FUEL POVERTY IN NEW ZEALAND – A PUBLIC POLICY INVESTIGATION

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Abstract

'Fuel poverty' means an inability of a household to afford an adequate level of energy services and appears to be entrenched for a proportion of the population. Because the issue is not formally recognised within policy there are gaps in knowledge about the extent of fuel poverty and the scope for policy interventions.

The objectives of this study are to investigate fuel poverty as a public policy issue and develop recommendations on policy priorities. Evidence for the existence of fuel poverty has been assembled and analysed, a conceptual framework developed, and New Zealand's particular circumstances and policy settings tested against this framework. Information for the study was assembled mainly through scrutiny of secondary sources, supplemented with primary-source information gathered from key informants.

The study has found strong evidence for the existence of fuel poverty, largely correlating to a socio-economic and deprivation gradient. Current policies on insulation and electricity affordability are having some positive impact, but crucial information about the specific benefits for vulnerable and at-risk households is lacking. It is recommended that this issue be re-considered within the policy agenda as one of 'energy service deprivation', with the policy objective to enable 'energy service sufficiency' for all.

Preface and acknowledgments

This work stems from a long-standing interest and involvement I have had in fuel poverty. I was involved in establishing Community Energy Action in 1993–1994, a charitable trust based in Christchurch set up with the primary aim of addressing fuel poverty at the community level, and have continued to serve as a trustee. At that time the issue did not seem particularly complex or large, and with naïve optimism we considered that in a few years this problem would be 'solved'. Two decades on, while much progress has been made, the persistence of this issue invites scrutiny.

Inevitably the Community Energy Action experience influences the perspective I bring to this work. It is hoped that this experience adds to the breadth of understanding rather than adding undue bias.

I wish to acknowledge the following who have assisted with this study: key informants interviewed for this project who gave willingly of their time and expertise; my supervisor Dr Amanda Wolf, School of Government, Victoria University of Wellington for her encouragement and wise counsel; and to Caitriona Cameron for her unwavering encouragement and support during the course of this study.

Glossary of abbreviations

AHC	After housing costs
CSC	Community Services Card
CSRE	Centre for Social Research and Evaluation
DECC	Department of Energy and Climate Change
EECA	Energy Efficiency and Conservation Authority
ESC rights	Economic, Social and Cultural rights
ELSI	Economic living standards index
EWM	Excess winter mortality
FPAG	Fuel Poverty Advisory Group
HEAP	Household Energy Affordability Project
HEEP	Household energy end-use project
HES	Household Economic Survey
HNZC	Housing New Zealand Corporation
HRC	Human Rights Commission
IEA	International Energy Agency
ICESCR	International Covenant on Economic, Social and Cultural Rights
kWh	kilowatt-hour
MSD	Ministry of Social Development
NGO	Non government organisation
NZFFBS	New Zealand Federation of Family Budgeting Services
NZLSS	New Zealand Living Standards Survey
NZPC	New Zealand Productivity Commission
PPM	Pre-payment meter
UDHR	Universal Declaration of Human Rights
WUNZ:HS	Warm Up New Zealand: Heat Smart

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1. Introduction

1.1. Overview and rationale

'Fuel poverty', as a term, originated in the United Kingdom in the mid 1970s and can be described as the *inability of a household to afford a sufficient level of energy services in the home* (see S1.3). Energy services are the things people need and desire from their use of energy e.g. warm and comfortable rooms, hot water, lighting, cooked food (Lovins, 1977), and are widely regarded as indispensable to modern living. Being deprived of energy services can adversely impact on people's physical and mental health, their wellbeing, and their social functioning (Boardman, 1991a; Hills, 2011).

In 1992 the New Zealand government explicitly recognised the importance of energy services to people's lives by specifying one desired outcome of energy policy as "basic energy services remain accessible to all members of New Zealand society" (New Zealand Government, 1992). Yet while government programmes and activities over the last two decades have focused on particular aspects of this issue fuel poverty seems well entrenched (Laugesen, 2011; Howden-Chapman, et al., 2011).

In 2008 the government began a three-year investigative study called the *Household Energy Affordability Project* (HEAP). Its focus included scoping energy affordability issues and developing "policy and other responses to fuel poverty" (MSD & EECA, 2010). Two reports were published – a literature review (MSD & EECA, 2010) and a qualitative survey (CSRE, 2010) – but in 2010 the project prematurely ended. A proposed quantitative assessment of fuel poverty did not proceed and the policy outputs were undelivered.

The continued lack of a policy focus, together with the apparent continuing presence of fuel poverty in the community, provides the impetus for this project. It is intended that this study contribute to the two areas that remained unfinished from the HEAP - the quantitative understanding of fuel poverty and policy responses. While it is acknowledged that government is actively addressing closely related issues (e.g. 'cold homes' and electricity

supplier switching) these issues are not necessarily fully congruent with the scope of fuel poverty.

1.2. Objectives and methodology

The objectives of this study are to investigate fuel poverty as a public policy issue in New Zealand, and develop recommendations on policy priorities. The approach has been to assemble and analyse evidence for the existence of fuel poverty, develop a conceptual framework in which to locate fuel poverty policy, and test New Zealand's circumstances and policy settings against this framework.

Information for the study was assembled mainly through scrutiny of secondary sources, supplemented with primary-source information gathered from key informants from central government, the electricity sector, the NGO sector, and private business. Key informant information was provided either through a formal interview or via email correspondence. Formal interviews were conducted in accordance with procedures approved by Victoria University's Human Ethics Committee (see Appendix 1). In total 15 people from 10 organisations were interviewed and a further 4 people from two organisations provided information via email correspondence. Where approvals were granted some information provided has been cited and attributed. Otherwise the information provided has been used for background and contextual purposes and is unattributed.

1.3. Report layout

Chapter 2 provides a brief background on the development of fuel poverty policy in the United Kingdom because of its influence on the way the issue is portrayed in New Zealand. Chapter 3 outlines household energy use in New Zealand and summarises the evidential base for the existence and depth of fuel poverty. The core evidential base is provided as Appendix 2. Chapter 4 develops the conceptual framework, and Chapter 5 assesses New Zealand's current policy performance against this framework. Chapter 6 contains conclusions and recommendations.

1.4. Terminology

Fuel poverty – The original meaning of 'fuel poverty' was "an inability to afford to keep warm" (Boardman, 1991a). Cold homes and warmth remains a major focus, but when the United Kingdom government adopted a formal strategy for fuel poverty in 2001 all energy use in the home was encompassed (UK Government, 2001). Thus the broader definition of fuel poverty, covering all core household energy services, is used here.

'Fuel poverty' is a contested notion. Some do not regard fuel poverty as distinct from poverty in general; some accept the general condition but are concerned about the 'poverty' connotations of the terminology; some reject the specific definition used in the United Kingdom; and some regard the use of 'fuel' in the local context as a misnomer and misleading because of the dominance of electricity in household energy use. Government officials working on the HEAP substituted fuel poverty with 'energy hardship' and used 'energy affordability' as a broader descriptor of the issue (CSRE, 2010). In other countries various terms are used. 'Energy affordability' is commonly used in the United States; the French use *"précarité energétique"* (energy precariousness), and 'vulnerable customer' is the term adopted within the European Union relating to electricity markets (Heffner and Campbell, 2011). 'Energy poverty' is used as the descriptor in developing countries (IEA, UNDP & UNIDO, 2010).

This essay initially uses 'fuel poverty' because (a) it has generated some level of common currency (e.g. Lloyd, 2006; CEA, 2008; Howden-Chapman et al., 2011), and (b) its broad meaning is worthy of public policy investigation. But throughout the essay the term is put under scrutiny for its *fitness for purpose* and as will be discussed the term *energy deprivation* offers advantages as a descriptor within the NZ context (see below also).

Energy service sufficiency – Since fuel poverty is a condition of *energy service deprivation*, freedom from fuel poverty creates a condition of energy service sufficiency. Thus *energy service sufficiency* is used throughout this report as the antonym of fuel poverty. This is consistent with the notion of "sufficient energy services" developed by the HEAP (CSRE, 2010).

Energy services, energy use and energy efficiency - Householders purchase or acquire energy to enable energy services to be provided. Various types of energy can be used (e.g. electricity, gas, wood), but all energy can be measured in a common metric. The energy metric used in this report is the kilowatt-hour (kWh). Energy services are related to energy use by the efficiency with which energy is converted to provide the energy service. Households can achieve high levels of energy service with low levels of energy use if they have highly energy efficient houses, appliances and practices. Conversely, poor efficiency produces low levels of energy service per kWh of energy used. Energy services do not have a common metric, although arguably they might be measured as units of 'well-being' or similar.

2. United Kingdom background

2.1. Early developments

'Fuel poverty' emerged as a public policy issue in the 1970s through public awareness of the social implications of the large energy price increases, economic recession, and fuel supplier disconnection policies that were occurring at the time (Boardman, 1991a). While it would take over two decades for the term to be formally recognised by central government, in the interim non-government organisations, local authorities, and central government agencies became engaged around concerns with cold homes and affordable warmth. The first household energy efficiency project was initiated by Friends of the Earth in Durham in 1975 (Boardman, 1991b), and many other local projects followed based around newly established funding from government (Boardman, 1991a, Neighbourhood Energy Action, 1991). Two other factors became prominent drivers of projects and provided the rationale for central and local government funding: first, local projects provided employment generation in often economically depressed areas, and second, the United Kingdom's relatively high excess winter mortality (EWM)[1] was being causally linked in part to the country's cold and poorly insulated homes, and energy upgrades were seen as addressing this concern (Collins, 1986; Boardman, 1986).

The Blair government, elected in1997, launched the *UK Fuel Poverty Strategy* in 2001 (UK Government, 2001). The Strategy was notable for adopting a formal definition of fuel poverty and setting binding targets for reducing, and ultimately eliminating, fuel poverty[2]. In England fuel poverty in the priority group (i.e. those deemed to be most at risk) was to be eliminated by

[1] The EWM is a measure of additional deaths over a 4 month winter period compared to the remainder of the year. It is also expressed as an index – the ratio of average monthly EWM divided by the monthly average of non-winter deaths multiplied by 100 (see Office for National Statistics, 2011).

[2] The Strategy covers the United Kingdom but specific interim targets and reporting responsibilities apply to the devolved regions (Scotland, Wales and Northern Ireland).

2010, with all households out of fuel poverty by 2016. The Strategy also revamped funding into a fuel poverty-focused retrofit grants scheme (*Warm Front*), and established a strong monitoring capability including an independent monitoring and advisory entity, the *Fuel Poverty Advisory Group* (FPAG).

2.2. The formal definition of fuel poverty

Fuel poverty was officially defined as a quantitative measure of the cost of energy relative to income; a household is in fuel poverty when it "needs to spend more than 10% of its income on all fuel use and to heat its home to an adequate standard of warmth" (UK Government, 2001). The definition is specified through a formal methodology (see DECC, 2010) with key points being:

- Fuel poverty is defined by what a household needs to spend, not what it actually spends i.e. it encompasses the notion of energy service sufficiency, using a calculation methodology that accounts for the energy efficiency of the dwelling and the specific fuels used.

- The definition captures the cost of all energy needed by the household, not just that required for heating.

- Disposable income is used (i.e. after tax) including all government housing support mechanisms and payments[3].

Despite adherence to a detailed, prescriptive methodology, at least one crucial aspect of the definition is quite tenuous. The 10% threshold was apparently based on little more than an

[3] Two different income calculations are used – 'full income' is used in the headline measure of fuel poverty, but a 'basic income' calculus is also provided which excludes a number of housing related benefit payments (and if used results in higher numbers of households in fuel poverty) (see DECC, 2010).

educated guess that twice the then median household spend on energy of 5% of net income would represent an at-risk threshold (Boardman, 2009).

Nevertheless, this methodology has led to a relatively simple formula whereby a household would be in fuel poverty if it met the following condition:

$$\frac{\text{Annual required energy use (kWh)} \times \text{Average cost per unit of energy (\$/kWh)}}{\text{Annual disposable income (\$)}} \geq 10\%$$

This formulation has led to the commonly quoted view that "There are three main causes of fuel poverty: poor energy efficiency in the home; high energy prices; and low household income" (DECC, 2012).

2.3. The last decade – successes and failures

When the fuel poverty strategy was enacted 1.7m households were estimated to be in fuel poverty in England (8.1% of total households) (FPAG, 2004). By 2003 this had reduced to 1.2m households, giving a level of confidence that the strategy was on course to achieve its targets (UK Government, 2005). However, fuel price rises and the economic fall-out from the global credit crisis saw these trends sharply reverse. By 2009 the number of households in fuel poverty in England had reached 4.0m (18% of households). Fuel poverty is strongly associated with low incomes, and the 'depth' of fuel poverty (the difference between required energy and what a household actually spends) also displays a strong income gradient Figure 1).

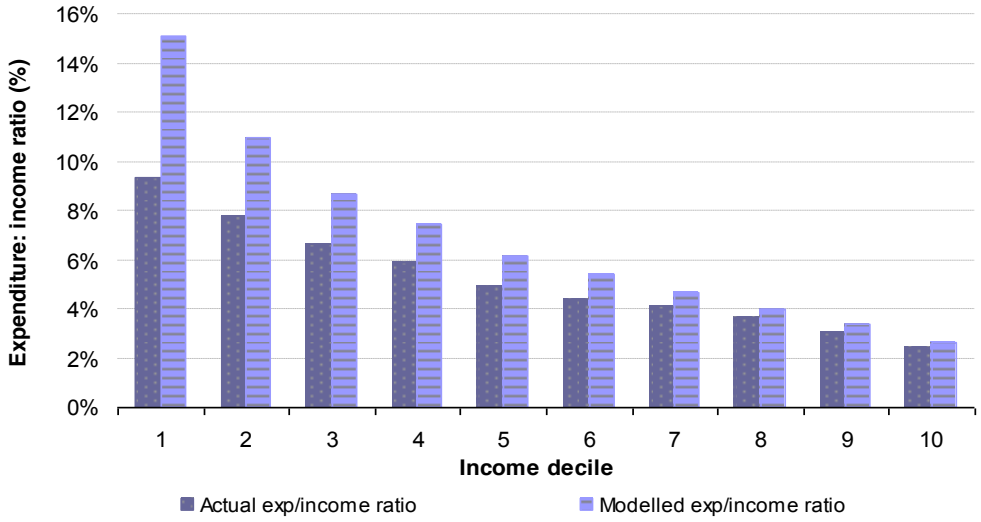

Figure 1. Comparison between actual and modelled energy expenditure/disposable income ratios across income deciles United Kingdom 2009 (Source: DECC, 2011).

These adverse trends have led to much scrutiny of the policy. The FPAG, reflecting perhaps its independent 'guardian' role of the fuel poverty strategy, advocated for more resources, better targeting, action to reduce the high charges borne by consumers using pre-payment electricity meters (PPMs), and implementation of regulations for private rental properties (FPAG, 2010; 2011). The Government, however, through their Spending Review announced an end to Warm Front in 2013, with fuel poverty programmes to be largely funded and run through energy supplier obligations linked to carbon emissions savings (HM Treasury, 2010). An independent review of the fuel poverty policy was also commissioned. The subsequent reports (Hills, 2011, 2012) have made a series of recommendations including changes to the way fuel poverty is defined and measured. The implications of these findings will be discussed further in Chapter 4.

3. New Zealand – evidence of fuel poverty

3.1. Introduction

Until the 1980s manifest signs of fuel poverty in New Zealand were not obvious. A scan of the main energy policy documents in the 1970s to mid 1980s reveals few references to energy affordability or equity issues[4], although that is not to say these issues did not exist. For example, poverty was emerging amongst newly urbanised Maori in the 1960s and 1970s – an issue not fully appreciated at the time (King, 2003). The economic reforms of the early 1990s saw a substantial change in the circumstances of low-income households. Electricity prices moved upwards to market rates, market rentals were introduced for state house tenants, and incomes were reduced for most low-income households (Kelsey, 2003). Low income, urban households were particularly susceptible to electricity price increases because of the dominant role that electricity had assumed as a form of household energy. This can be traced to the government's electricity developments of the mid-20th century (Rennie, 1989), and the decline in traditional practices of accessing and using cheap wood supplies for household energy, especially in urban areas. Furthermore, government policies provided for lower electricity prices for residential consumers by cross-subsidising from commercial and industrial users (in itself something of a de-facto policy to provide energy service access and affordability). In comparison with most other developed countries New Zealand homes became highly electricity-dependent. By 2010 electricity comprised almost 75% of household energy use and 86% of energy costs on average (MED, 2011a; Statistics New Zealand, 2010).

Energy consumption is spread amongst several end-uses with space heating and hot water heating accounting for almost two-thirds of energy use on average. Space heating averages 34% but is highly variable between households (20% or less in warmer areas to over 50% in

[4] An early acknowledgement within the energy agenda of the time was from the then Energy and Minerals Advisory Committee (1987) who recognised potential social impacts arising from higher energy prices and reported some public concern (via submissions) to see greater social equity through ensuring access for all citizens to energy supplies (p11).

cooler areas) (Isaacs et al., 2006). A related factor is what might be described as a cultural disposition for New Zealanders to sparsely heat their homes, a characteristic that appears to have little to do with income (Isaacs, Amitrano, Camilleri, Pollard & Stoecklein, 2003). Various explanations have been offered; that this culture derives from pioneering 'macho' attitudes, shunning the need for warmth; that exposure to fresh air is associated with good health; that parsimonious heating reflects an attitude of thrift and good household management; and that numerous public energy conservation campaigns over the years have reinforced a sense of personal sacrifice (particularly by the elderly) for the wider good (Taylor Baines & Associates, Smith, McChesney & Butcher, 2005; Cupples, Guyatt & Pearce, 2007; Isaacs et al., 2003). Whatever the reasons – and they are all likely to have some validity – this aspect of New Zealand's household energy culture is integral to the consideration of fuel poverty.

3.2. Assessing fuel poverty

Some assessments of the incidence of fuel poverty have been undertaken using the United Kingdom 10% threshold definition and have put the number of households in fuel poverty in New Zealand at 10-14% in 2001 (Lloyd, 2006), and a "ballpark" estimate of up to 25% in 2008 (Lloyd & Callau, 2009; Howden-Chapman et al., 2011). Howden-Chapman et al considered that the "dramatic" increase in fuel poverty numbers from 2001 to 2008 was due mainly to electricity prices increasing much faster than incomes. However these assessments are problematic. Rather than using specific household data, generalised, proxy numbers have been used for many of the calculations[5]. Also, the assessments found that fuel poverty conformed to a strong geographic gradient (i.e. much higher in colder areas), but this finding, rather than necessarily being indicative of fuel poverty, highlights issues with the definition. By defining fuel poverty as an energy cost threshold the ability of householders to afford higher energy costs if they incur lower costs in other areas of expenditure is ignored. For

[5] The United Kingdom methodology uses a 'ground up' approach whereby a representative survey of houses, using specifically calculated energy need and actual energy costs, forms the basis of the calculation of fuel poverty.

example in 2006 average rental costs were $275/week in the Auckland region, reducing to $211/week in Wellington, $200/week in Canterbury, $181/week in Otago and $131/week in Southland (Statistics New Zealand, 2011a) – suggesting that higher energy costs in colder areas may not necessarily be unaffordable.

Rather than relying on the United Kingdom definitional approach the following paragraphs summarise a set of evidence based around the broader definition of fuel poverty outlined on page 1. This summary is drawn from a more detailed review contained in Appendix 2.

Electricity prices – Since the late 1980s real household electricity prices have increased by over 70%. Many vulnerable households are fully reliant on electricity for their energy needs and they may also be paying higher-than-average prices because of debts incurred, or be tied to more expensive tariffs because of their circumstances.

Bill paying difficulties –The 2008 *New Zealand Living Standards Survey* (NZLSS) found that 11% of people could not pay electricity/gas/water bills on time because of a shortage of money more than once in the last 12 months. These people were spread across low-middle deprivation groups but with a concentration in the most disadvantaged group i.e. there was a distinct 'deprivation gradient'. Late bill paying also has adverse compounding effects – people lose prompt payment discounts, they may get into energy debt, and they may face disconnection.

Disconnections - Disconnections for electricity non-payment occur in two ways – the 'visible' disconnections initiated by electricity suppliers, and the 'hidden' disconnections caused when households on pre-payment meters (PPMs) are unable to retain electricity supply because they lack money to charge the meter. In total over 50,000 households (over 3% of all households) suffered disconnection for financial reasons in 2011.

Income poverty - In 2009–10, 500,000–750,000 people (including 170,000–270,000 children) were in households with incomes below low-income thresholds (i.e. 'in poverty'). This equates to some 200,000–300,000 households (12–18% of households). These numbers have been generally steady for the last decade after a rise in poverty rates in the early 1990s.

Trends by household and family type show sole-parent households with dependent children have the highest rate of income poverty; they also had the largest increase in poverty rates over the last two decades.

Warmth and dampness – Several studies undertaken in the last decade show that many houses have indoor temperatures well below recommended levels. Along with associated dampness and mould these conditions represent a risk to health and well-being. In part the issue straddles income bands, suggesting that lifestyle or the cultural disposition to minimally heat are important factors. But there is also a strong association with lower incomes and deprivation (Figure 2). Winter heating costs are particularly problematic because of high and often unpredictable winter power bills – hence heating is often the first to be cut back.

