organisations other than the Institute and MEFL. The reasons for designing the HWP in this way are discussed in Section 4.5.

4.3.4 Fact sheets for participants

To support the delivery of the education session, the research team developed an accessible information package for participants, containing eight fact sheets. The fact sheets covered household energy use, energy saving tips focusing on different rooms (kitchen and dining room, living / lounge room, bedroom, bathroom and other areas), information on retail contestability and a list of phone numbers and websites with further information. Fact sheets were provided to participants during or at the conclusion of the workshop, and were summarised on overhead projector slides used during the workshop. A copy of the information pack is provided in Appendix E.

4.3.5 Facilitator's pack

In addition to the HWP, a facilitator's pack was developed to provide further support for workshop facilitators. A copy of the facilitator's pack is provided in Appendix F. The pack includes copies of the participation agreement, demographic data form, a workshop evaluation form and a set of overhead projector slides to use in running the workshop. The slides provide general information on the share of electricity in the fuel mix, what it is used for, information on practical demand management actions in each room of the home, a summary of policy options and descriptions of each policy option. The selection of policy options for workshop discussion is described in Section 4.4.

Facilitators were also provided with a range of products for display and handling by participants. Though there was some variation between Victorian and NSW workshops, these included: a CFL, a AAA-rated showerhead, a tap-flow restrictor, a draught stopper, an electric timer, a fridge thermometer, foam lagging for hot water pipes and door and window adhesive seals.

4.4 Selection and description of policy options

A particular challenge when designing the workshop was to identify an appropriate set of conceptual policy options for the research session and describe them in language suited to the intended audience. There were two possible approaches. The first was to present a small number of options but describe each in depth. The second was to present a comprehensive set of options and describe each briefly. The research team opted for the second approach, as it was felt that data on householder preferences within a broad set of options was a priority for this project. The research team did not wish to artificially constrain the choice of policy options at this point. Thus, data from this project provides an initial understanding of the types of policy options preferred by householders, providing a foundation for detailed research on those preferred options in the future.

Policy options were developed in six categories, drawing on the literature review and the knowledge and experience of the research team and RRG. Each option is briefly described below. Some of the policy options are new and have not been trialled in Australia. Others have been implemented in particular jurisdictions, or in a limited way, and could potentially be expanded or modified to include all householders. Not all of the options are necessarily feasible or cost-effective – the intention was to test an array of options and identify any barriers to their implementation perceived by householders. Participants were encouraged to add options to the list prepared by facilitators.

4.4.1 Better Information

Education campaigns and the provision of better information are identified in the literature as important demand management strategies (e.g. Darby 2001; Shipworth 2000). These strategies are often driven by an ‘information deficit model’, which assumes that householders do not adopt more energy-saving behaviours because they lack information about how to save energy. According to this model, householders will modify their behaviour if provided with more information. While there are criticisms of this model in the literature (e.g. Jaeger et al. 1993), better information is generally accepted as being an important, if not sufficient, element of demand management strategies. The policy options discussed in the workshops are described below.

Better information on energy-efficient appliances

At present, information on the energy ratings of different appliances and the make and model of the most energy efficient appliances is available online at www.energyrating.gov.au. However, as many householders, particularly in disadvantaged groups, do not have Internet access, this option asked householders whether printed information on the make and model of the most energy efficient appliances would be useful to them.

Newsletters

Regular newsletters on how to reduce electricity consumption and the products and services that can help are another option for providing householders with better information. Members of the Community Power buying group receive a quarterly newsletter that includes energy-saving tips, product information and news of events that householders can participate in. A similar newsletter could be distributed more widely.

Information in different languages

There is a great deal of information available on ways to save energy, however only some of this information is available in different languages. This policy option would seek to provide more of the available information in different languages.

Information available at social venues

This option would make energy-saving information available at the social venues where different communities congregate, such as bowling clubs, pubs and cafes.

Energy audits

Energy audits are a way of tailoring energy-saving advice to the specific situation and context of individual householders. The workshops discussed several ways in which energy audits could be implemented, including:

- A home visit by an energy expert or community group representative
- Virtual audits accessed through the Internet
- Loans of home audit kits from the local library, modelled on a Cool Communities program in South Australia. The kits contain a manual and worksheets to guide the householder through the audit process, a power meter for measuring appliance energy consumption, a thermometer to measure fridge and hot water temperature, a bucket to measure showerhead efficiency, incense sticks for chasing draughts and a compass for checking orientation.

Cent-A-Meter installation

As described in Section 3.4.3, Cent-A-Meters provide instantaneous information on household electricity use and cost. This feedback potentially allows householders to track their energy consumption, experiment with changes and adopt those changes that have a noticeable impact. In-house displays of this type are identified as a promising feedback option by Darby (2001). This policy option contemplates widespread installation of Cent-A-Meters to provide householders with feedback. A question for workshop discussion was who should pay for installation – the householder, the electricity supplier or the government.

4.4.2 Billing and Pricing

Policy options focused on billing and pricing generally seek to provide householders with feedback and price signals to encourage behavioural change. Several tariff, metering and billing options were considered in the workshops.

Inclining block tariffs

With an inclining block tariff, the price of electricity rises, step-wise, as consumption thresholds are exceeded. Thus, there is a standard rate for all consumption up to a particular threshold and a higher rate for all consumption above that threshold. There may be multiple steps. The intention is that the price increase will encourage consumers to limit their electricity consumption to avoid exceeding the threshold.

Interval meters with cost-reflective tariffs

Interval meters record electricity consumption at half-hour intervals, providing superior data on fluctuations in electricity use compared to a standard accumulation meter that is read once a month, or once a quarter. The half hourly consumption data facilitates the introduction of tariff structures that reflect changes in the cost of electricity supply over time. Thus, tariff structures may include higher prices at peak times (e.g. between 5.00 pm and 7.00 pm on weekdays) and lower prices at off-peak times. Although this is an area of significant uncertainty and contention, it is possible that householders would respond to cost-reflective tariffs by load shifting, thereby reducing the peak

demand and the cost of network infrastructure to meet peak demand. The Essential Services Commission in Victoria is mandating the rollout of interval meters to all electricity consumers.

Pre-payment meters

Pre-payment meters are another metering option in which the householder pays (e.g. \$50) to have a special meter installed with a Smart Card. The householder then puts credit on the Smart Card at newsagents and other stores to pre-pay for their electricity. About 10% of electricity customers in Tasmania use pre-payment meters and Country Energy is planning a trial of these meters in NSW.

Pre-payment meters are controversial. A recent report by KPMG (2004) summarises benefits and concerns relating to pre-payment meters. Benefits for householders include the ability to control debt by only using what they can afford at the time, so that they do not face financial crisis when they receive a large bill every quarter. In addition, householders can avoid paying disconnection fees. However, there are serious concerns about the higher cost of pre-payment meters, rates of 'self disconnection' for householders on pre-payment meters and issues of coercion and misinformation. Self-disconnection will not be picked up in retailer or ombudsman reporting. The KPMG (2004) report makes the important point that the benefits of pre-payment meters can be achieved through other mechanisms that may not have the same negative social impacts.

Experience in the United Kingdom, where pre-payment meters have been used for some time, confirms these criticisms. A recent report by the Department for Environment, Food and Rural Affairs (DEFRA) in the United Kingdom indicates that many pre-payment customers pay more for their electricity than they would on a standard quarterly billing system (DEFRA 2004). Further, pre-payment customers tend to be more vulnerable to fuel poverty. Indeed, the number of customers on pre-payment meters is used as one of a suite of fuel poverty indicators in the United Kingdom (DEFRA 2004). Clearly, there are serious equity concerns when those who are least able to afford their electricity bills are forced to pay higher tariffs.

Given these concerns and additional feedback from social advocacy groups in Victoria, the research team decided to exclude pre-payment meters from workshop discussions. It was felt that pre-payment meters were primarily a credit management tool rather than a demand management tool and that equity concerns were significant enough to make advocacy of this option inappropriate. The decision to exclude pre-payment meters was made after several workshops had already been conducted, so this option was discussed at some early workshops. Findings have been reported where appropriate.

More frequent bills

The quarterly bills received by most households do not provide a useful price signal for reducing electricity consumption. For example, the bill that covers winter electricity consumption often arrives at the end of winter, when it is too late for a household to reduce its electric heating through energy efficiency improvements. By the time next winter comes around, the high bill is often forgotten. A more frequent (e.g. monthly) bill could help households to respond more rapidly to high bills.

More retail choice

With the advent of full retail competition for electricity at the household level, the potential now exists for retailers to offer innovative retail products to small customers. In addition to existing Green Power options, retailers could potentially offer different prices for particular types of households, or include energy efficiency improvements in a billing package.

Bills that separate costs

Nance (2004) found that 'discovering' the running costs of appliances was a key 'trigger' for action. Further, Kempton and Layne (1994, p.857) argue for 'a method of billing per end use rather than

aggregating all energy uses in the household and a method for reporting the results of prior conservation efforts'. The workshops tested householder interest in bills that report the cost of different end uses or appliances separately, allowing householders to identify where most of their costs are and prioritise their demand management action.

4.4.3 Incentives

In many of the surveys reviewed in Section 2.2, householders identified financial incentives as the most effective way to encourage reductions in energy use. Some of the ways that financial incentives can be implemented include rebates or subsidies for purchase of efficient products, tariff structures, loans, grants and provision of free audits or equipment. Relatively small financial incentives can achieve significant outcomes if supported by education campaigns. In particular, a small financial incentive can provide reassurance that a particular product is the 'right choice' for the environment, which can encourage householders to purchase a product for the first time. If the product performs well, they may continue to purchase it without financial incentives (Nance, 2004, pers. comm., 5 May).

Despite the apparent popularity of financial incentives, Shipworth (2000) points out that money does not always motivate action, in practice. There are many individual, cultural and institutional reasons why households may not respond to financial incentives. In addition, many actions that can be taken to improve energy efficiency are already economically rational, so it could be argued that financial incentives are not necessary. Rather, programs that address the social and institutional aspects of energy use may be more beneficial in terms of reducing energy consumption. Further, programs that offer financial incentives inevitably attract 'free riders', who would have taken the demand management action anyway, but will happily take advantage of the incentive. The workshop tested several ways in which financial incentives might be provided.

Rebates or discounts for energy efficient appliances and products

These rebates reduce the initial price for energy efficient appliances and products so that householders are more able to capture the life cycle cost savings that these products typically provide. Examples of appliances and products for which rebates could be introduced include:

- Insulation
- Double-glazing
- Efficient showerheads
- Compact fluorescent light bulbs
- Appliances with a high energy rating.

Penalties for inefficient appliances

An alternative form of implementation could be to introduce a surcharge for purchase of inefficient appliances. This would essentially be a tax on emission-intensive products.

Energy bill discounts for remote load control

This option would provide householders with discounts on their energy bills in return for allowing the electricity company to remotely control load by, for example, switching off air conditioners for 10 minutes per hour on hot summer days. The Sacramento Municipal Utility District (SMUD) has implemented this option for householders, on a voluntary basis. More than 100,000 customers have taken up the option, which allows SMUD to install a cycling device for central air-conditioners so that

they can be switched off or cycled using a radio signal. SMUD offers a monthly discount on bills and an additional discount for each day on which cycling occurs.

Rebates or discounts for energy supply options

This option provides a rebate or discount for purchase of energy supply options, such as solar hot water systems and solar photovoltaic panels.

Buy-back schemes

Buy-back schemes offer a small payment for old appliances (usually old fridges). The intention is to remove old, inefficient appliances from the total stock. In Australia, the 'beer fridge' in the garage could be a particular target of buy-back schemes. MEFL has implemented a similar program, called the Phoenix Fridge program, in which people donate their old fridge for retrofitting to improve energy efficiency. The retrofitted fridges are donated to disadvantaged households. A buy-back scheme would add an incentive payment for old fridges.

4.4.4 Disclosure

The workshops considered several options requiring mandatory disclosure of information relevant to energy-saving decisions.

Disclosure of home energy ratings

This option requires property owners to engage an accredited assessor to provide an energy efficiency rating for their property, and to disclose this rating when selling or leasing their property. It is modelled on the ACT House Energy Rating Scheme. The intention is that knowledge about the energy efficiency of a home will influence the decision to buy or rent the property, and will encourage energy efficiency improvement over time.

Extending the Energy Rating program

This option would extend the existing star-rating scheme for appliances to additional appliances. Currently, the scheme only applies to fridges, freezers, dishwashers, clothes washers, clothes dryers and some air conditioners.

Advertise hourly running costs

This option would extend existing labelling schemes by requiring retailers to advertise the hourly running cost of appliances at the point of sale. This could be implemented through changes to the existing Energy Rating label. Although tariff variation across Australia presents a problem for such labelling, it would be possible to establish one or more standard tariffs for use in calculating hourly running costs.

Benchmarking on bills

Currently, electricity bills show average consumption from the previous bill and the same period last year so that householders can compare their current consumption. This option would expand benchmarking on bills by showing electricity use for an average household, or a selection of typical household types, so that householders can compare their own electricity use.

4.4.5 Regulation

Governments implement the options in this category through changes to legislation, regulations, standards or codes. While many of the disclosure options are implemented in a similar fashion, these

options differ in that they do not try to encourage action by providing information. Instead, they establish minimum standards that must be met and do not require any particular action by householders.

Mandatory gas installation

This option requires the installation of natural gas heating when it is available in the street. Natural gas heating is less greenhouse-intensive than most electric heating options, so may be considered a preferable heating option where available. A question for workshop discussion was who should pay the cost of installation.

Energy efficiency standards for rental housing

This option would require landlords to meet minimum energy efficiency standards when they lease out a property. The standards could be implemented as a minimum star-rating requirement, or mandatory installation of certain products, such as insulation.

Energy efficiency standards for new homes and renovations

Energy efficiency standards for new homes have already been established in Victoria and NSW. In Victoria, all new homes must meet the five-star standard for energy and water efficiency. In NSW, all new housing must achieve energy and water reduction targets under the BASIX program. This option considers extension of these standards to other states and expansion to cover renovations.

Extending Minimum Energy Performance Standards for appliances

This option would extend the existing Minimum Energy Performance Standards scheme to cover a wider range of appliances. The program currently applies to fridges, freezers, some air conditioners, water heaters and some fluorescent lights.

4.4.6 Community Support

Community support and development approaches seek to establish support networks and action groups to help people to reduce their energy consumption. For example, Lawrence (2002) discusses the establishment of Community Energy Action Groups and Michaelis (2003) notes the important role of green consumer groups and the work of the Global Action Plan (see <http://www.globalactionplan.com/>, e.g. Eco-Teams and Community Energy Projects in UK). The Moreland Energy Foundation, AGO's Cool Communities program and the Sustainable Living at Home program implemented by Melbourne's City of Port Phillip Council are excellent examples of this type of approach.

Community development approaches recognise that energy consumption is influenced by group membership, identity and other social and cultural factors. Establishing groups that can work together to achieve demand management and provide mutual support is more likely to be successful than relying on individual consumers to implement demand management. Support networks provide motivation and a source of identity that can assist individuals to commit to demand management actions. The importance of social and cultural approaches was evident in the AGO's (2003) national survey, in which two-thirds of participants said that following the example of others would encourage them to reduce their energy use.

Join or start a community support group

This option asks the householder to join or start a community support group focused on energy saving or reduction in greenhouse gas emissions. Some examples of this type of approach are the

Sustainability Street program and the Sustainable Living at Home and Cool Communities programs mentioned above.

Community fundraising

This option asks the householder to get involved in community fundraising to pay for local installation of renewable energy or other greenhouse abatement measures. For example, a group might get together to raise funds to install solar panels on the local school or community centre.

4.5 Participant recruitment

This section describes the participant recruitment strategy adopted for the research. As discussed in Section 4.1, a purposive sampling strategy was chosen to facilitate access to diverse householder perspectives. Consequently, the recruitment strategy needed to attract householders from diverse groups, including disadvantaged groups. In addition, the research team was particularly interested in attracting participants without a pre-existing interest in reducing their energy use.

To meet these objectives, the research team adopted a network approach to recruitment. Instead of recruiting participants on an individual basis, the research team sought the involvement of community groups and non-government organisations that would be interested in co-facilitating a workshop with their *existing* participants or clients. In this way, the research team hoped to gain access to existing groups that had formed around other community issues and would not necessarily have an electricity focus. It was anticipated that there would be enough members of the group interested in the new topic to encourage others in the group to attend.

There were two main stages in the recruitment process, discussed below.

4.5.1 Develop and distribute request for expressions of interest

In the first stage of recruitment, the Institute developed and distributed a request for Expressions of Interest (EOIs). The request for EOIs was a three-page document with a brief, plain-English description of the project, describing the purpose of the workshops and outlining what participation would entail. Also included in the document were descriptions and contact details for the Institute, MEFL and NCEAP, and an EOI form for interested parties to complete and return. A copy of the request for EOIs is provided in Appendix G.

The EOI form provided several options for interested parties:

1. They could attach information, experiences or stories about home electricity use
2. They could express interest in participating in one of the workshops in Adelaide, Melbourne or Sydney on behalf of their group or organisation
3. They could express interest in participating in a workshop for householders (as a householder)
4. They could express interest, on behalf of their group or organisation, in running a workshop with support from the Community EmPOWERment team
5. They could ask to be kept informed about Community EmPOWERment.

As these options indicate, the research team was interested not only in identifying possible participants, but also in identifying community groups or organisations that were interested in working together to organise a workshop.

The request for EOIs was distributed and/or advertised through the following networks and locations:

- An event advertisement on the Community Builders NSW website (<http://www.communitybuilders.nsw.gov.au/>)
- An advertisement in NCOSS News, the monthly newsletter of the New South Wales Council of Social Services
- An advertisement in CUAC's newsletter
- An advertisement in the quarterly Community Power newsletter
- Advertisements on the MEFL and Institute websites
- An email to the *ausenergy* email list for energy campaigners
- An advertisement in the Climate Action Network Australia (CANA) Member Update
- An email to the Institute's staff list and the UTS staff notices list
- An email to the Institute's database of contacts
- Emails and mail drops to other opportunistic contacts identified throughout the project.

4.5.2 Negotiation and direct recruitment

In the second stage of recruitment, the Institute contacted organisations that had expressed interest in participating and worked with them to establish workshops. The responses to the request for EOIs did not adequately cover the categories of interest within the critical reference group, listed in Section 4.1. Consequently, this stage also involved purposive recruitment via phone calls, emails and visits to organisations likely to have access to householders in the different categories of interest. Interested organisations contacted householders to gauge their interest and arrange a suitable time. This process of negotiation and direct recruitment led to the establishment of the 12 workshops listed in Table 2.

4.6 Data collection

The research team considered several possible approaches to data collection. While tape recording and transcription of workshops would have provided the most extensive data set, it is difficult to audibly record a large group of people, and the tape recorder can inhibit interaction. Further, tape transcription is time-consuming and expensive. The research team therefore chose to take detailed notes on what was said at each workshop as the primary approach to data collection. Consequently, two members of the research team (from MEFL or the Institute) were assigned to most workshops. One person was responsible for workshop facilitation, the other for note taking, though in some cases roles alternated during the workshop.

Each workshop was assigned a unique code. All participation agreements, demographic data forms, evaluation forms and workshop notes were marked with this code to ensure data from different workshops was not confused.

5 RESEARCH FINDINGS

This section summarises the findings of the workshops and interviews. Section 5.1 outlines some important limitations of the research, to provide context for interpreting the research findings. Section 5.2 provides brief summaries of each workshop. Section 5.3 outlines the specific findings in relation to policy options, including the results of the voting on different policy options. Section 5.4 reports on a thematic analysis of the workshops. Section 5.5 discusses the demographic profile of participants. Section 5.6 describes important points to emerge from interviews. Finally, Section 5.7 outlines the results of the Cent-A-Meter trials.

5.1 *Limitations of the research*

This section discusses some limitations of the research, arising from the choice of research methods and specific problems that arose during implementation of those methods. These limitations are discussed for transparency and to ensure that the research findings are interpreted appropriately. Further research is recommended to address these limitations in the future.

5.1.1 Sample distribution

As discussed in Section 4.1, a purposive sampling strategy was adopted for the research to ensure that the views of diverse categories of householder, particularly low-income and disadvantaged householders, would be included in the research. Further, as discussed in Section 4.5, a network recruitment approach was adopted in which the research team collaborated with existing community organisations, groups and centres to deliver workshops. This ensured access to diverse groups of householders.

The workshop summaries in Section 5.2 and the demographic summary in Section 5.5 give a profile of workshop participants. In general, compared to Australian averages, the research sample was skewed towards householders in low to average income brackets, towards renters, and towards people living in flats and units. In addition, significantly more women participated than men and there was high representation of people from non-English speaking backgrounds. These results indicate that, while the purposive recruitment strategy was very successful in providing access to low-income and disadvantaged householders, it was less successful in providing access to householders with average to high incomes and/or high discretionary energy use.

There are several reasons for the observed sample distribution. First, a network recruitment approach tends to involve a high proportion of disadvantaged households, as most community organisations focus their scarce resources on helping those households that are most in need. There are proportionally less community organisations that work with “typical” households.

Second, the workshops set up to attract “typical” households were very poorly attended. Three public workshops were organised in Darebin, Coburg and Ballarat. These workshops were advertised in newsletters sent out by MEFL and CUAC, were the subject of a media release by MEFL, were advertised on the MEFL website and were mentioned to householders that responded to the general call for EOIs. However, the Darebin workshop was cancelled when only one householder turned up, the Coburg workshop was attended by four householders, two of whom were local energy experts, and two community workers attended the Ballarat workshop.

The sole attendee for the Darebin workshop indicated that other people she had spoken to felt that they already knew all they needed to know about saving energy. Further, two of the three workshops were arranged during the day, which may have made attendance difficult for many working households. Whatever the reasons, the lower than expected attendance of typical households at these workshops contributed to the observed sample distribution.

Third, there is a natural tendency for low-income households to be more interested in saving money on their energy bills than higher-income households. For a low-income household, the potential savings are proportionally much higher and can make a real difference to quality of life. This may also help to explain the sample distribution.

The main impact of the skewed sample distribution is to limit the conclusions that can be drawn about how households with high energy use, and significant discretionary use, might respond to some of the policy options discussed in the workshops. Further research is recommended to capture the particular concerns of these households. Some suggested approaches for the research are discussed in Section 7.6.

5.1.2 Complexity of technical policy options

As discussed in Section 4.4, the focus in the workshops was on briefly presenting a broad range of options to avoid artificially constraining discussions. The intention was to identify popular options for further detailed research. For many policy options, a brief description is sufficient to capture the important points. However, for some complex or technical policy options, it is difficult to provide sufficient detail in a brief description to support informed discussion. These options include cost-reflective tariffs, interval metering and remote load control.

