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# WARMER HOMES

A Strategy for Affordable Energy in Ireland

**Technical Annex**





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# Chapter 1

## Understanding and Measuring Energy Poverty

### 1.1 Energy Poverty and Affordable Energy

The strategy defines the two closely related concepts of *energy poverty* and *affordable energy*. 'Energy poverty' is used to describe those households who are unable to attain an acceptable level of heating and other energy services in the home due to an inability to meet these requirements at an affordable cost. 'Affordable energy' pertains to a situation whereby a household can attain an acceptable level of heating and other energy services in the home at a level of expenditure that is affordable relative to its overall disposable income. In practice, the achievement of more affordable energy services for households equates to a position where there is a corresponding reduction in energy poverty.

This strategy sets out a *formal definition* that will facilitate the ongoing measurement of energy poverty. It also includes a *complementary affordability index* which will enable monitoring of the extent to which energy is becoming more or less affordable for households from a macro perspective as a result of changes in key drivers such as energy prices. The two indicators will play an important role in understanding both the prevalence of energy poverty and the number of at-risk households.

### 1.2 Drivers of Energy Poverty

Energy poverty can be considered as the product of the interaction of three factors:

1. Household income
2. The cost/price of energy
3. The energy efficiency of the dwelling and its energy systems, and the household's energy consumption pattern

It follows that any definition of energy affordability and measures designed to alleviate and/or address energy affordability should reflect the impact of each of these factors.

In practice, each factor is influenced by a complex mix of economic and social issues. The nature and extent of energy poverty will vary depending on how these issues interact with the three factors. This makes the development of a comprehensive measure of energy poverty a complex process, requiring data from a number of sources to be integrated in order to create a robust reporting framework.

### 1.3 Methodological Issues in Defining Energy Poverty

Ultimately, there are varying levels of energy poverty, depending on the precise approach applied to its definition and particularly its measurement. An effective definition of energy poverty must serve three purposes:

- To establish the existing position in relation to the extent of energy poverty and the groups most affected by energy poverty
- To facilitate effective policy design to address energy poverty, particularly for the most vulnerable groups in society
- To monitor progress and assess the effectiveness of policy interventions to address energy poverty and improve energy affordability

In developing the definition of energy poverty underpinning this strategy, a wide range of possible alternative definitional approaches were considered, based on existing Irish and international research and experience in this area.

The existing international literature indicates that a number of constituent parts are relevant to selecting a comprehensive definition of energy affordability. These constituent parts are set out in the table below.

**Table 1.1: Constituent Parts of the Definition of Energy Poverty**

| <b>Component</b>               | <b>Description</b>  | <b>Notes</b>  |
|--------------------------------|---|---|
| Temperature                    | For example, using WHO standards, 21oC in the living-room, 18oC elsewhere   | Note that in UK, Scotland uses a high temperature of 23oC for the elderly and infirm.   |
| Hours of heating               | Energy/heating hours used   | UK - England assumes 9 hours a day for those at work or in full-time education and 16 hours/day for those likely to be at home all day  |
| Proportion of house            | Need to take account of occupancy and under-occupancy                       | UK – England assumes all rooms are occupied unless there is under-occupancy. It is important to take into account the risk of under-occupancy as this will increase the risk of energy poverty. |
| Energy for all energy services | All energy services in the home, not just heating                           | Need to take into account services such as hot water, cooking, appliances.  |
| Need to spend                  | To reflect required expenditure to achieve needed/adequate energy provision | Need to account for households that are restraining expenditure and are cold. This raises the key issue of the energy efficiency of the home.   |
| Proportion of income           | 10%, 15%, 20% (fixed) or other (e.g. relative) proportion                   | UK administrations use a 10% fixed threshold (based on required expenditure). Using proportion of income means that, importantly, rich households are generally excluded.                       |

|                      |   |   |
|----------------------|---|---|
| Definition of income | Full income or adjusted income (adjusted to subtract housing-related state transfers) | UK utilises both basic income (excl. housing benefits) and full income (basic plus housing-related state transfers). Indecon believes all income should be taken into account and the level as well as the % of income is important. Priority should be given to low-income households. |
| Vulnerable           | Characteristics which determine whether a household is vulnerable to energy poverty   | UK includes householders aged 60+, families with children, with disabilities or a long-term illness.  |

Source: Indecon and Boardman (2010)<sup>1</sup>

The formal definition of energy poverty set out in *Warmer Homes – A Strategy for Affordable Energy in Ireland*, shown below, reflects detailed consideration of a range of inputs, including a detailed review of national and international research, and the broad direction of policy in this area, including developments at European Union level.

### **Definition of Energy Poverty**

***A household is considered to be energy-poor if it is unable to attain an acceptable standard of warmth and energy services in the home at an affordable cost.***

<sup>1</sup> Boardman, Brenda, 2010, Fixing Fuel Poverty – Challenges and Solutions, Earthscan.



# Chapter 2

## Methodologies for Measuring Energy Poverty

### 2.1 Approaches to Measuring Energy Poverty

An important challenge is how to operationalise the definition of energy poverty. Broadly speaking, there are three approaches to measuring energy poverty (and the extent of affordable energy), as follows:

- Expenditure-based approach (and associated variants)
- Subjective approach
- Objective approach

Table 2.1 sets out a summary of the main features, and the strengths and weaknesses, of the above approaches and their possible variants. The summary indicates that there are advantages and disadvantages associated with each measurement approach. An important challenge is to identify a definition and measurement approach that meets the requirements of different stakeholders in terms of monitoring and policy intervention.

**Table 2.1: Alternative Approaches to Measuring Energy Affordability**

| Definition and Measurement Approach  | Comment   |
|--|---|
| <p>Actual energy expenditure-based:</p> <ul style="list-style-type: none"><li>• A household is in energy poverty if it spends more than a fixed proportion (e.g. 10%, 15% or 20%) of its income on energy</li></ul>  | <ul style="list-style-type: none"><li>• Straightforward to monitor based on existing data (HBS)</li><li>• Would only indicate actual, not required, expenditures to achieve adequate energy provision</li><li>• Issue of delineating most vulnerable groups</li><li>• Could include median and higher-income households</li></ul>   |
| <p>Required energy expenditure – reflecting energy ‘needs’</p> <ul style="list-style-type: none"><li>• A household is in energy poverty if, in order to maintain an acceptable level of energy services in the home, it must spend more than a fixed proportion (e.g. 10%, 15% or 20%) of its income on energy</li></ul> | <ul style="list-style-type: none"><li>• Comprehensive definition (based on UK approach)</li><li>• Reflects required expenditure to meet energy needs in the home</li><li>• However, there is a challenge in measuring required expenditure across population/ households in Ireland – UK uses house condition survey coupled with energy poverty model</li><li>• 10% (or other proportion) is fixed and this is arbitrary</li><li>• Issue of delineating most vulnerable groups</li></ul> |