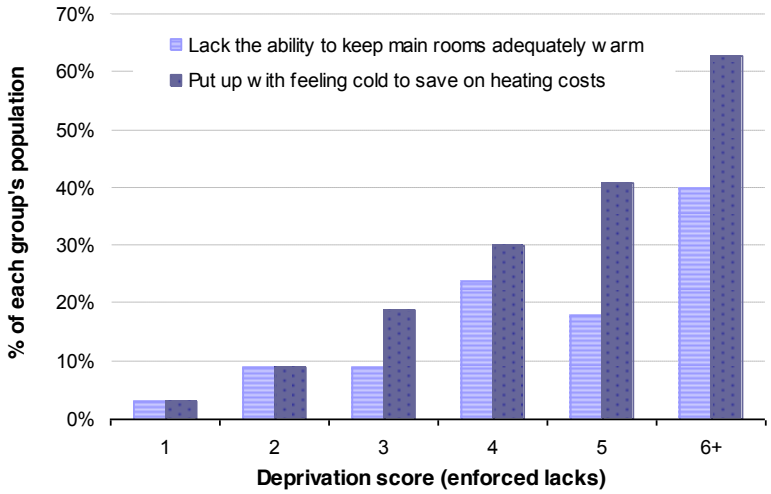

Figure 2. Rates of fuel poverty indicators by deprivation group[6] (Source: from the New Zealand Living Standards Survey (NZLSS) 2008 (Perry, 2009)).

Cold homes and child poverty – Similar warmth and dampness deprivation gradients are also associated with child poverty. The *Growing Up in New Zealand* study, reporting on babies at

[6] An 'enforced lack' was constructed as a measure of deprivation to indicate whether the lack of a particular need was enforced by lack of income or resources, as distinct from choice.

9 months of age (data was collected during the 12 months to January 2011), found overall 18.4% of households "putting up with feeling cold to save on heating costs", with progressively higher levels of mould, condensation and dampness, and houses lacking heating being found in more deprived areas (Morton et al., 2012).

Adverse health effects – A range of studies focusing on the health impacts of cold, damp and under-heated homes have been carried out under the Wellington School of Medicine *He Kainga Oranga* Housing and Health research programme. These studies have found measurable health impacts in under-heated and under-insulated homes for those with pre-existing respiratory conditions, and higher winter hospitalisation rates related to a range of household factors including relative socio-economic deprivation and dwelling quality. Higher rates were found in Maori and Pacific households.

Heating characteristics – There is a large range in the energy costs for common heating appliances (Figure 3). Many low income households purchase appliances to minimise investment cost and to be portable (bearing in mind the high likelihood of regular shifting because they are renting), with running cost, efficiency or heating effectiveness secondary. This puts these households to the right hand end of Figure 3 (e.g. plug-in electric heaters and unflued gas heaters) paying 3–4 times the energy cost of more efficient appliances.

Heat pump availability and use is increasing rapidly with approximately 35% of houses having heat pumps in 2011, up from 2% in 2000, but the proportion of low income houses with heat pumps is unclear.

Affordability – Relative to income and other household expenses, energy expenditure has increased substantially for the lowest three income deciles in the last two decades. Cost pressure is also coming from increases in other expenses. After a period from the late 1990s–mid-2000s where rental costs declined relative to income there has been generally upward price pressure since (NZPC, 2012). An increasing number of households are spending more than 30% of their income on housing – for those that are renting the increase was from 34% in 2010 to 39% in 2011 (Statistics New Zealand, 2011c).

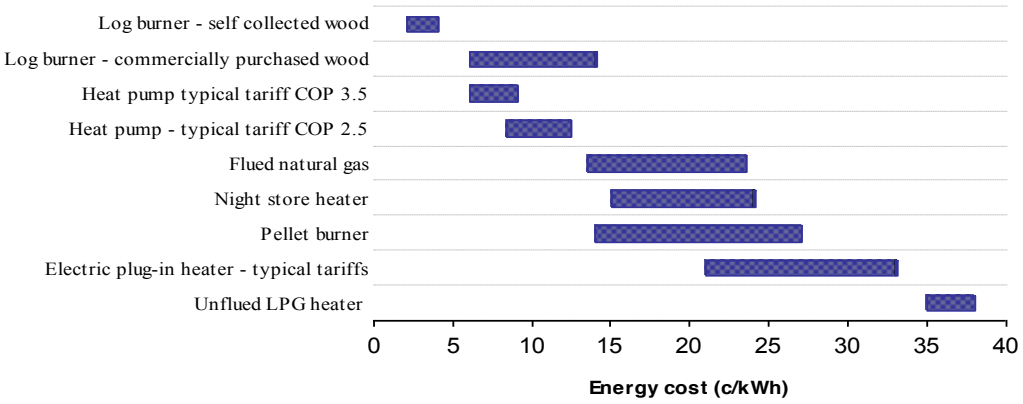

Figure 3. Energy costs for various heating appliances 2011-12 (sources: this study; Frederikson & Whitley, 2012)

3.3. Discussion

There is strong prima facie evidence for the existence of fuel poverty. However, the information outlined above needs careful interpretation because it comprises a mix of trends and snapshots-in-time, but often at different times. Also, some of the information is several years old and pre-dates recent government initiatives in this area (see further below). Some information applying specifically to vulnerable households (as distinct from national averages) was not able to be found e.g. prices paid for energy. Also, because 'energy services' are not captured in any of the measures the potential energy disparity between the fuel poor compared with those that might be described as 'energy healthy' is not necessarily obvious. An indication can be gained by an example given in Appendix 2 where for the same energy cost an energy deprived household was achieving only 40% of the energy service of an 'energy healthy' one.

The NZLSS deprivation assessments were made in 2008. Up to that time just over 60,000 low income houses had been insulated by government-funded schemes and Housing New Zealand Corporation's retrofitting. But since then over 100,000 low income homes have been insulated. Efficient, clean heating has also been provided in a proportion of homes. Most

upgrades have been part-funded by the government's flagship home insulation programme *Warm Up New Zealand: Heat Smart* (WUNZ:HS) which was established in 2009 with $340M of central government funding to retrofit 188,500 houses, including at least 70,000 homes occupied by those on low incomes[7], over the period 2009–2013 (New Zealand Government, 2011). Announcements in the 2012 Budget have extended the scheme until 2014, targeting a further 41,000 homes, but within previous financial appropriations i.e. there is no additional funding (The Treasury, 2012). Heating and insulation retrofitting has also occurred in association with implementing national air quality standards through regional councils, which require non-complying household solid fuel burners to be phased out in 22 urban areas (Ministry for the Environment, 2011).

Three electricity supply initiatives are also relevant. First, since 2004 electricity retailers have been required to provide a low fixed charge tariff option for households using less than 8,000kWh per year[8]. Second, guidelines have been developed in relation to supply and payment issues for medically dependent and vulnerable customers (Electricity Authority, 2010a, 2010b). These guidelines establish minimum expectations on retailers with an emphasis on minimising disconnection. Third, government-sponsored activities to encourage consumers to save costs by switching electricity supplier, primarily through the *Powerswitch* website and *WhatsMyNumber* campaign, have been considerably enhanced in the last 2 years (New Zealand Government, 2011; Electricity Authority, 2012a). The effect of these initiatives will be discussed further in Chapter 5.

The evidence presented suggests that the occurrence and depth of fuel poverty largely conforms to a socio-economic gradient. At the lower end of deprivation some households display economising behaviours and deprivation/cold homes issues, but this is likely to be a temporary hardship, or a heating culture issue, rather than a chronic condition. At higher

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[7] Qualification is a household member in receipt of a Community Services Card (CSC).

[8] *Electricity (Low Fixed Charge Tariff Option for Domestic Consumers) Regulations 2004*. An amendments in 2009 raised the threshold to 9,000kWh for cold zone areas.

deprivations there is a clustering of multiple fuel poverty characteristics – higher rates of cold homes and under-heating, difficulty with energy bill paying, periods of disconnection, and poor heating appliance effectiveness and efficiency. The health-related studies also suggest a multiple clustering effect. Adverse health outcomes from cold homes and dampness are most heavily concentrated in those with pre-existing health conditions, with a socio-economic gradient towards higher deprivation and an aggregation of possible causative pathways e.g. overcrowding, high smoking rates, higher use of unflued gas heaters, sub-standard health care.

For individual households things can, and do, change, so the information needs to be interpreted from a dynamic standpoint. The recent longitudinal analysis by Carter & Imlach Gunasekara (2012) is helpful in showing the mobility/immobility of low incomes and deprivation[9], and the relationships between them. Fifty percent of the population experienced low income for at least one year in seven, and the persistence and/or recurrence of low income was also high. Of those who were in low income in the first year of the study, half were in low income in year 7 with one quarter in low income across all 7 years of the study (6% of the total sample). A similar pattern was found with deprivation, although at lower overall levels. And while higher levels of deprivation were found at lower incomes, low income per se was not necessarily a good predictor of deprivation. Two-thirds of those experiencing low incomes for at least 5 of the 7 years recorded no deprivation (p25). Higher rates of low income and deprivation were recorded for Maori.

Such dynamic effects are also likely to apply to fuel poverty. Increases in income might largely eliminate energy deprivation with little change being made to the energy input side. Retrofitted insulation and efficient heating might transform the affordability of heating for many households, but it cannot be assumed that this will apply to all. Insulation may have

[9] The New Zealand Index of Deprivation (NZiDep), an 8 point qualitative assessment using a set of questions similar to those in the NZLSS, was used with a score of 3 being used to indicate deprivation. One of the questions in the NZiDep concerns foregoing heating to save costs (see Salmond, King, Crampton & Waldegrave, 2005).

little effect on energy affordability if the heating bill is already low[10]. A loss of job might make electricity bill paying difficult, and lead to further adverse consequences, regardless of whether a house is insulated. On the other hand it is also important to note that even at the highest deprivation levels the NZLSS indicates that not all households are energy deprived.

3.4. Conclusions

Because an objective of this study is to contribute to the quantitative understanding of fuel poverty, an estimate is made based on the 2008 year:

- At least 5% of households display symptoms of chronic fuel poverty with a concentration of adverse factors accompanied by other deprivations
- Another 10-15% display varying levels of energy service deprivation and associated adverse factors and who may be in this situation for some years
- A further number display low level deprivation and some cold homes issues, but this is most likely a temporary hardship or heating culture issue.

The largest number of at-risk households appears to be those with children, while one-parent families display the highest rate. Other risk factors include living in rental accommodation, being unemployed, and having existing health conditions including disabilities. Maori and Pacific households feature in these higher risk groups.

Evidence on the direction of change since then is inconclusive. Government energy programmes have attracted many households, but other external conditions – incomes, employment and the effect of other cost pressures – have been flat or negative.

[10] Insulation might typically have the ability to reduce heating costs by 25-40%, but if heating comprises only 20% of the energy bill, the total energy cost is reduced by only 5-8%.

4. Recognising and addressing fuel poverty: a conceptual framework

As the next step in exploring the case for a policy agenda, this chapter develops a conceptual framework with the aim of formulating a coherent way of thinking about, and responding to, fuel poverty as a policy issue. The chapter explores fuel poverty from the viewpoint of human needs, and moves to consider a concept of 'sufficiency' of energy services. Finally the question of whether this concept of sufficiency should be regarded as a human right is assessed.

4.1. Fuel poverty and human need

4.1.1. Needs concepts

Fuel poverty is most commonly understood as a form of material deprivation, with 'deprivation' implying unmet need. A common conception of need is the implication that if it remains unmet a person will be harmed in some way i.e. it is linked to the avoidance of serious harm (Doyal and Gough, 1991). Others, notably Amartya Sen, have conceptualised needs in terms of what an individual requires in order to fulfil their 'capabilities' (Sen, 1982, 1999). This approach looks at a wider conception of needs beyond just material deprivation and towards the higher ends of human endeavours – which are about reaching capabilities. While some consider this to be a more affirmative conception of needs rather than solely focusing on 'deficits', others are concerned that capabilities says nothing about the opportunities available to individuals (Hick, 2012; Young Foundation, 2009). In their *Theory of Human Need* Doyal and Gough (1991) contend that there are two *basic* human needs – physical health and personal autonomy – and that these are universal. Without physical health, the fundamental basis for core functioning as human beings is compromised, while autonomy is conceived as comprising of 'understanding', 'mental health' and 'opportunities'. In autonomy, Doyal and Gough's view overlaps with Sen's capabilities approach (see Dean, 2010).

In order to inform the further discussion on fuel poverty three needs issues are briefly discussed below because it is necessary to state the position this essay adopts. First is whether poverty (which sits at one end of the needs spectrum) should be regarded in relative or absolutist terms. This has provoked much debate, but it has often been a case of arguing between 3rd world and 1st world perspectives. Townsend (1979) has been influential in making the case for a relative concept of poverty:

> "Individuals, families and groups in the population can be said to be in poverty when they lack the resources to obtain the type of diet, participation in the activities and have the living conditions and the amenities which are customary, or at least widely encouraged or approved in the societies to which they belong. Their resources are so seriously below those commanded by the average family that they are in effect excluded from the ordinary living patterns, customs, and activities". (Townsend, 1979:31)

Doyal and Gough (1991) concluded that "…it is widely agreed that deprivation is relative in both time and space. What deprivation consists of varies over time and is dependent on the social situation (group, community, society) in which it is experienced" (p20). This has also been the position adopted in the studies of deprivation in New Zealand reported in Chapter 3 and Appendix 2 (Perry, 2009; 2011), and is the position adopted here.

Second, is the distinction between 'needs', 'wants' and 'preferences'. Some consider there are no such things as needs; rather people's preferences being expressed through market arrangements is what is important (see Dean's (2010) review). But if the relativist position is accepted the distinction between needs, wants and preferences becomes blurred – what was a 'want' 20 years ago may be a 'need' today. This proposition is generally accepted in this report and is discussed further in the following section.

Third, is understanding how needs are interpreted. Needs are perceived differently through different lenses, and Bradshaw's (1972) taxonomy makes the important distinction between needs as interpreted by experts (normative and comparative) and needs as judged by individuals themselves (felt and expressed needs). These are not necessarily the same, and

different perceptions can lie at the heart of debate about 'needs'-based policies. There is no 'correct' interpretation – rather the important point is to appreciate the potential for bias or perception differences according to source.

4.1.2. Household energy services and human needs

Energy service needs can be interpreted in a number of ways. First, householders themselves can rate and rank priorities. An example of this form of needs interpretation are the surveys undertaken periodically in the United Kingdom on perceived social necessities, the most recent being the 'Millennium Survey' undertaken in 1999 (Pantazis, Gordon & Townsend, 2006). The surveys have been used to generate a consensual view on social necessities, with the authors commenting there is "virtual unanimity" of opinion on the top necessities, which have been demonstrated to exist across social groupings, time and space (Figure 4). Of the top 10, half relate directly to, or are dependent on, 'energy services'.

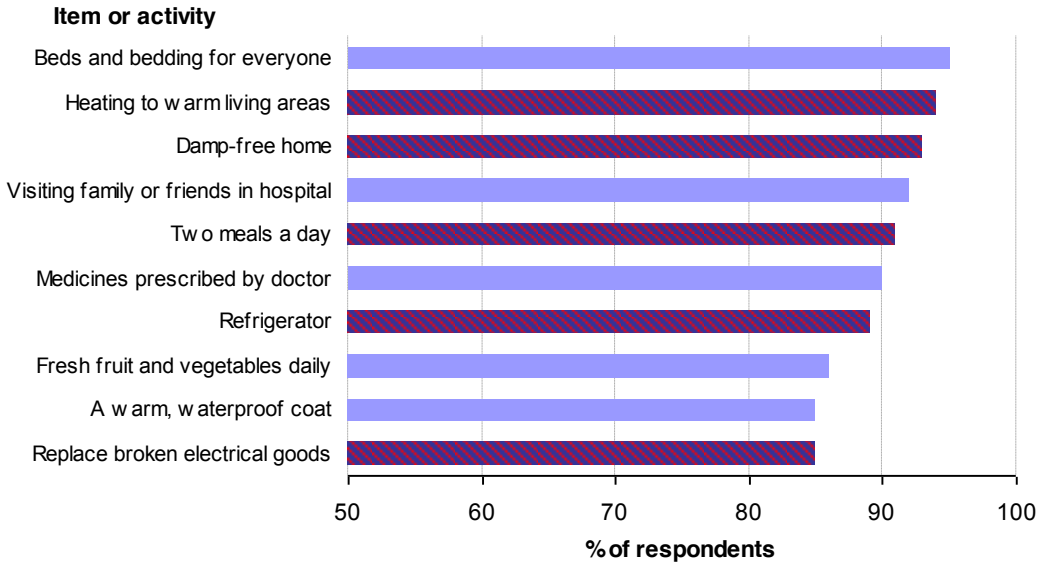

Figure 4. Top 10 socially perceived necessities – Millennium Survey 1999 (note dark colour banding denotes energy service related) (Source: Pantazis et al, 2006).

While the top necessities had been relatively stable for two decades the authors noted that some differences seemed to be opening up between younger and older participants. For

example the Young Foundation (2009) has asked whether communication technologies (e.g. access to the internet, mobile phones) are assuming the characteristic of a need. This is unsurprising and reflective of the socially determined, temporal nature of needs discussed in the previous section. For instance, had a ranking of necessities been taken in the 1960s a refrigerator may not have made the top 10. Some other energy related items (e.g. washing machines) have continued to rise as a perceived necessity over time. Whether these are 'needs' or 'preferences' is not particularly relevant once they reach a high level of social consensus. As Mack & Lansley (1985) note "In a practical sense items that become customary also become necessary because other aspects of life are planned and built on the very fact that these items are customary" (p56). Interestingly the Millenium Survey did not include electric lighting, which from an energy services perspective many would regard as a most basic necessity. In that lighting appears to have been taken for granted, it is worth noting that such surveys are a product of 'expert's' normative needs perceptions (as per Bradshaw, 1972).

A second way of assessing need is through technical assessments. The fuel poverty methodology used in the United Kingdom is based around explicit notions of energy need. The methodology uses a mix of technically derived energy needs combined with empirically based assessments (DECC, 2011). Warmth and comfort needs, for example, are based on physiological understandings of the reaction of the human body to temperature (Hartley, 2006). These needs have then been used to generate heating regimes taking account of individual house factors such as levels of insulation.

4.1.3. Energy need and the fuel poverty definition

There has been a tendency in New Zealand to regard the United Kingdom 10% threshold formulation as the 'official' definition of fuel poverty, but this reverence to the definition may not have been particularly helpful. Hills' (2011, 2012) reports on the United Kingdom fuel poverty target have rejected the current definition in favour of a new formulation. Hence it is appropriate to review his findings and critically assess what might be appropriate in a New Zealand context.

Hills' (2011) review highlights several concerns:

- The "essentially arbitrary" 10% threshold;
- The formulation of the measure as a fixed ratio which makes it sensitive to underlying variables, particularly energy price changes, in ways that do not allow for legitimate adjustments over time;
- The structure of the measure does not allow for easy identification of the 'fuel poor' on the ground, with the proxy qualifying criteria used for fuel poverty programmes leading to poor targeting of assistance[11]; and
- The focus of the definition does not allow the 'depth' of fuel poverty (i.e. the extent to which households fall short of meeting energy service needs) to be easily identified.

In the light of these shortcomings a revised definition has been recommended whereby houses in fuel poverty comprise the twin attributes of low income and high relative energy costs (Figure 5). This definition provides a more stable year-to-year measure with total households in fuel poverty in England (2.7m in 2009) lying between the 2003 and 2009 totals under the existing definition. To supplement this measure an indicator of the 'fuel poverty gap', a measure of the depth of fuel poverty is also recommended i.e. the aggregate shortfall in energy expenditure compared with achieving energy sufficiency. These recommendations are currently under consideration by the United Kingdom government.

[11] For example Boardman (2009) had previously argued that of the £3.7B of household energy assistance in England in 2006 under one-quarter went to fuel poor households. Part of the reason is that a significant amount of assistance is provided through a non-means tested winter fuel payment for the elderly. Nonetheless, Warm Front, a specifically fuel poverty-focused intervention, also shows poor targeting.

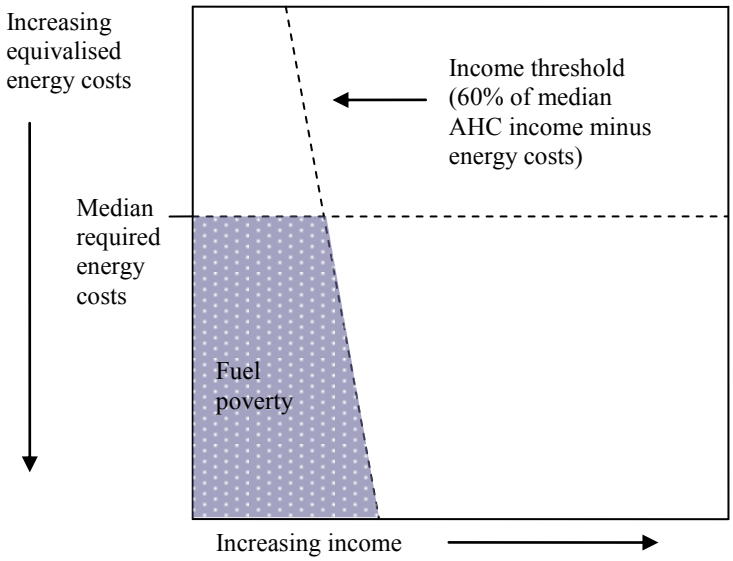

Figure 5. Depiction of the recommended new United Kingdom fuel poverty measure (Source: Hills, 2011).

