
Characteristics of Household Energy Behaviours

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Executive Summary

The specific aims of this research were to:

- Develop an improved understanding of the drivers of energy-related behaviours amongst Thorndon and Wadestown residents.
- To identify the variability in householder values, energy practices and energy-related technologies relating to household hot water and space heating.
- To identify opportunities for promoting energy-efficient behaviour change.

Twenty three household energy-saving behaviours were investigated through face-to-face interviews, using laddering methods designed to uncover rationalisations for action as well as the underlying values. Household surveys provided detailed data on how residents use and understand energy.

Key findings are:

- Behaviours are influenced by many drivers, and personal values often are not a good predictor of behaviour.
- Respondents often could not articulate any values relating to a given behaviour. This was particularly marked with inefficient energy behaviours.
- The four values of Being Capable, Being Intelligent, Protecting the Environment and Enjoying Life are most strongly aligned with energy-efficient behaviours. However behaviour may at times be inconsistent with values, or values may drive energy-inefficient behaviours.
- The most common rationalisations of energy-related behaviours are that they are economically efficient, followed by situational constraints or opportunities. Environmental efficiency and inconvenience are also common rationalisations.
- Rationalisations provide insights into the direct drivers and barriers to behaviour change, and these differ greatly between specific behaviours.
- The Thorndon-Wadestown households are relatively wealthy, and lack of finance is not an important determinant of most of their energy behaviours. Participants were conscious of their energy use and many actively pursued easy and low cost energy-saving behaviours such as pulling curtains.
- Norms of comfort associated with household heating are changing, with smaller electrical appliances like towel rails and dehumidifiers being abandoned in favour of larger heat pump technologies.
- A substantial proportion of households use gas water heating. Where electric hot water cylinders are in use, many of those that are more than ten years old do not have extra insulation wrapping as recommended by EECA.
- The reasonably high levels of sunshine most households receive offers an opportunity to improve the uptake of solar hot water heating systems in this area.

- There is a strong willingness and desire to move to more efficient behaviours – particularly for energy-efficient investments.
- There is surprisingly low take-up even of some very simple actions such as wrapping hot water cylinders, energy-efficient light bulbs or sealing drafts – activities that cost little but may seem just too difficult if households are time-poor.
- Fifteen percent would like to change their main method of heating, and most of these currently heat their homes with inefficient and/or carbon-generating technologies.
- Overall the results indicate a strong willingness by householders to become more energy-efficient amongst the vast majority of respondents (almost 90%).
- A large number of households are thus well-positioned to make a change to more energy-efficient behaviours, but are not doing so.
- Most respondents feel it is not hard to find information about being energy efficient, and are well aware of sources of knowledge, although some sources were clearly more useful than others. Not knowing what information to trust, and finding it difficult to make choices, are problems for at least a quarter of households.
- Although consumers appear to have the efficacy and some knowledge, as well as the financial means to make the right decisions in terms of energy efficiency, they are still reluctant to make larger energy-saving investments and lifestyle changes.
- Reasons for not taking action vary considerably. This reinforces the need to craft different approaches towards promoting efficiency will be needed for different households.
- Conversations about energy, and sharing of energy-efficiency experiences and knowledge, are occurring regularly in the community.

High-level recommendations:

- EECA should align marketing campaigns with values that appear to be most closely and consistently associated with energy-efficient behaviour - in particular Being Capable, Being Intelligent, Protecting the Environment and Enjoying Life. EECA should focus on addressing the obstacles that prevent people from acting in energy-efficient ways that are consistent with their values.
- Understanding people's rationalisations for behaviour are likely to be more relevant than values in seeking to identify appropriate interventions. Identifying the most common rationalisations for given behaviours, as outlined in the report, will assist in crafting behaviour-specific interventions.
- Given the relative lack of financial constraints in the Thorndon-Wadestown area, the evident willingness and ability to act, and significant opportunities for change, we suggest EECA develops a program that creates situational opportunities, requires relatively little time and effort by householders, and helps them make choices with trustworthy information.
- EECA could potentially make a big difference in community efficacy levels by tapping into unofficial but expert 'efficiency leaders', and supporting these people in their key roles of sharing knowledge and experiences.

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1 Introduction

The aim of this research is to support EECA's work in promoting more energy-efficient household behaviours. The critical importance of improved energy efficiency – using less energy to achieve the same (or better) level of service – means that much of the investment required to mitigate future climate change will be made by energy consumers, rather than suppliers. The International Energy Agency has concluded that;

“A huge step-change in the attitudes to energy efficiency and consumer purchases by hundreds of millions of people worldwide is needed. Governments, through information provision, sound regulation and targeted fiscal incentives, have a key role to play in ensuring that, worldwide, the right decisions are taken to safeguard the future of the energy sector – and of the planet” (IEA, 2009).

There is significant potential in New Zealand to achieve greater efficiencies in energy use, as indicated by the Government's target to save 55PJ pa by 2015 (NZES/NZEECS 2010). A deeper understanding of consumer behaviour and barriers to smart energy use could further refine EECA's interventions and support its mandate to promote energy efficiency and conservation.

It is clear from the literature, and from our own observations within the Energy Cultures research programme, that there is surprising variability in energy-related behaviour, even across households or firms with apparently similar characteristics. We suspect that the lack of achievement of potential savings to date might in part arise from interventions being designed to influence an imaginary typical consumer, rather than selected as 'best fit' for definable clusters of consumers or behaviours. This research will help find some way to describe and characterise this heterogeneity, so as to be in a better position to match interventions to the situation.

This research is aimed to support EECA in planning more targeted interventions to maximise uptake of smarter energy use by consumers.

1.1 Background to Research

This research is associated with a larger FRST-funded research programme, led by the University of Otago. “Energy Cultures” is based on a conceptual framework that utilises systems and behavioural theories, amongst others, to assist in understanding the factors that influence the energy decisions of consumers and their impact on the adoption of more efficient energy practices within society (Stephenson, et al., 2010). The Energy Cultures framework suggests that consumer energy behaviour can be understood at its most fundamental level as the interactions between cognitive norms (e.g. values, beliefs, and understandings), material culture (e.g. technologies, building form) and energy practices (e.g. activities, processes). The research programme hypothesises that within New Zealand there are clusters of households with identifiably different sets of norms, material culture and practices relating to energy use (i.e. 'energy cultures'). The research sets out to identify the characteristics of, and influences on, different energy cultures to help to develop more effective interventions.

1.2 The Thorndon-Wadestown research

The Energy Cultures programme initially set out to study three case study areas – Pakuranga in Auckland, Cambridge in the Waikato and North-East Valley in Dunedin. EECA provided funding for Energy Cultures to investigate an additional affluent urban area where both knowledge and financial barriers to change were likely to be low.

The aims of the research were to:

- Develop an improved understanding of the drivers of energy-related behaviours amongst Thorndon and Wadestown residents.
- To identify the variability in householder values, energy practices and energy-related technologies relating to household hot water and space heating.
- To identify opportunities for promoting energy-efficient behaviour change.

Note: Within this report, ‘behaviour’ refers to the combination of energy practices (actions relating to energy use) and household investments in energy-related technologies.

The Thorndon-Wadestown case study area consists of two adjacent suburbs of Wellington, close to the inner city, which appear in the NZ census as the Thorndon-Tinakori Rd Area Unit and the Wadestown Area Unit (see Figures 1 & 2).

Figure 1: Thorndon-Tinakori Rd Area Unit

(Source: Statistics New Zealand website <http://apps.nowwhere.com.au/StatsNZ/Maps/default.aspx>)

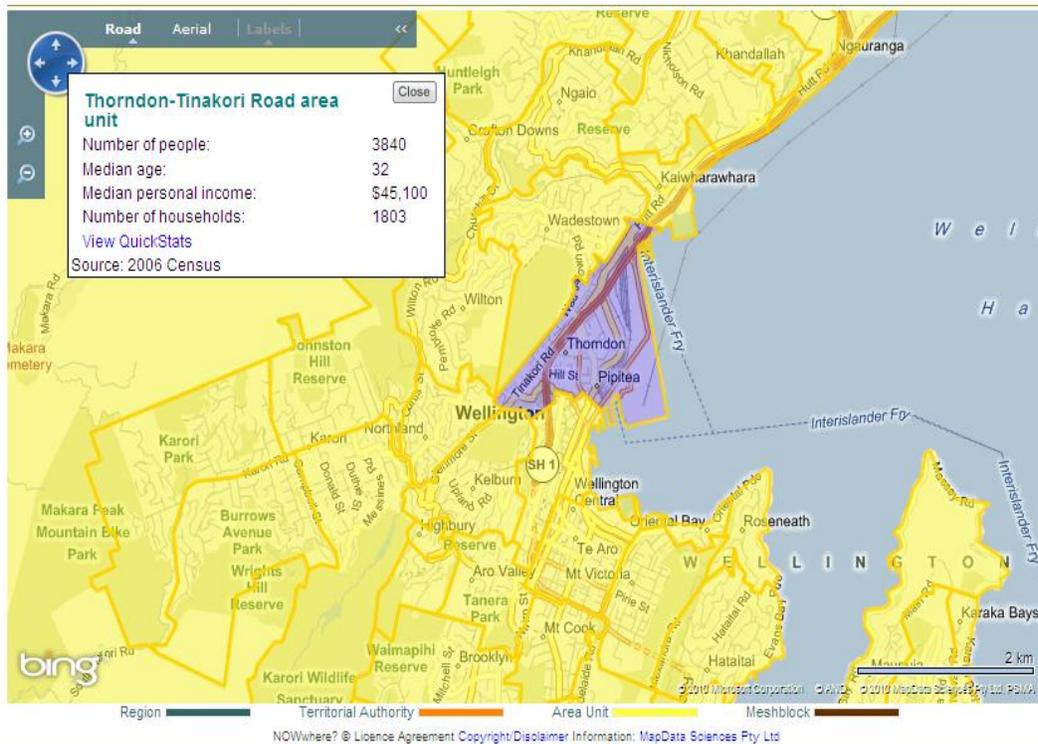
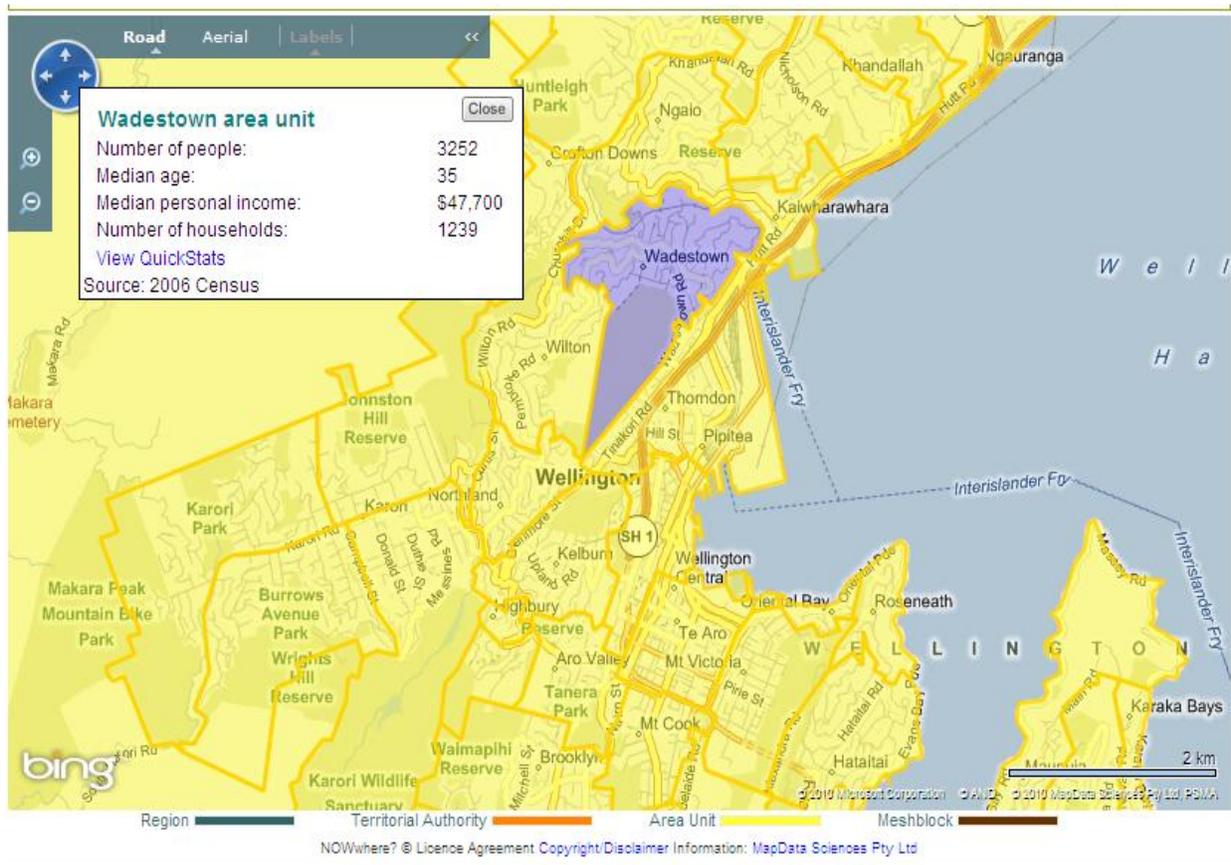


Figure 2: Wadestown Area Unit

(Source: Statistics New Zealand website <http://apps.nowwhere.com.au/StatsNZ/Maps/default.aspx>)



According to the 2006 census data, 3,840 people usually live in the area of Thorndon-Tinakori Road, 0.9% of the Wellington region's population, and there were 1,896 occupied dwellings on census night. For people aged 15 years and over, the median personal income is \$45,100. This compares with a median of \$28,000 for the Wellington region overall, and \$24,400 for NZ as a whole. The unemployment rate in Thorndon is 2.5% for people aged 15 years and over, compared with 5.2% for the Wellington region and 5.1% for New Zealand, and the most common occupational group in Thorndon is 'Professionals'. The ethnic make-up of the suburb differs from the Wellington region average, with Europeans over-represented and Māori and Pacific peoples under-represented. In Thordon, only 31.6% of households in private occupied dwellings own the dwelling, with or without a mortgage, which is considerably below the 55.1% home ownership rate for the Wellington region. This suggests a relatively high proportion of rented houses or flats.

The population in Wadestown on census night was 3,252 (0.7% of Wellington Region's population) in 1,251 occupied dwellings. Like Thorndon, the median income in Wadestown (\$47,700) was considerably higher than the Wellington average. The unemployment rate in Wadestown was 3.0% and, like

Thorndon, the most common occupational group were 'Professionals'. Another similarity between the two suburbs was the overrepresentation of European residents. The home ownership rate in Wadestown was higher than that in Thorndon, with 52.6% of households in private occupied dwellings owning the dwelling, with or without a mortgage. Schools in both areas are all classified in the top socio-economic decile to describe their catchment areas.

Table 1: Ethnic Groups in Thorndon-Tinakori Road, Wadestown and the Wellington region, 2006 Census

	Thorndon-Tinakori Rd %	Wadeston %	Wellington region %
European	76.9	83.1	69.8
Māori	5.6	4.6	12.8
Pacific peoples	1.7	1.2	8
Asian	10.0	4.2	
Middle Eastern/Latin American/African	1.0	0.6	
Other ethnicity	11.8	13.6	

After comparative analysis of the demographic data for Wadestown and Thorndon, it was decided that there were enough similarities between the two to treat them as one case study area. Although there are some differences in household ownership and type, the incomes, employment and educational backgrounds are similar.

2 Methodology

The field research involved a two-part process. Part 1 sought to identify householder values and behavioural rationalisations using a technique known as ‘laddering’. This is a qualitative method of inquiry that uses semi-structured, in-depth interviews to probe deeply the reasons for behaviour. Means-end chains are then constructed that display the associations between behaviours, the reasons people give for their behaviours, and personal values (c.f. Reynolds & Gutman, 2001). Part 2 gathered data on energy technologies, energy practices, values and energy literacy by means of a household survey.

2.1 Part 1: ‘Laddering’ Interviews

Initially, residents in Thorndon and Wadestown were contacted by randomly selecting numbers from the telephone directory. A snowballing recruitment method was then employed which involved asking the respondents at the end of the interview to pass on contact details for other Thorndon/Wadestown residents. One participant was recruited via an intercept method in a local cafe. Twenty eight people were interviewed in total. The data collection ceased once researchers reached saturation, i.e. when no new values were being presented.

Two researchers attended each interview and these were conducted either in the respondents’ homes, in a local cafe, or at the EECA offices. The duration of the interviews varied between 40 and 90 minutes. At the start of the interview, respondents were asked to read an information sheet about the interview (Appendix A) and then asked to sign a consent form (Appendix B). Twenty seven of the 28 interviews were recorded on a digital voice recorder and the researchers also wrote notes throughout the interview process. One interview was recorded as notes only). At the end of the interview, researchers thanked the respondents and gave them \$20 cash for their time.

The interview process (Appendix C) consisted of three sections. The first section asked questions about 12 possible energy-saving practices in the home. This included questions such as “do you reduce heating in unoccupied rooms?” and “do you line dry laundry?” For each of these questions, respondents were asked to give an answer on a scale of 1-5 (1=never, 2=rarely, 3=sometimes, 4=often, and 5=always). The second section contained 11 questions about energy related investments which included questions such as “how likely would you be to consider installing double glazing?” and “how likely would you be to install energy efficient light bulbs?” Respondents were again asked to give an answer from 1-5 (1=never, 2=unlikely, 3=would possibly consider, 4=would actively consider, and 5=already do). The list of items discussed with respondents in these two sections was derived from the work of Barr and Gilg (2006; 2007), who carried out an extensive analysis of activities that could support living a more sustainable lifestyle. For this study, those items related to energy efficiency were selected.

The third section asked about the interviewee’s demographics, the household and their electricity costs.

After each question in sections 1 and 2, the interviewer probed for the reasons for the answer given. Why Questions such as “why do you do this?” or “why is that important to you?” were asked in order to reveal motivations were for doing, or not doing, the energy-efficient behaviours.

The interviewees would generally give an immediate and often quite practical reason for their behaviour (e.g. not using energy-efficient light bulbs because they felt the light was harsh). If probed further, they would sometimes talk about a value that they associated with the behaviour (e.g. aesthetic value). In the analysis, the immediate explanation for the behaviour is described as a 'rationalisation' of the behaviour, and philosophical or belief-related comments are described as 'values'.

All interviews were transcribed and then coded to identify rationalisations and values (see Appendix D) using a formal text analysis method and the analytical software NVIVO. Three different people were involved in devising the coding schema and coding the text: checks for consistency between coders were undertaken to ensure inter-coder reliability.

The coding for values was guided by the work of Schwartz and Bilsky (1990). Their values classification was chosen because it is the most widely validated measurement system for personal values, it provides insights into how values are structured in relation to each other, and it allows for people to be aligned with or opposed to a particular value.

Rationalisations were not predetermined – they were simply the patterns of responses that emerged from the interview data, as discussed and agreed by the researchers.

For each interview, the text was coded to identify the rationalisations and values relating to each of the 12 questions about energy practices and 11 questions about energy investments. The relevant parts of the responses were coded – sometimes a phrase but at other times a whole paragraph – to help ensure the response remained in context. Although the coding was guided, if information did arise that did not fit into one of the predetermined categories, researchers devised a new category. The examples given in the Laddering Findings section of this report have been selected from the 'pool' of coded responses because they best reflect the type of response coded into that category.

Once coding was complete, aggregate value-rationalisation-behaviour ladders were constructed. For each behaviour, two sets of ladders were drawn: one ladder for negative responses (1&2 "never" and "unlikely to consider") and one ladder for positive responses (4&5 -"likely to consider" and "already do"). Response 3 ("sometimes") was omitted from this analysis in order to restrict comparisons to those between positive and negative responses to energy efficient behaviours.

Devising the aggregate ladders involved identifying the rationalisations and values stated by all respondents relating to a given behaviour, and assessing the relative frequencies of these. While NVIVO could produce the aggregate number counts based on the coding, this data then needed to be exported to EXCEL where the ladders were drawn manually using basic design tools.

2.2 Part 2: The Household Energy Survey

The survey collected a wide range of information, including house and householder characteristics, space and water heating, appliances and insulation, heating behaviours, recent changes in technologies or behaviours, and asked where householders source their energy-related information (see Appendix F). The survey format had been previously trialled in South Auckland, Waitati (Dunedin) and Brockville (Dunedin), and since then had been revised as a result of discussions with Dr Sea Rotmann at EECA.

Survey delivery involved a combination of letterbox dropping and door knocking. Every third house on all of the streets in these two suburbs received a paper version of the survey. In total 1100 surveys were delivered which equates to 35% of all households in Thorndon and Wadestown. Of these, approximately 350 were handed over to residents by the researchers, and the rest were left in letterboxes. The purpose of delivering the surveys in person whenever possible was to increase the response rate. To try and maximize the number of people that were home, researchers delivered surveys during the weekends and at different times of the day, including evenings. Each survey had an information sheet about the research (see Appendix E), which also gave people the option of filling out the survey on-line.

The response rate was satisfactory at approximately 34%.

3 Findings

3.1 Part 1: Laddering

Table 1 shows the participants' reported likelihood of considering the energy-efficient practices and investments discussed in the interviews. It shows the percentage of people who answered either negatively or positively for each of the questions based on the 5-point Likert scale. Note that midpoints have been omitted.

Energy-efficient practices that a large percentage of respondents are already doing on a regular basis, or highly likely to adopt, include things such as cooling houses by opening windows, waiting for a full load before using washing machines, and putting more clothing on before turning up the heating. The most unlikely practices include reducing hot water temperatures, washing hands in cold water, and doing dishes by hand.

The most likely energy-efficient investments are house insulation, installing energy efficient light bulbs, and having an energy-efficient fridge. Unlikely investments include having a smaller fridge, and insulating heating pipes. Surprisingly, 25% would be unlikely to install energy efficient light bulbs, suggesting a strong polarisation around this issue. Another surprise was that almost 36% are unlikely to change energy suppliers to save money.

Table 1: Summary of Energy-saving Practices and Investments

Practices	Likelihood of Consideration	
	% Likely	% Unlikely
Cooling house by opening windows	92.9%	3.6%
Wait for a full load before using washing machine	82.1%	17.9%
Put on more clothing before turning up the heating	78.6%	10.7%
Line drying of laundry	67.9%	10.7%
Reduce heating in unoccupied rooms	67.9%	17.9%
Keep household heating low to save energy	64.3%	32.1%
Cooking on gas	60.7%	25%
Taking shorter showers	50%	39.3%
Rinsing the dishes in cold water	46.4%	32.1%
Washing hands in cold water	39.3%	46.4%
Reducing hot water temperature	36.4%	54.5%
Doing dishes by hand	35.7%	42.9%
Turning appliances off instead at the wall	28.6%	32.1%
Investments		
House insulation	85.7%	7.1%
Installing energy efficient light bulbs	71.4%	25%
Installing an energy efficient refrigerator	71.4%	14.3%
Applying hot water cylinder insulation	53.6%	3.6%
Insulation of heating pipes	53.6%	28.6%
Consider changing energy suppliers to save money	50%	35.7%

Installing an energy-efficient heating system	50%	21.4%
Installing an energy efficient washing machine	50%	7.1%
Installing double glazing	46.4%	21.4%
Buying a smaller refrigerator	14.3%	82.1%

3.1.1 Rationalisations

Table 2 presents the main rationalisations of behaviours that were mentioned during the interviews, and the frequency with which these were mentioned. Note that the ‘real’ reasons for certain behaviour may be more complex and nuanced than the reason given by the interviewee, so these rationalisations cannot be considered to be the only or even the main drivers of behaviour. Nevertheless the frequency with which the same reasons are given by a range of interviewees to explain behaviours does give them credibility.

While there were 27 different categories of rationalisations identified in the interviews, the top 10 accounted for approximately 80% of the responses. Appendix G explains the categories of rationalisations and exemplar quotes are given to illustrate their meanings.

Tables 2 and 3 represent aggregations of the rationalisations that were given across all of the 23 energy-related behavioural questions.

Table 2: Overall Frequency of Main Rationalisations Identified from Value Laddering Interviews

Rationalisation	#
Situational Factors	206
Economic Efficiency	157
Convenience	136
Environmental Efficiency	88
Comfort	86
Conservation	79
Technological Factors	67
Time Efficiency	57
Physical Factors	45
Hygiene	33

Table 2 shows that the most common rationalisations for energy related behaviours overwhelmingly involve situational factors. Economic efficiency and convenience are also important factors. Environmental efficiency, comfort and conservation are also well-used rationalisations, but the first three clearly dominate the responses. Interestingly, convenience ranks above comfort and environment as a rationalisation for behaviour.

Reasons given for energy-related behaviours could involve either a positive or a negative response in relation to any of these categories. For example, for the first rationalisation category (‘situational

factors’) responses people could explain their behaviours as a response to either a situational opportunity or situational constraint. For example:

“Yes we have two refrigerators. Again it’s because of the number of people that live here... There is four people, and various hangers on at various times” (Robberts)

“We have not swapped [to energy efficient light bulbs] here because we are renting and it was a short time rental, if we were renting here for longer I would have invested in them... “(Jackells)

Likewise with the second most common rationalisation (‘economic efficiency’) people could either explain their behaviour as being economically efficient or as a perception that the possible alternative was not economically efficient. Table 3 shows the results split into positive and negative rationalisation categories.

