



Fuel poverty, affordability, and energy justice in England: Policy insights from the Warm Front Program



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ABSTRACT

Millions of homes around the world suffer from “fuel poverty,” commonly defined as the necessity to spend more than 10 percent of their income paying energy bills. This article first discusses how home energy efficiency schemes, such as those that pay to weatherize doors and windows, install insulation, and give free energy audits, can significantly reduce the prevalence of fuel poverty. It then examines the “Warm Front” program in England, which over the course of 2000–2013 saw 2.3 million “fuel poor” British homes receive energy efficiency upgrades to save them money and improve their overall health. Warm Front not only lessened the prevalence of fuel poverty; it cut greenhouse gas emissions, produced an average extra annual income of £1894.79 per participating household, and reported exceptional customer satisfaction with more than 90 percent of its customers praising the scheme. This study details the history, benefits, and challenges of the program, and it teases out six noteworthy lessons for energy analysts, planners, and policymakers.

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1. Introduction

This study examines the second largest national program ever conceived and implemented to address fuel poverty: England's Warm Front Home Energy Efficiency Scheme. From 2000 to 2013, Warm Front removed about 2.36 million English households from fuel poverty. Warm Front interventions have been credited with reducing carbon dioxide emissions per home by 1.5 tons per year, displacing £610.56 in modeled, potential annual energy costs and generating an average annual increase in income per customer of £1894.79. Notable achievements include more than one million homes refitted with draught proofing and cavity wall insulation, 722,300 lofts insulated, the replacement of 479,000 boilers, and 75,000 new electric central heating systems installed, among others. Moreover, the Warm Front scheme accomplished these tasks with an extremely high satisfaction rate, with an average annual customer satisfaction score of 92.3 percent for its most recent year [1]. But how did it accomplish these feats? What challenges did it have to overcome, and which remain, now that the

program is over? What is the likely future of fuel poverty in England?

To provide insight into these questions, this article proceeds as follows. After introducing the issue of affordability and fuel poverty as a major energy policy and justice concern, the article articulates the connections between thermal comfort, mental health, and physical health. It then details the frequently inequitable nature of household energy consumption, with poorer households paying a greater share of their income on energy services than wealthier and middle class households. It then describes the history of the Warm Front Program before assessing its benefits, identifying its challenges, and presenting six lessons and insights for energy analysts and planners.

In embarking on this path, the study makes at least three contributions. First, it makes visible and humanizes the topic of fuel poverty and vulnerability, one that is all too often ignored in contemporary energy policy discussions [2,3]. Though many may take it for granted, having a warm, comfortable, well-lit home is an instrumental part of modern, industrialized life. Without sufficient warmth or electricity, modern families must suffer the harsh climates of winter without heat, leading to hundreds of thousands of excess winter deaths every year, or rely on “coping” strategies such as cutting down on expenses related to food or medical care to pay their energy bills. Second, rather than focus on national or geopolitical energy security concerns, it centers on the household dimensions of energy security, a scale under-examined in

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contemporary energy research [4,5]. Third, it centers the discussion of fuel poverty not only on traditional notions of affordability or household energy poverty, but also on novel notions of energy justice, ethics, and recognition [6–8].

2. Background: affordability, fuel poverty, and energy justice

Affordability matters from an energy policy perspective—when energy prices rise and households cannot afford heat or electricity, it is functionally the same as if they lack access to reliable energy services altogether. In addition, less affluent families spend a larger proportion of their income on energy services, hindering the accumulation of wealth needed to make investments to escape their poverty. One study looking at the effects of increases in energy prices in four developing Asian economies from 2002 to 2005 found that poorer households paid 171% more of their income for cooking fuels and 120% more for transportation, 67% more for electricity, and 33% more for fertilizers when compared to the expenditures on energy from middle- and upper-class households [9].

The concept of “fuel poverty” is one useful way of framing the issue of affordability. Initially defined as “households with high fuel expenditure as those spending more than twice the median on fuel, light and power,” it is now commonly associated with households that must spend greater than 10 or 15 percent of their monthly income on energy services [10–12]. The European Union states that it is “persons, families and groups of persons whose resources (material, cultural and social) are so limited as to exclude them from the minimum acceptable way of life in the Member State to which they belong [13].”

To be clear, poverty, influenced deeply by income, is not identical with fuel poverty, conditioned by household income as well as fuel prices and the energy efficiency of residential building stock [14]. As one study put it bluntly, “raising incomes can lift a household out of poverty, but rarely out of fuel poverty [15].” As another team of researchers have noted:

Fuel poverty is a difficult concept. It is not the same as poverty. Some people are poor but can afford adequate warmth. Others with incomes above the accepted poverty line nevertheless cannot afford to be warm - because their home is difficult or expensive to heat. There are also people who purchase warmth only at the expense of adequate diets or going short in other ways. There are also those who live on in cold conditions despite having incomes which are sufficient to purchase adequate warmth - because of helplessness or fear of fuel bills [16].

