

Luiza Brabo-Catala, Eva Collins
and Barry Barton

Fuel Poverty or Energy Hardship?

Analysing the literature, the proposed official definition, and the views of experts in Aotearoa New Zealand

Abstract

Fuel poverty is a serious condition in New Zealand, caused by the inability to afford sufficient energy services and resulting in detriment to health and wellbeing. Inconsistent ways of describing and measuring fuel poverty affect the perception and depth of the issue and the proposed interventions. This article analyses the proposed definition and indicators of energy hardship developed by the Ministry of Business, Innovation and Employment, in addition to the literature and the perspectives of five New Zealand experts. Findings suggest that the proposed energy hardship description and measures are well-aligned with the recommendations given by the interviewed experts and the literature findings on fuel poverty, which bodes well for effective interventions to minimise the issue.

Keywords fuel poverty, energy hardship, energy poverty, energy wellbeing, energy policy, New Zealand

Luiza Brabo-Catala is a PhD candidate researching energy hardship at the Waikato Management School, University of Waikato. Eva Collins is a professor and director of the New Zealand Institute for Business Research in the Waikato Management School, University of Waikato. Barry Barton is a professor at Te Piringa Faculty of Law at the University of Waikato, specialising in energy and natural resources law.

In 2017 it was estimated that over 100,000 households in New Zealand struggled to afford energy services (New Zealand Government, 2019; Statistics New Zealand, 2017), representing approximately 6% of all New Zealand households in that year (Statistics New Zealand, 2017, 2020). Fuel poverty can cause severe health and wellbeing repercussions, mainly associated with insufficient heating (Baker, Mould and Restrick, 2018). Consequently, fuel poverty was one of the main topics explored in the final report of the Electricity Price Review in 2019 (New Zealand Government, 2019). One of the report's recommendations was to define the issue in order to standardise its measurement, align it with other frameworks (such as the Wellbeing Budget and child poverty measures) and evaluate progress. Unfortunately, there is no standard definition or set of indicators of fuel poverty internationally; however, some countries adopt standardised official

ones according to their priorities and context (Boardman, 2013; Thomson, Snell and Liddell, 2016).

This study analysed the issue of fuel poverty in New Zealand from three different perspectives to find the best practice for the definition, leading to meaningful indicators. The first was an analysis of the international and national literature on fuel poverty, including journal articles, reports, websites and books. In addition, the proposed definitions and measures contained in the Ministry of Business, Innovation and Employment (MBIE) discussion document *Defining Energy Hardship* (Ministry of Business Innovation and Employment, 2021) were evaluated.

Finally, the views of five experts on fuel poverty in New Zealand were solicited. The experts had diverse backgrounds, including academia, government, an energy company, an independent consultancy, and a non-governmental organisation (NGO). Four of them were selected for being currently engaged in regional and national energy hardship projects, with three participating in the Energy Hardship Forum organised by MBIE in March 2021. Additionally, one expert was chosen for having produced a significant study on fuel poverty in New Zealand. The initial contact was made via email, and the interviews were carried out via Zoom in 2021.

Experts were asked about eight critical areas relating to fuel poverty, which are discussed below in comparison with the MBIE discussion document and the literature:

- differences between fuel poverty and energy hardship;
- who are the actors engaged with initiatives on fuel poverty in Aotearoa?;
- how is it defined?;
- how is it measured?;
- how can current definitions and indicators be improved?;
- what are the causes of fuel poverty?;
- other issues associated with fuel poverty; and
- the reason behind eradicating fuel poverty.

Fuel poverty versus energy hardship

Isherwood and Hancock first used the term fuel poverty in 1978 (Liddell et al., 2011). It is the primary term used in the United

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Kingdom and Ireland (leading countries in fuel poverty research and policies) (Bouzarovski and Petrova, 2015; Li et al., 2014). The term energy poverty is often used in the European Union to denote energy unaffordability, even though it can be considered a different issue, relating to the lack of access to modern energy infrastructure (Li et al., 2014). Both energy and fuel poverty can have overlapping causes, resulting in similar outcomes, and often coexist (ibid.).