Table 3: Frequency of Main Rationalisations (broken down into Positive and Negative Rationalisations)

Positive rationalisation	#	Negative rationalisation	#
Economically Efficient	132	Situational constraint	99
Situational opportunity	107	Not Convenient	78
Environmentally Efficient	80	Financial Constraint	36
Comfortable, Pleasurable	62	Technical Constraint	35
Convenient	58	Physical Constraint	32
Time Efficient	38	Not Hygienic	25
Financial Opportunity	32	Not Economically Efficient	25
Technical Opportunity	32	Not Comfortable, Not Pleasurable	24
Physical Opportunity	13	Not Time Efficient	19
Hygienic	8	Not Environmentally Efficient	8

Broken down this way, the most commonly-used positive rationalisation for energy behaviour is economic efficiency, followed by situational opportunities. Environmental efficiency, convenience and comfort are also relatively common rationalisations. For positive rationalisations, comfort and convenience rank similarly.

The most commonly-used negative rationalisations for energy behaviours are situational constraints and inconvenience. Financial, technical and physical constraints are also relatively commonly used. Unlike positive rationalisations, inconvenience ranks well above discomfort.

Of particular interest is the unexpectedly low frequency of ‘financial constraint’, suggesting that the inability to pay is not often the main driver for energy behaviours, for Thorndon-Wadestown respondents at least. At the same time, economic efficiency is an important consideration for many.

It should be noted that Tables 2 & 3 contain the aggregated responses across all energy behaviours (practices and investments). In section 3.1.2 and Appendix I a more detailed analysis is given, where the rationalisations are linked to specific practices and investments.

3.1.2 Values

As noted previously, interviewees generally gave a practical rationalisation when first asked about a behaviour, but when probed, they sometimes spoke of personal values that they felt underpinned their practices or investments. These self-reported values cannot be assumed to ‘drive’ behaviour, as research has shown that there are often poor linkages between values and behaviour (Barr & Gilg 2007). However, it can be said is that the reported values are *associated* with the given behaviours (in those respondents' minds at least).

Table 4 presents the main values that were elicited in the interviews and the number of times that each of these values were mentioned. While three quarters (31 out of a possible 41) of the values from Schwartz and Bilsky’s work were identified in the interviews, ten values accounted for approximately 70% of the responses. The top ten values are detailed in Appendix H, with exemplar quotes provided to aid comprehension. Values identified fewer than 17 times have not been included in the table below as they seemed to represent particular situations unique to individuals. While many of these individual stories are very interesting, it is not possible to generalise these findings across the data set.

Table 4: Frequency of Main Values Identified from Value Laddering Interviews

Value	#
Capable	153
Protecting the Environment	101
Pleasure	71
Intelligent	56
Clean	32
Respect for Tradition	22
Choosing own goals	21
Honouring Parents and Elders	20
Obedient	19
A meaning in life	17

These values were not only associated with energy-efficient behaviours, they were also used to justify energy-*inefficient* behaviours. Table 5 details the relative frequency of these values. The left hand side of the table shows the values that are associated with the likelihood to undertake energy-efficient behaviours (positive behaviours). The right hand side of the table shows the values that are associated with unlikelihood of energy-efficient behaviours (negative behaviours).

Table 5: Frequency of Main Values (Broken Down into Positive and Negative Responses)

Values associated with positive responses (are doing, or are likely to do energy efficient behaviours)	#	Values associated with negative responses (not doing or not likely to do energy efficient behaviours)	#
Capable	122	Capable	31
Protecting the Environment	92	Pleasure	24
Pleasure	47	Clean	21
Intelligent	42	Intelligent	14
Choosing own goals	18	Protecting the Environment	9
Respect for Tradition	17	Obedient	7
A meaning in life	14	Honouring Parents and Elders	6
Honouring Parents and Elders	14	Respect for Tradition	5
Obedient	12	A meaning in life	3
Influential	9	Choosing own goals	3

It is notable that values were far more frequently mentioned in relation to positive behaviours than with negative behaviours. Values were frequently volunteered in relation to positive behaviours, but respondents appeared to have much more difficulty articulating any underlying values behind negative behaviours. Such behaviours may be largely habitual and not subject to much conscious consideration. The relative scarcity of stated values associated with negative responses may also suggest that some respondents are acting at odds with their values.

It is also of interest that the same values were associated with both positive and negative behaviours. Nine of the top ten values associated with energy-efficient behaviours were the same as those associated with energy-inefficient behaviours. Despite some variation in order, four of the top five values are identical: 'Capable', 'Protecting the environment', 'Pleasure' and 'Intelligent'. However, values could be used to justify different aspects of positive and negative behaviours. For example, where 'Pleasure' is cited as an obstacle to an energy efficient behaviour, it was often the physical pleasure of having a long shower or washing hands and dishes in warm water that was discussed. In the cases where 'Pleasure' was associated with an energy efficient behaviour, respondents talked about the pleasure they got of doing something they knew was good for the environment, or from hanging out the washing (e.g. gave them time to think while also getting fresh air). This will be discussed more fully below in relation to specific behaviours.

The only value unique to positive behaviours was 'Influential'. Here, respondents saw value in modeling good behavior or feeling they were showing the way. The only value unique to negative behaviours was 'Clean'. Some respondents felt it was not clean to undertake some of the positive behaviours - washing dishes by hand, taking shorter showers, and washing hands and dishes with cold water.

3.1.3 Constructing 'Ladders'

For each given behaviour discussed in interviews, it was possible to 'map' an individual's explanation of the reasons for the behaviour – the immediate rationalisation, and (if mentioned) the values they associate with this behaviour. By compiling these responses across all respondents, aggregated 'ladders' of all of the rationalisations and values for a given behaviour are produced. Two 'ladders' (one for negative behaviours and one for positive behaviours) have been constructed for all of the interview questions. These are detailed in Appendix I.

It should be noted that these ladders cannot be claimed to represent the sole causes or drivers of behaviour. Behaviour has many influences, some of which are able to be easily verbalised by individuals, and others which may be unable to be articulated or even understood to be an influence. Nevertheless, the 'ladders' do give useful insights into people's rationalisations for their behaviour.

The chains for two questions – turning appliances off at the wall and buying energy-efficient light bulbs – are presented below and discussed (Figure 1 and Figure 2). The titles on the left hand side of the diagrams (B, R and V) represent the three levels of the ladders (B=Behaviour, R=Rationalisation, V=Value). The thickness of the lines indicates the frequency with which the rationalisations or values were reported.

Figure 1: Means-end Chains for Q1

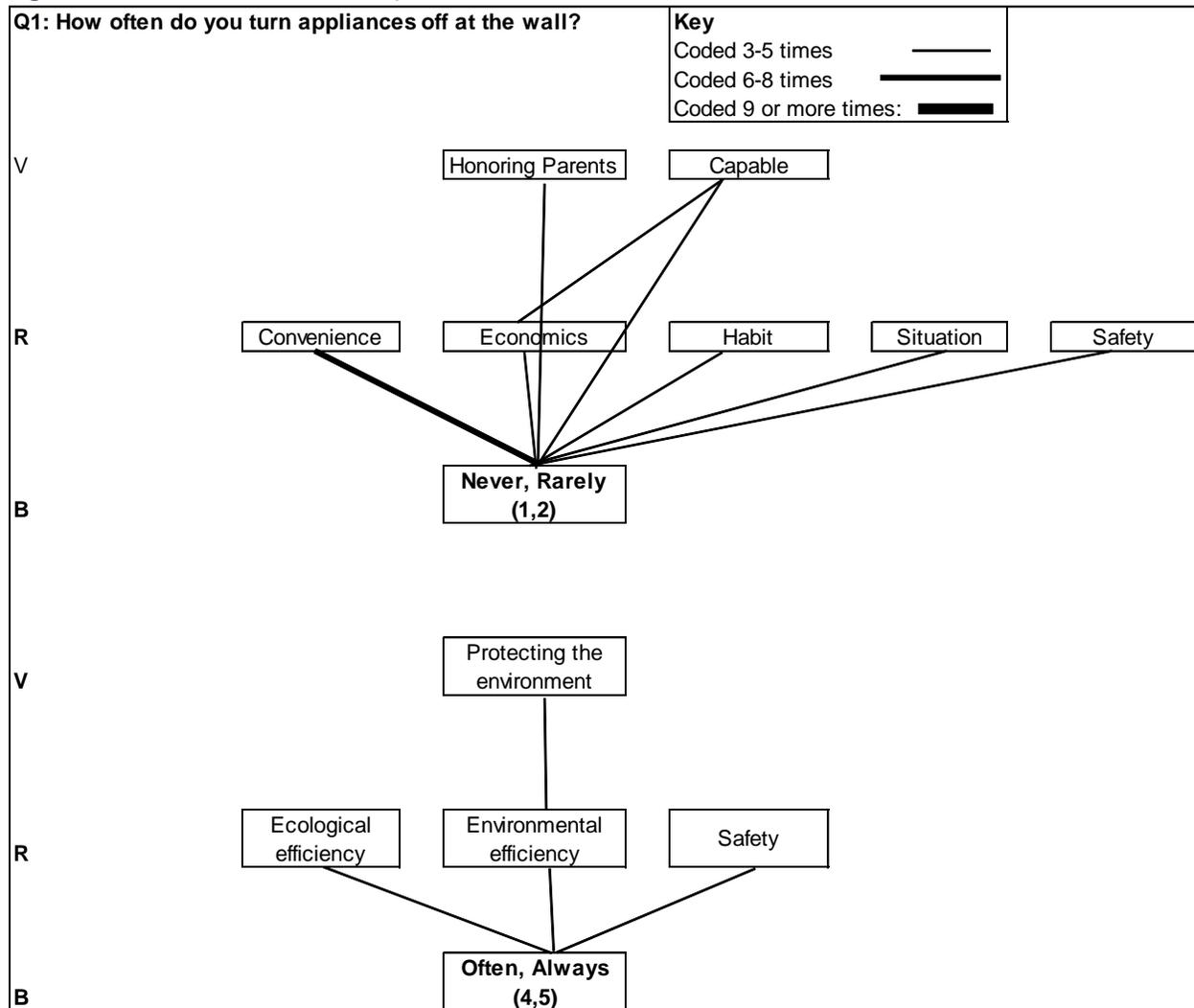


Figure 1 shows the ladders for Question 1: "How often do you turn appliance off at the wall?" The top ladder shows the aggregated responses of people who answered that they never or rarely did so (negative behaviours). The bottom ladder shows the aggregated responses of people who responded that they always or often did so (positive behaviours).

For negative behaviours, 'Convenience' is the most common rationalisation. Generally this was to do with the time and effort involved and (for some appliances) the difficulty in physically reaching the off switch. The following example typifies many of the responses: "It just seems to be a bit of a pain going to put things on at the wall, particularly if things are hidden under the bench or things you know, are

hard to get to” (Croft¹). Some respondents rationalised their negative behaviours as a habit, or relating to a specific situation.

‘Safety’ was given as a reason for both positive and negative behaviours. For example, one respondent didn’t turn his appliances off because he perceived there to be no safety risk in leaving them on: “In my country, Malaysia, you have to turn them off because when we have storm or thunder they can spark. But the system in NZ is better” (Baaty). Other respondents perceived a safety risk in leaving appliances on: “Because I think it’s safer. Televisions I have heard about have sort of burst into flames at times. When I go out or at night when I go to bed I turn them off at the wall” (Baledoy).

Economic rationalisations were also given for both positive and negative behaviours. Some respondents believed that not turning appliances off is either cheaper (“there’s no need to turn off at wall because... the power has to go right back to the beginning before it comes in... meaning it goes little further and might cost you little bit more” (Baaty)), or not saving sufficient money to make turning them off worthwhile. Other respondents talked about cost saving as a main driver for switching off appliances - “there’s no point in keeping things on when you are not using them and then paying money that you don’t need to pay” (Ford).

The only rationalisation unique to positive behaviour (often or always turning appliances off at the wall) was environmental efficiency. A typical response here was: “Just aware of waste of energy, it is in the back of my mind...Well I’m just thinking of the future and just maintaining resources and things” (Finch).

Stated values related to negative behaviours were ‘Honouring parents’ and ‘Capable’. ‘Honouring parents’ is illustrated by the following quote: “I don’t switch it [the stove] off at the wall. I think because I never been in a house where it's ever done like my mother, wherever I’ve stayed the stove always sort of been left on. You just switch it on and you switch it off but you don’t touch it at the wall like, that’s where I’ve you know sort of been brought and lived and I just carry on”(Shriff).

The ‘Capable’ value in this context was directly linked to economic arguments for leaving the appliances on at the wall: “I should let you know that I’m an electrical engineer. A little while ago I bought a little device that allows you to actually measure the currents from devices. And the only thing that I found round here that uses significant power while it was turned, in standby mode was the relatively old Fisher and Paykel washing machine. All the rest draw virtually nothing” (Forad).

The only value associated with positive behaviours was ‘Protection of the environment’

Overall, the most frequently cited rationalisation was that it is ‘convenient’ to leave appliances on at the wall. To achieve a positive shift for this behaviour, addressing the ‘convenience barrier’ would appear to have the greatest likely effect. It would also be useful to promulgate accurate information about the safety issues and energy-savings achieved from switching off at the wall.

¹ Note that all respondents have been given pseudonyms to protect their privacy

Figure 2: Means-end Chains for Q18

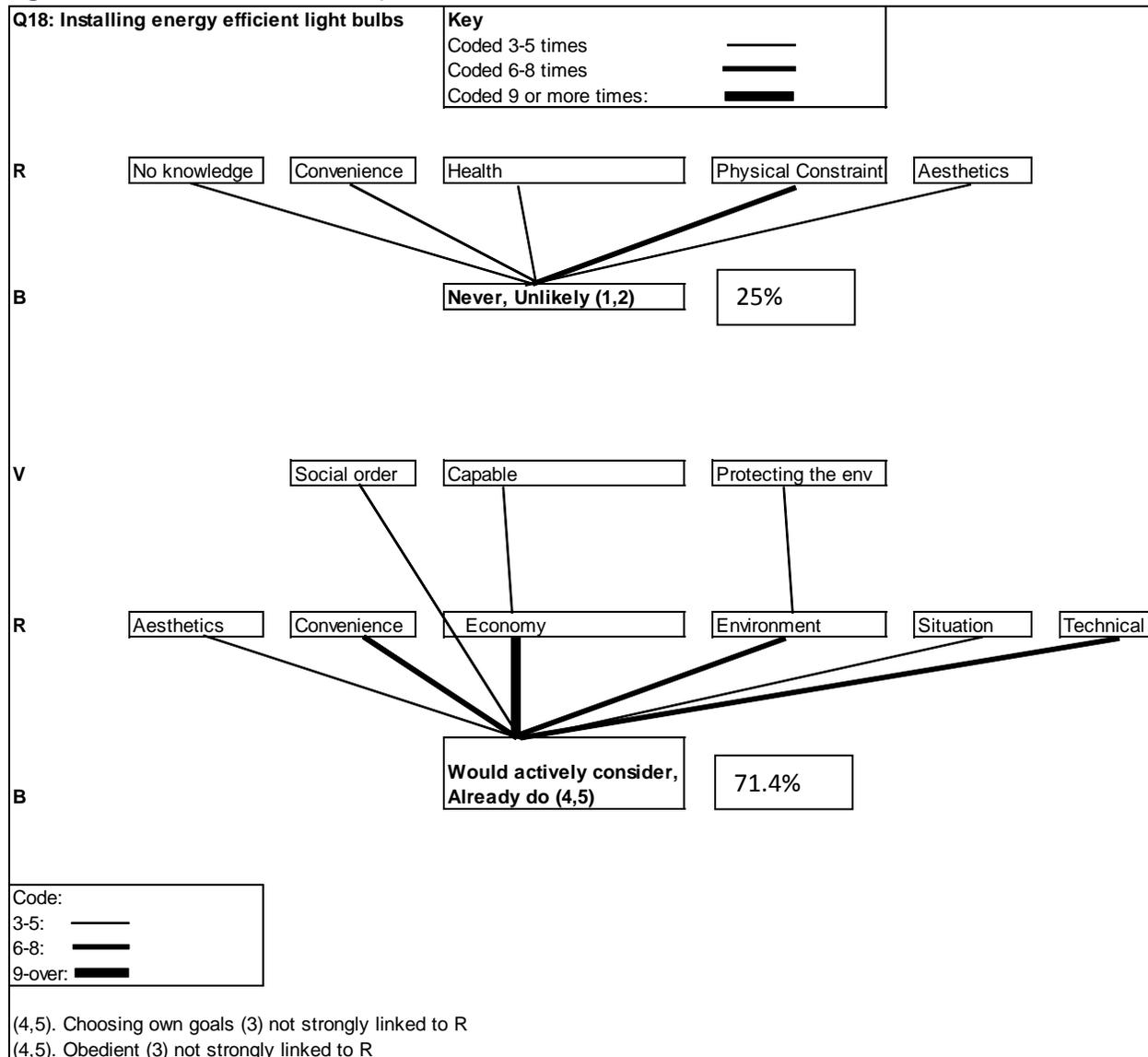


Figure 2 shows the set of ladders for Question18: How likely would you be to install energy efficient light bulbs? Five rationalisations were given for negative behaviours – ‘No knowledge’, ‘Convenience’, ‘Health’, ‘Physical constraints’ and ‘Aesthetics’, with ‘Physical constraints’ being the most frequently cited.

‘Physical constraints’ were explained as difficulties, and/or impossibilities, of fitting the new types of bulbs into existing light fittings. For example: “No [I wouldn’t install energy efficient light bulb], I would probably have to change most of the fittings unfortunately... It would cost a lot to cover this house, to do it properly; I mean this was all done 20 years ago” (Fazer). ‘No knowledge’ was where respondents felt they didn’t know enough or were unsure of information about energy-efficient light bulbs. Barton’s quote is an example: “I’ll wait until this is cleared up...(referring to insecurities presented in the media)

does it really save? Is it effective to employ?" 'Convenience' refers to the perceived hassle involved in fitting and maintaining the bulbs; for example: "I don't like those curly ones, I think they collect an awful lot of dust you know, they must get quite dirty unless you take them out and clean them or something" (Cairns). 'Health' reasons were related to the quality of the light "Oh they are very hard on the eye the energy efficient ones, horrible... I found the light very difficult, it hurt my eyes" (Baledoy), or the mercury in the bulbs "also the mercury that comes out if you break them" (Sabarsky). 'Aesthetic' concerns were about the actual look of the light bulbs. For example, when asked "would you consider getting the energy efficient ones?" one respondent commented "have you seen how ugly they are? Once again there are limits!" (Croft). No values were identified for the negative ladder.

For the positive ladder, six rationalisations were mentioned by respondents. Of these, 'Economics' was overwhelmingly dominant, followed by 'Convenience', 'Environment', and 'Technical'. Convenience and cost often appeared to be linked in people's minds. For example: "Oh well its cost long term and the fact that you don't have to keep changing them" (Hauston). 'Environment' was the rationalisation where respondents believed that the energy-saving bulbs saved electricity and therefore was a better alternative for environmental reasons e.g. "Finite resources, do not want to waste" (Simpson). 'Technical' in this case, referred to people being more willing to buy energy efficient light bulbs because of advances in the technologies: "this is a new one [a new energy efficient bulb] it starts off the light immediately" (Bielsty).

Of the less common rationalisations for positive behaviours, 'Situation' refers to situational opportunities that arose to change the bulbs. For example, one respondent said: "whenever I replace them [the bulbs] I replace them with energy efficient light bulbs" (Bielsty). Rather than rushing out and just replacing all the bulbs in the house, many people were willing to change bulbs only as the old ones blew. 'Aesthetics' is interesting because it came up as a rationalisation for both the negative and the positive ladder. This respondent's comment sums up this mixed result: "I don't agree that they are ugly, I think beauty is in the eye of the beholder" (Barchi).

Three values were prominent in this ladder. 'Protecting the Environment' is self explanatory. 'Capable' is where people felt that using energy efficient light bulbs supported being competent and efficient. A number of respondents explained their positive behaviour on the basis of 'Social order' – a belief in the previous government's position that energy-efficient bulbs were better than the incandescent light bulbs, and was working towards legislation that would ban their use. For example, one respondent said: "I'm all for the Nanny state... Yes I wouldn't mind the government [nudging you to do what is right for you and for the environment] No I wouldn't mind at all" (Heap). Interestingly, another respondent said that although he thinks energy efficient light bulbs are "ugly actually" he does think that "they have got to legislate, they should legislate...I prefer to use incandescent but they should have the right to legislate against us using light bulbs if they think it's going to be heaps savings for the country or whatever for electricity or whatever cause" (Watkins).

These finding suggest that a behavioural shift towards greater adoption of energy efficient light bulbs would best be supported by addressing the issue of the physical incompatibility of bulb design and light

fittings, and stressing their economical benefits and convenience. Information about the health aspects and technical advances in energy-efficient bulbs may also assist in winning more converts.

3.2 Part 2: The Household Energy Survey

The purpose of implementing the household survey was to understand how Thorndon and Wadestown residents use energy in the home, to learn about their values and opinions regarding energy use, and to gain insights into where they get their energy-related information and how they share this information.

The 49-question survey (Appendix F) gave a wealth of data, and the following sections report only on some of the key findings from the data.

3.2.1 Survey Statistics

293 paper surveys and 76 online surveys were returned totalling 369 completed questionnaires. This is a satisfactory response rate of approximately 34%.

3.2.1.1 Participant demographics

Respondents were spread across a range of ages (Figure 3) with approximately 15% of respondents falling into the over 65 year-old category. With regards to gender, 43% of the total respondents were males and 57% females. Half of respondents had a household income of over \$120,000 (Figure 4). The majority of respondents worked for someone else, either full-time or part-time (Figure 5). In terms of ethnicity, 87% of respondents classify themselves as New Zealand (European descent), compared with only 2% New Zealand (Māori) and 10% 'Other'. This sample appears reasonably representative of the Thorndon-Wadestown area units.

Figure 3: Age Distribution of Respondents

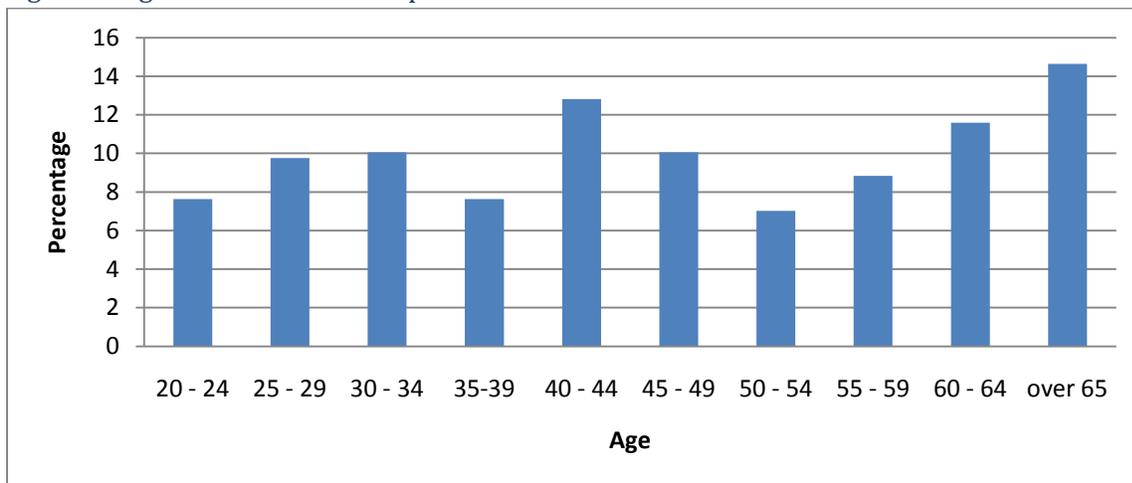


Figure 4: Income Distribution for the Household (Before Tax)

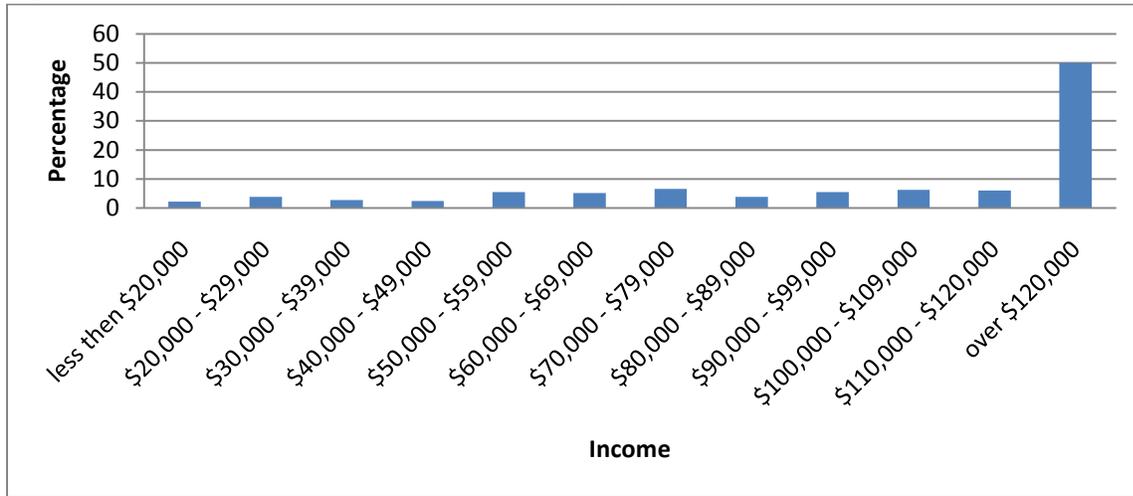
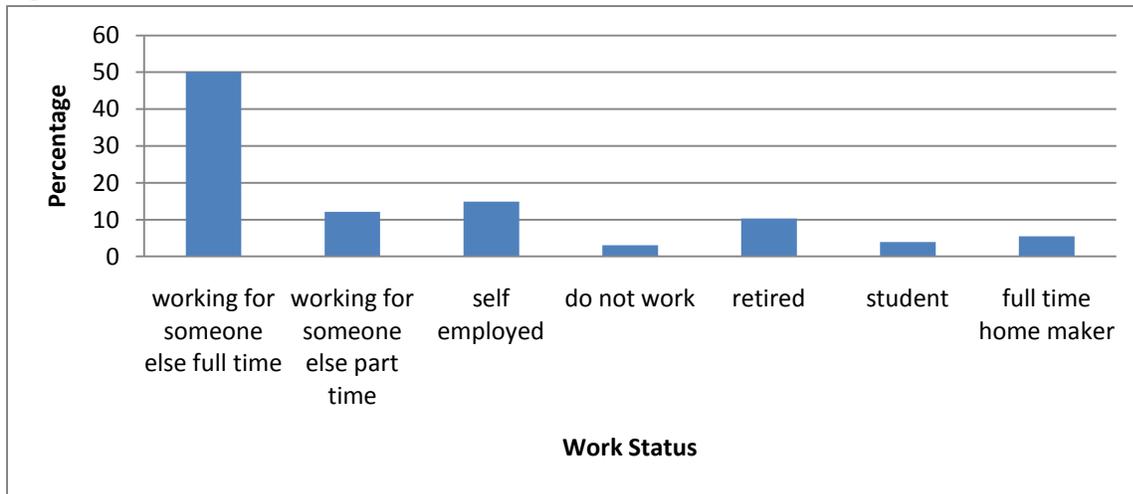


Figure 5: Work Status



3.2.1.2 Household Situation

There was a relatively even spread between home ownership status (Figure 6), with just slightly more respondents owning their house debt-free (37%) than renting or owning a house with a mortgage (both 31%). The average time that people had been living in their house is 8.45 years, but with a considerable difference between renters and home owners. The average time for those who rent from a private owner was 1.95 years, compared to those who own debt free (15.8 years) or own with a mortgage (6 years).