|   |   |
|---|---|
| <p>Variations on expenditure-based definitions – including:</p> <ul style="list-style-type: none"> <li>• Fixed definition – as above, based on expenditure at or exceeding a fixed proportion of income (e.g. 10%)</li> <li>• Relative definition – e.g. based on twice median expenditure on energy (proportion moves over time)</li> <li>• Income before or after housing-related state transfers</li> <li>• Equivalised incomes – adjusted to reflect household size</li> <li>• Severity – proportion spending &gt;15% or &gt;20% of income on energy</li> </ul> | <ul style="list-style-type: none"> <li>• Sensitivity of outcomes to definition of income used</li> <li>• Depending on approach and treatment of income, may exclude certain households affected by energy poverty (e.g. households in receipt of housing-related state benefits)</li> <li>• Key advantage of relative definition is that it measures relative affordability/hardship over time and reflects impacts of energy price movements on the average household</li> <li>• Advantage of severity index/banding approach in identifying most critical groups</li> </ul> |
| <p>Subjective approach:</p> <ul style="list-style-type: none"> <li>• Households unable to heat their homes adequately</li> <li>• Households that do without heating due to lack of money</li> <li>• Composite of above</li> </ul>   | <ul style="list-style-type: none"> <li>• Annual data available from SILC survey</li> <li>• Issue of consistency with data derived through above approaches and may return substantially varying results</li> <li>• May not accurately reflect required energy services</li> </ul>   |
| <p>Objective approach:</p> <ul style="list-style-type: none"> <li>• A household is energy-poor if measured comfort and energy service levels are below required levels</li> </ul>   | <ul style="list-style-type: none"> <li>• Question of wider feasibility as would require ongoing monitoring of temperature/comfort levels in the home</li> </ul>   |
| <p>Variations – Efficiency:</p> <ul style="list-style-type: none"> <li>• Household energy poverty could be related primarily to whether the dwelling has an energy performance rating lower than a pre-specified threshold (e.g. lower than a BER C3 rating)</li> </ul>   | <ul style="list-style-type: none"> <li>• Reflects importance of energy performance</li> <li>• Challenge in obtaining BER (or other energy performance indicator) data for all dwellings. This could be modelled/estimated</li> <li>• Would not capture poverty issue</li> </ul>   |
| <p>Affordability Index:</p> <ul style="list-style-type: none"> <li>• New approach which looks at how affordability of energy services evolves over time in response to movements in energy prices, incomes and energy efficiency improvements</li> </ul>  | <ul style="list-style-type: none"> <li>• Based on methodology developed internationally</li> <li>• Enables tracking of affordability over time and modelling of impacts of carbon tax and other policy measures</li> </ul>  |

Composite approaches:

- Option of combining aspects of above approaches – particularly in terms of measurement approach
- This could involve tracking a number of measures but with one central focal-point definition
- To include other, complementary indicators such as those listed later.
- Advantage of combining strengths of above definitions
- However, less transparent and more challenging to update on frequent basis
- Key issue of absence in Ireland of integrated datasets which combine income/expenditure features with energy performance characteristics of same household/dwelling
- May require new, ongoing survey work to measure
- Has advantages in targeting resources at low-income households experiencing energy poverty

Source: *Indecon, based on review of international approaches to defining and measuring energy affordability/poverty*

## 2.2 Measurement Challenges

### Actual versus Required Energy Expenditure

In considering household expenditure on energy within the context of measuring energy poverty, an important requirement is the need to distinguish between *actual* expenditure and the level of expenditure *required* in a given period to enable the household to attain a satisfactory level of comfort. This reflects the impact of energy prices and efficiency on expenditures.

In particular, for a given level of household disposable income, the higher the level of energy prices and the lower the efficiency of the dwelling and its energy systems, the higher the level of expenditure that the household will be required to spend to achieve a defined level of comfort. Thus, higher energy prices and/or lower energy efficiency increase the risk that a household may under-heat its dwelling relative to the levels consistent with adequate warmth. This means that any expenditure-based approach to measuring energy poverty should ideally reflect the required levels of household expenditure to attain pre-defined heating and comfort levels, rather than actual expenditures. This aspect is reflected in the comprehensive measure of energy poverty set out in this strategy (see below).

### Data/information constraints

A particular measurement-related challenge concerns the availability of data/information required to support a comprehensive definition of energy poverty which integrates information on each of the three drivers of energy affordability identified in section 1.2 above. The application of a formal definition in line with best practice internationally is dependent upon the availability of detailed information on the characteristics of households and the accommodation in which they live.

However, in Ireland at present there are a number of deficiencies in the information available to enable precise measurement, which leads to difficulties tracking energy poverty on an ongoing and consistent basis. Particular data-related constraints include:

- An absence of integrated datasets that marry information on the income and expenditure characteristics of the household with the energy efficiency characteristics of the dwelling in which that household resides
- The poor availability of up-to-date data which reflect in a timely fashion the impacts of movements in energy prices and household incomes on energy usage and energy poverty

To overcome these informational constraints, this strategy sets out a two-stage approach to implementing the above definition of energy poverty. This involves initially using existing information to estimate the extent and nature of energy poverty currently affecting Irish households but moves, over the next 3-5 years, towards a comprehensive data-collection and modelling framework which will enable more precise measurement and assessment of energy poverty on an ongoing basis.

Crucially, this approach will allow us to take into account the relative thermal efficiency of households combined with occupation patterns in determining numbers in energy poverty. This will greatly assist in targeting households for future energy efficiency upgrades.

The methodological components underpinning the two-stage approach to measuring energy poverty are described below.

## 2.3 Preliminary Measure of Energy Poverty

A *preliminary measure* of energy poverty will be estimated which compares an individual household's expenditure on energy relative to its income to the average proportion of income spent on energy across all households in the State. This preliminary approach represents a partial application of the definition of energy poverty set out in the strategy. This is because it measures energy poverty on the basis of a household's *actual* expenditures on energy as opposed to the *required* expenditure to achieve pre-defined levels of comfort.

**Under the preliminary approach, a household will be defined as experiencing energy poverty if, in any one year, it spends more than 10% of its disposable income on energy.**

### Data source

In applying this preliminary approach, expenditure and household incomes are measured using the Central Statistics Office (CSO) Household Budget Survey (HBS), which measures the income and expenditure characteristics of households across the State using a representative sample of households.<sup>2</sup> The relevant expenditure category is 'Light and Heat'. As per the above preliminary measurement approach, household expenditure on energy is related to household disposable income (i.e. gross household income *less* taxes *plus* state transfers).<sup>3</sup>

It should be noted that the latest Household Budget Survey pertains to 2004/05. In estimating the current extent of energy poverty, the 2004/05 HBS data are combined with data on the movements in energy prices and household incomes over the period 2005 to 2009, to develop estimates for the average (median) ratio of household expenditure to disposable income across all households in 2009 terms. This process uses data on residential energy prices published by the Sustainable Energy Authority of Ireland (SEAI) and data on household income and consumption patterns from the CSO's National Accounts. This average ratio is then used in conjunction with the household behavioural patterns revealed by the 2004/05 HBS and the number of households in the State in 2009 to estimate the numbers of households experiencing energy poverty (in addition to severe and extreme energy poverty) in 2009.<sup>4</sup>

2 For a detailed description of the CSO Household Budget Survey, refer to: [http://www.cso.ie/surveysandmethodologies/surveys/housing\\_households/survey\\_hbs.htm](http://www.cso.ie/surveysandmethodologies/surveys/housing_households/survey_hbs.htm).

3 Household Disposable Income used in the energy poverty definition equates to total Household Disposable Income and is unadjusted.

4 This estimation process is required due to the absence of current HBS data. However, as the HBS is due to be updated in 2011, it will be possible to reflect the prevailing position using the preliminary measurement approach at that stage.

### Reference threshold

An important feature of the preliminary measurement approach (as well as the comprehensive approach, discussed below) is the use of a relative poverty approach.

**Specifically, a household is defined as being unable to afford its energy needs if it spends at a level greater than twice the national average (median) share (currently 10%) of disposable income spent on energy services.<sup>5</sup>**

In 2009 terms, it is estimated that this definition equates to a situation where a household spends greater than 9.6%<sup>6</sup> or approximately €80 per week or €4,200 per annum of its disposable income on energy to attain an acceptable standard of warmth.

The rationale for selecting twice the median proportion of income spent on energy as the basis for the measurement approach is that this threshold is regarded as signalling a statistically disproportionate level of expenditure in relative terms across the population of households.

