



DIRECTORATE-GENERAL FOR INTERNAL POLICIES

POLICY DEPARTMENT **A**  
ECONOMIC AND SCIENTIFIC POLICY



How to end Energy Poverty? Scrutiny of Current EU and Member States Instruments

Economic and Monetary Affairs

Employment and Social Affairs

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Internal Market and Consumer Protection

# How to end Energy Poverty? Scrutiny of Current EU and Member States Instruments

Study for the ITRE Committee





**DIRECTORATE GENERAL FOR INTERNAL POLICIES**  
**POLICY DEPARTMENT A: ECONOMIC AND SCIENTIFIC POLICY**

# **How to end Energy Poverty? Scrutiny of Current EU and Member States Instruments**

**STUDY**

## **Abstract**

Policymaking to alleviate energy poverty needs to find a balance between short-term remedies and the resolution of long-term drivers of energy poverty. EU policy might need to work towards a) finding a definition of energy poverty; b) supporting national policies financially through EU coordination; and c) setting minimum standards for energy efficiency of buildings and devices. This document was provided by Policy Department A at the request of the Committee on Industry, Research and Energy (ITRE).

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## **AUTHORS**

Katja SCHUMACHER, Öko-Institut e.V.  
Johanna CLUDIUS, Öko-Institut e.V.  
Hannah FÖRSTER, Öko-Institut e.V.  
Benjamin GREINER, Öko-Institut e.V.  
Katja HÜNECKE, Öko-Institut e.V.  
Tanja KENKMANN, Öko-Institut e.V.  
Luc VAN NUFFEL, Trinomics

## **RESPONSIBLE ADMINISTRATOR**

Frédéric GOUARDÈRES

## **EDITORIAL ASSISTANT**

Karine GAUFILLET

## **LINGUISTIC VERSIONS**

Original: EN

## **ABOUT THE EDITOR**

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To contact Policy Department A or to subscribe to its newsletter please write to:

Policy Department A: Economic and Scientific Policy  
European Parliament  
B-1047 Brussels  
E-mail: [Poldep-Economy-Science@ep.europa.eu](mailto:Poldep-Economy-Science@ep.europa.eu)

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|             |                                         |
|-------------|-----------------------------------------|
| <b>BKG</b>  | National Economy Bank                   |
| <b>DECC</b> | Department of Energy and Climate Change |
| <b>DEPA</b> | Natural Gas Corporation                 |
| <b>ERDF</b> | Regional Development Fund               |
| <b>EC</b>   | European Commission                     |
| <b>EU</b>   | European Union                          |
| <b>GDP</b>  | Gross domestic product                  |
| <b>GJ</b>   | Gigajoule                               |
| <b>KfW</b>  | Kreditanstalt für Wiederaufbau          |
| <b>kWh</b>  | Kilowatt hour                           |
| <b>LIHC</b> | Low-Income, High Costs indicator        |
| <b>MS</b>   | Member States                           |
| <b>PPP</b>  | Purchasing Power Parity                 |
| <b>VAT</b>  | Value Added Tax                         |
| <b>UK</b>   | United Kingdom                          |



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## EXECUTIVE SUMMARY

Energy or fuel poverty<sup>1</sup> is increasingly becoming an issue in Europe. BPIE (2014)<sup>1</sup> estimates that between 50 and 125 million people in the European Union (EU) are currently suffering from fuel poverty and are unable to afford proper indoor thermal comfort.

This study provides an overview of the various instruments and policy measures that are implemented to alleviate energy poverty at EU level and in the following Member States (MS): Bulgaria, France, Germany, Greece, Ireland, Italy, Poland, Spain and the United Kingdom.

A comparative assessment aims to identify good practices and reasons for success and shortcomings of policies and measures. Based on these findings, recommendations are derived for policy making both on the EU and MS level. They address questions such as whether i) new policies should be envisaged, ii) data collection needs to be improved and/or iii) a refinement of the implementation of measures is needed.

There is no EU-wide consensus on the definition of energy poverty. Only the UK has a legal definition of energy poverty, called "fuel poverty" according to the "Low Income, High Costs" indicator. This definition states "a household is considered to be fuel poor if its required fuel costs [to maintain an adequate heating regime] are above average, and, were it to spend that amount, it would be left with a residual income below the official poverty line". Various other approaches exist to describe and measure energy poverty; nevertheless a common position is missing. The analysis reveals that electricity and gas prices are gradually increasing in most Member States. Income equality and GDP per capita are other parameters that determine energy poverty. Bulgaria, Spain and Greece exhibit the highest income inequality with an upward tendency. Bulgaria has by far the lowest GDP. There is a strong correlation between these economic indicators.

The comparative analysis across the selected Member States assesses the effectiveness of energy poverty policies and identifies good practices as well as reasons for the success or shortcomings of policies and measures. The results show for Bulgaria, for example, that the current instruments are only reaching a small share of households. National policies are restricted to financial support of low-income households for a limited amount of energy. In order to improve the situation, Bulgaria has to address low energy performance of its building stock (particularly the reliance on inefficient heating systems) coupled with low-income levels resulting in overall poverty. According to our review, the current Bulgarian policies are not addressing energy poverty in an effective or sustainable manner.

France appears to have established a pragmatic and effective way of addressing energy poverty, e.g. by introducing the "Habiter Mieux" scheme. In order to effectively reach energy poor households, make policies and measures transparent, and account for regional disparity in terms of the climate and fuel mix, France has granted departmental authorities freedom in their methodology for identifying target areas and households and for implementing programmes. This enables tailored approaches to data availability, networks, and methods and improves the overall efficiency and effectiveness of the programme. Nevertheless, some areas for further improvement has been identified, such as a more coherent energy poverty strategy and increased funding.

In Germany, the social security system includes provisions for energy expenditure. This approach is transparent and reaches the households in need. However, it is expensive and involves a high level of administration costs. Germany also has three successful instruments to assist energy poor households via the provision of advice on reducing

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<sup>1</sup> Both terms are used interchangeably.

electricity consumption (“electricity saving check”) and improving the efficiency of heating energy use.

Greece offers a social tariff for customers with specific social characteristics. The Greek parliament has also recently introduced a “free electricity” quota for households with energy debts. This approach is not typical among the subsidy policies reviewed. While providing a short-term remedy for both households and power companies, it is an expensive program which does not sustainably address a long term transition towards efficiency improvements and affordable energy for (poor) households.

The UK has a clear definition of energy poverty which covers households whose share of energy spending exceeds a certain level and those that ration their energy use to fit within their available budget. The policies have been targeted at low-income households in general. The reasons for this inability to directly address fuel poor households include a lack of data and the intrusiveness of the surveys required to generate the necessary data. Boardman (2012) estimates that less than a quarter of funds spent on UK fuel poverty policies are actually reaching the fuel poor and that the total volume of funds is far too small to reach the UK’s 2016 national energy poverty target. The UK example illustrates the difficulties in implementing a fuel poverty policy as well as the mismatch between a stagnating political will to secure funding and the need for an extensive data collection and elaborate monitoring and evaluation system.

Ireland established a “Warmer Home Strategy” in 2011. This strategy builds on UK experience by addressing energy poverty via measures to enhance the thermal efficiency of buildings and via financial support to enable households to pay their energy bills. Ireland has designed programs, such as an oil stamp saving program to take into account their specific fuel mix. Analysis suggests that the efficiency and effectiveness of the existing policies and measures would be improved by directly addressing fuel poor households and coupling income support schemes with energy efficiency upgrades.

The Italian scheme of energy benefits consists of a lump sum contribution to vulnerable consumers, similar to the schemes adopted in France. The effectiveness of the Italian energy benefits scheme could be improved by revising the eligibility criteria. In particular, it would be appropriate to differentiate the allowances in order to take into account the variation in cost of living across the country.

Initial approaches in Poland to address high energy prices focused on social subsidies as well as VAT and other tax reductions. There is also a formal agreement with energy companies to avoid disconnecting the energy supplies for those households that are so affected by energy poverty that they go in default on payment. However, since this agreement has no special conditions for low-income-households, it cannot be considered as an energy poverty policy and it is unlikely that it efficiently targets the energy poor households.

Fuel or energy poverty is not legally recognised in Spain although indicators show that it is in fact a major problem. Spain should establish policy action to improve the situation of low-income households – in both the short and the long term. Long-term measures related to improving the energy efficiency of buildings and adapting heating systems are particularly necessary.

The lessons learned can be summarised as follows: A common definition of energy poverty and a strategy to collect the required data is needed to correctly identify energy poor households. Modernisation of buildings and energy-using appliances is an effective remedy. Obliging energy utilities to provide social tariffs, discounts, or tolerate the accumulation of consumer debt is a short-term remedy but not a sustainable policy in the long term as it does not tackle the root causes of energy poverty. State-funded subsidies and benefits for

energy poor households differ in success. Often they provide lump sum support to low-income households and do attempt to target the energy poor. They would also benefit from being provided alongside energy efficiency improvement programs. Monitoring and evaluation of programs is indispensable to assess and improve the effectiveness and efficiency of policies and measures.

If policies and measures are to be successful, the targeting and the efficiency of spending must improve drastically. Three EU-level recommendations emerge from this review: i) develop an adequate definition of energy poverty by providing data, information and co-ordination, enhance the European discussion by providing platforms for dialogue to help identify and recommend best practices; ii) support national policies financially through EU co-ordination, e.g. co-funding of housing stock renovation programs; and iii) continue to set minimum standards for energy efficiency of buildings and appliances.

## 1. GENERAL INFORMATION

### 1.1. Energy Poverty in the EU

In February 2015 the European Commission (EC) published a communication on the Energy Union package “A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy”. One of the main targets of this strategy is providing consumers with secure, sustainable and affordable energy. The subject of energy poverty is also addressed in this communication; specifically taking into account aspects of poor living conditions and health of EU citizens. The communication recognises that households facing a combination of low income and inefficient homes are particularly vulnerable to energy poverty.

Energy or fuel poverty is an important issue in many European countries. It mainly refers to the inability of households to pay their bills for electricity, which is considered as a vital good without proper substitute, and energy for heating purposes. According to the Buildings Performance Institute Europe (BPIE 2014)<sup>II</sup> between 50 and 125 million people in the European Union are currently suffering from fuel poverty and are unable to afford proper indoor thermal comfort. The problem is particularly common in Central and Eastern Europe, in many of the Southern EU countries, but also in the UK, Ireland and France. The households which are mostly affected are those already vulnerable to income poverty.<sup>III</sup>

One of the main issues is to define at which point these impacts (arrears on utility bills, the inability to keep the home warm and dwellings with leakages) become a major problem for households and when and how policy makers should react. It is therefore important to define a threshold, which when exceeded means that a household faces ‘fuel poverty’. This threshold could then be used as a baseline against which developments and policies are to be compared. However, the definition of such a threshold is difficult and subject to debate (Heindl 2013<sup>IV</sup>, Tyszler et al. 2013<sup>V</sup>). This difficulty is largely due to the fact that who is identified as ‘fuel poor’ strongly varies depending on the measure chosen, but also from country to country. Methods that have been proposed to calculate an appropriate threshold include a fixed share of expenditure spent on energy, deviations from average energy expenditures, but also self-assessment (‘feeling cold indicator’, cf. Tyszler et al. 2013).

### 1.2. Objective

This study gives an overview of the various instruments in place at the EU and Member State levels with regard to energy poverty. Energy poverty is a situation where a household is unable to access a socially and materially necessitated level of energy services in the home (Bouzarovski et al. 2012<sup>VI</sup>). In the present note we use the terms energy and fuel poverty interchangeably.

This study aims to investigate the extent to which energy poverty is an issue in the selected EU Member States, which households it applies to, how it is addressed, how well the identified policies and measures work and whether they reach their intended target groups. Based on the insights from addressing these questions, the study further aims to elaborate policy recommendations for improving or refining existing policies or designing new policy measures.

Our assessment focusses on Member States, which were selected according to a “vulnerability selection process”: This process was based on a literature review designed to highlight which countries in the EU are most vulnerable to energy poverty.

The indicators which guided the selection process were

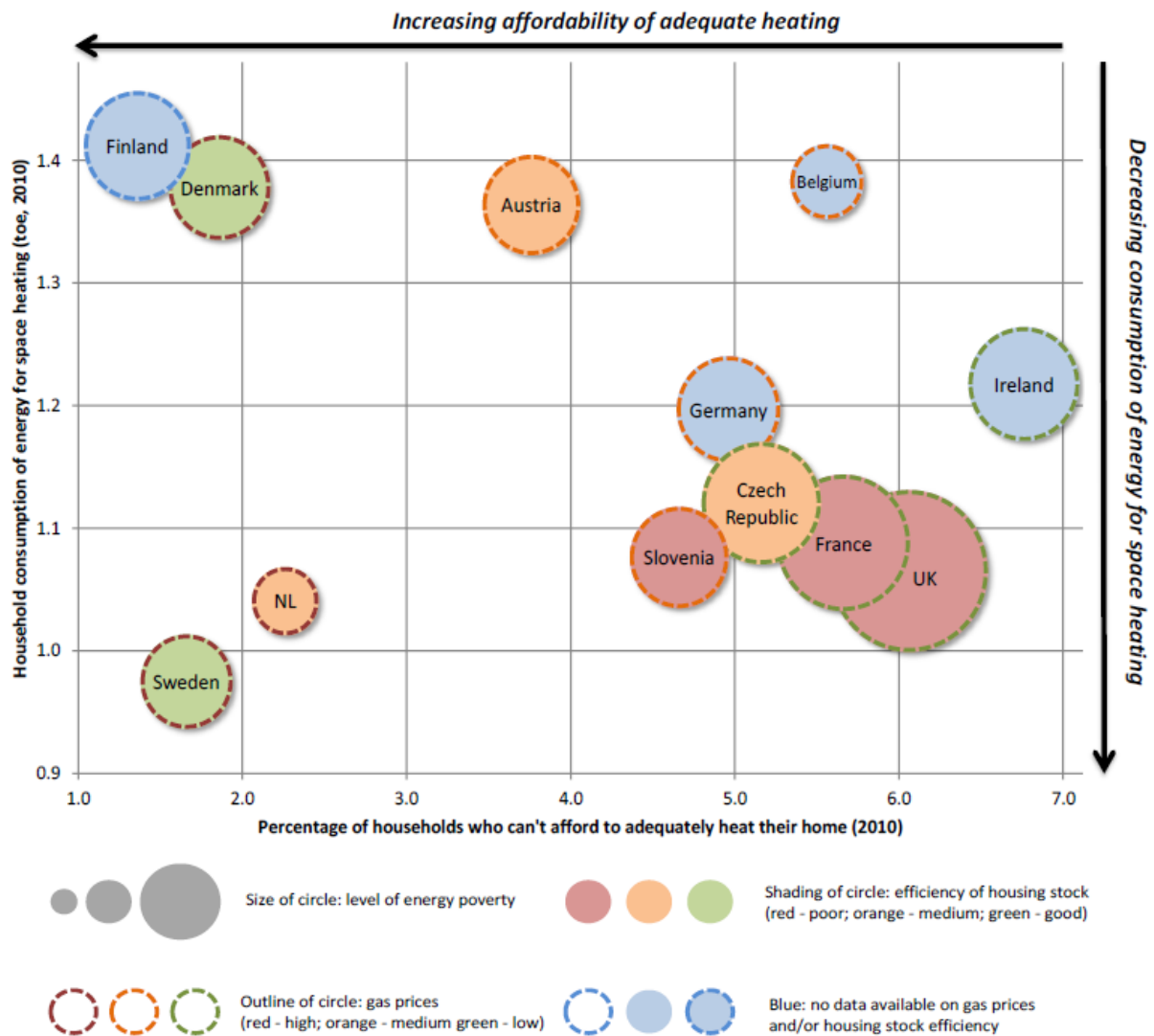
- reported energy poverty in the Member State,
- existing policy measures or instruments to alleviate energy poverty, and
- the availability of valuable expert contacts or data sources.

The following nine Member States from four geographic regions were selected:

- North: Ireland
- West: Germany, France, UK
- South: Greece, Spain, Italy
- East: Bulgaria, Poland

In their (2013)<sup>VII</sup> report on fuel poverty the Association for the Conservation of Energy presented a figure which plots Member State data on heating affordability vs. household energy consumption for heating. The results confirm the relevance of our country selection and visualise the correlation between low heating affordability and low energy efficiency housing stock.