Thus, low-income households with sound investments in energy efficiency may not be in fuel poverty, whereas households with larger incomes in less efficient homes may be in fuel poverty [17]. Though the classic definition of fuel poverty is the “10 percent of household income” metric, another way of measuring it is those households that actually spend more on energy than on food [18]. Still others rely on the term “severe fuel poverty” to indicate needing to spend 15–20 percent of household incomes on energy, i.e. between three- and four-times the median for a given year, and “extreme fuel poverty,” those needing above 20 percent or greater than four times the median for a given year [10].

Conceptions of fuel poverty have been heavily influenced by Boardman [19,20], who initially argued that “fuel poverty occurs when a family is unable to afford adequate warmth because they live in an energy-inefficient home [21],” that fuel poverty “occurs when a household is unable to afford adequate energy services in their home on their present income,” and that it “relates to consistent, defined standards of energy services, not just actual expenditure [17].” Her work has been primarily concerned with

fuel poverty in the United Kingdom, where she calculated that the poorest 30 percent of households spend less money per person on fuel than the other 70 percent of households, but pay twice as much as a proportion of their monthly budget. She calculated that an astounding 68 percent of homes with incomes in the lowest decile in the United Kingdom were in fuel poverty in 2006.

The problem is most certainly not limited to the United Kingdom. In New Zealand, about one-quarter of homes suffer from fuel poverty due to a generally poor quality of housing in terms of thermal efficiency, comparatively high levels of income inequality, and rapid increases in the real price of residential electricity [15]. In Austria, a “large number of households live in deprived conditions, carrying multiple burdens (lack of financial resources, energy-inefficient dwellings, old devices, energy costs or long-term illnesses) [22].” In Hungary, the problem of fuel poverty can be too much heat that cannot be controlled rather than too little. There, the fall of the Soviet Union “progressively brought energy prices to full-cost recovery levels, reduced household incomes and left a legacy of inefficient and deteriorating residential buildings lacking basic energy efficiency requirements [18].” When Hungarians cannot pay their heating bills, in serious cases they can lose their home as accumulated housing and utility bills force families to move to less valuable properties as a way to repay their energy debts [18].

The impacts of fuel poverty extend well beyond defaulting on energy bills, and can threaten personal wellbeing and modern notions of equity, justice, and fairness. O'Brien found that fuel poverty results in “inadequately heated housing” and, as a result, higher rates of mortality among the elderly, a greater prevalence of circulatory and respiratory diseases in adults, reduced physical and emotional well-being, and an increased risk of falls, mental health illness, social isolation, and hospital admissions [14]. More severely, fuel poverty quite literally kills people who go without essential heat and then suffer “excess winter mortalities.” One epidemiological study looked at 11 industrialized countries in both the Northern and Southern Hemispheres and found a clear correlation between the winter months and unusually high rates of mortality [23]. Average excess winter deaths—defined as the extra deaths in the four winter months in comparison with the previous and succeeding four months—across a dozen countries amounted to 278,409 in 2008, exceeding the global number of deaths (about 166,000) attributed by the WHO (World Health Organization) to climate change. This makes fuel poverty as urgent a health issue as climate change, given that a 2006 WHO review of 10 countries projected that the attributable fraction of excess winter deaths due to housing conditions was 40 percent [15].

Such findings have been confirmed by scores of independent assessments [24–26]. To cite a few prominent examples, Liddell has found that cold-related deaths from fuel poverty can occur through “changes in blood pressure and blood chemistry during cold weather, which in turn increase the risk of catastrophic cardio- or cerebro-vascular events such as strokes, myocardial infarctions or pulmonary embolisms” as well as the suppression of immune systems [27]. The Marmot Review Team demonstrated that countries with more energy-efficient housing had lower excess winter deaths, that children living in cold homes are more than twice as likely to suffer from a variety of respiratory problems than children living in warm homes, and that cold housing increases the level of minor illnesses such as colds and flu and exacerbates existing conditions such as arthritis and rheumatism. It also noted that cold housing negatively affects dexterity and can heighten the risk of accidents and injuries in the home [28]. A team of researchers led by the WHO's Collaborating Center for Housing Standards and Health documented that “an inadequate supply of energy may also mean an inadequate supply for other basic domestic needs such as for food storage and cooking, maintenance of personal and

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