A particular feature is that the reference threshold for the national average ratio of energy expenditure to household disposable income will be updated/re-benchmarked against the CSO's Household Budget Survey, which is currently updated every five years. The advantage of this approach is that it allows for the reference threshold to be adjusted on a periodic basis to reflect developments in the position of the average household, thereby capturing the relative poverty dimension. (Measurement relative to a reference proportion that is fixed in the long run would mean that the reference value could become inappropriate as a threshold against which to measure and assess relative energy poverty.<sup>7</sup>)

### Severity of energy poverty

The preliminary measure of energy poverty enables the estimation of the overall extent of energy poverty in Ireland. In practice, some social groups are likely to be more severely affected by energy poverty than others. As a result, it is appropriate to complement the core preliminary indicator of energy poverty with supporting indicators which capture the severity of energy poverty in terms of households that are most critically affected. This is critical in terms of prioritising and targeting measures and resources at households that are most in need. The three measures of severity of energy poverty set out in the strategy are shown below. It should be noted that the 15% and 20% thresholds applied in the case of severe and extreme energy poverty also reference the national (median) average ratio of energy expenditure to household disposable income. The 15% threshold approximates to three times the national median while the 20% extreme energy poverty threshold approximates to four times the national average ratio of energy spend to income.

5 The median average share of income is used since this measure of statistical average is less susceptible to the influence of high or low outlier values than the mean average.

6 For the purposes of ease of application, the twice-median threshold is rounded to 10%.

7 Another potential approach would be to update the

reference threshold on an annual basis to reflect annual movements in household incomes and energy prices. The main disadvantage of this approach, however, is that it would make policy targeting very difficult to achieve in the medium term (i.e. within a five-year period).

### ***Estimating Severity of Energy Poverty under the Preliminary Measure***

- 1. The core indicator of energy poverty set out above, i.e. where a household is considered to be experiencing energy poverty if, in any one year, it spends more than twice the national median ratio of household energy expenditure to household disposable income (currently 10%) on energy services in the home.**
- 2. An indicator of severe energy poverty: whereby a household is considered to be experiencing energy poverty if, in any one year, it spends more than three times the national median ratio of household energy expenditure to household disposable income (currently 15%) of its disposable income on energy services in the home.**
- . An indicator of extreme energy poverty: whereby a household is considered to be experiencing energy poverty if, in any one year, it spends more than four times the national median ratio of household energy expenditure to household disposable income (currently 20% of its disposable income on energy services in the home.**

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## **2.4 Comprehensive Measure of Energy Poverty**

As noted above, measurement based on actual household expenditures on energy may underestimate the extent of energy poverty as low-income households can under-heat their homes relative to the level that would be required based on healthy standards.

To address this drawback, the strategy indicates that a *comprehensive measure* of energy poverty will be developed using a new energy poverty modelling framework. It is envisaged that this

approach will form the basis for future ongoing measurement of the extent and nature of energy poverty in Ireland. Importantly, this will follow best-practice approaches applied in other countries with well-developed information and monitoring systems in this area, including in the UK.

This approach will combine a survey of housing conditions with a formal energy poverty modelling framework to estimate what households need to spend “to attain an acceptable standard of warmth and energy services in the home at an affordable cost” as per the full definition of energy poverty set out above.

The comprehensive measurement approach will define ‘acceptable standard of warmth’ by reference to international best-practice standards and will take account of the efficiency of the dwelling, variations in outside temperatures (particularly during winter) and energy/fuel costs to determine the required levels of household energy use.<sup>8</sup> Combining this information with data on household incomes will assist in the identification of energy-poor households.

The comprehensive core measure of energy poverty will be as follows:

**A household is defined as being unable to afford its energy needs if it is required to spend at a level greater than twice the national average (median) share (currently 10%) of disposable income spent on energy services to achieve an acceptable standard of warmth.**

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<sup>8</sup> The standard approach to defining ‘adequate warmth’ is by reference to World Health Organisation (WHO) guidelines, which defines ‘adequate’ as equating to a temperature of 21oC in the main family/living-room and 18oC in other occupied rooms of a dwelling.

### ***Estimating Severity of Energy Poverty under the Comprehensive Measure***

**The comprehensive measure will seek to assess the severity of energy poverty in a household by reference to the following indicators:**

- 1. Core Energy Poverty Indicator: A household is considered to be in energy poverty if it is required to spend greater than twice the national median ratio of household energy expenditure to household disposable income (currently **10%** of the household's disposable income) on energy services to achieve an acceptable standard of warmth.**
- 2. Severe Energy Poverty Indicator: A household is considered to be in severe energy poverty if it is required to spend greater than three times the national median ratio of household energy expenditure to household disposable income (currently **15%** of the household's disposable income) on energy services to achieve an acceptable standard of warmth.**
- 3. Extreme Energy Poverty Indicator: A household is considered to be in extreme energy poverty if it is required to spend greater than four times the national median ratio of household energy expenditure to household disposable income (currently **20%** of the household's disposable income) on energy services to achieve an acceptable standard of warmth.**

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As in the case of the preliminary measure, the reference threshold for the national average ratio of energy expenditure to household disposable income used in the comprehensive measure will be updated/re-benchmarked against the CSO's Household Budget Survey as this survey is updated every five years.

Under the comprehensive approach, a formal, comprehensive measure of energy poverty will be developed and implemented over the next 3-5 years once an energy poverty/residential fuel-cost model is developed (see further below).

## **2.5 Development of an Energy Poverty Model**

Accurate measurement and monitoring of energy poverty requires the estimation of required levels of energy expenditure in the home, taking into account energy/fuel prices, household energy requirements, household income and the characteristics of the dwelling/accommodation, including the thermal efficiency of the dwelling and the efficiency of its energy systems.

The development of a fully functioning residential fuel-cost model, along with an associated national housing/household survey, is a complex task but one that is crucial for policymaking in this area.

As noted earlier in this section, there does not currently exist an integrated set of information which combines data on the energy efficiency of the housing stock with data on the socio-economic characteristics of households. Without access to up-to-date, integrated datasets, it is not possible to identify and measure energy poverty or energy affordability on the basis of energy needs as opposed to actual energy expenditures. This means that existing estimates of energy poverty in Ireland may underestimate the extent of the challenge, because these estimates do not factor in the expenditures required to achieve adequate warmth and energy provision. This is particularly the case where poorer households are more likely to under-heat their homes.

The development of a residential fuel-cost model should involve the Department of Communications, Energy and Natural Resources working closely with SEAI and the Department of Environment, Heritage and Local Government to scope out the requirements for such a model. This should leverage the experience and build on the approaches applied elsewhere, including in the devolved administrations in the UK.

Critically, a fully functioning model will entail the development of an associated national house condition survey. This will combine for each household a physical survey of the dwelling (akin to an expanded version of the survey currently undertaken for the purposes of the SEAI-administered Building Energy Rating) and a socio-economic survey which would collate information on household income and other key characteristics impacting on energy requirements.

# Chapter 3

## Extent of Energy Poverty

### 3.1 Extent of Energy Poverty – Subjective Measures

This section presents additional detail in relation to the extent of energy poverty based on subjective measures, using the EU Survey of Income and Living Conditions.

#### EU Survey of Income and Living Conditions

The EU Survey of Income and Living Conditions is an annual survey conducted by the Central Statistics Office in line with EU common methodologies to facilitate comparison of information on the income and living conditions of different types of households. A representative random sample of households