The consequence of not being able to provide detailed descriptions of these options is that their popularity in the workshops may not accurately reflect their real popularity. When householders are given time to understand the complexities of a policy option, they may become more or less likely to support it. In general, options that are too complex to understand from a brief description will perform poorly in workshop voting. However, some options may perform well because their disadvantages are difficult to understand. These issues need to be considered when interpreting the findings relating to complex policy options.

Additional research on some of the more complex policy options is recommended. Some options for such research are discussed in Section 7.6.2.

5.1.3 Sensitivity to magnitude of costs and benefits

A further limitation is that the popularity of policy options involving rebates, incentives or costs to the consumer may be very sensitive to the magnitude of that rebate, incentive or cost. Without detailed cost-benefit analysis, it was not possible to specify the exact incentives, rebates or costs when discussing conceptual policy options. Instead, options were presented for “in principle” discussion. This allows those options that are unpopular regardless of the level of incentive to be screened out. However, it may mean that participants will prefer options involving rebates and incentives with the expectation that the rebate or incentive will be higher than it is in a real situation.

Again, further research is recommended to determine the level of incentive or rebate at which particular policy options become attractive to householders. Some options for such research are discussed in Section 7.6.2.

5.2 Workshop summaries

The workshop summaries in this section provide details of the date, time and venue of each workshop, the number and demographic profile of participants and a brief summary of the main issues to emerge from the workshop. Issues raised in relation to specific policy options are generally discussed in Section 5.3. A collated analysis of key themes and issues to emerge across the total workshop data set is presented in Section 5.4.

5.2.1 Northern Migrant Resource Centre, Coburg, Victoria (V1)

Date: 12 August 2004
Time: 10 am – 12 noon
Venue: Northern Migrant Resource Centre

Participants:

Seventeen people participated in this workshop, four males and thirteen females. Many of the participants were staff of the Migrant Resource Centre, so they brought both their own householder perspectives and the perspectives of their clients – migrants and refugees. The majority of these staff were also migrants or children of migrants. The workers represented a wide cross section of cultures including Arabic, African, Serbian, Macedonian and Vietnamese.

The group had a wide distribution of incomes – all income categories from under \$200 per week to \$1,200 - \$1,399 per week were represented. Most participants (13) lived in houses, with only two participants each living in townhouses or units. The number of bedrooms ranged from one to five, with three most common. Household sizes were mainly between one and five people, but there was one household of eight people. More than half of the group (10) came from a non-English speaking background.

Content:

- Participants were surprised at the amount of power used by appliances on standby. Also little knowledge of the Energy Rating program.
- Patterns of energy use depend on the type of family. Families with young children use more appliances, teenagers are in their own room using computers, heating and games consoles.
- Participants wondered whether lights use power to turn on, so is it really efficient to turn them off.
- Cheaper appliances encourage people to buy more. 'More appliances are finding their way into the house'. People in a capitalist society respond to advertising. Once you have used a new appliance (e.g. a microwave) you develop a dependency.
- The first impression on arriving from a developing country is 'wow, look at all the white goods, dryers, coffee machines!' Electrical products are seen as a symbol of success – 'look, we've made it, we have a...' A related issue is that people prefer to buy new appliances as a mark of success – the used appliance market is seen as 'dirty', often reflecting prevailing cultural values and the lack of experience with this sector in countries of origin.
- Perception that it costs more to fix an appliance than to buy a new one.
- Clients (i.e. migrants) buy food in bulk so need a big fridge and freezer. There is a 'shame' issue. It is 'shame' to buy just two apples at the supermarket – must buy a whole box at the market. Anything less is shame – poor hospitality and poor provision for family.
- There were various cultural issues around fridges. Food is at the centre of hospitality and generosity and these values override energy considerations. Clients will cook enough to ensure there are leftovers – culturally, there must be an abundance of food. Cultural issues also included the location of the fridge, which could not be in a laundry (due to this being a 'dirty' place) despite this being a cooler location.

- There was evident competition between health values and energy-saving values, e.g. the idea of leaving food to cool before putting it in the fridge was rejected as a health risk, hot water bottles were seen as unhealthy.
- St Vincent de Paul provides refugees with new appliances (fridge, washing machine, TV, vacuum cleaner) as part of a humanitarian relief package. These appliances are not selected for energy efficiency.
- Need to use hot water for washing dishes for hygiene reasons and so dishes dry better.
- There are cultural issues around heating, including lack of experience with dressing for the cold, the need to have heating up high for hospitality and use of heaters as a focus for social interaction (i.e. social and family groups gather around a heater for interaction with some cultures preferring radiant heat). Many cultures required loose fitting clothing which were not well suited to keeping warm.
- Most people don't turn anything off when they go away on holidays. People felt uncomfortable with turning off pilot lights on gas hot water systems (might not be able to turn them back on) and found them difficult to access as well.
- Participants were interested in lagging pipes and wanted details of local suppliers.
- Little understanding of bills. In some instances, countries of origin had low or infrequent electricity charges so participants had little understanding of billing and higher prices. Participants felt that the greenhouse emissions graph was there 'to make you feel guilty' and 'most people wouldn't have a clue about what this graph means'. Their motivation for saving energy is convenience and saving money.
- There was a feeling that owners of rental properties only do the basic things – they wouldn't do anything to help renters save if it costs money. 'There should be a requirement that all rental properties have off-peak meters'.
- Policies need to avoid penalising the poor and need to consider the context (e.g. family size, availability of gas).
- There was concern about the utility practice of charging an estimate if they can't read the meter. Householders have little ability to argue or negotiate if they think the estimate is too high as they have no information to back their case. Power companies are seen as unhelpful and serving their own interests. People with English as a second language have particular difficulties, even with an interpreter. Complaints services do not provide satisfaction.
- The Privacy Act makes it difficult for anyone else to deal with the power company on behalf of a client.
- Popular policy options in this workshop were information in different languages, bills that separate costs, standards for rental housing and rebates/discounts for energy efficient appliances.

5.2.2 The Avenue Neighbourhood House, Blackburn, Victoria (V2)

Date: 13 August 2004
Time: 1.30 pm – 3.30 pm
Venue: The Avenue Neighbourhood House

Participants:

There were five female participants in the Blackburn workshop; two aged 25 – 44 and three aged over 65. All lived in three or four-bedroom houses; four owned their home and one rented. One participant lived alone, three lived in three-person households and one lived in a five-person household. One participant was from a non-English speaking background.

Content:

- Participants had old hot water systems – one was 16 years old, another 18 years old. Old hot water systems are difficult to access – located in the roof. For elderly people, the only option is to employ someone to check the system. The participants were not aware of the issue of valve leakage or of the value of insulating hot water pipes.
- Consensus among participants that low flow showerheads are ‘revolting’; the flow is terrible, particularly in areas with low water pressure. ‘You have to run around to find a drip to stand under’. Also problems with models that can’t be detached for cleaning when spray outlets get blocked.
- Too difficult to adjust thermostats, overflow valves, install water saving appliances without a plumber or electrician.
- Stage of life changes mean people get stuck with big appliances that they don’t need, e.g. large family fridge is too big once children leave, and too expensive to replace before breakdown.
- Fridges are usually in alcoves with poor circulation. Difficult for participants to diagnose problems, e.g. needed an expert to work out that the door was not closing properly. Participants had old fridges, e.g. 16 years old, but still working well. Participants were interested in how to check fridge temperatures, as these vary from the top to the bottom.
- ‘It’s businesses that use the most energy so price increases shouldn’t come back on small users’.
- Air conditioning: ‘People wanting air-conditioning are softies – people survived without it in the past’. It’s easy to forget to turn off air-conditioning. Participants suggested inbuilt timing devices in appliances (e.g. air conditioners) that automatically switched off periodically and then restarted, as a mechanism for energy saving.
- Thermal comfort: Need heating at night when bathing kids, relaxing and in morning for comfort when showering, dressing. Some participants like to have windows open a little at night, especially in bedrooms – fresh air is prioritised over heating efficiency. Most participants were happy to use clothing to stay warm, or even a knee rug, up to a point, but heating is needed beyond that. Being warm is an important luxury that makes you feel safe and secure.
- Modern house designs are very open and hard to heat selectively. In addition, it is difficult to zone with ducted systems, particularly older systems. A participant had been informed by a manufacturer or energy utility that simply closing a room vent does not reduce energy consumption.
- Participants were concerned about fire hazards with electric blankets and had heard that they were not safe for health reasons.
- CFLs: Participants find them a bit dull, not good for reading by and don’t light up instantly. Tend to use in stairwells and children’s rooms where lower light levels are acceptable. Note that these may have been older CFLs – one was nine years old. CFLs are particularly useful in fixtures that are hard to reach, as they don’t have to be changed so often. One participant had tried CFLs but

they blew within a few months, so went back to incandescent. In general, most people had tried CFLs some time ago but were not happy with the light quality.

- Participants were cynical about greenhouse graph on bills as it is not a complete picture and puts the focus on the householder when a wider range of methods is needed.
- Mixed views on gas cooking – positive and negative.
- Retailers need to provide equal service to all users, meeting social obligation and equity measures.
- There is a need for cooperation between states and national coordinated standards.
- St Vincent de Paul and the Salvation Army won't take second hand appliances due to litigation risks. Participants felt this was a missed opportunity.
- Participants felt bills would be fairer if there was averaging for household size (that is, average use for household size was related to pricing structure and householders were financially rewarded with lower rates for staying within the average consumption range for their household size).
- There was a sense of insecurity about signing contracts with new electricity providers as there is no written guarantee of how much you will save. Participants were uncomfortable about information provided by retailers and its potential bias.
- Participants generally wanted energy use breakdowns, i.e. more information related to actual cost of energy use in their home in major areas (eg heating, hot water, fridge etc), so they could target reduction strategies effectively.
- Participants felt that energy efficiency measures don't necessarily add to the value of your home and therefore aren't beneficial to people who move frequently.
- There was a general consensus that positive rather than negative messages are needed. 'You are helping' instead of 'You are destroying'. Greenhouse gas chart on bill is a negative message. Better to see what you saved in positive terms.
- Popular policy options were fridge buy-back schemes, Cent-A-Meters, energy ratings for houses and free audits by independent people.

5.2.3 Chadstone Neighbourhood Renewal Project, Chadstone, Victoria (V3)

Date: 24 August 2004
Time: 6 pm – 8 pm
Venue: Chadstone Neighbourhood Renewal Office

Participants:

There were five participants (two males and three females). Three were aged between 25 and 44, one between 45 and 64 and one over 65. Weekly household incomes were low – four participants received between \$400 and \$599 per week and one received between \$200 and \$399 per week. Four participants lived in houses that they owned and one lived in a rented flat. One participant was from a non-English speaking background.

Content:

- Participants were interested in hints on saving energy, whether paying an extra dollar would make energy more sustainable and, in one case, the specific issues and problems associated with living in a concrete house. Concrete houses are common in the Chadstone area and have some particular problems, including lack of insulation and steel-framed windows that act as a heat bridge. Some solutions tried or suggested by participants included planting deciduous trees to provide summer shade and insulating the outside of the house with cladding.
- Participants had tried a range of things to reduce energy use in the kitchen, such as checking the star rating, not putting hot food in the fridge and only using the dishwasher when full. One participant had gone so far as to remove the internal fridge light, as their kitchen was bright enough to see inside.
- There was a feeling that appliances with more stars were often, but not always, more expensive. They were starting to see more four-star fridges on the market.
- The idea of keeping the fridge in the laundry to keep it cooler was a problem because it made it too hard to cook.
- There was uncertainty about defrosting requirements for fridges and whether frost-free fridges use extra energy (e.g. for heating in the sides).
- Most participants had gas heating and one had ducted heating. Participants did not use a lot of cooling. One participant only used a “whirly gig” in the roof. Those with air conditioning only turned it on when it was very hot.
- CFLs: Most people had tried these. Problems are that they don’t provide as much light and can’t be used with dimmers. The up-front cost of a CFL can also be a deterrent, despite their advantages in life-cycle cost. In addition, downlights are fashionable at the moment. One participant suggested writing the date on the globe to see how long they last.
- Hot water: None of the participants had been able to choose their hot water system. Most found that it took ages to get hot water out of their taps. Some had high pressure and were concerned that tap restrictors would make this worse.
- Low flow showerheads: One participant wouldn’t use these because she ‘Enjoys a proper shower’.
- Suggestion to unplug equipment to avoid standby power use is a problem because switches are often not handy, people use powerboards and the video has to be reprogrammed.
- Participants thought Cent-A-Meters were good for awareness raising but they couldn’t see people paying for them and felt that the same functionality should be available in the standard meter. They suggested that this could be mandated in design standards for new homes.
- The participants were cynical about Green Power and whether it actually makes a difference. ‘It’s not like you are really getting different electricity. They just want to get more money out of you’.
- The participants had problems with full retail competition, including how to choose a retailer and feeling harassed by retailers doing door knocking.
- Suggestion to abolish service fees and pay a higher consumption charge as a way to encourage demand management.

- Popular policy options were information on energy efficient appliances, information in different languages, energy audits, bills that separate costs, rebates on energy efficient products, energy ratings for houses at sale or rent, energy standards for new homes and community support groups.

5.2.4 Migrant Information Centre, Mitcham, Victoria (V4)

Date: 25 August 2004

Time: 2.30 pm – 4.30 pm

Venue: Migrant Information Centre (Eastern Melbourne)

Participants:

Two Sudanese women, one male Sudanese interpreter and one female migrant worker attended this workshop. All participants rented their homes, which included houses, townhouses and units. The two Sudanese women lived in large households, with six or seven people.

Content:

- The workshop began with a discussion of experiences with electricity in Sudan. Availability of electricity is erratic, there are frequent interruptions and can be time restrictions (rationing). Electricity is cheap and bills are infrequent (e.g. yearly). There is no electric heating – people are used to gathering around the fire. There is no water heating.
- Upon arrival in Australia, most Sudanese will experience electricity bills for the first time and have their first experience with heating. It takes a lot of time to understand the system. When they arrive, they will just use electricity, especially heating. They will then get high bills (e.g. \$600 to \$800 per quarter for a family of six to eight without ducted heating) and have trouble paying. They have trouble negotiating with the utility company over high bills – an interpreter is available and the household is usually put on Easy Pay. It is not clear whether they modify their behaviour to use less or just get used to paying more.
- The participants had very little knowledge or education about how much electricity different appliances use, the star rating system, off peak metering, power pricing and the electricity system in general.
- Standby power: Participants did not know about this. They felt that little red lights are good – they mean that everything is working OK and the power is on. They did not realise that appliances draw power to run these lights and were keen to educate their kids about this.
- CFLs: Participants felt that these were very expensive (e.g. \$15) and difficult to fit in certain light fittings.
- Heating: The participants identified heating as the biggest user of electricity in their homes. Usual practice is to turn heating up high and wear T-shirts and light clothes inside. Participants would sometimes come inside and feel that the house is hot, but would remove clothes rather than turn the heater down. They are used to gathering around a fire, and now gather around a radiant heater. Participants reported experiencing arthritis from sitting near the heater, then going outside or to colder parts of the house (temperature change). They said that they sit so close to the heater that their legs get brown from the heat.
- Little was known about drafts, insulation and the use of different heaters for different purposes. There was an impression that the fan on a heater uses a lot of power and should not be used.

- **Cooking:** The participants were not comfortable with electric stoves and told stories of people refusing rental accommodation because it had electric cooking. A major cooking appliance is an electric flat bread pot, used for hours at a time to make large amounts of flat bread at home. A lot of traditional cooking is done on weekends with guests invited. Dishes like stews and curries take a long time to cook and have many steps. There is no time for this type of cooking during the week. Microwaves are used to warm left overs, but never to cook.
- **Need large fridges** due to large family and lack of transport to make frequent trips (which means participants must buy a lot on each shopping trip). Participants were used to having a large freezer in Sudan, but don't have room for one here. The participants shared stories about broken seals, inefficient fridges and problems with ice-cream melting and damaging seals.
- Participants were provided with fridges as part of a Department of Immigration package but had no control over the efficiency.
- Participants were unable or unwilling to invest in some changes, such as pipe insulation, as they are in temporary accommodation.
- Due to large household sizes, any high usage power fee would need to take into account household size. The migrant worker reports that this is also a problem for water (Yarra Valley Water) where the base rate is calculated using a low household size.
- Policy options were not discussed at this workshop due to time constraints resulting from interpretation. Participants did support the provision of energy efficient appliances by the Department of Immigration.

5.2.5 Public workshop, Coburg, Victoria (V5)

Date: 25 August 2004
Time: 7 pm – 9 pm
Venue: Moreland Civic Centre

Participants:

There were four participants (one male and three females). Two of the participants were professionally involved in energy policy issues. Three participants were aged between 25 and 44 and one between 45 and 64. Weekly household incomes were between \$200 and \$999. Three participants lived in houses and one in a flat, all with two or three bedrooms. Three participants owned their homes and one rented. Two households had one person, one had two and one had three. One participant was from a non-English speaking background.

Content:

- **CFLs:** Participants had tried these in the kitchen – found the tone a bit cool for the bedroom. One CFL installed in the kitchen lasted over six years.
- **Fridges:** One participant had an old fridge (7 or 8 years) that was not working that well but no money to replace it. Fridges are often in a bad spot with no air flow and direct sunshine. One participant had fridge on bricks to increase air flow – cheaper than buying a five-star fridge, which they can't afford.

- Cooling: One participant made sure not to set the thermostat too low to save money. Another doesn't like air conditioning – prefers ceiling fans and cold showers. Participants use awnings for shading on windows.
- Hot water: One participant had day-rate electric hot water in her small flat and turned it off during the times when it was not needed. Another had instantaneous gas, chosen for efficiency. Some participants had tried turning down the hot water system, but mainly to reduce risk of burns.
- When renting, it is hard to make the big changes to reduce electricity use. Can only do basic stuff like closing the blinds at night and not filling the kettle all the way up.
- One participant had removed downlights from the kitchen because it was too bright with white painted walls. Participants also found that halogen lights make the kitchen hot in summer.
- Low-flow showerheads: Sometimes took a while to get used to but fine now. New models are better than the old ones.
- Heating: Participants close doors to contain heat, use fan on gas space heater. One participant with central heating had tried to close vents but found this difficult. Another: 'I live in a flat with electric everything and it's really hard to tackle saving energy, but at least I own it, so I could put a reverse-cycle heater rather than using portable heaters'.
- Insulation: Participant added insulation in some walls when replastered, but found it hard to access all walls. Also added ceiling insulation and found it made an amazing difference. Tried to block fireplace to stop draughts, used curtains and pelmets and installed foil batts under floorboards.
- There was a feeling that more frequent bills would mean more frequent financial crisis. 'I'm a low income resident and it doesn't help me – it's a cash flow problem'.
- It was suggested that appliance advertisements (e.g. in junk mail) should be forced to give the star rating of advertised models.
- Participants were aware of problems with the mandatory disclosure of house energy ratings in the ACT because owners put in pelmets and blinds when the energy rating happens then rip them out before they sell the property.
- The most popular policy options were energy efficiency standards for new homes, appliances and lighting and rebates/discounts for energy efficient products.

5.2.6 Indigenous workshop, Ringwood, Victoria (V6)

Date: 27 August 2004
Time: 11 am – 1 pm
Venue: Maroondah Federation Estate

Participants:

Four adults (two males and two females) and three children attended the workshop. However, only two participants gave consent for reporting of data, so the remaining discussion is based on their input. The two consenting participants were both female, aged between 25 and 44 and of Aboriginal or Torres Strait Islander descent. Household incomes were between \$200 and \$599 per week. Both participants lived in houses, with three or four bedrooms and large household sizes (five and eight

people). One participant owned their home and the other was renting. This group was keen to stress that their viewpoints should not be seen as representative of Indigenous people nor reduce ongoing responsibility for government to undertake extensive consultation with Indigenous people.

Content:

- The participants had little knowledge of standby power. They didn't like the suggestion of unplugging appliances because that would mean running around after the kids hassling them to turn things off – this is stressful and affects the enjoyment of these few small luxuries of life.
- Heating: Feeling that the heaters with fans in them use a lot of power and that radiator heaters are expensive to run. One household had convection heaters and a radiator in the bathroom. The other household had ducted reverse cycle air conditioning. Participants tried to cut back on power by turning off heating during the day and when leaving the house. The main heating times are when getting up and in the evening (e.g. bath times).
- One participant was suspicious about using the microwave to cook – only used it to warm or cook vegies. They were concerned about its safety for cooking – 'does it do something to the meat?'
- Hot water runs out frequently. Participants were interested to know about insulating hot water pipes. They reported that the hot water takes a long time to get to the kitchen sink through a pipe running under the house and that insulation would have to help.
- There was a debate over whether the bath or the shower is more efficient. Participants thought that a bath uses less water and power. The kids get in the shower, play in there, and take a long time. Better to put them all in the bath together and let them play. Participants currently turn up the ducted heating at bath time to keep the kids warm whereas after discussion they felt a bathroom ceiling radiator may be more efficient.
- There was a story about one old bloke who leaves an egg to cook on his hot water pilot light as he goes out in order to save fuel. 'He reckons he's pretty clever'.
- Participants had little experience of AAA showerheads but one was open to using one to replace a faulty showerhead in the second shower.
- When Aboriginal people are in Aboriginal Housing Board of Victoria housing (i.e. public housing), the main appliances are supplied (e.g. hot water system, heating and stove). None of these are energy efficient. There is also no incentive to upgrade the home and a strong message of 'don't touch it' – leave the house as you found it.
- It was strongly felt that it should be the responsibility of government (and via them, landlords) to ensure that housing is fitted out with energy efficient appliances and that appliances sold are energy efficient. It should not be the responsibility of people who are already struggling to find out about these things. Also: 'Government should be responsible to mass produce efficient power'. Aboriginal people would like solar power – they have this in remote areas, communities and outstations. Not available to people on low incomes but would increase Aboriginal peoples' 'control over our living standards'.
- Participants suggested having information sessions on energy efficient appliances in the home (run by the Aboriginal Housing Board). Aboriginal people often buy inefficient second hand appliances.
- It was felt that the star rating should have a dollar value attached. People can't translate the kilowatt number into a cost.