Figure 6: Home Ownership Status

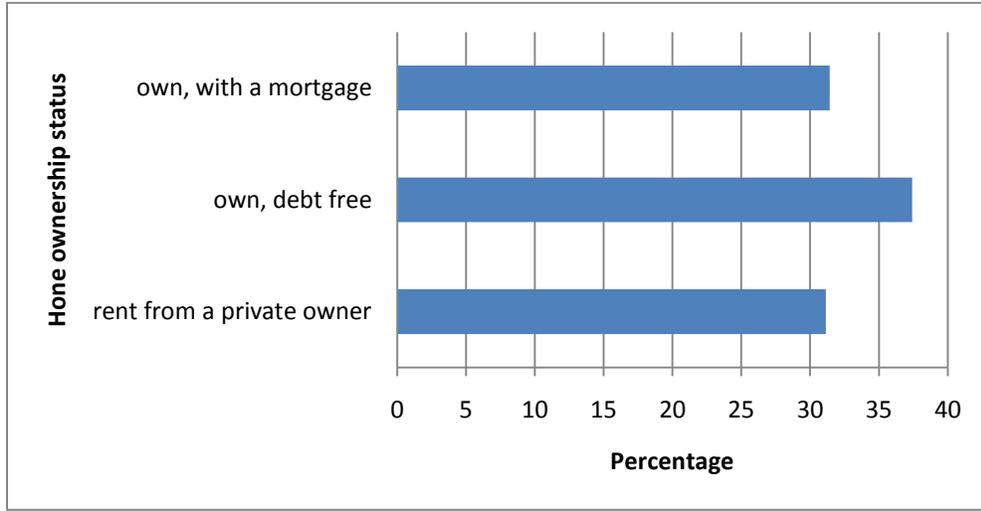
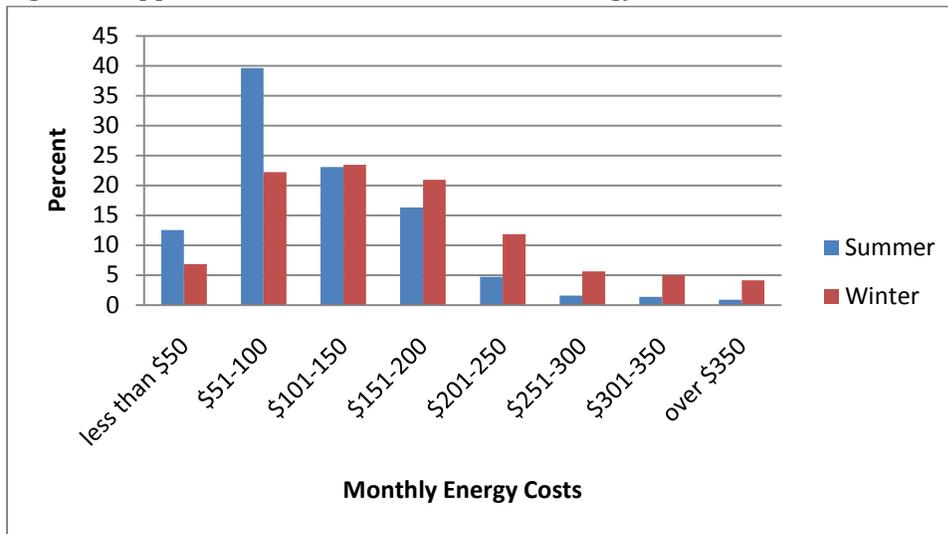


Figure 7 shows respondents' estimates of their energy bills (total of electricity, gas, coal, wood) over the summer and winter months. In summer, the most common total energy cost was \$51-\$100 per month and in winter it was \$101-\$150 per month. The range of costs is very broad – from less than \$50 in winter for around 7% of households, to over \$350 for around 4% of households.

Figure 7: Approximate Summer and Winter Energy Costs



3.2.1.3 Dwelling Characteristics

Most respondents live in separate houses (64%), or flats/apartments (33%), most of which were built before 1978 (Figure 8). The external walls of these dwellings are primarily (58%) timber or steel framing (including those with brick veneer cladding), or otherwise concrete, brick or solid timber (39%). Two to three bedroom houses predominate (Figure 9).

Figure 8: Year Dwelling Was Built

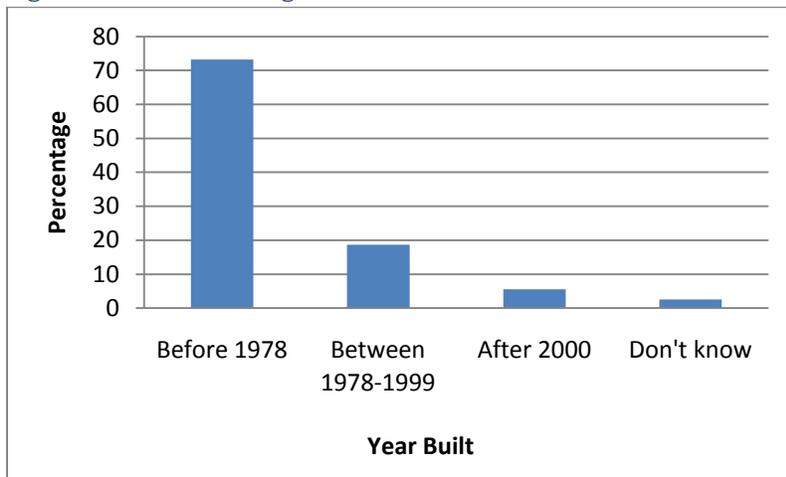
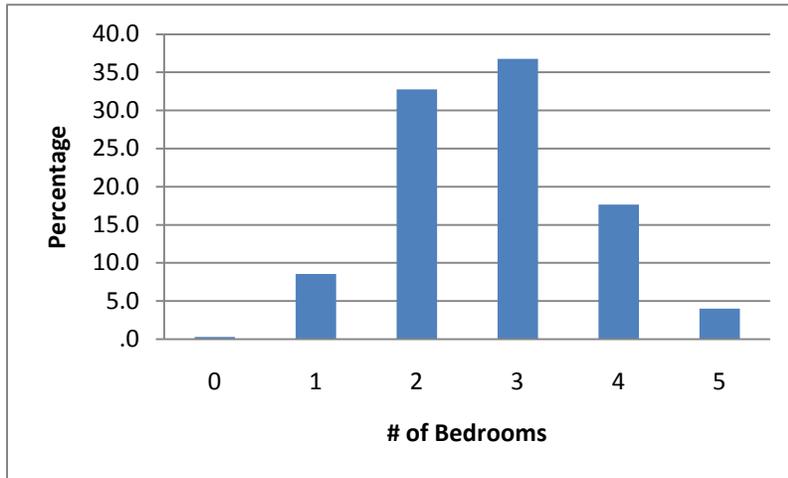


Figure 9: Number of Bedrooms



3.2.1.4 Household Heating

Space heating is the main use of energy in households and thus invites the most focus from researchers and policy makers. Forty percent of households can apply a temperature setting to their houses. Thermostat settings range from 15-38 degrees, with an average of 20 degrees Celsius. This challenges the myth that New Zealanders like to be cold – given the opportunity most of these householders heated to a comfortable level (i.e. over 17 degrees). Table 8 shows that whilst 44% households have a heat pump or gas central heating, a majority (59%) have and use portable electric heaters in the home.

The most common **main** heat sources were evenly split between gas central heating (19%), portable electric heaters (19%), and heat pumps (18%) (Table 9). However many of the households used a variety of heating methods (Table 8), with over half using at least one portable electric heater. Comparing Tables 8 and 9, households that had a heat pump typically used it as the main heating method, as did most of those who had an enclosed wood burner or a fixed gas heater. While 13% of respondents have an open fire, only 1% reported using them as a main heat source.

Table 8: Heating Appliances that Participants Have and Use

Appliance	% Have and use (rounded to nearest whole number bar those under 1%)
Portable electric heaters	59
Heat pump	23
Gas heaters fixed in place	22
Central heating – gas (flued)	21

Electric heaters fixed in place	16
Open fires	13
Enclosed wood burner	13
Portable gas heater	8
DVS or other heat transfer system	6
HRV or other ventilation system	5
Electric night-store	4
Central heating – electrical	1
Enclosed coal burner	0.33

Table 9: Main Heat Source

Appliance	% (rounded to nearest whole number bar those under 1%)
Central heating – gas (flued)	19
Portable electric heaters	19
Heat pump	18
Gas heaters fixed in place	13
Enclosed wood burner	6
Electric heaters fixed in place	5
Portable gas heater	3
HRV or other ventilation system	3
Electric night-store	2
Open fires	1
Central heating – electrical	1
DVS or other heat transfer system	0.28

Table 10 shows respondents' satisfaction with their main method of heating. While 15% were dissatisfied with their current heating system and wanted to change it, the majority of respondents were relatively happy with their main method of heating. Interestingly however, 50% either wanted to, or would at least consider changing to 'something better'.

Table 10: Overall Satisfaction with Main Method of Heating

I am happy with it and don't want to change	48%
I like it but would like to get something better if the opportunity arose	35%
I am unhappy with my current method and want to get something else	15%

Table 11 breaks down the above results. Here we can see that those respondents who have a heat pump, an enclosed wood or pellet burner, gas central heating, or electrical central heating tend to be happier with their heating devices (and less likely to change) than those respondents who have alternative methods of heating.

Table 11: Satisfaction with Main Method of Heating Broken Down by Type of Heating

main method of heating	happy and don't want to change	like it but would get something better if opportunity or unhappy and want to get something else
heat pump	74%	26%
electric night storage	43%	57%
portable electric heaters	24%	76%
oil heater	18%	82%
fixed electric heaters	36%	64%
enclosed wood or pellet burner	53%	47%
open fires	33%	67%
portable gas heater	25%	75%
fixed gas heaters	47%	53%
gas central heating	75%	25%
electrical central heating	67%	33%
other	50%	50%

- There is a good opportunity to work with the 15% who would like to improve their heating system. Those with electric night store heaters, portable electric heaters, oil heaters, fixed electric heaters, open fires and portable gas heaters are the most likely to want to change.

3.2.1.5 Household Hot Water Heating

Hot water heating is the second largest contributor to household energy use. Electric hot water cylinders are used by close to 60% of households, with instant natural gas the next most common system (around 35%) The third most common system is cylinders heated by natural gas (10%). Solar has been installed in around 8% of households.

Most homes receive around five and a half hours of sunlight on a winter's day (June-July) which suggests that these Thorndon-Wadestown households have opportunities to make use of solar hot water systems.

- Given the winter sunlight hours, solar hot water systems could be far more extensively used in the Thorndon-Wadeston area.

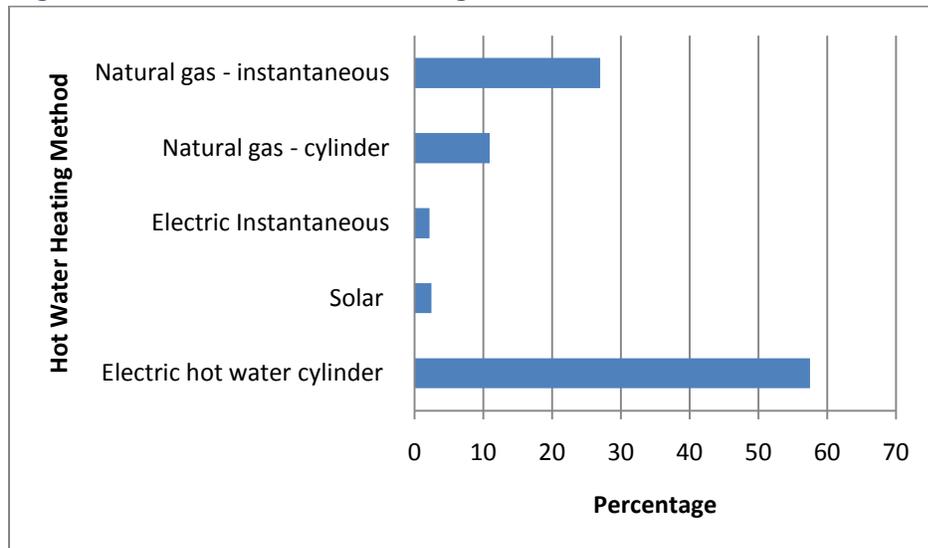
Table 12: Extra Hot Water Cylinder Insulation on Older Cylinders

Extra Insulation Wrapping	26%
No Extra Insulation	73%

Of those respondents who knew the history of their hot water cylinder, 25% stated that it had been replaced in the last 10 years. These will be well insulated. Out of the participants who had not replaced their hot water cylinder within the last 10 years, only 26% had applied extra insulation to their cylinder. all in all, around 50% of respondents who had older hot water cylinders had not applied extra insulation wrapping.

- The low rate of insulation of hot water cylinders presents an opportunity for behaviour change interventions.

Figure 10: Main Methods for Heating Water



3.2.1.6 Household Appliances

Respondents were given a list of household appliances, and asked which they had and used, as well as the ones they owned but did not use. This allows us to consider whether certain appliances are becoming redundant or less popular, as well as helping to explain the changing dynamics in household material cultures.

Figure 11 shows the frequency of unused appliances. Three of the five most unused technologies were associated with household heating and circulation, whereas the other two were associated with entertainment. The lack of use of dehumidifiers, towel rails and electric blankets suggests that ideas of comfort associated with heating and dryness are changing. Possibly this is due to the increasing uptake of household heat pumps, which make the house warmer and drier.

Figure 12 shows a list of commonly used household appliances. Over 50% of household own dishwashers, fridge/freezers, clothes driers, DVD players, electric blankets, computers and heated towel rails.

Figure 11: Number of Unused Appliances in the Household

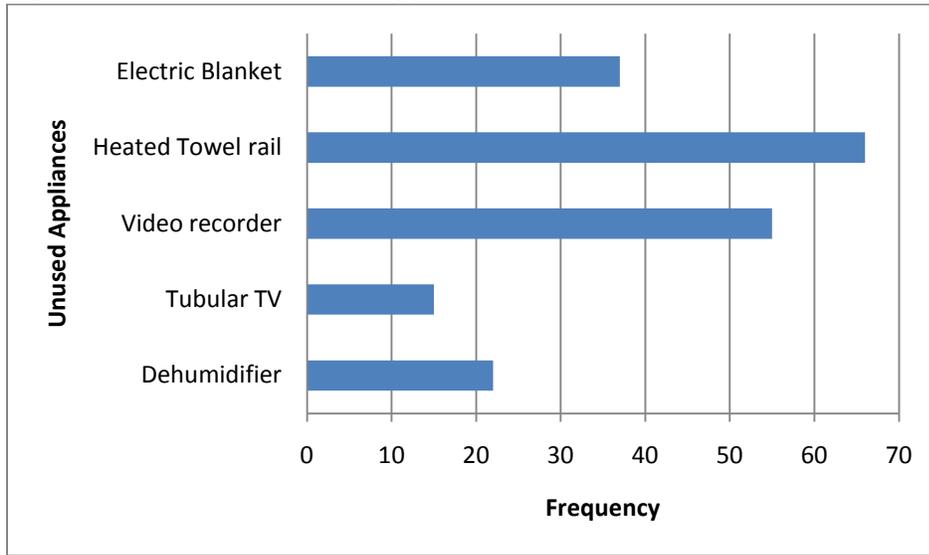
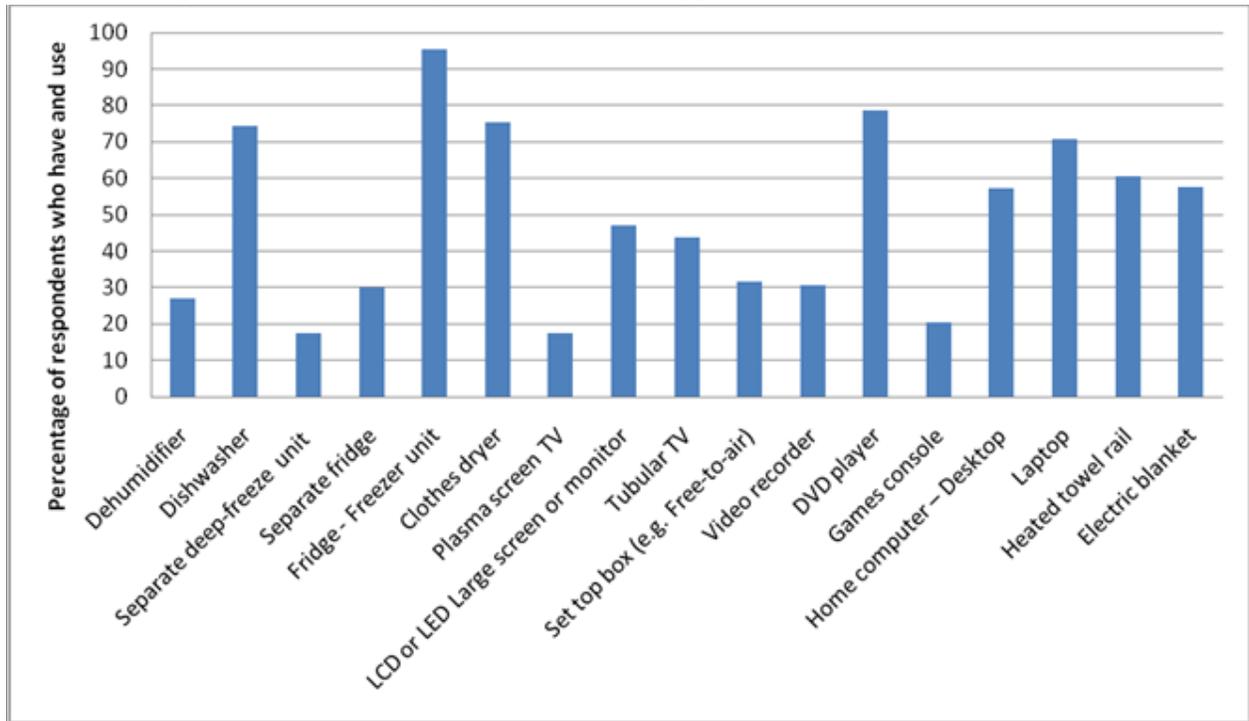


Figure 12: Proportion of Commonly Used Household Appliances

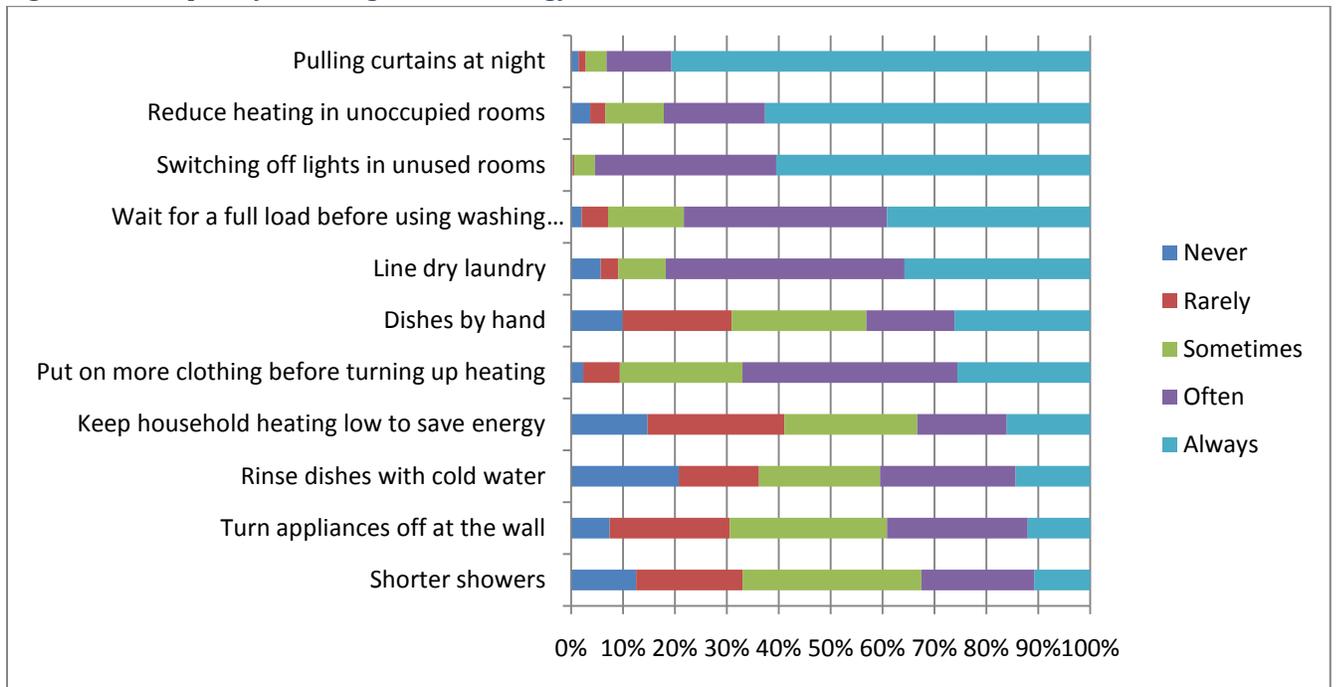


3.2.1.7 Energy Behaviours

The questionnaire asked similar questions regarding energy related behaviours as were asked in the laddering interviews. As in the interviews, respondents were asked to answer on a scale of 1-5 how often they do, and/or how likely they would be to consider certain energy related practices or investments.

The most common practices people engaged in were pulling curtains at night, reducing heating in unoccupied rooms, switching off lights in unused rooms (Figure 13). The first and third questions were not asked in the laddering interviews, where the most likely behaviours were cooling the house before opening windows, waiting for a full load before turning up heating, and line drying of laundry (see Table 1). Reducing heating in unoccupied rooms was 'already done or likely' for 68% of people in the laddering interviews, compared to 'always or often' for 82% in the surveys.