**Figure 1 : Heating Affordabilities**



**Source:** Association for the Conservation of Energy 2013<sup>VIII</sup>.

This study aims to summarise and add value to the general debate about the effectiveness of policies (at both national and EU level) which address vulnerable households. It provides independent information which should help the reader establish an informed view on the subject, including the advantages and bottlenecks of specific approaches. Special attention is given to the EU level.

Our assessment of the Member states was guided by the following questions:

1. Who is affected by energy poverty?
  2. How do Member States protect vulnerable customers?
  3. What is the role of the welfare system in alleviating energy poverty?
  4. How to keep energy bills affordable?
  5. Which Member States are in the lead in alleviating energy poverty?
  6. How can energy efficient homes and appliances be delivered to vulnerable customers?
  7. How can vulnerable customers be better informed about their options for support?
  8. How effective are the measures currently taken to address energy poverty?
- I. Guided by the questions above, best practices will be identified and recommendations derived: This answers the question whether new initiatives or policies should be envisaged at EU and/or at national level.
- II. Our analysis also attempts to answer the question of is there a need for an improvement in data collection and/or refinement of the implementation of existing measures.

### **1.3. Reading guide**

This study starts with a country specific analysis for the selected Member States and the EU level. The annex contains Fact-Sheets and further information which provide an extended summary of the main aspects of energy poverty for each selected Member State.

The Member State and EU specific analysis is followed by a comparative analysis between the Member States providing an assessment of the identified national policies and measures and a discussion of the results. Based on the lessons learned from the evaluation, policy recommendations are derived.



## 2. COUNTRY SPECIFIC ANALYSIS

### 2.1. Bulgaria (BG)

In 2011, the Republic of Bulgaria had approximately 3 million households<sup>IX</sup>.

The standard of energy efficiency in the Bulgarian building stock is rather low, which is demonstrated in the energy consumption levels for heating of buildings in different age groups. Energy consumption for heating in buildings built before 1990 is about 200 kWh/m<sup>2</sup>/year, up to 250 kWh/m<sup>2</sup>/year in single family homes built between 1960 and 1980. These are really high numbers taking into account, that there are less heating degree days in Bulgaria than in Ireland or Germany, where the building stock has a lower specific energy consumption for heating<sup>2</sup>. As of 2001 the new residential buildings are showing a better standard with an energy consumption of less than 130 kWh/m<sup>2</sup>/year<sup>XII</sup>. 76% of all Bulgarian dwellings were built before 1990<sup>X</sup>. More than 20% of all residential buildings are panel buildings, and most of them need refurbishment. There are severe problems especially with renovating buildings which use large-panel construction technology<sup>XI</sup>. In addition to the energy consumed for heating, energy use for lighting is about 8 kWh/m<sup>2</sup>/year<sup>XII</sup>.

The average floor area per capita in residential buildings in Bulgaria is 26 m<sup>2</sup>, with 197 Mio. m<sup>2</sup> floor area in total.<sup>XIII</sup> On average, there were living 2.7 persons in one household in 2013<sup>XIV</sup>. The average household in Bulgaria consumes about 14 100 kWh/year electricity and about 560 kWh/year for heating<sup>3</sup>.

The household energy mix in 2013 was dominated by electricity (40%) and renewables (33.8%) mainly biomass (fuelwood). Natural gas and oil only have minor shares in the fuel mix of 1 to 2%. The share of derived heat decreased in the last decades because it became too expensive after subsidies by the government declined<sup>XV</sup>. The development of the energy mix shows a strong increase of the use of fuelwood between 1990 and 2013 from 7,2% to almost 34% now and a decrease in the use of coal during the same period. Especially low-income households shifted to fuelwood due to its lower price<sup>XVI</sup>. The high share of electricity for household heating is one of the reasons for energy poverty: the equipment is not very efficient and results in higher total heating costs.

Households' equivalised disposable income<sup>4</sup> (in purchasing power parities, PPP) in Bulgaria in 2013 was 7 080 PPP<sup>XVII</sup>. Since the year 2000 the Gini coefficient steadily increased starting at 25 and reaching a peak of 35.9 in the year 2008. From 2009 to 2013 the coefficient varied between 33 and 35.4. With these numbers Bulgaria belongs to the Member States with the highest inequality of income distribution within the EU<sup>XVIII</sup>.

Energy retail prices in Bulgaria have been rising<sup>5</sup> significantly during the last 10 to 15 years. Since 2001 electricity tariffs have risen almost annually, as part of an agreement between the World Bank and the government of Bulgaria. By 2005, household daytime electricity tariffs had doubled from 2002 levels. At the same time, there have also been reforms within the gas sector, with gas and heat prices undergoing significant increases in recent years. Absolute prices are still among the lowest in the EU; but expressed in PPP gas

<sup>2</sup> The average specific energy consumption for heating of the German residential building stock in 2013 was about 144 kWh/m<sup>2</sup>/year (Bürger/Hesse 2015).

<sup>3</sup> Energy consumption for cooking or other electrical appliances is not included.

<sup>4</sup> the total income of a household, after tax and other deductions, that is available for spending or saving, divided by the number of household members converted into equalized adults

<sup>5</sup> Electricity tariffs increased from 1998, with a mean yearly 10% increase as from 2001 (Peneva, T. 2014 and Bouzarovski et al. 2015).

prices in Bulgaria are now among the highest in Europe<sup>6</sup> while electricity prices are slightly below the European average<sup>XX</sup>. During the last 10 to 20 years the increase of energy prices has been much higher than the increase of income.

The term energy poverty is not defined in Bulgarian legislation. Currently, there are only principles for providing social support for heating purposes, concentrated on assisting people whose average monthly income for the past six months is lower than the minimum income.

State-wide, in 2013, households spent around 24.5% of their disposable income for living costs, including rent<sup>XX</sup>. About 50% of the Bulgarian population are at risk of poverty and social exclusion, even two thirds of the Bulgarians are limiting their heat comfort in winter due to a lack of money<sup>XXI</sup>. Among low-income employees 89% are affected by energy poverty; they make up 45% of the entire population. Additionally 23% of Bulgarians are retired with little income. Another 12% are jobless people which may also be affected by energy poverty<sup>XXII</sup>.

It can be concluded that there is a severe problem with energy poverty in Bulgaria. The main reasons are the poor efficiency standards of buildings resulting in high energy needs for heating combined with low-incomes leading to overall poverty, and, compared to the income, very high energy prices.

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<sup>6</sup> Gas prices are only in Portugal and Spain higher.

**Table 1: Instruments affecting energy poverty in Bulgaria**

| Instrument                                                  | Description                                                                                                                                                                                                                                                                                                          | Effectiveness                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Residential energy efficiency credit line (REECL) programme | <p>addressed problem: poor building standard and high energy needs for heating</p> <p>provides loans and incentive grants for energy efficiency refurbishment of multifamily residential buildings for households or Associations of Home Owners up to 35% of the cost of the energy saving project</p>              | <p>“Up to date” about 60 000 supported projects which save 0.4 Mt CO<sub>2</sub> per year (www.reecl.org)</p> <p>Problem is, that overall poverty prevents households from energy efficiency measures<sup>XXIII</sup></p>                                                      |
| Energy retrofitting of Bulgarian homesprogramme             | <p>addressed problem: poor building standard and high energy needs for heating</p> <p>provides 75% funding for energy retrofitting of inefficient multifamily buildings up to at least energy class “C”.</p>                                                                                                         | <p>From 2012 to 2014, 379 multifamily buildings have successfully filled up application and met the conditions, but only two have been refurbished so far<sup>XXIV</sup></p>                                                                                                   |
| Guaranteed Minimum Income (GMI)                             | <p>addressed problem: overall poverty</p> <p>provides income transfers to poor households</p>                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                |
| Winter Supplement Program” (WSP)                            | <p>addressed problem: energy poverty</p> <p>financial support of socially vulnerable households for their heating expenditures during the winter season</p> <p>households with an income below the guaranteed minimum wage are eligible, also some families with higher income</p>                                   | <p>About 250 000 households per year are being supported</p> <p>The amount of the payment is based on the equivalent of 450 kWh of electricity (300 kWh daytime tariff and 150 kWh nighttime tariff)</p> <p>Support is too low, only heating cost of one room is supported</p> |
| Energy assistance schemes                                   | <p>addressed problem: energy poverty</p> <p>reduced tariff rate for electricity usage up to a limited consumption of electricity, a reduced nighttime tariff in winter months for those not connected to district heating, ceiling on gas prices, general tolerance nonpayment</p> <p>not targeted<sup>XXV</sup></p> |                                                                                                                                                                                                                                                                                |

**Source:** own compilation.

## 2.2. France (FR)

In 2011, there were about 27.3 million households in metropolitan France<sup>xxvi</sup>. Electricity has a larger share (30%) in the domestic fuel mix than in other countries. This is caused by the French nuclear energy policy. It results in a large share of households with electrical heating, growing from 29.6% in 2006 to 32.0% in 2010. 34% of household energy is produced from gas, 21% from renewables, and 15% from heating oil<sup>xxvii</sup>. Renewables and natural gas are slowly displacing heating oil. Energy consumption per household has remained fairly constant at around 20 MWh/year.

France has a temperate, but very diverse climate, with six climatic regions. They range from a cool, maritime climate with mild winters and summers in Brittany to a dry, Mediterranean climate with hot summers in the South and South-East. Accordingly, the amount of heating degree days in France according to Eurostat varied in 2009 from 2 826 in Auvergne (central highlands) to 1 849 in Aquitaine (Southern Atlantic coast).<sup>7</sup> The energy performance of the French housing stock is fairly uniform compared to other countries, ranging from 155 to 224 kWh per m<sup>2</sup> and year.<sup>xxviii</sup>

Energy retail prices have risen, with electricity rising 8.2% p. a. from 11.4 to 15.6ct/kWh (2010–2014), bringing French prices closer to the EU average. Gas prices have increased by 11.5% yearly for small consumers below 20 GJ/a (8.7 to 13.4ct/kWh), and 7.8% per year for larger consumers (4.6 to 6.8ct/kWh). During the same period, household incomes in purchasing power parity have risen from 20 870 € to 22 743 € after having remained stable during the crisis of 2008-2009. Household incomes below the poverty threshold have also risen from 8 963 € to 9 744 € in 2013, however, the Gini coefficient indicates an increase in inequality over the years (27 in 2003 vs. 30.1 in 2013).

Energy poverty, or precariousness (“précarité énergétique”), has been on the French national agenda since 2007, but programmes targeting a growing number of energy debts have been in place since the mid-1980s. In 2000, electricity was declared an “essential good” and a basic “right to energy” was enacted.<sup>8</sup> The Energy Solidarity Fund (FSL) obliges utilities to support people who are unable to pay their energy bills, but does not specifically target energy-poor households.

Specific policies targeting fuel poverty in all its aspects, including the energy performance of buildings, have only been implemented since 2010. In the context of the Grenelle 2 law<sup>9</sup>, a first survey of energy poverty was conducted, and energy precariousness was defined as an actual spending of more than 10% of household income on energy. According to those surveys, 13% of all households in mainland France are identified as fuel poor, against 36% of the households in the lowest income quartile.<sup>xxix</sup>

The most important policy according to Dubois (2012)<sup>xxx</sup> is the “Habiter Mieux” (Better Living) scheme for housing renovation grants up to 1 600 €. It is targeted at low-income homeowners. Since the start of the scheme in 2010, about 50 000 dwellings have been renovated. The Habiter Mieux scheme is accompanied by social tariffs for electricity and gas (TPN and TSS), and other social policies (see ONPE’s 2015 report for details). More than four million households are eligible for the social tariff, but just over a million of them (number of citizens is higher than number of households) actually benefit from it and get a rebate of 90–100 € yearly (ONPE 2015<sup>xxxi</sup>).

<sup>7</sup> There is even less need for heating on the island of Corsica (1 063 HDDs), however, many energy-related statistics cover mainland France only.

<sup>8</sup> Loi du 10 février 2000 relative à la modernisation et au développement du service public de l’électricité.

<sup>9</sup> Loi no. 2010-788 du 12 juillet 2010 portant engagement national pour l’environnement

### 2.3. Germany (DE)

In 2012, Germany had approximately 40 million households. In 2012, the average energy consumption of German households was 16 027 kWh, 21% of which was related to electricity consumption and 79% heating energy<sup>xxxii</sup>.

The household energy mix utilised in 2012 was dominated by natural gas (41.6%), followed by oil (23.1%), electricity (11.1%), derived heat (7.9%), renewable energies (13.9%), district heating (7%), coal (2.4%)<sup>xxxiii</sup>.

Germany has a moderate climate with generally no extended cold or hot periods. The mean temperature in summer is about 20°C. Between 2000 and 2009 the average number of heating degree days was 3 015 per year<sup>xxxiv</sup>. Germany ranks second in the number of heating degree days amongst the selected countries.

Households' equivalised disposable income in Germany in 2013 was € 22 304 on average. Compared to the other Member States under investigation, the income distribution in Germany is quite balanced. However, in the last decade (2005-2013), a trend towards less equal distribution could be observed, as indicated by the Gini coefficient, although income is distributed the most equally amongst all Member States considered.

With respect to energy prices, Germany ranks highest for household electricity prices and average for natural gas prices. Prices households pay for electricity have steadily increased, with an average rise of by 6% p.a.. Natural gas prices fluctuated over time, on average however, they increased by 49% p.a. between 2010 and mid 2014 (> 20 GJ). Due to the fact that tariffs consist of fixed and variables components, low consumption households (< 5 555 kWh or 20 GJ per year) face higher prices per kWh, and they increased 4.1% per year.

There is no official or legal definition of energy poverty in Germany. Nevertheless a rising number of households which cannot afford to pay their energy bills in time has been observed in connection with steadily increasing prices of essential goods like housing, electricity, stagnating incomes and precarious employment, small pensions, high debt ratio or unemployment level. Nationwide 322 000 cases of disconnection from the electricity grid have been reported in 2011, the actual number might be even higher<sup>xxxv</sup>.

A number of policies in Germany aim at improving the energy performance of the building stock: The Energy saving legislation (EnEV 2013) and its further tightening planned for 2016, sets minimum efficiency standards for the renovation of existing, as well as for the construction of new buildings. Another important policy in the building sector are the loans and subsidies available from the KfW bank. These loans and subsidies are accessible for renovation of existing or construction of new buildings that meet certain efficiency standards. These instruments will in principle also have a benefit for energy poor households, as building societies or real estate companies use them to improve the building stock. However, these efforts are usually accompanied by an increase in rent, so that benefits thanks to lower heating costs are (at least partially) compensated by an increase in rent costs. Low-income owner-occupiers may often not have sufficient access to capital to provide a contribution to the refurbishment costs. It can therefore be concluded that the existing financial instruments to improve the building stock are likely to only have a limited impact on the alleviation of (future) energy poverty amongst German households.

There are two instruments directly addressing energy poor households in the form of energy saving advice. One is a specific advice and consultancy service to low-income households offered by Caritas and the German Association of Energy and Climate-Protection agencies; its implementation is funded by the Federal Ministry for the Environment. It consists of two modules: On the one hand it provides energy-saving

consultation towards replacement and behavioral changes; on the other hand it provides certain high-efficiency devices as "emergency aid". These devices directly enable energy savings. This instrument addresses electricity consumption ("electricity saving check"), as well as efficient heating energy use. It also provides an employment stimulus as long-term unemployed people are trained and involved as energy counselors. The other instrument is the energy saving advice by German Consumer Advice Agencies.<sup>xxxvi</sup> Both projects have been evaluated and are considered very successful. A significant extension of this programme could be helpful to further address energy poverty. A new instrument is the refrigerator-exchange action for low-income households. Eligible households get 150 Euro towards the cost of a new highly efficient fridge. Within 2 years 16 000 refrigerators should in principle be exchanged.

The German social security system also includes provisions for energy expenditure. It consists of three pillars of support provided by the government: Firstly a basic allowance that includes a component for household energy (i.e. mostly electricity) is paid. Secondly living expenses are paid for directly by the local authority and include payment of heating costs of low-income households. Finally, there are provisions for cases with additional needs, such as cases where hot water is provided through individual electric hot water boilers which place additional burden on household budgets. Whilst actual expenses for heating and decentralized hot water provision are covered, it has been noted that the fraction of the basic allowance dedicated to electricity expenditure may be insufficient considering the high increase of the electricity bills<sup>xxxvii</sup>.