As well as addressing shortcomings inherent in the previous definition the proposed new measure contains many desirable features including aligning with conventional measures of income poverty[12], and continuing to base energy costs on what is required rather than actually used, consistent with a sufficiency approach.

Would this be a suitable definition for New Zealand to adopt? It is necessary to ask what purpose such a definition might serve and to consider a number of related issues:

- It is still a binary threshold measure – one is either in or out of fuel poverty. The concern is that this does not reflect the reality of diverse household situations, and therefore does not necessarily capture 'real' fuel poverty[13] (McChesney, 2008). This

[12] Using 60% of equivalised median AHC income.

[13] This is essentially a point around the needs interpretation highlighted by Bradshaw (1972). Thresholds invariably rely on expert judgement, but both judgement and method cannot account for all circumstances of household need.

is a well-recognised problem with such indices (known as *reification*) where the definition starts to substitute for the meaning of the concept for which it is only an imperfect estimate (Carr-Hill & Chalmers-Dixon, 2005). The evidence presented in Chapter 3 suggests that rather than being defined by a single threshold fuel poverty might be better encapsulated in a scalar manner representing extent of severity.

- An intricately constructed index such as this means there will almost certainly be a disconnection between the definition and the ability to identify fuel-poor households on the ground.

- The proposed measure is data intensive. Using required energy costs introduces layers of data gathering and analysis that currently do not exist in New Zealand at the level of accuracy that might be required (although this is not meant to imply that the current level of data collection and analysis is satisfactory).

An alternative approach is to not use a single quantitative measure as such and continue with a more generic definition backed up by indicators that paint a picture of the breadth and depth of energy deprivation.

4.1.4. Fuel poverty as a distinct form of poverty?

There is also the broader question of whether there truly is a 'fuel poverty' that is somehow distinct and separate from poverty in general. Hills (2011) covered this ground and concluded that while there is a significant overlap between those in fuel poverty and those in poverty more generally, fuel poverty had some specific characteristics that were compelling in terms of justifying specific policy interventions:

- The public health costs imposed by fuel poverty

- The interaction with policies to reduce CO_2 emissions – both the coincidental nature of policies to improve energy efficiency which benefits both fuel poverty and CO_2

outcomes, and the regressive nature of CO_2 pricing policies which exacerbates fuel poverty, and

- The unique needs met by energy services and the lack of alternatives.

Another distinguishing feature is that unlike some other forms of expenditure by low income households where economies can be made (e.g. buying second-hand clothes, or cheaper food options), those in fuel poverty are often locked in to paying higher than average prices for energy. The high dependency on electricity is one reason, and the barriers to capital investment to enable greater efficiency and choice is another.

However, while these characteristics have a particular energy association they are not necessarily unique to energy. Public health costs, for example, are imposed by various manifestations of poverty, not just fuel poverty. Nor do United Kingdom conditions necessarily apply to New Zealand. Emissions of CO_2 from New Zealand households are much lower than in the United Kingdom, while the New Zealand energy policy goal to achieve 90% renewable electricity generation by 2025 (New Zealand Government, 2011), which would lower emissions further, places responsibility with the electricity industry, not consumers[14].

The overall conclusion drawn is that in the same way that certain aspects of poverty such as housing access and affordability, child poverty, or food quality and access justify specific policy interventions, so too can a case be made for giving energy deprivation a specific focus. Whether the term fuel poverty is appropriate is a moot point. Given that 'fuel poverty' seems destined to be associated with the United Kingdom approach and definition (whatever that definition will be) it would therefore be desirable to distinguish a New Zealand approach by using a different terminology. The HEAP used 'energy hardship' as the alternative to fuel poverty, but it is suggested here that 'energy service deprivation' and its antonym 'energy service sufficiency' would better describe both the scalar nature of the problem and the

[14] It is recognised that ultimately consumers will end up paying the cost for achieving this outcome.

solution. Inclusion of 'service' is the technically correct terminology but for public consumption the simpler and more easily understood 'energy deprivation' and 'energy sufficiency' would suffice.

4.2. The concept of energy service sufficiency

The needs-based challenge articulated earlier – to free people from energy deprivation to the extent that it no longer limits their health, autonomy or capability – implies an ability to achieve a sufficiency of energy services for all. While this statement may have an internal logic it nevertheless posits a normative, contestable position around provision of a sufficiency of energy services for all as a social goal, and by implication as a focus of public policy. Some will consider that extending public policy into the realm of 'energy service sufficiency' represents another intervention of the state into an area that is essentially a matter for individual choice and preference, and yet a further form of welfare. The counter-argument is that through a myriad of current policies (e.g. provisions for energy efficiency assistance, welfare assistance and minimum wage policies, policies to assist vulnerable electricity customers) the state already intervenes, directly or indirectly, in this space in order to achieve more equitable results. Focusing on energy service sufficiency is a more clearly enunciated, and transparent, assertion of desired outcomes.

4.2.1. What is sufficiency?

There is no definitive prescription of energy service sufficiency – one person's sufficiency might be another's deficiency. It is contended here that energy service sufficiency should be *pragmatically* interpreted within the needs-based principles outlined in the previous section.

A first-principles 'bottom-up' assessment of sufficiency would entail being able to heat occupied living areas to comfortable and healthy temperatures, and to have warmth in occupied bedrooms so that health is not endangered, hot water at suitable temperatures for washing, safe food storage and cooking, adequate lighting for safety and health, and the ability to power basic electrical appliances. For any particular individual or household, energy service sufficiency is not a fixed quantum and will depend on variables that relate primarily to

the occupants themselves, their particular needs, and the environment around them (Figure 6) (see also Figure A3 in Appendix 2). Account needs to be taken of specific energy needs such as additional heating where there is an underlying medical condition.

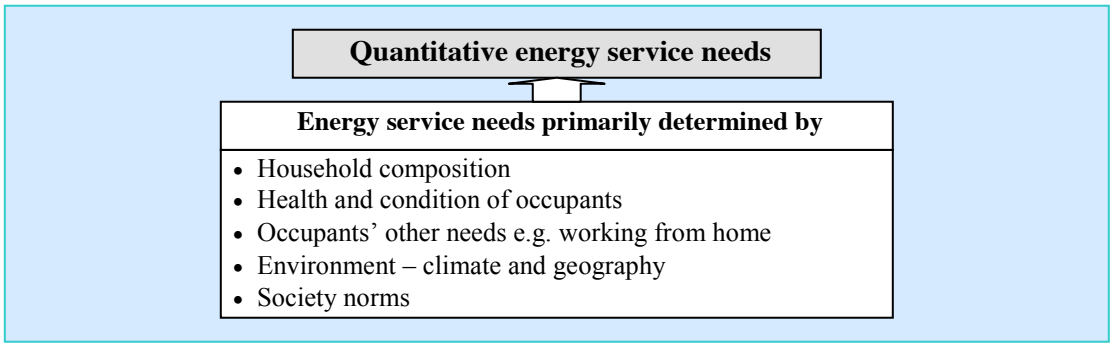

Figure 6. Primary determinants of energy service needs.

In order to meet these energy service needs three key 'necessary conditions' are required to be present:

a. there is continuity/connectivity of energy supply

b. energy services are affordable to the householder, and

c. householders' behaviour is well-informed.

A summary model of energy services sufficiency – energy needs met through provision of a sufficient quantity of energy services within a framework of continuity/ connectivity of supply, affordability and informed behaviours was developed (Figure 7). Each of the necessary conditions is now considered in more detail, with specific reference to the New Zealand situation.

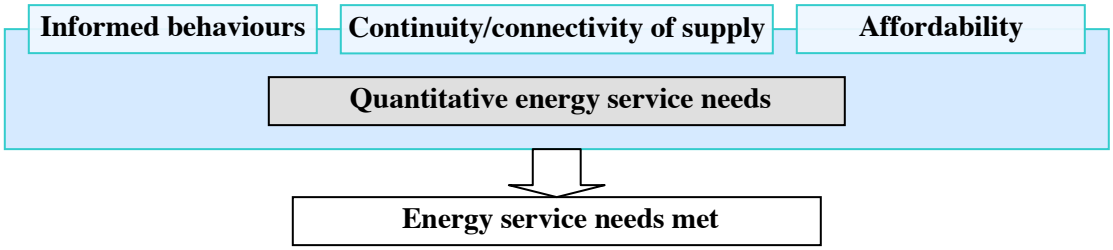

Figure 7. Schema of energy service sufficiency

Affordability - Lack of affordability is of course a definitional condition of fuel poverty, not only affecting the ability to purchase sufficient levels of quantitative service, but also being the primary reason that continuity and connectivity of supply is compromised for the fuel poor. For vulnerable householders many affordability issues are structural e.g. income may be tied to minimum wage rates or benefit rates, electricity prices may be primarily driven by the structure of the electricity market and local supply conditions, and for those in rented houses core efficiency features that drive affordability such as insulation, efficient heating, and hot water services will be determined by the owner.

One way in which affordability can be pragmatically gauged, at least at some aggregated level (rather than specific individual), is by seeing what constrained households currently spend on energy – an indicative 'willingness to pay' (a similar concept to that used by Lloyd & Callau, 2009). That would then set a target against which energy service sufficiency options can be determined (see S4.2.3).

Continuity/connectivity of supply - The ability to maintain access to continuous supply, especially the need to avoid electricity disconnection, is fundamental to having energy needs met. Invariably the reason that supply was compromised for the approximately 50,000 households who were disconnected in 2011 was lack of ability (or willingness?) to pay. There are two aspects to consider:

- Systemic issues around electricity pricing and/or policies that may be exacerbating disconnection risks; and

- Choices made at the household level. These include tariff and metering options and choices, the manner in which debt and other household expenditure is controlled, and processes for bill paying.

Informed behaviours - The need for 'informed behaviours' is cross-cutting and is essentially about giving householders the autonomy to make the best possible decisions with the resources available to them. Achieving informed behaviours will depend on the various channels by which householders receive, and act on, information, and may require overturning norms and other influences on current behaviours. For vulnerable households, information tailored to their needs and limitations is required, and may involve active and ongoing participation of third-party advisers along with other forms of influence.

4.2.2. A pragmatic interpretation of sufficiency

Previous modelling exercises have been undertaken on the heating requirement and energy efficiency investment needed to avoid fuel poverty in New Zealand using the United Kingdom 10% definition[15] (Lloyd & Callau, 2009). However the modelling produced levels of internal heating that were far higher than accepted norms in New Zealand. Calculated heating energy use was up to 2½ times actual heating use, resulting in very large investments in energy efficiency required to address fuel poverty ($4 billion ($2008)). As previously noted accepted norms for heating in New Zealand are not necessarily a good guide, and an individual's perception of sufficiency can move upward over time through conditioning (Nimmo & McChesney, 2007; Vujcich, 2008). Nevertheless, given that the majority of New Zealanders do not perceive they have a warmth deprivation problem, 'sufficiency' needs to be more aligned to the perceptions (and reality) of the majority. There is little evidence, for example,

[15] The indoor temperatures and heating regime adopted was slightly different from the United Kingdom norm.

that most healthy New Zealanders need, want, or are prepared to pay, to sleep in bedrooms consistently heated to 16-18ºC. Bradshaw's (1972) interpretative framework helps to guide us towards a more acceptable, middle ground solution.

Understanding people's energy decision-making behaviours is at the heart of a pragmatic interpretation of sufficiency and the design of policy solutions. The *Energy Cultures* framework, developed by researchers at the University of Otago, posits that consumer energy behaviour is a product of the interaction between three categories of influence – cognitive norms (e.g. beliefs, understandings), material culture (e.g. house and appliances, income), and energy practices (e.g. activities, processes) (Stephenson et al., 2010). In applying this framework to the energy deprived one sees that their circumstances both define, and influence, their energy culture. Cognitive norms are often characterised by low expectations, a very short-term timeframe of planning, and limited understanding and experience of alternative options; material culture is generally low in both quantity and quality, heavily income constrained and often determined by the quality of the rental house; and energy practices are generally highly prescribed by habit and circumstances, with partial heating common, and a range of coping strategies pursued. Some householders normalise behaviours around staying away from the home, or going to bed earlier and staying in bed longer, while a few go to extreme lengths[16] (Boardman, 1991a; CSRE, 2010).

These are mainly generalisations of course, and stated with some hesitation, but an important point about the Energy Cultures framework is that it stresses the interdependence between these three influences. Policies designed to achieve an energy sufficiency goal would need to recognise and address these influences in an integrated manner, otherwise solutions to energy deprivation might remain elusive. For example the main focus of government policy is subsidising insulation in homes, which addresses one aspect of the material culture deficit. But research has shown that choosing between extra warmth or additional cash after

[16] Budget advisers report, at the extreme, that some families have cut off their electricity supply over the summer to eliminate power bills. Personal communication with Raewyn Fox, NZFFBS.

retrofitting insulation varies considerably between individuals (Howden-Chapman et al., 2007). A highly income constrained household may apply compensating behaviours and adjust their energy practices by reducing heating and using the saved costs for other things. While they may perceive this to be in their best interest, such behaviour may compromise public policy objectives, particularly if benefits such as public health cost savings are dependent on achieving warmer homes.

Finally, part of the pragmatism concerns the interpretation of *ability to achieve*. The concept implies autonomy on the part of the householder. Energy service sufficiency is not an imposed condition. The policy focus would be *enabling* – attempting to remove barriers and assist households so that sufficiency is able to be achieved within their means. But it is based on the householder making reasonable choices.

4.2.3. Giving effect to energy service sufficiency

Institutional arrangements – A goal of energy service sufficiency requires policy affirmation. There are various ways in which such a policy might be expressed, and limitations on how binding such a goal might be. The United Kingdom fuel poverty targets were established within a legal framework that obliged the government to do "all that is reasonably possible" to end fuel poverty (UK Government, 2005). A challenge to the High Court in 2008 from parties seeking judicial review in order to force greater action from the government (*Friends of the Earth & Anor v Secretary of State for Business Enterprise and Regulatory Reform & Anor* (2008) EWHC 2518 (Admin)) was dismissed with the judge noting that in taking up the challenge to eliminate fuel poverty the government had "…imported a statutory duty to make those efforts. It did not assume a statutory duty to achieve the desired results, whatever the cost" (paragraph 29).

Within New Zealand's policy-making tradition a commitment to energy service sufficiency is most realistically going to be one of 'best endeavours'. Essential elements to a best endeavours approach in dealing with this issue are (a) having overall responsibility for the policy reside with an appropriate agency, (b) orientating policy actions towards the outcome of

energy service sufficiency, and (c) recognising that energy service deprivation is a cross-disciplinary issue.

This issue, in its various policy formulations to date (e.g. cold homes), has drawn in a wide range of organisations including central government agencies, local government, researchers, energy companies, health authorities, private energy service providers, and NGOs (e.g. see Courtney, 2009). However, very few organisations have fuel poverty as a main focus. Organisational motivations for involvement vary and alignments can be fleeting, with inherent tensions. As in the United Kingdom, NGOs and local government agencies (sometimes through associated energy entities) have the longest-standing 'voluntary'[17] involvement in this issue, and even although coverage throughout the country is inconsistent, NGOs and local government have been at the forefront of project development and innovation.

Reference standards – One way in which the concept of energy service sufficiency can be operationalised is by developing reference standards. 'Reference' means that they are not formalised through the New Zealand Standards process. Rather, their purpose would be to define acceptable minimum levels of energy service for households, segmented by a range of household types/composition and environmental location combinations. Reference standards would be matched with comparable 'ability to pay' information for households, most probably using Household Economic Survey data. This defines the policy challenge – if a particular low income household grouping has a realistic ability to pay for energy of (say) $1,800pa, how can their energy service needs be met? What combinations of energy efficiency, heating and energy choices, tariff choices, and informed behaviours would achieve sufficiency? This is an outcomes driven, but constrained 'optimisation' process – largely technical, but also factoring in behavioural considerations. Conceptually, it is a similar process to that used by Lloyd & Callau (2009).

[17] 'Voluntary' in the sense that they are involved without government policy direction or obligation.

This information would primarily serve the purpose of providing options for designing assistance measures and guiding advice at the individual household level. Reference standards also have a role in informing policy decisions.

Other kinds of 'standards' have been advocated to address energy concerns e.g. minimum standards for house condition and energy efficiency in rental housing (Boardman, 2009; James & Saville-Smith, 2010). These may well have a role in enabling tenants achieve more cost-effective warmth and heating. But for the purpose of this framework they are secondary to establishing the principle of energy service sufficiency.

Response framework – The evidence that energy deprivation fits along a gradient defined by socio-economic factors, deprivation and health issues parallels the understanding for poverty in general. As the intensity of poverty deepens so too does the range and depth of related issues. Mental health issues, transience, addictions and intergenerational dependencies become common features (CSRE, 2007, Young Foundation, 2009). The possibility that energy deprivation, as a stand-alone issue, can be 'solved' in these circumstances is remote. In parallel with the understanding that addressing deeply entrenched poverty requires a continuum of responses, so too energy deprivation entails a more intense, integrative approach, operating at the local level and strongly networked across organisations (Figure 8).

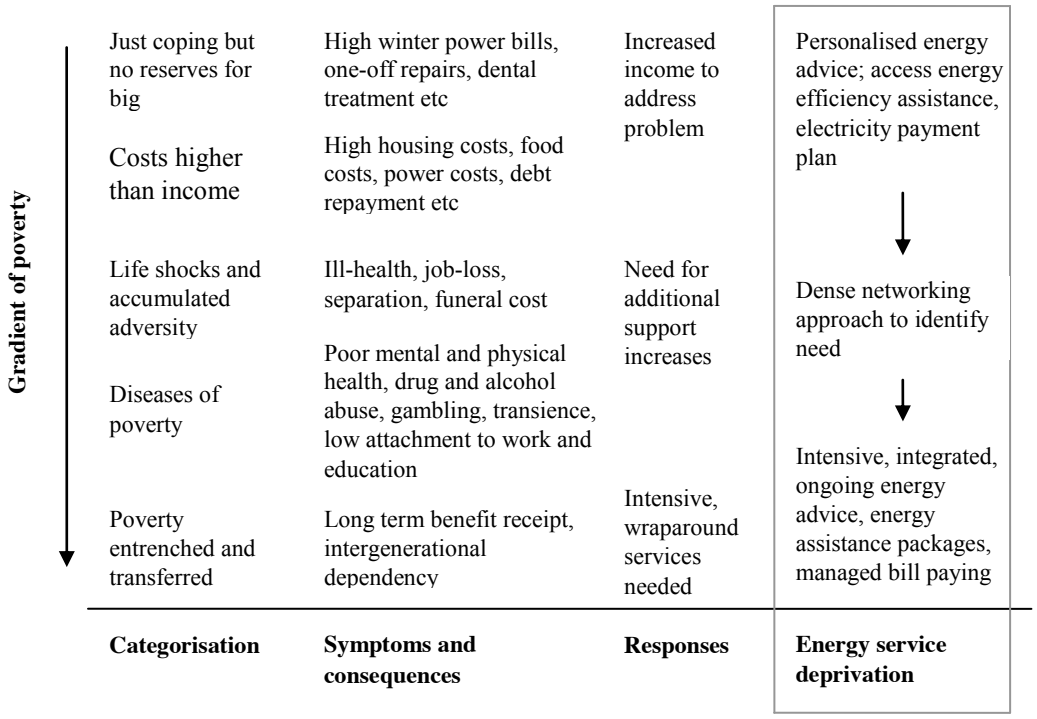

Figure 8. Poverty continuum and responses showing comparable energy service deprivation response (Source: based on framework in CSRE, 2007)

Within the collaborative framework recognised to address cross-boundary issues a key role has been identified for 'boundary spanners' – individuals whose specific job it is to work across institutional boundaries, make connections, and provide the continual impetus and 'glue' that helps bind collaborative efforts together (Williams, 2002; Williams & Sullivan, 2010). An example of the crucial 'boundary spanning' roles played by the project manager and community energy adviser in a Northern Ireland rural fuel poverty project were highlighted by Rugkåsa, Shortt & Boydell (2007). The project achieved unprecedented levels of uptake and partner/ participant perceptions of success, largely through the personalities and skill of the 'spanners', and their affinity to the local area[18]. This emphasises the importance of

[18] The rural setting in which tenure and relationships are perhaps more settled than they might be in an urban setting would also be a significant reason for success.

'localised' project approaches and the vital role played by key individuals with skill bases covering project management, motivation, facilitation and communication, and technical energy understanding.

Monitoring and indicators – "Measurement serves as the handrail of social policy" (UNICEF, 2007). A final element of the framework is to emphasise the importance of monitoring and indicators. Energy deprivation is essentially a distributional issue, and policy needs to be informed by sufficiently disaggregated data and analysis.

The analysis presented in Chapter 3 suggests that some key indicators of energy deprivation can be well captured through using (or adding to) more broad-ranging, regular surveys. Qualitative indicators have value in that the questions they ask can be replicated 'on the doorstep' by experienced energy assessors or other professional advisers, thus providing an important bridge between the way energy deprivation might be portrayed at a policy level and the way it is identified on the ground[19]. The use of similar indicators has been discussed by EPEE (2009) and the list includes 'inability to pay energy bills', 'energy debts', 'disconnection from energy supply', 'perceptions of cold', and 'incidence of illness, disease or health impacts'. However it should be noted that UK assessments have commented on the possible unreliability of subjective views from householders, particularly the tendency of some fuel poor to understate their deprivation (Hills, 2011; Owen, 2010). Quantitative indicators, such as the proposed United Kingdom fuel poverty definition, also need to be developed. There is also a need to extend the reach of indicators beyond the current focus on cold and damp housing into broader energy service needs.