- Participants felt that all this information was too much, too messy and too complicated – information overload. Need more of an overview. Too much stress to think about saving \$3 here and there, even though it all adds up. The feeling was, ‘who cares, too hard, for just \$3’. People are already stressed enough with other things to worry about (managing bills etc) to bother with saving energy. There is already enough to remember with all the family tasks and deadlines and having to do the kids’ reading from school every night.
- For people who are struggling, the only comfort in life is in the home – they want to let the kids be able to watch a DVD and have a warm house to ease the hardship. People need to have the basic comforts of life, and all of these depend on power. The house is the one area of freedom and relaxation – when in the house ‘let ‘em do what they want’. Don’t have any other luxuries. Participants don’t want to be on everyone’s back about watching the power and turning things off – it’s unrealistic for the lifestyle, creates too much pressure and stress and takes the enjoyment out of basic comfort. All that stress puts an emotional toll on the family.
- Aboriginal people have more family and visitors on weekends, let kids stay up late, use more power. Weekends are peak times for Aboriginal people.
- Utility companies treat electricity not as an essential service but as a consumer item, with complicated rules like credit cards, different rates and so on. It is all very confusing, when an essential service should be straightforward.
- People don’t know about the concessions they are entitled to. Problem of constantly having to ring up and ask for concession, not applied automatically. People don’t know at what times they are eligible for concession (eg. winter only?). Felt that many people missed out on concession entitlements due to lack of information.
- Participants ‘freak out’ at their bill – it’s too much, a heavy burden.
- With Easy Pay, if you exceed the bill target, they just let you keep paying and don’t tell you to stop or adjust the payment as they argue you will be in credit for winter/summer when your consumption is higher. They just pocket that money that you could have used at the time.
- Suggestion of a fridge magnet with a few energy saving tips. Also educate kids at school about these things.
- There was no voting on policy options, but there was approval for standards for rental and other housing.

5.2.7 Public workshop, Ballarat, Victoria (V7)

Date: 31 August 2004
Time: 1 pm – 3 pm
Venue: BEST Community Development Centre

Participants:

There were two male participants in this workshop, both from an agency in Geelong that provides services to the elderly (some with dementia) and people with intellectual and physical disabilities. The participants were there mainly as representatives of their clients. Demographic data forms were not completed for this workshop.

Content:

- Started with an anecdote of a client that was suspicious of ‘new’ gas heaters and insisted on using an electric blow heater instead.
- Most of their clients are in rented accommodation – old-fashioned single room flats or bed sits at the cheapest end of the market. They often take un-renovated, sub-standard and run-down units because they are cheaper (\$85-\$90 per week) and as a result unwittingly also rent the worst and most inefficient hot water services and heating appliances (if any).
- Some clients and their carers believe gas heaters to be dangerous (even when they have gas cooking) and the agency tends to help their clients buy column oil-filled electric heaters with thermostat controls. There was some discussion of the safety of gas stoves and a suggestion that halogen cooktops might be more suitable (these are cool to the touch immediately they are turned off).
- One participant questioned whether power companies had any reason to reduce energy use. They have a vested interest in selling more energy.
- Clients spend most of their time in the kitchen/living area and bedroom, which are the same place if it is a bed-sit. They often have second-hand fridges and hot water services are often electric, old and in poor working order.
- Price is by far the biggest influence on their choice of appliances. Many clients buy very cheap goods from the Discount Electrical Centre, a bulk warehouse retailer that sells second-hand appliances from New Zealand and unfamiliar brand names (e.g. Candy). The goods have no warranty or back up servicing, may last a short time and will be thrown away rather than fixed when faulty. Running cost of appliances is not considered.
- Clients do not cut back on use after they get a large bill. They want to pay the full amount, ask the caseworkers to help with payment plans, and to intercede on their behalf with power companies. Most are on some kind of regular payment plan, but do sometimes go under with big bills (i.e. bankrupt). Some clients have lived for years without power after receiving a bill too big to pay and other clients go without heating and spend all day in bed rather than get another large bill.
- Direct debit payments and CentrePay are helpful, but some utilities don’t offer these options. Fortnightly payments linked to benefit payments work well. The participants regularly negotiate with utilities over client bill payments. Often need to invoke ‘life supporting machine’ to keep power supply on after a client defaults. ‘What does a client do if the power is cut off and they have a freezer full of food?’
- The agency has a contact that retrofits free fridges and sells them for cheap second-hand prices. Participants thought new fridges should have auto-defrost, but not the type that works by heating the walls, as that defeats the purpose of saving energy.
- Clients don’t use dishwashers. Some are suspicious of microwaves due to radiation.
- Heating: Most clients have built-in electric radiators or use small cheap electric fan heaters (chosen for cheap purchase price without any comprehension of running costs). Many clients won’t use their heaters as they are the symbol of power use – they will wear many layers of clothing, beanies and three cardigans or will go to bed with an electric blanket to keep warm. Other clients will run the heater full on all day regardless of cost because they want to have the ‘right’ to keep warm.

- Electric blankets: most clients use them as a primary form of heating, both day and night. Discussed using timers for those who may have safety issues, also suggesting hot-water bottles instead.
- Most housing stock is poorly insulated or not at all, representative of the era in which it was built – some are concrete walls, no insulation, hot in summer, cold and damp in winter, others are only insulated in the roof, not in the walls.
- Lighting: Workers replace globes with CFLs wherever possible. CFLs are excellent for the vision-impaired but clients don't like the look of standard CFLs. Some of the new CFLs look like the lamps they are used to but give better quality of light.
- Many clients hang out at shopping centres or at the pokies to keep warm and sociable during the day.
- Suggestion that training workers like themselves in energy saving or energy auditing or workshop delivery might work well across all service sectors. These workers would be well placed to pass on information to clients, taking into account context.
- Participants were sceptical about low-flow showerheads. Clients don't pay water bills so no incentive to save water. Some clients have changed over and then switched back.
- Bills: most clients would appreciate bills that are more frequent. Most access a form of EasyPay (or regular payments in advance). Some then redraw credit at later time and as such, this method has added benefit as a form of saving.
- Bills: most clients wouldn't know if they had off-peak, nor how to evaluate its advantages (if any).
- No interest in green power or green objectives as cost is the only incentive.
- Landlords should be required to retrofit to minimum standards, on all accounts, not just energy. Unfortunately, the reason clients get cheap housing is because landlords let their properties run down. If standards were met, rents would rise, and this would seem like a worse situation because running costs are not factored into rents. The Tenancy Act is difficult to reinforce for the middle classes, so these clients have no hope.
- The most popular policy options were: disclosure, linked to better information and education; billing incentives; standards for rental properties; Cent-A-Meter with green and red lights to indicate appropriate and inappropriate use of power. There was some interest in pre-payment meters, but participants couldn't see how it would work in practice, i.e. can't have a life-support system switch off because you ran out of credit.

5.2.8 Arabic-speaking women's group, Fawkner, Victoria (V8)

Date: 6 September 2004
Time: Not recorded
Venue: Fawkner Community House

Participants:

This workshop was run at the regular weekly meeting of an Arabic-speaking women's group, organised by Australian Lebanese Welfare. Fifteen women, including the organiser of the group,

attended the workshop. About half of the women are Lebanese. Most of the remaining women are from Iraq, specifically the Assyrian/Chaldean community, and speak Arabic as their *second* language.

Content:

- This workshop did not follow the standard HWP. Instead, it was conducted as a general discussion about electricity issues. Four of the women in attendance had heard the facilitator from MEFL speak (in Arabic) last year about energy saving so one focus of the workshop was to discuss any changes the women had made since then.
- CFLs: All the women who had attended the earlier MEFL workshop had installed CFLs in their homes since last year's talk. They were impressed with their long life and had no complaints about the colour (they used white globes rather than warm).
- Standby: The women who attended the earlier MEFL workshop had also all turned off their standby power but couldn't see any difference in their bills.
- One woman complained that there was no noticeable change in her bill, but then went on to describe her son's showering habits: two one-hour showers each day. Participants suggested some ways to stop their kids showering too long, including docking pocket money or having a timer on the shower.
- One woman had installed weather-stripping on all her doors and windows, which she said had kept the house warmer.
- When asked if they had turned down their heaters, one mother said her children were always getting sick and her husband had insisted they spend the money on heating rather than doctor's bills. A lively discussion followed on whether it was making children sicker to overheat the room and send them out into cold weather than to have the heater lower.
- One woman was puzzled as to why her bill was different at different times of the year – she had not realised that the bill was connected to how much energy she used.
- Another woman complained that she did not use much energy and yet she paid the same service fee, which was comparatively high. She felt that if you used more energy you should pay proportionally more service fee – she was not rewarded for being conservative.
- There was some discussion about using CentrePay as a useful way to manage paying bills and perhaps saving at the same time.
- Microwaves were perceived as using a lot of power. Some were suspicious of radiation from these appliances. Some women won't use them; others used them only for defrosting.
- There was discussion about using hot water bottles to heat beds and baby's beds in particular – all the women use them, but only for when they are sick.
- Discussed using timers for heaters, especially in bedrooms. All the women liked the idea but had never been shown how they work. The English instructions are hard to follow. Translation of timer instructions is needed so that they can be used.
- Hot water: There was some confusion about off-peak rates. One woman had a bill with off-peak charges, rang to have them explained and was told her meter didn't read off-peak. She was understandably confused, felt patronised and made to feel stupid. Most women had not heard of off-peak, although they had heard that there were better times to use electricity than others. If

there were cheaper times to use electricity than others they would make the effort to use power when it was cheapest.

- Appliance star ratings: Participants were generally suspicious of the ratings because they appeared to add cost and were therefore to be avoided.

5.2.9 Salvation Army workshop, Brunswick, Victoria (V9)

Date: 8 September 2004
Time: 2 pm – 4 pm
Venue: Salvation Army, Brunswick

Participants:

There were nine participants in this workshop, six males and three females. Two toddlers were also present. Three were aged 15 to 24, three were aged 25 to 44, two were aged 45 to 64 and one was aged over 65. Participants were from low-income households, all receiving less than \$399 per week. Participants lived in rented townhouses or flats, typically with two bedrooms, in households of one, two or three people. Four participants had disabilities and two were carers of people with disabilities. Two participants were from a non-English speaking background and three were of Aboriginal or Torres Strait Islander descent.

Content:

- CFLs: Participants thought that energy saving lights were good – they cost more but they save dollars. ‘They last heaps longer’. Participants had CFLs that had lasted for three to five years. There were some concerns about CFLs being too strong or bright for baby’s/toddler’s eyes. Participants were not aware that CFLs come in a range of strengths.
- Participants had good knowledge of standby power. One participant turns everything off, but can’t with the VCR, because you lose the programming and it takes half an hour to set it up again.
- One participant had a bill of \$130 for three months, not including gas. Another said ‘mine are heaps bigger than that – I hate being cold though’. ‘I can’t stand being cold – that’s why my bill is so high’. This participant lived in a home with floorboards everywhere that gets cold and was concerned about the baby catching a cold so has to leave the heating on all night and ‘wear heaps of clothes’.
- Participants discussed health concerns with hot water bottles and electric blankets. ‘They say you shouldn’t use a hot water bottle with the baby’ because its scalding, too hot. Electric blankets are ‘no good for some people’ because of health and safety issues.
- In public housing, people often move in and find curtains have been taken by previous tenants so there is no insulation for the windows and the house is cold. There is an issue of who should pay for these – the tenants can’t afford to. There are also big gaps under doors – ‘already put on that draught tape around doors but still big gaps’. ‘It’s an old house and the draught comes straight under’.
- Participants were generally happy about putting on more clothes to stay warm. Some didn’t have heating and just jumped into bed with lots of clothes on. One said, ‘I just get used to being cold’.
- Most participants in public housing had gas wall heaters.

- On saving on bills: '\$30 a year sounds like nothing but if you add up all the little bits it really counts. I did a study at school and it does add up'. The participant thought that you need more pamphlets for 'normal people' with information on ways to save.
- Appliances: One participant had a fridge that freezes everything up. There was a discussion about how to buy appliances at the Op Shop (Brotherhood of St Lawrence). One participant bought a colour TV for \$40 – 'good stuff and cheap – maybe have a little problem like the TV makes a squeal noise but still works'. One participant also recommended Cash Converters and had bought a four-year old fridge there that still had a star rating sticker. Participants 'can't afford new stuff'.
- Cooking: Family with toddler used an electric frying pan a lot. A single older man uses the microwave a lot.
- Experiences with public housing: 'In the flats, you get one bill for everything and you can have showers as long as you want!' There was a general consensus that the landlord should fix stuff, not the resident. Participants felt that public housing was better than private landlords for maintenance and responsiveness.
- AAA showerheads: Most participants had not seen these. One said, 'Oh yeah, seen them, they really hurt your skin'.
- Laundry: Some participants had tried washing in cold water, but most use warm water. One young father found that the 'NapiSan doesn't dissolve properly, goes clumpy' in cold water. Most participants hang their clothes out to dry rather than using a dryer. Discussion about how hot water not hot enough to kill germs and suggestion that hot taps should be made obsolete on washing machines.
- Laundry: some participants had no laundry and used laundromats. Water appeared to be permanently warm for washing with no option to select cold. Cost single man around \$5.00/wk for washing and drying.
- Bills: Most participants felt that bills don't make sense, but they 'just look at the money and try and figure out how to pay it'. They also felt an enormous sense of powerlessness in judging or arguing about appropriateness of bill: 'What can you do? Just have to pay it'. 'Can't do nothing'. 'Not like a telephone bill that you can look at and say, no, I never called that number – you can see what you've spent on a phone bill. Can't say nothing with electricity bill'.
- Greenhouse graph: 'Yeah, that ozone or greenhouse stuff innit? Pollution, yeah pollution. Nah, I don't care about pollution – just the money – yeah, the money. Can't do much about it. They should look at other options for power, not us'.
- Participants felt they should have cheaper power and the government should give vouchers or something. This led to a discussion about the government concession on bills. Participants were not clear whether it was included on their bill or not and suspicious that the concession had not in fact been automatically deducted as claimed by utility provider. They would prefer a voucher that they could spend on electricity any time when you didn't have the money. This would let you choose the best time to get the reduction according to when you need it. General discussion that participants didn't trust the government to give them the concession.
- Full retail competition: Participants were suspicious of the deals on offer and felt that the utilities were 'dodgy', offering 'cheaper energy but much bigger [service] charges'. People didn't want to be locked in for three years – 'what happens in that three years?'
- Most participants were on EasyPay and were generally happy with the fortnightly payments so that they don't end up with a big bill. In this way, they had confidence they could spend the

money left over without having to withhold some for bills. There was no sense that EasyPay encourages reductions in energy consumption – it is primarily a way of managing finances. Participants were uncertain about what happens when you get in credit with EasyPay. Some participants had problems paying at the Post Office and finding that it takes a few days to go through. This had made their payments late and they were threatened with disconnection as a result. Participants felt this was unfair as it was the processing rather than their tardiness that had made them late – the utility companies should factor in the processing time and set payment dates in line with this.

- There was no voting on policy options but some general discussion. Participants were enthusiastic about rebates for efficient appliances and getting landlords to fix up existing housing stock. Some felt that there should be a single price for electricity and that electricity bills should break down costs according to appliances.
- Participants felt that electricity is an essential service and should be cheaper but it's moved away from that to become like a business. Felt that the government does not do enough for the needy in Australia.

5.2.10 Bondi/Waverley ECHO discussion group, Waverley, NSW (N1)

Date: 30 August 2004
Time: 10.30 am – 12 noon
Venue: Waverley Bowling Club

Participants:

There were 15 participants in this workshop, 6 males and 9 females. The participants included members of a regular weekly discussion group and organisers from the ECHO Neighbourhood Centre. All of the discussion group members are aged over 55, have physical disabilities and live in the Waverley and Randwick municipalities. Due to the shortened format for this workshop, the participants did not complete demographic data forms and there was no voting on policy options.

Content:

- Some participants had been visited by electricity companies offering to save them money if they changed electricity companies. They were unsure how to decide and lacked information about what this means for them.
- One participant had bought a refrigerator (approximately 20 years ago) and been shocked to find that his electricity use had increased dramatically – he questioned why he had not been given information on usage rates when choosing the fridge.
- One person never uses the hot water for clothes washing, but still gets a bill that is larger than her neighbour. She doesn't understand why this is.
- **Lighting:** Participants were unsure about how to save energy with light bulbs – 'should we turn them off if it's just for a short time, or does it use more energy to turn them on again?' Participants wanted to know whether a clear globe uses more energy than a pearl one. Participants made use of a free CFL provided by the utility company and another noted that the local government had visited and fitted fluorescent lights free of charge.

- Participants thought that the star rating system was good when buying new appliances, but how do we know how much energy our existing appliances use?
- Cooking: Participants had heard that copper-bottomed saucepans save energy and wanted to know if this was true.
- Participants had tried several ways of reducing energy bills in the kitchen, including using the microwave rather than the oven where possible, installing fluorescent tube lighting and installing the free CFL provided by Energy Australia. One participant mentioned a program where Waverley Council came and fitted CFLs and other energy-saving appliances free of charge.
- There was a general discussion about the value of having north-facing windows. One participant said that she didn't need to use heating in winter because of her north-facing windows. She found that a rug was sufficient.
- Many participants had portable electric heaters and most had electric hot water systems.
- There was a general discussion about the energy consumption of quartz halogen lights and bathroom heat lamps.
- Hot water: Some participants had recently replaced their hot water system when the old one broke down. It was noted that when this happens you are likely to just replace it quickly, not take the time to shop around for a more efficient one. The participants had basically just rung the company named on their old hot water system and asked them to recommend and install a new system. They did not ask for information on energy efficiency and were not offered any.
- Policy options were not discussed at this workshop due to time constraints.

5.2.11 Harris Community Centre (Chinese speakers), Ultimo, NSW (N2)

Date: 31 August 2004
Time: 10.30 am – 12.30 pm
Venue: Harris Community Centre

Participants:

This workshop had 19 participants, 6 male and 13 female. All participants were from a Chinese-speaking background and many were members of a regular English class held at the Harris Community Centre. A staff member from the Harris Community Centre translated the workshop. Given the time required for translation and the difficulties most of the participants had reading English, demographic data forms were not completed for this workshop and there was no voting on policy options.

Content:

- Participants wanted to know if it is better to turn things (like lights) on and off if it's just for a short time, or do they use more energy to start up again?
- Cooking: Some cultural differences were evident in the appliances used for cooking. Participants made significant use of rice cookers and thermal pots. Thermal pots are very efficient and especially good for Chinese dishes, like soups and stews. The inner pot is heated on the stove for

about 20 minutes then put inside an outer pot designed like a vacuum flask to retain heat. The food will continue cooking without additional energy input for several hours.

- Fridge: Participants wanted to know whether the fridge is always on, or does it turn on and off? They also wanted to know whether it costs more to turn the fridge temperature down colder.
- There was little general knowledge about energy use. Participants wanted to know whether a power point uses energy when it is switched on with nothing plugged in, or only if something is plugged in. They were not sure how to understand meters and whether there are different meters for gas and electricity. They also wanted to know whether a rangehood uses much energy.
- Some participants had tried some small things to save energy, such as switching things off when they are not being used and thinking about what they wanted from the fridge before opening it so that they don't have the door open for too long.
- There was a general discussion about the size of electricity bills. Quarterly electricity bills were compared - they ranged from \$41 (after the concession discount) to \$276. Some of the reasons for differences were discussed, including different household sizes, access to natural gas and different appliances.
- Most participants used electric heating. They wanted to know which type of heater is best and whether gas or electricity is better for heating and cooking.
- CFLs: Participants were unsure whether energy saving light bulbs gave the same brightness. They had little knowledge about how long CFLs last and how much they cost. They were concerned that they give off a 'weird blue light'. Participants wanted to know if they could save energy using light dimmers and whether a lower wattage light bulb uses less energy.
- Participants in apartments were not sure where their hot water system was located and how they would turn it off if they went on holidays.
- Many of the participants reported washing in cold water, but some felt that cold water doesn't get clothes clean enough. They wanted to know if filling the washer with more water reduces energy consumption and whether clothes dryers use a lot of energy.
- One participant wanted to know if they could get their electricity deposit back when they move house.
- Another participant wanted to know what a transformer is and whether it saves energy.
- In general, most of the participants had very little basic knowledge of energy and ways to save energy. Consequently, most of the session was spent on education.

5.2.12 Harris Community Centre (English speakers), Ultimo, NSW (N3)

Date: 31 August 2004
Time: 1.30 pm – 3.30 pm
Venue: Harris Community Centre

Participants:

This workshop had ten participants, two males and eight females. More than half were aged over 65 and most of the remainder were aged between 45 and 64. More than half the participants had a weekly household income of less than \$200. However, most other income brackets were represented, including one participant with a household income of over \$1,400 per week. Most participants lived alone, in rented one-bedroom flats or units (mainly public housing). However, there were also members of three larger households with three or four people. Two participants had disabilities and three were from a non-English speaking background.

Content:

- One participant had a small hot water system in her flat and once the hot water runs out the system has to start all over again to reheat the water, which is not very efficient – this is frustrating for her when she is trying to save money on her bills.
- Another participant had tried AAA-rated showerheads and found that they don't give as good a shower so he ends up spending longer in there – he feels that maybe this defeats the purpose?
- Participants had tried a few things to save on their electricity bills, including using a blanket instead of heating. One participant goes around and closes the blinds and curtains before sunset to keep the heat in during the night. Another tries to use the natural weather by opening windows facing north to let the sun's heat in. This participant found they could maintain a fairly stable temperature in their home.
- One participant switches her hot water system off regularly to save money. She has found that, because her tank is so big and the insulation is quite good, the hot water lasts for a couple of days after it is switched off. She turns the tank back on every third day to heat the water back up. This strategy only works because the participant has a large tank and lives alone, so is not using much hot water.
- Participants wanted to know about the characteristics of different light bulbs, whether cordless phones and answering machines use a lot of energy and how much energy clothes washers use. They also wanted to know whether it is worth turning lights off if just for a short time or does it use more energy to start the light up again.
- One participant had a waterbed, which uses a heater to keep the water at a suitable temperature. He realised that this probably used a lot of energy but found the comfort of the waterbed more appealing than any incentive to save energy.
- There was a lot of discussion about problems with the Department of Housing (DOH) and landlords in general. Participants said that the DOH is slow to undertake necessary repairs and that it is difficult to get a response to complaints. Participants had lots of ideas for things that the DOH could do to help them reduce their energy use, including fixing washing machine leaks, sealing draughts and gaps in window and door frames to make heating more efficient and fixing old/poor oven seals so that tenants don't need to turn the oven up so high to cook.

- One participant noted that some rooms are very dark so they always need to have lights on. He suggested that the DOH should install a skylight to increase natural light so they can reduce use of lighting. Others mentioned similar problems with dark rooms without windows, or windows that have not been cleaned for years, so they are very dark. All this means they need to use more lighting, therefore more energy.
- Participants wanted to know whether a hairdryer uses much energy and whether it uses a lot of energy to turn on a small radiant heater for 10 minutes while getting dressed.
- One of the participants was experiencing a financial crisis as a result of an unexpectedly high bill. Normally her quarterly bill is around \$100 but this time it was over \$300 and she was not aware of any changes that could have caused the increase. The participant had poor English and had found the utility company very unresponsive when she rang to investigate the source of the high bill. She had recruited the assistance of a neighbour to speak to the utility on her behalf but had made little progress. There was no evidence of a leaking hot water system and the participant claimed that there had been no change in her use of heating. The facilitator suggested that the participant should contact the Energy and Water Ombudsman of NSW (EWON), as this is the type of issue that they deal with regularly. However, the participant was clearly reluctant to take that step and seemed concerned about getting another organisation involved.
- Participants had questions about full retail competition. They wanted to know how to decide which energy company is better. They felt that it was difficult to get impartial advice on this issue.
- Participants suggested that DOH should do a bulk deal with one of the energy companies to get tenants a better deal because there are so many of them.
- The most popular policy options at this workshop included better information on energy efficient appliances, more frequent bills, bills that separate costs, standards for rental housing and joining or establishing a community support group.