In the MBIE discussion document, the term energy hardship is used for both affordability and availability issues, even though the former is considerably more relevant to Aotearoa, which is this article's focus. The selected experts for this study were asked if they saw a difference between the terms fuel poverty and energy hardship. According to three experts, fuel poverty and energy hardship have been used interchangeably in New Zealand. However, three experts believe that energy hardship can be considered a broader term associated with vulnerabilities related to the issue.

Three experts associated the term poverty with economic poverty, which connects to income as an indicator and cause. However, the overlap between fuel poverty and economic poverty depends on the definitions and indicators chosen for those two conditions (Boardman, 2013). For example, some fuel-poor households

are more affected by poor housing quality, home under-occupancy, and/or having high energy expenditure rather than having low incomes (Hills, 2011; Legendre and Ricci, 2015).

Three experts said that the term poverty has a negative connotation, and that can push people away from seeking assistance, with one stating: 'We've gone the hardship way because we try to be probably PC [politically correct], but whether that's right or wrong, I don't know.' Two experts believe that fuel poverty can be specifically associated with petrol for fueling a car. However, transportation fuel is not traditionally included in fuel poverty discussions (Mattioli, Lucas and Marsden, 2017), and it was not included in the proposed MBIE definition.

Actors involved with fuel poverty in Aotearoa

Experts were asked what groups of actors are involved with the issue of fuel poverty in New Zealand. All emphasised the importance of the government managing the problem, mentioning agencies such as MBIE, the Energy Efficiency and Conservation Authority, the Ministry of Health, the Electricity Authority and Kāinga Ora.

Four experts said that energy companies, especially retailers, are also responsible for preventing fuel poverty. NGOs and community groups were highlighted by four experts, including curtain banks, financial mentoring services and charities. Three experts mentioned landlords, as they are responsible for ensuring that the quality of the housing they provide is up to health and efficiency standards; failing to do so results in increased energy consumption and extenuating health concerns for the tenants (Ambrose and McCarthy, 2019).

It is crucial to create protections for vulnerable populations, such as disabled people, the elderly and young children (O'Meara, 2015), and the commitment from various organisations can be more efficient in targeting those groups. None of the experts believed that a single actor should be responsible for fuel poverty mitigation initiatives, with one saying:

And I think an advisory board, again ... from all the different organisations,

not only the main one set, that looks at [it] from a very different angle, how their particular organisation can help minimise this for people. Looking at the context of the people, the cohorts that we often don't think about, like we talked about, the sick and the disabled and elderly ... So I think it's a lot of different interventions at different stages but underlying it all is a strong political commitment from all the parties working together and also changing the lens that we look at it through: energy is a basic right in order for us to improve the quality of life and drive that [equality].

Defining fuel poverty

Experts were asked how they define fuel poverty. Three of them associated fuel poverty with the inability to afford energy services connected to health, quality of life, safety and comfort. This is similar to Lewis's 1982 definition of fuel poverty as 'the inability to afford adequate warmth in the home' (Lewis, 1982, p.1). Even though affordable warmth is still an essential component of modern concepts of fuel poverty, it is generally accepted that fuel poverty comprises a household's energy use for its overall everyday needs in its dwelling, such as electricity, firewood and cooking gas (Simshauser, 2021).

One expert responded that they were satisfied with the proposed MBIE definition. It considers that energy hardship is a continuum, with energy wellbeing at the other end of the spectrum. Energy wellbeing is expressed as a condition in which 'individuals, households and whānau are able to obtain adequate energy services to support their wellbeing in their home or kāinga' (Ministry of Business Innovation and Employment, 2021, p.vii). The proposed definition includes various energy services, but excludes transportation fuel (*ibid.*). It also acknowledges cultural differences in living arrangements in Aotearoa, which is highly relevant, as Māori whānau traditionally consist of various family units (Boulton et al., 2021), and they are over-represented in fuel-poor homes (O'Sullivan et al., 2017; Teariki et al., 2020).