[19] Some care would need to be taken to ensure that assessor bias or other influences were minimised.

4.3. Energy service sufficiency as a right?

4.3.1. Overview

If needs entail responses of some kind, Spiker (1993) argues "there are no needs that are not in some sense a claim…to service" (p9). A claim to service is essentially an assertion by that party to have their needs met. That party may also equate the claim to "their right". This section explores whether energy service sufficiency should be considered a right.

The 1948 Universal Declaration of Human Rights (UDHR) (United Nations, 2012a) established a set of universal citizens' rights, but there is a much longer tradition to rights. Dean (2010) traces the modern conception of rights to the western enlightenment period of the 17th and 18th centuries which saw a radical break from the 'rights' of the feudal era to a new conception of the human individual as a bearer of rights (e.g. and as set out in The English Bill of Rights (1690) and the American Constitution (1789)). Under the principles of *universality, interdependence and indivisibility, equality and non-discrimination* the UDHR set out to consolidate civil and political rights (CP rights) and to establish rights claims to economic, social and cultural security (ESC rights). This framework offered not only individual property rights but rights to security within a social order (Dean, 2010).

The UDHR is non-binding but is given effect by a set of covenants and charters which are binding by international law. Obligations with respect to ESC rights are set out in the International Covenant on Economic, Social and Cultural Rights (ICESCR) which New Zealand ratified in 1978. The core provisions of the ICESCR encompass labour rights, health, family life, living standards (including food and housing), social security, education, and cultural participation. The ICESCR is given effect through Article 2(1) which states:

> "Each State Party to the present Covenant undertakes to take steps, individually and through international assistance and co-operation, especially economic and technical, to the maximum of its available resources, with a view to achieving progressively the full realization of the rights recognized in the present Covenant by all appropriate means, including particularly the adoption of legislative measures". (Source: OHCHR, 2012).

This is commonly referred to as the principle of *progressive realisation* because it recognises that the pace of achievement of rights is limited by the competing demands on resources available to the state.

A rights-based approach contains an underlying principle of mutual obligation – "human rights simultaneously entail both rights and obligations from duty bearers and rights owners" (United Nations, 2012b). Geiringer & Palmer (2007) note that this language – emphasising the particular dimensions of the "interests, entitlements and duties that are at stake" (p15) – distinguishes a rights-based approach from a 'needs' or 'wellbeing' focus.

4.3.2. Associating energy service provision with rights

The condition of poverty has increasingly been conceptualized as a denial of human and citizenship rights (Lister, 2004), and the linking of fuel poverty to a claim on rights is not new. The first citizen-based fuel poverty initiative in the United Kingdom invoked a rights-based position (the Right to Warmth Campaign), and arguments that fuel poverty is a direct contradiction of the UDHR have been made since (e.g. Boardman, 1991a). One of the few formal governmental expressions linking fuel poverty to human rights is in Iowa, United States, where the State's low-income energy weatherization programme[20] is housed within the Iowa Department of Human Rights. The Department serves as an umbrella with a mission "to ensure basic rights, freedoms, and opportunities for all by empowering underrepresented Iowans and eliminating economic, social, and cultural barriers" (Iowa Department of Human Rights, 2012).

Nevertheless, within the articles of the UDHR and the specifications of the ICESCR there is no direct reference to a basic level of energy service[21] (or, conversely, freedom from energy poverty) as a right. A claim to such a right therefore must be made by association. Article 25

[20] The nomenclature used for insulation and heating retrofit programmes.

[21] Note that a right to sufficient energy services should not be regarded as a right to energy per se.

states "everyone has the right to a standard of living adequate for the health and well-being of himself (sic) and of his (sic) family, including food, clothing, housing and medical care and necessary social services…" (United Nations, 2012a), and it is from this that a basic level of energy service might be considered an implied necessary condition. The reasons are:

(a) the essential health sustaining attributes of energy services where the difference between adequacy and inadequacy of service can, at the extreme, be a matter of life or death;

(b) the fundamental role played by energy services in providing for adequate living standards and well-being; and

(c) the unique qualities of, and lack of substitutes for, basic energy services[22].

Bradbrook & Gardem (2006) consider that the core argument for placing energy services within a human rights framework is that of inter-dependence:

> "It is increasingly apparent that the socioeconomic goals contained in the ICESCR cannot be achieved without access to such services. So, in effect, the argument can be made that the right to access to modern energy services is already implicit in a range of existing human rights obligations" (p405).

Inter-dependence provides a logically strong connection with a rights-based approach. There are parallels with access to water which, like energy, is not specified under the UDHR, but is seen as fundamental to achieving a range of other rights (UNDP, 2012). And Geiringer & Palmer (2007) point out that "a rights-based approach to the development of social policy is required of the New Zealand government as a matter of binding international law". Yet these

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[22] This statement derives from energy being a fundamental requirement of life on earth, and that basic energy services, while they can be provided in a range of ways involving trade-offs between energy and capital/technology, are essentially non-substitutable.

reasons in themselves do not place an obligation on government to regard energy service sufficiency as a right, and this essay does not advocate this position.

But there is a compelling rationale to consider energy service sufficiency within a human rights framework because of the potentially positive flow-on changes in the attitudes and behaviours of duty bearers and rights-holders. Geiringer & Palmer (2007) have provided a very useful analysis of government obligations inherent in the ICESCR and have proposed seven elements that a rights-based approach to social policy should entail. Regardless of the fact that 'energy service sufficiency' is not an obligated right under the ICESCR, a policy to treat energy in this way and use the seven elements as a set of guiding principles may induce institutional responses that not only advance the energy outcomes desired but through the inter-dependencies also advance the realisation of obligated rights. Geiringer & Palmer's seven elements are listed in Figure 9. While these principles were developed with reference to the obligations on right bearers, rights holders have responsibilities as well. A rights-based framework could usefully help establish what these are.

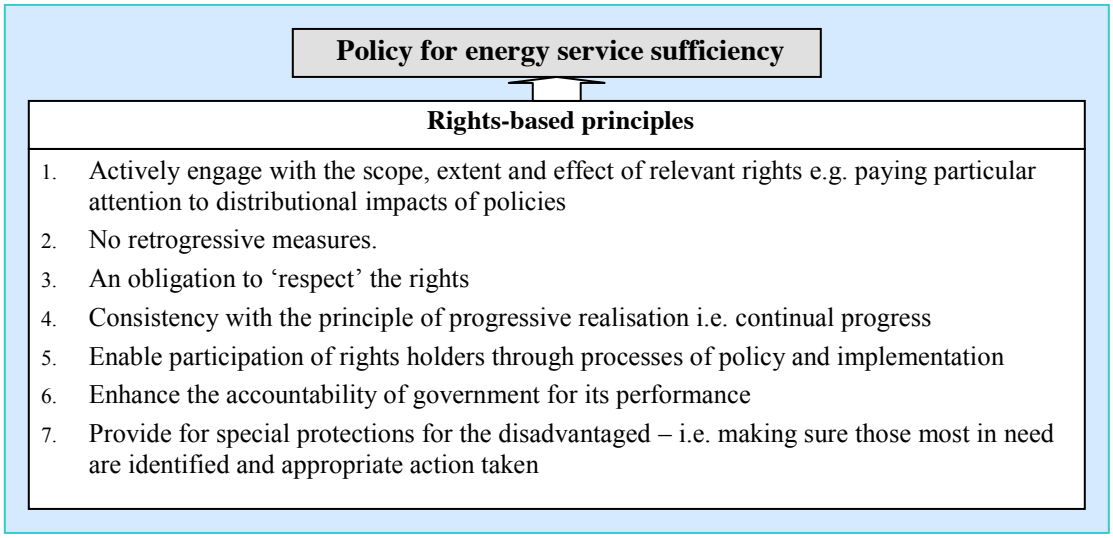

Figure 9. Rights-based principles that could inform policies for energy service sufficiency (from Geiringer & Palmer, 2007).

4.4. Summary and conclusions

The framework developed in this chapter began by exploring fuel poverty within a concept of needs. It was argued that the logical implication of comprehensively and successfully addressing the deprivation of human need caused by fuel poverty is achieving the outcome of 'energy service sufficiency' for all. A summary model of energy services sufficiency – energy needs met through provision of a sufficient quantity of energy services within a framework of continuity/ connectivity of supply, affordability and informed behaviours was developed.

Because of interdependencies with a number of established ESC rights there is a strong argument that energy service sufficiency should also be regarded as a right. This essay stops short of advocating that position, but does argue that a rights-based approach should be used to progress this issue throughout the policy process to implementation.

5. Implications of energy service sufficiency as a policy goal

The primary focus of this chapter is assessing the objective of enabling energy service sufficiency for all against current policy and initiatives. It is acknowledged of course that current policy is not directed at this outcome. But the rationale for this focus is that current policies potentially contribute to such an outcome, without explicitly stating as such, and hence the policy investigation should start here before asking what more might need to be done. In this analysis particular regard is paid to the three necessary conditions for energy sufficiency (affordability, continuity of supply, and informed behaviours), and the rights-based principles outlined in the previous chapter.

5.1. Recognition within policy

A goal of energy service sufficiency needs to have policy recognition. Interestingly, a similar policy position to this existed from 1992-2007. As mentioned in Chapter 1 the Government's 1992 Energy Policy Framework specified the outcome "Basic energy services remain accessible to all members of New Zealand society" (New Zealand Government, 1992). Subsequent policy reduced the scope somewhat – 'energy services' were replaced by "heat and light" in the 2007 Energy Strategy (New Zealand Government, 2007) – but the principle of *universality*, whereby policy explicitly stated that these outcomes should apply to all New Zealanders, continued. However the wording in the final New Zealand Energy Strategy in 2011 contained no reference to universality and focused instead on the programme goals of WUNZ:HS and electricity supplier switching (New Zealand Government, 2011). This change appears to have been made as a matter of government priority to focus on short-term actions since public submissions apparently did not suggest the universality provision be dropped and neither did officials recommend it (Ministry of Economic Development, 2011b).

The current government might justifiably argue that for most of its existence the universality provision achieved little, and that it is the commitment to action that matters, not words. They could point to the fact that many more low income houses have been insulated and heated in the last 3½ years during the time of the current government than in the prior 15 years.

The argument for retaining such a policy is that its loss represents loss of an important statement of principle – an explicitly stated goal of equity of energy service access. Without such a clear purpose the danger is that energy policy regresses to a focus on ad-hoc, short-term projects. For example the first weakening of the original policy, when the principle of 'energy services' gave way to 'heat and light', seemingly occurred for no other reason than to reflect a current project emphasis at that stage on lighting. The current WUNZ:HS programme, however impressive the outputs achieved, contains no commitments beyond 2014. Moreover, the focus has shifted towards general income rather than low income households (EECA, 2011).

5.2. Warm Up New Zealand: Heat Smart

Energy service sufficiency is a wider remit than just addressing cold homes. But energy deprivation continues to be closely associated with cold homes issues and hence it is important to address the achievements of the WUNZ:HS programme, since it is the government's flagship programme addressing cold homes. Key questions are around (a) the 'reach' (e.g. to what extent are the most needy accessing the scheme, and who is missing out?), and (b) outcomes achieved.

5.2.1. Reach

Since WUNZ:HS involvement is voluntary factors such as eligibility criteria and assistance levels automatically create certain patterns of self selection. But there is limited data available on the way WUNZ:HS reaches (or not) the most needy. Programme targets are set primarily by numbers (see New Zealand Government, 2011), not by need prioritisation. There is no systematic process to ascertain whether those most in need are gaining access, and the only segmented data is of landlord uptake. The landlord uptake shows that to date 20% of retrofits within the low-income stream are rented homes[23]. By comparison the rate of private renting in

[23] Information provided by EECA.

the lowest two income quintiles in the wider population is a little over 30% (Statistics New Zealand, 2010). This lower rate of retrofitting ties in with surveys of landlords by Saville-Smith (2008a, 2008b) who found that while a majority of landlords reported having already retrofitted insulation or being prepared to do so with incentives, 23% of private landlords reported they did not want to retrofit any of their houses[24].

A customer profile provided by a community service provider contracted under WUNZ:HS (and working mainly with low income customers) both conforms with, and adds some detail to, the observed deprivation gradient effect[25]. Customers were categorised as:

a. Informed and motivated individuals, able to meet the user contribution required under WUNZ:HS, and who proceed with retrofitting. Includes some landlords.

b. Informed and motivated individuals, but lacking financial resources. Some proceed – sometimes assisted by additional co-funding to help bridge financial gaps – but others become 'lost' to the system[26]. Some in this category are renters who have not persuaded their landlord to invest. A sub-group identified were those not qualifying for the CSC-holder subsidy, and who could not meet the higher user contribution required under the general income category.

c. Those who know they have an energy problem but don't know how to proceed, and have too many other issues in their lives taking priority. This group requires substantial assistance, advice and guidance. Only some end up proceeding.

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[24] However, this percentage was not too different from homeowners, and there are valid reasons why landlords might not want to insulate a property, just as there are for home-owners.

[25] From energy advisers and assessors at Community Energy Action Charitable Trust, Christchurch.

[26] Some of these may have proceeded with a WUNZ:HS retrofit but with another service provider.

d. Those hard to reach (physically and communicatively), lacking in life skills, often with psychological problems or other issues such as addictions or crime and not necessarily well connected with formal networks.

This analysis suggests that two distinct actions are necessary to reach the most deprived – bringing hard-to-reach households into the process, and preventing attrition. Bringing householders into the process is a common problem in fuel poverty projects, once recruitment moves beyond the self-motivated responders. In the United Kingdom, local area-based, saturation coverage methods have been used (Warm Zones, 2009). In New Zealand the most successful approaches appear to involve intensive, discrete community/ township projects (e.g the Bluff Healthy Homes Project (EECA, 2006)) or where intensive networks of central and local government, health and NGO agencies work in partnership to provide a dense 'safety net' approach (McChesney, 2008).

Prevention of attrition often comes down to affordability. Higher rates of subsidisation for low income households are built in as a matter of programme design[27]. But beyond the government subsidy the balance of cost must be found either through co-funding arrangements (often organised by the service provider), and/or from the householder[28]. The current average cost, net of the EECA subsidy, is $1,240 for insulation and $1,655 for a heat pump (or $2,027 for a log burner) (EECA, 2012). One of the potential barriers to needy householders accessing the scheme is the variability around the country in the cost to be found by householders. Some areas in the country have generous levels of co-funding, meaning insulation is able to be provided for a small contribution from customers or for free, while a few areas have none. Even where part co-funding is available other discretionary funding mechanisms have been found to be necessary to overcome affordability barriers (CEA, 2011).

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[27] EECA provides a 60% subsidy for insulation and a flat rate of $1,200 for a clean heating appliance, for those qualifying under the Community Services Card stream.

[28] Some local councils are now also providing a payment facility whereby the customer share of costs can be paid off via a targeted rate.

The immediate concern for this analysis is that necessary information is not being gathered on the reach of the programme. A policy framework built around energy service sufficiency would require this level of disaggregated monitoring as an integral part of programme design.

5.2.2. Outcomes

The WUNZ:HS programme was developed largely on the basis of assumed health and warmth benefits. The first year of the programme has been the subject of an extensive evaluation of health, energy and employment impacts. The studies have reinforced that those with pre-existing health conditions are primarily susceptible to adverse health outcomes from cold homes (Grimes et al., 2011; Telfar Barnard et al., 2011). The programme was estimated to provide a net benefit of $1.2 billion[29] mostly from reduced hospitalisation costs, reduced pharmaceutical costs and reduced mortality. About 90% of the benefit derived from CSC households and 10% from the general income stream. Most of the benefits were ascribed to insulation, with heating showing a negative net benefit.

But there are issues with this analysis. Discrepancies over basic data may not have a material effect on the overall findings[30], but the evaluation of benefits is only partial and the appraisal omits one of the main benefits of insulation and heating retrofitting, the direct warmth gained as a private benefit by household occupants. This is a common issue – warmth benefit can be methodologically difficult to determine, and other studies (e.g. see Preval, Chapman, Pierse & Howden-Chapman, 2010) and the EECA evaluation methodology[31] also ignore this benefit.

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[29] This is based on the 2009-2013 programme commitments.

[30] Discrepancies were found between the projections of insulation and heating retrofits in 2011/12 and 2012/13 in Grimes et al (2011) and information in the EECA Statement of Intent (EECA, 2011) and referred back to EECA and the Ministry for Economic Development.

[31] EECA declined requests to examine their household benefit:cost model (called the Net Benefit Model), but other sources have confirmed that the intrinsic value of warmth is not included in the calculus.

But in doing so the overall benefit streams are potentially skewed, and a large part of the benefit of efficient heating in particular, remains unquantified in the calculus[32].

Part of the challenge of meeting the affordability condition of energy service sufficiency is enabling the main heating in the home to be provided in the 5–10c/kWh range of energy costs rather than the 25–35c/kWh that is common (from Figure 3). Heat pumps have become the heating system of choice but the scope for efficient, clean wood burning should not be overlooked. Clean air regulations (*Resource Management (National Environmental Standards for Air Quality) Regulations 2004*) have resulted in the loss of the customary right to burn wood in some circumstances, but this energy source is one of the cheapest available and an efficient wood burner can provide space heating needs and possibly also hot water if fitted with a wetback.

Grimes et al. (2011) suggest some possible refinements to the WUNZ:HS programme and while the suggestions for greater targeting strategies to at-risk households seems robust, the suggestions for a blanket prioritisation of insulation over heating is not supported. Further analysis of heating as part of an overall strategy of energy service sufficiency is needed.

5.3. Electricity

5.3.1. Supplier switching

The number of electricity supplier switches increased from 175,000 in 2007 to 412,000 in 2011, and in the 2 years to February 2012 31% of households had switched supplier at least once (Electricity Authority, 2012c; UMR Research, 2012). Average savings in 2011 have been assessed at $165/household in 2011 based on "each consumer switching to the cheapest retailer in their region each month" (Electricity Authority, 2012d, p2, 4). While this is a

[32] A method to quantify this benefit stream using supply curves was developed as an adjunct to this study and is not reported here in detail, but the approach offers a methodology that would enable the warmth benefit to be quantified and valued.

questionable methodology[33], it is nevertheless true that savings opportunities exist – from zero if one is already with the cheapest supplier to potentially several hundred dollars per year. An exercise undertaken for this study showed that in order to maximise the savings available it was necessary to not just switch once, but to continue switching[34]. This contrasts with observed consumer behaviour which indicates that of those switching in the last two years only 16% switched more than once (UMR Research, 2012).

Because this is the main focus of government policy for addressing energy affordability it is vital that the results are scrutinised for their potential impact on the disadvantaged. Is supplier-switching an opportunity for the energy deprived, or do barriers prevent access? The evidence is patchy. Budget advisers and energy advisers report being able to advise a proportion of their clients on switching, and in some cases they facilitate the process with clients. But various sub-segments of vulnerable customers cannot easily benefit from supplier switching. First, those using PPMs are paying 3-38% more than equivalent standard payment tariffs, with a mid-point of around 12% (Wilson, 2012)[35], and little competition exists in the PPM market. This is declining further with the announcement that Meridian Energy's PPM customer base will be taken over by Mercury Energy. Second, some of the cheapest tariff offers require transactions to be on-line (effectively making this option unavailable for those without the requisite facilities and skills), and some customers are unable to switch because of debt or other issues. These concerns are not just confined to vulnerable customers – web-based transactions present a barrier to many elderly, and others fear the 'fine print' and the possibility they will be locked into a poor choice (UMR Research, 2012).

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[33] The initial calculation undertaken in 2010 estimated savings of $150/household and total savings across the country of $240M. It is simply not possible for every consumer to switch to the cheapest retailer without fundamentally altering the dynamics of the market, which would result in the cheapest retailer raising prices to cover inevitable cost increases, and other retailers adjusting prices to regain market share.

[34] The exercise examined switching choice options for 10 supply areas around the country using price information from the Powerswitch website. It involved making a series of switching choices at various price differentials.

[35] Consumer New Zealand survey of 10 areas in the country carried out in 2012.

But price is not the only consideration for constrained households. For some it may be advantageous to pay higher tariffs to reside with an electricity provider that is more sympathetic to the needs of low income customers and who have facilities that provide better overall services. Similarly the 'willingness to pay' for PPMs illustrates that for some households the benefits outweigh the additional costs.

Overall it is considered that supplier switching offers potential cost reductions for some at-risk householders. But they may require assistance from an independent adviser, and once switched they may need further prompting and assistance if they are to continue benefiting. For other at-risk householders however, and especially those on PPMs, supplier switching is not feasible.

5.3.2. Disconnections, debt and payment issues

> "…the Authority considers electricity to be an essential service for domestic consumers – it is a necessity for individuals and household groups to maintain health and wellbeing, and to sustain a reasonable standard of living" (Electricity Authority, 2010a).

These comments preface the Guidelines for medically dependent and vulnerable customers which set out obligations, responsibilities, and recommended processes between providers and customers with the aim of minimising disconnections. Despite early success in 2007 and 2008 in bringing down disconnection rates (see Appendix 2) customer debt greatly increased as more lenient credit controls were applied. Debt presented to New Zealand Federation of Family Budget Services (NZFFBS) advisers increased from $2–2.5m/year in 2008 and 2009 to over $4m/year in 2010 and 2011[36]. However, in 2011 while the average debt per household reduced the number of families presenting with debt was approximately 40% higher than the average of the previous 3 years. The total number of households in debt across the country, or level of debt, is not known.