#### 2.4. Greece (EL)

In 2013, Greece had approximately 4.1 million households. In 2012, the average Greek household consumed 13 994 kWh of energy. 73% of which (10 244 kWh) was dedicated to thermal energy such as heating (86%), cooking (10%), and domestic hot water production (4%). 3 750 kWh is consumed as electricity.

The household energy mix in 2013 was dominated by electricity (40%), followed by renewable energies (27%) and oil (26%). Natural gas accounted for 6% of energy consumption and no solid fuels were used. The fuel mostly used for heating is, i.e. heating oil (60%) followed by firewood (24%)<sup>xxxviii</sup>.

According to the Greek household survey, energy consumption is directly influenced by the degree of urbanisation of the area where the dwelling is located. The thermal energy needs are much higher in rural areas, while the need for electricity is higher in urban areas<sup>xxxix</sup>.

The climate of Greece is Mediterranean with summers that are usually hot and dry, and winters that can be cold and wet. The mean minimum winter temperature is about 10°C. From 2000 to 2009 the number of heating degree days declined by an average of 1% per year (from 1 580 to 1 448)<sup>xl</sup>. Greece has the fewest heating degree days among the selected countries.

Households' average equivalised disposable income in Greece in 2013 was € 10 066. Greece belongs to the Member States with the highest inequality of income distribution. However, from 2003-2013, a slight trend towards more equally distributed income could be observed, as indicated by the Gini coefficient.

Between 2010 and mid 2014 prices households paid for electricity increased, with an average annual rate of 12.8%. Natural gas prices decreased between 2012 and mid 2014 by 13.5% per year (> 20 GJ). Households with low consumption (< 20 GJ per year) faced higher gas prices than those with higher consumption (20 GJ to 200 GJ), but the prices < 20 GJ fell on average by 8.8% per year over the same period.<sup>xli</sup>



Nationwide, in 2013 households spent around 40% of their disposable income for living costs, including rent<sup>XLII</sup>. The percentage of energy poverty in Greece was at that moment close to 36%<sup>XLIII</sup>. Almost 20% of the population was living in low-income households and 26% of the low-income population in Greece cannot afford to cover the expenses for heating while the national average across all-income groups is close to 8%. It is also reported that 28% of the population (not only low-income houses) lives in houses with unsealed windows<sup>XLIV</sup>.

There is no standard quantitative definition of energy poverty in Greece. However, an approach that is often used is the following: If a household spends more than 10% of its annual income for energy, it is considered as energy poor. Especially in Greece, mountain communities are threatened as they do not have easy access to energy and economic support. Between December 2010 and February 2011, incidents of illegal logging through a severe winter period were recorded in mountainous areas of Greece, as many people were unable to afford the cost of diesel oil and sought ways to meet their thermal energy needs<sup>XLV</sup>.

In order to alleviate energy poverty the following policies and measures are put in place in Greece:

To protect vulnerable groups, the government introduced social electricity tariffs for residential consumers. These give a discount of up to 42% on annual consumption of up to 5 000 kWh, compared with the average household bill<sup>XLVI</sup>. This tariff is provided to persons/families with an income lower than € 12 000<sup>XLVII</sup>:

In March 2015, the Greek parliament adopted a law introducing free of charge supply of up to 300 kWh electricity per household in 2015 targeted at households which are not able to pay their energy bills. The state meets this cost. The reason could be that the inability of customers to pay their electricity bills has created important liquidity problems for the Public Power Corporation. As a result of this policy, the debts due to unpaid bills declined within one year by about 45%<sup>XLVIII</sup>. In addition, up to 30 000 households are supposed to get housing allowances of 70–200 Euro per month<sup>XLIX</sup>.

## 2.5. Republic of Ireland (IE)

In 2013, the Republic of Ireland was home to approximately 1.7 million households in permanent housing units<sup>L</sup>. At that time, an average Irish dwelling consumed 18 652 kWh of energy. 75% of which was dedicated to nonelectric purposes, such as heating<sup>LI</sup>. On average, households consumed 143 kWh final energy per square meter per year (107 kWh non-electrical energy and 35 kWh electricity).<sup>LII</sup>

The household energy mix in 2013 was dominated by oil (33%), followed by electricity (25%), natural gas (22%), coal 10% and peat 8%. Renewable energies had a share of only 2%.<sup>LIII</sup> Around half of the households utilise fossil fuels as their main source for heating, i.e. heating oil, coal and peat. This share is higher than in many other European nations; partially because of the number of stand alone houses in rural areas, but also due to a large share of the population that deliberately chose to not connect to the gas network.<sup>LIV</sup>

The climate of Ireland is strongly influenced by the Atlantic Ocean and it therefore has less extreme temperatures than other countries at similar latitudes. The mean daily minimum temperature in winter is about 2.5°C in areas of the middle and the east where temperatures are more extreme than in other parts of Ireland.<sup>LV</sup> From 1980 to 2009 the number of heating degree days declined by an average of 0.3% per year (from 3 133 to 2 841).<sup>LVI</sup> Ireland is among the three countries which exhibits the most heating degree days from the selected countries.

Households' equivalised disposable income in Ireland in 2011 was € 21 440. From 2004 to 2011, a trend towards a more equally distributed income could be observed, as indicated by the Gini coefficient which declined by 2.2%, from 31.8 to 31.1.<sup>LVII</sup>

Between mid 2007 and mid 2014 prices households paid for electricity and natural gas<sup>10</sup> have been fluctuating. On average, the yearly increase of the electricity price was around 4% while gas prices decreased by an average of 3%.<sup>LVIII</sup>

State-wide, in 2009/2010 households spent around 4.5% of their weekly disposable income for energy purposes. For the poorest households (1<sup>st</sup> decile), however, this share was as high as 13% (with 52.2% facing energy poverty), while those in the 5th income decile spent around 6.5% and those in the 10th income decile only 2.5%.<sup>LIX</sup>

In the Irish Governments Warmer Homes Strategy (2011) a household is considered energy poor if it is unable to attain an acceptable standard of warmth and energy services in the home at an affordable cost. Energy poverty is currently measured via the expenditure approach according to which a household is deemed in energy poverty if it spends more than 10% of its income on energy, in severe energy poverty if it spends more than 15%, and in extreme energy poverty if it spends more than 20%.<sup>LX</sup>

It was estimated that 20% of Irish households experienced energy poverty in 2009. 45% (151 000) of them were considered to have faced severe energy poverty and 25% (83 000) were considered having experienced extreme energy poverty.<sup>LXI</sup>

The number of households in energy poverty strongly correlates with the disposable income. For example 52.1% of the households in the lowest (1<sup>st</sup>) income decile experience energy poverty, while only 6.4% of the households in the 5th income decile are considered energy poor, and none in the 10<sup>th</sup> income decile. In 2009/2010, the average weekly spending on energy in the 2<sup>nd</sup> income decile was approximately 8.5% – 9%. Close, but below the threshold of 10% which categorises a household to be energy poor.<sup>LXII</sup>

In order to prevent and mitigate energy poverty and support those in need two strands of policies and measures are important: those which target thermal efficiency of buildings and those providing financial support to enable households to meet their energy bills. Ireland has several dedicated policies in place which address both these strands:

- Addressing the primary mechanism to support low-income households with respect to thermal efficiency is the Better Energy Warmer Homes Scheme. This scheme is part of the wider Better Energy Program and funds energy efficiency measures of low-income households.<sup>LXIII</sup>
- Two other schemes address the need for financial support of those in energy poverty: The Household Benefits Package (HBP) and the Fuel Allowance scheme.
  - The HBP provides support to eligible households by providing monthly allowances for electricity and natural gas. The monthly allowance is a € 35 cash credit or allowance which is targeted at gas or electricity bills. Eligible persons are citizens over 70 years of age meeting general criteria such as permanently living in the state, being the only person receiving the allowance and being a registered consumer of electricity or gas. Younger persons meeting specific eligibility criteria (such as the receipt of state pension, living alone, receipt of disability or invalidity payment) also qualify.
  - Via the fuel allowance scheme, eligible applicants<sup>11</sup> receive a weekly support to enable them to appropriately heat their homes. The fuel allowance is paid to a household and amounts to € 20 for 26 weeks of the year.<sup>LXIV</sup>

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<sup>10</sup> Prices for households which consume between 20 GJ and 200 GJ annually.



Information on these policies, the eligibility criteria and how to apply is provided online via the Citizens Information Board website.<sup>LXV</sup>

While the above schemes target the regulated markets (gas and electricity), a large share of energy for heating purposes is supplied from nonregulated markets (heating oil, solid fuels).

- *The Better Energy Communities Scheme*, launched in 2015 and administered by the Sustainable Energy Authority of Ireland, funds projects such as oil purchasing clubs. Communities jointly fund purchases of oil supply, buy in bulk, and thus reduce the unit costs.<sup>LXVI</sup>
- In addition, in 2015 an oil stamps saving program will be launched. Savings booklets and associated stamps will be made available via the Society of Saint Vincent de Paul to help households to put aside sums of money dedicated to a future supply of oil.<sup>LXVII</sup>

A recent analysis suggests that reallocating the funds currently utilised for the support schemes which target income support and thermal efficiency could reduce the overall severity of fuel poverty and the number of households considered energy poor. Reallocation of existing financial resources (subsidies) to the most needed (low-income and poor dwelling efficiency) could remove almost 30 000 homes from fuel poverty (by the 10% definition), move a further 20 000 homes from severe to a lesser categories, and move over 30 000 from extreme energy poverty to lesser categories. Coupled with targeted energy efficiency upgrades for the worst off such a reallocation of subsidies would lead to net savings on subsidies, reduced energy bills and improved health for householders. A detailed cost benefit analysis estimated energy euro invested returns €2 - €3 to society when health benefits are included.<sup>LXVIII</sup>

## 2.6. Italy (IT)

In 2013, Italy had approximately 24 million households. The total household final energy consumption amounted in 2012 to 31 million toe. The energy use of households increased about 1.3 percent since 1990<sup>LXIX</sup>. In 2012, the average Italian household consumed 15 022 kWh of energy including approximately 5 000 kWh electricity. Italians consume per capita less energy than most other MS. This is due to relatively high power prices and the impact of the economic crisis<sup>LXX</sup>. More than 20 households out of 100 use wood for energy purposes (consuming 3.2 tons on average per year), while 4.1% uses pellets. The firewood consumption is higher in mountain municipalities (over 40% of households)<sup>LXXI</sup>.

The household energy mix in 2013 was dominated by natural gas (50%), followed by renewable energies (20%) and electricity (17%). Oil accounted for 6% of energy consumption and no solid fuels were used. Italy has limited energy resources and is a net importer of electricity<sup>LXXII</sup>.

The climate of Italy varies considerably from the north to the south. Italy experiences a Mediterranean climate with hot and dry summers, and cold, wet winters. From 2000 to 2009 the number of heating degree days increased by an average of 0.8% per year (from 1 694 to 1 828)<sup>LXXIII</sup>. Italy has the third fewest heating degree days from the selected countries.

Households' equivalised disposable income in Italy in 2013 was € 17 285. From 2004 to 2013, the inequality ratio as indicated by the Gini coefficient was approximately constant

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<sup>11</sup> See: [http://www.citizensinformation.ie/en/social\\_welfare/social\\_welfare\\_payments/extra\\_social\\_welfare\\_benefits/fuel\\_allowance.html](http://www.citizensinformation.ie/en/social_welfare/social_welfare_payments/extra_social_welfare_benefits/fuel_allowance.html).

at 32. Italy ranks in the middle of income distribution inequality amongst the considered Member States.

Between 2010 and mid 2014 the prices households paid for electricity have been fluctuating and generally experienced increases, with an average yearly increase of 5.1%. Natural gas prices decreased between 2010 and mid 2014 by 7.2% per year (> 20 GJ). Households with low consumption (< 20 GJ per year) faced higher gas prices than those who consumed between 20 GJ and 200 GJ, but the prices in this category fell on average by 20.6% per year between 2010 and 2014.

In 2013, households spent over 42 billion euro on energy consumption, with an average expenditure per household of € 1 635. Households expenditure for energy consumption is highest in the North and lower in the South, with a differential of over € 400 (30% more than the expenses incurred in the South). The annual average expenditure increases due both to the number of households members and to their age. A single young component household spends on average about € 650 more than a couple with three or more children. Many households have made investments aimed at achieving energy savings over the past five years: more than half of the families in order to reduce expenses for electricity, 21% for space heating costs, 15% for water heating costs and, finally, 10% for air conditioning<sup>LXXIV</sup>.

According to the UK government's Warm Homes and Energy Conservation Act, a person is said to be in fuel poverty "if he is a member of a household living on a lower income in home which cannot be kept warm at a reasonable cost"<sup>LXXV</sup>.

In order to contrast the effect of increasing costs for heating and electricity on vulnerable households the Government launched an energy rebate for electricity and gas ("bonus gas" in 2008 and "bonus elettrico" in 2007). In 2012 approximately 20% of the households got energy rebates with € 286 on average per year. The declared aim of the policy was to support: (i) households living in poverty—or on its margins; (ii) large households; (iii) in case of electricity, households which include a disabled, or a critically ill person. The program is funded through specific components in transmission or distribution prices, paid by all consumers. To be eligible, the household's equivalent income indicator must not exceed € 7 500 unless the family includes more than three dependents, in which case the threshold is increased to € 20 000. Given that the benefits are paid in the form of lump-sum discounts on electricity and gas bills, a necessary eligibility condition is that the household is a domestic customer in its primary residence. In the case of electricity, some limits to the installed power must be met (3 kW for up to four household members, 4.5 kW if more), unless the household includes a person who needs essential electromedical appliances. In the case of gas, customers having a condominium contract (usually due to the presence of centralised heating) receive their benefit with a bank transfer. The electricity bonus depends on the number of components and it is independent of actual consumption, with the exception of the presence of electromedical appliances, where it is calculated on the ground of the electricity usage intensity. For gas, the discount is proportional to the family size and depends on the classification of the municipality according to its typical winter temperature and the declared use (hot water and cooking and/or heating)<sup>LXXVI</sup>.

## **2.7. Poland (PL)**

In 2011, the Republic of Poland was home to approximately 13.6 million households.<sup>LXXVII</sup>

The specific energy consumption for heating of the Polish building stock is major factor to bear in mind when discussing energy poverty. The energy consumption decreases the newer the building is, being clearly lower in multi family buildings than in single family

buildings. It decreases from 210 (181) kWh/m<sup>2</sup>/year (for single family homes; multi family houses in brackets) built before 1945 to 178 (137) kWh/m<sup>2</sup>/year for single (multi) family houses built between 1989 and 2010<sup>LXXVIII</sup>.<sup>12</sup>

20% of the Polish building stock of residential buildings was built before 1945, altogether 69% were built before 1989<sup>LXXIX</sup>. In Poland the number of heating degree days is around 3 500 per year, which is the highest number of all the countries considered in this study. The standard of energy efficiency in the building stock is slow with a high potential for enhancement and thus energy savings. Energy use for lighting is of about 7 kWh/m<sup>2</sup>/year<sup>LXXX</sup>.

The average floor area per capita in residential buildings in Poland is 24,7 m<sup>2</sup>, with about 942 Mio. m<sup>2</sup> floor area in total.<sup>LXXXI</sup> In 2013 there were 2,8 persons in one household on average.<sup>LXXXII</sup>

Based on a weighted average energy consumption for heating of 171 kWh/m<sup>2</sup>/year and 7 kWh/m<sup>2</sup>/year electricity use for lighting an average household in Poland consumes about 11 826 kWh/year for heating and about 484 kWh/year for lighting, altogether 12 310 kWh/year. There is no energy consumption for cooking or other electrical appliances included.

The household energy mix in 2013 was dominated by coal (33.9%), followed by derived heat (20.6%) and natural gas (16.8%). Oil only has a minor share in the fuel mix of 3%. There are only small changes in the energy mix between 1990 and 2013. The main changes show derived heat, which decreased from 32.5% to 20.6% and renewables, which increased from 0% to 13.8%<sup>LXXXIII</sup>. Derived heat in Poland is mainly based on fossil fuels (89%), 74% of all fuels is hard coal.