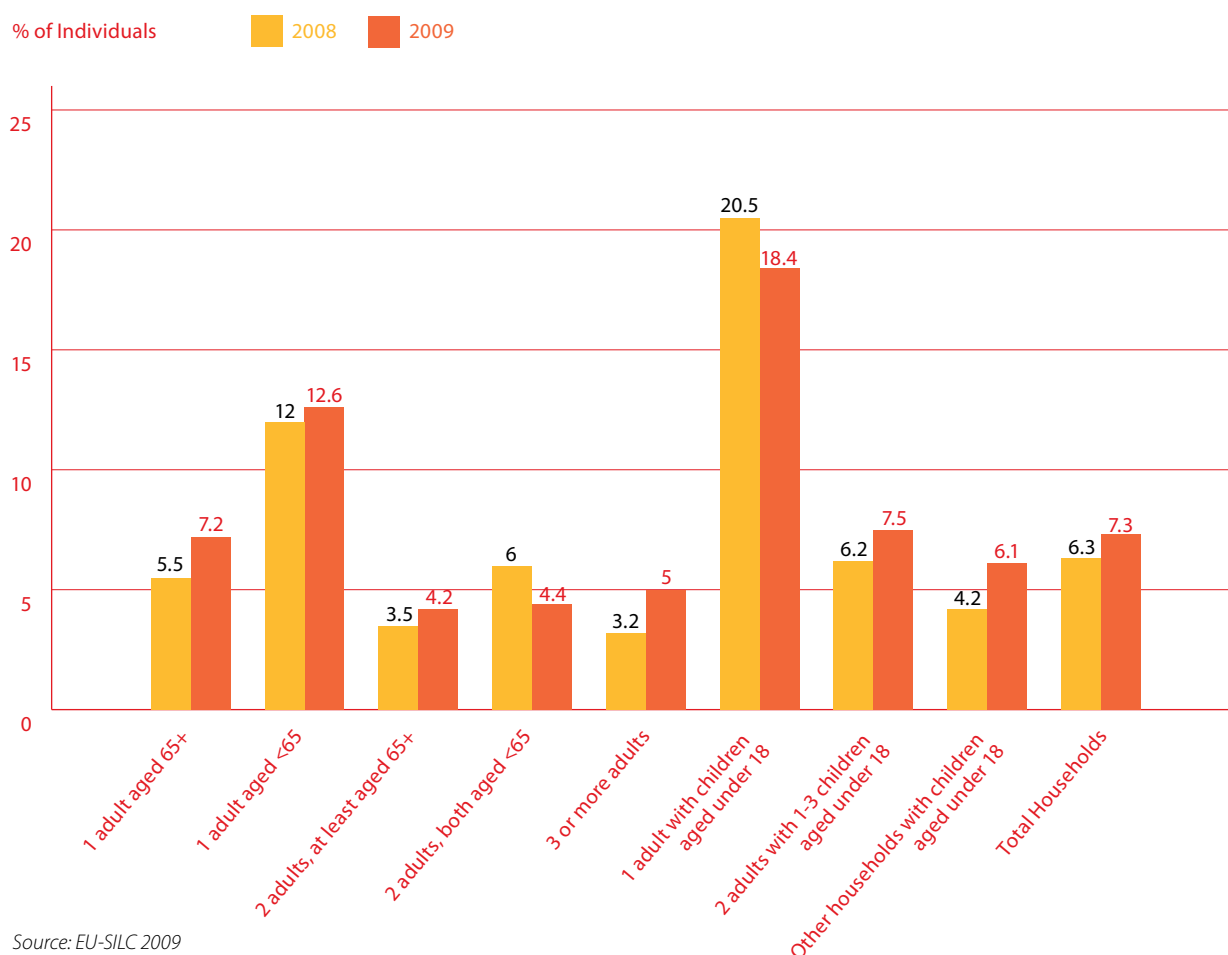
throughout the country is used to complete the survey.

The survey also collects information on a number of aspects of poverty and social exclusion, based on questions eliciting subjective responses from households in the survey sample. These include the following components in relation to energy poverty:

- Whether a household has had to go without heating at some stage in the last year
- Whether a household is unable to afford to keep the home adequately warm

The chart below shows the proportion of individuals in the population in 2008 and 2009 who indicated that they have been without heating at some stage in the last year.

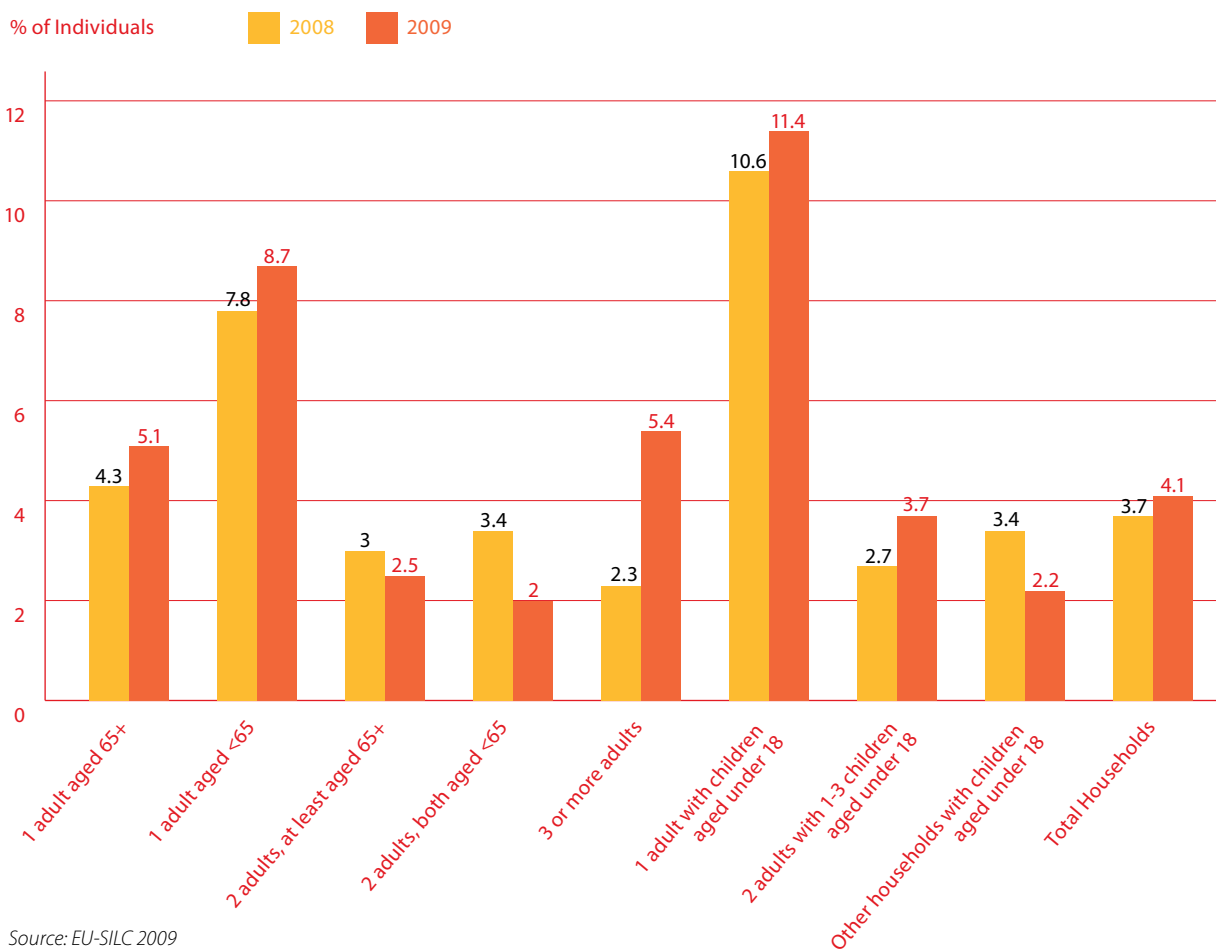
**Figure 1: Population Reporting Deprivation by Household Composition – Households ‘Without heating at some stage in the last year’ – % of individuals**



Source: EU-SILC 2009

The next chart shows the proportion of individuals in the population in 2008 and 2009 who indicated that they had been unable to keep their home adequately warm during the last year.