Figure 13: Frequency of Doing Certain Energy Related Practices



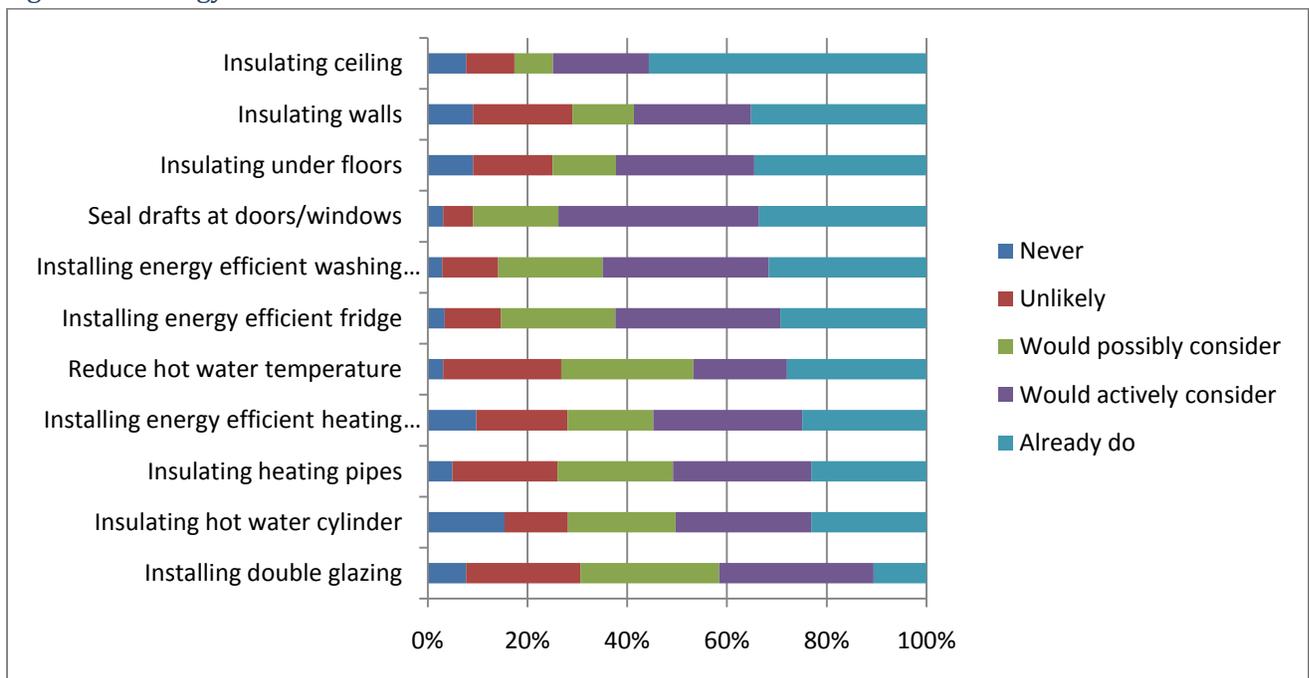
The least popular practices were taking shorter showers and turning appliances off at the wall. Turning appliances off was the lowest ranked of the practices in the laddering surveys as well, while around 40% of laddering respondents were unlikely or would not take shorter showers. Clothes driers are widely used, by around 75% of households (Fig 12). Fig 13 shows around 35% always line-dry their laundry, with the rest doing this often, sometimes, rarely or never.

- Clothes driers are a high-energy appliance, and even a partial further shift to line drying could reduce energy use considerably. This may represent another area for EECA action.

Respondents were also asked how likely they would be to make a range of energy related investments (Figure 14). Only just over 50% already had insulated ceilings, and a little over a quarter already had insulated walls, under floors and had sealed drafts. At least 20% more would actively consider insulation, and nearly 40% would actively consider sealing drafts.

- Given the energy savings from insulation and draft sealing, these would appear to be obvious areas for EECA promotion, especially given Thorndon/Wadestown’s relatively high income level and willingness to consider action in these areas.
- There is a high level of willingness to consider energy efficient appliances. As these tend to be investments made when the old one breaks down, information about sourcing such items should be easily available.

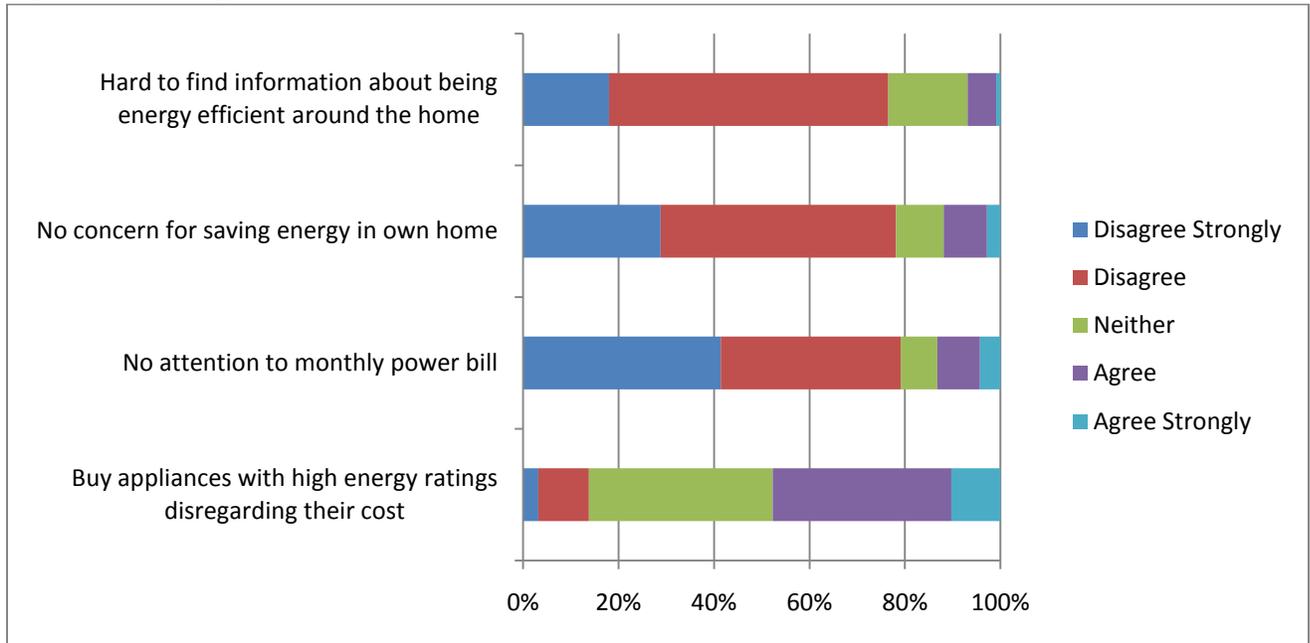
Figure 14: Energy Related Investments



Respondents were asked a series of questions about their attitudes to energy. As shown in Figure 15a, most respondents don’t think it is hard to find information about being energy efficient in the home (76.6%), are concerned with saving energy in the home (76.6%), and do pay attention to their monthly power bill (79.1%). When asked if they would buy appliances with high energy ratings, even if they cost more, a surprisingly high proportion (almost 50%) agreed.

- Considering the high income levels, and the low level of rationalising behaviours on the basis of financial constraints, we suggest that there is a good case for promoting the acquisition of energy-efficient appliances in the Thorndon-Wadestown area.

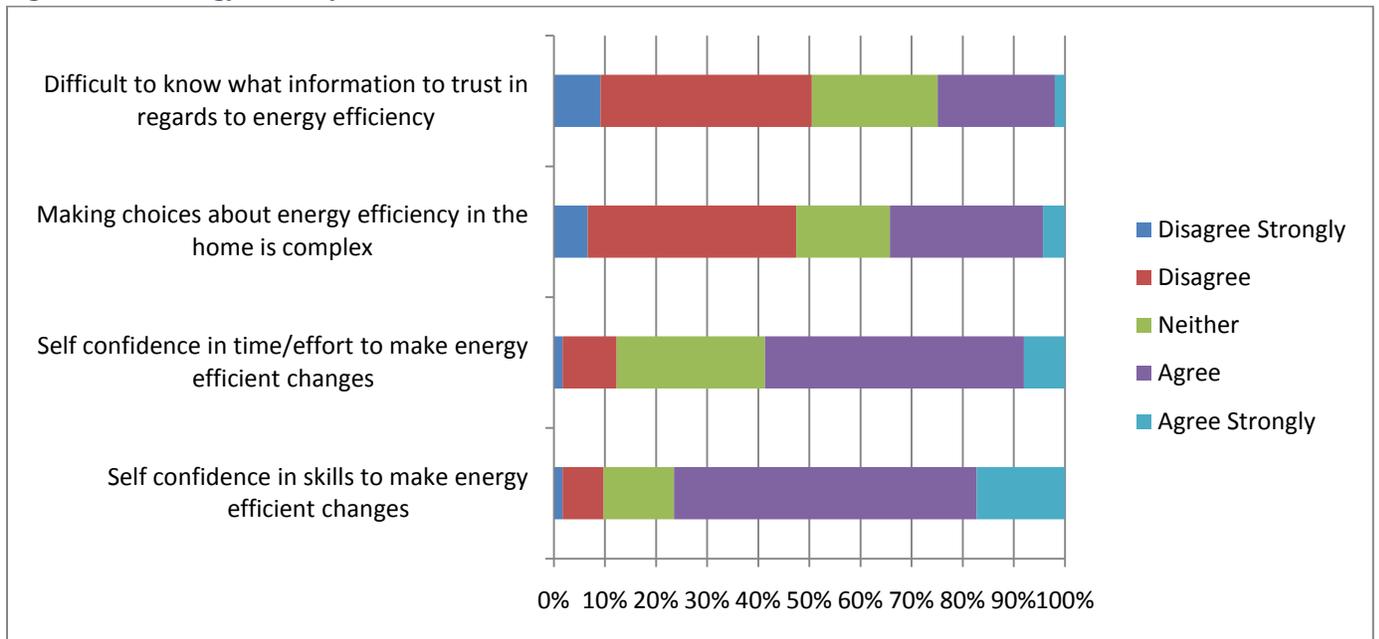
Figure 15a: Energy Attitudes



Self-efficacy is the belief that one is able to make decisions and take actions. Respondents appear to be generally well empowered (Fig 15b) with a high proportion feeling confident that they have the time and effort (almost 60%) and skills (over 75%) to make energy efficient changes. However at least a quarter find it difficult to know what information to trust, and find it complex making choices about energy efficiency.

- Assisting people with trustworthy information and in making personal choices about energy efficiency is likely to enhance their actions towards greater energy efficiency.

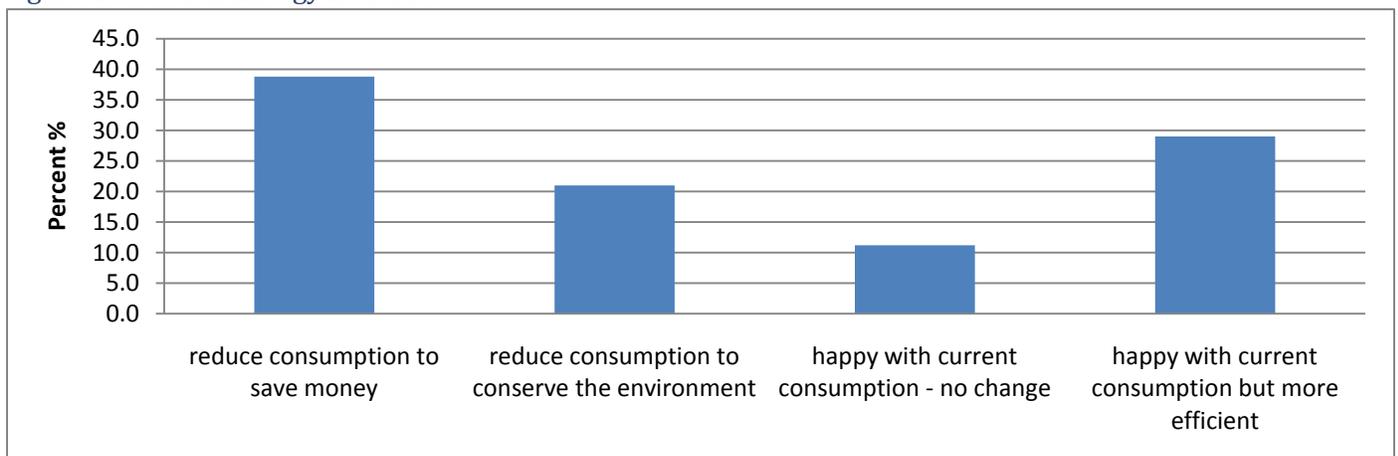
Figure 15b: Energy Efficacy



Participants were asked to choose one out of five statements about attitudes towards energy use. No one wanted to increase the amount of energy that they consumed CHECK. Almost 30% of respondents were happy with their current level of consumption (in terms of how much they spend on energy costs) but wanted to use it more efficiently. The highest proportion of respondents (38%) wanted to reduce their consumption to save money. Interestingly, 21% of residents reported that they wanted to conserve energy, but for environmental reasons rather than economic ones.

- These results indicate a strong willingness to become more energy-efficient amongst the vast majority of respondents (almost 90%). The fact that the reasons vary suggests that different approaches towards promoting efficiency will be needed for different households.

Figure 16: Overall Energy Attitudes



3.2.1.8 Sourcing Energy Information

In this section we sought to find out where people gained energy-related information, and to what extent they discussed energy issues with friends and family. Television was the most common source of information about energy efficiency, followed by power companies, newspapers and EECA (Table 13). The internet, friends and family, and magazines were also well used.

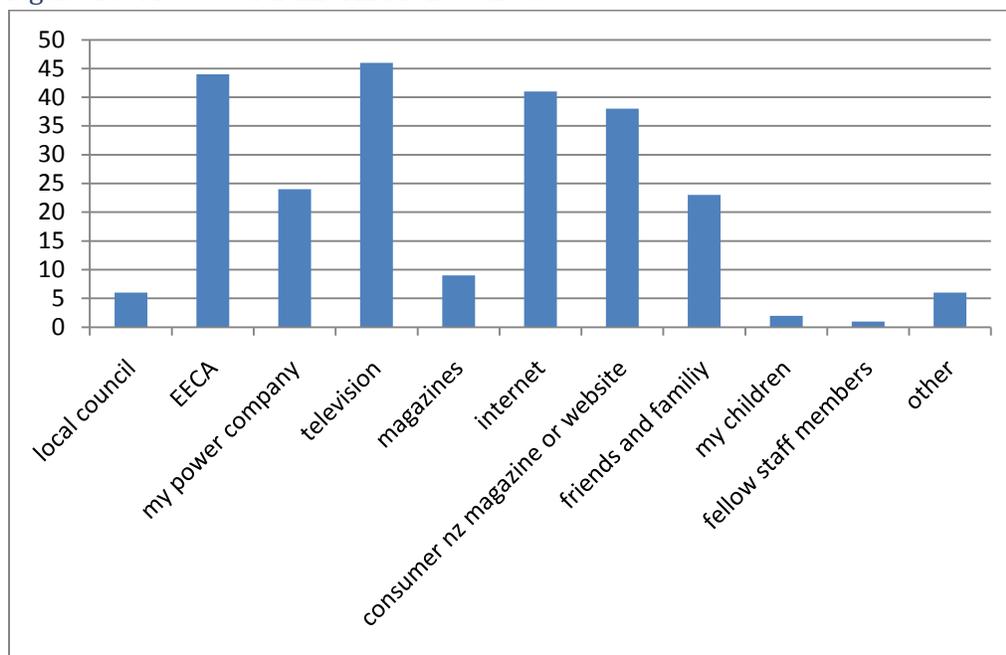
The information sources that respondents found most *useful* were television and EECA (Figure 17) and it is likely that there is some overlap here given that EECA advertise on TV. The internet and Consumer NZ were also highly ranked as useful. It is notable that Consumer NZ was not mentioned as frequently as many other sources in Table 13 (31%), but was highly ranked in usefulness (Fig 17) (37%) – that is, everyone who read it found it useful. In contrast, power companies were the second most mentioned source of information (nearly 62%) but were far less well ranked in the usefulness of the information (23%). Just under a quarter noted they sourced information from councils but only 5% found this useful.

Table 13 shows which information sources the respondents' reported they used when they made changes to help the household use energy more efficiently. Here, own knowledge was the most popular choice reflecting New Zealanders 'handyman' skills or at least 'can-do' attitudes.

Table 13: Recent Energy Information Sources

Television	65.9%
Power Company	61.6%
Newspaper	57.4%
EECA	44.6%
Internet	41.2%
Friends and Family	39.5%
Magazines	35.8%
Consumer NZ Magazine or website	31.0%
My local council	23.0%
Fellow Staff Members	15.1%
Other	8.5%
My children	6.8%

Figure 17: Most Useful Information Sources



EECA is clearly a well used and useful source of information on energy efficiency.

Consumer NZ magazine and website are highly regarded, but have relatively poor penetration into the households surveyed (possibly because of the cost involved).

- Councils and power companies should improve the usefulness of their information for households.

3.2.1.9 Energy Information Sharing

In this section we were interested in finding out how energy information and issues are ‘socialised’ within community networks. Almost half of the respondents said that they talk about energy with friends and neighbours, either ‘sometimes’, ‘often’ or ‘very often’ (Table 14). In response to a question about how much information they give to others in these discussions, over 50% of respondents said they gave from ‘some’ to ‘a great deal’ of information. Over two-thirds told others (from ‘a few’ to ‘quite a number’ of people) about conserving energy in the past 6 months (Table 16). Some respondents are clearly considered more expert than others – around 15% are ‘likely’ or ‘very likely’ to be asked for advice (Tables 17 and 19).

The most talked about energy issues in conversations with friends/neighbours (in order) were heat pumps, insulation, double glazing and lighting. Most of these energy-related conversations involved two-way information exchanges (nearly 62%, Table 18). Around 20% of conversations involved the respondent telling the other person, and around 20% involved the other person telling the respondent about energy efficiency.

It is clear that conversations about energy, and sharing of energy-efficiency experiences and knowledge, are occurring regularly in the community. Around 15% of people seem to be ‘unofficial experts’, to whom others often go to for advice. Another 45% are sometimes used for advice. Peer-to-peer communication is well known to be a very powerful way of passing on information and achieving change – the issue is to ensure that it is accurate.

- EECA could potentially make a big difference in community knowledge levels by tapping into these informal community networks, finding the unofficial but expert ‘efficiency leaders’, and supporting these people in their key roles of spreading knowledge and know-how.

Table 14: Frequency of Energy Discussions with Friends/Neighbours

Never	16.2%
Little	37.5%
Sometimes	31.6%
Often	12.0%
Very Often	2.7%

Table 15: Amount of Information Given in Energy Discussions with Friends/Neighbours

give very little information	15.4%
give little information	25.8%
give some information	42.7%
give much information	14.6%
give a great deal of information	1.5%

Table 16: How Many People Respondents Told about Conserving Energy (Last 6 Months)

told no one	28.7%
told a few	36%
told some	20.8%
told a number of people	11.1%
told quite a number of people	3.5%

Table 17: Compared with Friends, How Likely Respondents are to be asked About Energy Efficiency

not at all likely to be asked	25.3%
not likely to be asked	33%
maybe asked	27.4%
likely to be asked	10.4%
very likely to be asked	3.8%

Table 18: What Happens the Most in Discussions about Energy Use

your friends tell you about energy efficiency	17.8%
both tell each other	61.8%
you tell your friends about energy efficiency	20.4%

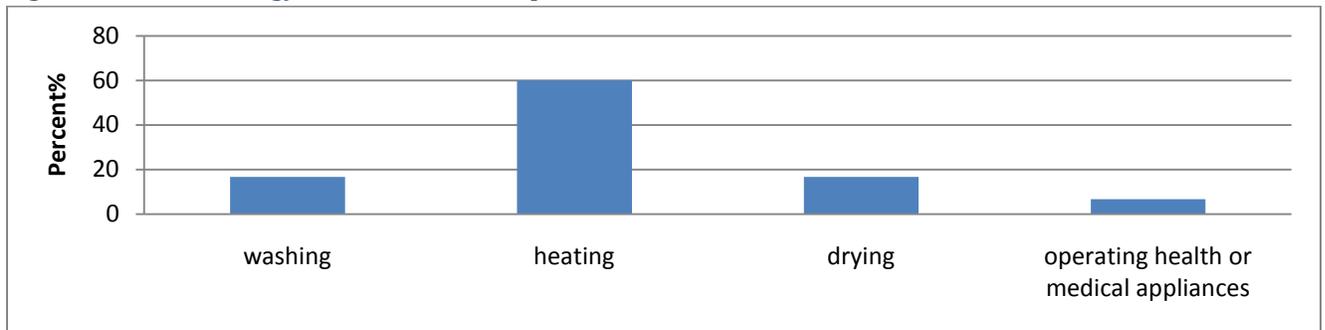
Table 19: How Respondents are Used Overall in Discussions with Friends and Neighbours

Not used as a source of advice (or not often)	39.4%
sometimes used as a source of advice	44.7%
often used as a source of advice	15.9%

3.2.1.10 Energy Use and Health

Respondents were asked the question “does anyone in your household suffer from an illness that requires additional use of energy?” to which 9% of all respondents answered yes. For these respondents, the additional energy is mainly used for heating, due to requirements to keep the house warm, although small numbers also use energy for washing, drying and operating appliances (Figure 18).

Figure 18: Extra Energy Use for Health Requirements



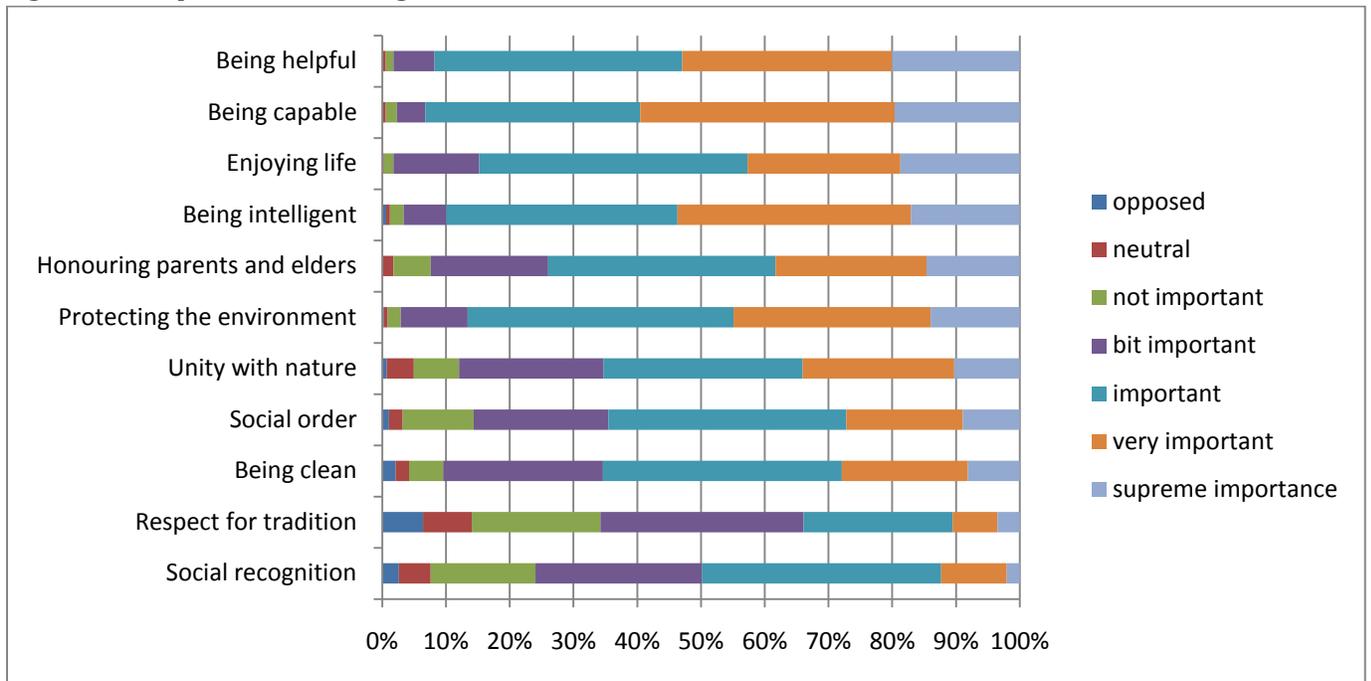
3.2.1.11 Personal Values

Personal values are of interest because even if people do not act in ways that are consistent with their values, they provide a basis which may be supportive of a change in behaviour to become more aligned with values. Respondents were asked their level of support (or opposition) to a series of personal values – largely the same set of values that emerged as important during the laddering interviews. Figure 19 shows the responses which were given on a seven-point scale from ‘opposed’ to ‘supreme importance’. It should be noted that unlike the process in the laddering interviews, the value questions in the survey did not relate to energy behaviour – they simply asked the importance of the values in a generic sense.

Being ‘Capable’ came through again as the most highly ranked value. Being ‘Helpful’ was second-ranked, but interestingly did not come through in the top ten list from the laddering interviews. This perhaps relates to the fact that being ‘Helpful’ is not strongly related to energy behaviours even though it may be an important life goal for many people. The next 3 values were all highly ranked in the laddering interviews as well: Being ‘Intelligent’ was third most important (4th in the interviews); ‘Protecting the environment’ was fourth most important (2nd in the interviews); and ‘Enjoying life’ was fifth most important (3rd in the interviews).

- This coherence between the two sets of results suggests that the four values of Being Capable, Being Intelligent, Protecting the Environment and Enjoying Life are all highly relevant in any work to promote energy efficiency. If campaigns can be aligned to promote these values, they are likely to touch a chord with many of the target audience within the Thorndon-Wadestown population.

Figure 19: Importance of a Range of Personal Values



4 Conclusions and Preliminary Policy Implications

This report reflects an interim point of the data analysis. Eventually, one application of the final results will be to find out which segments of respondents are most likely to share information about energy efficiency so that EECA's campaigns can target these people. Although the cluster analysis required for segmenting the respondents is beyond the scope of this report, these interim results still provide some useful insights into behavior and values.

Research internationally has generally revealed that the links between values and behaviours are not particularly strong, and this is reinforced by our findings. People frequently behave in ways that are not consistent with their values. However, understanding people's values is still useful as they tend to be stable over time and do exert some influence on behaviour as people are usually unwilling to act in conflict with their values. Given the right set of circumstances, most people are likely to adjust their behaviour to act more consistently with their values. However given that people's lives are complex and full of conflicting demands, their actions may be inconsistent with a goal such as energy efficiency.