[36] Information from Raewyn Fox, NZFFBS (see Appendix 2 for further detail).

By the end of 2011 disconnections had risen to about three-quarters of pre 2008 levels. Disconnection rates vary greatly between companies and do not appear to be related to public or private ownership status[37] (Electricity Authority, 2012b). Discussions with electricity retailers suggests that corporate attitudes and the presence of pro-active customer relationship processes play a large part in minimising disconnection rates and in controlling customer debt levels.

Both the Guidelines and the Electricity Industry Act 2010 place primary responsibility on electricity retailers to manage customer issues with respect to disconnection, debt and vulnerability. However, there appears to be a lack of public interest, interpretive oversight of this issue. Enactment of the Act in 2010 focused the statutory objectives of the Electricity Authority on competition, efficiency and reliability in the industry (Part 2 s15), and took away a social oversight role that the Electricity Commission had previously played. While retailers must report annually on implementation of the Guidelines, to date no reporting is publicly available[38]. Neither is there any central record of the numbers of medically dependent or vulnerable customers.

Pre payment meters – There is also concern with the rate of 'hidden' disconnections from PPMs. Views on the benefits of PPMs are split – some see them negatively as a means of essentially 'privatising' disconnection, while others view them as a valuable budgeting aid for households and indeed they could be regarded as an important mechanism to achieve *informed behaviours*. However, while PPMs 'incentivise' economising behaviours, this may add to energy deprivation concerns (O'Sullivan, Howden-Chapman & Fougere, 2011). PPMs may

[37] Some of highest rates were recorded by smaller, relatively newly formed retailers (some of which are owned by larger State Owned Enterprises (e.g. Bosco Connect is a subsidiary of Mighty River Power). Of the large retailers Meridian Energy and Contact Energy had the lowest rates of disconnection.

[38] The Electricity Authority provided information that the report was soon to be published.

also pose a risk for medically dependent customers[39]. The NZFFBS considers that many households on PPMs would be better off on a 'level-pay'[40] (or similar) payment plan. While lacking the usage feedback provided by a PPM, regular payments can be set aside at source, cheaper tariffs are available, and the higher winter usage is offset by making higher payments over summer months. As above, there appears to be a lack of oversight of this issue, with no consolidated reporting since a 2008 Electricity Commission report (Beatty, 2008).

5.4. Discussion

5.4.1. Organisational roles and responsibilities

Two organisational role issues emerge from the evaluation above. First, there is a lack of central government oversight of this issue, with no one agency seemingly having clear responsibilities to assess overall energy adequacy. EECA and the Electricity Authority have responsibilities for outputs associated with particular programmes, but even then some important monitoring information about the distributional aspects of their programmes is lacking. This is perhaps also symptomatic of the loss of the universality clause within the New Zealand Energy Strategy, the discontinuation of the HEAP project before the quantification and policy outputs were delivered, and the overall government focus on short-term projects rather than aspirational goals.

The framework in Chapter 4 outlined the importance of having a government agency with oversight and policy responsibility for energy deprivation. Traditionally this is an issue that energy agencies have taken a lead role in. But it is suggested that because this is essentially an issue of welfare and human need, and especially given the alignment with broader deprivation

[39] Note that refusal to provide a PPM to a customer on those grounds is considered to be in breach of the Human Rights Act 1993 (Electricity Authority, 2010a).

[40] Where equalised monthly payments are made throughout the year to avoid unaffordably high winter electricity bills.

gradient indicators, the Ministry of Social Development should be assuming this oversight role.

Second, as well as a unified overview at the top it was argued in Chapter 4 that this issue needs strength at the grassroots. Despite energy NGOs assuming, perhaps through their historical involvement[41], a degree of 'ownership' of this issue, the evolution into more extensive retrofitting through WUNZ:HS has reduced NGO influence. A similar evolution occurred in the United Kingdom which saw local energy NGOs largely exit retrofitting and assume different roles[42]. Regardless of any other reason, the reliance of energy NGOs on income generated by insulation retrofitting was always going to be time-limited, and there is evidence that in some areas of the country a reasonably high proportion of low-income houses have been insulated e.g. Christchurch[43] and Southland (Grimes et al., 2011).

One of the 'key conditions' that local organisational networks could provide is helping meet the need for *informed behaviours*. NGOs have for some time attempted to build a base of energy advisers, but the future will likely be better served by a more broad-based hub of independent advice practitioners including local government personnel, an initiative that is currently under active discussion[44]. Energy advice professionals would have a key role in translating *reference standards* to individual situations and circumstances. Another key role is 'advising the advisers' in terms of supporting front-line staff from other agencies. Indeed, this more integrated, networked model is consistent with that outlined in Figure 8, and initiatives underway through Work and Income's roll-out of *Community Link* hubs, and the family-

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[41] The first 'fuel poverty' project in New Zealand was established by an NGO (CEA, 1994), and early retrofitting activities under the Energy Saver Fund were largely localised initiatives with a strong NGO and local community involvement.

[42] Personal communication with David Green, Vice-President of Neighbourhood Energy Action (NEA), United Kingdom.

[43] Based on retrofit numbers provided by EECA.

[44] Personal communication with Sally Blackwell, Community Energy Network

centred well-being approach of Whānau Ora. However, the transition of NGOs towards a different level of focus and role will need enabling support from government.

5.4.2. Monitoring and evaluation

Deficiencies in the available information base, monitoring and evaluation have been discussed throughout this report. Perhaps the most important to address are shortcomings in the assessment and monitoring of current programmes. These programmes are the building blocks for further policy and as such their performance should inform the further policy interventions are required.

Better information on the energy prices paid by at-risk households is needed. A reliance on average prices may understate adverse trends for those on low incomes. It might be possible to use electricity company data bases, segmented by particular customer profiles, to obtain this information.

It would be helpful if trend monitoring of the heating and bill paying 'enforced lacks' (in line with the 2008 NZLSS) could be continued. It may be possible to incorporate questions into the regular data collections occurring with the Household Economic Survey.

A final point concerns the potential role played by the Human Rights Commission (HRC). Cold, unhealthy homes have been formally identified within the scope of human rights issues in New Zealand[45] (New Zealand Government, 2009; Human Rights Commission, 2010). However, the HRC reporting is generally limited to cataloguing actions and Geiringer & Palmer (2007) have previously noted the specificity of a rights-based approach (which is couched in the language of obligations and responsibilities) is lacking in HRC reporting. Geiringer & Palmer's set of seven principles provide a further point of reference for HRC

[45] Under Article 11 of the UDHR - Right to an adequate standard of living: housing – habitability. The HRC have identified cold, dampness and crowding as key habitability issues.

reporting. The HRC could play a valuable role in seeking agency accountability for energy sufficiency outcomes.

5.4.3. Further options

The scope of this essay has not allowed for the assessment of further policy options, but two areas stand out for examination. First, there are many issues related to rental properties. Home ownership rates are declining and projections indicate more households living in rented accommodation in the future (NZPC, 2012). Currently, almost 50% of new babies are being born into households that are renting (Morton et al, 2012). No regulations govern the 'energy worthiness' of rental accommodation, and evidence presented in this report suggests that on average rental houses are less energy efficient (although this may relate more to a core group of poor quality rental houses). James & Saville-Smith (2010) have proposed that payment of the accommodation allowance be tied to minimum standards including energy. However, at this time the issue needs to be considered in terms of flow-on effects and other possible impacts in the light of a very tight rental market. The Productivity Commission's report on housing (NZPC, 2012) signalled a need to investigate regulation around quality issues – a suggestion endorsed here.

Second, there are a number of unresolved issues related to electricity pricing and costs to consumers. Generally, the further development of options would be contingent on a more thorough analysis of issues raised earlier around barriers to switching and other cost issues. But the prospective role of electricity vouchers, which have been trialled in New Zealand projects (Morgan, 2007; O'Sullivan, 2008 and forthcoming research), could be an option worth considering within the development of reference standards. Of course consideration of any further options would need to be mindful of the current 'authorising environment' (Scott & Baehler, 2010) which is clearly one of fiscal constraint.

6. Conclusions and recommendations

The premise of this project is that the inability of a household to afford an adequate level of energy services – labelled by the imported term 'fuel poverty' – is a social issue worthy of further public policy investigation. The issue was briefly considered within government in 2008–10 but that inquiry was discontinued before policy outputs were produced. Hence this project has sought to address some of the unanswered questions. One conclusion, which informs the manner in which other conclusions are presented, concerns terminology. Fuel poverty is a term that originated in the United Kingdom and is associated with the specific policy and circumstances of that locale. But it is concluded that fuel poverty is an unsuitable term for this issue in New Zealand, and that 'energy service deprivation' and its antonym 'energy service sufficiency' would be more appropriate. Inclusion of 'service' is the technically correct terminology but for public consumption the simpler and more easily understood 'energy deprivation' and 'energy sufficiency' would suffice.

Evidence for the presence of energy service deprivation in New Zealand is strong. Indicators appear to conform to a socio-economic and deprivation gradient associated with indicators of poverty more generally. It is estimated that in 2008 at least 5% of households displayed symptoms of chronic energy deprivation, with another 10–15% displaying varying levels of deprivation and associated adverse factors. Other households displayed economising behaviours and some deprivation/cold homes issues, but this was likely to be a temporary hardship, or a heating culture issue, rather than a chronic condition. Evidence on the direction of change since then is inconclusive. Government energy programmes have attracted many households, but other external conditions – incomes, employment and the effect of other cost pressures – have been flat or negative.

A central aspect of the project was developing a conceptual framework. Concepts of need were explored in relation to energy service deprivation. It was concluded that the provision of energy services is strongly associated with both expert and individual perceptions of needs and necessities. Addressing energy deprivation implies achieving a sufficiency of energy services,

and it is recommended that policies should be focused on enabling this outcome to be realised. Three 'necessary conditions' were identified – continuity/ connectivity of energy supply, informed behaviours, and affordability. A number of institutional responses were discussed with the development of 'reference standards' being a means by which energy service sufficiency could be specified and operationalised.

There is a strong case, because of inter-dependencies with named economic, social and cultural human rights, to consider 'energy service sufficiency' as a right. But the process to formalise such a right would be complex, and would not necessarily be a high priority in the current environment. Rather, it is recommended there be adoption of rights-based principles through the policy and implementation process in order to encourage new and positive institutional responses. Rights-based principles stress the obligations on duty holders and responsibilities of rights bearers. Applied to current programmes a rights-based framework would require greater attention to distributional aspects of policy and the targeting of measures.

The scalar nature of energy deprivation suggests that a binary threshold definition such as the current United Kingdom fuel poverty definition, or the proposed fuel poverty definition, is not appropriate for New Zealand. Rather, a descriptive definition, backed up by a set of qualitative and quantitative indicators is recommended.

The evaluation of current policy settings and issues has drawn the following conclusions and recommendations:

a) High level energy policy – government should reinstate a high level policy establishing a universal energy services sufficiency outcome – similar in concept to the 'basic energy services' policy that was in place from 1992 to 2007.

b) WUNZ:HS – results of the government's flagship insulation and heating programme to date have been very positive. In order to meet an outcomes-based 'energy service sufficiency' objective it is recommended that there be (a) better identification and targeting of those most in need (b) a prioritisation of funding to the most needy in

order to overcome affordability barriers and maximise programme benefits (c) revised methodologies for valuing the benefits of warmth, which may lead to some pre-prioritisation of spending.

c) Electricity – several concerns have been highlighted mainly relating to the relatively high prices many vulnerable and at-risk households appear to be paying, and their susceptibility to disconnection (either visible or 'hidden'). A more thorough investigation of these issues is recommended.

Currently no central government agency appears to have oversight of, or responsibility for, this issue. Agency responsibilities have become focused around the delivery of specific outputs from discrete programmes. Because energy deprivation is essentially an issue of welfare and human need the Ministry of Social Development should be assuming this oversight role. Historically, NGOs have been important players and advocates on this issue, but with market changes NGOs will need to adapt to the new realities in order to maintain effectiveness.

A number of monitoring and evaluation shortcomings were identified. Because energy service deprivation is essentially a distributional issue, policy needs to be informed by sufficiently disaggregated data and analysis.

A number of further issues were identified for further policy consideration including quality standards for rental accommodation given the increasing proportion of the population projected to be renting in the future.

7. References

Beatty, R. (2008). *Prepayment meter survey results 2008*. Wellington: Electricity Commission.

Boardman, B. (1986). Seasonal mortality and cold homes. In *Unhealthy housing – a diagnosis*. The Institution of Environmental Health Officers and the Legal Research Institute, University of Warwick. 14–16 Dec.

Boardman, B. (1991a). *Fuel poverty: from cold homes to affordable warmth*. London: Belhaven Press.

Boardman, B. (1991b). *10 years cold: lessons from a decade of fuel poverty*. Newcastle-Upon-Tyne: Neighbourhood Energy Action.

Boardman, B. (2009). *Fixing Fuel Poverty - Challenges and solutions*. London: Earthscan.

Bradbrook, A. & Gardam, J. (2006). Placing access to energy services within a human rights framework. *Human Rights Quarterly, 28*(2), 389-415.

Bradshaw, J. (1972). The concept of social need. *New Society*, 30 March: 640-3.

Buckett, N. (Ed), Marston, N. (Ed), Saville-Smith, K., Jowett, L. & Jones, M. (2011). *Preliminary BRANZ 2010 house condition survey report – second edition*. Study Report 240. Judgeford: BRANZ Ltd.

Carr-Hill, R. & Chalmers-Dixon, P. (2005). *The Public Health Observatory handbook of health inequalities measurement*. Oxford: South East Public Health Observatory.

Carter, K. & Imlach Gunasekara, F. (2012). *Dynamics of income and deprivation in New Zealand, 2002–2009. A descriptive analysis of the survey of family, income and employment (SoFIE)*. Public Health Monograph Series No. 24. Wellington: Department of Public Health, University of Otago, Wellington.

CEA (Community Energy Action). (1994). *Report of the Te Whare Roimata neighbourhood energy improvement project*. Christchurch: Community Energy Action.

CEA (Community Energy Action). (2008). *Fuel Poverty Workshop Proceedings*. Christchurch: Community Energy Action Charitable Trust.

CEA (Community Energy Action). (2011). *Annual Report 2010*. Retrieved from: http://www.cea.co.nz/files/Annual_Report_2010_FINAL.pdf

Collins, K. (1986). Low indoor temperatures and morbidity in the elderly. *Age Aging 15*: 212-220.

Courtney, M. (2009). *Putting partnering in practice: collaboration on complex issues – healthy homes*. Wellington: Department of Internal Affairs. Retrieved from:http://www.communityoutcomes.govt.nz/web/coutcomes.nsf/files/puttingpartneringinpractice/$file/putting%20partnership%20in%20practice%20_2.pdf

CSRE (Centre for Social Research and Evaluation). (2007). *Pockets of significant hardship and poverty*. Wellington: Ministry of Social Development. (Internal Advice: In Confidence – released under the Official Information Act).

CSRE (Centre for Social Research and Evaluation). (2010). *Household energy affordability: qualitative research report*. Wellington: Ministry of Social Development and EECA.

Cupples, J., Guyatt, V., & Pearce, J. (2007). "Put on a jacket, you wuss": cultural identities, home heating, and air pollution in Christchurch, New Zealand. *Environment and Planning A 39*(12), 2883–2898.

Davie, G., Baker, M., Hales, S. & Carlin, J. (2007). Trends and determinants of excess winter mortality in New Zealand: 1980 to 2000. *BMC Public Health*.*7*: 263. Published online 2007 September 24. doi: 10.1186/1471-2458-7-263

Dean, H. (2010). *Understanding human need*. Bristol: The Policy Press.

DECC (Department of Energy and Climate Change). (2010). *Fuel poverty methodology handbook*. Retrieved from: http://www.decc.gov.uk/assets/decc/statistics/fuelpoverty/614-fuel-poverty-methodology-handbook.pdf

DECC (Department of Energy and Climate Change). (2011). *Fuel poverty monitoring indicators 2011: Annex to the annual report on fuel poverty statistics 2011*. Retrieved

from: http://www.decc.gov.uk/assets/decc/statistics/fuelpoverty/2184-fuel-poverty-monitoring-indicators-2011.pdf

DECC (Department of Energy and Climate Change). (2012). *Fuel poverty*. Retrieved 25 February 2012 from: http://www.decc.gov.uk/en/content/cms/funding/fuel_poverty/fuel_poverty.aspx

Doyal, L. & Gough, I. (1991). *A theory of human need*. Basingstoke: Macmillan.

EECA. (2006). Bluff gets an allover home makeover. *EnergyWise News 92:* 1, 4-6.

EECA. (2011). *Statement of intent 2011–12 – 2013–14*. Wellington:EECA.

EECA. (2012). *Funding and payment options for insulation and efficient heating*. EECA EnergyWise Webpage. Retrieved 29 May 2012 from: http://www.energywise.govt.nz/funding-available/insulation-and-clean-heating

Ekholm, Y., Krey, V., Pachauri, S. & Riahi, K. (2010). Determinants of household energy consumption in India. *Energy Policy 38*, 5696–5707.

Electricity Authority. (2010a). *Guideline on arrangements to assist medically dependent consumers - Version 2.1*. Wellington: Electricity Authority.

Electricity Authority. (2010b). *Guideline on arrangements to assist vulnerable consumers - Version 2.1*. Wellington: Electricity Authority.

Electricity Authority. (2012a). *WhatsMyNumber*. http://www.whatsmynumber.org.nz/

Electricity Authority. (2012b). *Disconnections for non-payment: January 2006 – December 201*1. Retrieved from: http://www.ea.govt.nz/industry/market/statistics-reports/

Electricity Authority (2012c). *Consumer switching statistics*. Retrieved from:http://www.ea.govt.nz/industry/market/statistics-reports/icps-changing-electricity-supplier/

Electricity Authority (2012d). *What's my number: A changing landscape for New Zealand electricity consumers*. Wellington, Electricity Authority.

Energy and Minerals Advisory Committee. (1987). *The role of Central Government in the energy sector*. Report EMAC 87/1. Wellington: Ministry of Energy.

EPEE (European Fuel Poverty and Energy Efficiency Project). (2009). *Tackling fuel poverty in Europe: recommendations guide for policy makers*. Retrieved from: http://www.fuel-poverty.org/files/WP5_D15_EN.pdf

FPAG (Fuel Poverty Advisory Group). (2004). *Second annual report 2003/04*. London: Department of Trade and Industry. Retrieved from: http://www.decc.gov.uk/assets/decc/what%20we%20do/supporting%20consumers/addressing%20fuel%20poverty/fpag/file12586.pdf

FPAG (Fuel Poverty Advisory Group). (2010). *Eighth annual report 2009*. London: Department of Energy and Climate Change.

FPAG (Fuel Poverty Advisory Group). (2011). *Ninth annual report 2010*. London: Department of Energy and Climate Change.

Frederikson, B. & Whitley, B. (2012). Home energy costs. *Consumer 523*: 22-23.

Free, S., Howden-Chapman, P., Pierse, N. & Viggers, H. (2010). More effective home heating reduces school absences for children with asthma. *J Epidemiol Community Health 64*:379-386.

French, L. (2008). *Active cooling and heat pump use in New Zealand – Survey results*. Study Report 186. Judgeford: BRANZ Ltd.

Geiringer, C. & Palmer, M. (2007). Human rights and social policy in New Zealand. *Social Policy Journal of New Zealand*, *30*, 12–41.

Grimes, A., Denne, T., Howden-Chapman, P., Arnold, R., Telfar-Barnard, L., Preval, N. & Young, C. (2011). *Cost benefit analysis of the Warm Up New Zealand: Heat Smart programme*. Report for Ministry of Economic Development.

Hales, S., Blakely, T., Foster, R., Baker, M. & Howden-Chapman, P. (2012). Seasonal patterns of mortality in relation to social factors. *J Epidemiol Community Health 66*, 379-384.

Hartley, A. (2006). *Fuel poverty and older people*. West Midlands Public Health Observatory.

Heffner, G. & Campbell, N. (2011). *Evaluating the co-benefits of low-income energy-efficiency programmes*. Results of the Dublin Workshop on Fuel Poverty, 27-28 January 2011. Paris: International Energy Agency.

Hick, R. (2012). The Capability Approach: Insights for a New Poverty Focus. *Jnl Soc. Pol. 41*(2), 291–308.

Hills, J. (2011). *Fuel Poverty: The problem and its measurement*. CASE Report 69. London: Centre for Analysis of Social Exclusion.

Hills, J. (2012). *Getting the measure of fuel poverty: final report of the fuel poverty review*. CASE Report 72. London: Centre for Analysis of Social Exclusion.

HM Treasury. (2010). *Spending review 2010*. Retrieved from: http://cdn.hm-treasury.gov.uk/sr2010_completereport.pdf

HNZC (Housing New Zealand Corporation). (2007). *The healthy housing programme outcomes evaluation*. Research and Evaluation Summary Report No. 3. Wellington.

Howden-Chapman, P., Matheson, A., Crane, J., Viggers, H., Cunningham, M., Blakely, T.,…Davie, G. (2007). Effect of insulating existing houses on health inequality: cluster randomised study in the community. *BMJ, doi:10.1136/bmj.39070.573032.80* (published 26 February 2007).