5.3 Policy options

This section discusses the results of voting on policy options conducted at the workshops and issues that arose in relation to specific options.

5.3.1 Voting results

In six of the twelve workshops, participants were given the opportunity to vote on their preferred policy options from the 27 options outlined in the workshop. As noted in Section 4.2.3, each workshop participant was allocated two votes and asked to mark their two preferred options on the policy option summary sheet (OH15 in the facilitator's pack). Given that voting was only conducted at half of the workshops, the voting results do not provide a definitive statement of the policy preferences of workshop participants. Further, this quantitative data on preferences is not intended to displace the richer qualitative discussions of policy options during the workshops. However, the voting results do give a useful indication of the type of policy options that were viewed favourably.

Although participants were instructed to allocate their votes to single policy options, some participants allocated their vote to one of the six categories discussed in Section 4.4. In these cases, the vote was distributed equally across the options within that category. For example, a vote for *Better Information* was recorded as 0.2 votes each for better information on energy efficient appliances, newsletters, information in different languages, energy audits and Cent-A-Meter installation.

Figure 1 summarises the voting results from the workshops. All options listed on the voting sheet received at least a partial vote during the workshops, although all options from *Compulsory gas*

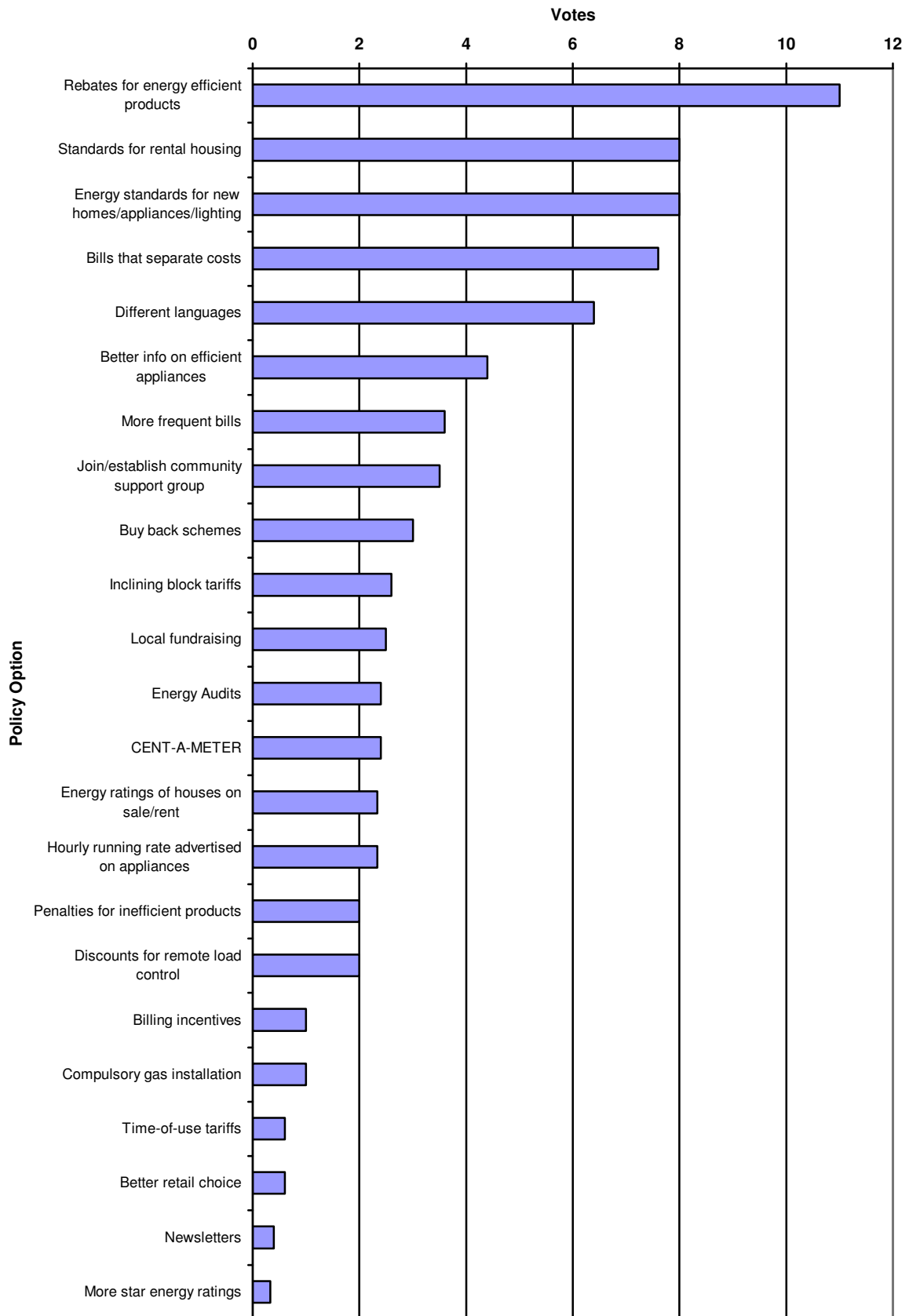
installation down (in Figure 1) were only selected as a consequence of a participant voting for the whole category. One option – *Billing incentives* – received a vote although it was not on the voting sheet. All options above *Billing incentives* received at least one full vote.

The top five policy options, all of which received six votes or more, were:

6. Rebates or discounts for energy efficient products (11 votes)
7. Standards for rental housing (8 votes)
8. Energy standards for new homes, appliances, lighting (8 votes)
9. Bills that separate costs (7.6 votes)
10. Information in different languages (6.4 votes).

Most categories of options were well supported, although the disclosure and community support categories received significantly fewer votes than the other categories. The sections below provide additional discussion of issues that arose during the workshops in relation to each of the option categories.

Figure 1: Results of voting on policy options.



5.3.2 Better information

Better information was generally well supported by workshop participants; options in this category received an average of 3.2 votes each. The most popular options were information in different languages (6.4 votes) and better information on energy efficient appliances (4.4 votes). The least popular was newsletters, which received 0.4 votes.

The support for information in different languages is unsurprising, given the strong representation of people from non-English speaking backgrounds in the workshops. Of the 44 participants in voting workshops, 16 (36%) were from a non-English speaking background. Workshop participants emphasised the need to take cultural issues into account when developing information, so that energy saving information does not recommend actions that are unacceptable to particular cultures. Participants suggested that ethnic media, including ethnic radio and newspapers, could be a conduit for better information. Another suggestion was to include bill inserts in different languages.

Workshop participants had mixed feelings about the need for better (e.g. printed) information on energy efficient appliances. Some participants were suspicious about information on appliances unless they could be sure it came from the government. One workshop suggested that energy saving tips on television renovator/lifestyle programs would reach the greatest audience. Another suggested developing energy efficient display homes so that people could see energy efficient appliances demonstrated.

There were no full votes for newsletters – some participants felt that people will throw out anything more than one page without reading it. These participants suggested that information works best when provided person-to-person or in groups.

Energy audits received little outright support, although some participants believed that free audits by experts from electricity retailers would be good. There was some evident demand for power meters that householders can use to test the energy use and cost of single appliances. The Cool Communities program in South Australia has made these meters available in self-audit kits available from the local library.

Section 5.7 discusses results relating to Cent-A-Meters in detail.

5.3.3 Billing and pricing

Billing and pricing options were not as well supported as better information, incentives and regulation, but still received an average of 3 votes each.¹ The most popular options were bills that separate costs (7.6 votes) and more frequent bills (3.6 votes). The least popular were interval meters with cost-reflective tariffs (0.6 votes) and more retail choice (0.6 votes).

Many of the workshop participants, particularly those that had unusually high bills, felt that it would be useful to receive a bill that separated total costs out according to different appliances. Participants felt that this would let them track down the source of high bills and prioritise energy saving actions according to the potential cost savings.

The possibility of more frequent bills elicited mixed reactions from participants. Of the participants that completed a demographic data form, 70% received their bills quarterly, 13% received their bill every two months and 7% received their bill monthly. There was concern in some workshops that

¹ Note that the option to install pre-payment meters has been excluded from the analysis as this option was excluded from the voting after workshop V3, in response to the concerns of social advocacy groups. Installation of pre-payment meters did not receive any votes in the three workshops in which it was considered.

more frequent billing would just equate to more frequent financial crisis and threats of disconnection. Other workshops felt that more frequent bills allowed people to budget better. In particular, some of the workshops involving recently arrived migrants or their advocates felt that more frequent bills would help those who have little experience with electricity bills to adjust.

There was discussion in several workshops about EasyPay and Centrepay options for bill payment. EasyPay is a direct debit option that can be set up with regular weekly, fortnightly or monthly payments to spread the cost of a bill out over a year. Centrepay is available to people that receive certain Centrelink payments. A regular amount is deducted from the Centrelink payment to cover bill payments. Participants were generally supportive of these payment schemes.

Participants generally thought that inclining block tariffs were fine in theory but had concerns about the impact on families and other large households. Several participants suggested that these tariffs would need to be implemented in such a way as to protect families and only penalise the wealthy.

There was little support for interval meters with cost-reflective tariffs, although it should be noted that this is a complex policy option that was difficult to summarise in the time available. Participants may have avoided this option because they found it difficult to understand. Some participants commented that it penalised people who have no choice but to use power at peak times, such as people living in cheap, poorly designed housing who need to use air-conditioning.

Similarly, the 'better retail choice' option was imprecise in its description and therefore difficult for participants to understand in a workshop format. Participants were generally suspicious of electricity retailers and uncertain about the offers available under full retail competition. Nevertheless, one workshop did suggest that the Department of Housing enter into a bulk electricity contract on behalf of its tenants.

As noted previously, pre-payment meters were removed from the workshop materials due to concerns about their social impact, including the higher cost and higher rates of disconnection than regular quarterly billing. Nevertheless, pre-payment meters were discussed in several of the early workshops. One of these workshops liked the idea of being able to set your own limit on what you can afford and being notified when you approach that limit. However, it should be noted that EasyPay payment systems, discussed above, essentially provide the same function without the social impact of pre-payment meters. The only other workshop to devote much discussion to pre-payment meters had concerns about how they would work in practice, for example with people on life-support systems who need constant power.

5.3.4 Incentives

Incentives were popular in the workshops. Options in this category received an average of 4.75 votes each and the option that received the most votes – rebates for energy efficient products – was included in this category. Implementation of appliance buy back schemes was the next most popular choice in this category, with three votes. Penalties for inefficient appliances and discounts for remote load control received two votes each.

The workshops were not designed to elicit responses from participants on the level of rebate or incentive that would be sufficient to encourage behavioural change. This is an important limitation of the research and an appropriate topic for future research. While people may generally welcome the idea of rebates and incentives, it may not be cost-effective to offer an incentive of the magnitude they desire. Some participants raised the example of the solar hot water rebate, which is not big enough to encourage people to select that option compared to, for example, an instantaneous gas system.

While workshop participants generally approved of incentives, they generally disapproved of the opposite option – implementation of penalties for inefficient appliances.

The idea of energy bill discounts for remote load control was of interest to participants. However, there was some suspicion about outside intervention in the home. Participants also felt that householders would need to have a very good understanding of the process so that they didn't think their appliance was broken. Further, some participants were more interested in having a positive environmental impact than in reducing peak demand and felt that this option was of more interest to utilities. Otherwise, participants were receptive to the idea, although few voted for it.

The participants who voted for appliance buy-back schemes wanted to see these schemes broadened to include rebates for changing 'life-stages'. For example, when children move out of home and the large family fridge becomes too big, they felt that there should be rebates for moving to a smaller fridge.

Some participants raised the idea of billing incentives, such as a discount for early payment, as a preferable approach to the current system of penalties and disconnection.

5.3.5 Disclosure

In terms of average votes per option, disclosure was the least popular category of options, with 1.7 votes per option. Disclosure of home energy ratings at the point of sale or rent and advertisement of the hourly running cost on appliances (in addition to the star rating) each received 2.7 votes. The option of expanding the appliance Energy Rating (star rating) scheme only received one third of a vote. However, these suggestions received favourable discussion in several workshops despite their poor performance in voting.

One option discussed during the workshops but inadvertently omitted from the voting sheet was benchmarking on bills. Several workshops liked this idea, particularly when moving to a new house where there is no previous bill or bill from the same time last year to benchmark against. However, both this option and the option of advertising hourly running rates on appliances have some practical implementation barriers due to variations in household characteristics and tariff structures.

One workshop raised the idea of requiring appliance retailers to show the star rating of appliances in advertisements, including print advertising and junk mail.

5.3.6 Regulation

In terms of votes per option, regulation was the most popular category, with each option receiving 5.7 votes on average. The two most popular options were standards for rental housing (8 votes) and standards for new homes, appliances and lighting (8 votes). The popularity of standards for rental housing is unsurprising given the relatively high proportion of renters participating in the workshops (see Section 5.5). Although there was general support for this option, some participants were concerned about the impact on cheap rents. They felt that if landlords were forced to improve their properties, then they would pass on the cost by raising rents, leaving low-income households unable to secure accommodation.

Energy efficiency standards for new homes have already been introduced in NSW and Victoria and the workshop participants endorsed these programs. In relation to appliance efficiency standards, some workshop participants specifically identified heaters as an appropriate target for new standards.

There were no full votes for mandatory installation of natural gas where available and this option did not prompt much discussion at most workshops. Where it was discussed, it was supported for new developments only. No participants were strongly against this option.

Participants raised several other possible regulatory changes during the workshops, including changes to the Tenancy Act and planning laws, putting energy auditing in the Energy Retail Code and requiring utilities to adopt least cost planning.

5.3.7 Community support

The two community support options received an average of three votes each. Joining or starting a community support group received 3.5 votes and local fundraising received 2.5 votes. There was a general feeling in many of the workshops that the burden of responding to climate change should not be put on communities but that support should be available for those that do want to take action.

However, there was substantial support for community groups to be resourced to do more with the community, including workshops of the type conducted during this research project and provision of tailored advice in the home or community. If these options had been listed on the voting sheet it is likely, based on the content of discussions, that they would have received greater support than the other options listed under the community support category.

5.4 *Thematic analysis of workshop data on electricity use*

Section 5.2 provides details of workshops conducted with householders and enables readers to ascertain the flavour of individual workshops and the dominant demographic characteristics of each. Despite their diversity, the workshop data offers many common themes and issues. The following thematic analysis identifies themes common across a significant section of the workshops. In identifying themes, particular attention has been given to those that directly address the research questions of this study.

5.4.1 Social/cultural factors of householder electricity use

Social and cultural factors reflect the underlying context, history, aspirations, experiences, ways of thinking and behaviours of given groups. As argued by Wilhite & Lutzenhiser (1999), all energy consumption ultimately serves a social purpose; so changing patterns of energy consumption requires attention to these social purposes. An analysis of these factors helps build understanding of the diverse lived experience of people in relation to electricity consumption and reduction, and is also valuable in understanding the barriers to reduction and changed behaviour (note that other types of barriers are discussed in Section 5.4.2).

This study collected data from a wide range of groups including, but not limited to, Aboriginal and Torres Strait Islanders, Chinese, Lebanese, Assyrian/Chaldean, Sudanese, Arabic, African, Serbian, Macedonian, Vietnamese, refugees, low-income householders, young people, the elderly, people with disabilities and public housing tenants. Given the wide diversity of workshop groups, the data provides a revealing cross section of the social and cultural factors that influence electricity use and attempts at reduction. Whilst some factors are common to a number of culturally and linguistically diverse groups, others are unique (at least within the limited scope of this study) to a single group or take on a defining flavour from a group. Overall, the social and cultural factors appeared to be such prominent factors in influencing electricity use that the researchers recommend further research to inform any policy or public education around energy reduction.

Hospitality

Participants from several different cultures identified a core value as being that of hospitality. This value underlies significant social behaviours such as visits of relatives and friends (especially on weekends), socialising on weekends for extended hours during the day and nights, and communal meals with a sense of abundant food. Cooking is undertaken for extended periods on weekends in preparation for communal meals, which impacts on energy use. In most cases, the value of hospitality requires that hosts cook more food than is actually required, which increases cooking times as well as the requirement for storage of leftovers.

For large communal meals, there is a need for storage of large quantities of food (both prior to and after cooking). As a result participants required larger or multiple refrigerators and/or freezers. The

need for large quantities of food storage is partly linked to the difficulty of accessing shops, due to poor access to transport and long trip times between the home and shops. Participants preferred to make fewer trips and shop for large amounts on those trips. The preference for shopping in bulk was so strong that participants feel 'shame' to shop for smaller amounts of foodstuffs.

Social interaction and heating

Many participants reported coming from a culture (and country of origin) that was used to structuring a high level of social interaction around a heating source. Participants recounted a preference for sitting around a fire and talking or undertaking other passive recreational pursuits. In Australia, this value manifested in a preference for radiant heat, or a fixed source of heat providing a social focus around which family and friends could gather. Even where other sources of heating, such as central heating were present, these groups still utilised a heating source (such as a radiant heater) in addition to other sources.

Comfort, security and quality of life

Participants from diverse cultural groups valued warmth as an indicator of well-being, comfort, security and quality of life. Whilst some participants on low incomes had learned to be cold, others felt that warmth was their most valued commodity and eased the hardship of their everyday living. For this reason, especially in the face of great adversity, participants would prioritise spending money on heating as the one "luxury" they could provide themselves and their families.

Health

Closely related to comfort and quality of life is the issue of health. In some workshops, participants indicated that they used heating for health reasons. For example, they used heating to keep warm while bathing and especially to keep children warm so that they would not get sick. Elderly people also talked about needing to stay warm to manage health conditions. In poor quality housing, a large proportion of heating may be driven by the need to keep warm to maintain health.

Preference for new appliances as an indicator of success

Some participants, especially migrants from some cultures, strongly valued new appliances. For them, Australia offered a plethora of white goods, all representing success and security in their new life. These groups were quite averse to buying second hand goods, believing they were 'dirty' or no good. In some cases, this reflected their experience in their country of origin where they had no contact with a second hand goods market or none existed. In most instances, new and multiple appliances symbolised a successful life in Australia.

Preference for second hand appliances or motivation to save money on purchase price

Alternately, other cultural groups valued cheap, value for money and second hand goods, placing emphasis on the importance of a bargain. Saving money was of main importance for these groups. These groups tended to shop for appliances (especially large appliances like TV's and fridges) largely in second hand stores, opportunity shops or pawnbrokers. As a result, the quality and energy efficiency of these appliances was variable.

Previous experience/expectations regarding electricity

Though it was not discussed at length in all workshops, some participants revealed how their previous experiences of electricity use and billing affected their behaviour in Australia. Several groups had little experience of electricity previously; some had no experience of billing (or experience of only very low prices for electricity), and had little understanding of how electrical products and services worked. This appeared to result in high initial consumption and extremely high bills. This was often

exacerbated by an increased need for heating due to the move from a hot to a cold climate. These participants had no or little knowledge of electricity particularly in the two areas of high consumption - water heating and household heating, having never used electricity for either. In addition, they had little or no knowledge about reducing usage and lacked even the most basic understanding of electricity, the market or their rights as a consumer.

Peak times for electricity use

Several of the workshop groups discussed when their electricity use peaked. These peaks frequently reflected social and cultural factors. As discussed above, one common peak was weekends, especially around meal times. Another peak was around dressing or bathing (especially where a household had children or elderly members that participants felt needed to stay warm at these times). Though peak times were not discussed to a large extent with people with disabilities, it was clear that energy required for life saving devices and support machinery was a major component of total energy use for this group. The special social, cultural and health factors affecting people with disabilities need to be further researched so as to ensure this group participates in benefits flowing from change proposals.

5.4.2 Barriers to householder electricity reduction

The above social and cultural factors represent strongly felt values, widely practised behaviours and ways of thinking that can facilitate or inhibit changes, including those pursued through demand management strategies. They can act as barriers to change if not taken into account. Other barriers to change were more overtly identified in the workshops and these are summarised below.

Infrastructure constraints

The above discussion indicates that one of the main energy services that participants desire is thermal comfort. However, due to the poor insulation and design of existing housing stock, most participants could only achieve the desired level of comfort in winter using artificial heating. This is despite Australia's relatively mild climate. The poor energy efficiency of the housing stock in which most of the participants live is a significant barrier to reduction of electricity use.

Lack of knowledge

To some extent, as discussed above, lack of knowledge was linked to lack of congruent prior experience with electricity (especially for some migrant and refugee groups). However, in general, participants identified a lack of knowledge about the actual functioning of appliances as well as the energy market. This lack of knowledge affected their behaviour. Examples included lack of knowledge about: the relative energy efficiency of turning off and on lights versus leaving them on; alternate forms of heating; the energy costs of running an appliance with a fan; and the costs of standby power.

Participants also lacked information to inform purchasing decisions. In most cases, participants did not fully understand (or understand at all) the Energy Rating scheme (star ratings) for appliances. They believed that it was poorly explained at the point of sale, if at all, and that its advantages in terms of dollar savings were not made clear. Without knowledge, householders are unable to make informed choices about energy reduction actions available to them. In general, participants welcomed the education component of the workshops and believed that there should be more such education available for 'normal people' that is interactive, related to the actual contexts they experience and accessible. Many commented on the need for tailored information, delivered in the home or community, as noted in Section 5.3.7.

Competing values

Repeatedly participants expressed competing values at play in their decisions about energy reduction. These included:

- Tension between different environmental agendas (i.e. reducing electricity versus reducing water – an example being using the dishwasher as a means of reducing water versus hand washing dishes as a means of reducing electricity).
- Competing values of health versus electricity reduction. For example: putting warm left overs in the fridge was valued for health reasons whilst allowing them to cool first achieved electricity reduction.
- Competing values of safety versus electricity reduction. For example: the use of a hot water bottle in bed reduces electricity but may pose a safety risk for young children or if leakage occurs onto electric appliances such as electric blankets.
- Competition between the values of electricity reduction and quality of life. As discussed above, these values were particularly significant for people experiencing hardship who felt that the outcomes of electricity use (warmth, comfort, entertainment etc) were of greater importance than energy reduction in a context where quality of life was comprised of these few ‘luxuries’.