There are two main ways that EECA can change household energy behaviours:

1. Get people to adopt more energy-efficient technologies
2. Get people to change their energy practices

Our research has shown that there are diverse set of 'drivers' for any given behaviour and also that many behaviours cannot be traced to identifiable values. This is typical of behaviours learnt 'socially' and formed into strong habits which can be resistant to change. Values are sometimes related to behaviour, but behaviour may at times be inconsistent with values, or values may drive energy-inefficient behaviours. Some non-efficient behaviours are driven by the same values as efficient ones (particularly 'Pleasure', 'Comfort' and 'Clean'). For example the value 'Pleasure' may be consistent with enjoying a warm, insulated house but may also be consistent with long hot showers. Both the value laddering interviews and the household surveys suggest that the four values of Being Capable, Being Intelligent, Protecting the Environment and Enjoying Life are strongly aligned with energy-efficient behaviours. If campaigns can be aligned to promote these values, they are likely to touch a chord with many of the target audience within the Thorndon-Wadestown population.

- Recommendation: EECA should align marketing campaigns with values that appear to be most closely and consistently associated with energy-efficient behaviour - in particular Being Capable, Being Intelligent, Protecting the Environment and Enjoying Life.² It is clear that simply using the 'environment' value to promote energy-efficient behaviours will miss out a significant chunk of the population for whom this is not a key value.

² The Energy Spot ads appear to have done this well.

People found it harder to express values in relation to non-efficient behaviours than for efficient behaviours. We suspect that this is because these behaviours have little relationship to underlying values, but instead relate to habit. People's personal values tend to be relatively immutable, and as noted earlier cannot be claimed to be 'drivers' of behaviour.

- Recommendation: For these reasons it makes sense for EECA not to try to change people's values, but to address the obstacles that prevent people from acting in energy-efficient ways that are consistent with their values.

To this end, the findings relating to people's rationalisations of their behaviour, together with findings from the surveys, suggest that there is a wide range of direct barriers and incentives relating to energy-efficient behaviour. As the laddering diagrams show (Appendix I) these barriers and incentives differ greatly between behaviours.

- Recommendation: Rather than blanket campaigns for efficiency, these findings suggest it would be beneficial to treat each behaviour individually. EECA should design interventions on a behaviour-by-behaviour basis to address the main barriers to more efficient behaviours.

For example, the main barrier to switching appliances off at the wall was that it was 'not convenient' – which suggests that market-ready technological solution is needed to make this more convenient. The main barrier to adopting energy-efficient light bulbs was the perceived physical incompatibility of bulb design and light fittings – again another technological issue, or perhaps a matter of making people aware of design advances. More detailed analysis of the 'ladders' would assist in this process.

The census data and the survey both reveal that the Thorndon-Wadestown households are relatively wealthy. The interviews and the survey both show that lack of finance is not an important driver of most of their energy behaviours. For example, in Table 3, financial constraints were mentioned only a third as often as situational constraints, as a reason for non-efficient behaviours. In the surveys, only 38% stated that they wanted to reduce consumption to save money (Figure 16), although economic efficiency was important to many – it was the most frequently cited rationalisation for energy efficient behaviours (Table 3).

At the same time, there is a strong willingness and desire to move to more efficient behaviours – particularly for energy-efficient investments. For example, 15% were unhappy with their main method of heating and wanted to change it, and another 35% would get something better if the opportunity arose (Table 10). Significant proportions of the survey respondents would 'actively' or 'possibly' consider all energy related investments listed (Figure 14) – with the stand-outs being sealing drafts, insulation, energy-efficient appliances and double glazing. And there is a significant potential for major efficiencies even just in household heating, when it is considered that 22% use portable electric heaters as their main method of space heating (Table 9). Households with electric night store heaters, portable electric heaters, oil heaters, fixed electric heatings, open fires and portable gas heaters are the most

likely to want to change their method of heating (Table 11). Additionally, there is surprisingly low take-up even of some very simple actions such as wrapping hot water cylinders, energy-efficient light bulbs or sealing drafts – activities that cost little but may seem just too difficult if households are time-poor.

All of these findings point to a large number of households that are well-positioned to make a change to more energy-efficient behaviours, but are not doing so. So what is holding households back? Most respondents feel it is not hard to find information about being energy efficient (Figure 15a). Respondents are also well aware of sources of knowledge, although some sources were clearly more useful than others (Table 13, Figure 17). Not knowing what information to trust, and finding it difficult to make choices, are problems for at least a quarter of households (Fig 15b). More than half expressed self confidence in their skills and time/effort to make changes, but over 40% were neutral or felt that they didn't have the time or effort, and around 25% felt they didn't have the skills (Fig 15b).

Situational constraints and opportunities were also hugely influential in people's behaviour. This was the most common rationalisation across both negative and positive energy behaviours ((Table 3) – either a situation holding back change, or a situation (e.g. appliance breakdown) compelling change.

- Recommendation: Given the relative lack of financial constraints, evident willingness and ability to act, and significant opportunities for change, we suggest EECA develops a program that creates situational opportunities, requires relatively little time and effort by householders, and helps them make choices with trustworthy information.

The results indicate a strong willingness to become more energy-efficient amongst the vast majority of respondents (almost 90%). However, reasons for not taking action vary considerably. This reinforces that different approaches towards promoting efficiency will be needed for different households.

- There is a good opportunity for EECA to work with the 15% of households who would like to improve their heating system. Those with electric night store heaters, portable electric heaters, oil heaters, fixed electric heatings, open fires and portable gas heaters are the most likely to want to change.

In considering how this gap between willingness and action could be bridged, we suggest that it is important to consider the power of social networks. As can be seen in Tables 14-19, and the related discussion, it is clear that conversations about energy, and sharing of energy-efficiency experiences and knowledge, are occurring regularly in the community. Peer-to-peer communication is well known to be a very powerful way of passing on information and achieving change – the issue is to ensure that it is accurate.

- Recommendation: EECA could potentially make a big difference in community efficacy levels by tapping into these informal community networks, finding the unofficial but expert 'efficiency leaders', and supporting these people in their key roles of spreading knowledge and know-how.

Other recommendations from the body of the report are:

- Considering the high income levels, and the low level of rationalising behaviours on the basis of financial constraints, we suggest that there is a good case for promoting the acquisition of energy-efficient appliances in the Thorndon-Wadestown area.
- There is a high level of willingness to consider energy efficient appliances. As these tend to be investments made when the old one breaks down, information about sourcing such items should be made easily available.
- Given the hours of winter sun for most houses, solar hot water systems could be far more extensively used in the Thorndon-Wadestown area.
- The low rate of insulation of hot water cylinders presents a opportunity for behaviour change interventions.
- Many homes use clothes driers. Even a partial further shift to line drying could reduce energy use considerably.
- Insulation and draft sealing appear to be obvious areas to promote given Thorndon/Wadestown's relatively high income level and willingness to consider action in these areas.
- Assisting people with trustworthy information and in making personal choices about energy efficiency is likely to enhance their actions towards greater energy efficiency.
- EECA is seen as a useful source of information on energy efficiency and is well used.
- Consumer NZ magazine and website are highly regarded, but have relatively poor penetration into the households surveyed (possibly because of the cost involved)
- Councils and power companies should improve the usefulness of their information for households.

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6 Appendices

6.1 Appendix A: Information Sheet for Interview Respondents

[May-June 2010]

Understanding Household Energy Behaviours

Thank you for showing an interest in this project. Please read this information sheet carefully before deciding whether or not to participate. If you decide to participate we thank you. If you decide not to take part there will be no disadvantage to you of any kind and we thank you for considering our request.



What is the Aim of the Project?

Targets for the uptake of national energy efficient technologies and behaviours by households have not been met. This project aims to accelerate the achievements of these targets by obtaining an understanding of household energy behaviours and decision making processes.

What Type of Participants are being sought?

The participants being sought for this project are those over 18 years of age who are responsible for making the key energy consumption decisions in their household.

To be included in this research you must be expecting to reside in the same house in 2010.

What will Participants be Asked to Do?

Should you agree to be involved in this project, you will be asked to partake in an interview with the researcher. The interviews will be typically between 30-60 minutes in duration. The interview will be tape recorded.

Please be aware that you may decide not to take part in the project without any disadvantage to yourself of any kind.

Can Participants Change their Mind and Withdraw from the Project?

You may withdraw from participation in the project at any time and without any disadvantage to yourself of any kind.

What Data or Information will be Collected and What Use will be Made of it?

Should you agree to take part in this project, you will be asked to answer a series of questions about recent energy related consumption decisions as well as a series of demographic and other general household questions related to energy consumption.

This project involves an open-questioning technique where the precise nature of the questions which will be asked have not been determined in advance, but will depend on the way in which the interview

develops. Consequently, although the University of Otago Human Ethics Committee is aware of the general areas to be explored in the interview, the Committee has not been able to review the precise questions to be used.

In the event that the line of questioning does develop in such a way that you feel hesitant or uncomfortable you are reminded of your right to decline to answer any particular question(s) and also that you may withdraw from the project at any stage without any disadvantage to yourself of any kind.

The data collected will remain confidential and will only be seen by the interviewer, other members of the research team and supporting research staff.

The results of the project may be published and will be available in the University of Otago Library (Dunedin, New Zealand) but every attempt will be made to preserve your anonymity.

You are most welcome to request a copy of the results of the project should you wish.

The data collected will be securely stored in such a way that only those mentioned below will be able to gain access to it. At the end of the project any personal information will be destroyed immediately except that, as required by the University's research policy, any raw data on which the results of the project depend will be retained in secure storage for five years, after which it will be destroyed.

Reasonable precautions will be taken to protect and destroy data gathered by email. However, the security of electronically transmitted information cannot be guaranteed. Caution is advised in the electronic transmission of sensitive material.

What if Participants have any Questions?

If you have any questions about our project, either now or in the future, please feel free to contact:-

Dr Miranda Miroso

Centre for the Study of Food, Agriculture and Environment (CSAFE)

University Telephone (03) 470 3577

energycultures.project@otago.ac.nz

6.2 Appendix B: Consent Form for Respondents

I have read the Information Sheet concerning this project and understand what it is about. All my questions have been answered to my satisfaction. I understand that I am free to request further information at any stage.

I know that:-

1. my participation in the project is entirely voluntary;
2. I am free to withdraw from the project at any time without any disadvantage;
3. the data will be destroyed at the conclusion of the project but any raw data on which the results of the project depend will be retained in secure storage for five years, after which it will be destroyed;
4. this project involves an open-questioning technique where the precise nature of the questions which will be asked have not been determined in advance, but will depend on the way in which the interview develops and that in the event that the line of questioning develops in such a way that I feel hesitant or uncomfortable I may decline to answer any particular question(s) and/or may withdraw from the project without any disadvantage of any kind;

the Energy Cultures Research Project is being funded by a grant from the Foundation of Research Science and Technology;

the results of the project may be published and available in the University of Otago Library (Dunedin, New Zealand) but every attempt will be made to preserve my anonymity.

I agree to take part in this project.

.....
(Signature of participant)

.....
(Date)

6.3 Appendix C: Interview Template

Card One Questions: (1 – never: 2 – rarely: 3 – Sometimes: 4 – Often: 5 – Always)

The following is a list of possible energy-saving behaviours. Please indicate how often you do each of the following actions.	Personal Notes/ Direction of interview
1. Turning appliances off instead of leaving them on standby 1 2 3 4 5	
2. Washing hands in cold water 1 2 3 4 5	
3. Rinsing the dishes in cold water 1 2 3 4 5	
4. Reduce heating in unoccupied rooms 1 2 3 4 5	
5a) Do you know what your hot water temperature is? ?	
5b).Would you consider reducing your hot water temperature?	
6. Wait for a full load before using washing machine 1 2 3 4 5	
7. Put on more clothing before turning up the heating 1 2 3 4 5	
8. Keep household heating low to save energy 1 2 3 4 5	
9. Line drying of laundry 1 2 3 4 5	
10. Taking shorter showers 1 2 3 4 5	
11. Doing dishes by hand 1 2 3 4 5	
12. Cooling house by opening windows 1 2 3 4 5	

Card Two Questions (1 – Never: 2 – Unlikely: 3 – Would possibly consider: 4 – Would actively consider: 5 – Already do)

Please indicate how likely you would be to consider the following energy related purchases.	Personal Notes/ Direction of interview
1. Cooking on gas 1 2 3 4 5	
2. Installing double glazing 1 2 3 4 5	
3. Installing an energy efficient refrigerator 1 2 3 4 5	
4. Buying a smaller refrigerator 1 2 3 4 5	

5. Installing an energy efficient washing machine	1 2 3 4 5
6. Installing energy efficient light bulbs	1 2 3 4 5
7. Insulation of heating pipes	1 2 3 4 5
8. House insulation	1 2 3 4 5
9. Installing an energy-efficient heating system (such as a heat pump)	1 2 3 4 5
10. Applying hot water cylinder insulation	1 2 3 4 5
11. Consider changing energy suppliers to save power	1 2 3 4 5

Demographic Questions	Personal Details
Age (category).....	Name
Rent/Own	Address
Income (category).....	Date:
# of members in household	Questionnaire number.....
Electricity bill (category)	Dictaphone track number
Do you think electricity has gone up since last year?.....	
Has this changed the way you think about and use energy?	

Does anyone in your household suffer from an illness that requires additional use of electricity? Y / N

Are you happy for the University of Otago to contact you again in the next 2/3 years for future research?
Y / N

Do you have any friends, family or neighbours in Thorndon/Wadestown who might consider taking part in this survey as well? YES/NO

If YES, what are their contact details:

Name

Address

Telephone number

Email

6.4 Appendix D: Coding Sheets

Rationalisations

1. Cleanliness
 - a. Social
 - b. Hygienic
2. Security (long term, precautionary)
3. Safety
4. Comfort /pleasure
5. Aesthetics
6. Convenience
7. Habitual
8. Efficient
 - a. Time
 - b. Economic
 - c. Environmental
9. Opportunities or Constraints
 - a. Physical
 - b. Technical
 - c. Situational (lock-in, necessity)
 - d. Financial
10. Knowledge (i.e. of energy-saving technologies)
11. Conservation
12. Taking care of product
13. Reflective Time
14. Compromise

1	Ambitious	hard working, aspiring
2	Authority	the right to lead or command
3	Capable	being competent, effective, efficient
4	Choosing own goals	selecting own purposes
5	Clean	being neat, tidy
6	Creativity	uniqueness, imagination
7	Daring	seeking adventure, risk
8	Detachment	from worldly concerns
9	Devout	holding to religious faith and belief
10	Enjoying life	enjoying food, sex, leisure
11	Equality	equal opportunity for all
12	An exciting life	stimulating experiences
13	Forgiving	willing to pardon others
14	Helpful	working for the welfare of others
15	Honest	Being genuine, sincere

16	Honouring Parents and Elders	Showing respect
17	Influential	Having an impact on people and events
18	Inner Harmony	At peace with myself
19	Intelligent	Logical thinking
20	Loyal	Faithful to my friends, group
21	Mature Love	Deep emotional intimacy
22	A meaning in life	A purpose in life
23	National Security	Protection of my nation from enemies
24	Obedient	Being dutiful, meeting obligations
25	Pleasure	Gratification of desires
26	Politeness	Courtesy, good manners
27	Preserving my Public Image	Protecting my 'face'
28	Protecting the Environment	Preserving nature
29	Respect for Tradition	Preservation of time-honoured customs
30	Responsible	Dependable, reliable
31	Self-Respect	Belief in one's own worth
32	Social Justice	Correcting injustice, care for the weak
33	Social Order	Stability of society
34	Social Power	Control over others, dominance
35	Social Recognition	Respect, approval by others
35	Successful	Achieving goals
36	A Spiritual Life	Emphasis on spiritual not material matters
37	True Friendship	Close, supportive friends
38	Unity with Nature	Fitting into nature
39	A Varied Life	Filled with challenge, novelty and change
40	A World of Beauty	Beauty of nature and the arts
41	A World at Peace	Free of war and conflict

6.5 Appendix E: Information Sheet for the Survey

[May-June 2010]

Understanding Household Energy Behaviours

INFORMATION SHEET

The Otago Energy Research Centre is conducting a survey to understand how Wellington residents use energy within their homes. The purpose of the survey is to gather information about different energy related behaviours and the way in which they frame and create energy demand.



Please read this information sheet carefully before deciding whether or not to participate. If you decide to participate we thank you. Completed surveys go in the draw to win one of five \$100 New World vouchers.

If you decide not to take part there will be no disadvantage to you of any kind and we thank you for considering our request.

What is the Aim of the Project?

Targets for the uptake of national energy efficient technologies and behaviours by households have not been met. This project aims to accelerate the achievements of these targets by obtaining an understanding of household energy behaviours and decision making processes.

What Types of Participants are being sought?

The participants being sought for this project are those over 18 years of age who are responsible for making the key energy consumption decisions in their household.

What will Participants be Asked to Do?

Should you agree to do this survey you will be asked to answer questions about the physical aspects of your household and how you interact with the technologies that you own. There will also be some questions about your personal attitudes and values regarding energy use as well as some demographic questions.

Can Participants Change their Mind and Withdraw from the Project?

You may withdraw from participation in the project at any time and without any disadvantage to yourself of any kind.

What Data or Information will be Collected and What Use will be Made of it?

Should you agree to take part in this project the responses you make on the survey will be entered into a computer program for statistical analysis.

The results of the project may be published and will be available in the University of Otago Library (Dunedin, New Zealand) but your anonymity will be preserved.

You are most welcome to request a copy of the results of the project should you wish.

The data collected will be securely stored in such a way that only those mentioned below will be able to gain access to it. At the end of the project any personal information will be destroyed immediately except that, as required by the University's research policy, any raw data on which the results of the project depend will be retained in secure storage for five years, after which it will be destroyed.

Reasonable precautions will be taken to protect and destroy data gathered by email. However, the security of electronically transmitted information cannot be guaranteed. Caution is advised in the electronic transmission of sensitive material.

You can also do the survey online just visit the link:

<http://survey.otago.ac.nz/TakeSurvey.aspx?SurveyID=l21M474>

What if Participants have any Questions?

If you have any questions about our project, either now or in the future, or if you wish to request a paper copy please feel free to contact:

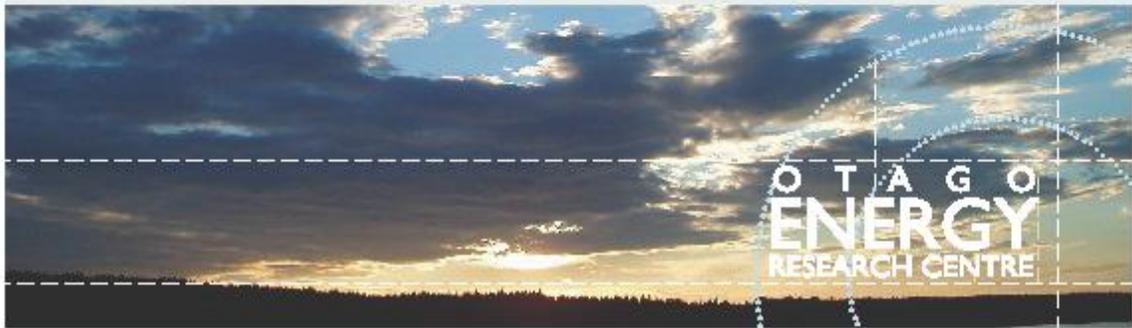
Dr Miranda Miroso

Centre for the Study of Food, Agriculture and Environment (CSAFE)

University Telephone (03) 470 3577

energycultures.project@otago.ac.nz

6.6 Appendix F: The Paper Based Survey



HOUSEHOLD ENERGY USE
A SURVEY OF LIFESTYLES, VALUES AND
OPINIONS REGARDING ENERGY USE WITHIN
WELLINGTON RESIDENTS
2010

FOR MORE INFORMATION REGARDING THIS SURVEY PLEASE FEEL FREE TO CONTACT
MIRANDA MIROSA BY PHONE:

0800 808098 extn 3577

or email: miranda.mirosa@otago.ac.nz

TO THE PERSON WHO PAYS THE ENERGY BILLS:

Thank you for agreeing to take part in this Household Energy Use Survey. This is designed to help us learn how people use various forms of energy and to better understand values and attitudes towards energy use.

The survey covers your opinions and behaviours to do with energy, as well as the technical aspects of how your household is designed and run. It is important that you give **your own views** on all of the items in this questionnaire. Please answer all questions.

To thank you for your time, your completed survey will go into a prize draw to win one of 5 x \$100 New World vouchers.

The survey is completely anonymous and no identifying information will be kept about you.

Please attempt to answer all questions which apply to you by placing a tick ✓ in the box or circle the number e.g. ① ② ③ ④ ⑤ next to the statement that best describes your situation.

DWELLING CHARACTERISTICS

1. What type of dwelling is this? (please circle the number which applies to you)

- Separate house ①
- Flat/apartment adjoining other flats (or buildings) ②
- Other (Please Specify)

2. When was your house built?

- Before 1978 ①
- Between 1978-1999 ②
- After 2000 ③

3. How are your external walls constructed?

- Timber or steel framing (including those with brick veneer cladding) ①
- Concrete, brick or solid timber ②

4. How many rooms does your dwelling have and which ones do you heat regularly? (please write the number of rooms in the boxes provided)

	NUMBER OF ROOMS OR AREAS	NUMBER HEATED REGULARLY
Bedrooms		
Lounges or living rooms		
Dining rooms or kitchen/dining areas		
Separate kitchens		
Studies or offices		
Bathrooms		
Separate toilets		
Laundries		
Rumpus room		
Other rooms		

5. How many hours of direct sunshine would your house get for heat on a clear winter's day in June-July?

hrs

HOUSEHOLD HEATING

6. Can you apply a temperature setting to your whole house (e.g. with a thermostat for heat pump or central heating)?

- Yes ①
- No ②

6b. If Yes, what temperature do you set your house at in degrees Celsius?

7. Which of the following methods do you use for heating your house? Please also indicate which items you use and do not use.

	DO NOT HAVE	HAVE & USE	HAVE & DO NOT USE
Heat pump	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Electric night-store	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Portable electric heaters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oil heater	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Electric heaters fixed in place	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enclosed coal burner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enclosed wood burner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Open fires	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Portable gas heater	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gas heaters fixed in place	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Central heating – gas (flued)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Central heating – electrical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
DVS or other heat transfer system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HRV or other ventilation system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (Please Specify)	<input type="text"/>		

8. Which of the heating methods given above is your main method of heating? (select one)

9. Have you changed your main method of heating in the past year?

- Yes ①
- No ②

9b. If Yes, what was your main method of heating originally?

9c. Why did you change your main method of heating?

TO THE PERSON WHO PAYS THE ENERGY BILLS:

Thank you for agreeing to take part in this Household Energy Use Survey. This is designed to help us learn how people use various forms of energy and to better understand values and attitudes towards energy use.

The survey covers your opinions and behaviours to do with energy, as well as the technical aspects of how your household is designed and run. It is important that you give **your own views** on all of the items in this questionnaire. Please answer all questions.

To thank you for your time, your completed survey will go into a prize draw to win one of 5 x \$100 New World vouchers.

The survey is completely anonymous and no identifying information will be kept about you.

Please attempt to answer all questions which apply to you by placing a tick ✓ in the box or circle the number e.g. ① ② ③ ④ ⑤ next to the statement that best describes your situation.

DWELLING CHARACTERISTICS

1. What type of dwelling is this? (please circle the number which applies to you)

- Separate house ①
- Flat/apartment adjoining other flats (or buildings) ②
- Other (Please Specify)

2. When was your house built?

- Before 1978 ①
- Between 1978-1999 ②
- After 2000 ③

3. How are your external walls constructed?

- Timber or steel framing (including those with brick veneer cladding) ①
- Concrete, brick or solid timber ②

4. How many rooms does your dwelling have and which ones do you heat regularly? (please write the number of rooms in the boxes provided)

	NUMBER OF ROOMS OR AREAS	NUMBER HEATED REGULARLY
Bedrooms		
Lounges or living rooms		
Dining rooms or kitchen/dining areas		
Separate kitchens		
Studies or offices		
Bathrooms		
Separate toilets		
Laundries		
Rumpus room		
Other rooms		

5. How many hours of direct sunshine would your house get for heat on a clear winter's day in June-July?

hrs

HOUSEHOLD HEATING

6. Can you apply a temperature setting to your whole house (e.g. with a thermostat for heat pump or central heating)?

- Yes ①
- No ②

6b. If Yes, what temperature do you set your house at in degrees Celsius?

7. Which of the following methods do you use for heating your house? Please also indicate which items you use and do not use.

	DO NOT HAVE	HAVE & USE	HAVE & DO NOT USE
Heat pump	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electric night-store	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Portable electric heaters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Oil heater	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electric heaters fixed in place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enclosed coal burner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enclosed wood burner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Open fires	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Portable gas heater	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gas heaters fixed in place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Central heating – gas (flued)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Central heating – electrical	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DVS or other heat transfer system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HRV or other ventilation system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (Please Specify) <input style="width: 150px;" type="text"/>			

8. Which of the heating methods given above is your main method of heating? (select one)

9. Have you changed your main method of heating in the past year?

- Yes ①
- No ②

9b. If Yes, what was your main method of heating originally?

9c. Why did you change your main method of heating?

	DO NOT HAVE	HAVE & USE	HAVE & DO NOT USE
Home computer – Desktop	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Laptop	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Heated towel rail	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Electric blanket	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rechargeable small vehicles; including mobility scooters or ride-on "toys"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. If you **have** a washing machine what **setting** do you usually wash with?

- Hot water 1
 Warm water 2
 Cold water 3

17. Do any of the appliances that you **have** in the list above include a **delay function that you use?** (a switch that can control the devices time of use)

- Yes 1
 No 2

17b. If **Yes** could you please write which one(s)

18. Do you have energy-saving light bulbs in more than half of your light fittings?

- Yes 1
 No 2

19. Have you **changed** or **added** any of the above appliances listed in the past year?

- Yes 1
 No 2

19b. If **Yes** please specify what items you have:

Acquired

Replaced

Got rid of

ENERGY BEHAVIOURS

20. The following is a list of possible energy saving behaviours. Please indicate how **often** you do each of the following actions.