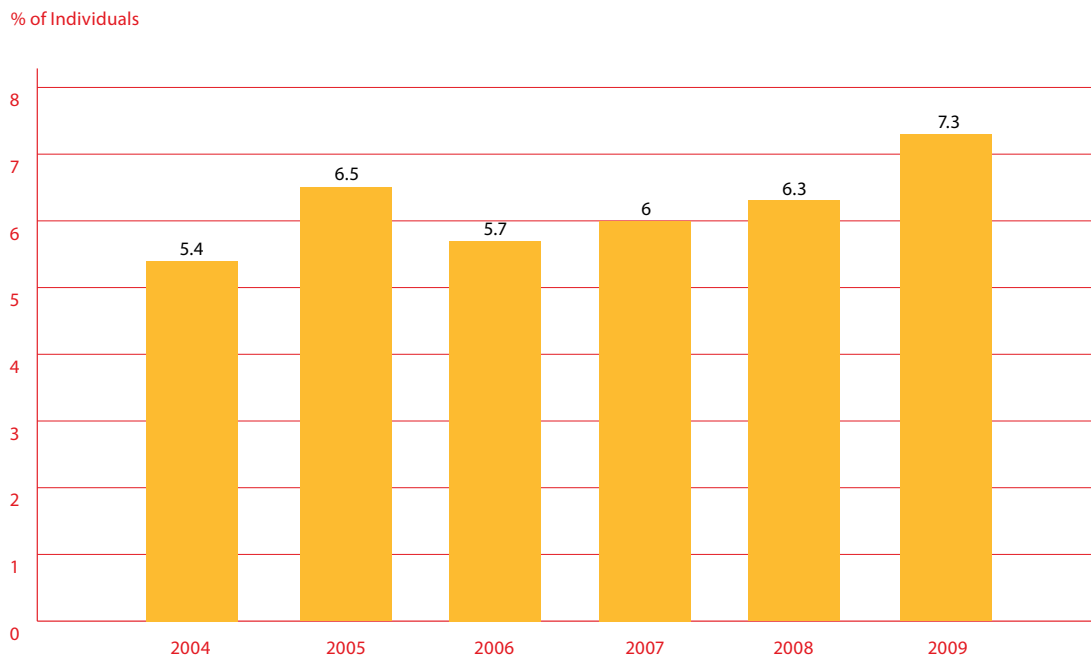
**Figure 2: Population Reporting Deprivation by Household Composition – Households ‘Unable to keep the home adequately warm’ – % of individuals**



Source: EU-SILC 2009

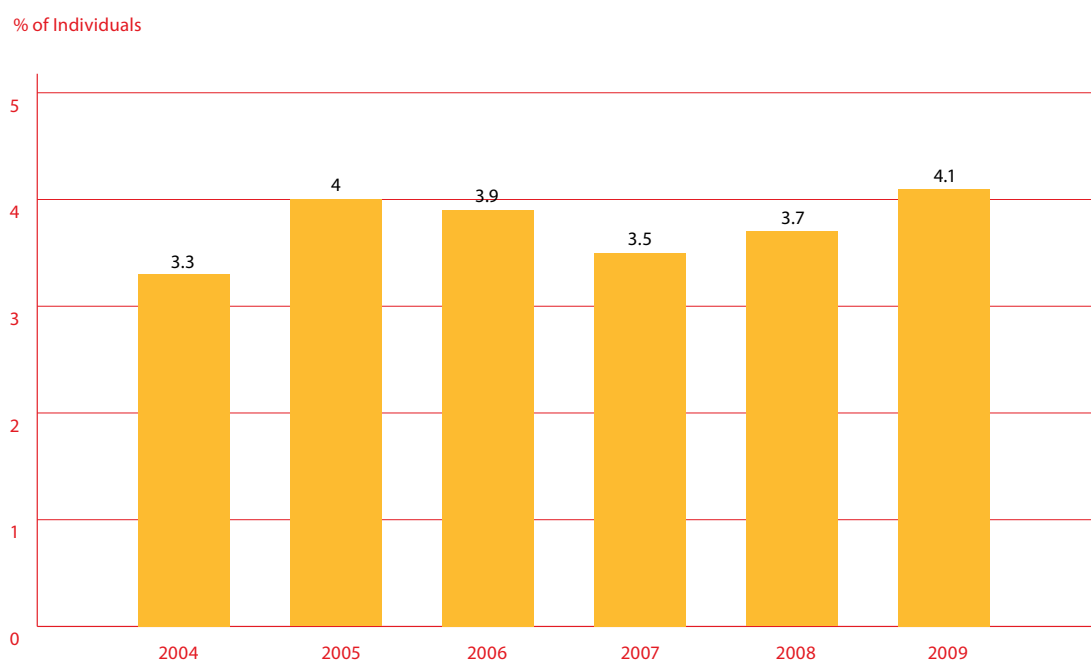
Finally, the following charts show the proportion of individuals who indicated that they had (a) done without heating at some stage in the last year and (b) been unable to keep their home adequately warm over the period 2004–2009.

**Figure 3: Without heating at some stage in the last year'**



Source: EU-SILC 2009

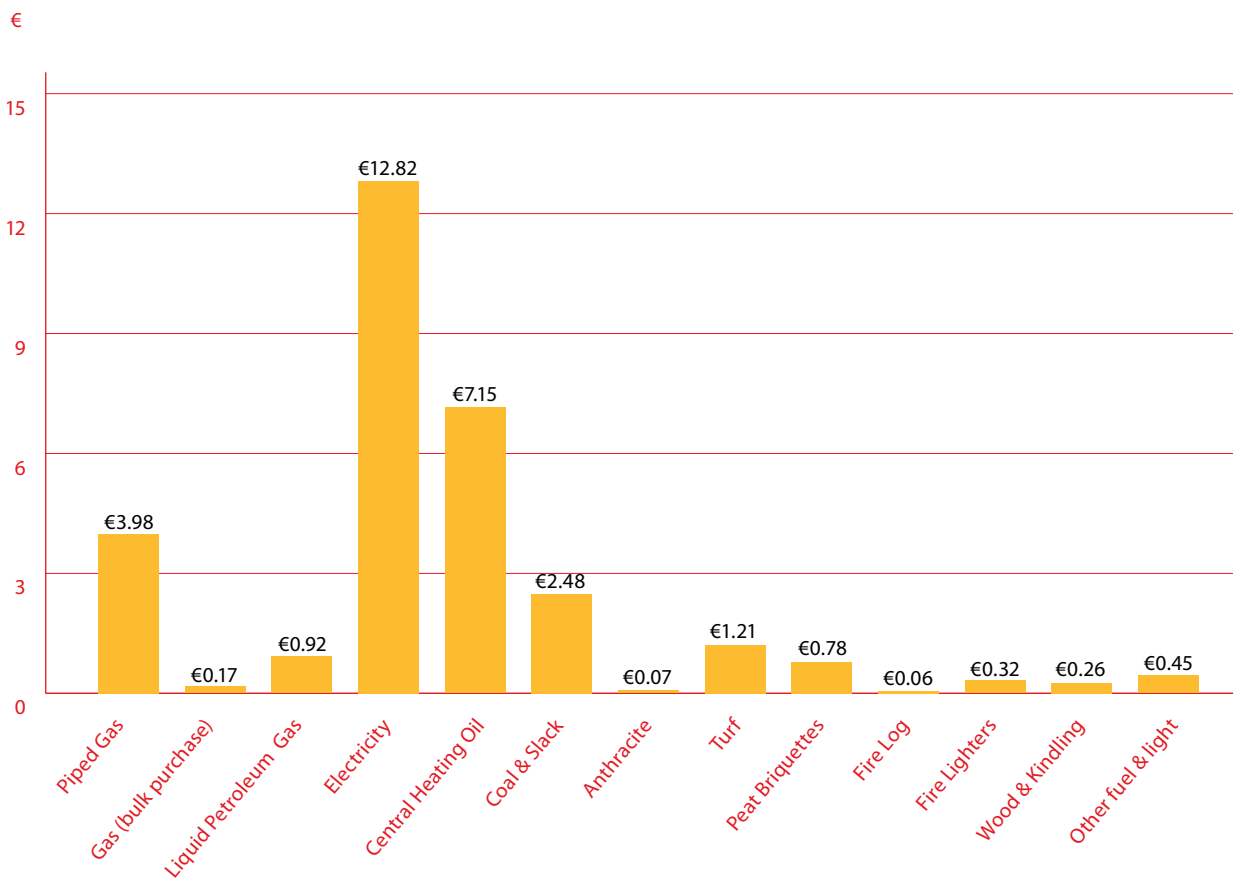
**Figure 4: 'Unable to keep the home adequately warm'**