One expert associated fuel poverty with being denied the right to energy, which they represented as missing bills and disconnections, saying that those households need immediate support.

In 1991, Boardman defined 'fuel poor' as having energy expenditure above 10% of the household's income (Boardman, 1991), which was referred to by one expert:

We define that as spending more than 10% of your wage, in a month, on energy or fuel. That is how we defined it. Whether I agree with that or not, but that is what we are defining it as at this current stage.

However, Boardman considered the estimated energy expenditure *required* to supply the household's needs (Boardman, 1991, 2013). Considering actual expenditure instead of required expenditure ignores the issue of self-rationing energy consumption due to limited financial resources, meaning that many homes can be experiencing the harmful effects of under-consuming energy without being considered in fuel poverty (Lacroix and Chaton, 2015). Indicators of fuel poverty are discussed further in the following section.

Measuring fuel poverty

The MBIE document proposes a set of indicators that includes both objective and subjective indicators, with the primary ones being: the proportion of income after housing costs spent on energy being two times the median or more; putting up with feeling cold frequently; and the presence of dampness and mould problems. The interim indicator for energy consumption is based on actual expenditure, as the indicators for estimating energy needs (e.g., dwelling and household characteristics) have not been established yet.

With subjective indicators, the danger of overlooking self-rationing is minimised (Lawson, Williams and Wooliscraft, 2015). Furthermore, capturing the lived experiences of fuel poverty can be extremely valuable in understanding and improving the associated systemic issues; looking solely at technical aspects gives a limited perspective on the causes and consequences of the problem (Mould and Baker, 2017).

Experts were asked how they would measure fuel poverty. Two of them discussed specific household needs and vulnerabilities, as some groups, such as disabled people and children, may require higher temperatures at home, due to their higher sensitivity to the effects of energy deprivation (McChesney, 2013; Snell, Bevan and Thomson, 2015). One of those experts also emphasised the need to model the household's required energy consumption based on the characteristics of its dwelling and the energy efficiency of its appliances. In England, the Standard Assessment Procedure has been used to measure the energy efficiency of a dwelling, and the required energy consumption for a household is based on that thorough assessment of their home (Department for Business Energy and Industrial Strategy, 2021).

One expert stated that including subjective parameters is important. Subjective indicators are commonly associated with the surveys used for the European Union Statistics on Income and Living Conditions, which ask households questions such as, 'Can your household afford to keep its home adequately warm?' (Thema and Vondung, 2020). That parameter is also a secondary indicator included in the MBIE discussion document.

Another expert said that in their organisation, income and actual energy expenditure are the only parameters used (based on Boardman's definition) and that 'low socio-economic' people are targeted. Using the 10% definition has the benefit of it being relatively easy to obtain data on the income and expenditure of a population (through reports from energy retailers, census data, or by conducting surveys), being simple to calculate on small and large scales, and not depending on comparisons with other households' data (since it is an absolute measure) (Moore, 2012; Romero, Linares and López, 2018). However, the 10% threshold was based on data from 1988 in England, associated with the poorest 30% of the population and their energy expenditure (Liddell et al., 2012), meaning it is region-specific and outdated. Some authors also argue that Boardman's definition overestimates the importance of energy prices (Moore, 2012; Romero, Linares and López, 2018).

One expert associated fuel poverty with being denied the right to energy, which they represented as missing bills and disconnections, saying that those households need immediate support. Data on the prevalence of missing bills and disconnection can be obtained from energy retailers or self-reported through surveys. For example, Thomson and Snell (2014) conducted an online survey in Europe that included the questions: 'In the last 12 months, how often was your household unable to pay energy bills on time?' and 'In the last 12 months, has your household's energy supply been disconnected because of unpaid bills?' MBIE proposes to use 'Could not pay electricity, gas, rates, or water bills on time (more than once)' as a secondary indicator (Ministry of Business Innovation and Employment, 2021, p.35).