Households' equivalised disposable income (PPP) in Poland in 2013 was 10 615<sup>LXXXIV</sup>. The Gini coefficient increased from 30 in the year 2000 to 35.6 in 2005, decreasing again to 30.7 in 2013. With these numbers Poland belongs to the third of Member States with the highest inequality of income distribution within the EU, slightly above the EU average.<sup>LXXXV</sup>

Natural gas prices in Poland have been rising slightly during the last seven years, whilst electricity prices have remained more or less constant since 2007. Gas and electricity prices are amongst the lowest prices within the EU. Comparing energy prices in purchasing power standards gas prices in Poland are slightly above EU average and electricity prices are among the highest in the EU, clearly above average<sup>LXXXVI</sup>.

25.8% of the Polish population are at risk of poverty and social exclusion. This share has been steadily decreasing since 2005, when 45.3% were affected. In 2006 there were 785 000 households, 8,6% of the total, suffering from fuel poverty in Poland. Depending on the increase of energy prices in the future the percentage of households in fuel poverty could rise to 11% (10% energy price increase) or 17,4% (30% energy price increase)<sup>LXXXVII</sup>

Policies addressing fuel poverty in Poland include financial support measures such as governmental support through allowances, and system solutions such as VAT and tax reduction. Apart from social subsidies provided by the state, energy companies took steps, based on a formal agreement, to avoid socially vulnerable consumers being disconnected from the grid. The company support includes installation of pre-payment meters, instalment payments, back interest exemption, shifting in terms of payment, and special agreements with Social Help Centres.

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<sup>12</sup> For comparison: The average specific energy consumption for heating of the German building stock in 2013 was about 144 kWh/m<sup>2</sup>/year (Bürger/Hesse, 2015).

The Thermal Modernisation Fund supports the energy efficient refurbishment of buildings. It was introduced in 1999. A bank can amount up to 80% of the costs of the refurbishment project. If the loan (plus interest), are theoretically repayable on schedule (within 10 years = maximum loan period), then the state owned "National Economy Bank" (BGK) can issue a bonus of 25 percent of the loan rate. All kinds of owners of residential buildings can apply.

## 2.8. Spain (ES)

In 2011, Spain was home to approximately 18 million households. The average consumption of a Spanish household is 10 521 kWh a year, with a predominance of fuels which are 1.8 times higher than electric power consumption. 62% of the electric consumption is related to household appliances, and to a lesser extent, to cooking, heating and hot water services. 47% of energy consumption is for heating<sup>LXXXVIII</sup>.

The household energy mix in 2013 was dominated by electricity (42%), followed by natural gas (21%) and renewable energies and oil (both 18%). Solid fuels accounted for 0.6% of energy consumption<sup>LXXXIX</sup>.

Spain has three different climate zones: mediterranean, north atlantic and continental climate zones. The mean temperature in summer is about 22°C. From 2000 to 2009 the number of heating degree days declined by an average of 0.7% per year (from 1 805 to 1 668)<sup>XC</sup>. Spain has the second fewest heating degree days from the selected countries. The Mediterranean climate zone presents lower values and lower consumption, than the continental area, which records higher consumption averages.

Households' equivalised disposable income in Spain in 2013 was € 16 474. From 2004-2013, a trend towards more less distributed income could be observed, as indicated by the Gini coefficient which decreased from approximately 31 in 2003 to 33.7 in 2013.

Between the first quarter 2010 and the second quarter 2014 prices households paid for electricity have fluctuated. In general the price has increased with a 9% yearly increase in the electricity price. Natural gas prices decreased between the first quarter of 2007 and the second quarter of 2014 by 9.8% per year (> 20 GJ). Households which consumed less natural gas (< 20 GJ per year) faced higher gas prices than those who consumed between 20 GJ and 200 GJ, but the prices in this category fell on average by 16.5% per year over the period 2010-2014.

State-wide, in 2013 households spent around 20% of their disposable income on living costs, including rent<sup>XCI</sup>. Approximately 10% of Spanish households live in energy poverty, mostly due to low-incomes<sup>XCII</sup>. Especially in the winter time Spain has excess mortality rate, among the highest in Europe<sup>XCIII</sup>. There is no standard quantitative definition of energy poverty in Spain. There is an indicator used to measure poverty with a household defined as being in poverty if their equivalized disposable household income < 60% Median<sup>XCIV</sup>.

In order to address energy poverty the following policies and measures are available in Spain: Spain is still missing a fuel poverty strategy, even though some policies, measures and elements of the legal framework such as the social tariff for electricity consumers are relevant. This tariff is temporary and only for electricity consumers. Particularly relevant is the unsolved issue of the electricity tariff deficit (i.e., the difference between what utilities are paid for the electricity they sell and their reported cost of producing power). The deficit has been accumulating since the early 2000s and reached 24 billion Euros in 2012 (with a foreseen increase of five Billion Euros per year in the coming years if measures are not adopted). This has threatened the longterm sustainability of the Spanish power generation

system and motivated electricity tariff increases above inflation rates since 2007. Electricity prices are likely to be a key reason why fuel poverty has increased in Spain since 2008. Spain can be considered to have a fuel poverty problem due to relative excess winter mortality rates. It is estimated that fuel poverty may be the cause of between 2,300 and 9,300 of these excess winter deaths<sup>xcv</sup>.

## 2.9. United Kingdom (UK)

In the UK, there are about 27 million households, the majority of which (22.6 m) are in England.<sup>xcvi</sup> Domestic heating is dominated by gas, growing over the past decades<sup>13</sup>, (74%) and solid fuels (14%), including renewable energy.<sup>xcvii</sup> In Northern Ireland, oil is the most important heating fuel at 68%, followed by gas at 22%.<sup>xcviii</sup> Energy consumption per household stood in 2014 at 15 MWh (54 GJ) annually, showing a steady decline since 1990.

The climate in the UK is moderate with little frost, but long heating periods and cool summers. As a result, the number of heating degree days is the second-highest in the sample, close to 3 000 a year (Eurostat). The energy demand of buildings in the UK varies from 103 kWh/m<sup>2</sup> p. a. in modern buildings to 585 kWh/m<sup>2</sup> in 1920's detached houses.<sup>xcix</sup>

Gas prices for UK consumers have been rising from 2010 to 2014, from 4.6ct/kWh to 8.3ct/kWh for consumers under 20 GJ/a (all figures in purchasing power parity) and from 4.1ct/kWh to 5.5ct/kWh for larger consumers. This amounts to a yearly increase of 15% and 7%, respectively. Electricity shows a 5.4% p.a. increase from 13.9 ct/kWh to 17.2 ct/kWh.

Household incomes have declined during the crisis, from 22 273 € in 2008 to 19 040 € in 2010, slowly recovering to 19 492 € in 2013. Income inequality has also declined, with the Gini coefficient dropping from 34.2 in 2005 to 30.2 in 2013. Incomes below the poverty threshold have only recovered to nominal 2006 levels (about 9 000 €/a).

Fuel poverty has been on the agenda since the 1980s with a first definition (more than 10% of household income spent on energy) adopted then. Since 2013, the more complex Low-Income, High Costs indicator (LIHC) has been in use UK-wide.<sup>14</sup> Fuel poverty is determined using a modelling approach that takes into account multiple properties of housing stock and incomes.<sup>c</sup>

In 2012, there were 4.1 million fuelpoor households in the UK with large regional differences: 12% of the population in England, 30% in Wales, 35% in Scotland, and 42% in Northern Ireland. Reasons for this are more off-grid households, harsher climate, worse housing stock, and lower incomes outside of England, but also methodological differences.<sup>ci</sup> Accordingly, fuel poverty in the UK is a "partially devolved" issue, and different policies have existed on different administrative levels since the 1990s. They can be broken down into three types of policies:

- Grants for improving the energy efficiency of buildings (Green Deal, Warm Front Scheme, Affordable Warmth Programme, Energy Assistance Package, and others)
- Financial support to vulnerable households (Winter Fuel Payment)
- Obligation for energy companies to support efficiency measures in low-income homes (via three different frameworks: Carbon Emissions Reduction Obligation, Carbon Saving Community Obligation, Home Heating Cost Reduction Obligation)

<sup>13</sup> between 2008 and 2014.

<sup>14</sup> Reports by devolved administrations predate the new definition, however, they are expected to change in the future. The DECC 2015 report for England and UK uses the new definition as well as data from older reports.

Over time, focus has shifted towards making the energy companies (or utilities) responsible for alleviating energy poverty. The Energy Company Obligation is now the most important instrument to tackle fuel poverty in mainland Britain, while the other measures are of very limited effect.<sup>15</sup> Notably, it is not targeted at fuel poor households specifically, but obliges utilities to help improve the energy efficiency of low-income homes or homes in low-income areas. While the three-pronged approach helps alleviate the difficulty of targeting, fuel poverty remains a massive issue in UK policy.

## 2.10. EU

At present, no specific policy targeting energy poverty in the form of a regulation or directive exists on the European level. However, energy poverty as an issue has gained some momentum on the European Agenda in the past decade, and references to it have been made in a variety of legal texts and institutional statements. Bouzarovski et al. (2012)<sup>CII</sup> identified three key milestones in addressing energy poverty at the European level:

- Firstly, the directives in the Third Energy Package (2009/72/EC and 2009/73/EC) on the liberalisation of the gas and electricity markets mention a growing problem of energy poverty in Europe. Member States which are affected by it are required "to ensure the necessary energy supply for vulnerable customers, so as to decrease the number of people suffering from this situation". No further specification or definition was made, leaving the decision on how energy poverty should be treated entirely up to Member States.
- The second milestone was a statement on 14 July 2010 from the European Economic and Social Committee,<sup>CIII</sup> recognising the cross-sectional nature of the issue, affecting "health, consumer issues, and housing". It stopped short of calling for unified European action on the matter, calling for improving the availability and reliability of data. It recommended finding a harmonised European definition and methodology for measuring energy poverty and the creation of a European monitoring centre that would monitor energy poverty, as well as assess policy measures in Member States in order to help identify best practices.
- Thirdly, in 2010 the Commission issued a Working Paper<sup>CIV</sup> on energy poverty, acknowledging the extent of the issue and recommending the improvement of energy efficiency and building performance rather than fuel subsidies. However, no consensus could be reached on a quantifiable definition. In the context of the Working Paper, the Belgian presidency also clearly stated that "EU policymakers did not wish to enter areas of national competence by harmonising social policy".<sup>CV</sup>

Since the publication of Bouzarovski et al.'s review in 2012, energy poverty has remained on the agenda of the Commission, and is referenced in most statements concerning energy policy. The Energy Roadmap 2050<sup>CVI</sup> refers to the "full implementation [...] of the existing EU energy legislation" (p. 17) as a measure against energy poverty, and calls on Member States to find solutions on the national level. The Commission has also made the "Energy Union" with its goals of "secure, affordable and climate-friendly energy" a priority.

Despite these declarations of intent, however, the Commission appears to have kept to its stance (possibly borne out of necessity) that policymaking against energy poverty should remain a national issue. The Energy Union programme, despite its affordability target, specifies no concrete measures. Commitments such as creating a free and fully-integrated

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<sup>15</sup> Interview with Dr J Rosenow on 25/6/2015.



internal energy market in order to provide the best energy prices to customers could be seen as an indirect measure, however, the effectiveness of liberalised markets in providing basic services to the poor is contested.<sup>CVII</sup>

In line with the recent developments, a report published in June 2015<sup>CVIII</sup> reviews existing policies on the Member State level, concluding that the Commission should not prescribe a definition or specific policies. It recommends leaving the issue to Member States and supporting them with coordination and data. As it stands, a consensus on policies regarding energy poverty or its definition and measurement on the European level seems unlikely in the near future.

### 3. COMPARATIVE ANALYSIS ACROSS THE MEMBER STATES AND EU

#### 3.1. Methodology

The policies described in the preceding chapter are comparatively analysed in order to determine their effectiveness and identify good practices as well as main reasons for success or shortcomings of the policies. The comparison is structured according to the framework presented by Dubois (2012)<sup>CIX</sup>, which is informed by observations of typical challenges that policymakers and implementing agencies face. She understands energy poverty policies as a threestep process (targeting, identification and implementation):

1. Targeting is the way in which a policy defines the population it wants to address, the “target population”, as it is often called in the literature on policy interventions. Politically, it is the most complex step because several tradeoffs must be made when defining the energy poor. Policies towards more specific or more elaborately defined groups may be more appropriate to an issue in theory, but can entail higher implementation costs while finding political support for very narrowly defined groups can be more difficult.
2. Identification means defining a process for finding specific households who are eligible for benefits related to energy poverty as well as actually doing so. In part, the definition of fuel poverty itself plays a role in this step, but the main challenges in identification are collecting data (or the selection of appropriate existing data) and informing eligible households about it.
3. Implementation is the step of actually carrying out a policy, be it a subsidy, a grant for renovation, renovation carried out in publicly owned properties, or other measures. In our understanding for this report, we evaluate whether a policy has been successful in improving the situation of those it reaches and the overall figure of energy poverty in a country.

Starting from the framework described above, four categories of questions have been defined to guide the evaluation of national policies. Not all of them can be answered for every Member State, rather, they are designed as a guidance for discussing the success of policies in a way that can lead to meaningful conclusions.

1. Treatment of energy poverty on the national level: i.) Does the Member State have a definition for energy poverty in place?; ii.) Is energy poverty statistically analysed?; iii.) Are there national strategies for energy poverty and is there coordination between different policy levels?
2. Definition of instruments and targeting: i.) Is the target population adequately defined?; ii.) Do policies and measures target symptoms or causes of energy poverty?; iii.) Identification, funding and auxiliary elements; iv.) Is the targeted household be properly identified and are they aware of the policy?; v.) Are policies and measures adequately funded?; vi.) Is there a monitoring and evaluation system or transparency rules in place?
3. Implementation and goal attainment: i.) Are policies and measures effectively improving the situation of energy-poor households?; ii.) Can statistical improvements be attributed to other factors?; iii.) Do measures help alleviate negative distributional effects of energy poverty?



### 3.2. Overview: Evaluation of Member State policies

The results of the evaluation are presented in the following table:

**Table 2: Overview of the assessment of energy poverty policies in the EU**

| National Level                                                                                                                                                                           | IE      | FR      | UK   | EL                 | IT                 | ES                 | BG                        | PL                        | EU               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|------|--------------------|--------------------|--------------------|---------------------------|---------------------------|------------------|
| Does the Member State have a definition for energy poverty in place?                                                                                                                     | yes     |         | yes  | no                 | no                 | no                 | no                        | no                        | no               |
| Does the Member State analyse energy poverty? (data collection etc.)                                                                                                                     | yes     |         | yes  | neutral            | neutral            | no                 | no                        | yes                       | yes              |
| Are there national strategies targeted at energy poverty and is there a coordination between different policy levels?                                                                    |         |         | yes  | yes                | yes                | yes                | neutral                   | neutral                   | no               |
| <b>Definition of political instruments</b>                                                                                                                                               |         |         |      |                    |                    |                    |                           |                           |                  |
| Is there a clear and adequate definition of the target group?                                                                                                                            | yes     | neutral |      | yes                |                    | no                 | yes                       | no                        | no               |
| Do policies and measures target short-term symptoms or long-term fundamental causes of energy poverty?                                                                                   | both    | both    | both | short term effects | short term effects | short term effects | mainly short term effects | mainly short term effects | efficient market |
| <b>Identification of the energy poor, and funding</b>                                                                                                                                    |         |         |      |                    |                    |                    |                           |                           |                  |
| Is the target population properly identified, and are targeted people aware of it and requesting support?                                                                                | neutral |         | no   | neutral            | neutral            | no                 | yes                       | no                        | no               |
| Are policies and measures adequately funded?                                                                                                                                             | neutral | no      | no   | neutral            |                    | no                 | no                        | no                        | neutral          |
| Is there a monitoring and evaluation system or transparency rules?                                                                                                                       | neutral | yes     | yes  | no                 | no                 | no                 | yes                       | neutral                   | no               |
| <b>Goal attainment and implementation</b>                                                                                                                                                |         |         |      |                    |                    |                    |                           |                           |                  |
| Are policies and measures actually improving the situation of energy-poor households, or can statistical improvements be attributed to other factors (fuel prices, winter temperatures)? |         |         |      |                    |                    |                    | very low level            | no                        | no               |
| Do measures help alleviate negative distributional effects of energy poverty?                                                                                                            | neutral | neutral | no   | no                 | no                 | no                 | no                        | no                        | no               |

**Source:** Own compilation.

**Legend:** light green and yes: assessment positive; dark green and empty: room for improvement; dark purple and no: negative assessment and urgent need for improvement; light violet and empty: slightly negative assessment; grey: not data available or no clear conclusion.