The right to essential services

Most participants strongly believed in the ‘right’ to affordable electricity as an essential service. This belief had several elements. Firstly, participants had noted changes in the way that utility companies and government promote electricity since deregulation of the energy sector. Electricity is now promoted as a product rather than a service, and householders are treated as consumers rather than recipients of an essential service. Bills look much like credit card statements with various sales gimmicks and incentives advertised on them or on bill inserts. Electricity provision has become a complex thing with various rates, choices and conditions. Participants resented this shift and were angry about their loss of an essential service at a price they could afford. Added to this was their resentment about the shift of responsibility from the utility provider (or government) to the consumer, in that consumers were expected to bear the responsibility for managing what was seen to be an inefficient or inadequate electricity supply.

Secondly, participants believed that their ‘right’ to electricity as an essential service had been greatly diluted as a consequence of the shift from public provision of electricity to market provision. They believed that there were few protections for them or requirements for utility companies to continue to provide affordable energy, or to practice social responsibility.² In this context, householders (and especially those from disadvantaged contexts) were resistant to taking responsibility for significant electricity reduction as they felt they were the least-resourced group to do so and that this expectation was unjust. There was a strong sense from the workshops that participants are looking to the government for leadership and appropriate regulatory responses to improve energy efficiency and reduce GHG emissions.

It’s all about cost

A significant barrier for participants was the cost of making changes to reduce electricity. While those with sufficient money welcomed information to assist in purchasing appliances with greater

² Given the obligation of electricity retailers to offer a regulated tariff to customers in their former franchise areas, this finding underlines the poor understanding of the deregulated energy sector in the community.

efficiency, most had no available funds to replace inefficient appliances. Additionally, most had no funds to upgrade housing infrastructure (such as insulation, draught sealing etc), and saw little value in doing so as they either did not own the home (so would be making improvements for someone else's capital benefit) or did not think such improvements would increase capital value sufficiently to recoup the funds spent. Where participants were public housing tenants, they often felt actively discouraged from making any improvements to the house. All believed it was the responsibility of the landlord (public or private) to equip and maintain housing to an appropriate energy efficiency standard. In summary, participants had no money with which to make changes to poor quality housing or appliances and had little choice but to deal with resulting high bills.

Disempowerment

Participants were conscious of their own disempowerment within the broad arena of electricity consumption. They perceive significant structural barriers to them being able to make changes. The householders in this study perceived themselves as frequently the victims of poor housing infrastructure. This was particularly so for renters (in both the public and private sectors). Low-income renters were particularly at risk of poor quality housing (evidenced strongly in the workshop in Ballarat focusing on the experiences of people with disabilities) as they have very limited funds with which to bargain for better housing conditions.

Participants believed that landlords had no concern for energy efficiency and as such, properties repeatedly lacked insulation, draught stoppers, efficient hot water systems and suitable heating. Tenants had no incentives, nor funds, to make capital improvements (especially when these would require considerable outlay (as in the case of insulation, hot water or heating). There appeared to be no regulatory environment to either encourage or enforce energy efficiency improvement on the part of landlords. Overall, landlords were considered unresponsive to requests to improve facilities. Participants felt that improvements should be the responsibility of the housing owner, not the tenant. They felt that regulations should be developed (perhaps as part of the Residential Tenancies Acts in each state) to force landlords to meet minimum energy efficiency standards.

Participants felt similarly disempowered when dealing with utility companies. Bills and meters provided too little information for householders to be able to defend claims that charges were incorrect. They reported that queries of this nature were badly handled by the utility company and in many cases participants felt they were belittled and offered no support at all for reasonable queries. The lack of information on bills also meant that householders had no way to judge which interventions had the most potential for bill reduction. In general, householders did not understand tariff structures, including off peak rates. They believed there was little reward for reducing consumption given the high proportion of fixed charges in their bills. In addition, many participants were ignorant of their concession entitlements, exacerbated in some cases by poor or misleading information from utility companies in this regard. Participant conversations indicated that a substantial proportion of eligible householders might be missing out on concession entitlements due to this combination of factors. Overall, there was a high level of scepticism and mistrust of utility companies about the handling of concessions.

The lack of knowledge discussed above also contributes to disempowerment. These various contexts of disempowerment functioned strongly as barriers to action in both material and psychological or cultural ways. It should be emphasised that participants resented their disempowerment and in general wanted to feel more informed and in control of decisions and actions about how electricity use (and billing) impacted on their lives.

5.4.3 Issues for the disadvantaged

The above discussion encompasses issues for disadvantaged householders. However, as this issue is of specific importance to the design of this research project, key issues will be itemised again here.

Low-income and disadvantaged householders are most likely to experience poor quality housing in the public and private rental markets. The effect of this housing means that householders have increased electricity bills due to inefficient heating, inefficient hot water (for example, electric hot water not connected to an off peak meter and gas not used for water heating, even where this is available), lack of insulation and other measures. This further disadvantages and penalises people with the least capacity to either pay or to make changes to reduce consumption. This requires a strong regulatory response in a range of fields including residential tenancy legislation and tax incentives to support landlord responsibility for meeting minimum energy efficiency standards. Further, participants argued that all energy efficiency improvements (even of small scale, such as window draught sealing) should be rewarded with financial rebates for the purchaser.

Low-income and disadvantaged householders simply have no money to use toward enacting changes to reduce consumption. In many cases, the replacement of inefficient or faulty appliances will be with similarly old, used and inefficient appliances. The focus is entirely on purchase cost rather than operating costs. However, even access to this market is limited as participants reported that many charity organisations have withdrawn from the sale of second-hand whitegoods due to the litigious environment. It is seen as unjust to expect low-income and disadvantaged households to bear, unassisted, the responsibility for funding changes to reduce consumption. To address this a range of measures could be implemented including: greater funding and regulatory support for the retrofit of second hand appliances and sale of these; and rebates on purchase price for purchase of energy efficiency appliances (including small appliances), with no minimum expenditure required to qualify.

In some cases, disadvantaged householders were provided with some level of whitegoods through government or charity agency support. Refugees receive a range of whitegoods as part of a humanitarian relief package. Likewise, disadvantaged people who gain “transient” public housing (in Victoria) are provided with housing, with whitegoods included, on a temporary basis. Aboriginal and Torres Strait Islander people accessing Aboriginal Housing Board housing are also provided with heating and cooking facilities. In none of these instances did there appear to be any attention to or requirement for the provision or selection of energy-efficient appliances. Rather, there appeared to be a focus on cheap purchase price to maximise limited funding. Again, this means that the most disadvantaged people are provided with inefficient appliances that will increase their living costs. There is significant potential for a stronger policy environment requiring consideration of energy efficiency when allocating government funds, supported by education of managers and purchasers within relevant agencies on energy efficiency choices.

Low-income and disadvantaged householders had a low level of knowledge about energy use and reduction. This lack of relevant knowledge was particularly evident for groups of newly arrived migrants and refugees that had little previous experience with electricity or market provision of electricity. In these cases, householders not only did not understand the electricity market, costs and how appliances functioned, but also had no understanding of how their behaviours and lifestyles contributed to high bills. In such contexts, householders have no ability to take actions to reduce energy use. Instead, their efforts are bent toward managing their finances so they can pay the high bills they incur. There appears to be little or no support for them to gain further information or to curb their consumption. Via contact with resource and community agencies that participated in this research, it is apparent that, though willing, these agencies also have little information or resources to contribute to educating their clients in this regard, especially when other priorities (for example domestic violence) present as more pressing. This group of householders requires targeted intervention that is sensitive to their social, cultural and economic contexts. It is preferable that this intervention be delivered via agencies that already have relationships with this group and that funding and training be provided for this to occur.

Within the research sample, there were examples of extreme hardship around electricity provision. In one case, a householder lived without electricity for an extended period due to inability to pay bills and severe financial crisis. Others reported drastic restrictions on the way they lived their lives. For example, some householders who could not afford heating spent all day and night in bed as the only

way they could afford to stay warm. This research did not set out to measure the extent of these practices and hardships. Other research on fuel poverty confirms that low-income households experience deprivation and health impacts (WREAG 2004). It is of concern that some householders simply cannot afford the provision of electricity. The experience of hardship clearly contributes to the view, widely-held by participants, that electricity should be understood as an essential service that is affordable to all. Participants believed that this understanding of electricity provision places an onus on utility companies to adopt socially responsible practices.

One positive feature of the electricity market for low-income and disadvantaged people was the provision of flexible payment systems, such as EasyPay, by electricity companies. Such systems, which allow householders to make weekly or fortnightly contributions towards their energy bills, offer householders: a way of managing their bills; an ability to meet their payment commitments in an appropriate and achievable way; confidence in their ongoing access to a service (i.e. by avoiding disconnection); and in some cases, a mechanism for saving via the ability to redraw funds when accounts go into (substantial) credit.

Whilst there were some glitches with this system (for example, problems of co-ordinating payment dates so that they encompassed delays in processing from post offices and banks), overall this group of householders widely accessed this service and highly valued it. For most, it took the stress out of the process and increased their quality of life. There was some distrust of how utility companies dealt with funds in credit (i.e. when regular payments exceeded the total bill for the period), but many participants reported success in redrawing these funds for use elsewhere.

5.5 Demographic summary

Participants completed demographic data forms at eight of the twelve workshops. For other workshops some demographic data was recorded without requiring participants to complete a form. A demographic profile of participants is provided in Table 4.

Table 4: Demographic summary of participants.

Category	Breakdown of Data	
Gender	Male	27%
	Female	73%
Age	15 to 24	13%
	25 to 44	47%
	45 to 64	20%
	65 and over	20%
Weekly household income (before tax)	Under \$200	20%
	\$200 to \$399	24%
	\$400 to \$599	19%
	\$600 to \$799	11%
	\$800 to \$999	15%
	\$1,000 to \$1,199	4%
	\$1,200 to \$1,399	6%
	Over \$1,400	2%

Category	Breakdown of Data	
Frequency of electricity bill	Fortnightly	2%
	Monthly	7%
	Every two months	13%
	Every six weeks	4%
	Quarterly	70%
	Never	2%
	Every 6 months	2%
House type	House	55%
	Townhouse, semi, duplex	13%
	Flat or unit	33%
Number of bedrooms (Average = 2.7)	One	20%
	Two	20%
	Three	41%
	Four	13%
	Five	7%
Household size (Average = 2.9)	One	27%
	Two	20%
	Three	27%
	Four	11%
	Five	9%
	Six	2%
	Seven	2%
	Eight	4%
House ownership	Owned/part owned by occupier	38%
	Rented/part rented	52%
	Other	11%
Disability	Yes	11%
Carer of person with disability	Yes	4%
Non-English speaking background	Yes	59%
Aboriginal or Torres Strait Islander	Yes	7%

Some points to note from this demographic profile are:

- The high proportional attendance by women relative to men
- The relative predominance of low-income households

- The relatively high representation of people living in flats or units (33% compared to national average of 11%)
- The relatively high proportion of renters (52% compared to national average of 26%)
- Very high representation of people from non-English speaking backgrounds.

These points and the data in Table 4 indicate that the purposive sampling approach was successful in providing access to specific target groups, including low-income households, renters, Indigenous people and people from non-English speaking backgrounds. There was also some representation from larger households and households with higher income, which are likely to be high energy users.

5.6 Interview findings

As discussed in Section 3.4.1, five interviews were conducted as part of the research project. Findings from each of these workshops are summarised in the sections below.

5.6.1 VCOSS Energy Group

A representative from MEFL met with the VCOSS Energy Group on 13 July 2004. Members of the VCOSS Energy Group include financial counsellors and representatives from charities, the Tenants Union of Victoria and Environment Victoria. The main purpose of the meeting was to seek methodological input on the specific issues faced by disadvantaged households and how to access this group in the research.

An important point to emerge from this meeting was the need to focus discussions not only on reducing energy use but also on helping households to better manage their electricity use. Low-income households often consume less energy than they need as a way of minimising cost and the risk of disconnection. This can be detrimental to health, comfort and well-being. For these households, a reduction in energy use in one area, such as water heating, can free up finances to improve space heating. An overall reduction in energy use is not necessarily the objective.

The other point to emerge from this meeting was the need to include households with high levels of energy use in the workshops, including people with large homes, large household sizes and high incomes. The demographic summary in Section 5.5 indicated that there was some representation from these groups in the workshops, although it was proportionally less than the representation of smaller, low-income households.

5.6.2 Essential Services Commission (Victoria)

A representative from MEFL met with a representative from the Essential Services Commission of Victoria on 13 July 2004. This meeting was arranged to comply with requirements in the funding agreement for the project to consult with regulators about electricity pricing issues. The main point to come out of this meeting was the need to interview an electricity retailer to understand the economic drivers that are shaping electricity pricing from the retailer perspective. This led to the interview described in Section 5.6.4 below.

5.6.3 Consumer advocacy groups

On 24 August 2004, representatives from MEFL and the Institute held a workshop with representatives from VCOSS, CUAC, COTA and the Victorian Greens. Although a workshop format was used, the discussions are summarised here to distinguish them from the householder workshops. The purpose of the workshop was to discuss proposed policy options for testing in householder

workshops with consumer advocacy groups, focusing particularly on issues for disadvantaged households. Key points emerging from the workshop are summarised below.

- The participants raised concerns about the inclusion of pre-payment meters as a proposed policy option for the householder workshops. One participant noted that a Tasmanian company that manufactures the meters is pushing them, and customers are four times more likely to be disconnected when they have a pre-payment meter. Concerns were also raised about the association of pre-payment meters with higher tariffs. Participants argued that pre-payment meters target vulnerable households that are at risk of defaulting – they are used as a credit management tool by utilities. Participants were concerned that there is a lot of misinformation about these meters and that participants might respond positively to them in workshops when they don't have all the facts. As noted previously, pre-payment meters were excluded from subsequent workshops given the evidence for negative social impacts.
- Participants believed that inclining block tariffs are socially responsible and noted that these tariffs have already been introduced for water. When implemented correctly, inclining block tariffs enable people to save money by reducing their consumption and recognise that large families need to access more of the resource.
- Participants argued that the large fixed charges on electricity bills, introduced during privatisation, are regressive. They conceded that some were needed to guarantee income but should be much lower.
- On interval meters and cost-reflective tariffs, the participants felt that key issues are whether feedback is instantaneous or retrospective, and how incentives are built in for remote load control etc. There is a need to emphasise the difference between the feedback provided by a meter and the tariffs that are likely to come with it. People are generally interested in more feedback but may reject the tariff changes.
- With Cent-A-Meters, the participants believed that households would be reluctant to pay for installation. This problem has already emerged with water tank rebates, where the householder has to pay for a plumber to fit the tank if they want to access the rebate.
- Participants advocated flexible payment options, such as EasyPay, which flatten expenditure but don't shorten the billing cycle. It was felt that utilities should actively promote these options.
- One participant had recently purchased some appliances from Harvey Norman and got good advice from the sales staff on the energy efficiency of the appliances.
- Participants believed that energy efficient appliances should be supported through subsidisation and no-interest loans for purchasing. Private tenants have a disincentive to invest in energy efficiency and rebates often give preference to owner-occupiers. The Utility Relief Grants Scheme is based on responding to a crisis instead of an upstream approach where the government helps people make an investment in energy efficiency before they hit the crisis. Participants felt that public housing maintenance budgets should be targeting energy efficiency. Experience of low-income households is to ration energy rather than wilfully consume.
- People are looking for advice on heating systems, including choosing the right one for the purposes, but not much is available as the government can't recommend particular brands.
- Audits: The Retail Code encourages retailers to do energy audits but does not require them.
- Least cost planning: Government should reward investment of retailers in demand management to stave off the requirement to build more generators. This is not currently the concern of retailers –

if they were energy service companies they would be interesting in minimising energy use but currently they are only interested in making a profit.

- Rebates do not work very well for low-income households. The highest cost items are space and water heating and these are not under the control of tenants. More research is needed to identify what level of rebates will actually work.
- The participants felt that standards for rental housing were important and could be combined with incentives. There may need to be awareness raising first, for example through disclosure. Unless rental standards are well managed, the low end of the rental market becomes the slum end.
- Participants felt that the policy options were a little light on government responsibility. It is uncertain whether things will get better with a National Energy Regulator.
- Participants were keen to see more government support for communities and were concerned that the onus is being put on communities to make changes.

5.6.4 Electricity retailer

On 26 August 2004, representatives from MEFL and the Institute met with a representative from an electricity retailer to discuss the retailer perspective on pricing, tariff structures and associated drivers. Important points to emerge from the interview are summarised below.

- Electricity retailers are unlikely to pursue pass-through tariffs with the Victorian roll-out of interval meters. More likely is some kind of seasonal tariff, e.g. a lower winter tariff that applies from 1 June to 30 September and a higher summer tariff to cover higher cost of peak capacity. Another possibility is the introduction of different price blocks during the day, overlaid on the seasonal tariff.
- Interval meters introduce extra data processing costs for retailers as data now comes in half-hour segments.
- Retail price increases are generally linked to CPI, however retailers have some scope for rebalancing to remove cross subsidies. This means that the overall revenue increases are in line with CPI but some tariffs may go up more and some may go up less.
- It is likely that existing customer protection measures will remain, including the obligation to offer in former franchise areas at the standing offer price. There will be a core of customers that are never exposed to full retail competition.
- Retailers have not yet started to offer demand management options as part of contract offers.
- Service to property charges: For retailers, these reflect the high fixed cost component for each supply point, linked to high network costs and the fixed cost of customer service centres to be on call for customers.
- Congestion pricing is difficult as it is hard to break down tariffs by areas. It may make more sense for retailers to adopt non-price initiatives in constrained areas.
- Higher prices take a while to have an impact and better results may be achieved by focusing more at the point of purchase of appliances, homes etc.
- The participant felt that the technology for remote load control was not really viable yet. Retailers interested in this technology would need to get distributors on board.

- It is difficult for electricity retailers to offer the same tariff variation as telecommunication companies due to differences in the technology – distributed meters versus a central telephone exchange.
- For most people, energy is not within the top ten expenditure items and is therefore not a priority issue. Lifestyle choices that drive energy use are much more powerful than price signals. There is high income elasticity of demand.

5.6.5 Energy and Water Ombudsman NSW

A representative from the Institute met with staff from the Energy and Water Ombudsman NSW (EWON) on 1 September 2004 to discuss the general role of the independent Ombudsman, EWON's specific experiences with householders and their suggested policy priorities. The key points from the interview are summarised below.

- EWON is an independent organisation for resolution of customer complaints. The electricity utilities are members of EWON. It sends reports to the DOH and to the utilities on the issues that are arising so that there are opportunities for improvement.
- The participants would like to see more flexibility for customers in managing bills (e.g. no payments required in December), payment matching and incentives for early payment instead of penalties for late payment.
- The idea of training financial counsellors to do energy audits was seen as a good one.
- The participants felt that industry should be more proactive in advertising running costs of appliances, for example in television advertisements.
- There is currently a problem with the timing of tariff increases, which are usually brought in on 1 July, in the middle of winter.
- There should be consideration of paying customers who experience outages. Some way of incorporating reliability (outages, quality and customer service) in the price cap is needed.
- The participants liked the disclosure options and thought that tax deductions for landlords might be a good way of improving efficiency of rental housing stock.

5.7 Results of Cent-A-Meter trials

This section discusses the results of the Cent-A-Meter trials. At the time of writing, three participants had been interviewed. The results for these participants are discussed in Sections 5.7.1, 5.7.2 and 5.7.3. Section 5.7.4 discusses additional findings relating to installation of the CAMs. Finally, Section 5.7.5 summarises relevant findings relating to CAMs from the workshops.

5.7.1 Participant One

The first household interviewed was a mother and young daughter (aged 5), living in a self-owned two-bedroom weatherboard house. Household income is about \$500 per week (before tax). Natural gas is used for water heating. The quarterly energy bill is between \$200 and \$250 and is lower in summer.

This participant had already tried several ways of reducing energy use, including installation of CFLs throughout the house, always turning lights and appliances off when not in use, keeping thermostats down and only using clothes dryer as a last resort. She had tried going without ducted heating for 2

winters and using reverse cycle air conditioning but found that this made the house too cold and had a negative effect on quality of life.

The participant recognised that there were more things she could do, including insulating floor and walls, redoing roof insulation and adding a vent system in the chimney. She would also like a solar hot water system. Cost is the major barrier in doing these things and also having to access expertise – it is too difficult to do these things alone as a single mum.

There were no problems with installation of the CAM. ‘The electrician was great – he explained the Cent-A-Meter in detail, walked around the house with me testing things and giving demos. I’m looking forward to him coming back so I can pick his brains again!’

The participant kept the portable display in the kitchen, where she spends most of her time. When she first got it she carried it around the house checking things out. She looked at it quite regularly during the first week but only every few days after that. She has shown it to visitors (extended family) who have been very interested.

The participant was surprised by how low the temperature in her house was (11°C when the heater was set for 23°C). She tested the energy consumption of her CFLs and found they barely registered; the standard fluorescent in the bathroom uses much more energy than CFLs. She also tested a range of other appliances and generally found that they used less power than expected. ‘I will now be less concerned about using them more often’.

After using the CAM, the participant plans to stop using her reverse cycle air conditioner as a heater, partly on the advice of the electrician, partly after seeing how much it costs on the CAM. She will go back to ducted heating next year with strategies to reduce cost as suggested by the electrician, e.g. check capacity - may be too low for my house; keep thermostat within recommended range.

This participant believed that the CAM needed to be better integrated with bills. The CAM only gives cost per hour, which is difficult to translate into bill sizes. One way might be to show hourly electricity cost on bills. ‘Thirty cents an hour doesn’t sound like much until you actually work out how much it adds up to over a quarter or a year’. The participant suggested some other improvements, such as a smaller remote and the addition of a magnet on the back of the display so it could be stuck on the fridge.

The participant did not believe that the CAM would affect her use as ‘I use energy as needed rather than as desired’. If anything, she believed that it would encourage her to increase her energy usage as ‘it made me realise that my appliances really don’t use that much energy, and I will switch back to ducted heating next winter as the inefficiency and inadequacy of my reverse cycle system has caused significant detriment to my quality of life’.

The participant would not pay the installation cost for a CAM (\$199). She would be willing to pay \$50 but the rest should be paid for by the utility company and the government. The cost of \$199 would be better value and more attractive if the electrician could also provide an energy consultation in your home as part of the cost. Having the electrician visit was extremely useful for the participant.

5.7.2 Participant Two

The second household interviewed was an elderly couple (both aged over 65), living in a self-owned four-bedroom house. Household income is about \$500 per week (before tax). Natural gas is used for hot water, heating and cooking. The quarterly energy bill is about \$150 to \$200 and changes a lot with the seasons.

The participants’ house is insulated and when their kids were at home they were very conscious of what was being used and turned on. ‘When electricity companies were state owned there was more

encouragement to use less energy - now that companies are privatised it feels that there is less encouragement or even that there is encouragement to use more; in the past we were conscious of economy, now we're conscious of greenhouse'.