Howden-Chapman, P., Pierse, N., Nicholls, S., Gillespie-Bennett, J., Viggers, H., Cunningham, M.,...Crane, J. (2008). Effects of improved home heating on asthma in community dwelling children: randomised controlled trial. *BMJ; 337*:a1411

Howden-Chapman, P., Viggers, H., Chapman, R., O'Sullivan, K., Telfar Barnard, L. & Lloyd, B. (2011). Tackling cold housing and fuel poverty in NewZealand: a review of policies, research, and health impacts. *Energy Policy* (2011), doi:10.1016/j.enpol.2011.09.044

Human Rights Commission. (2010). *Human rights in New Zealand*. Wellington.

IEA (International Energy Agency), UNDP (United Nations Development Programme) & UNIDO (United Nations Industrial Development Organisation). (2010). *Energy poverty: how to make modern energy access universal?* Paris: OECD/IEA, Retrieved from:

http://www.beta.undp.org/content/dam/aplaws/publication/en/publications/environment-energy/www-ee-library/sustainable-energy/energy-poverty-how-to-make-modern-energy-access-universal/Energy_Poverty_Excerpt_WEO2010.pdf

Iowa Department of Human Rights (2012). Webpage. Retrieved from: http://www.humanrights.iowa.gov/index.html

Isaacs, N. & Donn, M. (1989). *Seasonality in New Zealand mortality – the influence of buildings*. Energy Research Group Report CRP 50, Victoria University of Wellington.

Isaacs, N. (ed), Amitrano, A., Camilleri, M., Pollard, A. & Skoecklein, A.. (2003). *Energy use in New Zealand households: report on the year 7 analysis for the household energy end-use project (HEEP)*. Study Report 122. Judgeford, New Zealand: BRANZ Ltd.

Isaacs, N. (ed), Camilleri, M., French, L., Pollard, A., Saville-Smith, K., Fraser, R.,…Jowett, J. (2006). *Energy use in New Zealand households: report on the year 10 analysis for the household energy end-use project (HEEP)*. Study Report 155. Judgeford, New Zealand: BRANZ Ltd.

Isaacs, N., Saville-Smith, K., Camilleri, M. & Burrough, L. (2010). Energy in New Zealand houses: comfort, physics and consumption. *Building Research & Information 38*(5), 470-480.

James, B. & Saville-Smith, K. (2010). *Children's housing futures*. Wellington: Centre for Housing Research Aotearoa New Zealand.

Johnson, A. (2012). *The growing divide*. Manukau City: The Salvation Army Social Policy and Parliamentary Unit.

Kelsey, J. (1993). *Rolling back the state*. Wellington: Bridget Williams Books.

King, M. (2003). *The Penguin history of New Zealand*. Auckland: Penguin Group.

Laugesen, R. (2011) Fuel poverty in the land of plenty. *New Zealand Listener*. Issue 3725 (1 October 2011). Retrieved on 15 December 2011 from: http://www.listener.co.nz/commentary/fuel-poverty-in-the-land-of-plenty/

Lister, R. (2004). *Poverty*. Cambridge: Polity Press.

Lloyd, C.R. (2006). Fuel poverty in New Zealand. *Social Policy Journal of New Zealand 27*: 142–155.

Lloyd, C.R., Shen, M., Taylor, N. & Callau, M. (2006). *Monitoring of energy efficiency upgrades in state houses in southern New Zealand*. Dunedin: University of Otago.

Lloyd, C.R. & Callau, M. (2009). *Research Report: Retrofit interventions to enable healthy living conditions in existing NZ houses*. Report for EECA. Dunedin: Energy Studies, University of Otago.

Lovins, A. (1977). *Soft energy paths*. Cambridge, Massachusetts: Friends of the Earth/Ballinger.

McChesney, I. (2008). *Reflections and wrap-up*. Fuel Poverty Workshop Proceedings, 4 June 2008, Christchurch. Christchurch: Community Energy Action Charitable Trust.

McChesney, I., Smith, N. & Baines, J. (2006). *The impact on housing energy efficiency of market prices, incentives and regulatory requirements*. Wellington: Centre for Housing Research Aoteoroa New Zealand (CHRANZ).

Mack, J. and Lansley, S. (1985). *Poor Britain*. London: George Allen & Unwin.

MED (Ministry of Economic Development). (2011a). *New Zealand energy data file: 2010 calendar year edition*. Wellington. Retrieved from: http://www.med.govt.nz/sectors-industries/energy/energy-modelling/publications/energy-data-file/new-zealand-energy-data-file-2011

MED (Ministry of Economic Development). (2011b). *Summary and analysis of submissions on the Draft New Zealand Energy Strategy and the Draft New Zealand Energy Efficiency and Conservation Strategy*. (ISBN: 978-0-478-38209-9). Wellington.

Ministry for the Environment. (2011). *Clean healthy air for all New Zealanders: National air quality compliance strategy to meet the PM10 Standard*. Wellington: Ministry for the Environment.

Morgan, J. (2007). *'Southern Comfort' – Fuel poverty in the south*. Presentation to Healthy Homes Hui Nov 2007. Rotorua.

Morton, S.M.B., Atatoa Carr, P.E., Grant, C.C., Lee, A.C., Bandara, D.K., Mohal, J.,...Wall, C.R. (2012). *Growing Up in New Zealand: A longitudinal study of New Zealand children and their families. Report 2: Now we are born*. Auckland: Growing Up in New Zealand.

MSD (Ministry of Social Development) & EECA. (2010). *Household energy affordability: a literature review*. Wellington.

Neighbourhood Energy Action (1991). *Fighting the cold: 10 years of energy efficiency achievement*. Newcastle-Upon-Tyne: Neighbourhood Energy Action.

New Zealand Government. (1992). *Energy policy framework confirmed*. (Media Release 30 June 1992). Wellington: Office of the Minister of Energy.

New Zealand Government. (2007). *New Zealand energy strategy to 2050*. Wellington: Ministry of Economic Development.

New Zealand Government. (2009). *Implementation of the international covenant on economic, social and cultural rights; third periodic report submitted by States parties under articles 16 and 17 of the Covenant*. Retrieved from: http://www2.ohchr.org/english/bodies/cescr/docs/AdvanceVersions/E.C.12.NZL.3AUV.pdf

New Zealand Government. (2011). *New Zealand energy strategy and New Zealand energy efficiency and conservation strategy*. Wellington: Ministry of Economic Development.

Nimmo, K. & McChesney, I. (2007). *Heat pump survey – report 3: Winters 2005 and 2006*. Christchurch: Community Energy Action.

NZPC (New Zealand Productivity Commission). (2012). *Housing affordability*. Wellington: NZPC.

OHCHR (Office of the High Commissioner for Human Rights) (2012). *International Covenant on Economic, Social and Cultural Rights*. Retrieved from: http://www2.ohchr.org/english/law/cescr.htm

Office for National Statistics. (2011). *Excess winter mortality in England and Wales, 2010/11 (provisional) and 2009/10 (final)*. Retrieved from:

http://www.ons.gov.uk/ons/rel/subnational-health2/excess-winter-mortality-in-england-and-wales/2009-10--provisional--and-2008-09--final-/index.html

O'Sullivan, K.C. (2008). *"Gee my account is in credit!" – Qualitative component of the Warm Homes Pilot Study*. Master in Public Health Thesis. University of Otago, Wellington.

O'Sullivan, K.C., Howden-Chapman, P.L. & Fougere, G. (2011). Making the connection: the relationship between fuel poverty, electricity disconnection, and prepayment metering. *Energy Policy 39*, 733-741.

Owen, G. (2010). *Review of the UK fuel poverty measure*. Report to Ofgem. Sustainability First.

Perry, B. (2009). *Non-income measures of material wellbeing and hardship: first results from the 2008 New Zealand living standards survey, with international comparisons*. Working Paper 01/09. Wellington: Ministry of Social Development. Retrieved from: http://www.msd.govt.nz/about-msd-and-our-work/publications-resources/monitoring/living-standards/living-standards-2008.html

Perry, B. (2011). *Household incomes in New Zealand: trends in indicators of inequality and hardship 1982 to 2010*. Wellington: Ministry of Social Development.

Pantazis, C., Gordon, D. & Townsend, P, R. (2006). *The necessities of life*. in Pantazis, C., Gordon, D. and Levitas, R, (eds). *Poverty and social exclusion in Britain: the millennium survey* (pp). Bristol: The Policy Press. 89-122.

Preval, N., Chapman, R., Pierse, N. & Howden-Chapman, P. (2010). Evaluating energy, health and carbon co-benefits from improved domestic space heating: a randomised community trial. *Energy Policy 38*, 3965-3972.

Rennie, N. (1989). *Power to the people: 100 years of public electricity supply in New Zealand*. Wellington: Electricity Supply Association of New Zealand.

Rugkåsa, J., Shortt, N.K. & Boydell, L. (2007). The right tool for the task: 'boundary spanners' in a partnership approach to tackle fuel poverty in rural Northern Ireland. *Health and Social Care in the Community 15*(3), 221–230.

Salmond, C., King, P., Crampton, P. & Waldegrave, C. (2005). *NZiDEP - A New Zealand index of socioeconomic deprivation for individuals*. Wellington; Wellington School of Medicine and Health Sciences, and The Family Centre Social Policy Research Unit.

Saville-Smith, K. (2008a). *House owners and energy – retrofit, renovation and getting house performance*. Report EN-6570 for Beacon Pathway Limited.

Saville-Smith, K. (2008b). *Appendix C: Landlords energy Working Paper - preliminary analysis of the telephone survey data*. Report EN-6570 for Beacon Pathway Limited.

Scott, C. & Baehler, K. (2010). *Adding value to policy analysis and advice*. Sydney: UNSW Press.

Sen, A. (1982). 'Equality of what?', in A. Sen (ed.). *Choice, welfare and measurement*, NewDelhi: Oxford University Press.

Sen, A. (1999). *Development as freedom*. Oxford: Oxford University Press.

Shannon, S., Lloyd, C.R., Roos, J. & Kohlmeyer, J. (2003). *EVH3 – Impact of housing on health in Dunedin NZ*. Dunedin: University of Otago.

Spiker, P. (1993). Needs as claims. *Social Policy & Administration 27*(1), 7-17.

Statistics New Zealand. (2003). *What is the extent of crowding in New Zealand: An analysis of crowding in New Zealand households 1986-2001*. Wellington: Statistics New Zealand.

Statistics New Zealand. (2010). *Household economic survey: Year ended June 2010*. Retrieved from: http://www.stats.govt.nz/browse_for_stats/people_and_communities/Households/HouseholdEconomicSurvey_HOTPYeJun10/Tables.aspx

Statistics New Zealand. (2011a). *Census quickstats about housing – tables (revised 31March 2011)*. Retrieved from: http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/quickstats-about-a-subject/housing.aspx

Statistics New Zealand. (2011b). *New Zealand general social survey: 2010*. Accessed on 15 December 2011 from:

http://www.stats.govt.nz/browse_for_stats/people_and_communities/Households/nzgss_HOTP2010/Commentary.aspx#home

Statistics New Zealand. (2011c). *Household economic survey (income): Year ended June 2011*. Retrieved from: http://www.stats.govt.nz/browse_for_stats/people_and_communities/Households/HouseholdEconomicSurvey_HOTPYeJun11/Data%20Quality.aspx

Stephenson, J., Barton, B., Carrington, G., Gnoth, D., Lawson, R. & Thorsnes, P. (2010). Energy cultures: a framework for understanding energy behaviours. *Energy Policy*, 38, 6120–6129.

Taylor Baines & Associates, Smith, N., McChesney, I. & Butcher, G. (2005). *Warm homes technical report: social drivers phase 1: interim progress report*. Wellington: Ministry for the Environment. (Available on line at: http://www.mfe.govt.nz/publications/energy/warm-homes-social-drivers-phase1-nov05/index.html)

Telfar-Barnard, L., Baker, M., Hales, S. & Howden-Chapman, P. (2008). Excess winter morbidity and mortality: still a lack of evidence that housing or socio-economic status makes much difference. *Rev Environmental Health*, *23*(3), 203-221.

Telfar Barnard, L. (2009). *Home truths and cool admissions: New Zealand housing attributes and excess winter hospitalisation*. *PhD Thesis*. Dunedin: University of Otago.

Telfar Barnard, L., Preval, N., Howden-Chapman, P., Arnold, R., Young, C., Grimes, A. & Denne, T. (2011). *The impact of retrofitted insulation and new heaters on health services utilisation and costs, pharmaceutical costs and mortality: the impact of Warm Up New Zealand:Heat Smart*. Report to the Ministry of Economic Development.

The Treasury. (2012). *The estimates of appropriations for the Government of New Zealand for the year ending 30 June 2013*. *Vote Energy*. Retrieved from: http://www.treasury.govt.nz/budget/2012/estimates/est12ener.pdf

Townsend, P. (1979). *Poverty in the United Kingdom*. Harmondsworth: Penguin Books.

UK Government. (2001). *The UK fuel poverty strategy*. Retrieved from: http://www.decc.gov.uk/en/content/cms/what_we_do/consumers/fuel_poverty/strategy/strategy.aspx

UK Government, (2005). *The UK fuel poverty strategy: 3rd annual progress report*. London: Department of Trade and Industry.

UMR Research. (2012). *Consumer switching: A quantitative study supplemented by qualitative research*. Wellington: UMR Research Limited.

United Nations. (2012a). *The universal declaration of human rights*. Retrieved from: http://www.un.org/en/documents/udhr/index.shtml

United Nations. (2012b). *The universal declaration of human rights*. Retrieved from: http://www.un.org/en/documents/udhr/hr_law.shtml

UNDP (United Nations Development Programme). (2012). *Mainstreaming human rights*. http://www.beta.undp.org/content/undp/en/home/ourwork/environmentandenergy/focus_areas/water_and_ocean_governance/human-rights-based-approaches.html

UNICEF (United Nations Children's Fund). (2007). *Child poverty in perspective : An overview of child well-being in rich countries*. Florence: UNICEF Innocenti Research Centre.

Vujcich, H. (2008). *Valuing warm homes -exploring New Zealanders' home heating choices*. Master of Environmental Studies Thesis. Wellington: Victoria University of Wellington.

Warm Zones. (2009). *Annual Report 2008-09*. Retrieved from: http://www.warmzones.co.uk/2997_05_WZ_ANNUAL%20REVIEW%202008%2009.pdf

Williams, P. (2002). The competent boundary spanner. *Public Administration 80*(1), 103–124.

Williams, P. & Sullivan, H. (2010). Despite all we know about collaborative working, why do we still get it wrong? *Journal of Integrated Care 18*(4), 4-15.

Wilson, J. (2012). The big chill. *Consumer 524*, 10-13.

Young Foundation. (2009). *Sinking and swimming: understanding Britain's unmet needs*. London: The Young Foundation.

Appendix 1 – Human Ethics Committee information sheet and consent form

PARTICIPANT INFORMATION SHEET FOR:

Fuel poverty in New Zealand – a public policy investigation

Researcher: Ian McChesney: School of Government, Victoria University of Wellington

I am a Master's student in Public Policy at Victoria University of Wellington. As part of this degree I am undertaking research investigating fuel poverty as a public policy issue in New Zealand. The University requires that ethics approval be obtained for research involving human participants. Approval was granted on 24 February 2012.

The purpose of my research is to develop an explanatory framework and to assess policies and priorities to address fuel poverty. I am approaching a number of 'key informants' (in government, NGOs, energy providers, and universities) seeking their views to inform this research. While the exact themes to be discussed in an interview will vary by informant, my overall interest is in your views on……..(***this will be personalised for each key informant***).

Should you agree to be interviewed, I will arrange a suitable time and place with you. I expect interviews to take 30-60 minutes.

All information will be assumed to be provided confidentially and will be reported in a non-attributed manner. That is, in the report, information will be reported without any identifying detail. However, there can be an exception when it is appropriate to cite and attribute specific information. If any such information is to be attributed to a person by name or affiliation, it would only be with the explicit permission of the informant, and the specific wording and attribution would be checked with that person.

I will audio record our conversation. The recording and any notes I make from them will be stored securely and destroyed by 31 May 2014. They will be retained in the interim only to support any checking required by the university or a potential publisher. Only my supervisor will have access to the raw data.

The research report will be submitted for marking to the School of Government by 5 June 2012 and deposited in the University Library. It is possible that one or more articles may be submitted for publication in scholarly journals and/or the results may be presented publicly in some form.

Should any participants feel the need to withdraw their information from the project they may do so, and any information provided will be destroyed. Please contact me before 1 May 2012 if this is the case.

If you have any questions or would like to receive further information about the project, please contact me at 03 348 5551 or mcchesian@myvuw.ac.nz, or my supervisor, Dr Amanda Wolf (Amanda.wolf@vuw.ac.nz), at the School of Government at Victoria University, P O Box 600, Wellington, phone 04 463 5712.

Ian McChesney
February 2012

CONSENT TO PARTICIPATE IN RESEARCH

Title of project: Fuel poverty in New Zealand – a public policy investigation

I have been given and have understood an explanation of this research project. I have had an opportunity to ask questions and have them answered to my satisfaction.

I understand that I may withdraw myself (or any information I have provided) from this project (before 1 May 2012) without having to give reasons. Should I withdraw from the study, information I have provided will be destroyed.

I understand that any information I provide will be kept confidential to the researcher and the supervisor.

I understand that the reported results will not use my name or organisational affiliation, and that no opinions will be attributed to me in any way that will identify me, with the exception of the instance outlined below:

> If there is specific information or opinions which I provide in the interview, and which I explicitly state may be attributed to me may be used and attributed in the final report. My statement that these comments may be attributed will be recorded in the interview. I will make clear if my consent is for my name and/or the name of my organization to be used. Furthermore, prior to use, the researcher, Ian McChesney, will allow me to check the comments for accuracy. I will have the opportunity to either reverse or confirm my decision at that time.

I understand that the interview will be electronically recorded. I understand that recordings of interviews will be electronically wiped and other notes will be destroyed by 31 May 2014.

I understand that the data I provide will not be released to others or used for any other purpose not mentioned in the information sheet.

I agree to take part in this research.

I would like to receive a summary of the results of this research when it is completed. Please send to:_____

_____

Signed:

Name of participant: Date:

(Please print clearly)

Appendix 2 – Fuel poverty indicators

Introduction

A key objective of this study is to provide a quantitative evaluation of fuel poverty in New Zealand in order to help populate the gap remaining when the HEAP was discontinued. Full details of the quantitative assessment of fuel poverty carried out for this study are set out in this Appendix.

Energy use overview

Almost all the increase in average per capita energy use in the last 4 decades has been from electricity (Figure A1), reflecting a greater availability and use of electrical equipment and appliances in the home, urbanisation, restrictions on solid fuel burning because of clean air policies, and consumer preferences. In 2010 electricity comprised almost 75% of household energy use (MED, 2011a), although burning is still an important means of supplying heat, especially in rural towns and farms where cheap wood supplies are readily available.

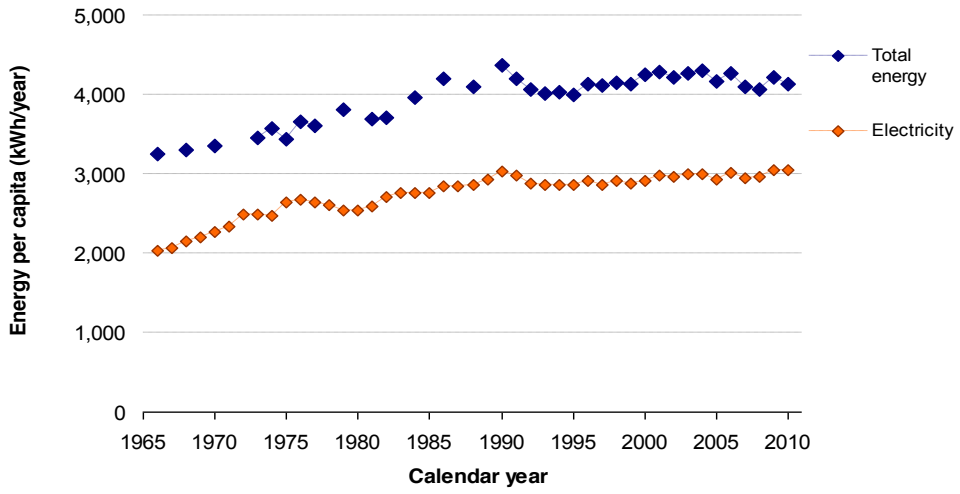

Figure A1. Average household energy use and electricity use per capita 1965-2010 (Sources: Energy Data File (MED, 2011a) and various prior energy databases).

The breakdown of energy into end uses shows that on average heating and hot water are the two largest energy end uses, with refrigeration, lighting, cooking and use of other appliances making up the balance (Figure A2). However the averages in Figure A2 disguise the influence of some key variables. For example while space heating averages 34% of household energy use, this can vary from typically 20% in warm zone areas to over 50% in cool zone areas, while disaggregating further to the individual household level shows still larger variability (Isaacs et al., 2006).

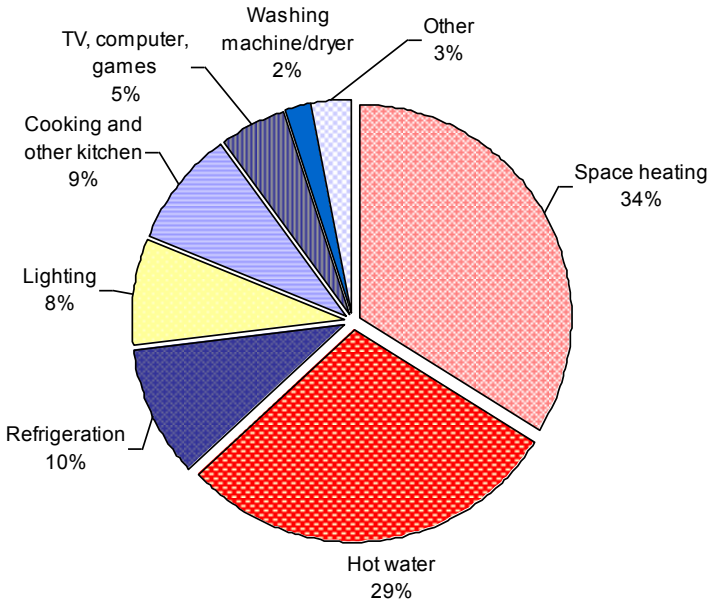

Figure A2. Breakdown of energy into end uses (Source: from data in Isaacs et al, 2006).