	NEVER	RARELY	SOMETIMES	OFTEN	ALWAYS
Turning appliances off at the wall (not just leaving on standby)	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Rinsing the dishes with cold water	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Reduce heating in unoccupied rooms	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Switching off lights in unused rooms	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Wait for a full load before using washing machine	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Put on more clothing before turning up heating	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Keep household heating low to save energy (below 18 °C)	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Line drying of laundry	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Taking shorter showers	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Doing dishes by hand	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Pulling curtains at night	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

21. Please indicate how **likely** you would be to consider the following energy related changes.

	NEVER	UNLIKELY	WOULD POSSIBLY CONSIDER	WOULD ACTIVELY CONSIDER	ALREADY DO
Cooking on gas	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Installing double glazing	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Buying an energy-efficient fridge-freezer	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Purchasing an energy-efficient washing machine	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Installing energy-saving light bulbs	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Insulation of hot water pipes	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Reduce hot water temperature	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Applying hot water cylinder insulation	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Install house insulation - Ceiling	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
- Walls	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
- Under floor	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Seal drafts around doors and windows	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Installing an energy-efficient heating system (such as a heat pump)	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Buying a smaller refrigerator	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Changing to a more efficient water heating system	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

22. If energy prices were to rise significantly, please list **three purchases or behaviours** from the lists above that you would be most likely to adopt

1

2

3

Prize Draw

WIN!

Win one of FIVE \$100 New World vouchers!!
 To enter, just add your name to the form provided.

23. In the last 12 months, have any alterations been made to the insulation of your building?

Yes 1

No 2

23b. If Yes, what alterations were made?

24. Do you agree or disagree with the following energy statements?

- | | DISAGREE STRONGLY | DISAGREE | NEUTRAL | AGREE | AGREE STRONGLY |
|--|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| I only buy appliances with high energy efficiency ratings even if they cost more | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| I don't think very much about ways of saving energy in my own home | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| I don't pay much attention to what my energy bill is each month | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| I find it hard to find information about being energy efficient around the home | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| It's difficult to know what information to trust in regards to energy efficiency | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| Making choices about energy efficiency in the home is complex | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| I am confident I can invest the time and effort to make changes towards being energy efficient | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| I am confident that I have the right skills to make informed decisions in energy efficiency | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |

25. Select **ONE** of the following statements that best describes your overall attitude to energy usage.

- I would like to reduce my consumption in order to save money 1
- I would like to reduce my consumption in order to help conserve the environment 2
- I am happy with my current level of consumption and don't want to change what I do 3
- I am happy with my current level of consumption, but would like to use it more efficiently 4
- I would like to increase the amount of energy that I consume 5

WORK

26. Do you work from home?

Yes 1

No 2

26b. If you **do not** work from home, what factors might make you decide to work from home (pick all that apply)

- Commuting costs
- Operational costs
- Less impact on the environment
- Better time management
- Better social activity/networking
- Working more efficiently
- I would/could not consider changing my workplace in my current occupation
- Other (please specify)

27. Please answer this question if you do any paid work from home. If **not**, please go to the next section.

If you use a computer for your work how many hours is your computer/work station turned on? (Choose one)

- Less than 1 hour a day (1 hour in 24 hours) 1
- Less than 2 hours a day 2
- Less than 5 hours a day 3
- Less than 8 hours a day 4
- More than 8 hours but less than 12 hours 5
- More than 12 hours but less than 24 hours 6
- 24 hours a day 5 days a week 7
- I do not turn my workstation off 8

27b. Do you let your computer go into sleep or standby mode when you are away from it?

- Never 1
- Sometimes 2
- Always 3

ENERGY SHARING INFORMATION

In this next section we are interested in how you acquire and share information about energy. We would like you to think back to when, where and with whom you had discussions on energy use, products, prices, efficiency etc. over the last 12 months.

28. In the last 12 months, which of the following have you heard about energy efficiency from, or had information provided by? (pick all that apply)

- My local council
- Energy Efficiency and Conservation Authority (EECA)
- My power company
- Newspaper
- Television
- Magazines
- The internet
- Consumer NZ magazine or website
- Friends and family
- Energywise
- My children
- Energy Spot on TV
- Fellow staff members
- Other (please specify)

29. In the last 12 months, which one of these information sources provided your household with the **most useful** information about energy efficiency? (circle one)

- My local council ①
- Energy Efficiency and Conservation Authority (EECA) ②
- My power company ③
- Newspaper ④
- Television ⑤
- Magazines ⑥
- The internet ⑦
- Consumer NZ magazine or website ⑧
- Friends and family ⑨
- Energywise ⑩
- My children ⑪
- Energy Spot on TV ⑫
- Fellow staff members ⑬
- Not applicable (i.e. I have not dealt with any of the above) ⑭
- Other (please specify)

If you have made a **change** recently to help your household use energy more efficiently please answer this question. **Otherwise** please move on to question 31.

30. Where did you go to for information when making your change? (tick all that apply)

- My local council
- Builder
- Website(s) (please specify)
-
- Neighbour
- Someone who has made the change already
- Community event or trade event
- Friend or family member
- Fellow staff members
- Own knowledge
- Other (please specify)
-

31. In general do you talk to your friends and neighbours about energy issues or products?

- Very often ⑤ ④ ③ ② ① Never

32. When you talk to your friends and neighbours about energy use do you?

- Give a great deal of information ⑤ ④ ③ ② ① Give very little information

33. During the past 6 months, how many people have you told about ways to conserve energy?

- Told a number of people ⑤ ④ ③ ② ① Told no one

Prize Draw



Win one of FIVE

\$100

New World vouchers!!

To enter, just add your name to the form provided.

34. Compared with your circle of friends, how likely are you to be asked about energy efficiency?

- Very likely to be asked ⑤ ④ ③ ② ① Not at all likely to be asked

35. In discussions about energy use, which of the following happens most often?

- You tell your friends about energy efficiency ⑤ ④ ③ ② ① Your friends tell you about energy efficiency

36. Overall in all of your discussions with friends and neighbours are you:

- Often used as a source of advice ⑤ ④ ③ ② ① Not used as a source of advice

37. Can you recall two (2) recent conversations you have had about energy issues or products?

Please indicate what aspect of energy were they about (e.g. rideshare, heat pumps, hybrid cars, insulation).

1.
2.

ENERGY USE AND HEALTH

38. Does anyone in your household suffer from an illness that requires additional use of energy?

Yes ①

No ②

38b. If Yes, please indicate below what it is for. If no, please go to the next section (Personal Values).

- Washing ①
- Heating ②
- Drying ③
- Operating health or medical appliances ④
- Other (please specify)

PERSONAL VALUES

39. To what level do you agree or disagree with the following statements about the environment?

	DISAGREE STRONGLY	DISAGREE	NEITHER	AGREE	AGREE STRONGLY
The balance of nature is very delicate and easily upset	1	2	3	4	5
Modifying the environment for human use seldom causes serious problems	1	2	3	4	5
Plants and animals exist primarily to be used by humans	1	2	3	4	5
The earth is like a spaceship with only limited room and resources	1	2	3	4	5
There are limits to economic growth even for developed countries like ours	1	2	3	4	5
Humans were meant to rule the rest of nature	1	2	3	4	5
Technology will solve many environmental problems	1	2	3	4	5
Exploitation of the earth's natural resources should be stopped	1	2	3	4	5

40. Below is a list of values that many people find important. Read through the list first to get an idea of how to answer, and circle the numbers next to your most and least important value(s) first. All other values should score between these extremes.

You may find it easiest to answer if you ask yourself this question; **HOW IMPORTANT IS THIS VALUE AS A GUIDING PRINCIPLE IN MY LIFE?**

	OPPOSED	NOT IMPORTANT	IMPORTANT	SUPREME IMPORTANCE			
BEING INTELLIGENT <i>(logical, thinking)</i>	-1	1	0	2	3	4	5
BEING HELPFUL <i>(working for the welfare of others)</i>	-1	1	0	2	3	4	5
PROTECTING THE ENVIRONMENT <i>(preserving nature)</i>	-1	1	0	2	3	4	5
HONOURING PARENTS AND ELDERS <i>(showing respect)</i>	-1	1	0	2	3	4	5
BEING CAPABLE <i>(being competent, effective, efficient)</i>	-1	1	0	2	3	4	5
RESPECT FOR TRADITION <i>(preservation of time-honoured customs)</i>	-1	1	0	2	3	4	5

OPPOSED
NOT IMPORTANT
IMPORTANT
SUPREME IMPORTANCE

ENJOYING LIFE <i>(enjoying food, sex, leisure)</i>	-1	1	0	2	3	4	5
SOCIAL RECOGNITION <i>(respect, approval by others)</i>	-1	1	0	2	3	4	5
SOCIAL ORDER <i>(stability of society)</i>	-1	1	0	2	3	4	5
BEING CLEAN <i>(being neat, tidy)</i>	-1	1	0	2	3	4	5
UNITY WITH NATURE <i>(fitting into nature)</i>	-1	1	0	2	3	4	5

HOUSEHOLD SITUATION

Now for some more general questions about the situation of your household.

41. Do you rent or own the dwelling you live in?
- Rent from private owner
 - Rent from Housing NZ
 - Rent from Local council
 - Own debt-free
 - Own, with mortgage(s) on it

42. How long have you lived in your current house?
 Years

43. Are you considering leaving this house?
 Yes 1
 No 2

41b. If Yes, in how many years' time are you planning to leave?
 Years

44. Now, some questions about people joining and leaving your household permanently.

- In the past year how many people joined this household?
- In the past year how many people left this household?
- How many people will be joining your household in the next year?
- How many people will be leaving your household in the next year?

45. What are your households approximate **monthly** energy bills in the **summer**?

	ELECTRICITY	GAS	COAL	WOOD	PETROL	OTHER
Do Not Use	0	0	0	0	0	0
Less than \$50	1	1	1	1	1	1
\$51 - \$100	2	2	2	2	2	2
\$101 - \$150	3	3	3	3	3	3
\$151 - \$200	4	4	4	4	4	4
\$201 - \$250	5	5	5	5	5	5
\$251 - \$300	6	6	6	6	6	6
\$301 - \$350	7	7	7	7	7	7
Over \$350	8	8	8	8	8	8

47. What is the approximate annual income of your **household** (before tax)?

Less than \$20,000	1
\$20,000 - \$29,000	2
\$30,000 - \$39,000	3
\$40,000 - \$49,000	4
\$50,000 - \$59,000	5
\$60,000 - \$69,000	6
\$70,000 - \$79,000	7
\$80,000 - \$89,000	8
\$90,000 - \$99,000	9
\$100,000 - \$109,000	10
\$110,000 - \$120,000	11
Over \$120,000	12

46. What are your households approximate **monthly** energy bills in the **winter**?

	ELECTRICITY	GAS	COAL	WOOD	PETROL	OTHER
Do Not Use	0	0	0	0	0	0
Less than \$50	1	1	1	1	1	1
\$51 - \$100	2	2	2	2	2	2
\$101 - \$150	3	3	3	3	3	3
\$151 - \$200	4	4	4	4	4	4
\$201 - \$250	5	5	5	5	5	5
\$251 - \$300	6	6	6	6	6	6
\$301 - \$350	7	7	7	7	7	7
Over \$350	8	8	8	8	8	8

48. In which of the following areas have you spent most of your life?

- In a NZ town or city (please specify) 1
- In a NZ rural area (please specify) 2
- In an overseas town or city (please specify) 3
- In an overseas rural area (please specify) 4

49. Would you be willing to take part in future research? If so, please provide your contact details here.

Name

Phone

Email

Prize Draw

WIN!

AWESOME PRIZES

FIVE \$100 GIFT VOUCHERS
for New World Supermarket to be won!

To enter, just add your name and contact details below.

Name

Home Phone Cell Phone

THANK YOU FOR PARTICIPATING!

Thanks!

Thank you for contributing to this
Otago Energy Research Centre Survey

Please fold and place in the pre-paid envelope
provided and put it in your nearest mailbox!

Don't forget!

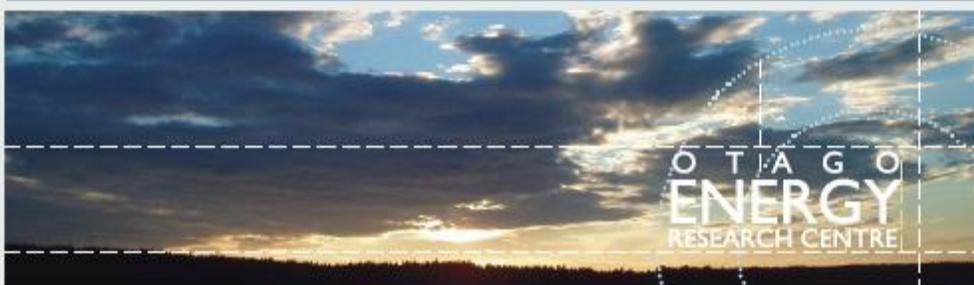
Don't forget to enter the prize draw too!
5 prizes to be drawn

For more information about how you can be more
energy efficient in your home, visit the following
websites:

www.physics.otago.ac.nz/eman/hew/index.html

www.energywise.govt.nz

We appreciate you participation!



6.7 Appendix G: Explanation of Rationalisations with Exemplar Quotes

Situational Factors	<p>“Yes we have two refrigerators. Again it’s because of the number of people that live here... There is four people, and various hangers on at various times” (Robberts)</p> <p>“We have not swapped [to energy efficient light bulbs] here because we are renting and it was a short time rental, if we were renting here for longer I would have invested in them... “(Jackells)</p> <p>“Meridian don’t take credit card payment, really drove me nuts cause we don’t anymore but we used to put every single thing we buy on credit card and pay it off at the end of the month, that’s how we worked and so they didn’t take it so that really bugged me that they didn’t and you know I’ve written to them an email you know ‘oh yes will let you know as soon as we do’ but... and then Power Shop came up to Gavin’s straight there and so we switched to Power Shop.” (Barchi)</p>
Economic Efficiency	<p>“It’s a money thing, always analyzing the value you can get form what appliance before you have to get another one. I mean if some dramatic breakthrough that came through that I could look at and say well that is going to save me money over the next year even if I throw that one out then I would do that.” (Fazer)</p> <p>I don’t like the wastage of it you know, it’s just sort of money going out the window really” (Rowling)</p> <p>I think it saves money, and if you’re going to be in a place in the long term its probably beneficial [insulation]” (Fazer)</p>
Convenience	<p>“It’s the effort, it’s just kind of inherently lazy, my appliances are always in awkward position like down on the bottom so it’s good to keep it out of the way but reaching around, behind the case every time to switch on the TV is such a hassle.” (Lyons)</p> <p>“Yeah convenience. I leave my TV on standby because it involves turning it off at the source; I mean there is no option on the remote.” (Johnson)</p> <p>“The reason why I’m getting renovating the kitchen is to make it more convenient for me and a dishwasher would add to that convenience.” (Cairns)</p>

Environmental Efficiency	<p>“I’m quite happy to do little things to be environmentally friendly as long as they are not too much effort like I’ll do the same things with plastic bags. If it’s just a couple of things I’ll say no to a plastic bag.” (Lyons)</p> <p>“Just aware of waste of energy, it is in the back of my mind, same with the lights, you are probably going to ask about light switches. I’ll make sure if I go out of the room I’ll turn them off... I’m just thinking of the future and just maintaining resources and things.” (Finch)</p> <p>“It’s also environment and stuff as well, I’m quite conscious of it, things like turning things off at the wall I’m not as conscious of the effect on the environment as turning lights off and not using heating because I think they’re bigger in using more energy and if you can save using energy like that” (Ford)</p>
Comfort	<p>“I have it (the heating) comfortable; I’m too old not to be comfortable.” (Gray)</p> <p>[would not take shorter showers] “I just love the feeling of the hot water running on my back! Yes, it’s a pleasurable thing, yes.” (Robberts)</p> <p>“I shower in the morning and it helps me to wake up and it’s comfortable and I feel good so I take long showers.” (Craig)</p>
Conservation	<p>“Well, [I don’t like to be] wasteful in an energy sense and wasteful in a money sense.” (Robberts)</p> <p>“As a matter of principal I don’t like to waste... there is a cost to the community of producing that water and is not... as a socially responsible citizen I shouldn’t waste those resources.” (Craig)</p> <p>“Yes, I would buy an energy and water efficient one... even though New Zealand seems to have plenty of water well you shouldn’t waste things regardless.” (Bielsty)</p>
Technological Factors	<p>“I have a rule in the house, [for showering] less than 5 minutes... Our tank only holds certain, I have couple of students living with me, so I have to have that rule” (Baaty)</p> <p>“No, mine is a very old fashion one [hot water cylinder], it doesn’t have anything on it so no [I can’t find what the hot water temperature is].” (Baledoy)</p> <p>“[Considering gas cooking] it’s a matter of choice I guess from as much from a cooking style point of view, I mean, you can’t make a Pavlova in a gas oven b/c you can’t control the temperature. “ (Sinclair)</p>

Time Efficiency	<p>[using clothes drier] "Maybe it is a balance thing where I go: 'well at least my clothes are going to be dry when I want them to be dry.'" (Jackells)</p> <p>[currently cooks on gas] "Gas is quicker; it doesn't take as long to heat up." (Lyons)</p> <p>"I would [wait for a full load before using washing machine] because it's most efficient... [In terms of] cost and time." (Johnson)</p>
Physical Factors	<p>"I'm not able to do that here [line drying laundry] being in an apartment so everything has to be machine dried." (Cairns)</p> <p>[Installing energy efficient light bulbs] "No, I would probably have to change most of the fittings unfortunately." (Fazer)</p> <p>"Basically if you have a look in the kitchen or anywhere there is not one little place where you could possibly put it [a clothes drier]. Absolutely I would have no space, I never even considered a dryer." (Baledoy)</p>
Hygiene	<p>[Line drying laundry] "Hygienic, [the] sunshine gets rid of all sorts of things." (Hall)</p> <p>"I think it's more hygienic [when washing hands] to use hot water or warm water yes." (Clarke)</p> <p>[Washing hands in cold water] "That's more from hygienic point of view I believe that there's more bugs killed with hot water than cold." (Croft)</p>

6.8 Appendix H: Explanation of Values with Exemplar Quotes

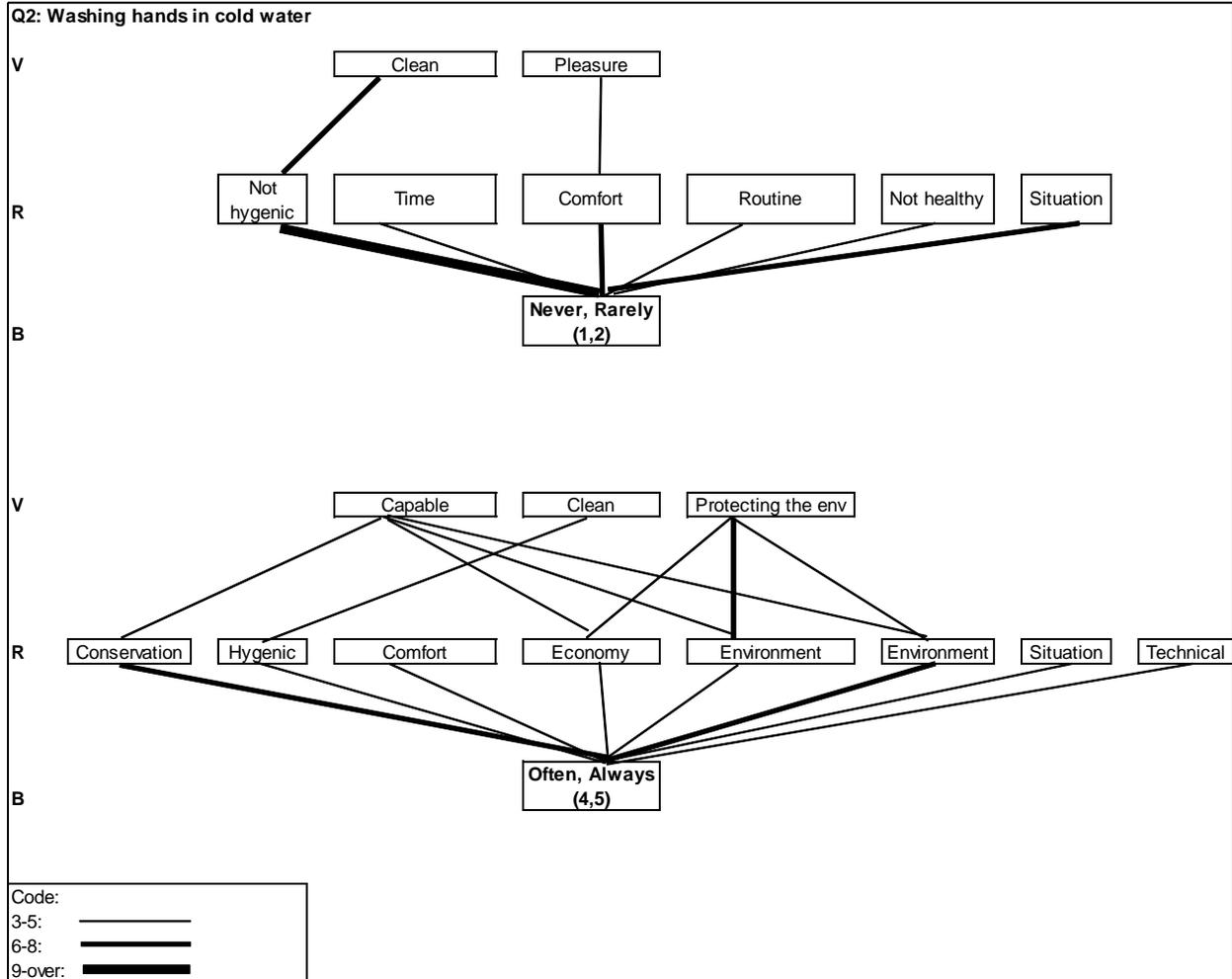
<p style="text-align: center;">Capable</p>	<p>Being competent, effective, efficient “I'm not, what you could call green as such so that the concept of saving the earth's resources isn't big in my mind. But saving money and having more efficient things around appeals to me as an engineer” (Fazer).</p> <p>“Money normally comes before energy... To save energy is conscience. You feel you need to do something for the country. Money is personal, that's the reason. To save money rather than energy” (Baaty).</p> <p>[Wouldn't buy a smaller refrigerator] “: because I try to shop once a week and part of that is the convenience in time saving but also I think there's been studies that if you shop once a week, and I budget and I've got my list, you are more likely to spend less money as opposed than just popping down to the supermarket every night on the way home (Ryan).</p>
<p style="text-align: center;">Pleasure</p>	<p>Gratification of desires [Discussing why they would not consider taking shorter showers] “It's my luxury, my one luxury, I'm not too fast, no absolutely not” (Barchi).</p> <p>I don't dry my clothes in the machine... they get a funny smell, I hate the smell. You can tell, you sit next to people you can smell this electric smell in their clothes (Baaty).</p> <p>[Discussing their heat pump] “Mine is set so that it goes off, I think it's about 9.30 at night and it comes on at 6 in the morning. So the house is warm overnight, I can hear it switching on at 6. It is nice. It's my treat” (Jenkins).</p>
<p style="text-align: center;">Protecting the Environment</p>	<p>Preserving nature “In the back of one's mind there is also that sort of conservation of energy ethic which is not just money based” (Rackmil).</p> <p>Well, I've got children and grandchildren and I'm thinking into them, what we're doing to them, that's probably my motive. Six grandchildren, how is their life going to be like? It's going to be a lot harder, resources are going to be more difficult for them to access (Bartton).</p> <p>You keep thinking about waste, wastage, the issue of wastage is quite big now in our minds I guess. The media sort of gets to us like that and you know you are seeing more and more things from the consumer society; there is a lot of wastage” (Finch).</p>

<p style="text-align: center;">Intelligent</p>	<p>Logical thinking</p> <ul style="list-style-type: none"> • “It just seems silly to heat a whole house when there is only two of us” (Rabling). • “I just can’t be the person that takes things from a washing machine and put it in the dryer though, ever, that is just not me and a lot of that isn’t about money and environment, a lot of it is just brain thing” (Barchi). <p>[When asked if he turns appliances off at the wall] “Only one... A while ago I bought a little device that allows you to actually measure the currency from devices. And the only thing that I found round here that uses significant power while it was turned, in standby mode was the relatively old Fisher & Paykel washing machine (Baaty).</p>
<p style="text-align: center;">Clean</p>	<p>Being neat, tidy</p> <p>“Yes I would [installing an energy efficient washing machine]. It would be a consideration however for me personally the overriding consideration would be how well it actually got the chemicals out you know all the you know the laundry powder cause I don’t like wearing that next to my skin or you know anybody else’s skin so I would rather use the extra water and know that that is really going to be safe and know that is costing extra but know that feel that I was actually going to be... you know we were all going to be healthy” (Sabarsky).</p> <p>Washing hands in cold water is not effective... It doesn’t remove the organisms you want removed from your skin. It’s a false economy, you are likely to transmit those organisms especially if you are going to be cooking (Bartton).</p> <p>I prefer the drying [my clothes] in the sunlight... Sunshine gets rid of all sorts of things (Heap).</p>
<p style="text-align: center;">Obedient</p>	<p>Being dutiful, meeting obligations</p> <ul style="list-style-type: none"> • [When asked ‘what is it about the energy efficiency that is important to you?’] Well it’s just uh, its economical. I think the whole community’s got to do this; I’ve been brought up with the whole propaganda. And I agree with it entirely so I do my biggest” (Hauston). <p>[Talking about why they do some dishes by hand] “We have a son who trained as a chef and that was one of the first things he said, he gave me a couple of his knives when he gave up cooking as a job and he just said “if I ever find them in the dishwasher then I will take them back”... I say, what’s the point of learning from experts if we don’t follow their advice” (Davis).</p> <p>[talking about taking showers as opposed to baths] “We have a grandson that lives with us, and they did a project at school on conservation, and it entailed finding out how much water there was in the bath compared with how much in the shower, and I was amazed at the difference. Poor kid, he then had to have showers” (Davis).</p>