One expert declared their preference for a multi-indicator approach and a sum of indicators:

If a household ticks the box on, say four out of four, or about four out of six, they would be regarded to be in severe energy hardship. And if they maybe did two or three, that would be moderate and maybe just zero or one, they probably would not be considered to be in any major risk category. So I think, their approach is not

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without its own problems, because depending on the indicators that you choose and your approach to how you add indicators together and how you group them, if you have two indicators that are quite similar, you may actually tend to weight your indicator, sorry, your approach to energy hardship, according to those two indicators, which start to dominate the way in which you see energy hardship, even though you've got this multi-indicator approach.

This type of approach has been used not to identify fuel poverty as an absolute condition but to identify risks and severity (Bosch et al., 2019; März, 2018), which can help prioritise certain groups and create appropriate interventions for each one (Healy and Clinch, 2004). This relates to MBIE's continuum of energy hardship and energy wellbeing.

Improving existing definitions and indicators of fuel poverty

Experts were asked if they had issues with the current ways of defining and measuring

fuel poverty, and how they would improve them. Common fuel poverty definitions include: 10% of income going on energy expenditure (Boardman, 1991); energy expenditure being more than twice the median (Isherwood and Hancock, 1979); and energy expenditure above the median and households falling below the poverty line after that expense (Hills, 2012). Income, age and number of household members, types of fuel used, presence of insulation, and ability to afford heating are some indicators used for measuring fuel poverty (Boardman, 2013).

Three experts highlighted the importance of considering the physical characteristics of the dwelling. Understanding the energy practices of the household – e.g., hours of heating; temperature (Stephenson et al., 2010) – was brought up by two of them. These types of indicators can help estimate the household's required energy expenditure (Boardman, 2013). However, as observed above, at the time of writing MBIE had not yet established indicators for estimating energy needs.

The use of both subjective and objective indicators was emphasised by two experts. The MBIE document considers that both primary and secondary indicators include subjective and objective parameters. Two experts highlighted the issue of under-consuming energy (especially for heating) to save money, which is a common problem in New Zealand (McKague et al., 2016). Indicators such as 'Put up with feeling cold to keep costs down a lot' and 'Not heating own bedroom in winter' relate to this issue (Ministry of Business Innovation and Employment, 2021, pp.33, 35).

Two experts felt that the definition should be broader rather than more specific, aligning with the energy wellbeing spectrum (Ministry of Business Innovation and Employment, 2021). One expert talked about having flexibility in the indicators but not in the definition:

I think the indicators should always be open to review. It's a combination of determining whether they are still relevant to the way we define energy hardship and/or whether we have now better information, which enables us to tweak indicators or to change them or

to add new indicators in, because we're basing it now on better and newer information. So, yeah, I think that's where I would prefer the review and change comes in. That's more at the indicator level. I think we should try and set a definition that is not going to be too changeable over time.

Using the capabilities perspective was highlighted by one expert:

[My previous work used] the Bouzarovski and Petrova definition, which is more based around their inability to access or afford, but focusing more on the capabilities of households by doing that, are they being deprived of participating in something as a result of that? So I really liked that definition, and I think that issues with the other ones were their focus on participation in society, the capabilities, which they lack had they spent that amount on energy, for example. So I think a definition is going to be very hard. Like I said, it's very contextual, but around those capabilities and participation should be taken into account.

The capabilities concept says that fuel poverty is caused by the lack of opportunities (referred to as capabilities) to fulfil needs and desires (referred to as functionings) that are powered by energy, associating energy with wellbeing (Bouzarovski and Petrova, 2015; Day, Walker and Simcock, 2016). According to Day, Walker and Simcock, '[p]romoting capabilities maximises opportunities, but leaves the individual free to decide what kind of life they value' (p.258). This framework significantly relates to energy wellbeing in the MBIE document.

Causes of fuel poverty

The experts were asked what causes fuel poverty. The literature attributes the issue to the energy efficiency of appliances, dwelling quality, household needs and income, and energy prices and sources (O'Sullivan and Viggers, 2021). Problems with the quality and the increasing costs of housing were discussed by four experts. Energy prices were seen as a cause by four experts. Earning a low income was

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mentioned by four experts as well.