Source: EU-SILC 2009

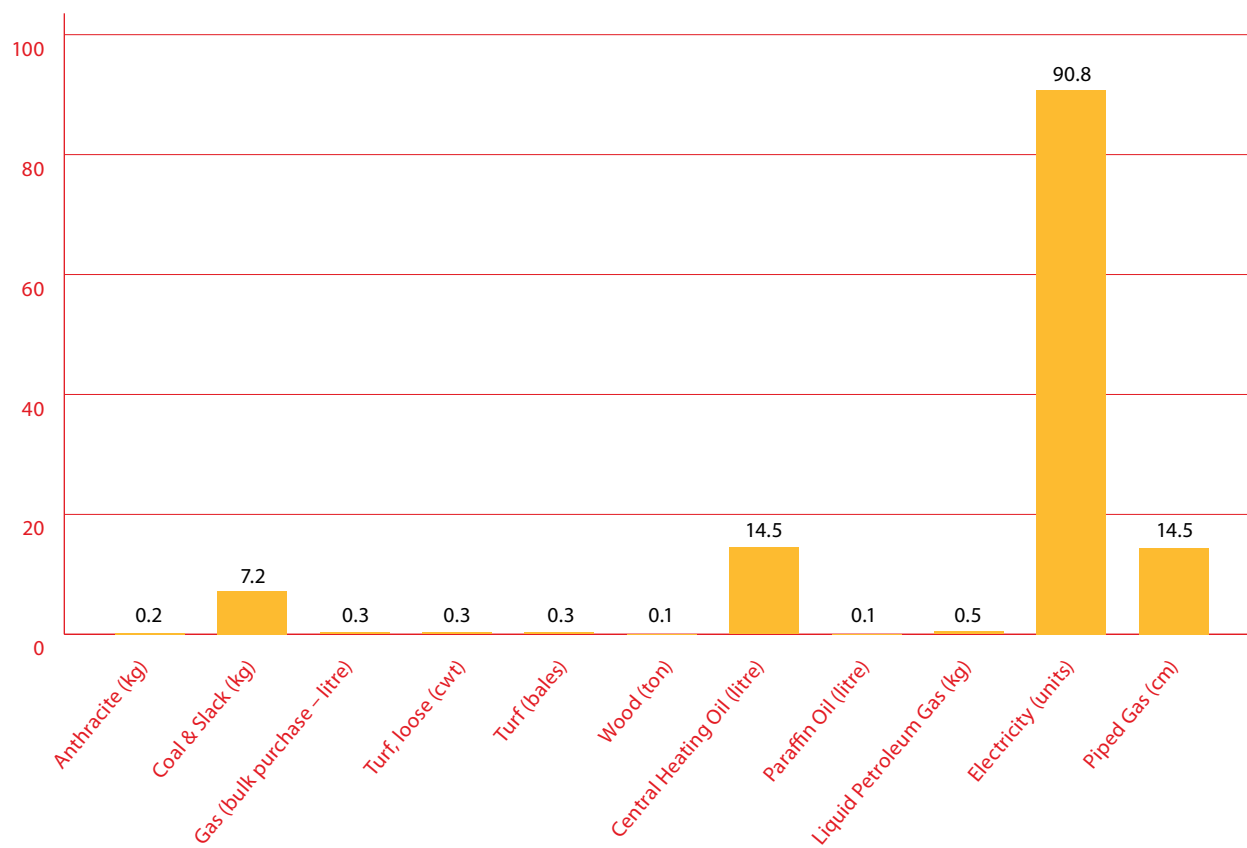
### 3.2 Household Budget Survey – Additional Detailed Data

Figure 5: Average household energy expenditure by product - € per Week



Source: CSO, Household Budget Survey, 2004/05

Figure 6: Average weekly energy use in households



Source: CSO, Household Budget Survey, 2004/05

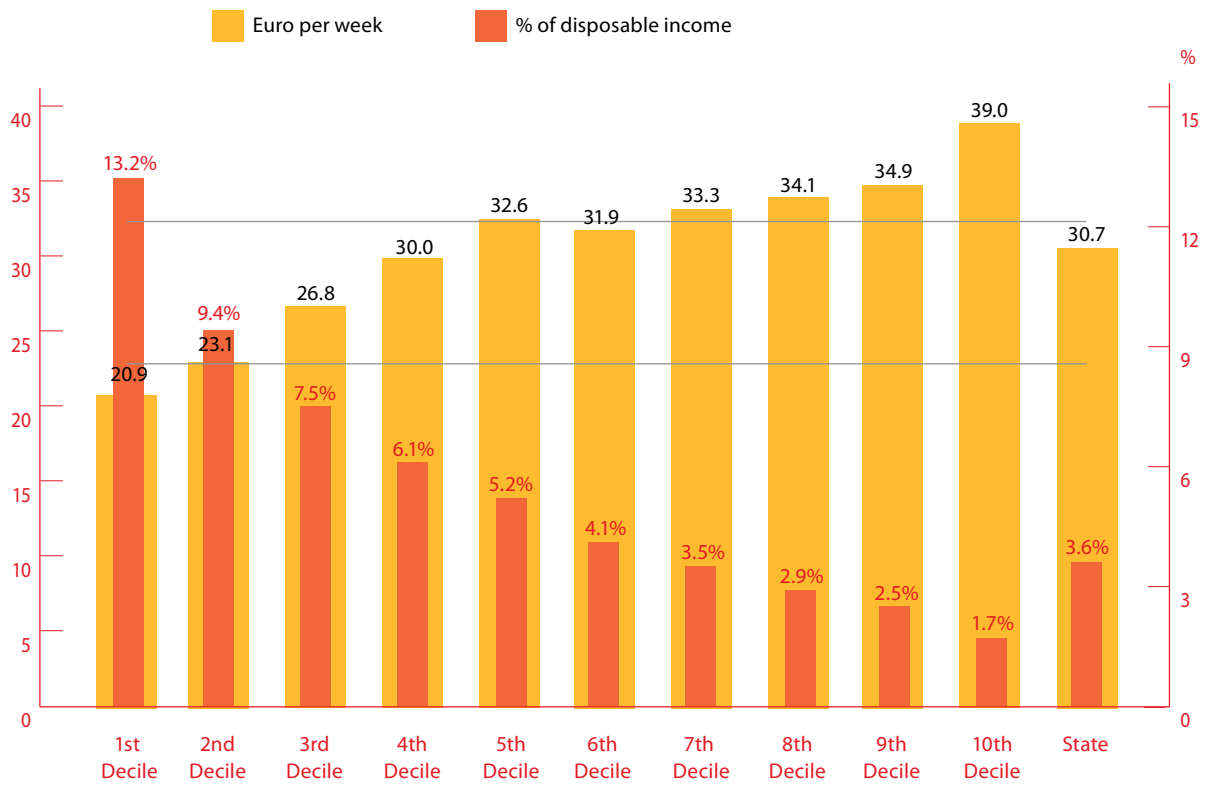
**Figure 7: Percentage of disposable income spent on fuel & light by area of residence\***



Source: CSO, Household Budget Survey, 2004/05

\*Upper and lower black lines illustrate the 10% threshold and twice the state average (7.2%) respectively

Figure 8: Percentage of disposable income spent on fuel & light by income decile



Source: CSO, Household Budget Survey, 2004/05

\*Upper and lower black lines illustrate the 10% threshold and twice the state average (7.2%) respectively