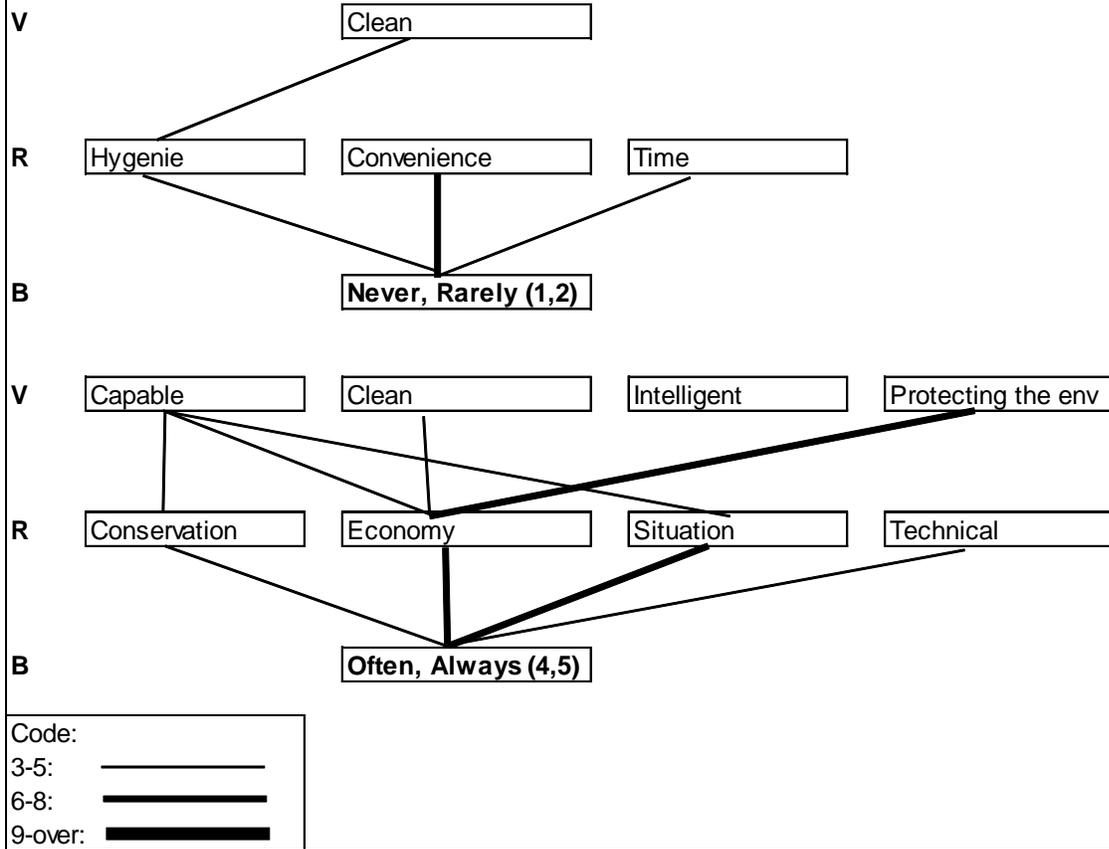
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Respect for Tradition</p>	<p>Preservation of time-honoured customs “As I get older I find that what I thought was a bit unfashionable, and we were ashamed of (like my mother wouldn’t use plastic when it first came to the market, she felt it was bad for us...) and I mean now...now we know... and I respect it much more” (Bartton).</p> <p>“Because in Malaysia we do that all the time” (Baaty).</p> <p>“I grew up in the country with tanks, so I know to be careful with water. I’ve been brought up to be careful with water” (Heap).</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Choosing own goals</p>	<p>Selecting own purposes [Talking about energy efficiency light bulbs] “I don’t agree that they are ugly, I think beauty is in the eye of the beholder” (Barchi).</p> <p>“I suppose it’s just the general lifestyle thing... I think very much the same about lots of things, and we just like to be modest on power usage, just like we are with cars - we’ve got small cars. It’s just, it is, we’re not fanatical but we do, it’s kind of a small hobby if you like” (Falckon).</p> <p>“I had a debate with the electrician who put the new cylinder in, I said no I want it that 5 degrees hotter” (Davis).</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Honouring Parents and Elders</p>	<p>Showing respect “I’ve invested in icebreakers of each colour... It’s the logical thing to do isn’t it? I can hear my parents, they’d say: ‘put another jersey on!’. [Interviewer: so you wear an icebreaker in the house?] Oh yes, just a light one, that’s the 1/50 icebreakers” (Bartton).</p> <p>“We never had money to throw around like you know my family in the old country, so we sort of grow up with those habits and switch the light off sort of thing” (Waters).</p> <p>[When asked ‘Is there any reason why you wait for a full load before doing your laundry?’] “Just because I’ve been brought up that way” (Jenkins).</p>

Social Order	<p>Stability of society</p> <p>[Explaining why they installed energy efficient light bulbs] “Tim’s is a new Zealander, Kiwi he’s very proud of his country and well he doesn’t like some of the idiots in the parliament but it doesn’t matter about that, but he feel like to do if the government asks him to do something, he will make sure we do it. I call it an obedient citizen and I live with him and I become that way and we train the children that way” (Baaty).</p> <p>[When asked if they would consider changing energy suppliers to save money] “We changed to Meridian in 2004 or thereabouts. We had Trustpower before that. We didn’t like Trustpower being foreign owned, much preferred Meridian being a NZ owned company, which had ties to the government people and also it used water and hydro power” (Falckon).</p> <p>[When asked if they would consider changing energy suppliers to save money], [We are with] Contact and I’m liking them, I find their consumer service to be good...I’ll pay more for service and you know we haven’t had any problems with them. They’ve been consistent in their usage. If we were talking about telecom, you know the phone service here I could go on for hours about how horrible it is in New Zealand, energy could go the same way so I rather use one company that I know I can talk to a person in English and they’ll work with me”(Jackells).</p>
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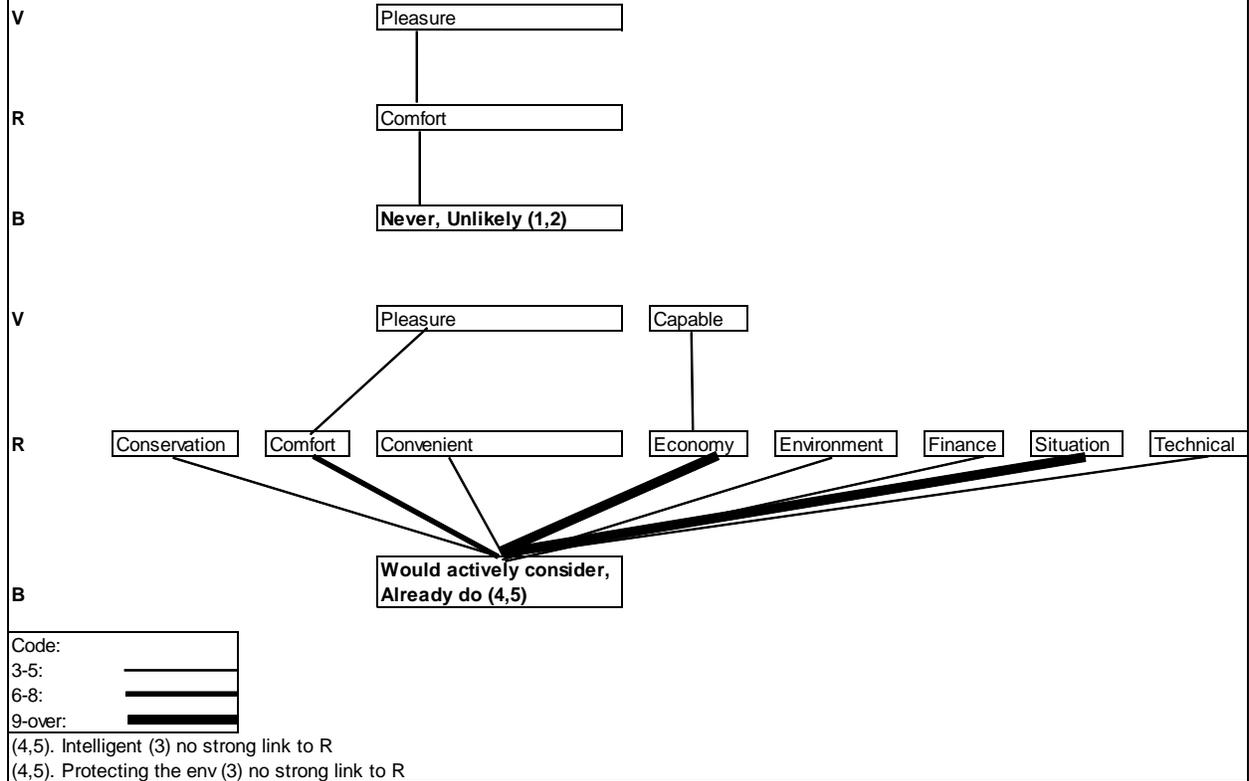
6.9 Appendix I: Value Ladders



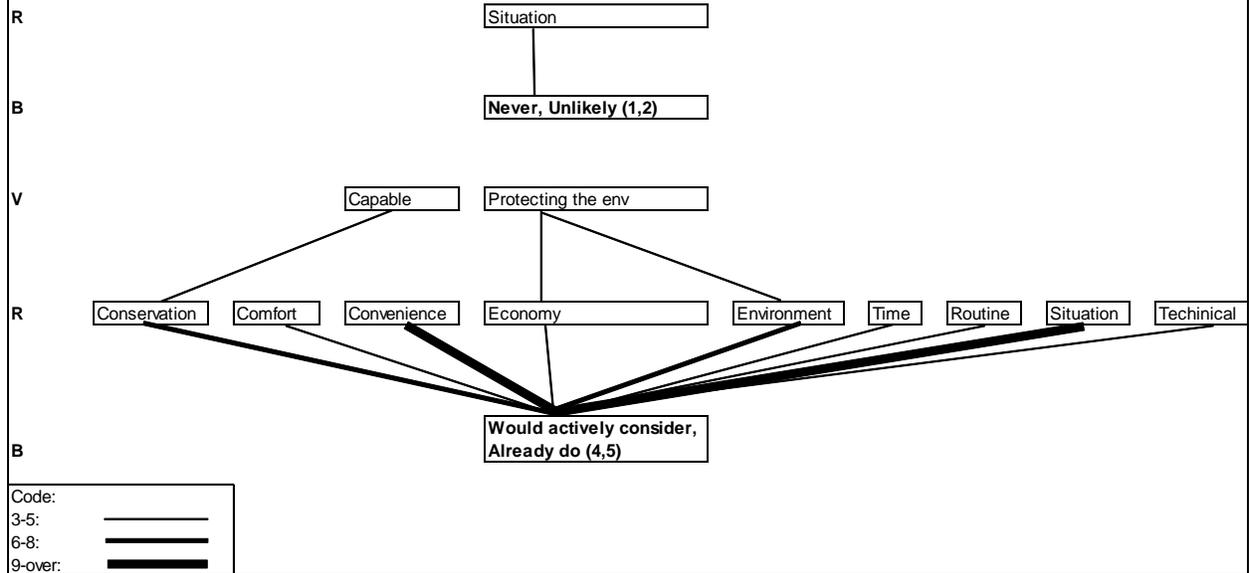
Q3: Rinsing dishes in cold water



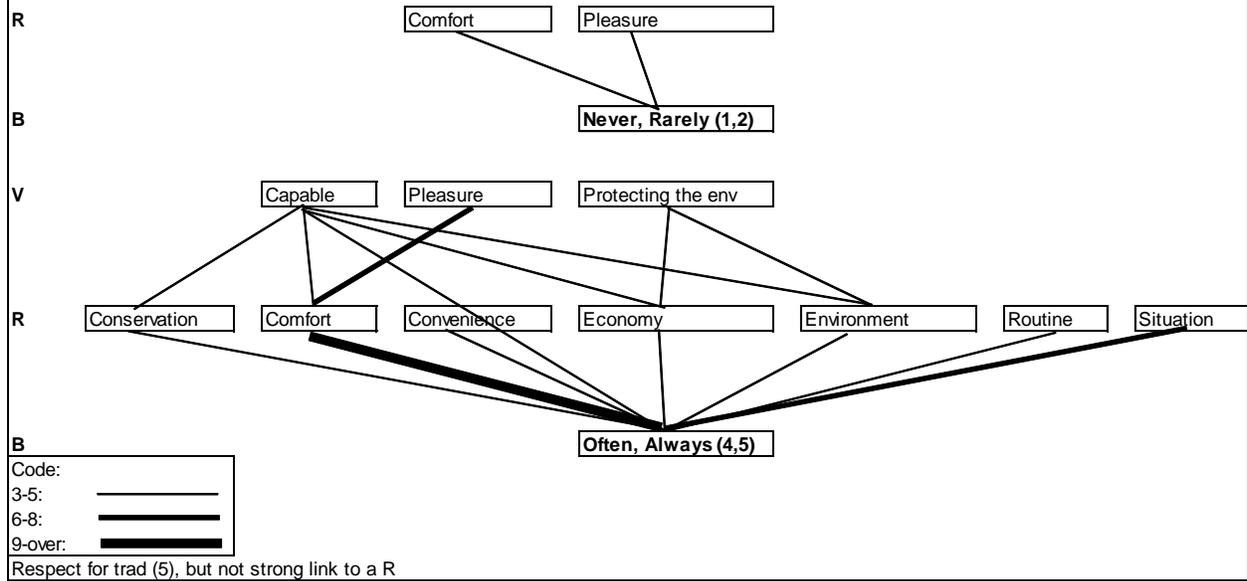
Q4: Reduce heating in unoccupied rooms



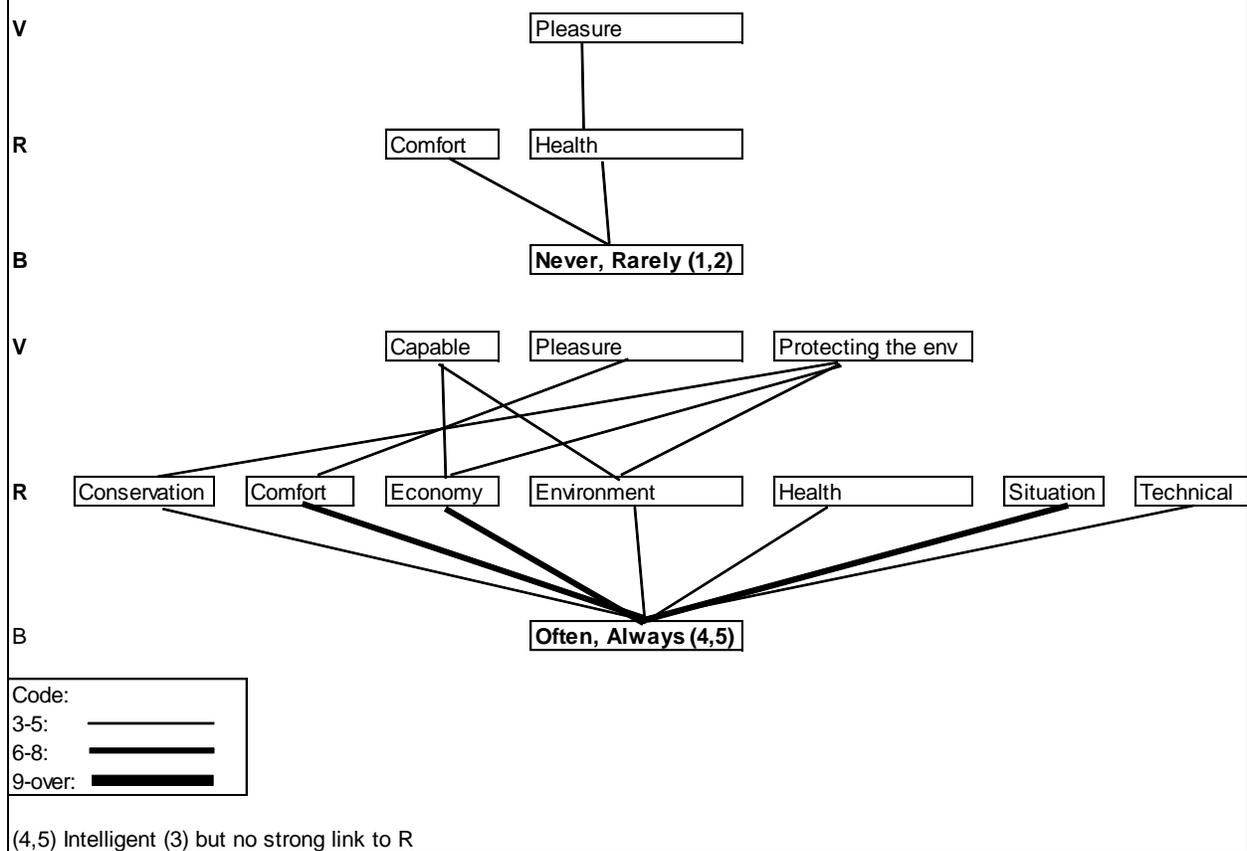
Q6: Wait for a full load before using washing machine