The participants had no problems with the installation of the CAM. They found the electrician very patient and the time was convenient. They have kept the portable display on the kitchen bench. They looked at it a lot at first but now glance at it occasionally. They look at the different information on the display, such as temperature, as well as cost. They hadn't tried pushing any buttons to change the display.

The participants were not particularly surprised by the cost of their electricity. They found that when the house 'is "at rest" it scarcely registers any usage at all, 1 cent or less - much lower than we expected'. They were surprised by how much energy their electric kettle uses - using the kettle makes the cost leap up to about 40 cents (per hour). The ducted heating costs about 11 cents per hour, which is also high but close to what the participants expected.

The participants did not try many experiments, but do check the display when using particular appliances. The CAM has not encouraged them to try anything new to reduce their energy use – the participants felt that they were not high energy users anyway.

The participants did not feel that the installation cost would be justified by the benefits: 'We own our own home and don't have trouble paying our bills'. They thought that a CAM would be useful for teaching children about energy use and how much it costs but not so useful for them: 'We wouldn't get one even if it were cheaper'.

5.7.3 Participant Three

The third household interviewed was a family of four with children aged 13 and 9, living in a self-owned four-bedroom house. Household income is about \$2000 per week (before tax). Natural gas is used for hot water, the stove and central heating. The quarterly energy bill is between \$200 and \$250 and is lower in summer.

The household was already using Green Power but had not tried anything specific to reduce energy use, other than being sensible with energy by turning lights off. They had considered getting a solar hot water system when replacing their hot water but had been put off by the cost.

The participants had no problems with the installation of the CAM. They found the electrician very helpful and the process was convenient for all. The CAM is kept on the kitchen bench. It had novelty value at first, particularly for the kids, who were interested in watching the figures change as appliances were switched on or off. However, since then they haven't really looked at it.

The participants felt that the cents per hour figure doesn't give you a feel for the cumulative usage. The CAM 'doesn't make a lot of sense in that respect. When it shoots up you notice it but it's hard to make the connection with your bill'. The participants were surprised by how little energy the washing machine used. They didn't feel that the CAM encouraged changes in their energy use: 'No, we don't have any major electrical appliances and things are pretty controlled anyway', e.g. switching lights off and keeping the thermostats turned down. Further: 'The things we do in peak times often have to be done then', e.g. cooking meals, so the CAM would be unlikely to have much effect.

The participants were not interested in buying a CAM: 'If we were wanting to cut our energy costs the cent-a-meter isn't of a standard that would make you want to buy it, particularly in terms of inability to relate per-hour figures to cumulative usage'. The participants would prefer to put money into other things in order to improve energy practices, like policy and incentive-based programs, such as subsidies for replacing old, inefficient appliances, especially for those on low incomes.

5.7.4 Other findings

The same electrician was responsible for installation of each of the CAMs discussed so far. The first three households had no problems with installation of the CAM and found the electrician helpful and responsive. However, a different electrician was responsible for installation of the CAMs at the fourth household and the community centre. The CAM was not installed at the fourth household, apparently because the householders were not home at the specified time.

At the community centre, the CAM was installed but the electrician did not put the tariff in and did not explain how to use the CAM. The community centre tried to find their tariff to enter into the CAM, however the church that owns the centre would not provide the bills to staff at the centre. These installation problems illustrate some of the difficulties faced in implementing demand management options.

5.7.5 Workshop comments

Workshop participants liked the idea of instantaneous feedback but were sceptical about the likelihood of people paying for a CAM. They felt that this functionality should be included in the normal meter as a design standard for new homes. Participants were more interested in the possibility of being able to log into the Internet and check usage per week or day – this would allow them to make interventions and test them. The Personal Energy Management system offered by Puget Sound Energy (see Section 2.2.2) provides a model for this.

6 REGULATORY REVIEW

This section briefly reviews laws, industry structures and government policies that are relevant to the issues raised by research participants. The purpose is to identify institutions that could potentially be changed to address the concerns raised by research participants. Specific recommendations for change are outlined in Sections 7.4 and 7.5, addressing Research Questions 4 and 5.

6.1 *National energy policy*

In 2001, the Council of Australian Governments (COAG) established the Ministerial Council on Energy (MCE) as the primary forum for the establishment of national energy policy. The membership of the MCE comprises Ministers with responsibility for energy from the Australian Government and all States and Territories. The MCE provides for national coordination of energy policy and has recently overseen a process of regulatory reform and consolidation.

The most recent comprehensive statement of Australian energy policy is *Securing Australia's Energy Future*, released by the Commonwealth Department of Prime Minister and Cabinet in 2004 (DPMC 2004). Chapter 6, on Energy Efficiency, is most relevant to this project. It makes the following relevant commitments:

- To improve price signals for demand side management as part of reforming Australia's energy markets
- To expand the range of appliances and buildings subject to minimum energy performance standards
- To increase the availability of information on the energy performance of appliances, buildings and vehicles
- Establishment of a Productivity Commission inquiry to provide further information on the potential benefits of, and policies to achieve, improved energy efficiency
- Continued Commonwealth cooperation with the states and territories on energy efficiency through the National Framework for Energy Efficiency process.

Most of these commitments have now been taken up in the National Framework for Energy Efficiency (NFEE), discussed in Section 6.2.

6.2 *The National Framework for Energy Efficiency*

On 27 August 2004, the MCE agreed to the implementation, within three years, of the first stage of a National Framework for Energy Efficiency. This first stage includes nine policy packages to be implemented nationally. The policy packages relating to residential buildings, appliance and equipment energy efficiency and general consumer awareness are directly relevant to this project and will start to address some of the concerns raised by participants. However, it is crucial that the promise of these policy packages is captured in the implementation phase. The research findings in this report can provide guidance on issues to consider during implementation. Specific issues are outlined in Section 7.5.1 in response to Research Question 5.

6.3 *National Appliance and Equipment Energy Efficiency Program*

The National Appliance and Equipment Energy Efficiency Program (NAEEEP) is a set of coordinated national energy efficiency programs, including the Energy Rating (labelling) scheme and Minimum Energy Performance Standards (MEPS) for appliances and strategies to address standby power. The

National Appliance and Equipment Energy Efficiency Committee (NAEEEC) coordinate the Program. NAEEEC decides on expansions to the Program, such as inclusion of more appliances. The NFEE policy package on appliance and equipment energy efficiency will be implemented by NAEEEC.

6.4 Productivity Commission Inquiry

The Productivity Commission is undertaking an Inquiry into the Economic and Environmental Potential Offered by Energy Efficiency, due for completion in mid-2005. This Inquiry will be important for setting the future direction of Australian energy efficiency policy. The findings of this research project are likely to be of interest to the Productivity Commission during its Inquiry. An important focus for advocacy should be the preparation of a submission, based on or including this report, to the Inquiry.

6.5 National Electricity Law

The National Electricity Law (NEL) is contained in a Schedule to the *National Electricity (South Australia) Act 1996*. There are few direct links between the NEL and the issues raised by participants during the workshops. However, it is clear that householders are looking to governments and businesses to take leadership on energy efficiency. At present, there is nothing in the NEL to specifically drive demand management at the household level.

Other research has examined the NEL in detail and suggested amendments to encourage demand management (see TEC et al 2004). Specific amendments focus on:

- Making ecologically sustainable development an objective of the NEM
- Requiring consideration of demand management in the NEC
- Recognising the need to reduce GHG emissions from electricity generation
- Ameliorating the impact of the NEM on low-income consumers
- Providing processes for community consultation, transparency, access to information and rights of review and appeal.

6.6 National Electricity Code

The National Electricity Code establishes the rules and objectives of the NEM. The National Electricity Code Administrator (NECA) administers the NEC. TEC (2004) and TEC et al (2004) propose changes to the NEC to encourage demand management. Many of the proposed changes would assist electricity retailers in offering a wider range of demand management options to consumers and are potentially consistent with the findings of this research.

6.7 State regulatory arrangements

In the electricity supply chain, it is the distribution and retail businesses that are most likely to impact on demand management by residential customers. The relevance of the retail business, as the primary point of contact for the customer, is clear. The relevance of the distribution business is less direct but still important; the choice between augmentation of the electricity distribution network and pursuit of demand management options to avoid or delay augmentation will affect the extent to which utilities offer demand management options to residential customers. Regulatory arrangements for electricity distribution and retail businesses vary across States. This section lists the relevant legislation, regulations and codes that apply to electricity distribution and retail in NSW, Victoria and South Australia.

In NSW, electricity distributors and retailers must comply with the *Electricity Supply Act 1995*, the *Electricity Supply Amendment Act 2000* and regulations made under those Acts. Of particular relevance is the *Electricity Supply (General) Regulation 2001*, which sets out customer rights and requirements for disconnection and billing. In addition, the Department of Energy, Utilities and Sustainability (DEUS) administers Electricity Market Operations Rules, created under Section 63c of the Electricity Supply Act. These rules cover issues like electricity metering and transfer of retailers. Finally, a Marketing Code of Conduct is established under the Electricity Supply Act.

In Victoria, there are numerous applicable laws and Codes, including:

- Essential Services Commission Act
- Electricity Industry Act
- Code of Conduct for Marketing Retail Electricity in Victoria
- Electricity Customer Transfer Code
- Energy Retail Code
- Electricity Customer Metering Code
- Electricity Distribution Code.

Similarly, in South Australia, the following relevant Codes apply:

- Energy Retail Code
- Energy Customer Transfer and Consent Code
- Energy Marketing Code
- Electricity Metering Code
- Electricity Distribution Code.

The MCE is currently considering the potential to consolidate these numerous regulatory requirements into a national regulatory framework (MCE 2004b).

6.8 Deregulated electricity sector

The deregulation of Australia's electricity sector has created some significant barriers to demand management, some of which are evident at the household level. IPART (2002) provides a good summary of these barriers. The disaggregation of state-owned electricity authorities has effectively split the costs and benefits of demand management between different businesses. Retailers have little incentive to engage in demand management as most of the benefits accrue to customers (in lower energy bills) or to network businesses (in avoidance of network augmentation). Distributors have an incentive to reduce demand but do not have easy access to customers. Thus, the structure of the electricity sector is an important consideration in identifying ways to implement the findings of this research project.

6.9 Electricity concessions

A system of electricity bill concessions exists in each of the NEM states. In general, a reduction on electricity bills is available to concession card holders in each state. The concession is deducted from

the bill. In Victoria, the concession is paid in winter. Most states also have specific concessions for people on life-support systems that require electricity.

In addition to these concession schemes, there are some schemes to help people who are in financial difficulty to cover the cost of their bill. In NSW, there is an Energy Accounts Payment Assistance (EAPA) Scheme in which charitable organisations issue \$30 vouchers to customers who are struggling to cover the cost of their electricity bill. Similarly, Victoria has a State Utility Relief Grant scheme that provides one-off assistance to cover utility bill payments.

6.10 Housing legislation

Each of the States and Territories currently involved in the NEM (Queensland, NSW, ACT, Victoria and South Australia) has a *Residential Tenancies Act* that governs agreements between landlords and tenants. Only the ACT *Residential Tenancies Act 1997* currently contains any requirements relating to energy efficiency. That Act requires the advertisement of any previous energy efficiency rating for the property when it is offered for lease.

The *Civil Law (Sale of Residential Property) Act 2003* in the ACT also requires that an energy efficiency rating is included in any advertisement for the sale of a residential property. The seller of a residential property must obtain an energy efficiency rating before sale and provide a copy to the buyer.

6.11 Integrated Humanitarian Settlement Strategy

The Commonwealth Government's Integrated Humanitarian Settlement Strategy (IHSS) provides initial support for humanitarian entrants to Australia (e.g. refugees). There are two programs under the IHSS that potentially impact on electricity use: the Accommodation Support program and the Household Formation Support program. The first assists humanitarian entrants with finding accommodation; the second provides humanitarian entrants with some of the material goods they require to establish a household. There is no indication that either program currently gives consideration to the efficiency of homes or appliances secured or provided to humanitarian entrants.

7 DISCUSSION: RESPONSES TO RESEARCH QUESTIONS, IMPLICATIONS AND RECOMMENDATIONS

This section draws on the literature review, regulatory review and research findings to develop responses to each of the five research questions, draw out implications of the research and outline recommendations for policy advocacy. Sections 7.1 to 7.5 draw out findings relevant to each research question in turn. A final section (Section 7.6) summarises recommendations for further research.

7.1 *Research Question One*

What are consumers' expectations about comfort, convenience, security and other concerns that impact upon electricity use? What are the implications for patterns of electricity use and service provision?

7.1.1 **The importance of social, cultural and economic factors impacting on electricity use**

This research confirms the views of Wilhite & Lutzenhiser (1999), that understanding the social and cultural dimensions of energy consumption is of key importance. The householders participating in this study did not easily conform to predetermined typologies in the literature (see for example, Keys Young, 2002; Barr, Gilg & Ford, in press; Dake and Thompson, 1999). Instead, their behaviours, understandings and attitudes were linked to the interplay between their social, cultural and economic contexts. Hence, consumers' expectations around electricity use and their understandings of comfort, convenience, security and other values can be understood as socially and culturally constructed. Consequently, this research endorses the arguments of Wilhite et al (2000) in favour of research that is sensitive to social, cultural and economic contexts and structural factors. Demand management programs that do not take these factors into account are unlikely to result in significant energy reduction by householders in Australia.

7.1.2 **Summary of social, cultural and economic factors**

The main social and cultural factors identified in this research are presented in detail in Section 5.4.1. They include behaviours and values around: hospitality (and communal eating); heating and social interaction; comfort, security and quality of life; preferences for new appliances as markers of success; and preference for second hand or cheap appliances linked to values around saving money. These factors reflect the interaction between past experiences, socially established norms and expectations, present living conditions and social contexts. They represent long standing and deeply held convictions and understandings that play out in behaviour. Likewise, social and cultural factors influence peak usage and it would be expected that peaks will differ for different socio-cultural groups.

It was evident from this research that participants would not easily modify strongly embedded socio-cultural behaviour. Participants appeared to extract those strategies from the education component of the workshops that were consistent with, or could be modified to fit with, their social and cultural contexts. Therefore, to maximise potential effectiveness, demand management strategies need to be adapted to socio-cultural context. The main social, cultural and economic factors that emerged during the research are summarised below.

Quality of life

It is worth reiterating the emphasis by many participants on quality of life issues. This notion was variously defined and strongly related to the social and cultural factors identified above. For many participants, especially those identifying as on low incomes and/or disadvantaged, electricity was a

key factor in quality of life. In particular, electricity provides warmth, which participants identified as a fundamental ingredient of quality of life. In many cases, being warm was linked to feelings of comfort and security. In the face of severe hardship, participants expected their homes to provide some small respite in the way of heating and entertainment (TV, VCR). Affordable electricity is fundamental to this. It should be noted that the need for heating to provide a reasonable level of comfort is linked to the poor quality of existing housing stock. Better insulation, orientation and design can drastically reduce heating (and cooling) requirements.

The need to stay warm is at least partially linked to a desire to stay healthy. Elderly participants used heating to manage existing health conditions. Others used heating as a preventative measure to avoid getting sick. Parents, especially, liked to keep the house warm to stop children getting sick. Thus, in some cases, the underlying driver for seeking a comfortable temperature may have been a desire to stay healthy.

Interestingly, the literature suggests that comfort is a key driver of energy use for other groups in Australia and internationally. An ABS (2002) survey found that comfort was the most significant motivator for installing insulation; 84% of respondents identified this as the prime motivator contrasted with only 10% identifying the prime motivator as cost. Shove (2003) and Wilhite et al (2000) emphasise the importance of comfort in the international literature. Clearly, the ways people understand comfort and how it is provided are very important for understanding and reducing electricity use.

The need to maintain an appropriate level of comfort places some constraints on the amount of demand reduction that is possible, particularly in low-income households. However, once comfort needs are met, quality of life can be used to promote demand management. Many demand management options, by improving the design quality of homes and appliances, bring improvements in quality of life as well as reductions in electricity demand. Understanding the importance of quality of life issues will help with the design of information and education campaigns for households outside the low-income category.

The “right” to electricity as an essential service

Linked to the notion of quality of life was the view of electricity as an essential service. As discussed in Section 5.4.2, participants believed that the shift from public to market provision of electricity had eroded their rights around electricity. Many found the products offered since the emergence of full retail competition complex and confusing and did not trust the motives of the utilities marketing these products, or the information provided by utilities. The commitment of Australian governments to electricity sector deregulation and National Competition Policy needs to be tempered by a realisation that some small customers do not welcome competition. Further, it is likely that there will always be some small customers that are not profitable for retailers and will therefore require appropriate regulatory protection to guarantee access to electricity service.

Prior experience with electricity

Prior experience with electricity (especially in the case of migrants) was a significant factor impacting on electricity use. Participants who were newly arrived in Australia described little prior experience with electricity, appliances, or billing and no experience with electric heating or water heating. Combined with transition from hot to cold climates, this meant that they were heavy users of electricity and were unaware of the cost implications until the first bill arrived. Even at this point, little support was available to help these participants to change consumption patterns. These participants were amongst the highest users of electricity in the sample. Therefore, it is critical for interventions to identify and link to householders whose prior experiences of electricity are markedly different from their current contexts.

Competing values

Participants in this study held competing values in regard to electricity use. Frequently, actions that would reduce electricity consumption were rejected due to conflict with values in the areas of health, safety or other environmental agendas (e.g. water saving). This situation suggests that a holistic approach to household change, focusing simultaneously on energy and water saving, health and safety, could be beneficial. That is, general education on sustainable living is likely to appeal more to householders, and to fit better with the way they understand their lives. At the very least, those seeking to educate householders on saving energy need to anticipate and be ready to respond to related environmental, health and safety issues.

Inconvenience of some energy reduction strategies

Some participants articulated the inconvenience or discomfort of some reduction strategies. Most common was the negative evaluation of AAA-rated showerheads, which were perceived by some householders to provide inadequate and uncomfortable showering. These perceptions were often based on bad experiences with earlier models that had turned householders off trying the showerheads again. Most of the householders that had tried newer models were satisfied with the experience. Similarly, while many householders were satisfied with CFLs they had installed, some reported negative experiences. These included dissatisfaction with the brightness or quality of light and, in some cases, rapid failure of the globe (within months instead of years).

All technologies have a learning curve; as experience with a technology grows, costs generally fall and negative aspects of the technology are gradually addressed. However, if participants try a product at an early point in the learning curve and have a negative experience, they are often reluctant to try the product again. The continuing negative perception of AAA-showerheads and CFLs indicates the importance of 'getting products right' before they reach the market and of continuing education as products improve. Of course, some householders will continue to find these products inconvenient or unsatisfactory.

Participants also described a reluctance to turn off stand-by power on VCRs due to the inconvenience of losing channel programming. For some, it was difficult to reset the VCR unassisted. Further, checking appliances for faults was difficult in many cases. For some participants this was due to poor knowledge of appliances (e.g. inability to check seal on fridge), but for others it was the physical location of appliances (such as water heaters in ceilings) that meant householders could not undertake their own maintenance or improvements (e.g. installing pipe insulation).

In many cases, barriers to reducing energy use went beyond inconvenience to become impractical. Housing design acted as a major barrier to change. Participants reported problems with concrete houses (prevalent in some areas), open plan houses, older ducted heating systems that are difficult to zone, peak electric hot water services and old hot water services. For renters, poor housing design and quality were of particular concern. To a significant degree, housing design and appliance quality establish the level of household energy use and constrain the ability of householders to reduce energy consumption or improve comfort through behavioural change. Conversely, retrofits of housing and appliance stock offer great potential for reducing electricity consumption and improving comfort.

Economic factors

Participants in this study identified saving money as a strong motivator for change. Similarly, lack of finances was a key barrier in implementing change. This is consistent with a survey by the AGO (2002), which found that the desire to save money was the primary motivation for demand management among householders. It is unsurprising then that rebates and incentives for energy efficient products achieved the most votes of the policy options considered in the workshops.

7.1.3 The impact of social relations on energy use

Wilhite et al (2000) argue that the network of relationships with ‘builders, utilities, estate agents, government regulators, retailers and engineers’ shapes energy consumption at the residential level. Wilhite et al (2000) explain that these institutional and social relationships can create opportunities for demand management, but often impose constraints. Whilst it was not a core feature of the research plan, the discursive nature of the workshop format allowed some analysis of the social relations which impact on energy use.

In this study, participants most frequently discussed their social relations with family and friends, landlords (public and private), utility companies and government. Many of these relationships, particularly those with landlords, utilities and government, were characterised as constraints on efforts to reduce electricity use. However, there was some discussion of social relations that facilitated reductions in electricity use or learning about electricity use. In particular, the participants in the Cent-A-Meter trials found the electricians that installed the devices to be helpful and informative.

The social relations likely to have the biggest impact on patterns of electricity use are those with other members of the household or family. Households and families are not homogenous, but comprised of individuals who all use and interact with energy in different ways. Parents in workshops frequently referred to issues with managing electricity use by children and teenagers. These younger family members, particularly teenagers, were characterised as acting largely independently and managing their own appliances (largely computers, TVs, VCRs, DVDs, computer games and portable heating). They were also characterised as having little regard for energy saving and engaging in high consumption habits e.g. long showers, turning up the heating and leaving lights on. Frequently these behaviours occurred behind closed doors (in private bedroom space) and parents felt unable to act or had decided it was too much “hassle” to seek reduction.

Older participants commented on changing life stages and the effect on electricity use. Some participants described how, as their children grew up and moved away, they were left living alone with appliances (especially fridges) designed for larger families. They could not afford to replace these (still working) appliances in favour of more appropriately sized and more efficient ones.

Relations with friends and visiting family impacted on electricity use. Some participants reported wanting to ‘look good’ in front of visitors in terms of the number of white goods they owned. Others identified that their social habits of communal meals and visits led to increased energy costs. Whilst the literature identifies some examples of householders being influenced to reduce energy consumption based on comparison with and support of friends/neighbours, the householders in this study used energy (and increased its use in various ways) as a result of these social relations.

Overwhelmingly, participants felt constrained by their social relations with landlords (public and private) in terms of taking action to reduce electricity consumption. Landlords were perceived to be uncaring about the energy efficiency of their housing stock. Tenants reported poor quality housing. Public tenants reported housing lacking in basic insulating measures, such as drapes and weather stripping on windows and doors. Tenants felt it was left to them to make improvements but either could not do so, due to finance constraints, or were reluctant to do so given the financial benefit accruing to the landlord. Participants strongly felt the need for regulatory reform in this area, as without this the social relation was one of considerable inequity, which inhibited their ability to reduce consumption.