### 3.3. Discussion of the results for each Member State

**Bulgaria** does not have a definition of energy poverty in place, and the issue is not explicitly on the agenda of national politics. National policies towards the problem are restricted to financial support of low-income households for a limited amount of energy. The extend of the financial support is very small; it is calculated that households can heat only one room of their apartment during winter. This is leading to mould formation and health implications<sup>CX</sup>. The instrument also supports only 8% of all households, while 50% of all households are at risk of poverty and even two thirds of the Bulgarians have to limit their heat comfort in winter. So the amount of 30 and 42 m EUR per year is too small and the criteria to be eligible for support are too tight.

The impact of measures to improve the energy performance of buildings is low. The instruments do not focus on low-income households and do not consider overall poverty. There are no consulting initiatives or other instruments focussing on more efficient electrical appliances or on behavioural aspects.

The following two main drivers of energy poverty should be put on the political agenda: i.) the low performance of the building stock including the reliance on inefficient heating systems and ii.) the low-incomes resulting in overall poverty. In the absence of a

conclusive strategy or definition and the low average performance of the building stock, policies targeted at low-income households in general actually identify the fuel poor quite effectively. However, in its current state, it cannot be concluded that the Bulgarian policy actually helps alleviate energy poverty in a meaningful and sustainable manner.

**France:** A specific evaluation of the *Habiter Mieux* scheme showed that among renovated homes, energy efficiency has greatly improved, although some dwellings remain in the worst band of energy efficiency even after renovation. More than half of the concerned inhabitants state financial savings, and the vast majority (82%) reports that they do not feel cold anymore during the winter.

*Habiter Mieux* has the advantage that local authorities have some freedom in identifying the energy poor in their communities and in implementing concrete measures. Data availability, networks, and methods on the local level can be different depending on the local specificities and this differentiated approach apparently improves the efficiency of the programme. Notably, the scheme targets low-income households instead of using the national definition of energy poverty. While a definition of energy poverty is missing, it avoids the problem of not identifying owner-occupiers who ration their energy consumption and spend less than 10% as a consequence. The French example shows how the problem of identifying specific fuel poor households can be mitigated by giving local authorities freedom in their methodology. Furthermore, the French schemes are accompanied by excellent monitoring, with specialised surveys.<sup>CXI</sup> On the downside, this scheme leaves energy poor tenants, who also tend to ration their energy use, literally out in the cold. For them, only the social energy tariffs remain. Funding is another critical issue: the current budget (500 million Euros) for *Habiter Mieux* would allow to cover just over 300 000 homes, less than 1/10 of the figure identified as energy poor. Similarly, a € 100 discount (social tariff) on energy bills to low-income households does not reach three quarters of those in need.

**Germany:** There is no scientific or legal definition of energy poverty in Germany and energy poverty is so far a rather marginal topic in the political discussion. There are policies addressing the energy performance of the building stock in general and providing financial support for refurbishment to improve it. These instruments are not focused on low-income households and they may even have a negative social impact, as highly efficient buildings usually have a much higher rent which makes them unaffordable for low-income households. On the other hand, low-income owners will not be able to finance a refurbishment with the current financial support level.

There are two instruments directly addressing energy poor households in the form of providing energy saving advice: an energy-saving consultation towards replacement and behavioral changes, and another providing high-efficiency devices that directly enable energy savings. These instruments address electricity consumption ("electricity saving check"), as well as efficient heating energy use. Additionally, the German social security system includes provisions for energy expenditure.

**Greece:** Greece has no legal definition of energy poverty in place. Therefore, data availability for analysing energy poverty is limited, and no monitoring system exists. The ongoing economic crisis in Greece has raised the question on its effect on the affordability of energy. The Greek Power Corporation has a social tariff for vulnerable customers, offering about 30–35% discount, with almost 7% of households being eligible. This target group has been clearly and adequately defined. Furthermore, the Greek parliament has recently adopted a law introducing free supply of up to 300 kWh electricity in 2015 to households that are not able to pay their energy bills. The inability of customers to pay their electricity bills had created major liquidity problems for the Power Corporation. Energy debts provoked a domino effect in the whole energy market, affecting liquidity (and

profitability) for producers, the Natural Gas Corporation (DEPA), the natural gas importers and transmission operators. This led to the risk of transforming an energy poverty issue into an energy supply security issue<sup>CXII</sup>. Therefore it is questionable whether these short term measures will be sufficient in the context of the current economic situation in Greece.

**Ireland:** Ireland established a “Warmer Home Strategy” in 2011, since when a definition of energy poverty has existed. The strategy also led to Ireland implementing data analysis and data collection with regard to energy poverty. Ireland is building on the experiences of the UK and is addressing energy poverty with a two-fold approach: On the one hand, the Better Energy Warmer Homes Scheme targets the thermal efficiency of buildings with a focus on low-income households. On the other hand, financial support is granted to enable households to pay their electricity bills via the Household Benefits Package and the Fuel Allowances scheme.

While a large share of energy for heating purposes is supplied from non-regulated markets (oil and coal), further schemes were launched in 2015, like the Better Energy Community Scheme, which funds projects with the aim to reduce energy costs. Also in 2015, an oil stamps saving program will be launched in order to stimulate households to put aside money dedicated to a future supply of oil. The reallocation of funds currently used for the income support could reduce fuel poverty. Additionally, coupling income support to energy efficiency upgrades would lead to much higher net savings on subsidies, reduced energy bills and improved health.

**Italy:** Italy has no definition of energy poverty. Nevertheless, Italy targeted energy poverty by general policies and measures with short term effects. The vulnerable target group is not sufficiently defined. The Italian scheme of energy benefits consists of a lump-sum contribution for vulnerable consumers, similar to schemes already adopted in France. The eligibility of a household is determined by a combination of income, wealth, labour force participation and demographics. It takes no account of the actual spending on energy, housing conditions or the cost of living of the household. The aim of the electricity and gas benefits scheme is to support low-income households, but the eligibility criteria do not ensure that all targeted households qualify for the benefits. The effectiveness of the Italian energy benefits scheme could be improved by substantially revising the eligibility criteria. In particular, it is necessary to acknowledge that the cost of living differs widely across the country: the material conditions of households with similar income or wealth levels but living in different areas of the country can be quite different. Cost heterogeneity is duly taken into account by the poverty and affordability indices, but not by the administrative rule applied to grant access to the benefits<sup>CXIII</sup>.

**Poland:** Energy poverty policy in Poland is still incomplete. Although there seems to be a national awareness of the problem, there is still no national definition of energy poverty and no appropriate data collection and monitoring systems. Initial approaches addressing high energy prices include social subsidies as well as VAT and tax reductions. Measures in Poland fall short of acknowledging and defining the problem of energy poverty and resort to energy-related benefits and rebates to those with low incomes. The other pillar of policies in Poland is a formal agreement with the energy companies to mitigate the financial effects of energy debts (avoid disconnection from the grid). In the absence of a national definition and specialised policies, the effectiveness cannot be estimated. Structural causes of energy poverty, such as low incomes, the low energy performance of the Polish building stock, and the predominance of inefficient heating technologies are only partially addressed. The Thermo Modernisation Fund does target inefficient buildings and has improved the performance of the building stock. However, since there are no special conditions for low-income households, it is not technically an energy poverty policy, and it is unlikely that it efficiently targets the energy poor efficiently.<sup>CXIV</sup>

**Spain:** Spain urgently needs a fuel poverty strategy. Fuel or energy poverty is not legally recognised in Spain, although indicators suggest that it is a major problem. The availability of data to analyse energy poverty is low. When a household is unable to obtain sufficient energy services it is considered to be in fuel poverty. Nevertheless, this approach is not a clear and targeted definition of energy poor households. As Southern Europe suffers from high levels of fuel poverty and the poorest housing conditions, it is evident that the concept needs to have its own identity and specific approach. Poverty in Spain is higher than the average in Europe. An important cause is low income. The higher level of fuel poverty is mainly due to poor housing conditions like lack of insulation, lack of central heating or inadequate heating systems. Therefore it is difficult to maintain adequate temperatures, especially in winter time. The consequences are lack of thermal comfort, health problems and in worse cases: death<sup>CXV</sup>. Spain urgently needs policy action to improve the situation of low-income households – in the short and long term. Long-term measures focused on the energy efficiency of buildings and adaptation of heating systems are particularly necessary.

**UK:** The energy performance of buildings has been identified as the main driver for fuel poverty in the UK and is decisively targeted. As a result, overall energy efficiency in buildings has increased significantly.<sup>CXVI</sup> Despite a fair amount of statistics, it remains difficult to identify specific fuel-poor households. Reasons cited are limited data availability, the intrusiveness of required surveys, data protection, and attached stigma. Policies like the Winter Fuel Payment do not target fuel poverty efficiently: Only 10% of pensioners living in inefficient homes or low-income households actually suffer from fuel poverty. On the other hand, the CSCO's low-income neighbourhood approach holds promise to identify people in need of support.

The absolute number of fuel poor households has remained fairly constant over the past ten years.<sup>CXVII</sup> The UK operate a policy known as the Energy Company Obligation (ECO). However, ECO measures are not specifically targeted at energy poor households, but rather at low-income homeowners or areas in general. All taken into account, funds could be spent more efficiently if policies were more specific and appropriate data available. Boardman (2012) estimates that less than a quarter of funds spent through UK fuel poverty policies are actually reaching the fuel poor, and that the volume of funds in total is far too small to have a chance of reaching the UK's national energy poverty target for 2016. Additionally, the current austerity policy in the UK makes an increase in public funding unlikely. All things taken into account, the UK example illustrates the difficulties in implementing fuel poverty policy as well as a mismatch between a stagnating political will to secure funding and the need for extensive data collection and monitoring and evaluation.

### 3.4. Lessons from evaluation of Member State policies

Across the Member States examined in this study, the performance of energy poverty policy varies widely. A high level review of policy indicates that having a definition and a national target does not automatically lead to effective poverty reduction. Even in Member States where energy poverty has been on the agenda for a while, the outcomes of the policies are mixed. Nevertheless, a pattern emerges from the comparison and can be summarised in four points:

1. Even with a conclusive definition of energy poverty, actually identifying eligible households in order to efficiently allocate funds has remained a challenge. Approaches to identify eligible households differ across policies with varying, but usually low, success. One reason for this is the lack of available of data appropriate to the definition of energy poverty. Two examples stand out as good practices: The French "Habiter Mieux" scheme has found that delegating information and action to local authorities with some freedom leads to useful results. This approach is

especially suited to a country with diverse climates and architectural heritage. The Bulgarian example shows that targeting and identification is less of an issue in a situation where energy poverty is very widespread. This is more likely to be the case in lower-income countries where mobilisation of funds may be the largest challenge.

2. Modernisation of buildings and energy equipment is an effective remedy for energy poor households, but funding and identification of households remains an issue even in high-income countries with the means for extensive data collection. The funding required for effective and widespread modernisation is significant and none of the studied countries have so far managed to raise enough money. Sufficient funding may be more difficult to acquire in lower-income Member States where building performance tends to be low and many people require support for modernisation, as the Polish modernisation fund shows.
3. Obliging energy utilities to provide social tariffs, discounts, or tolerate the accumulation of consumer debts is by itself not a sustainable policy in the long term because it does not address the root causes of energy poverty: low-incomes and poor building and energy equipment performance. However, it can be an effective remedy for high energy costs in the short term. Among the studied countries, most have some form of social tariff scheme implemented with varying levels of success. One striking observation about social tariffs and measures is the significant burden on utility companies in situations where energy poverty is widespread and the economic power of the companies is limited. Spain and Greece illustrate this situation where the burden on utility companies has become so high that the accumulated debts endanger their economic viability and possibly, in the longer term, energy supply security.
4. The third large group of policies is state-funded subsidies and benefits for the energy poor, which have been implemented in various forms in most selected Member States. They differ in success depending on their targeting. One negative example is the Winter Fuel Payment in the UK, which is framed as a policy for the energy poor but allocates funds very inefficiently to a vast majority of pensioners who are vulnerable but can actually afford sufficient heating. In a situation of widespread energy poverty, the Bulgarian subsidies have a good chance of actually reaching the energy poor, but their funding (or the means to allocate funds in Bulgaria) have been but a drip in the ocean so far.

A clear distinction must be drawn between long-term policies to address the root causes of energy poverty (generic social and economic policies, policies concerning heating technology, grid access, and the energy performance of buildings) and policies designed to ease the burden on energy poor households in the short term (tariff reductions, benefits, and subsidies). As a short-term remedy, they have the side-effect of creating a constant flow of state funds or debt accumulation in utility companies while statistically masking the issue of energy poverty. A sustainable policy solution should be accompanied by a solid monitoring mechanism as well as policies that address the root causes of energy poverty for eligible households.

In answer to the question, what are the drivers of energy poverty in a society? It comes with little surprise that energy poverty appears worst in those countries with inefficient building stock (Poland, Bulgaria, UK), low incomes in general (Poland, Bulgaria) and high energy prices (Spain). Income inequality as measured by the Gini coefficient seems to play a major role as well: Bulgaria, Greece, and Spain exhibit the highest Gini index of all surveyed Member States as well as a comparatively low number of heating degree days, but still suffer from a relatively high level of energy poverty. A second comment is that all selected Member States have underestimated the funding necessary to effectively solve the

problem of energy poverty (or, more likely, it was politically not feasible to allocate the necessary funds). Boardman (2012)<sup>CXVIII</sup> estimates that funding of 120 billion pounds would be necessary to effectively modernise the dwellings of the energy poor in the UK, a very large amount of money even for the highest-income Member States. If policies are to be successful at viable costs, targeting and efficiency of spending must drastically improve.



## 4. POLICY RECOMMENDATIONS

### 4.1. Challenges and Good Practices

Energy poverty is a widespread problem across Europe. Low-income households are in general more vulnerable. The low level of energy performance in buildings and inefficient energy using appliances lead to higher energy needs and hence higher costs. Low-income households are especially affected by these aspects since they are not able to buy efficient appliances and often live in older non-refurbished buildings. Not all Member States surveyed have specific energy poverty policies in place, but large challenges remain even in Member States in which some have been implemented. In summary:

1. Member States have struggled to find definitions for energy poverty that are appropriate, assessable with reliable data and realistically feasible to apply in concrete measures.
2. Identification of eligible households has remained a challenge, such that most funds are currently allocated with low effectiveness.
3. Sustainably preventing and mitigating energy poverty by structural measures – in particular energy efficiency – is expensive and no Member State has so far been able to secure sufficient funds. However, a long-term policy of this kind would lead to the best outcome for low income consumers.
4. Policymaking to address energy poverty needs to find a balance between short-term remedies and the resolution of the long-term drivers of energy poverty.

### 4.2. Diversity of situations in Europe

A first lesson is that the circumstances of energy poverty are diverse due the heterogenous European landscape of energy mixes, policy approaches, building stock, and so on. Energy poverty is not related to the number of heating degree days, but countries with low incomes and a high income inequality are more affected by it. Any policy on the EU level must take this diversity into account. The problem is more widespread in Member States with low purchasing power. An analysis of the sample of Member States investigated suggests that there are at least three typical situations:

1. Member States in Eastern Europe share a common problem of poor standards of the building stock, reliance on inefficient heating technologies often based on electricity, and comparably low incomes. Energy poverty is widespread, making identification less of a problem, but funding even more of a problem.
2. Member States with higher incomes (determined based on purchasing power parity<sup>16</sup> (PPP)) and a generally better quality of energy using equipment and building stock, such as Germany, the UK and France have greater difficulty identifying those households which are actually energy poor. Data availability, policy design, and methodology are a larger issue in this context, while funding is arguably more constrained by political will than by economic necessity.
3. Member States in southern Europe, despite warmer climates, are not invulnerable to energy poverty and may be even more at risk of rising energy prices, as the Spanish

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<sup>16</sup> Purchasing power parity (PPP) is an economic term used to compare income levels in different countries. The expenditure on a similar commodity or a basket of goods must be same in both currencies when accounted for exchange rate. The purchasing power of each currency is determined in the process.

example has shown. A different approach is needed when heating is not as central an issue as in the North.