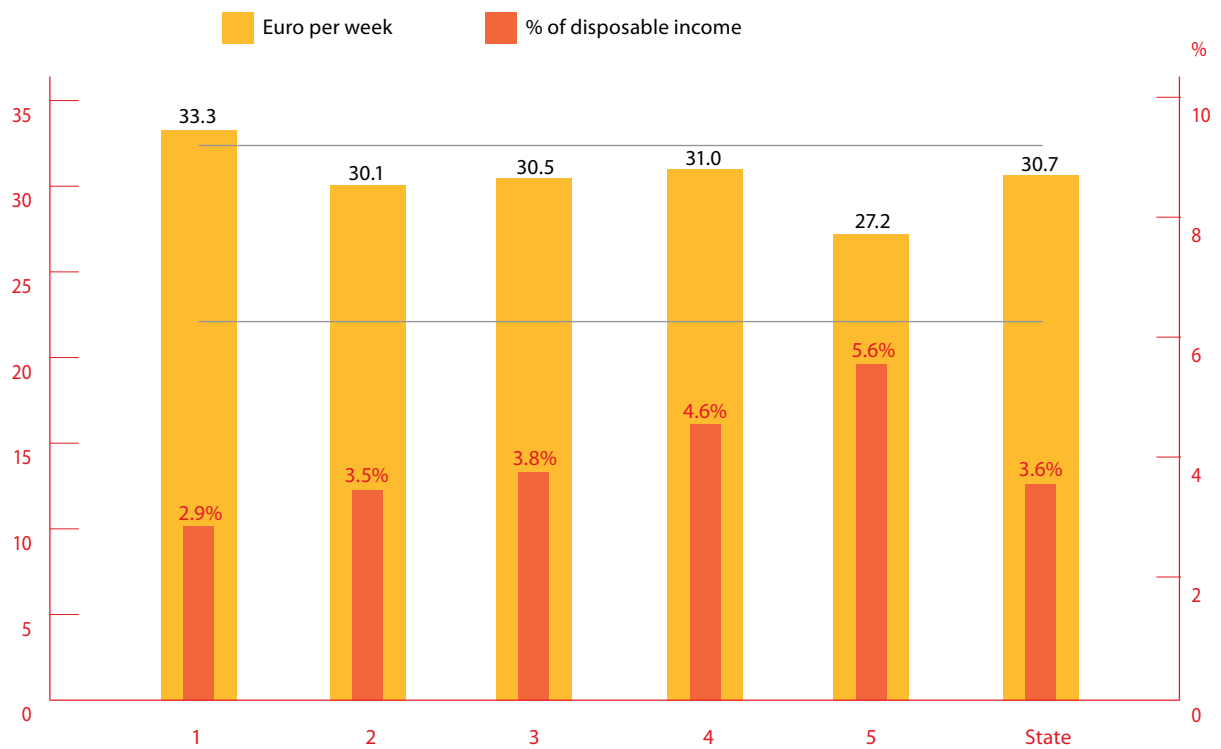
**Figure 9: Percentage of disposable income spent on fuel & light by housing tenure**



Source: CSO, Household Budget Survey, 2004/05

\*Upper and lower black lines illustrate the 10% threshold and twice the state average (7.2%) respectively

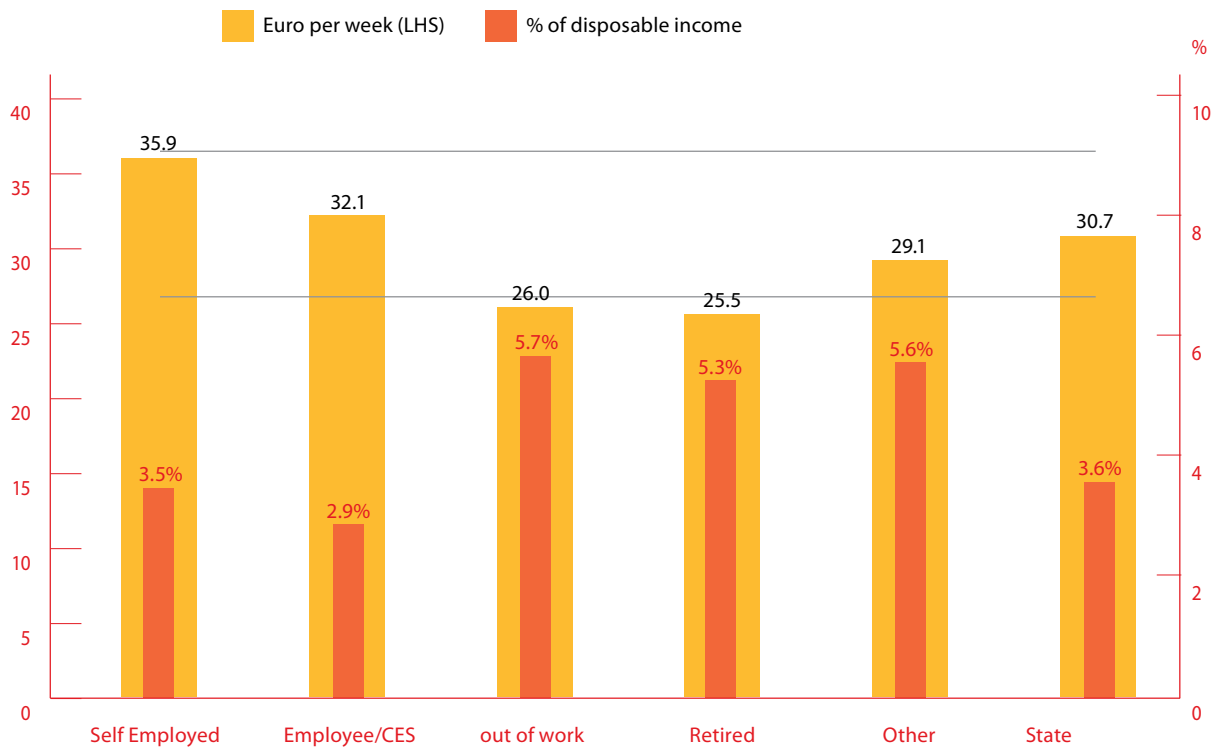
Figure 10: Percentage of disposable income spent on fuel & light by social group



Source: CSO, Household Budget Survey, 2004/05

\*Upper and lower black lines illustrate the 10% threshold and twice the state average (7.2%) respectively

**Figure 11: Percentage of disposable income spent on fuel & light by economic status**



Source: CSO, Household Budget Survey, 2004/05

\*Upper and lower black lines illustrate the 10% threshold and twice the state average (7.2%) respectively

Figure 12: Percentage of disposable income spent on fuel & light by household type



Source: CSO, Household Budget Survey, 2004/05

\*Upper and lower black lines illustrate the 10% threshold and twice the state average (7.2%) respectively

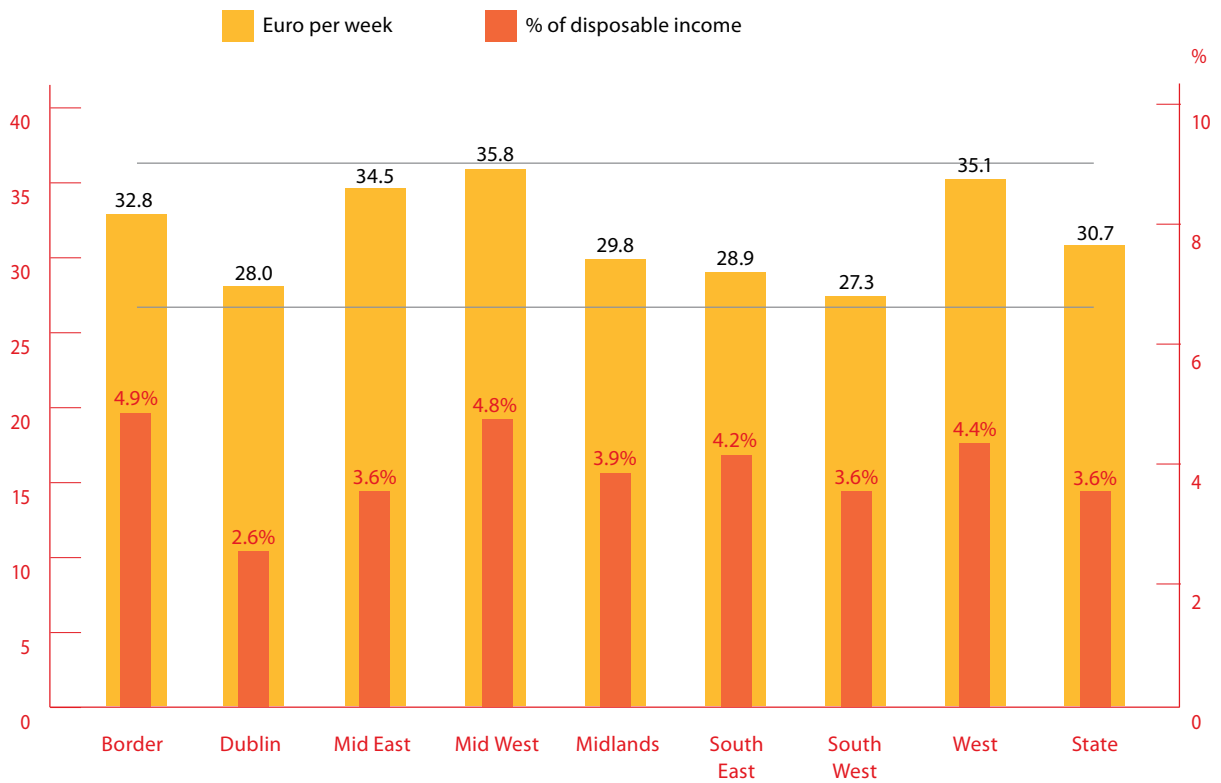
**Figure 13: Percentage of disposable income spent on fuel & light by household size**