Most participants held a high degree of scepticism about their electricity company. It was felt that the social relation should be one of service by the utility company (consistent with the notion of electricity as an essential service). Instead, deregulation was transforming the social relation to a market relationship in which, according to participants, their rights were diminished. In this transformed social relation, it appeared (to participants) that the utility company had no obligation to provide a socially responsible service and that issues of economic return would always take precedence over

social obligations. Consequently, householders felt disempowered. They required electricity, but the process by which they gained and paid for it was unsatisfactory. They felt they had no rights in this system, no information, a lack of transparency and no ability to argue a case where they felt they were being overcharged.

Consistent with the literature (Keys Young 2002), householders felt they were asked to take a disproportionate responsibility for energy reduction, or were the victims of price increases generated by overuse by other players, such as industry or wealthy households. The only positive in the social relation with utilities was the provision of Easy Pay by utility companies; this is a service that directly addresses householder needs. The social relation with utilities acted as a constraint on householder change, in that they received little information from the utility company and distrusted what they did receive.

Participants expressed a range of social relations with government. For some, government directly provided services, including public housing and funding for humanitarian relief packages. In such cases, it was felt that governments were failing to meet social obligations by failing to provide energy efficient housing or appliances. The householder was left with the burden of high ongoing energy costs due to inefficient housing and appliances.

Participants were also conscious of the regulatory role of government and felt that governments could do much more in this regard, particularly in the area of mandatory standards for rental housing and regulation of energy efficiency in the electrical appliance market. As a result of increased privatisation and competition in the energy and appliance markets (with utility companies also acting as appliance retailers), householders also felt government should have an increased role in the provision of high quality, unbiased information about energy efficiency, appliances and strategies. Householders expressed distrust of energy providers and retailers providing this kind of advice. Further, participants felt governments should be more active in offering incentives and rebates to assist and encourage uptake of energy efficient products. In general, householders felt they were bearing a disproportionate responsibility for energy reduction in a social relation where government should be leading and resourcing social and environmental reform.

7.2 Research Question Two

What are therefore the most effective approaches to products/services to respond to the needs of small consumers to help them understand and manage their overall consumption and peak demand for electricity?

This research project has generally interpreted the products and services referred to in Research Question 2 as different policy options that might be pursued within the NEM. Widespread testing of actual products and services was not feasible within budget constraints and was not consistent with the advocacy focus of the research. A small-scale trial of a particular product – the Cent-A-Meter – was conducted as part of the research after the opportunity arose to work with AGL on this trial. The results of this specific trial are summarised in Section 7.2.3.

For the most part, this section reports on the policy needs and preferences identified by householders participating in the research, drawing also on relevant literature. The literature suggests some caution in equating householder preferences with effectiveness of strategies in terms of actual energy reduction, for two main reasons. First, there is substantial evidence that the values expressed by people in a research setting do not necessarily translate into effective action (Blake 1999). Social and cultural factors, institutional constraints and psychological barriers can all play a part in preventing the translation of expressed values into effective action.

Second, some of the strategies preferred by householders actually increase, rather than decrease, consumption. For example, Oliphant (1999) found that the provision of detailed feedback on electricity use prompted some households to increase electricity consumption, as they discovered how

little some appliances cost to run. Participants in the Cent-A-Meter trial reported similar surprise at the low cost of some appliances and planned to use them more in the future.

There are many other factors that can influence effective implementation of strategies preferred by householders. There appears to be little research into the implementation process and the various social, cultural, economic and other factors that impact on successful implementation over time. Longitudinal studies are required to explore the barriers that arise when householders try to implement preferred demand management strategies.

It should also be noted here that research findings relating to summer peak demand were limited for a number of reasons. First, the workshops were conducted during winter and participants were inclined to discuss heating rather than cooling. This meant that discussion of air-conditioning and summer electricity peaks was limited. Second, the penetration of air-conditioning in the research sample was fairly low. Third, the predominance of low-income householders with little discretionary energy use in the research sample meant that there was little opportunity to discuss options for load shifting. Nevertheless, there was some discussion of policy options to manage peak demand and findings are summarised in Section 7.2.6.

The sections below outline the policy approaches that are likely to be most effective in helping small customers to understand and manage their electricity demand, based on the findings of this research project. Policy approaches that primarily assist disadvantaged households are discussed separately, in Section 7.3. However, many of the strategies discussed below will also assist disadvantaged households, and many of the strategies discussed in Section 7.3 will have wider applicability.

7.2.1 Increased and targeted education

Consistent with the literature (e.g. Roy Morgan Research 2002), this research found that knowledge about energy reduction strategies, and the electricity market in general, is poor. Householders generally had little working knowledge of reduction strategies such as turning off lights and standby power, were unaware of advances in energy saving technologies, such as CFLs and AAA-showerheads, and lacked information to guide decisions about appropriate heating, cooling and other appliance options. They did not feel equipped to decide between different retail offerings emerging since the advent of full retail competition.

Knowledge of existing policy programs, such as the Energy Rating scheme for appliances, was also poor in some cases. Few participants realised that the number on the Energy Rating label was the annual consumption and could be used to calculate running costs. Several participants wanted to see actual running costs advertised on the Energy Rating label. In one workshop, there was a perception that the Energy Rating label actually added costs and was therefore to be avoided. These findings suggest the need for greater promotion and explanation of the Energy Rating scheme with targeted audiences. Participants ranked better information on energy efficient appliances at the point of sale as the sixth most popular policy option in voting, emphasising availability of printed information in retail outlets and advertising of running costs on Energy Rating labels.

Overwhelmingly, householders sought context-relevant information, presented in appropriate language. This is consistent with findings in the literature emphasising the importance of tailoring information to specific circumstances and adopting a personalised approach (Darby 1999; Strahan Research 2003b). There was a general perception amongst participants that face-to-face delivery of information was preferred, possibly because this was linked to a high level of customisation and detailed responses to individual contexts and questions. Home visits by energy experts were particularly favoured. Various participants felt that community organisations could be resourced to undertake this role, which is again consistent with findings in the literature (e.g. Boardman & Darby 2000). Participants appeared to appreciate seeing and handling various pieces of equipment such as pipe lagging, AAA showerheads, CFLs, window sealers and fridge thermometers. In some workshops the ability to actually demonstrate actions by using fridges, heaters etc was valuable, especially for

newly arrived migrants who had little previous experience with electricity. Further, participants expressed a desire for information on local suppliers of appliances and equipment.

Some of the literature argues for tailoring of information by market segment (Dake & Thompson 1999; Keys Young 2002; Shipworth 2000). The findings from this research project are more supportive of tailoring information according to social/cultural clusters (following Jaeger et al. 1993). This implies working with community organisations and cultural groups that are already part of the cultural context of participants. Further, research participants emphasised the need to take cultural issues into account when developing information, so that energy saving information does not recommend actions that are unacceptable to particular cultures. The provision of information in different languages was among one of the most popular strategies amongst participants (ranked fifth), with participants suggesting the use of ethnic media, including ethnic radio and newspapers, as well as bill inserts in different languages.

The research also highlighted the possibility of identifying suitable appliances for different cultural needs. For example, efficient thermal pots were used for cooking by many of the participants in the Chinese-speaking workshop. This culturally specific demand management strategy could be promoted more widely. There may be other opportunities for the exchange of strategies across diverse groups.

7.2.2 Train-the-trainer

Some workshops raised the idea of training community agencies and their workers to deliver energy efficiency education and audits. Suggestions on delivery were varied including: in-home demonstrations and discussions; via regular worker contact with clients; and by using a similar workshop model to that offered in this project. The use of community networks for education and provision of home energy audits is also identified as an effective strategy in the literature (Boardman & Darby 2000; Nance 2004). Two of the workshops in this research project functioned with the secondary aim of skilling support workers in community agencies to better advise and educate clients.

MEFL has some experience with training programs of this type, having previously trained Home Maintenance workers at Moreland City Council, who do maintenance work for disadvantaged and elderly residents, to do a basic energy audit and make retrofits. MEFL also trains volunteer to do energy audits for their friends and families. However, a comprehensive train-the-trainer strategy would target a wider range of community workers and would require significant funding.

Given the existence of competing values in household management and decision-making, discussed in Section 7.1.2, a train-the-trainer program would do well to focus more broadly than on energy efficiency alone. Community workers who have regular contact with householders could be trained in strategies for sustainable living, as part of a broader educational campaign that integrates energy, greenhouse, water, waste, transport and health issues.

7.2.3 Metering and feedback

In general, participants welcomed the idea of instantaneous or rapid feedback on their daily electricity use. This is consistent with the literature, which found high levels of customer satisfaction with rapid feedback systems such as the Internet-based Energy Tracker system (previously called Personal Energy Management) employed by Puget Sound Energy (Gullekson 2002), the computer-based feedback trialled by Brandon & Lewis (1999) and various forms of direct in-home feedback (Darby 2001).

To provide feedback on daily electricity use, it is necessary to install an interval meter. The Essential Services Commission in Victoria has already decided to pursue a compulsory rollout of interval meters for all electricity customers. The MCE recently decided that all jurisdictions should complete an assessment of the costs and benefits of a similar rollout by 2007. The research findings generally

support the rollout of interval meters to residential customers as a means of providing feedback on electricity use.

However, the research findings also indicate that interactive, user-directed feedback is likely to be most effective in meeting the needs of householders. That is, rollout of interval meters needs to be supported by provision of accessible, interactive displays and online tools for householders with Internet access. Wood & Newborough (2003) found that electronic feedback indicators were significantly more likely to encourage reductions in consumption than paper-based information. The research support for rollout of interval meters is therefore contingent on the provision of appropriate interactive feedback displays, in-house and online. This, in turn, will require meters with remote reading capability.

The research participants welcomed rapid feedback as a way of helping them to reduce their electricity use. However, it should not be assumed that feedback will automatically lead to reductions in energy consumption. For the participants in the Cent-A-Meter trials, the novelty of feedback wore off rapidly. Further, consistent with Oliphant's (1999) findings, the low cost of electricity and consequent low cost of running many appliances meant that some participants planned to increase their use of those appliances as a result of feedback. In addition, many participants reported social or cultural constraints that would prevent them from reducing peak consumption or overall consumption.

The value of feedback to most participants was as a way of testing the impact of particular behaviours or products. It can provide an indication, when a household buys a new appliance or adopts a new behaviour, of the impact on electricity use. Participants were particularly interested in feedback that disaggregates electricity use according to different appliances or end uses. This was the fourth most popular policy option overall, with 7.6 votes. Interval meters do not provide this information. While this type of feedback could potentially be provided through other smart metering technologies, such an approach is likely to be expensive.

A superior approach is to deliver this feedback through energy audits. Professional energy audits provide the most detailed and accurate information to help a householder reduce their energy bills, but are relatively expensive. Self-administered audits are a cheaper alternative, although they will not be suitable for all householders. An example is the Cool Communities program in South Australia, which made plug-in power meters available in self-audit kits that could be borrowed from the local library. Householders can use these power meters to test the electricity consumption of different appliances themselves. This program could be advocated Australia-wide. In addition, community workers trained in energy auditing (see Section 7.2.2) could be equipped with these meters to assist their clients.

Another model, employed by MEFL, captures some of the advantages of professional advice and some of the cost savings of self-administered audits. MEFL runs workshops to teach householders how to use a paper-based audit and retrofit tool. The workshop gives the householders access to professional advice but the householders then conduct the audit themselves. Again, this model could be advocated more widely.

A final point to note is the general unwillingness of householders to pay more than a small amount for the provision of extra information. None of the participants in the Cent-A-Meter trial were willing to cover the cost of installing such a device. Other participants felt that instantaneous feedback on amount and cost of electricity use should be part of the normal functionality of their meter, implying that they expect utilities to cover these costs.

7.2.4 Billing and pricing

In addition to metering, billing is an important way of providing householders with information about their electricity use. The literature links more informative bills to reductions in energy use (Wilhite & Ling 1995). As well as bills that report on the cost of different end uses (see Section 7.2.3), some householders supported more frequent bills. However, most were happy with quarterly bills and the

research does not support any change in billing cycles. The research does support payment flexibility – this is discussed in Section 7.2.4.

While participants generally welcomed the type of information and feedback that an interval meter could provide, they were resistant to the idea of cost-reflective tariffs. Discussion during workshops tended to focus on the higher prices during peak times rather than the possibility of lower prices at other times. Most participants, especially low-income participants, did not feel that their consumption during peak periods was discretionary and were dubious about their ability to respond to higher prices at those times by changing their practices. Some participants felt that cost-reflective tariffs would unfairly penalise those who had no choice but to consume energy at peak times, including families and people in poorly-designed housing. Other participants had poor understanding of existing off-peak tariffs, indicating that the added complexity of many cost-reflective tariff proposals will be difficult for some householders to grasp. If cost-reflective tariffs (with diurnal variation) are implemented, there must be appropriate regulatory control and supporting program (e.g., retrofits for families and low-income households) to prevent regressive social impacts.

It should be noted, once again, that different findings would be expected for householders with a higher proportion of discretionary energy use. These householders would be better placed to shift energy use to take advantage of lower prices during non-peak periods. Further research on the attitudes of high energy users towards cost-reflective tariffs is recommended.

The type of tariff structure that received the most support was an inclining block tariff with a low access to service charge. Some participants wanted to abolish fixed charges entirely and pay a higher consumption charge. Others suggested that the fixed fee should be proportional to usage. Both of these suggestions would provide a stronger price signal to consumers to reduce electricity use. Participants recognised the need to take household size into account when establishing block tariffs. One interesting suggestion was to relate the size of the cheaper block of electricity use to household size; larger households would have a larger block size. However, this would introduce an additional level of administrative complexity that could be counterproductive and there could be privacy issues with requiring households to reveal their size. An alternative is to offer rebates to particular categories of household (e.g. large families) that exceed the threshold.

7.2.5 Incentives and rebates

Consistent with the literature (e.g. AGO 2003), rebates and incentives for installing energy efficient products, equipment and appliances were very popular with research participants. Participants felt that they should be rewarded for doing the right thing and that the government should provide assistance with the high initial capital costs of some demand management actions to capture the ongoing economic and environmental benefits. The provision of rebates and incentives was the most popular policy option in voting, with 11 votes.

The popularity of rebates and incentives is no great surprise. In a workshop context, when options must be presented rapidly without time for deep discussion of their implications, it is in an individual's self-interest to call for rebates and incentives. The problem is identifying how these rebates and incentives should be funded (i.e. who should pay?), to what level (i.e. how much is enough to encourage adoption and do the benefits outweigh the costs?) and on what basis they should be allocated (i.e. who is eligible?) This research project was not designed to answer these questions. Further research on these issues is a high priority recommendation.

Although it is possible that rebates and incentives were popular because participants were pursuing their own self-interest, it was also evident that participants found it genuinely difficult to afford the high initial cost of demand management options, even when they recognised the lifecycle benefits. Given this situation, funding options that reduce upfront costs by slightly increasing electricity prices are attractive. If implemented appropriately, the increased affordability of demand management will offset the increase in electricity prices, leaving energy bills at much the same levels. Consequently,

proposals for Demand Management Funds, funded by a small levy on each unit of electricity sold, are an attractive way of providing the type of rebates and incentives desired by participants.

7.2.6 Managing peak demand

Research Question 2 draws attention to the issue of peak demand, which is of great interest to energy utilities and regulators charged with ensuring a reliable electricity supply. Many families discussed dinnertime and the time of arrival home from work or school as a period of higher energy use. These times are used for bathing children, making dinner and heating rooms prior to bathing and sleeping. Given the context of these activities, and the social and cultural needs attending them, most participants felt that they could not make a significant reduction in electricity use at these times. Indeed, the research participants overwhelmingly claimed that they used energy at particular times because they had to, or for social and cultural reasons that they were not inclined to change. Few were willing or able to contemplate voluntary reductions in energy use at these times. Further, low income households were already constrained in their energy use and exhibiting rationing behaviour. Low-income households have limited discretionary energy use that they can willingly reduce or shift to other times.

As noted previously, the weighting of the research sample towards low-income households means that these findings are not likely to be representative of the attitude of the wider population towards demand shifting. For households with a higher proportion of discretionary energy use, there should be a wide range of options to shift demand out of peak periods. For example, swimming pool owners can put pumps on timers, dishwasher owners can turn on dishwashers before going to bed and air-conditioner owners can switch off the air-conditioner for periods when prices are higher.

Nevertheless, the research reveals the possibility that cost-reflective tariffs will negatively impact on those households that have few options to shift demand out of peak periods. It also identifies some examples of social and cultural constraints that may limit the effectiveness of cost-reflective tariffs and similar constraints may apply within the wider population. Further research, preferably involving trials of interval meters with dummy cost-reflective tariffs, is recommended to determine whether householders are willing and able to shift their demand out of peak periods in response to price signals. This research should focus particularly on discretionary energy use by households with higher incomes and energy use than were typical among the workshop participants.

Given that the research was conducted during winter, it was difficult to get a strong sense of whether people would be willing to modify their air conditioning behaviour. Some participants were attracted to the concept of remote load control; others were suspicious of this as interference in the home. However, in the context of the popularity of rebates and incentives during the workshops and the apparent success of remote load control programs offered elsewhere (e.g. SMUD), further attention to remote load control is recommended.

7.3 Research Question Three

What are the particular issues around these products/services for disadvantaged consumers and what can be done to minimise the disadvantage?

The key barriers for disadvantaged consumers seeking to understand and manage their electricity use are structural in nature. Models of behaviour categorisation and change (e.g. Barr, Gilg & Ford in press; Dake & Thompson 1999; Keys Young 2002; Shipworth 2000) are not suitable for addressing the needs of this group, where the potential for behavioural change is so structurally constrained. In general, this research confirms the findings and recommendations of the Western Region Energy Action Group (WREAG 2004). This research found that barriers to improving energy efficiency included: poor energy efficiency of public housing; lack of affordability or interest as a tenant to invest in substantial home modifications to increase energy efficiency; and lack of affordability to

purchase more expensive energy-efficient appliances. Recommendations from the WREAG report include a focus on:

- Socially responsible tariff structures, implemented as inclining block tariffs
- Improving housing stock through retrofits, simple, low-cost actions and no-interest loans for energy-efficient appliances
- Subsidisation of energy bills for people who must have heating or cooling to prevent serious illness
- Establishment of independent advocacy capacity for energy consumers.

With this in mind, this research suggests that work to support electricity reduction among disadvantaged consumers needs to focus on overcoming structural barriers to energy access and efficiency. Specific strategies against these broad needs are described below. It would be appropriate to implement these strategies as part of an integrated Fuel Poverty Strategy to address the energy needs of low-income households. The Fuel Poverty Strategy is discussed in Section 7.5.10.

7.3.1 Concessions for low income and disadvantaged householders

Concessions are one way that governments recognise the role of electricity as an essential service and attempt to meet social obligations relating to this service. This research found that the area of concessions could be improved in a range of ways.

First, there is evidence that some disadvantaged householders are not adequately supported by financial rebates or concessions to the extent that they either cannot access electricity at all, or are so restricted in its use as to affect their quality of life severely. Expansion of concession schemes may be appropriate to provide further support for disadvantaged households. Additionally, some householders have special health needs that must be managed through heating and cooling. Existing electricity bill concessions for life support equipment could be expanded to cover other health needs that require electricity use.

However, there may be better ways than expansion of concession schemes to provide financial support for low-income households. In particular, providing subsidised retrofits or access to capital to purchase insulation and efficient appliances can permanently reduce energy bills, reducing the need for concessions.

Second, householders in this study had little understanding of how concessions worked, what periods of the year they covered, or how they were applied. Participants reported ongoing problems with receiving bills on which concessions had not been applied or in assuming that the electricity provider automatically applied concessions when they did not. From the evidence provided by householders, it appears that many householders who are eligible for concessions are not receiving them. Whilst governments fund concessions, it is the utility companies that administer them. As such, utilities need to be involved in promotion of concessions. Householders need to know when concessions are available, at what rate, eligibility requirements, how to obtain them, and if they are required to repeatedly apply for concessions for each bill period. All concessions applied should be clearly stated on each bill so householders can ascertain if they have been applied. Governments should regularly evaluate the uptake of concessions against other data (e.g. health care or ABS data) to ensure concessions are being accessed proportionate with eligibility.

Third, further research is needed to determine whether the provision of concessions in their current form is the most useful method for supporting the access of disadvantaged people to electricity. For example, participants in this research suggested that a concession voucher system may be more appropriate where eligible householders could opt to use concession vouchers (to a predetermined

value) at the point in the year when most needed. This would more accurately relate to the actual and changing financial contexts of disadvantaged householders. Further research and policy work is required in this area.

7.3.2 EasyPay

The opportunity to make regular contributions towards bills is already available to most householders via systems such as EasyPay. This research found some evidence that EasyPay may lessen householder motivation to reduce energy consumption. The regular contribution amounts do not vary according to consumption, which means that there are no financial incentives for reducing bills (as payments remain static). Further, bills are less meaningful when they are already paid for, so less attention is paid to them (and to any educational inserts). However, the effect of EasyPay payment structures on electricity usage requires further research before conclusive results can be offered.

Despite these issues, EasyPay has a significant place in the management of householder electricity and should be continued. EasyPay structures greatly assist householders to meet their payment commitments and remain eligible for electricity connection. Additionally, householders view these structures positively, and in some cases, this is the only positive view of the utility company that the householder holds. In such cases, EasyPay is a key mechanism in building relationships between the service provider and consumer. These relationships are critical if utility companies are to continue to expand the effectiveness of their role as an educator and change agent in the area of energy efficiency.

Several research participants felt that the availability of EasyPay, and other flexible payment options, should be advertised more widely and actively promoted by utilities. Participants encouraged further attention by utilities to flexible payment options to assist disadvantaged households. Some options suggested included:

- Introduction of incentives for early bill payment instead of penalties for late payment
- Payment matching for households experiencing financial crisis
- Targeting retrofit programs to households experiencing financial difficulties and big bills
- Suspending payment requirements in the lead up to holiday periods (e.g. December).

7.3.3 Public housing policy

A significant proportion of low income and disadvantaged householders reside in public housing supplied by the Department of Housing or Aboriginal Housing Board in each State. According to participants, this housing is often poorly designed from the perspective of energy efficiency (especially heating and cooling requirements), stocked with inefficient appliances and lacking in insulation, including window and door seals and drapes. Consequently, tenants must use high levels of electricity to maintain comfort and operate appliances, incurring high costs.

One of the most popular policy options during the workshops was the establishment of an energy efficiency standard for rental housing; this option was particularly popular with public housing tenants. Government policy in regard to the development and upgrade of public housing needs to prioritise energy efficiency, particularly through the retrofit of existing housing stock. Additionally, rental payments could be structured to reward improvements made by the tenant (such as installation of drapes, window and door frames, AAA showerheads, CFLs etc) or direct cost reimbursements made to tenants. Where public housing also supplies appliances (for example, transient housing), these should meet appropriate energy efficiency standards and not just be selected on the basis of minimum cost.