### **4.3. Policy Recommendations on the European level**

In light of such diversity, it would be ill-advised to recommend a unified, one-fits-all strategy against energy poverty at EU level. This may help to explain why consensus on this issue has not yet been reached. EU policy needs to take account of the diverse nature of the problem and base future policies on the idea of supporting Member States. This could be achieved by:

1. Finding an adequate definition of energy poverty by providing data, information and coordination and further the European discussion by setting up platforms and dialogue for information exchange and sharing of best practices.
2. Supporting national policies financially through EU co-ordination and co-funding of housing stock renovation programs.
3. Continue to set minimum standards for the energy efficiency of buildings and energy using appliances.

#### **4.3.1. Providing a solid European data base and definition for discussion**

The Union can support Member States by agreeing on a minimum definition of energy poverty that is feasible to implement today, with existing data. An appropriate suggestion should be compiled and coordinated. The definition used by some Member States (e.g. the UK, Ireland), that households are energy poor if they spend more than 10% of their disposable income on energy, does not seem to be appropriate. This definition fails to consider the fact that poor households might not heat their homes adequately or buy or use less energy using appliances because they would not be able to pay the energy bills. A more appropriate definition would be one that integrates the purchase power parity of households and a factor for the national energy prices. It should also be assessed whether energy poverty already starts above the poverty threshold. An example of a definition that includes income and prices is the UK's modelling-based Low Income, High Costs indicator.

Secondly, the necessary data for evaluating energy poverty should be harmonised on the European level and provided to Members from a central place, e.g. Eurostat. This should include data on building energy performance and data on those health issues that are related to fuel poverty. The Member States should be encouraged to conduct detailed analysis of energy poverty-affected households (e.g. where they live, in what kind of buildings, what energy carrier they use and household size). This data could help to design highly targeted policy instruments.

In those Member States in which the data is lacking, EU support for its collection could be useful. In this way, the discussion on the European level could be made more comparable and rational, and some of the point of contention taken out of the energy poverty debate.

#### **4.3.2. Addressing energy poverty through existing EU arrangements**

In recent years, energy poverty has turned out to be an issue of contention, with agreement on the EU level proving difficult to attain. While a more coordinated and specific EU policy on energy poverty is of course desirable, EU legislation exists that allows policy-makers to address the issue indirectly. The following mechanisms seem feasible:



1. The “Energy Union” strategy states a goal of affordable energy which has not so far been specified any further. However, the strategy also includes provisions on further integration and liberalisation of the energy market. While economic efficiency is desirable, free markets may not always lead to the best outcome for low income households.
2. The consequences of future energy market legislation, especially for the energy poor, should be brought onto the agenda and carefully assessed. The same can be said about the evaluation of the existing Energy Packages, which may have had negative consequences for the provision of energy to low-income consumers through negative side effects of market liberalisation. Low-income households with low consumption and which have difficulty paying their bills are at risk of being locked into contracts that disadvantage them even further (cf. Thomas 2008).
3. There is existing legislation on energy efficiency and standards for buildings, which should be used as a vehicle to tighten standards on housing quality in the EU and push forward a modernisation agenda. In this context it is necessary to evaluate and implement appropriate measures to avoid the situation of rents increasing following building refurbishment, leading to a rising burden for vulnerable households.
4. Energy efficiency is part of the EU’s 2030 climate targets and plays an even stronger role in the framework of the Energy Roadmap for 2050. The connection between energy efficiency and energy poverty should be emphasised, giving the issue of energy poverty further urgency by connecting it to the discourse on climate change, and also illuminating the social aspects of climate policy.

#### 4.3.3. Securing funding for modernisation

Inefficient building stock and reliance on solid fuels have proven to be the two major structural issues that exacerbate energy poverty in most parts of Europe, particular in the Eastern European Member States. At the same time, the amount of money needed to accelerate the building modernisation process is substantial and certainly so large that lower-income Member States would struggle to finance such a program.

The EU’s funds for structural development and mainly the Regional Development Fund (ERDF) might be reviewed in terms of their ability to mitigate energy poverty. In the Eastern Member States with a convergence target, measures for building modernisation could be framed as a way to support the local economy while improving living conditions and especially health, all of which are already goals of the EU as mentioned in the treaties.

Secondly, in those Member States in the Competitiveness and Employment objective of the ERDF, energy efficiency could be directly used as a rationale for providing funds to regions that suffer especially from energy poverty. The ERDF has two objectives: competitiveness and employment for richer MS (EU15) and convergence for others (new MS), with different targets under each objective.

#### 4.3.4. Policies appropriate for the fuel mix

The analysis showed that fuel poverty is diverse but there seems to be a relation in some Member States to the fuel mix: For example, Bulgaria has a high share of inefficient and expensive electrical heating. This is also the case in Spain, where small-scale electric radiators are widely used in badly insulated houses. Such regions are at higher risk of fuel poverty than others. The conclusions for the best energy mix to avoid energy poverty are different: the use of natural gas for heating can contribute to a lower energy consumption

and hence positively affect energy poverty. However, in Bulgaria its use has declined dramatically because it is too expensive without public support. In contrast, as the UK report on energy poverty shows, those parts of the UK without access to the gas grid mainly use solid fuels for heating and are more at risk of energy poverty.<sup>CXIX</sup> This means that modernisation policies in some Member States should consider the region's fuel mix.

## ANNEX

### ANNEX A: DEFINITION OF ENERGY POVERTY

There is only one EU Member State – the UK - with an official definition of energy poverty, called “fuel poverty” according to the “Low Income, High Costs” indicator. Thereafter “a household is considered to be fuel poor if it has required fuel costs [to maintain an adequate heating regime] that are above average, and, were it to spend that amount, it would be left with a residual income below the official poverty line”.<sup>CXX</sup>

Within the EU there is no consensual definition of energy poverty, but there is a recommendation on how to measure fuel poverty: “Energy poor are households that spend more than a pre-defined threshold share of their overall consumption expenditure on energy products”.<sup>CXXI</sup> The studies use energy and fuel poverty as a synonym.

Within the EU, there are various approaches which describe and measure energy or fuel poverty. A selection is the following:

- The budget-standard-approach<sup>CXXII</sup> establishes the minimum income needed by different household types in different locations to participate in society. A household is in fuel poverty if its fuel costs are higher than its net household income minus housing and minimum living costs.
- According to the after fuel cost property approach a household is considered fuel poor if its equivalised household income (household income minus housing and domestic fuel costs) is less than 60% of the country’s national equivalised household income (median household in-come minus median housing and fuel costs) (Hills 2011).<sup>CXXIII</sup>
- According to the low income/high cost-definition<sup>CXXIV</sup> a person is to be regarded as living in ‘fuel poverty’ if he/she is a member of a household living on a low income in a home which cannot be kept warm at reasonable cost’. If high energy cost would push a household under the poverty line, the costs are not regarded as reasonable. The low income threshold for each house-hold is defined as 60% of the country’s median equivalised income.
- Hungary defines fuel poverty as a situation in which a household is unable to heat sufficiently; or if a household spends more than a certain percentage (around 10%) of its income on energy costs. This is based on the threshold for each household of 60% of the country’s median equivalised income.<sup>CXXV</sup>
- In Spain fuel poverty is defined as the inability to afford adequate warmth in the home’. For possible cooling needs, no definition exists.<sup>CXXVI</sup>
- The EESC approach<sup>CXXVII</sup> says: a household finds it difficult or impossible to ensure adequate heating in the dwelling at an affordable price and having access to other energy-related services, such as lighting, transport or electricity for use of the Internet or other devices at a reasonable price.
- In France fuel poverty is measured based on a minimum income threshold approach: any-one who encounters, in his/her home, particular difficulties in obtaining the energy required to meet his/her basic energy needs due to insufficient resources or housing conditions is considered fuel poor.<sup>CXXVIII</sup>
- According to the Warmer Homes Strategy (2011)<sup>CXXIX</sup> in Ireland, a household is considered energy poor if it is unable to attain an acceptable standard of warmth and energy services in the home at an affordable cost. Energy poverty is currently measured via the expenditure approach according to which a household is deemed

in energy poverty if it spends more than 10% of its in-come on energy, in severe energy poverty if it spends more than 15 %, and in extreme energy poverty if it spends more than 20 % . This methodology is currently under review.<sup>CXXX</sup> Further, fuel poverty is described as the inability to afford adequate warmth in a home, or the inability to achieve adequate warmth because of the energy inefficiency of the home.<sup>CXXXI</sup>

## ANNEX B: EU MEMBER STATES SCORES ON THREE FUEL POVERTY INDICATORS

| Country   | Arrears on Utility bills (%) | Inability to keep home warm (%) | Dwellings with leakages (%) | Country   | Arrears on Utility bills (%) | Inability to keep home warm (%) | Dwellings with leakages (%) |
|-----------|------------------------------|---------------------------------|-----------------------------|-----------|------------------------------|---------------------------------|-----------------------------|
| Bulgaria  | 50.7                         | 70                              | 29.5                        | Estonia   | 20                           | 9.6                             | 30.3                        |
| Hungary   | 58.8                         | 33.9                            | 53                          | Belgium   | 14                           | 18.8                            | 26.2                        |
| Greece    | 54.4                         | 47.6                            | 21                          | Ireland   | 27.5                         | 12.5                            | 16.2                        |
| Latvia    | 39.5                         | 35.1                            | 43.3                        | France    | 17.8                         | 15.2                            | 22.1                        |
| Cyprus    | 25.9                         | 50.6                            | 34.6                        | Czech Rep | 19.4                         | 15.3                            | 20                          |
| Slovenia  | 37.5                         | 17.3                            | 46.1                        | Spain     | 17.9                         | 18.2                            | 17.9                        |
| Italy     | 24.5                         | 44.1                            | 30.1                        | Slovakia  | 18.3                         | 13.6                            | 19.7                        |
| Romania   | 41.5                         | 25.4                            | 30                          | Netherl.  | 8.6                          | 8.7                             | 27.4                        |
| Lithuania | 22.8                         | 38.2                            | 28.6                        | Germany   | 8.6                          | 14.8                            | 21                          |
| Portugal  | 14.5                         | 43                              | 28.4                        | Denmark   | 5.5                          | 7.1                             | 25.3                        |
| Croatia   | 40.9                         | 21.8                            | 19.9                        | Luxemb.   | 6.6                          | 2.2                             | 29.9                        |
| Poland    | 30.1                         | 27.6                            | 20                          | Austria   | 11.3                         | 7.7                             | 15.2                        |
| Malta     | 19.4                         | 32.1                            | 12.4                        | Finland   | 13.7                         | 3.8                             | 8.6                         |
| UK        | 30.3                         | 19.4                            | 21.4                        | Sweden    | 10.3                         | 3.5                             | 11                          |

Source: BPIE 2014<sup>CXXXII</sup>; percentage number shows the share of persons affected by this indicator.

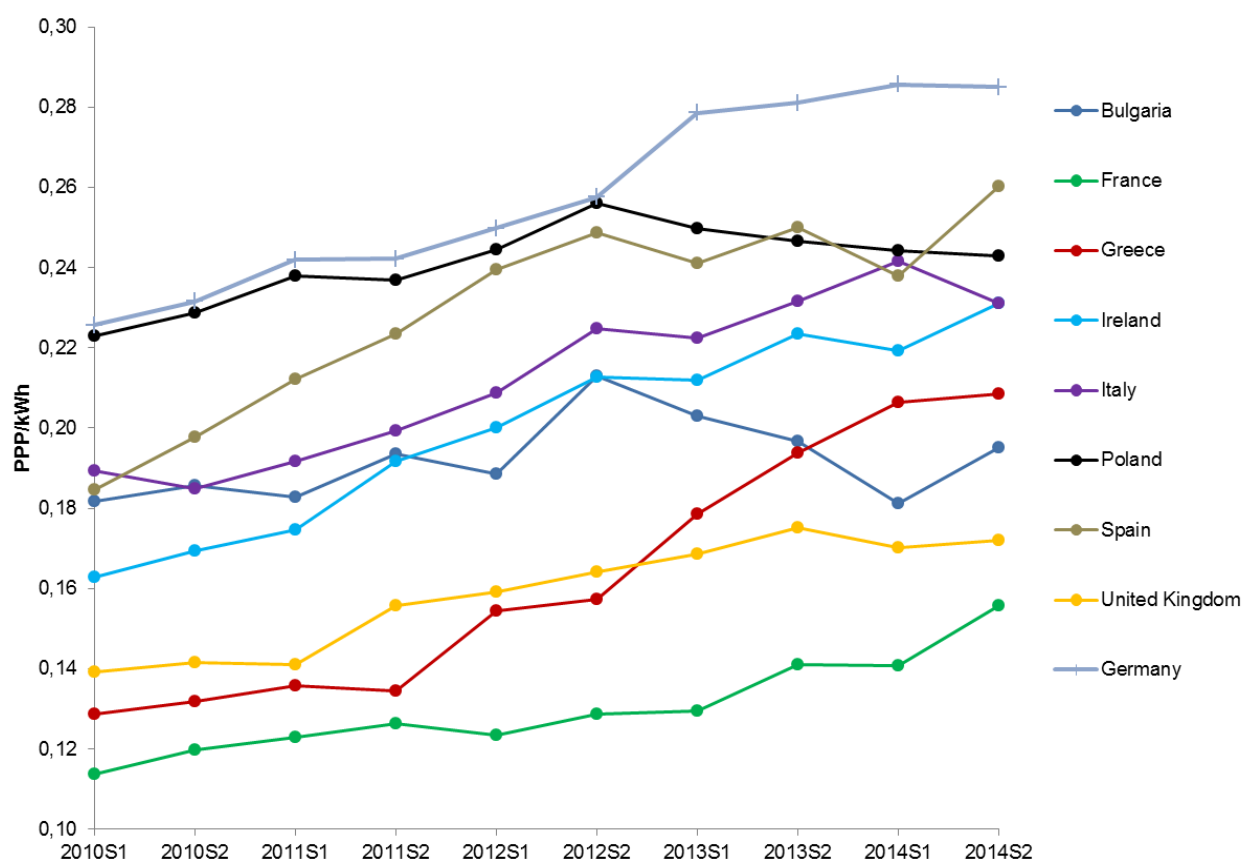
## ANNEX C: ENERGY RETAIL PRICES

In most of the selected countries electricity retail prices show a fluctuating but steady increase since 2007. Germany has currently the highest electricity price, followed by Ireland and Spain. Bulgaria has, compared to the other selected Member States, the lowest electricity prices. Contrary to the other countries, electricity prices in Poland declined steadily between 2012 and 2014.

The development of household gas prices demonstrate a similar pattern, but with more volatility within a year. For consumers which require below 5 555 kWh (< 20 GJ) of gas a year, France faces the highest gas price level followed by Italy, Spain and Ireland. Bulgaria exhibits again the lowest price level in household gas prices. The range of price levels lies between 0.03 Euro/kWh (in 2007) and 0.14 Euro/kWh (in 2014) for gas consumption consumption below 20 GJ, which translates to 5 555 kWh.