Source: CSO, Household Budget Survey, 2004/05

\*Upper and lower black lines illustrate the 10% threshold and twice the state average (7.2%) respectively

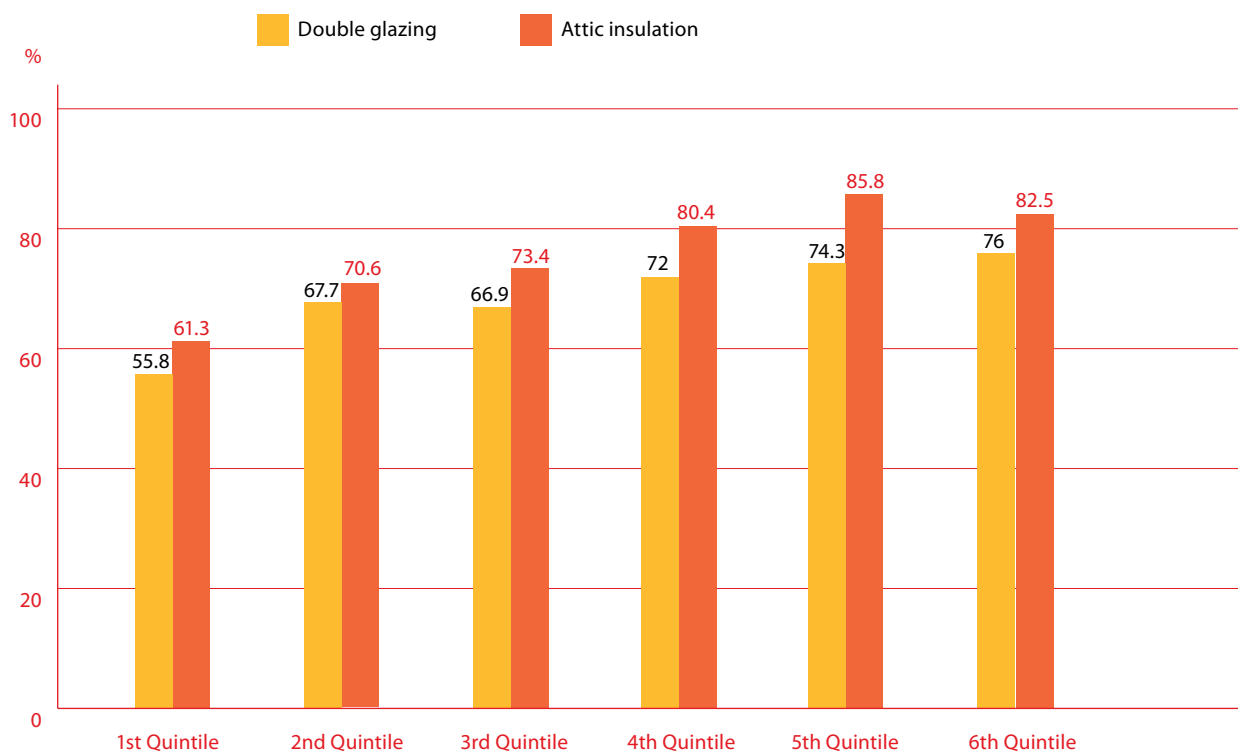
Figure 14: Percentage of disposable income spent on fuel & light by region



Source: CSO, Household Budget Survey, 2004/05

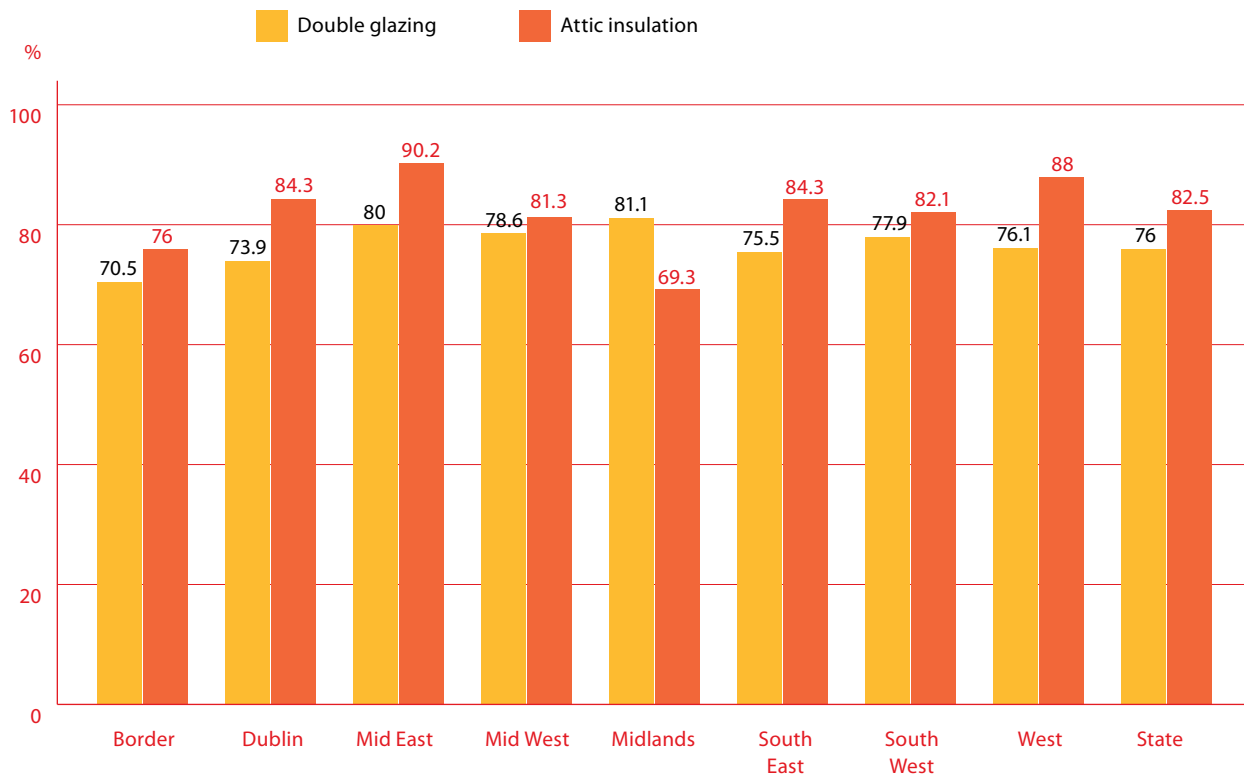
\*Upper and lower black lines illustrate the 10% threshold and twice the state average (7.2%) respectively

**Figure 15: Fuel & light efficiency measure coverage among households by income quintile - % of households**



Source: CSO, Household Budget Survey, 2004/05

Figure 16: Fuel & light efficiency measure coverage among households by region - % of households



Source: CSO, Household Budget Survey, 2004/05