One workshop raised the idea of the DOH negotiating a bulk electricity supply agreement for its tenants, effectively acting as an energy cooperative to increase tenant purchasing power. The contract put out to tender could potentially include retrofits as well as electricity supply. This idea is worth further investigation.

7.3.4 Private rental accommodation regulation

At present, the Residential Tenancies Acts in Queensland, NSW, Victoria and South Australia offer no regulation in regard to energy efficiency. In the ACT, landlords must advertise any previous energy efficiency rating in the advertisement for lease, but do not need to obtain a new energy efficiency rating. All Acts require landlords to ensure prices they charge for electricity consumption are consistent with utility companies and include concession rebates, but none require landlords to offer housing stock with minimum energy efficiency standards. Nor are landlords significantly rewarded for such expenditure through the taxation system.

Research participants sought the establishment of minimum energy efficiency standards for rental accommodation and requirements for capital improvements to bring housing stock up to these standards. The establishment of such standards is cautiously endorsed. The main reason for caution is the possibility of rent increases that would worsen the overall financial situation of low-income households. It is possible that taxation incentives for landlords could be used to offset the need for rent increases. However, as a first step in moving to energy efficiency standards for rental housing, mandatory disclosure of energy efficiency ratings in lease advertisements should be strongly pursued.

7.3.5 Support for migrants and refugees.

As discussed in Section 6.11, the IHSS provides refugees with a range of basic appliances via the Household Formation Support program. This program is largely administered through community organisations that undertake purchasing and provision of appliances and do not have the resources to prioritise energy efficiency. Government guidelines for the program need to require the purchase of appliances that meet a minimum energy efficiency standard. This will likely require allocation of additional resources to the program, however these resources will be recouped, on a whole of society basis, through reduced energy bills for refugees.³ The agencies administering this program would benefit greatly from a train-the-trainer program of the type discussed in Section 7.2.2.

Although it was mentioned only once, it is likely that the Commonwealth Government's Emergency Relief program also provides appliances to victims of natural disasters. If this is the case, the Emergency Relief program could also benefit from the changes contemplated above.

Additionally, many refugees and migrants begin life in Australia with little knowledge of electricity markets and appliances. To avoid initial high energy bills, there is a need for on-arrival education about electricity, what it is used for, strategies to reduce consumption and the cost of electricity use. Recently arrived refugees and migrants should be a key priority for immediate and extended education in this regard. To achieve this, government and/or utility companies must allocate funds to community agencies dealing with these groups (including the cost of accessing train-the-trainer programs in energy sustainability).

7.3.6 Second-hand appliances

Low income and disadvantaged householders reported increasing difficulty in accessing cheap second hand goods due to the withdrawal from the market of many charitable organisations. Participants

³ An additional advantage is that bulk purchasing of efficient appliances will help to reduce their cost.

claimed that this withdrawal was a result of the current litigious environment, however this research project has not attempted to confirm this claim by interviewing representatives from charitable organisations. Whatever the reason for the withdrawal from the market, without access to cheap energy efficient alternatives to existing poor quality, old or oversized appliances householders have no choice but to continue use of inefficient appliances. The involvement of charitable organisations in the second-hand appliance market should be supported and protected through appropriate policy and regulatory changes.

In addition, retrofitting programs offer the potential to improve the efficiency of some second-hand appliances, especially fridges. The Phoenix Fridge program, implemented by MEFL, is a good example. Donated fridges are retrofitted to remove CFCs and improve energy efficiency and provided to disadvantaged households. Expansion of such programs is recommended, both to remove inefficient fridges from the appliance stock, and to provide cheap, efficient fridges to low-income households.

7.4 Research Question Four

What are the existing rules and regulations, industry structures, government policies etc that may impede the implementation or effectiveness of these approaches?

Section 6 identified the policies, legislation, rules, regulations and other institutions that potentially impact on the ability of householders to manage their electricity use. Of direct relevance are:

- National energy policy
- The National Framework for Energy Efficiency
- The National Appliance and Equipment Energy Efficiency Program
- The Productivity Commission Inquiry into the Economic and Environmental Potential Offered by Energy Efficiency
- National Electricity Law
- The National Electricity Code
- State regulatory arrangements
- The structure of the deregulated energy sector
- Housing legislation in each State
- The system of electricity concessions
- The Integrated Humanitarian Settlement Strategy.

These institutions can act to impede or facilitate management of electricity use by householders, depending on the context and the specifics of their implementation. Section 7.5 considers some of the ways in which these institutions might be improved to respond to the concerns raised by participants during this research project.

7.5 Research Question Five

What changes are required to the National Electricity Code, or jurisdictional laws, regulations and policies so as to remove “roadblocks” that inhibit the development of a demand side response by small consumers?

The institutions discussed in Section 7.4 do not all act to inhibit the development of a demand side response by small consumers. Most have numerous positive features. Nevertheless, there are always opportunities for improvement. This section draws on the research findings to identify specific opportunities for improvement that might be suitable for advocacy purposes.

7.5.1 National Framework for Energy Efficiency

As discussed in Section 6.2, the NFEE includes three policy packages that are potentially relevant to the findings of this research project. The residential building policy package includes the following measures:

- Nationally consistent minimum energy efficiency design standards for new homes, units and apartments
- Minimum energy efficiency design standards for major renovations
- Mandatory disclosure of the energy performance of homes, units and apartments at the time of sale or lease.

The first two measures will implement one of the most popular policy options from the workshops (ranked equal second in voting) and are strongly endorsed by the research team. Advocacy could focus on ensuring that consistent national standards adopt the best practice standards developed in NSW and Victoria, rather than some lower standard.

The third measure was also discussed during the research. It was generally supported by workshop participants, although few felt strongly enough about it to vote for it as their favourite option. Consumer advocacy groups also supported this measure. Two problems with this option raised during the research include landlords installing equipment to get a high rating then removing it after their rating has been determined and advertising of the rating that was almost too small to be visible. Advocacy could focus on ways to implement mandatory disclosure that avoid these problems. For example, there could be a requirement to have an audit of the energy rating after tenants move in and a requirement for a minimum size in advertisements.

The policy package on appliance and equipment energy efficiency includes the following measures:

- Broadening the scope of MEPS and labelling to include gas products
- Introduction of new or more stringent MEPS for residential products.

Both of these measures were discussed during the research. Energy efficiency standards for appliances were one of the most popular options (ranked equal second in voting). As this project focused specifically on electricity, expansion of MEPS and labelling to gas was not considered. The only appliances specifically mentioned for expansion of MEPS by participants were heaters.

A previous review of the feasibility of MEPS for electric space heaters concluded that such standards are neither necessary nor practical, given that electricity conversion efficiencies are close to 100% and space heating conditions vary so widely (GWA 2001). However, electric heaters do differ in the efficiency with which they transfer heat to a room. It may well be possible to develop MEPS for

electric heaters based on their efficiency in heating a room. While it is recognised that the varying conditions under which heaters are used poses a problem for the development of suitable testing procedures, a more comprehensive assessment of the potential for MEPS is recommended.

The policy package on general consumer awareness includes the following measures to raise awareness and motivate energy saving actions:

- A requirement for energy retailers to provide benchmark data on energy bills
- Development of a nationally coordinated network to facilitate easy and timely access to high quality and relevant information
- Targeted promotional campaigns for specific energy efficiency issues
- Integration of energy efficiency concepts into the school curriculum.

The first and fourth measures were discussed or raised by participants during the research. Participants generally approved of benchmarking on bills and were keen for the inclusion of benchmarks for different household types to enable relevant comparison. However, this research project indicates that household characteristics vary widely, making development of meaningful benchmarks difficult. Further, it is possible that benchmarks could be counterproductive if households that find they are consuming less than the average use them as justification to consume more. Consequently, the authors do not believe that there is value in pursuing a benchmarking scheme.

Participants in several workshops felt that teaching children about energy efficiency in schools would be a very effective strategy. This policy measure is endorsed by the research findings.

For the second and third measures, the research raises some important issues, discussed in Section 7.2.1. For advocacy purposes, the points raised in that section should be considered in any information services or promotional campaigns developed through the NFEE process. These points include responsiveness to cultural contexts, provision of information in different languages, provision of information in tailored forms that meet householders' specific requirements, face-to-face delivery of information, hands-on demonstration of options for energy efficiency improvement and cooperative delivery of information programs with community organisations and cultural groups.

7.5.2 National Appliance and Equipment Energy Efficiency Program

Specific suggestions from participants for improvements to the NAEEEP focused on provision of information on energy efficient appliances at the point of sale (e.g. in the form of a printed booklet) and inclusion of average running costs on Energy Rating labels. It is recognised that the inclusion of running costs on Energy Rating labels is problematic given the variation in tariffs and tariff structures across Australia. However, the value that householders place on this information warrants consideration of ways in which these problems might be overcome, such as adopting an average Australian tariff for cost calculation or providing several figures based on different tariffs.

7.5.3 The National Electricity Law

Appropriate amendments to the NEL, consistent with the findings of this research, have already been proposed by TEC et al (2004). Specifically, the proposed addition of a new clause to Part 2 of the NEL requiring that the NEC include provisions for the development of demand management is consistent with the research findings. Until demand management is supported by national legislation, the low prioritisation of demand management by utilities, landlords and other organisations is likely to continue.

This research project has also confirmed the impacts of the NEM on low-income households and identified a strong sense among participants that electricity is an essential service. TEC et al (2004) propose amendments to the NEL, including:

- The insertion in Part 1 of an Objects clause, including the objective ‘to ensure consumers have continuous access to the affordable, reliable and safe supply of electricity under the NEM, in recognition that electricity is an essential service in the community’
- A new clause in Part 2 requiring regulators and market participants to consider the impact of their activities on low-income consumers.

Both of these amendments start to address some of the concerns raised by participants in this research project and should be advocated.

7.5.4 State regulatory arrangements

Concessions

Currently, the NSW *Electricity Supply (General) Regulation 2001* specifically requires any concessions applied to the bill to be itemised on the bill. The Victorian Electricity Retail Code and South Australian Energy Retail Code do not have this requirement, although they require general information on concessions to be included on each bill. An amendment to these Codes to require itemisation of concessions on bills would go some way to addressing concerns raised by householders. It is also clear from the level of confusion displayed by householders that existing requirements to provide information on concessions are not completely effective. Further analysis of information provided by utilities on concessions is recommended.

Payment flexibility

The options suggested by participants for flexibility in bill payment requirements (see Section 7.3.2), or additional payment options, could potentially be incorporated into the Retail Codes in Victoria and South Australia and the Electricity Supply (General) Regulation in NSW. For example, disconnection could be disallowed unless the utility has worked with the customer and perhaps the relevant Ombudsman to develop a flexible payment option for that customer. Further analysis of additional options for payment flexibility and advocacy of the enshrinement of greater flexibility in the Retail Codes and regulations is recommended.

Metering requirements

The Electricity Metering Codes in Victoria and South Australia and the NSW Rules for Electricity Metering, or a consolidated national equivalent, would be an appropriate location to capture feedback requirements relating to interval metering, discussed in Section 7.2.3.

Energy efficiency audits

Currently, Section 11.3 of the Electricity Retail Code in Victoria and Section 12 of the Energy Retail Code in South Australia encourage retailers, respectively, to consider conducting an energy efficiency audit for customers that are having difficulty paying bills and to provide information on availability of energy audits. These existing requirements could be modified to *require* retailers to offer an energy efficiency audit to customers experiencing payment difficulties and/or customers with large bills. The audits could be delivered cooperatively with community workers trained in energy auditing. Funding support would be necessary for training and to cover the costs of the audit, as it is inappropriate for customers already experiencing financial difficulty to pay for the cost of the audit. In addition, the existing requirements relating to audits should be included in all Retail Codes and Regulations.

Least cost planning

Several participants felt that utilities should be required, encouraged or rewarded for undertaking least cost planning. It was felt that this would encourage greater demand management, as this would be cheaper than augmentation of the electricity distribution network in many cases. Encouraging the least cost solution for provision of network services is generally the role of the independent economic regulators in each State, achieved primarily through network price determinations. Distribution businesses are required to go to tender for demand side management when considering network augmentation through guidelines in the jurisdictions. However, the experience up to date is that demand side management is never implemented to avoid augmentation.

A specific requirement in the Electricity Distribution Codes in Victoria and South Australia and Electricity Supply (General) Regulation in NSW for distribution businesses to apply least cost planning in network investment decisions would provide a much stronger signal to distribution businesses. However, it is also clear that more needs to be done to understand the barriers to demand side management and intervention needs to occur to overcome barriers. This is outside the scope of this investigation.

This does not address the issue, raised by some participants and discussed in Section 6.8, of how to reward electricity retailers for investing in demand management. Retailers do not currently see the benefits of avoiding network augmentation. This issue requires more detailed analysis, beyond the scope of this report.

7.5.5 Tariff structures

There was little direct support for changes in tariff structures from the research participants. Abolition or reduction of fixed service charges and implementation of inclining block tariffs for consumption were the most popular tariff-related options. In addition, participants overwhelmingly felt that declining block tariffs were unfair. The research therefore advocates that Governments in each jurisdiction ban declining block tariffs and investigate the feasibility of implementing inclining block tariffs (at distribution and retail levels), linked to community service obligations.

Further, regulators should consider the merit of reducing the proportion of fixed charges in total residential bills and increasing the proportion of consumption-related charges as a way of providing a stronger demand management price signal (as well as reducing bills for very small consumers, including many low-income households).

7.5.6 Delivery of concessions

Some participants suggested that concessions would be more useful if supplied as vouchers that they could use when required, in times of financial hardship. This would allow concession schemes to better meet the objective of easing financial hardship at appropriate times. There is already some experience with voucher systems through the NSW EAPA scheme. Investigation of the delivery of concessions through a voucher system is recommended.

7.5.7 Public housing policy

There are several ways to implement the public housing policy recommendations discussed in Section 7.3.3. First, the Department of Housing or equivalent in each State could adopt a progressive energy efficiency standard for all new public housing developments. There may be overlap here with minimum energy efficiency standards for new housing in general. Second, the DOH in each State could embark on an ongoing retrofit program to bring existing public housing stock up to a suitable energy efficiency standard. There is some existing experience with such programs, including a Sydney Water retrofit program with the DOH in NSW. Third, government procurement policies applying to

public housing could be revised to require minimum energy efficiency standards are met for all appliances and equipment installed in public housing and for any other building services provided by contractors.

7.5.8 Housing legislation

As a first step in moving towards energy efficiency standards for rental housing, this research recommends the adoption of mandatory disclosure of energy efficiency ratings at the point of sale or lease for all residential properties. For rental properties, this could be implemented through amendments to the Residential Tenancies Act in each state, similar to those already adopted in the ACT. However, these amendments would go further than the ACT amendments by requiring landlords to obtain an energy efficiency rating before leasing their property and providing a report to prospective tenants describing how the rating was achieved.

In conjunction with these disclosure requirements, consideration should be given to the implementation of taxation incentives for landlords making certain improvements to rental properties that improve the energy efficiency of those properties. This would help to encourage gradual improvement of the efficiency of existing stock.

After evaluation of the impact of disclosure and taxation incentives on energy efficiency of housing stock, particularly the least efficient stock, consideration should be given to the adoption of minimum energy performance standards for rental housing. This integrated policy approach, similar to that already adopted for many appliances, provides market pull to raise overall energy efficiency and regulation to ensure a minimum standard is achieved.

7.5.9 Integrated Humanitarian Settlement Strategy

It is evident that aspects of the IHSS, specifically the Accommodation Support program and the Household Formation Support program, would be of greater value to humanitarian entrants if they prioritised energy efficiency. This would help to minimise ongoing energy bills for refugees and ease their transition to life in Australia. The necessary changes could be implemented through policy change, with appropriate funding support and education for the humanitarian organisations that deliver the IHSS. Further, education on electricity use is a clear priority for inclusion in the IHSS. This education could be delivered by organisations that work with recently arrived refugees and migrants. Train-the-trainer programs would be required to support these organisations.

7.5.10 New programs

The research identified potential for new programs that are not directly linked to the existing institutions described above. These programs are outlined below.

A sustainable living program

Given the evidence for competing values around energy saving, water saving, health and safety, it would be advantageous to develop and deliver integrated householder education programs that consider the interactions between these values. A sustainable living program, covering energy, greenhouse, water, waste, health and transport issues, could provide integration as well as being more in tune with the way householders understand their lives. There are many existing models for such a program, including the Sustainable Living at Home program developed by Port Phillip City Council and the Sustainability Street program. Consolidation and national delivery of such programs would be advantageous.

A key element of such a program would be community involvement in, and delivery of, information and education. The program could include a train-the-trainer program, as described in Section 7.2.2, to

improve access to different cultural groups and disadvantaged households. Existing community groups and organisations could be resourced to deliver workshops and in-home education.

Another important consideration for a sustainable living program would be to begin the long process of establishing positive cultural attitudes towards demand management and conservation. The current “culture of consumption” is a strong barrier to demand management, evident in the responses of many of the research participants. The establishment of sustainable lifestyles and housing as attractive options requires attention to the increased comfort, convenience that sustainable options can provide. That is, sustainable design needs to be high-quality, attractive design. The AGO’s Your Home website (www.yourhome.gov.au) is an excellent example of attractive presentation of sustainable design.

Given that a sustainable living program of this type is not focused on energy alone, it would be most appropriately delivered under the auspices of the Department of Environment and Heritage, preferably with collaboration by the Australian Greenhouse Office and relevant State departments.

A National Demand Management Fund

IPART (2002) has proposed the establishment of a Demand Management Fund in NSW and this proposal is currently under consideration. TEC (2004) recommends the establishment of Demand Management Funds by each of the NEM jurisdictions with funding sourced from a levy on electricity. A National Demand Management Fund, funded by a small levy on each unit of electricity sold, could be an appropriate way to provide the energy efficiency incentives and rebates desired by research participants. While the electricity levy would slightly raise the price of electricity, the funds would be returned to consumers through reductions in the initial capital cost of efficient products and services.

There is an opportunity to establish a National Demand Management Fund as part of the ongoing electricity market reform process overseen by the MCE. The rules for the Fund could be included as rules under the NEL. Utilities, community organisations and others could apply for funds to implement a range of innovative demand management initiatives.

Fuel Poverty Strategy

An integrated Fuel Poverty Strategy would address the specific needs of low-income households in relation to energy. As in the UK, the objective should be to eliminate fuel poverty in Australia by a target year and indicators should be developed to measure progress. The Fuel Poverty Strategy would contain a mix of existing and new programs, and could employ a variety of specific strategies, including:

- Electricity concessions and/or payment vouchers for households experiencing fuel poverty
- Access to flexible payment mechanisms and dispute resolution schemes
- Socially responsible tariff structures
- Subsidised retrofits for public housing and low-income households
- Energy-efficient procurement policies for new public housing
- Energy efficiency standards for rental housing.

The Fuel Poverty Strategy would be a high priority for funding under the National Demand Management Fund.

7.6 Recommendations for further research

This section briefly summarises recommendations for further research made throughout the report.

7.6.1 Research with high consumption households

Section 5.1.1 identified a need for further research with households that have higher incomes and higher energy use than those participating in this research, particularly households that have significant discretionary energy use. This research could employ the same general approach employed in this project, but with some modifications to the recruitment strategy. Several modifications could be contemplated. One would be to hold public workshops that were advertised very widely. However, there is a risk here of 'preaching to the converted' and failing to reach those households that do not contemplate reductions in energy use. Another possibility is to send invitations to participate to randomly selected households and to recruit from the subset of respondents, according to pre-determined targets for income distribution. A third possibility would be to continue with a network approach but target organisations more likely to involve high-income householders. For example, the researchers could work with companies to establish workshops with professional staff, or with schools to establish workshops with parents.

In addition, workshops would preferably be scheduled in the evening, on weekends or, in the case of company workshops, during work hours.

7.6.2 Detailed research on specific options

As discussed in Sections 5.1.2 and 5.1.3, constraints on the time available for workshops prevented detailed discussion of specific policy options. Further detailed research on specific policy options, with groups of householders, is recommended. Options suitable for further research would include those that were particularly popular with householders and those that were too complex to easily present in the workshop format. A workshop format may still be appropriate, but the workshop would need to focus on a small number of options in detail.

An important focus for detailed research would be the level of incentive or rebate that would encourage householders to adopt particular options. This is likely to be a major influence on the popularity of different options. With better information on the necessary level of incentive, it will be possible to determine whether particular options will have a net benefit to society and should therefore be recommended.

The detailed research recommended here would likely require more time to go through the details of particular options with participants. It may also require expert presentations and technology demonstrations. This type of research would demand more of participants and would provide less by way of practical education, so would likely require incentives to encourage participation. For example, participants could be offered a free energy retrofit or vouchers to purchase energy efficient equipment.

7.6.3 Interval meter trials

A particular recommendation for further research is to conduct an interval meter trial, using dummy cost-reflective tariffs, to investigate whether participants actually react to this combination of feedback and tariffs by shifting and reducing energy use. Such a trial could consider:

- The extent to which participants were able to respond to interval meters and cost-reflective tariffs by modifying behaviour
- The magnitude of resulting reductions in energy consumption

- Whether particular types of interval meter are preferred by customers and/or prompt larger reductions in energy use
- Which tariff structures prompted the greatest reductions in energy use, e.g. full pass-through tariffs or tariffs with blocks of different price during the day?

Households participating in the research would need to have a new interval meter installed. Meters could be installed specifically in a randomly selected sample of households. Another possibility is to recruit participants opportunistically at the time when they have a meter installed. This would be possible from 2006 in Victoria, when all new and replacement meters must be interval meters.

The sample size would depend to some extent on the available funding and on the final research design, however the literature indicates that a sample size of 50 to 100 households in any participating city would be appropriate to adequately investigate the issues listed above. Householders could be assigned to different groups with different meters and/or different dummy tariff structures.

To allow for seasonal variation, the research project would ideally run for a full year, and would need to obtain access to billing data for the previous year to enable comparison. Participants could be interviewed at the start and end of the project to investigate how the metering and tariff combination affected their attitude to electricity consumption.

7.6.4 Concessions research

As noted in Section 7.3.1, further research is needed to determine whether the provision of concessions in their current form is the most useful method for supporting the access of disadvantaged people to electricity. This research could consider the possibility of implementing a concession voucher system so that eligible householders could opt to use concession vouchers (to a predetermined value) at the point in the year when most needed. It could also investigate information provided by utilities about concessions, given the high level of confusion evident amongst research participants. In addition, the advantages of using public funding currently used for concessions to provide retrofits should be investigated. Retrofits would provide a permanent bill reduction for a single investment, as opposed to the ongoing investment required for concessions.

8 REFERENCES

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Appendix A
Participation Agreements

Appendix B
Metering Trial Questionnaire

Appendix C

Householder Workshop Plan

Appendix D
Demographic Data Form

Appendix E
Information Pack for Participants

Appendix F

Facilitator's Pack

Appendix G

Recruitment Materials