

# Quantifying the severity of fuel poverty, its relationship with poor housing and reasons for non-investment in energy-saving measures in Ireland

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## Abstract

Fuel poverty has generally been calculated by quantifying the number of households spending in excess of 10% of income on home heating. This definition has a number of significant practical and scientific limitations. This paper employs self-reported data to calculate the severity of fuel poverty in Ireland to identify chronic fuel-poor households from occasional sufferers. It also assesses domestic energy-efficiency levels. Ireland is a useful case study as it demonstrates the highest variations in seasonal mortality and morbidity in northern Europe, both of which are associated with fuel poverty. Ireland is also experiencing extreme difficulties meeting its environmental emissions targets in light of recent spectacular economic growth. Reducing fuel poverty would lower energy-related emissions, assisting policy makers achieve these challenging targets. Furthermore, little empirical research has been undertaken on fuel poverty in Ireland. This paper identifies key social groups at risk by conducting detailed socio-economic and socio-demographic analyses. The relationship between fuel poverty and adverse housing conditions (damp, condensation) is also examined. Moreover, the reasons behind householders not investing in energy-saving measures are reported. The results show that Ireland suffers from similar levels of fuel poverty as the UK, with low-income households suffering the greatest. The key policy implications are outlined.

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## 1. Introduction

Domestic energy-efficiency levels vary considerably across Europe (Healy, 2002). Certain countries prioritise thermal efficiency in the design and construction of new housing, as it is essential protection to combat the relatively severe winters experienced in these colder climates where winter temperatures are often below freezing (Boardman, 1991). Despite enduring relatively mild winters, Ireland and the UK have the highest rates of seasonal mortality in northern Europe, and it has been shown that such mortality rates result, in no small part, from the inadequately protected, thermally inefficient housing stocks in these countries (Clinch and Healy, 2000a; Curwen, 1991). There are also strong associations between inadequately heated homes and

increased rates of morbidity; higher incidences of various cardiovascular and respiratory diseases have been associated with chronic cold exposure from within the home through living in fuel-poor conditions (Collins, 1986; Evans et al., 2000). Thus, when temperatures fall during a typical British or Irish winter, households need to increase their expenditure on fuel considerably to heat their home adequately, owing to the poor level of heat retention in their dwellings. The problem of fuel poverty occurs, therefore, when a household does not have the adequate financial resources to meet these winter home-heating costs, and because the dwelling's heating system and insulation levels prove to be inadequate for achieving affordable household warmth.

In addition to the public-health policy implications of fuel poverty, many countries demonstrating poor levels of domestic energy efficiency are consuming greater amounts of energy than necessary, as individuals inhabiting inefficient dwellings must consume more fuel to heat their homes adequately. This is of considerable

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importance given that many European countries—most notably Ireland—are having extreme difficulty in meeting their agreed targets for stabilisation of greenhouse-gas emissions under the Kyoto Protocol and acidification precursors under the Gothenburg Agreement (Clinch and Healy, 2000b).

A recent study by the UK Government (DEFRA and DTI, 2001) and other recent research (DETR, 1999; Milne and Boardman, 2000) confirmed both the persisting nature and considerable scale of the problem in the UK. However, this research is based on a standard expenditure approach to calculating fuel poverty, in which households spending more than 10% of income on home heating are deemed ‘fuel-poor’. This approach has many limitations. First, it can be misleading, as several formulae now exist for calculating fuel poverty, some with housing costs *included* in net household income, other calculations *exclude* housing costs from the denominator of the formula, while other calculations analyse *gross* household income as opposed to *net*. Second, there does not appear to be any substantial rationale behind setting the budget line at 10% of net income, and, therefore, this approach has been seen by some as lacking in any scientific basis. Third, such a definition is not useful for cross-country comparisons of fuel poverty, especially in countries (e.g. Ireland) where such data is unavailable. Fourth, studies using this method to quantify fuel poverty in the UK (e.g. DETR, 1999) have reported levels far greater than those using approaches based on social indicators of deprivation<sup>1</sup> (e.g. Healy, 2003; Whyley and Callender, 1997) which has led some commentators to wonder whether the two approaches are measuring the same type of fuel poverty, i.e. persistent versus intermittent fuel poverty.

In order to address these legitimate concerns, a large household survey has been developed and employed to assess the severity of fuel poverty in Ireland, an interesting country to examine for four key reasons. First, very little empirical research on fuel poverty exists in Ireland because of the lack of suitable data hitherto. Second, Ireland has been identified as a country marked among the highest levels of housing deprivation, and among the least energy-efficient dwellings in northern Europe (Healy, 2002). Third, Ireland, like the UK, has among the highest levels of seasonal variations in mortality, leading many researchers to believe that the relatively poor thermal efficiency of the Irish housing stock is a major reason for these rates of mortality (Eng and Mercer, 1998). Fourth, Ireland’s spectacular economic success over the last decade has placed a considerable burden on policy makers to achieve various challenging environmental targets, most notably on emissions of greenhouse gases and acidification

precursors. By delivering the first estimates of fuel poverty in Ireland, this study assists policy makers in assessing how much the alleviation of fuel poverty would make in bridging the gap between business-as-usual energy-related environmental emissions and emissions from an energy efficient domestic sector.

The study contributes to the methodological discussion on fuel poverty by identifying chronic sufferers from intermittent sufferers. The recent (2001) survey data also allow for a great degree of data disaggregation, and a detailed socio-economic and socio-demographic analysis pinpoints those suffering disproportionately from fuel poverty in Ireland. Moreover, the relationship between fuel poverty and adverse housing conditions, such as damp and condensation, is examined, while the effect of fuel subsidies is also analysed. The survey also identifies the key reasons for non-investment in energy-saving measures by Irish households. This is a crucial component of the study as it identifies the relative importance of the various reasons for market failure in domestic energy efficiency, outlined in Clinch and Healy (2000c), and thus contributes strongly to the policy debate on energy efficiency and fuel poverty. Some discussion is given to the various environmental, public-health and social policy implications of these findings. The paper begins with the results of the survey regarding the thermal efficiency of the dwelling stock. Data from two other previous surveys of the housing stock are compared to assess the penetration of energy-efficiency measures over time.

## 2. Domestic energy-efficiency levels

The data in this study are derived from a statistically representative, face-to-face household survey of 1500 homes in Ireland, conducted in spring 2001. The sample was selected randomly using probability-based sampling. Results are only reported in this study where sample sizes allow for a reasonably low level of error.

The overall level of fuel poverty is directly related to the level of household energy efficiency (Clinch and Healy, 1999). Previous research by one of these authors has shown that Ireland and the UK have similar poor levels of domestic energy efficiency (Healy, 2002). The first results of the survey report the latest levels of ownership of various energy-saving measures in the dwelling stock. To assess the penetration of various measures over time, two previous surveys of the dwelling stock’s energy-efficiency standards are compared.<sup>2</sup> The

<sup>1</sup>I.e. consensual approaches.

<sup>2</sup>The 1996 survey relates to a pan-European study conducted by the European Statistical Office (see Eurostat, 1999), while the 1998 data are taken from an Irish energy-efficiency study (see Clinch and Healy, 1999).

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