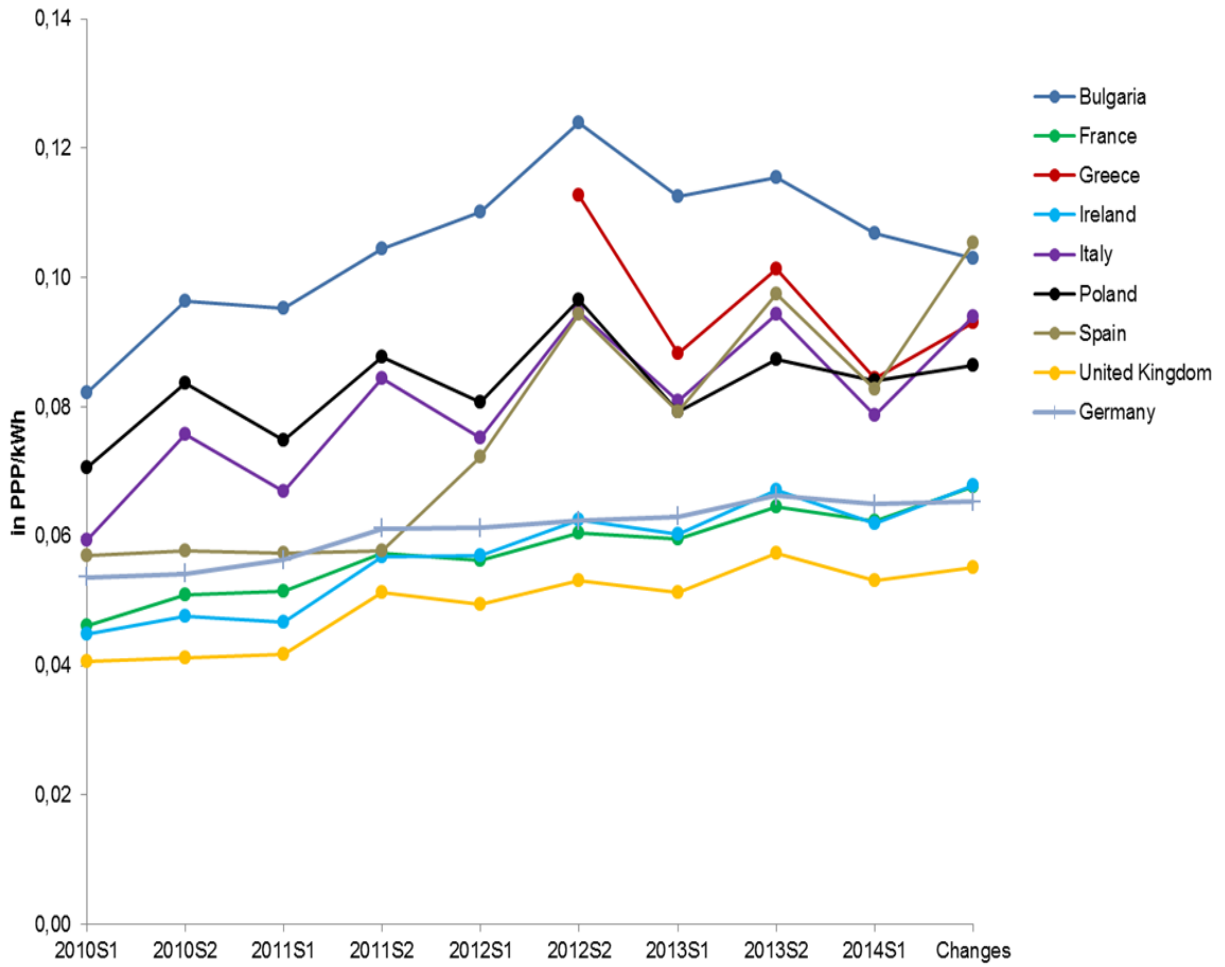
It needs to be noted that even if a country faces energy prices which are lower than in other countries, this does not indicate a better affordability of energy in general, as the per capita income and the in-come equality may be less (see Annex D). Bulgaria for example exhibits the lowest energy prices, but is also the country with the lowest income equality between 2007 and 2013.

**Figure 2 : Household electricity price development 2010-2014**



Source: Eurostat nrg\_pc\_204, last update 07-05-15.

**Figure 3 : Household gas price development 2007-2014**  
**Consumption 20 GJ – 200 GJ (5 555 kWh – 55 555 kWh)**



Source: Eurostat nrg\_pc\_202, last update 04-05-15.

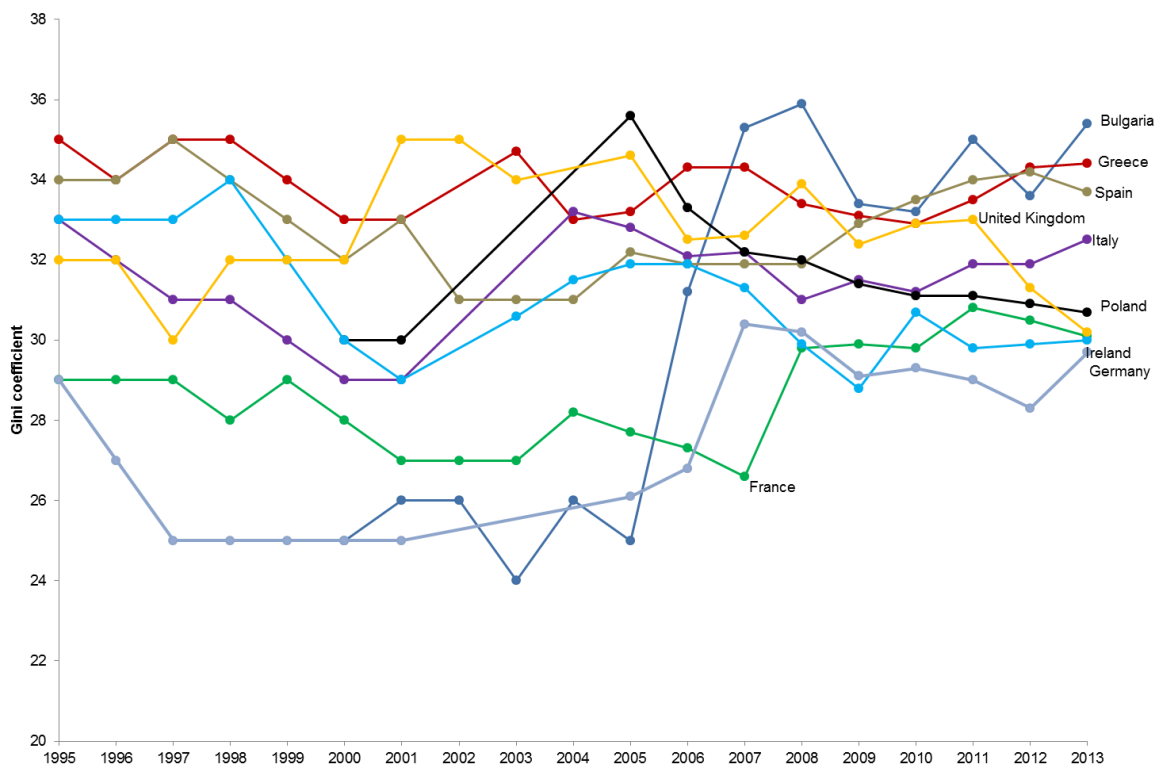
## ANNEX D: INCOME INEQUALITY

Income equality is measured by Gini index. The Gini index measures the extent to which the distribution of income or consumption expenditure among individuals or households within an economy deviates from a perfectly equal distribution. A Lorenz curve plots the cumulative percentages of total income received against the cumulative number of recipients, starting with the poorest individual or household. The Gini index measures the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line. Thus a Gini index of 0 represents full equality, while an index of 100 implies full inequality.<sup>CXXXIII</sup>

The Member States comparison below highlights that Bulgaria, Greece and Spain exhibit the highest income inequality, with fluctuating nature and upward tendency. Bulgaria experienced a sharp increase between 2005 and 2007. In general, Germany exhibits the highest income equality, but with a slight backward trend since 2012. The UK and also Ireland have been more balanced in recent years, while Bulgaria has moved from a rather balanced distribution to the highest Gini index in recent years.

To help ranging the income equality compare the GDP per capita development between 2010 and 2014 (see Annex F). Bulgaria has by far the lowest GDP per capita, followed by Poland.

**Figure 4 : Income inequality**



Quelle: SILC 2015.

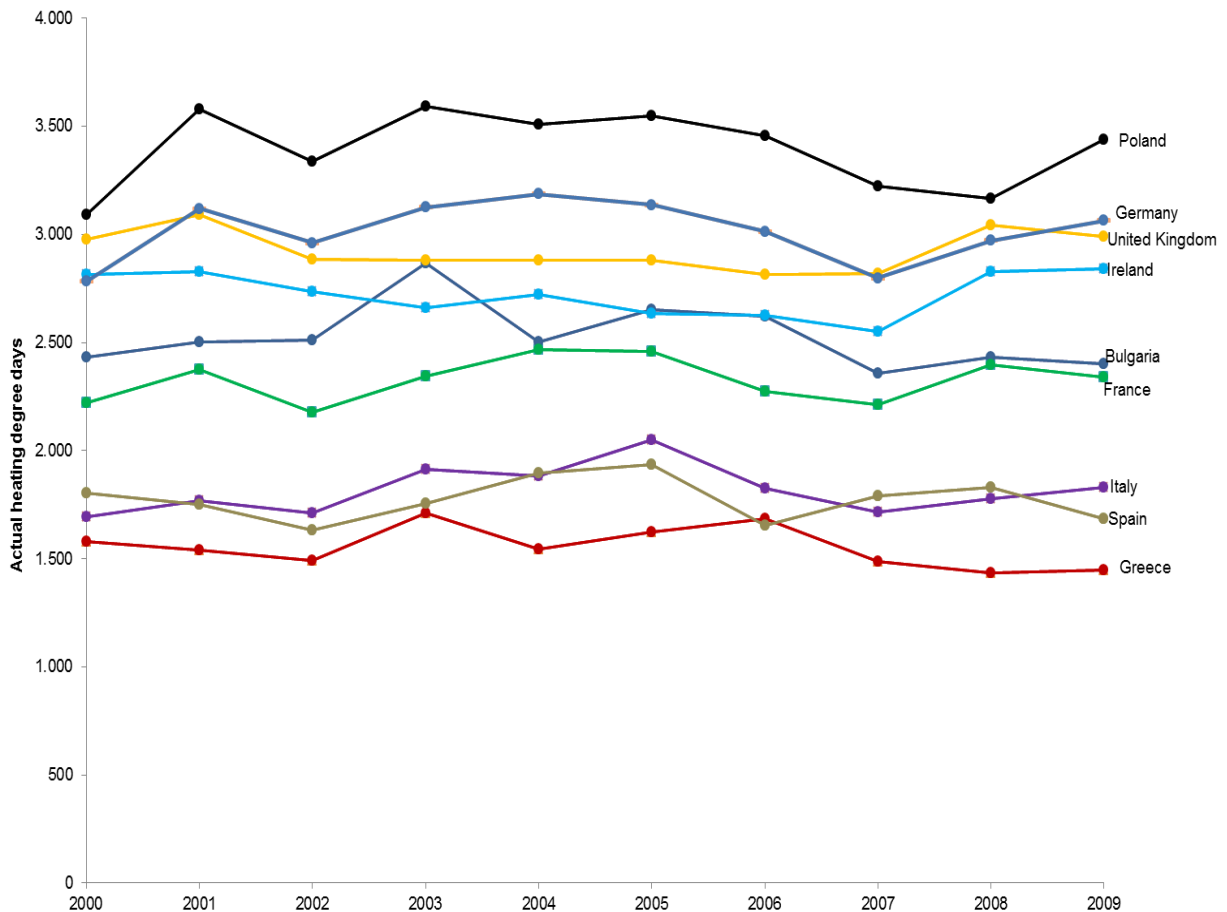


## ANNEX E: CLIMATE CONDITIONS

Climate conditions determine the amount of energy needed for heating, and also cooling which is not within the scope of our study. Thus, a country which, due to its geographical situation, faces many heating days will also require more energy to provide the needed warmth.

Heating degree days are an indicator which can inform about the need for heating.<sup>17</sup> Figure 4 illustrates the number of heating degree days in the selected Member States. Due to its climatic conditions, Poland has the highest number of heating degree days amongst the selected Member States, followed by Germany and the United Kingdom. Greece, Spain and Italy – the Mediterranean countries – have the lowest number of heating degree days<sup>18</sup>.

**Figure 5 : Actual heating degree days**



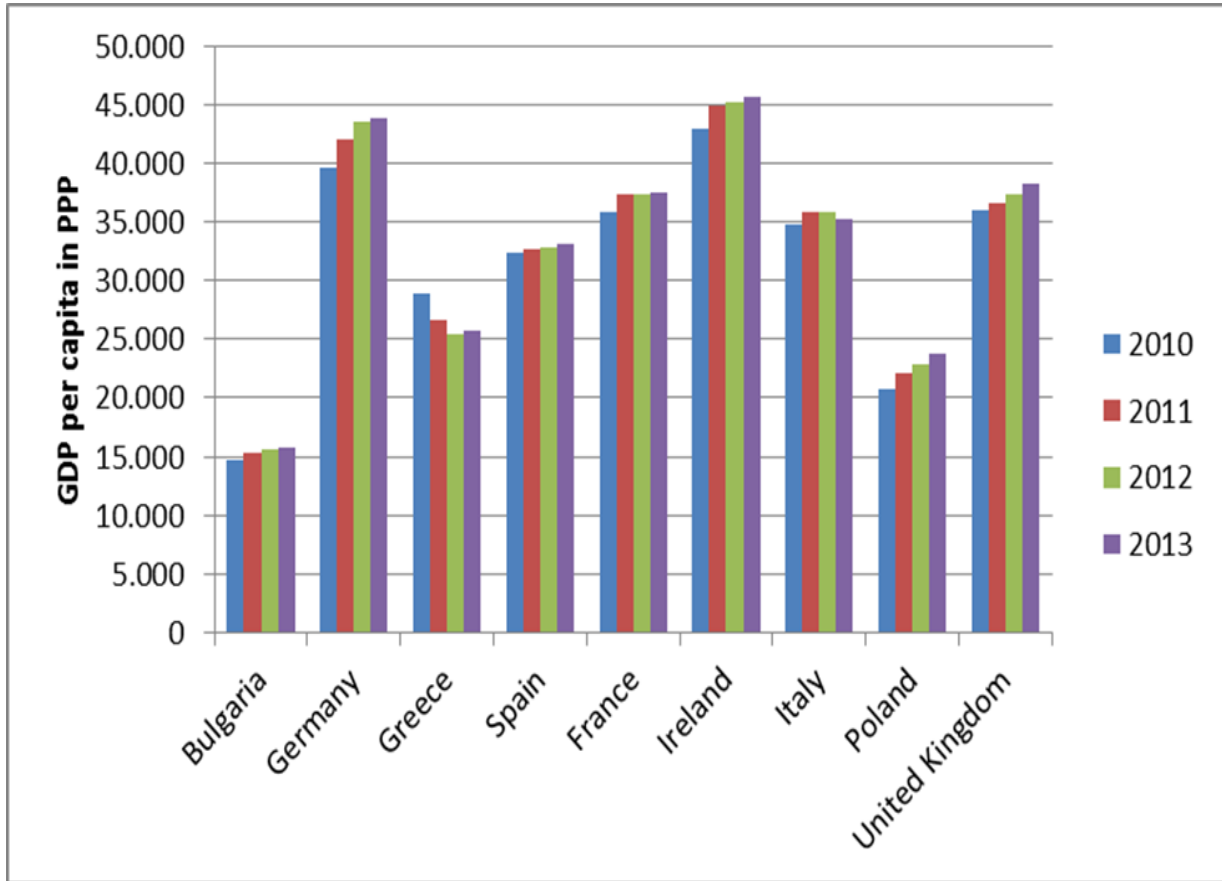
Source: Eurostat nrg\_esdgr\_a, last update 26-3-13.

<sup>17</sup> Eurostat calculates heating degree days (HDD) as  $(18\text{ °C} - T_m) \times d$  if  $T_m$  is lower than or equal to  $15\text{ °C}$  (heating threshold) and zero if  $T_m$  is greater than  $15\text{ °C}$ ,.  $T_m$  is the mean  $(T_{min} + T_{max} / 2)$  outdoor temperature over a given period of  $d$  days.

<sup>18</sup> It needs to be noted that the more Southern a location, the more energy for cooling purposes in the summer will likely be required. Unfortunately no harmonised information on national cooling degree days was available at the time of writing this report.