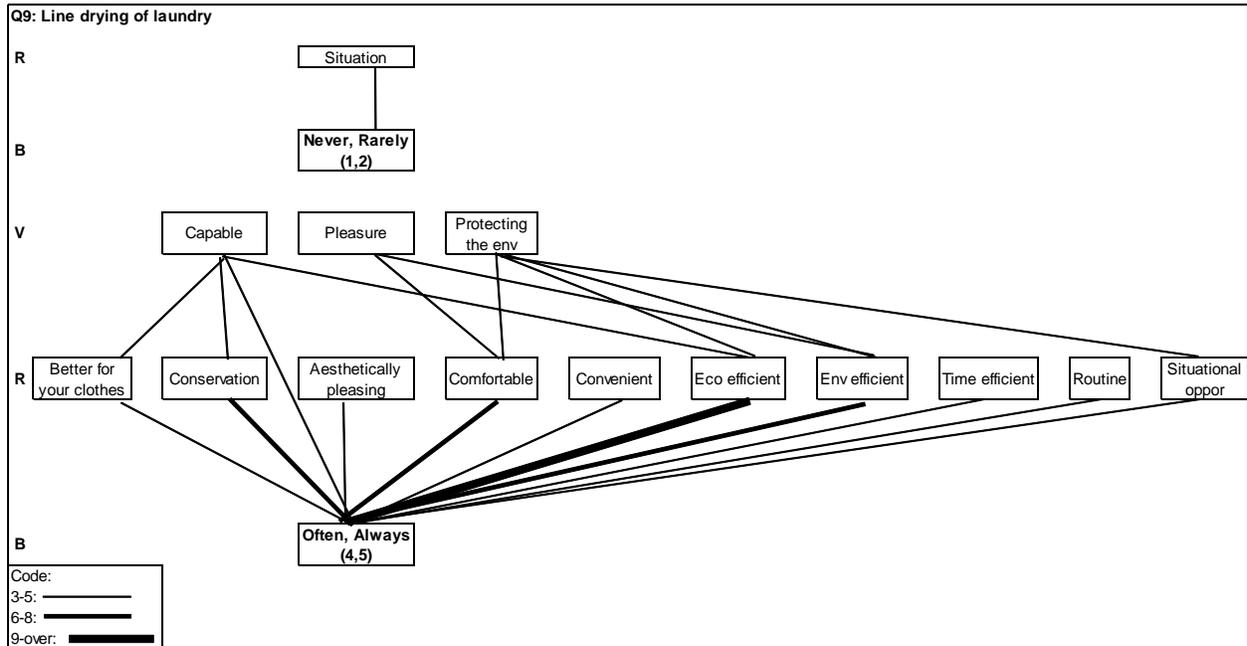


Q7: Put on more clothing before turning up the heating

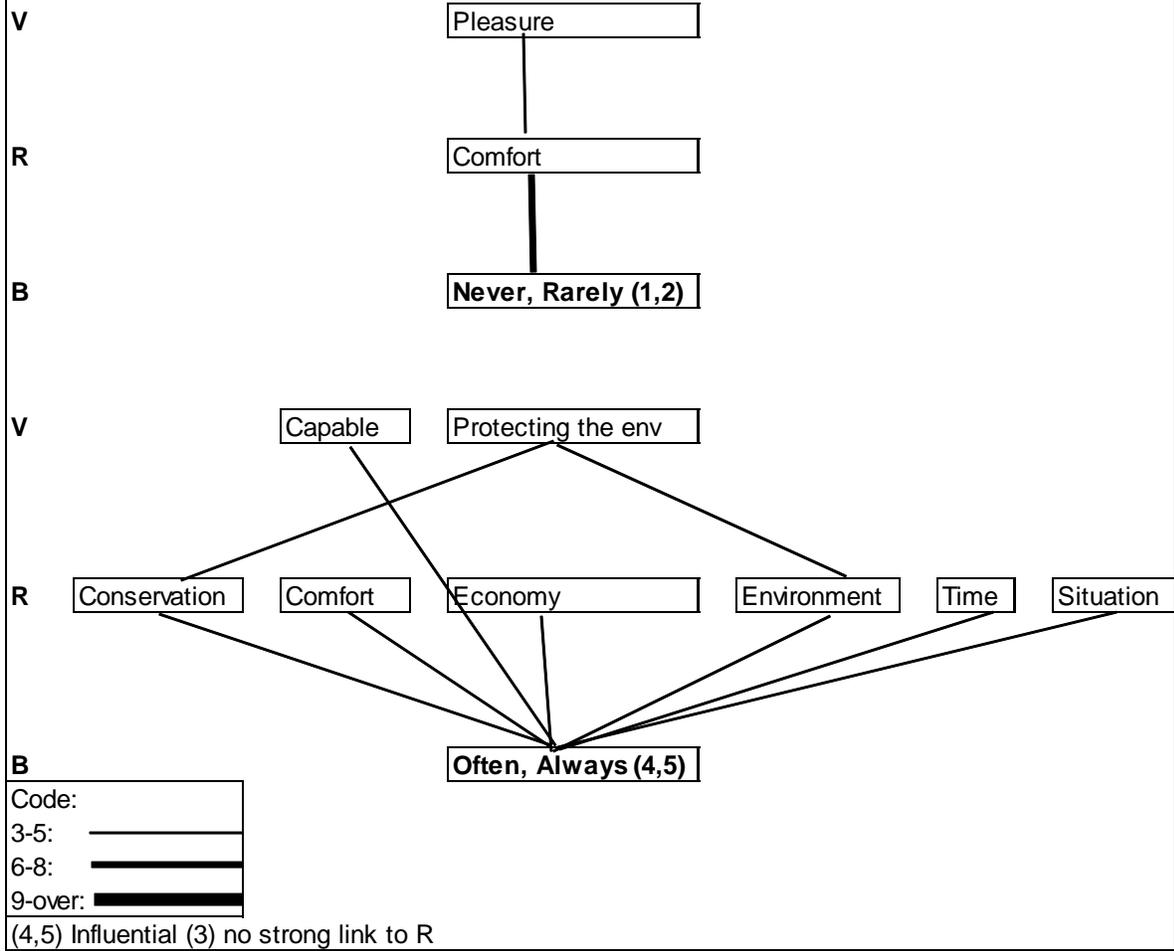


Q8: Keep household heating low to save energy

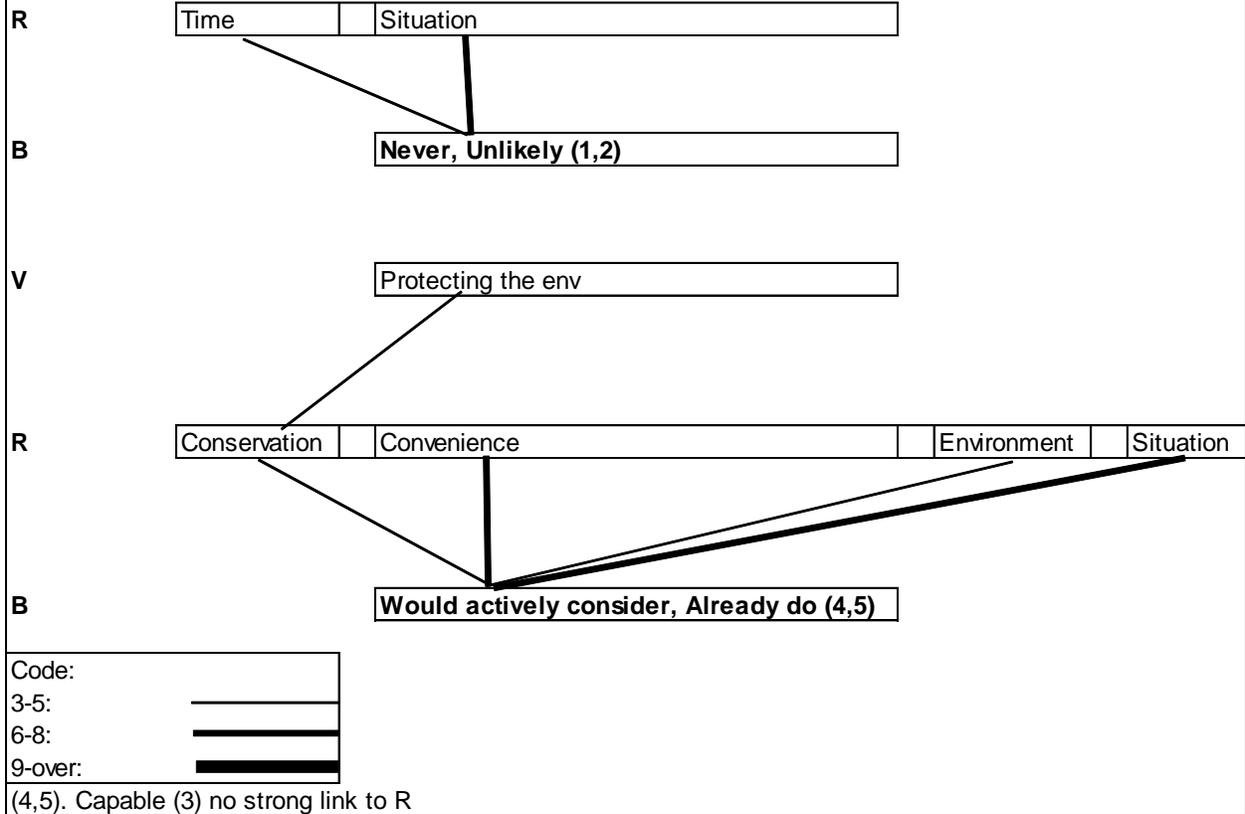




Q10: Taking shorter showers

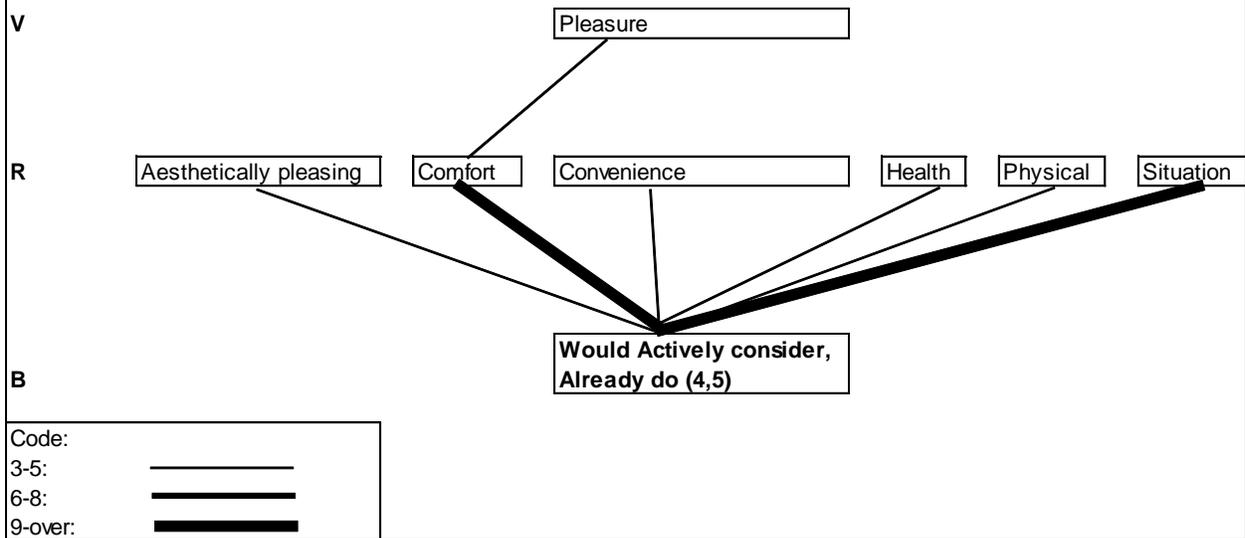


Q11: Doing dishes by hand

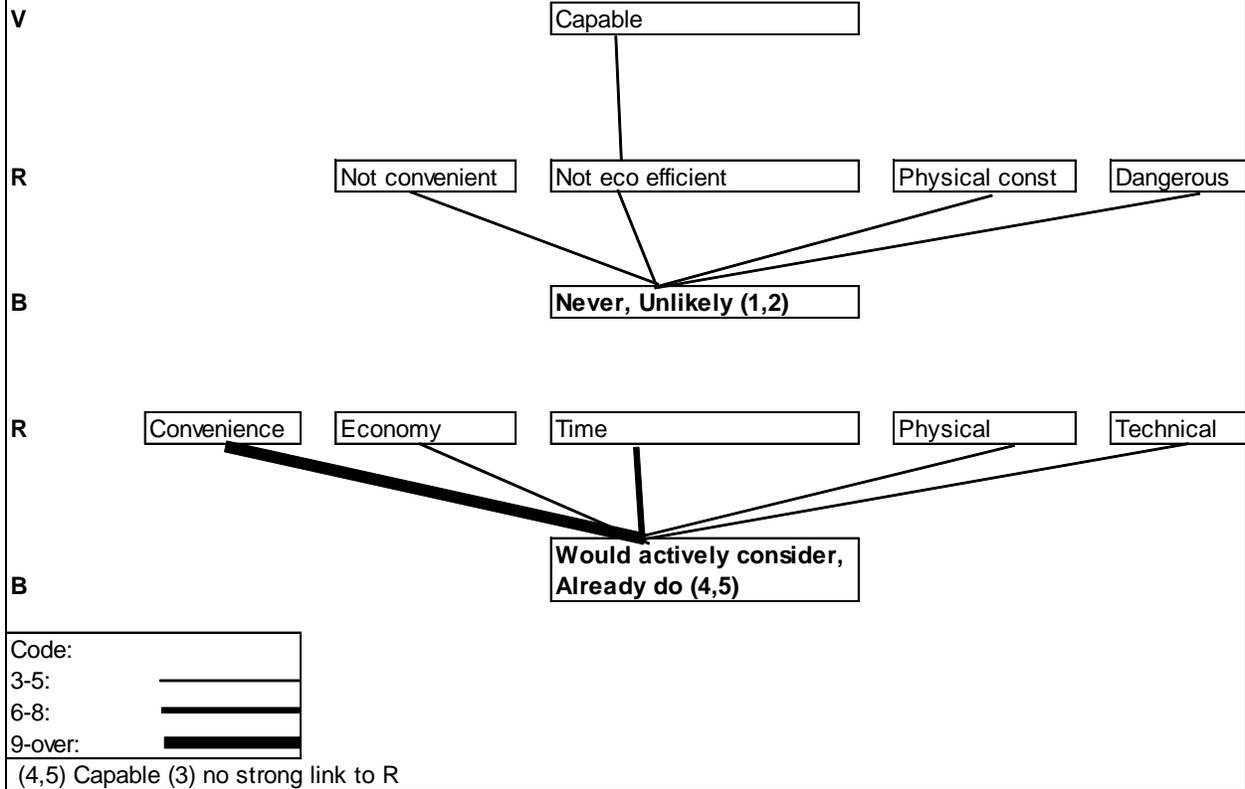


Q12: Cooling down house by opening windows

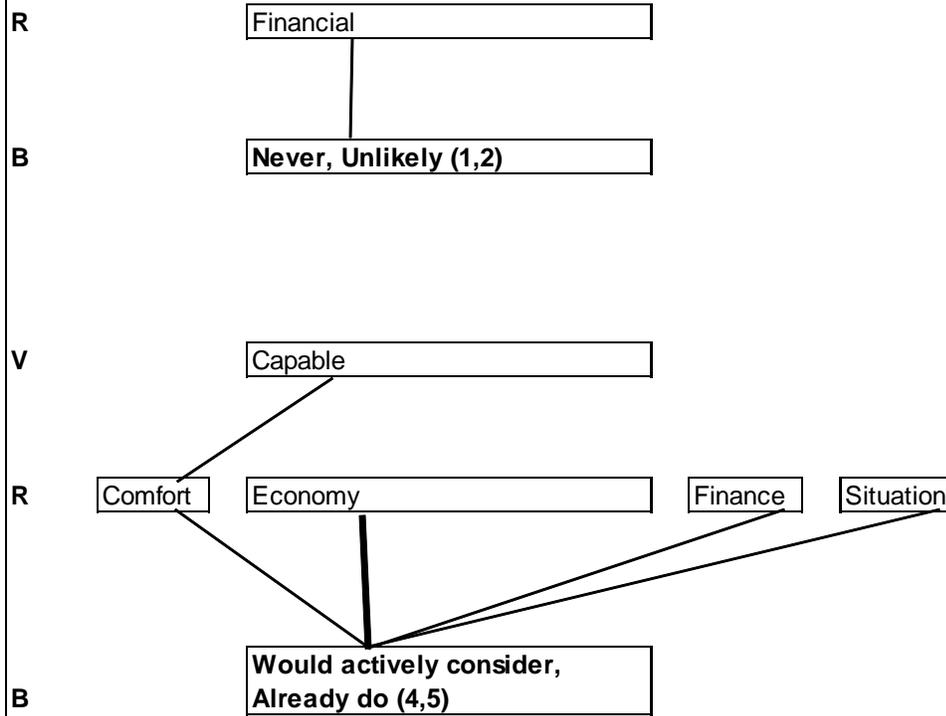
No (1,2) map



Q13: Cooking on gas



Q14: Installing double glazing

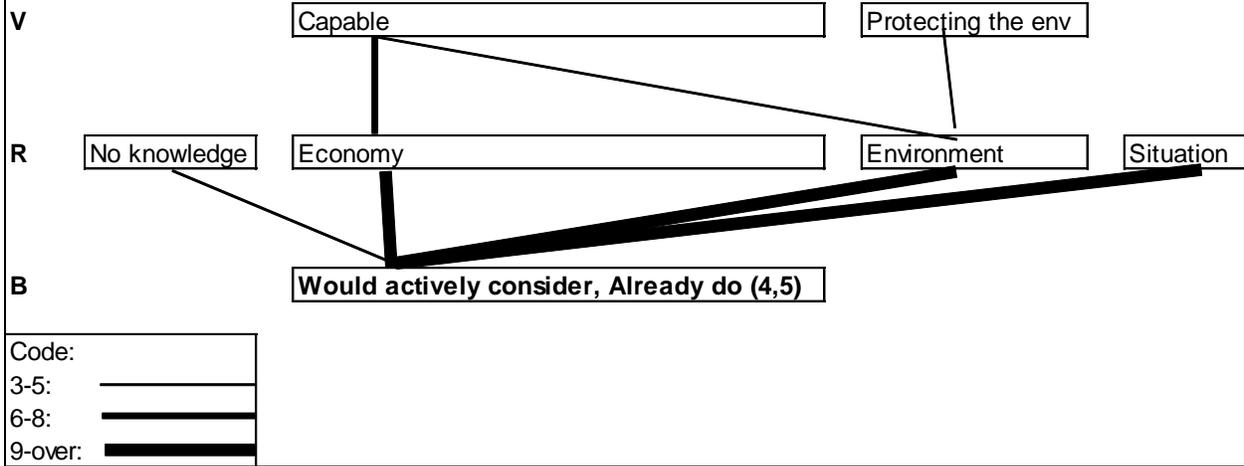


Code:	
3-5:	—
6-8:	==
9-over:	===

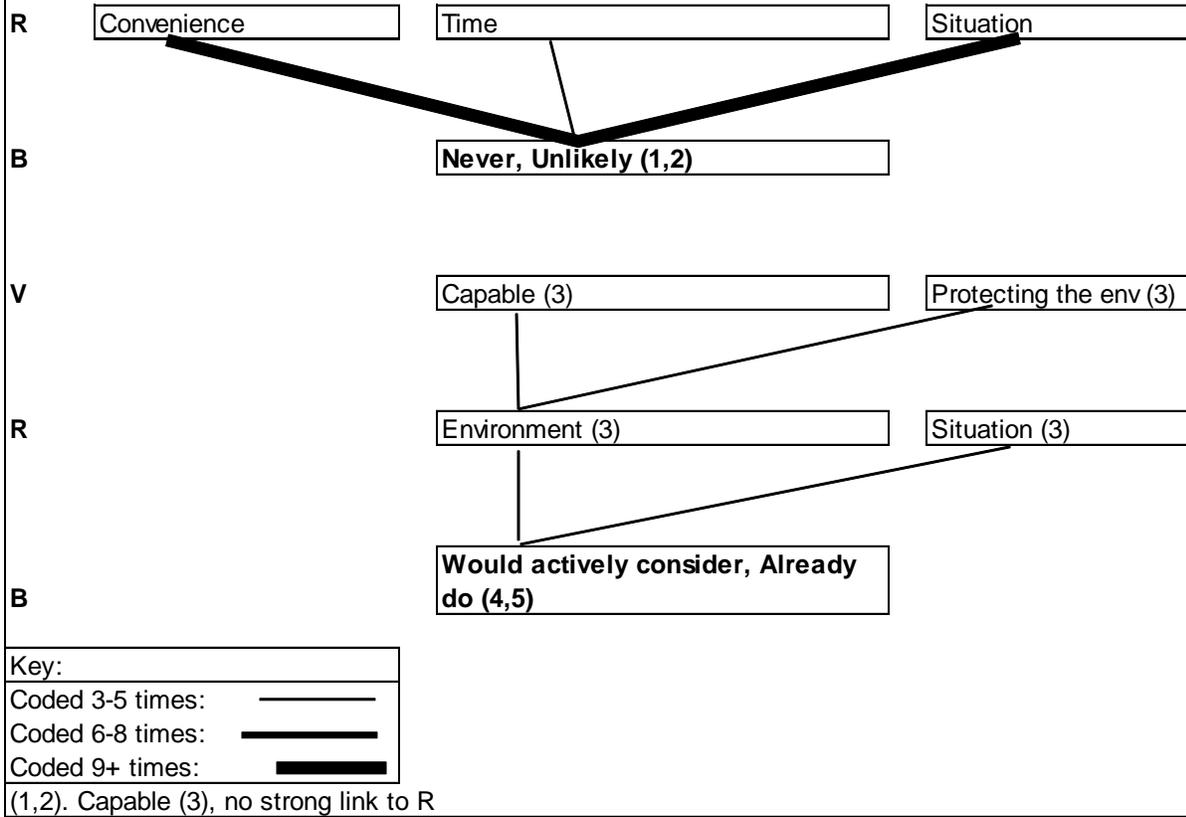
(1,2). Capable (3) no strong link to R
 (4,5). Choosing own goals (3). No strong link to R
 (4,5) Intelligent (6). No strong link to R

Q15: Installing an energy efficient refrigerator

No map for (1,2)

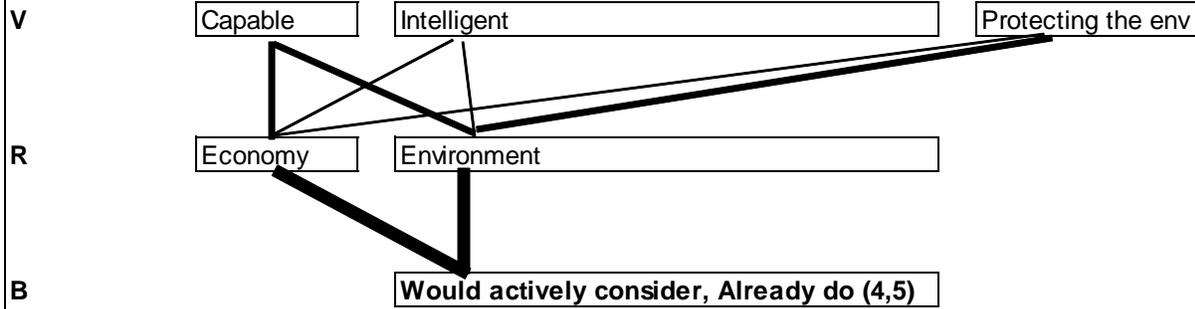


Q16: Buying a smaller refrigerator



Q17: Installing an energy efficient washing machine

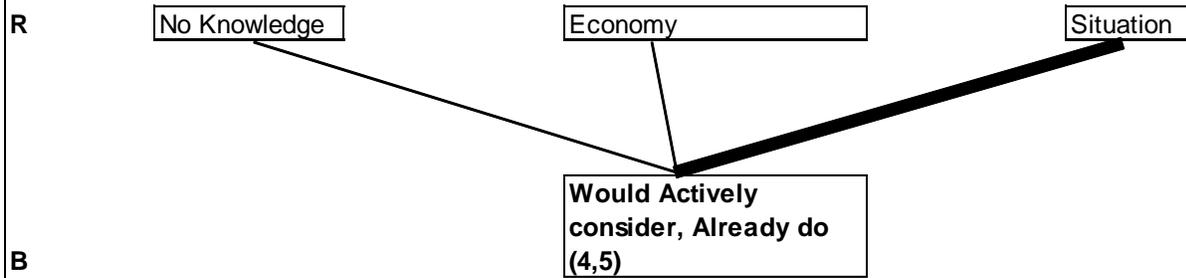
No map for (1,2)



Code:
 3-5: ———
 6-8: ———
 9-over: ———

Q19: Insulation of heating pipes

No (1,2) map

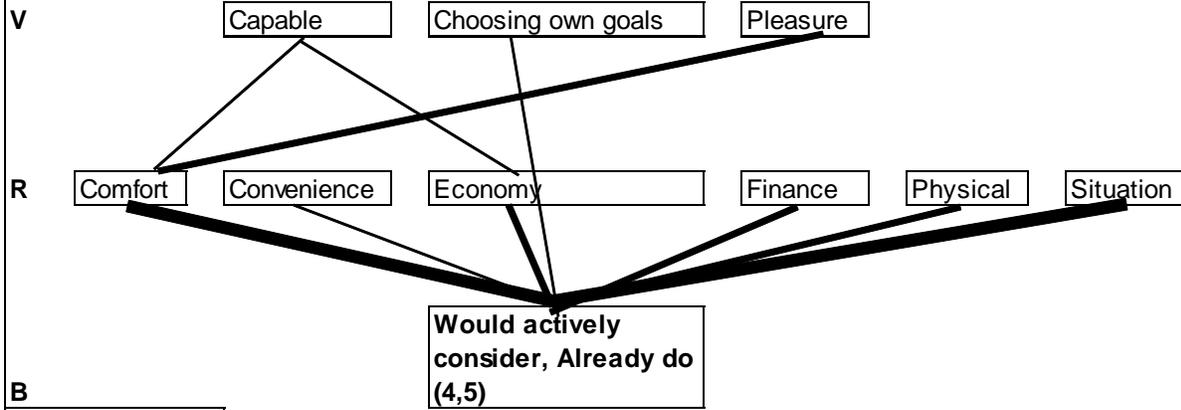


Code:
 3-5: ——— 1pt width
 6-8: ——— 2 1/4 pt width
 9-over: ——— 4 1/2 pt width

(4,5). Capable (4) no strong link to R

Q20: House insulation

No map for (1,2)



B

Key

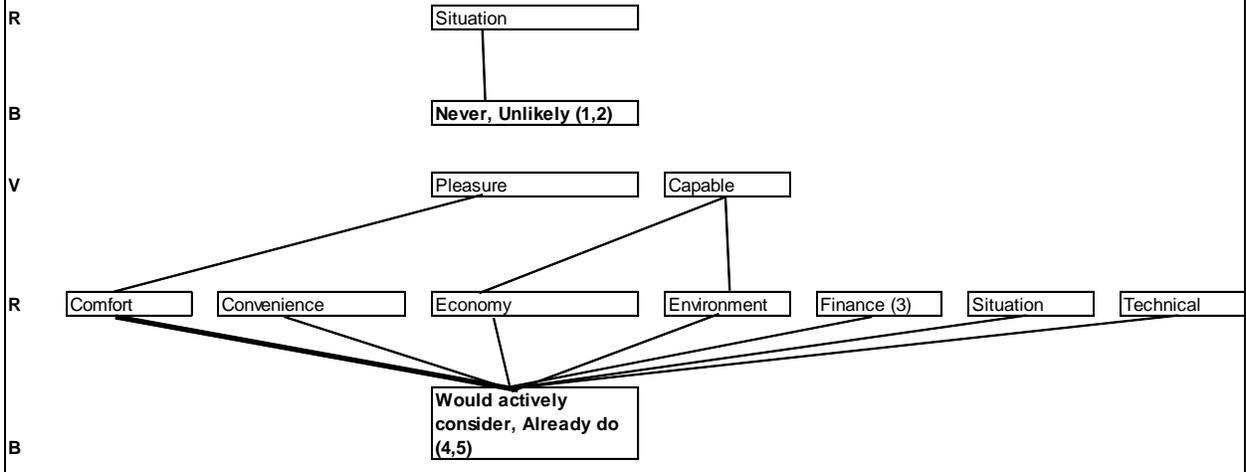
3-5 times —

6-8 times —

9+: —

- (4,5). A meaning in life (3) no strong link to R
- (4,5). Intelligent (3) no strong link to R
- (4,5). Protecting the env (4) no strong link to R

Q21: Installing an energy-efficient heating system (such as a heat pump)



Code:

3-5: —

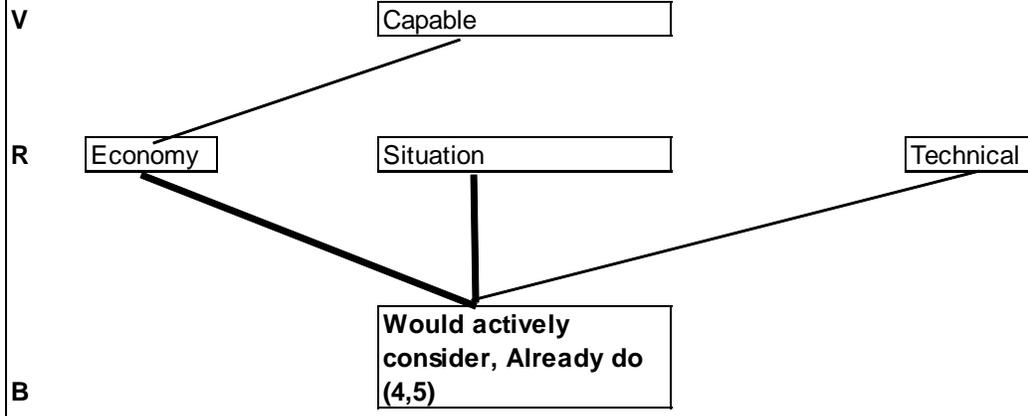
6-8: —

9-over: —

- (4,5). Intelligent (3) no strong link to R
- (4,5). Obedient (3) no strong link to R

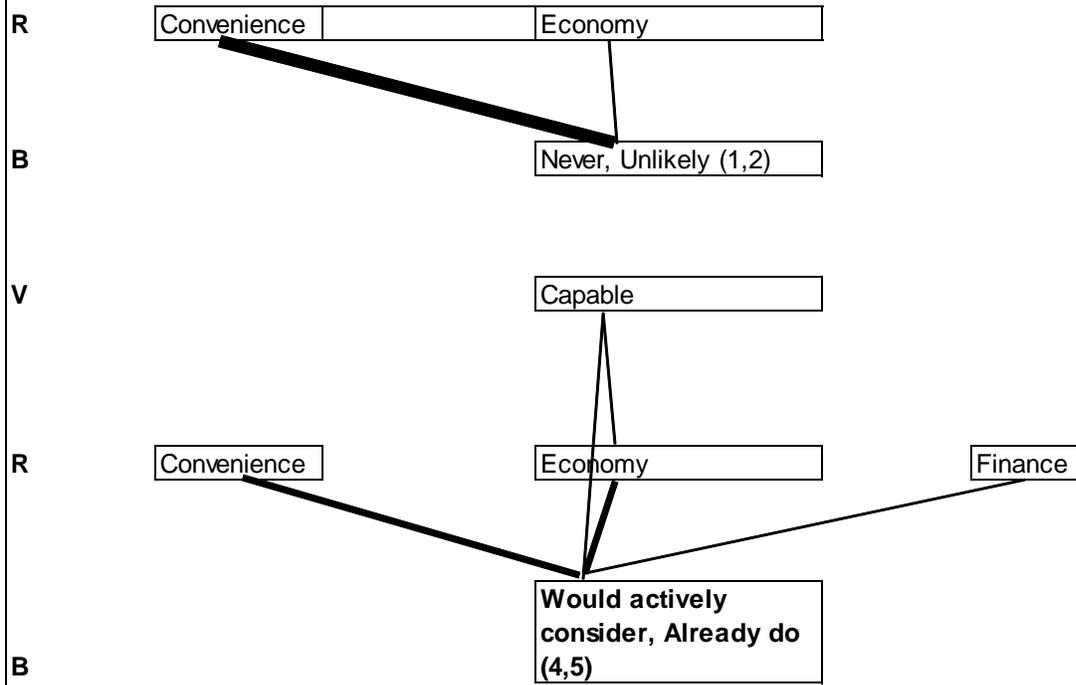
Q22: Applying hot water insulation

No map for (1,2)



Code:
3-5: _____
6-8: _____
9-over: _____

Q23: Changing energy suppliers to save money



Code:	
3-5:	_____
6-8:	=====
9-over:	—————

(4,5). Protecting the env (3) no strong link to R