Lack of economic resources not only makes it challenging to afford energy costs; it also correlates with renting instead of owning the property, living in low-quality housing, being unable to perform or pay for energy efficiency retrofits and home repairs, being food insecure, and delaying medical care (Barton, 2014; Cook et al., 2008; Healy and Clinch, 2004; McKague et al., 2016). The overlap between households earning low incomes and households being in fuel poverty in the United Kingdom was discussed by Boardman (2013):

in 2006, 89 per cent of the fuel poor (2.1 million) were in the 30 per cent of households with the lowest incomes ... There are virtually no fuel poor households above median income, although some are only just below, in the fourth and fifth deciles. (Boardman, 2013, p.31)

Still on the financial aspect, the case of predatory loans was brought up by one expert, who had organised focus groups to discuss energy issues:

One of the other major areas they brought up is irresponsible lending that's related to energy debt. So, someone might go out and get a high-cost loan to pay off an energy debt, which ultimately compounds their hardship over time. So, they become less and less likely to be able to pay because of the pressure put on them.

They took out a loan that was unsuitable, and the responsible lending laws did not protect them from getting this predatory lending. Also, just that generally that irresponsible lending puts people into poverty in the first place.

Three experts mentioned the lack of information, meaning households having difficulty understanding their bills and finding the best and cheapest energy plans. Increasing energy awareness and literacy have also been addressed by MBIE in their discussion document, relating to improving understanding of energy habits and how the energy retail sector operates.

Other issues associated with fuel poverty

Fuel poverty is associated with several adversities, such as issues related to health, housing, finances and structural racism (McKague et al., 2016; O'Sullivan, Howden-Chapman and Fougere, 2012). Experts were asked about the non-causal issues associated with fuel poverty. Food insecurity associated with fuel poverty, known as the 'heat or eat dilemma' (choosing food over energy payments or vice versa (Cook et al., 2008)), was discussed by four of them.

Health issues were the initial concern in early fuel poverty discussions (relating to insufficient heating) (Boardman, 1991), and they were brought up by three experts. Fuel poverty is associated with cardiovascular and respiratory morbidity and mortality (World Health Organization, 2018), as well as mental health issues (Baker, Mould and Restrict, 2018). In addition, one expert mentioned domestic violence. A 2021 study in Australia found that being fuel poor increases the chances of experiencing physical violence, and that the mechanisms of influence are social capital, psychological distress and substance use (Hailemariam, Sakutukwa and Yew, 2021).

Two experts cited the educational attainment of the household, which can also be affected by the stress caused by financial issues associated with fuel poverty (Baker, Mould and Restrict, 2018). Additionally, a study from France demonstrated that households with greater educational attainment are at minimal risk

of being in fuel poverty, due to earning higher incomes (Legendre and Ricci, 2015). In Aotearoa, Māori and Pasifika groups present lower educational attainment and incomes than the Asian or white populations (Ministry of Social Development, 2016).

Cultural and behavioural aspects were cited by two experts. One noted that combining energy advice with budgeting advice has become an important strategy for managing fuel poverty. Educational attainment and energy habits are correlated with service literacy and household circumstances and practices, facets of energy wellbeing mentioned by MBIE. They may result in inefficient energy use and more expensive or inappropriate plans.

One expert discussed an issue associated with pre-payment, which is more costly and less convenient than regular plans, but used by many low-income households (O'Sullivan, Howden-Chapman and Fougere, 2011): 'I'm particularly very concerned about pre-pay metering or pre-pay use and how that would be a safe reconnection, whereas there are requirements around checking things like the oven off and heaters are off before reconnecting on post-pay.' A study showed that Māori and Pasifika households using pre-payment presented higher odds of being self-disconnected compared to non-Māori and non-Pasifika households (O'Sullivan et al., 2013). Ethnicity was discussed by two experts, as Māori and Pasifika populations are over-represented in fuel-poor homes (O'Sullivan et al., 2017; Teariki et al., 2020), as are refugees.