The influence of some key variables is shown in Figure A3 which sets out per-person energy consumption for sub-segments of climate zone, household size, and household income[46]. Further disaggregation would likely produce a wider range of energy use values. Note that the current average per capita energy consumption is about 4,200 kWh (see Figure A1).

[46] Note that the income distribution is equivalised to account for the effect of household size.

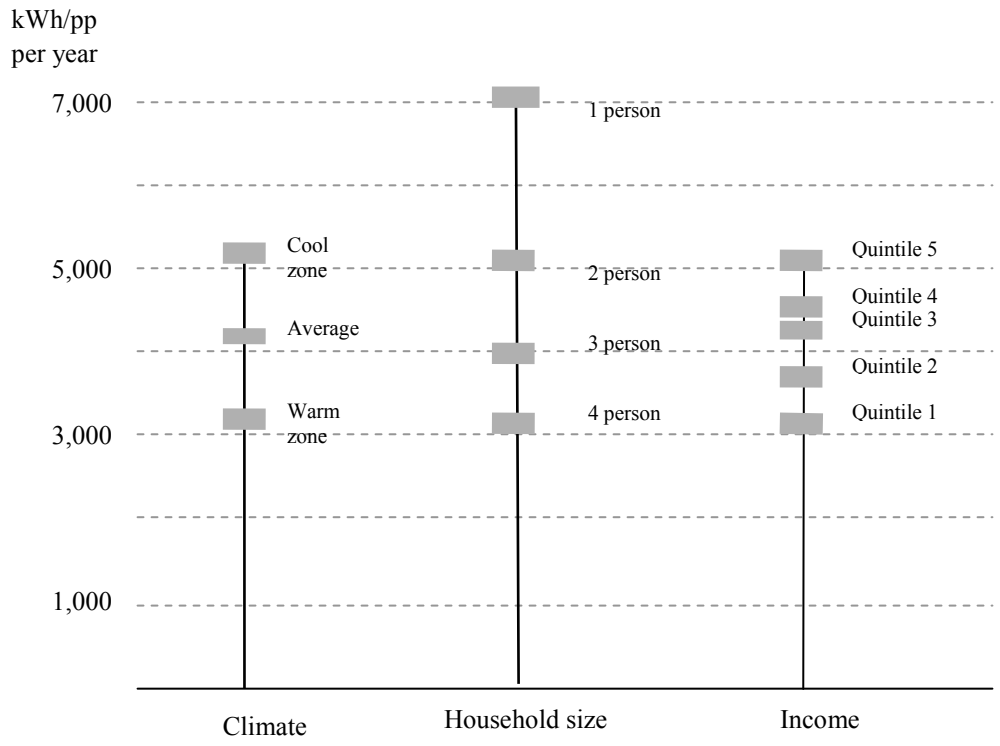

Figure A3. Association of key variables with energy use per person per year (Source: derived from household energy modelling and Household Economic Survey (HES) data (see Statistics New Zealand, 2010, and prior surveys data).

Electricity prices

Since the late 1980s average real household electricity prices have steadily increased and by 2010 were over 70% higher (Figure A4). On average electricity now makes up 90% of household energy costs (calculated from Statistics New Zealand, 2011c), but many potentially fuel poor households are 100% reliant on electricity. These households may also be paying higher-than-average prices because of fuel debts, or be tied to more expensive tariffs (e.g. using PPMs, not having the ability to access cheaper tariffs that rely on timers or off peak storage, or through living in remote rural areas). Specific information on the energy costs faced by the fuel poor is lacking.

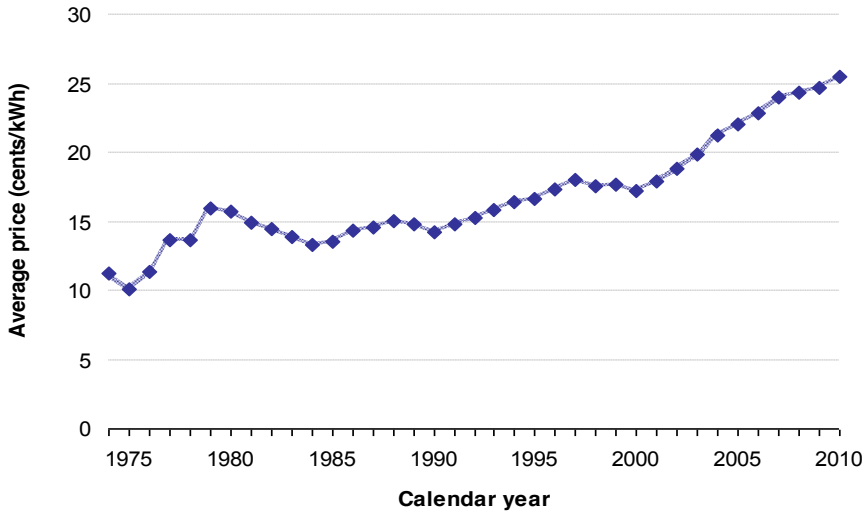

Figure A4. Average real household electricity prices 1974-2010 ($(2010) (Source: MED, 2011a).

Bill paying difficulties

The 2008 *New Zealand Living Standards Survey* (NZLSS) found that 11% of people could not pay electricity/gas/water bills on time because of a shortage of money "more than once in the last 12 months" (Perry, 2009). These people were not just concentrated in the most disadvantaged groups (those with an ELSI (economic living standards index) score of 6 or 7) but were also in within the moderate deprivation groupings (Figure A5).

In 2011 Work and Income made 37,443 hardship payments to assist with electricity payment and disconnections (Wilson, 2012), a similar number to five years earlier. This represents about 2.5% of households. Disconnections for non-payment reduced substantially during 2007 following new industry guidelines developed following the death of a medically dependent patient, but have steadily increased since mid-2008 and at the end of 2011 were up at around three-quarters of the pre-guidelines level (Figure A6).

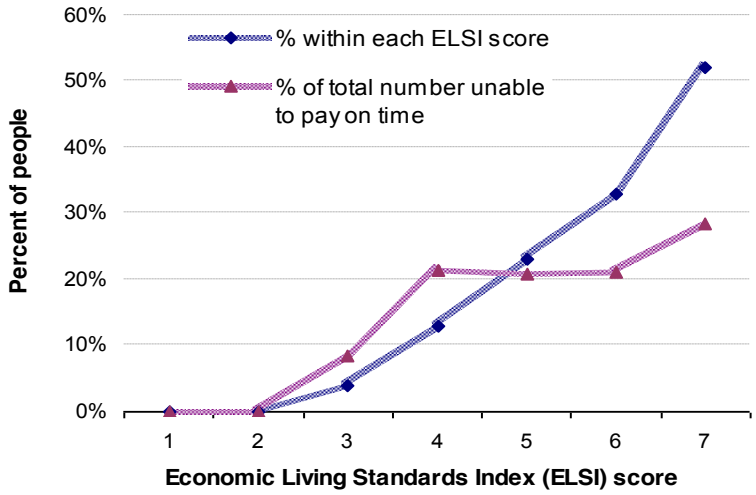

Figure A5. People not being able to pay bills on time 'more than once in the last 12 months' - 2008 (Source: Perry, 2009)

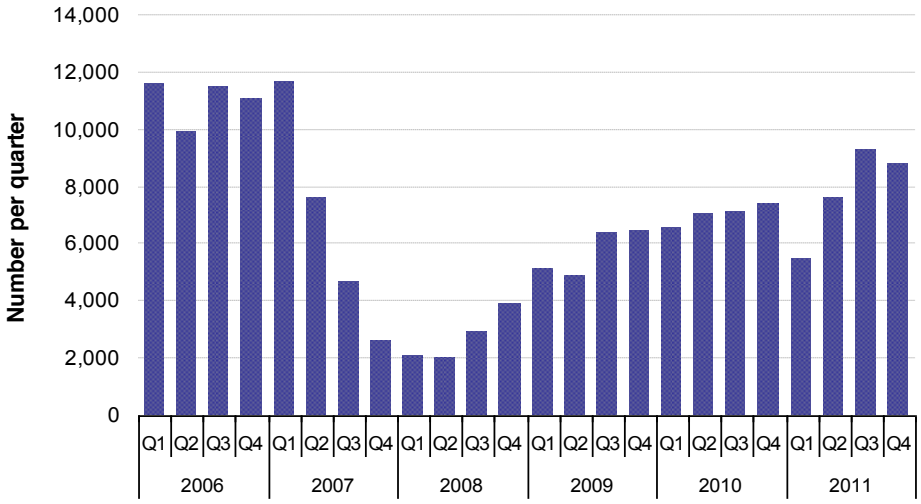

Figure A6. Residential disconnections 2006–2011 (Source: Electricity Authority (2012b)).

A number of households are also in debt to their electricity provider. The New Zealand Federation of Family Budgeting Services (NZFFBS) report that total debt presented to their advisers increased from $2m in 2008 ($176/family) and $2.5m in 2009 ($195/family) to over

$4m in both 2010 and 2011[47]. Much of the increase in 2010 was considered to stem from the reduction in disconnections, but in 2011 while the average debt reduced from $321 to $227/family the number of families presenting with debt was approximately 40% higher than the average of the previous 3 years. The total number of households in debt across the country, or level of debt, is not known.

Pre-payment meter (PPM) 'hidden disconnections' – While a 2008 Electricity Commission survey showed there were 52,664 PPMs installed (Beatty, 2008) current PPMs in use are estimated to be lower (see Wilson, 2012). A longstanding concern is that PPMs are associated with a level of hidden disconnection caused by householders having insufficient money to top up the meter, and hence going without electricity for periods of time. Some of the social impacts have been reported by O'Sullivan (2008) and CSRE (2010). In the mid–1990s a small survey undertaken in Christchurch with an at-risk group of customers found 59% had gone without electricity in the previous 14 days, ranging from 1–6 days with a mode of 2 days[48]. More recently a national postal survey of households using PPMs indicated 52% had 'self disconnected' in the previous year – half reporting disconnecting once or twice but 17% more than 6 times (O'Sullivan quoted in Wilson, 2012).

Income poverty

Trends over the last three decades show a rise in poverty rates in the early 1990s, followed by a small decline from around the mid–2000s which Perry (2011) attributed to the effect of the *Working For Families* package (Figure A7). The trends shown are based on the accepted European Union household poverty threshold of 60% of median household income. Poverty is

[47] Information from Raewyn Fox, NZFFBS.

[48] The survey involved 29 vulnerable households using PPMs who were associated with social agencies in the city. Unpublished survey carried out by Community Energy Action in association with social agencies in Christchurch.

represented 'after housing costs' are deducted (AHC)[49]. In 2009–10, some 500,000–750,000 people (including 170,000–270,000 children) were in households with incomes below low-income thresholds (i.e. 'in poverty') (Perry, 2011)[50]. This represented some 200,000–300,000 households (12–18% of households).

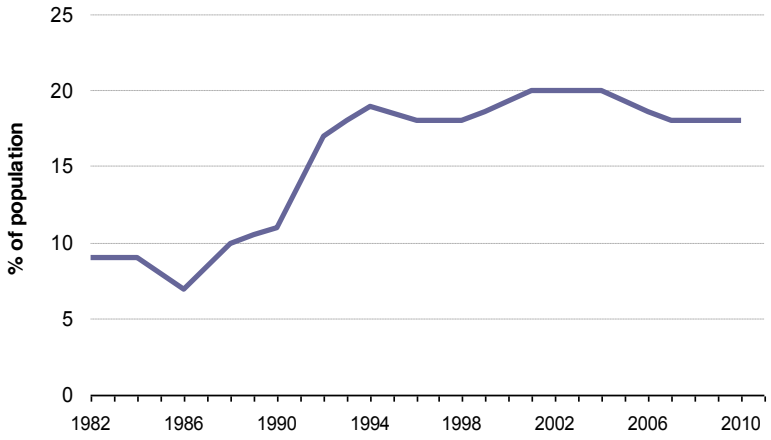

Figure A7. Proportion of the population below threshold of income poverty using 60% median income after housing costs (AHC), relative to each year's median income (Source: Perry, 2011).

Trends by household and family type show sole-parent households with dependent children having the highest income poverty rates, followed by single person households under 65 years (Figure A8). However, allowing for the much larger numbers of two-parent households with children, there are more poor individuals from this household type than from sole-parent households, or indeed from single person households. Overall two-thirds of people below the threshold were from households with children, and just 12% from all single person households (including those over 65 years).

[49] Perry (2011) argues that AHC income is a more effective way of representing poverty because housing costs are, in the short term at least, a fixed cost that households have to meet.

[50] Perry's analysis is based on 'equivalising' household incomes to account for changes in household structure.

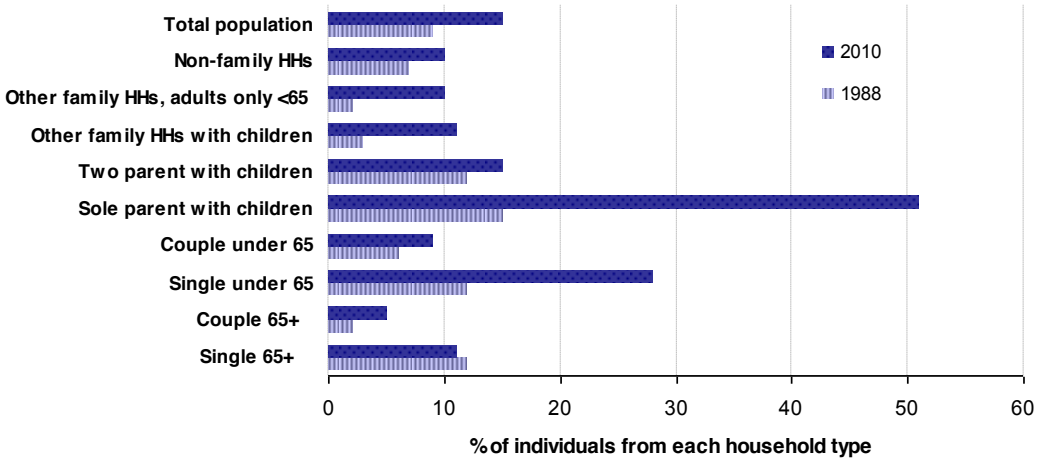

Figure A8. Change in the percent of individuals in households below 60% AHC income (CV) by household and family type -2010 vs 1988 (Source: Perry (2011).

Income trends have been steady over the last few years, and while NGO-reported trends through to 2011 suggest little change in key indicators in the last 2–3 years, they also note concern with "entrenchment of marginalisation" (Johnson, 2012).

Warmth and dampness

The Household Energy End-Use Project (HEEP) recorded indoor temperatures in a broadly geographically representative sample over the period 1999–2003. The study found 30% of houses not reaching above 16°C average wintertime temperatures in their living areas, and some houses with minimal heating (Isaacs et al., 2006). Bedroom temperatures were lower still. Overall temperatures were little different from those found in a 1970s survey. The study found the percent of homes not reaching 16ºC average wintertime evening temperature to be related to income (Isaacs, Saville-Smith, Camilleri & Burrough, 2010), although some higher income houses were also cold, suggesting perhaps that lifestyle or the cultural disposition to minimally heat are also important (Figure A9). The lower percent of quintile 3 houses not achieving the temperature threshold was most likely related to the higher level of enclosed solid fuel heating found in these homes. Houses heated with these heaters on average achieved the highest indoor living area temperatures.

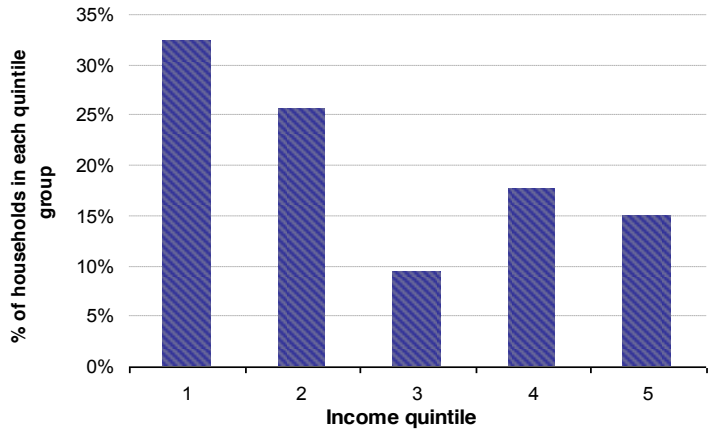

Figure A9. Percent of houses within each income quintile not achieving 16ºC wintertime evening temperature – HEEP study (Source: Isaacs et al, 2010).

The HEAP qualitative study reported that most low income households were limiting heating in some way (e.g. just heating the main room at particular times), with a number of households going without heating altogether (CSRE, 2010). Ongoing increases in both energy and non-energy costs put increasing pressure on households' ability to afford sufficient energy services. Winter heating costs are particularly problematic because of high and often unpredictable winter power bills – hence heating is often the first to be cut back.

Other surveys of low income and rental housing in NZ have consistently found average indoor temperatures well below recommended levels, in many cases representing a danger to health (Shannon, Lloyd, Roos & Kohlmeyer, 2003; Lloyd, Shen, Taylor & Callau, 2006; Morgan, 2007; Howden-Chapman et al., 2007). Note that these surveys largely pre-date the increase in the installation of heat pumps in the last decade (see Heating Appliances).

The 2008 NZLSS found the ability to keep main rooms adequately warm was an *enforced lack*[51] for 7% of the population, while 10% reported economising *a lot* and putting up with

[51] An enforced lack refers to a particular aspect of deprivation that is enforced through lack of income rather than through choice.

feeling cold to save on heating costs (Perry, 2009). These two fuel poverty indicators, and measures of deprivation more generally, show a strong coincidence (Figure A10). Approximately 50% of those indicating each of the fuel poverty-related enforced lack were experiencing multiple deprivations of six or more, and overall, 75% were experiencing 4+ enforced lacks (Figure A11). The data suggests that only about 2% of total households had these fuel poverty indicators as their only enforced lack (i.e. they indicated either lack of heating or feeling cold as their sole lack, or both these indicators were their two enforced lacks).

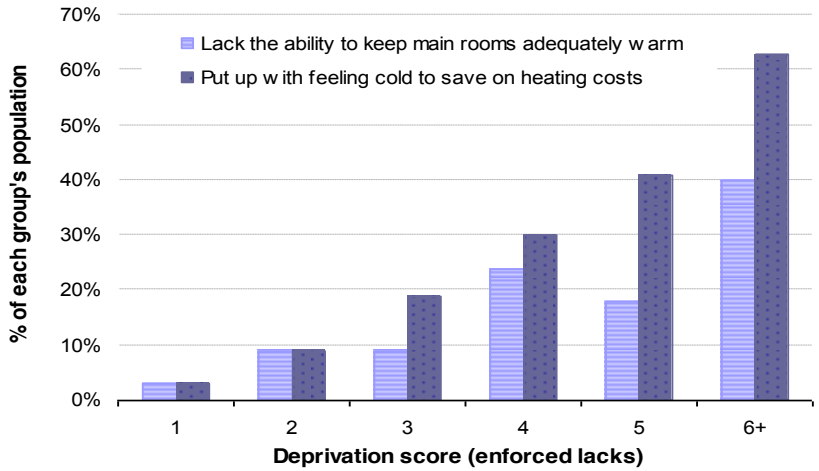

Figure A10. Rate of fuel poverty indicators by deprivation group (Source: data from Perry, 2009).

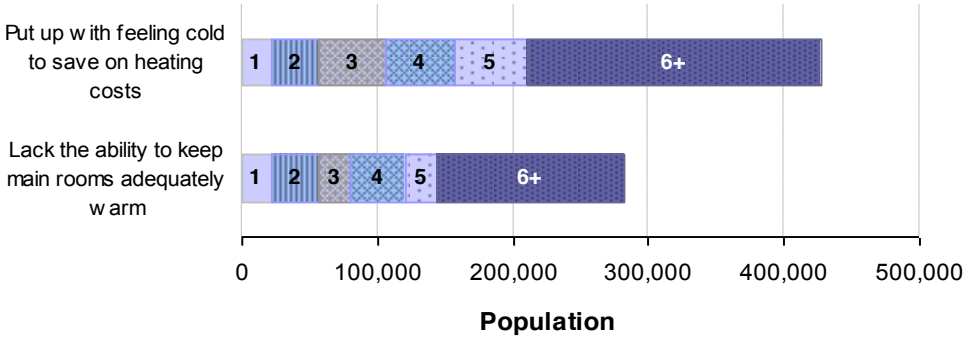

Figure A11. Numbers of people in the population indicating the enforced fuel poverty-related lacks, showing their deprivation score (Source: data from Perry, 2009).

The 2010 New Zealand General Social Survey reported 36% of households having one or more major problems relating to the house or flat they live in with the main problems reported related to heating, size, and dampness. Higher levels of problems were reported for rental houses, younger families, and sole parent households (Statistics New Zealand, 2011b).