One expert acknowledged the issue of household crowding, which disproportionately affects Pasifika, African, Māori, Asian and Latin American populations (Statistics New Zealand, 2018). According to the MBIE document, the 'three most challenging housing issues for Māori are that homes are cold, mouldy and in urgent need of repairs' (p.9), with an unequal representation of Māori and Pasifika children being hospitalised due to those circumstances.

Ethnicity on its own is not a cause of fuel poverty, but systemic racism exacerbates material differences between different ethnicities that relate to the causes of fuel poverty (e.g., inferior housing

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quality and income). Approaches aiming to eradicate the issue must acknowledge cultural and language barriers that ethnic minorities have to face regarding energy services. Similar to the New Zealand context, African-American households are more likely to live in energy inefficient homes and present higher fuel poverty rates than Asian or white households in the United States (Lewis, Hernandez and Geronimus, 2019; Wang et al., 2021).

It is about wellbeing

The selected experts were asked about the purpose of eradicating fuel poverty. Increasing happiness and wellbeing were brought up by all of them. The MBIE document affirms that '[l]iving in energy hardship affects the quality of life of the household and impacts their wellbeing physically, mentally, and socially' (Ministry of Business Innovation and Employment, 2021, p. 8). Four experts talked about achieving a more equitable society.

Four experts talked about economic reasons, as solving fuel poverty will increase disposable income in the affected households and financial savings for the government. A study estimated that poor housing conditions (e.g., damp, cold, mould, crowding) cost NZ\$141 million annually in hospitalisations (Riggs et al., 2021). There is a strong association between poor dwelling conditions and poor health in children (Howden-Chapman, Baker and Bierre, 2013). Positive health impacts were mentioned by four experts, and an improvement in children's lives was mentioned by two, with one saying:

People's health and wellbeing are affected, but we know that there's people who are hospitalised and children every year with housing-related illnesses. So the Ministry of Health, in combination with academic researchers, have looked at things. They've got a category of housing sensitive hospitalisations. And so they've actually been able to kind of calculate the financial cost as well to the country or people living in really inadequate housing. That's damp, cold and mouldy. So, things like fever, asthma, bronchitis, et cetera.

One expert mentioned environmental benefits associated with higher energy efficiency (e.g., replacing older appliances and installing insulation), which requires less energy and thus results in fewer emissions. While not detailed in the MBIE discussion document, the framework is also connected to the Climate Change Response Act 2002 (Ministry of Business, Innovation and Employment, 2021, p.8). In addition, as the seventh United Nations Sustainable Development Goal is to 'ensure access to affordable, reliable, sustainable and modern energy for all' (United Nations, 2021), fuel and energy poverty actions are essential for a socially, environmentally and economically sustainable future.

Conclusion

The MBIE discussion document of November 2021 advanced thinking and policy on defining energy hardship in Aotearoa New Zealand, a condition that includes both fuel and energy poverty.

Fuel Poverty or Energy Hardship? Analysing the literature, the proposed official definition, and the views of experts in Aotearoa New Zealand

The proposed definition of and indicators for energy hardship and energy wellbeing consider multiple facets of insufficient energy consumption in the country, and are adequate and well-aligned with five experts' opinions and the literature. Even though the primary focus of this article and the MBIE document is fuel poverty (relating to energy affordability), as it is the predominant issue in this country, the terms

energy hardship and fuel poverty are not synonyms. Properly estimating the energy needs of households, considering the needs of the households and the dwellings where they live, is an important step for the future, as selecting the proper indicators is crucial for identifying the presence and depth of fuel poverty. The government, energy companies, landlords and NGOs need to work together to target vulnerable

groups for efficient interventions necessary to eliminate the issue in this country. When this article was written, MBIE was seeking public feedback on its discussion document. Eradicating fuel poverty is of critical concern, considering the potential improvement in the health and wellbeing of New Zealanders, as well as the environmental and financial benefits.

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