Coincidence with child poverty concerns – The 2008 NZLSS found 9% of children living in homes where main room cannot be kept warm, 17% where there is a major problem with dampness and mould, and 22% where there is a major problem with keeping the house warm in winter. Again, the incidence of these indictors displays a strong deprivation gradient (Figure A12)[52].

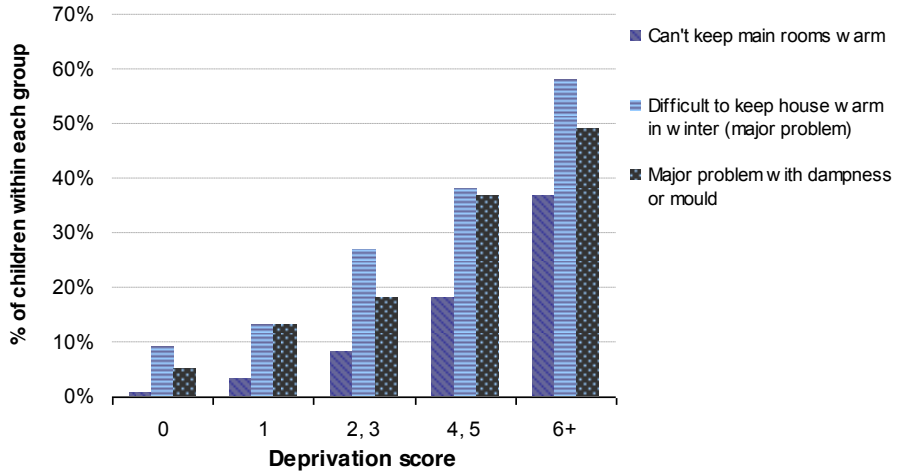

Figure A12. Rate of fuel poverty indicators for children by deprivation group (Source: Perry, 2009).

The *Growing Up in New Zealand* study, reporting on babies at 9 months of age (data was collected during the 12 months to January 2011), found 18.4% of households "putting up with feeling cold to save on heating costs" (Morton et al., 2012). Progressively higher levels of mould, condensation and dampness, and houses lacking heating were found in more deprived areas (Figure A13).

[52] Note that only the 'Can't keep main rooms warm' is a contributor to the overall deprivation score.

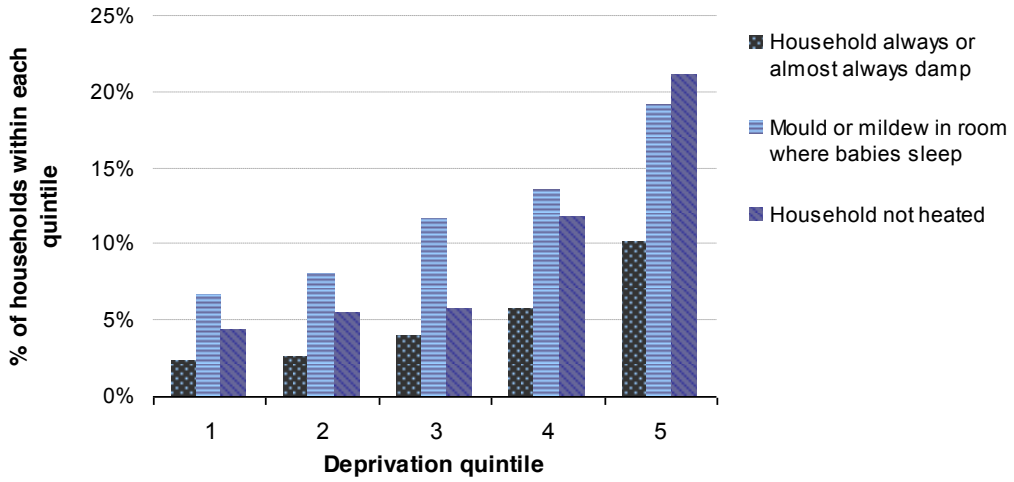

Figure A13. Incidence of fuel poverty related indicators - Growing Up in New Zealand households 2010–11 (Source: Morton et al, 2012)

Other studies have shown a concentration of housing-related multiple deprivation risk factors including house crowding (Statistics New Zealand, 2003) and the physical condition of the dwelling e.g. James and Saville-Smith (2010) estimated 80,000 children living in temporary dwellings. Fuel poverty indicators are likely to be strongly present in these situations.

Adverse health effects

Isaacs & Donn (1989) analysed New Zealand's Excess Winter Mortality (EWM) during the period 1960s–1980s, and in finding a higher rate than in the United Kingdom postulated a possible causal link with poorly insulated and heated houses. This question went largely unanswered for a decade until the Wellington School of Medicine *He Kainga Oranga* Housing and Health research programme began several projects to seek answers about the health impacts of cold, damp and under-heated homes. These studies have found measurable health impacts in under-heated and under-insulated homes for those with pre-existing respiratory

conditions (Howden-Chapman et al., 2007, Howden-Chapman et al., 2008, Free et al., 2010)[53], and higher winter hospitalisation rates related to household factors including relative socio-economic deprivation and dwelling quality (Telfar Barnard, 2009). Evaluations of Housing New Zealand Corporation's Healthy Housing initiatives found reduced risk and rate of housing-related diseases, and broader well-being benefits from retrofitting (HNZC, 2007). Population studies attempting to link EWM and winter morbidity to specific socio-economic factors have been less conclusive (e.g. Davie et al 2007, Telfar Barnard et al., 2008) although Hales et al. (2012) found small elevated risks of EWM associated with low income, living in rental accommodation, and living in urban areas.

In 2011 a health outcomes evaluation was undertaken on the first 11 months of households receiving insulation and heating from the WUNZ:HS programme using a matched cohort methodology[54] (Telfar Barnard et al., 2011). The findings indicated reduced hospitalisation costs, reduced pharmaceutical costs and reduced mortality as a result of insulation, with the benefits for the low income participants averaging 3½ times higher per household than general income households. This study has reinforced the particular susceptibility of those with pre-existing health conditions to cold and damp homes.

Overall the studies suggest that health outcomes are associated with a 'multiple clustering' effect related to socio-economic status and deprivation. Adverse health outcomes from cold homes and dampness are most heavily concentrated in those with pre-existing health conditions, with a socio-economic gradient towards higher deprivation and an aggregation of possible causative pathways e.g. overcrowding, high smoking rates, higher use of unflued gas heaters, sub-standard health care.

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[53] The adverse impacts of cold homes were implied by measured reductions in adverse health indicators after insulation and heating improvements were made.

[54] The matched cohort was some 10 times the size of the WUNZ:HS treatment group and used as the control.

Energy affordability

Analyses of energy affordability in New Zealand have tended to follow the United Kingdom lead and portray relative affordability as the ratio of energy costs to income, compared across income groupings (e.g. McChesney, Smith & Baines, 2006: Lloyd, 2006; Lloyd & Callau, 2009; Howden-Chapman et al., 2011). Figure A14 shows actual cost/gross income ratios since the late 1980s across income groupings. It does not purport to indicate 'fuel poverty' since the ratio is not consistent with the United Kingdom method[55]. Rather, it indicates that since the late 1980s household energy costs have required a greater share of income across income groups except at the top end, and has been most pronounced for lower income households[56].

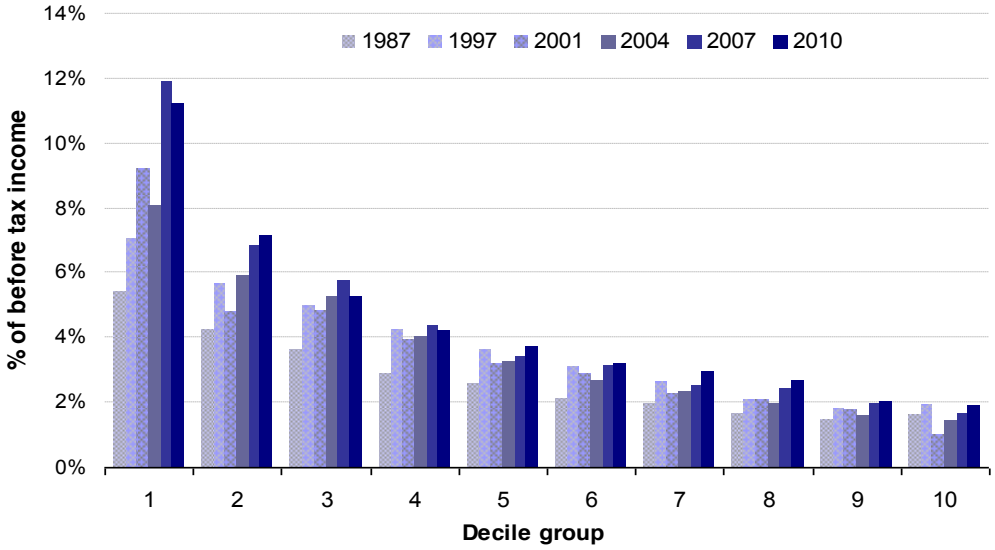

Figure A14. Energy expenditure as a percentage of gross (before tax) income (Source: Derived from HES data (see Statistics New Zealand, 2010, and prior surveys).

[55] The UK fuel poverty measure is explicit with respect to using calculated energy costs (i.e. what a house needs) and disposable income (i.e. net of income tax).

[56] Perry (2011) cautions about the reliability of decile 1 data because it includes households recording zero or negative income, which may be related to self-employed tax positions or other reasons, rather than a true measure of income.

Another way of representing the HES data is by normalising household energy expenditure for each income group against household size (based on number of occupants) and showing the variance between actual expenditure and the normalised average for each decile. This was carried out for 2004, 2007 and 2010, and shows a reasonably consistent trend towards under-expenditure in the lower-mid decile groups and higher expenditure in the highest three deciles (Figure A15)[57]. Note that the under-expenditure is not just confined to the lowest income deciles but extends to deciles 3-5. Comparing normalised and actual expenditure by household type the largest variation from the norm was for 'one parent with children' households (-16% in 2010) – a result consistent with the income poverty analysis and wider deprivation analysis reported by Perry (2009 and 2011).

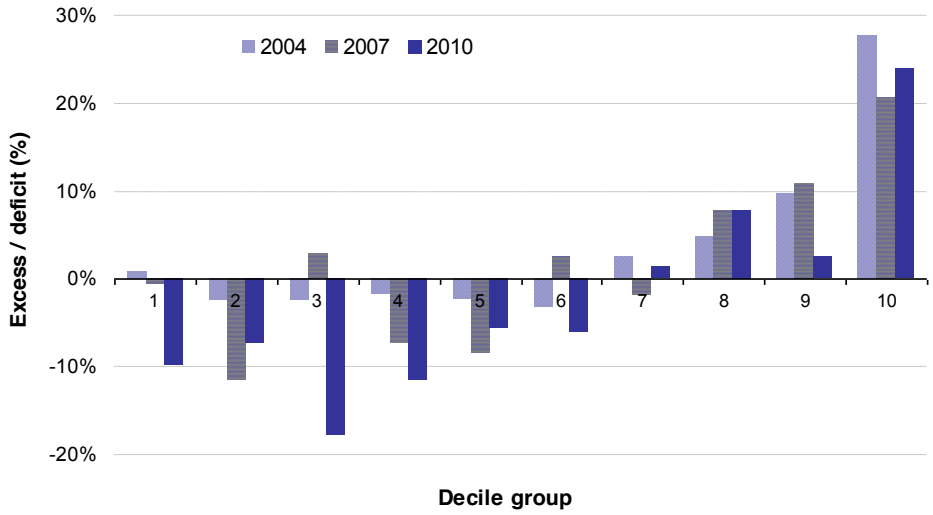

Figure A15. Household energy expenditure variations against normalised averages for each income decile class 2004, 2007 and 2010 (Sources: derived from Statistics New Zealand, 2010, and prior survey data)

[57] This cannot be used to infer levels of energy services available because there is not a direct correlation between expenditure and energy service; under-expenditure could imply high efficiency and other positive reasons, although under-expenditure in lower income households is most likely to reflect various levels of energy deprivation.

Insulation

Insulation status is an indicator of the warmth potential of homes. Homes with satisfactory ceiling and underfloor insulation will achieve heat loss reductions of 40-45% compared to those without insulation. The 2010 House Condition Survey indicated ongoing improvement in the coverage and quality of insulation in houses (e.g. thickness, lack of defects) (Buckett, Marston, Saville-Smith, Jowett & Jones, 2011). Only 5% of houses had no ceiling insulation and a further 4% had less than 50% coverage[58], although insulation thickness was sub-standard in many houses and the survey reported a reasonably high level of defects. Where sub-floors were accessible more than 50% of houses now have some type of insulation. Further breakdowns into particular household segments will be forthcoming.

The insulation status of the houses occupied by those on low income or pone to fuel poverty is not clear. Evidence suggests that rental houses are less well insulated than those of home owners. Surveys undertaken by Saville-Smith (2008a) found a lower incidence of insulation in rented houses, and the uptake of insulation by landlords under WUNZ:HS shows that to date 20% of retrofits within the low-income stream are rented homes[59] - by comparison the rate of private renting in the lowest two income quintiles in the wider population is a little over 30% (Statistics New Zealand, 2010). Nevertheless, the situation is dynamic. At June 2011 about 150,000 houses had been retrofitted since the mid 1990s under EECA programmes (for low income households) or within the Housing New Zealand Corporation stock (Figure A16). About 25,000 further houses are projected to be insulated in 2011-12. The current criteria for qualification to the low income stream of WUNZ:HS is a household member holding a Community Services Card (CSC).

[58] The coverage of ceiling insulation was actually marginally less than found in the 2005 survey, but the 2010 survey fully covered rental properties and the 2005 survey did not.

[59] Information provided by EECA.

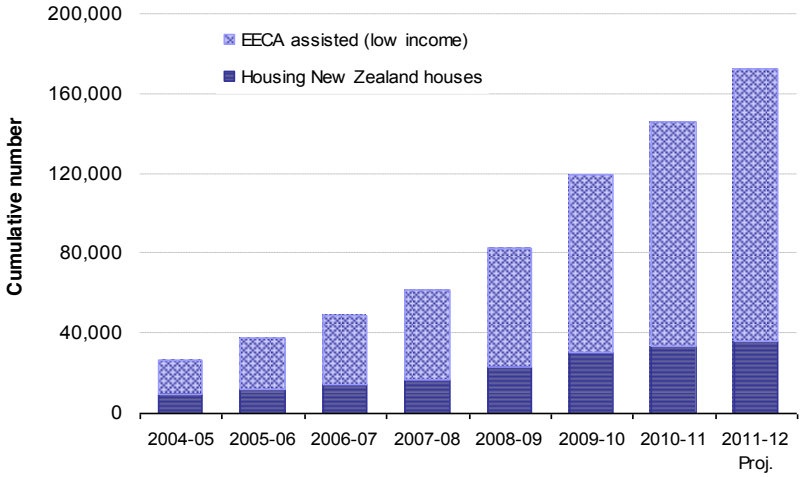

Figure A16. Estimated cumulative low income households receiving retrofit insulation (Sources: derived from HNZC and EECA Annual Reports: EECA, 2011).

Heating appliances

The type and quality of heating appliances available to low income households is determined largely by two realities. First a high proportion of such households rent, so choice is constrained by (a) what the landlord provides[60], and (b) what is reasonable for a tenant to own bearing in mind the high likelihood of regular shifting[61]. Rented properties have lower levels of permanently installed heaters (e.g. log burners are much more prevalent in small towns and rural areas whereas rental houses are concentrated in urban areas), but landlords are not unresponsive to tenant demand. Saville-Smith (2008b) reported 15% of rented properties in 2008 having heat pumps, a level similar to the overall population at the time (French, 2008), although the quality of heat pumps is unclear. Some rental markets are highly sensitive to the visible presence of heat pumps (e.g. the Otago University student rental market where student renting preferences have resulted in large numbers of flats having heat pumps[62]), but there is a

[60] The Residential Tenancies Act 1986 requires only that an electrical output is provided i.e. for plug-in heaters.

[61] The average tenancy period is less than 2 years.

[62] Personal communication Dr Paul Thorsnes, University of Otago.

core of rental properties where little interest is shown by the landlord in providing effective or efficient heating[63].

Second, the type and quality of heating and other appliances is generally heavily income constrained. Heating appliances, for example, are often purchased to minimise investment cost, with running cost, efficiency or heating effectiveness secondary. For low-income households heater choices are often based on minimising purchase cost and having the ability to control running costs, rather than achieving low running cost, efficiency or heating effectiveness (CSRE, 2010) – see Figure A17. This is consistent with the well observed characteristic of the very high discount rates applied by the income-constrained and those in poverty (Eckholm et al., 2010). Unflued gas heaters remain popular despite health concerns and concerns with the relative cost of energy services provided – the belief that unflued gas heaters are a cheap form of heating is widespread amongst low income households. The HEAP study also noted variable knowledge on the part of householders – some were poorly informed and mis-understood cost differences between heater types, while others had good heating appliances and had prioritised energy spending.

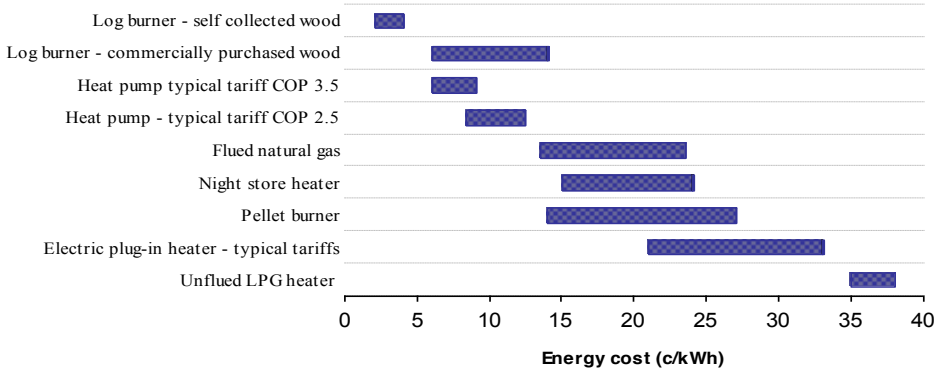

Figure A17. Energy costs for heating appliances 2011-12 (sources: this study; Frederikson & Whitley, 2012).

[63] Personal communication, Helen Gatonyi, Tenants Protection Association.

The increasing adoption of heat pumps over the last decade is, arguably, the most profound change to home heating since the uptake of enclosed wood burners in the 1970s and 1980s. By 2011 it is estimated 35% of houses had heat pumps compared with about 2% in 2000[64]. The extent to which heat pumps have penetrated into low income houses is unclear – only 20% of the WUNZ:HS low income stream have installed clean heating through the scheme[65] – but heat pumps are consistently the preferred heating option when made available through subsidised schemes with 60-90% uptake rates (based on WUNZ:HS, Clean Heat and other schemes). Some low income households have had heaters installed outside of any assistance scheme.

Energy service deprivation

The disparity in energy services available to the fuel poor compared with those that might be described as 'energy healthy' does not come through clearly from the information reported above because there is no formal measure available of 'energy services'. But an indication can be gained by combining the effects of energy prices and energy efficiency. A comparative example based around an 'energy deprived' and 'energy healthy' household each spending $2,000pa on energy is shown in Figure A18. The relative results are a product of the assumptions used, of course, but the assumptions are based on the typical depictions of energy efficiency and energy prices outlined earlier and are not extreme (e.g. the energy deprived are not assumed to be using a PPM and paying the associated additional margin, and the 'energy healthy' are not using higher efficiency technologies such as double glazing or hot water heat pumps). This example shows the energy deprived household getting only about 40% of the energy service per $ spent on energy compared with the 'energy healthy'. Realistic examples showing more extreme energy service deprivation can easily be demonstrated.

[64] Based on sales information provided by EECA and the survey by French (2008).

[65] Information provided by EECA for the period July 2009–March 2012.

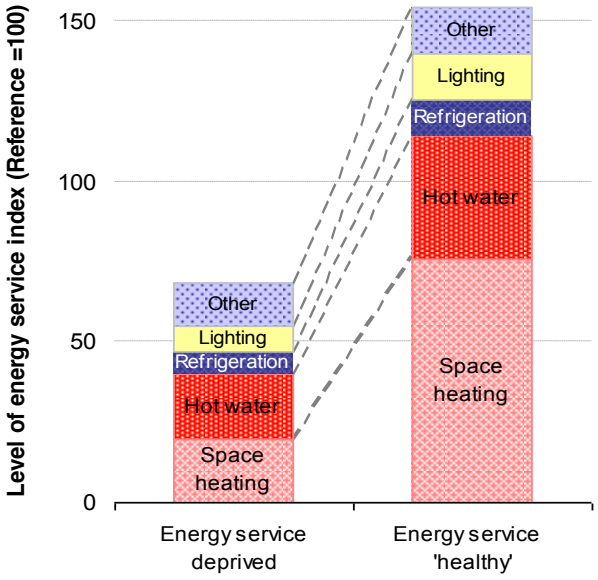

Figure A18. Depiction of energy service for energy deprived and energy 'healthy' for the same level of energy expenditure (Source: this study[66]).

[66] The analysis was based on Genesis Energy tariffs in Wellington (May 2012). The 'deprived' household was on the Variable Composite plan, incurred fees for 2 months late payment, and used a mix of electric bar heating and unflued gas heating. The house had a low level of ceiling insulation and overall energy efficiency was low. The 'energy healthy' home utilised variable day and night tariffs, used a heat pump and night store heater, had good basic insulation and good efficiency of other appliances.