## ANNEX F: GDP PER CAPITA (IN PPP)

Figure 6 : GDP per Capita in Purchasing Power Parity



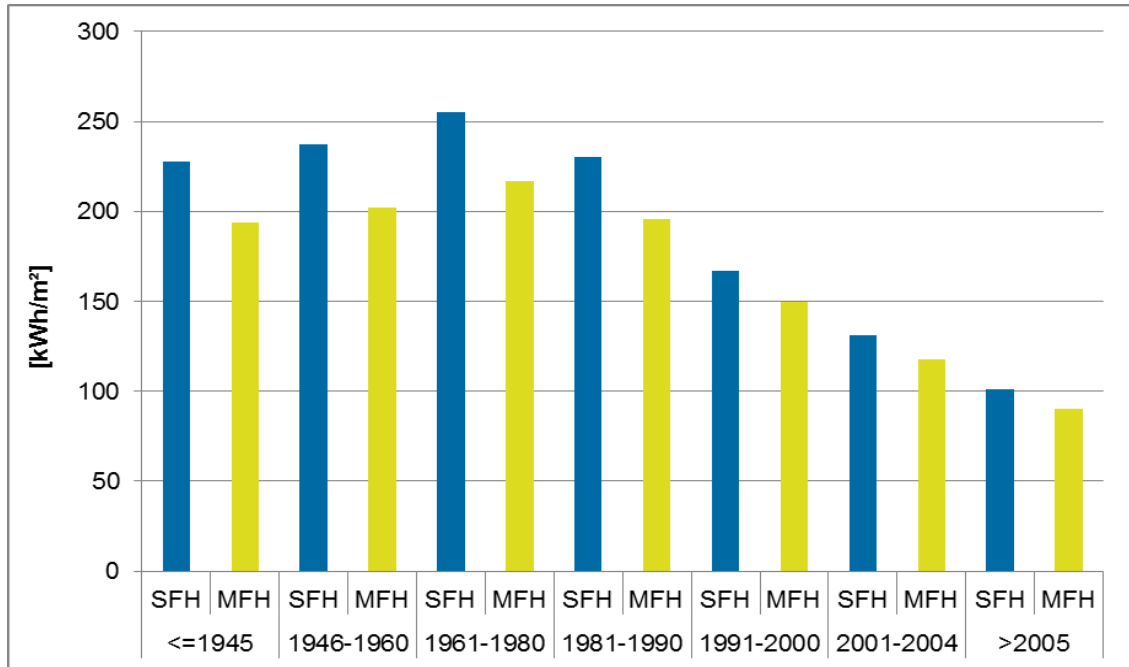
Source: Worldbank 2015.

## ANNEX G: FACT SHEETS

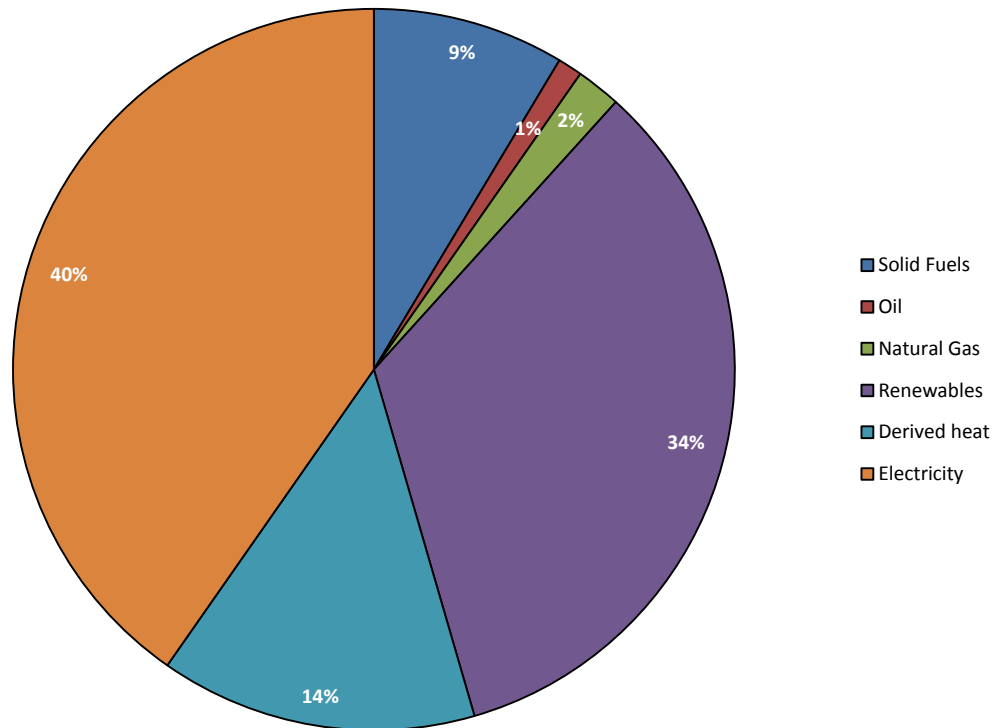
### Factsheet Bulgaria

#### General Information

- Number of households (2011)<sup>3</sup>: 3 Mio.
- Energetic standard of the building stock: specific energy use for heating (kWh/m<sup>2</sup>)<sup>1</sup>



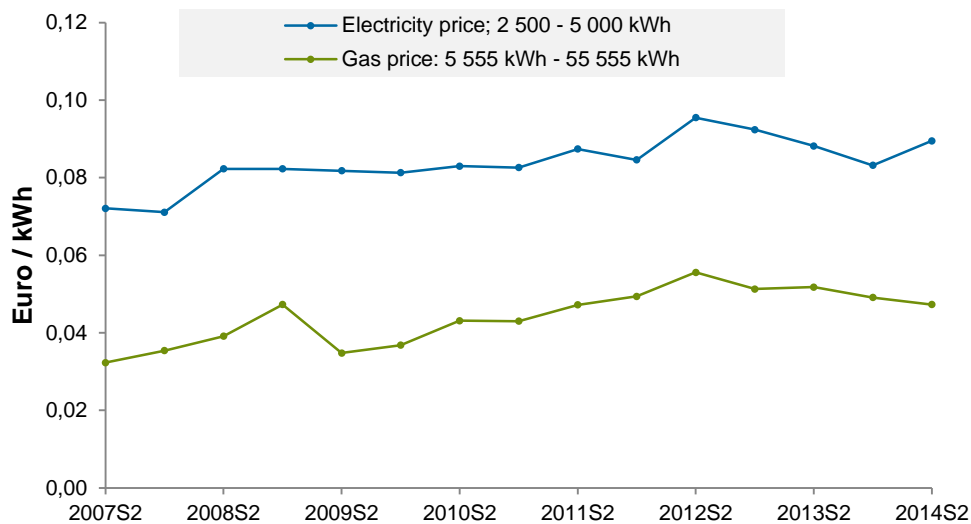
- Household fuel mix for heating (2013)<sup>2</sup>



- Heating degree days (HDD)<sup>4</sup>

| Year | 2000  | 2001  | 2002  | 2003  | 2004  | 2005  | 2006  | 2007  | 2008  | 2009  |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HDD  | 2 431 | 2 501 | 2 513 | 2 869 | 2 500 | 2 650 | 2 623 | 2 357 | 2 430 | 2 403 |

- Household energy price development (2007-2014)<sup>2</sup>



### Energy / fuel poverty indicators

- Energy consumption per household, household income and distribution of income in society

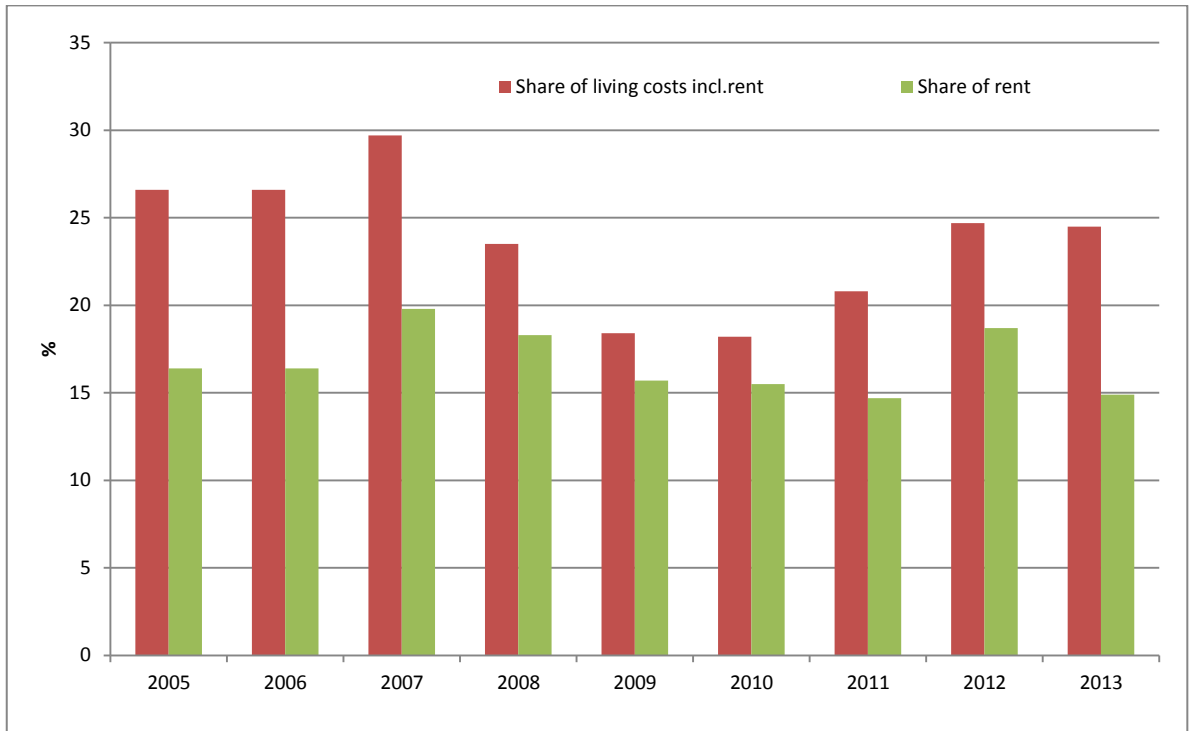
In 2013, the average household consumed about 14 700 kWh/yr. energy for heating, warm water and lighting

- Gini-coefficient<sup>3</sup>

Household equalised disposable income (ppp) in Bulgaria in 2013 was € 7 080. The income distribution of income in society can be measured by the Gini coefficient. Perfect income equality equals a Gini coefficient of zero. The higher the Gini coefficient, the more inequal is the income distribution. The Gini coefficient in Bulgaria for the period 2004-2011 is given provided by the table below.

| Year             | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|------------------|------|------|------|------|------|------|------|------|------|------|
| Gini coefficient | 26   | 25   | 31   | 35   | 35   | 33   | 33   | 35   | 33   | 35   |

- Share of living costs (including rent) and share of rent of disposable household income



- Share of households in energy poverty:

About 50% of Bulgarian population is at risk of poverty and social exclusion. Even two thirds of the Bulgarians are limiting their heat comfort in winter due to a lack of money<sup>5</sup>

About 250 000 households are eligible for the winter supplement program. These are 8.3% of all households.

- Definition of energy poverty: none

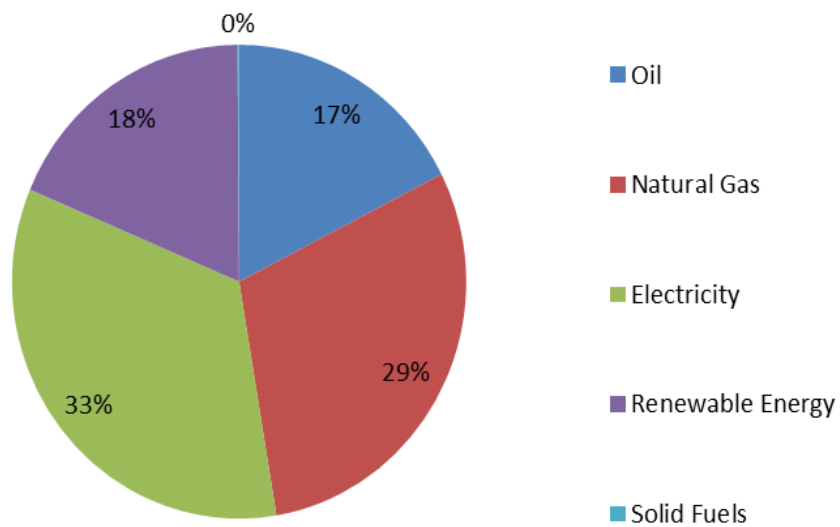
#### Data Sources

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4. Eurostat (2015): Actual Heating Degree Days, nrg\_esdgr\_a.
5. Peneva, T. (2014) Energy Poverty: the Bulgarian case.

## Factsheet France

### General Information

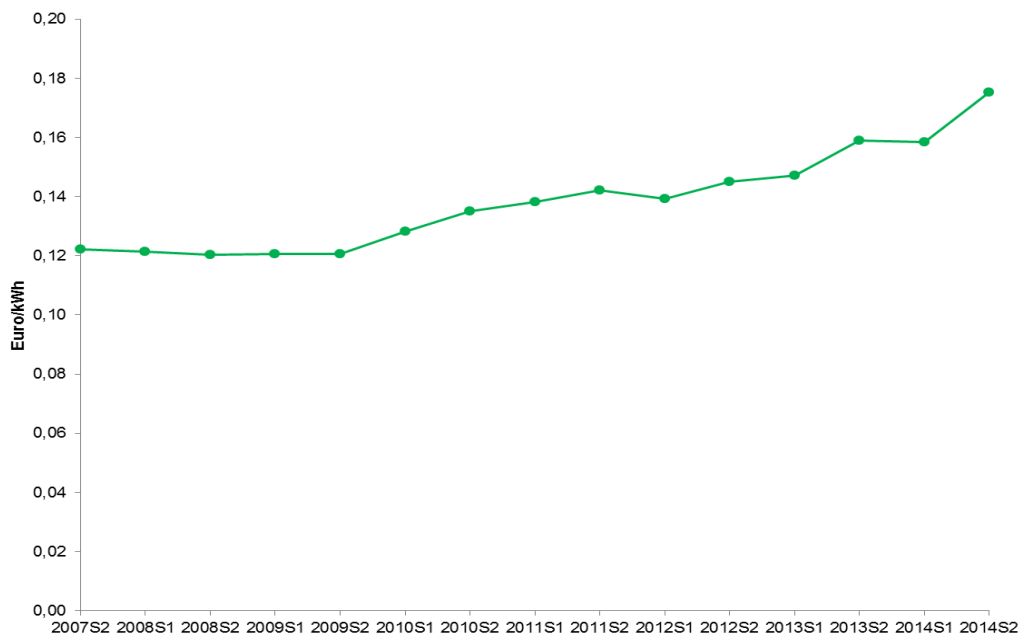
- Number of households (2010): 27.3 Mio.
- Household fuel mix for heating (2013):



- Heating degree days (HDD)

| Year | 2000  | 2001  | 2002  | 2003  | 2004  | 2005  | 2006  | 2007  | 2008  | 2009  |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HDD  | 2 222 | 2 376 | 2 176 | 2 343 | 2 467 | 2 456 | 2 274 | 2 212 | 2 397 | 2 340 |

- Household energy price development (2007-2014)



## Energy / fuel poverty indicators

- Energy consumption per household, household income and distribution of income in society

Energy consumption per household has remained fairly constant around 20 MWh/year. During the same period, household incomes in purchasing power parity have risen from 20 870 € to 22 743 € after remaining stable in the crisis. Household incomes below the poverty threshold have also risen from 8 963€ to 9 744€ in 2013.

- Gini-coefficient

The Gini coefficient indicates more inequality over the years (27 in 2003 vs. 30.1 in 2013).

- Definition of energy poverty

“Précarité énergétique”: More than 10% of actual household spending on energy (defined in “Grenelle II” law); 13% of households and 36% of households in lowest income quartile are energy poor

## Existing or planned policies/measures/welfare systems

- Energy saving and efficiency policies

Plan de rénovation énergétique de l’habitat (PREH) housing modernisation scheme at 500 000 dwellings p. a.

Réglementation thermique regulating performance of new buildings

- Policies and measures to prevent energy poverty

Energy poverty, or precariousness (“précarité énergétique”), has been on the French national agenda since 2007, but programmes targeting a growing amount of energy debts have been in place since the mid-1980s. In 2000, electricity was declared an “essential good” and a basic “right to energy”.<sup>19</sup> The Energy Solidarity Fund (FSL) obliges utilities to support people who are unable to pay their energy bills, but does not specifically target energy-poor households.

Specific policies targeting fuel poverty in all its aspects, including the energy performance of buildings, have only been implemented since 2010. By way of the Grenelle 2 law<sup>20</sup>, a first survey of energy poverty was conducted, and energy precariousness defined as an actual spending of more than 10% of household income on energy. According to those surveys, 13% of households in mainland France are identified as fuel poor, and 36% of households in the lowest income quartile.

“Habiter Mieux” modernisation scheme targeted at low-income homeowners (€ 500 million)

Social tariffs for electricity and gas (TPN, TSS); 90–100 € p. a. savings on average for eligible households

## Data Sources

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<sup>19</sup> Loi du 10 février 2000 relative à la modernisation et au développement du service public de l’électricité.

<sup>20</sup> Loi no. 2010-788 du 12 juillet 2010 portant engagement national pour l’environnement

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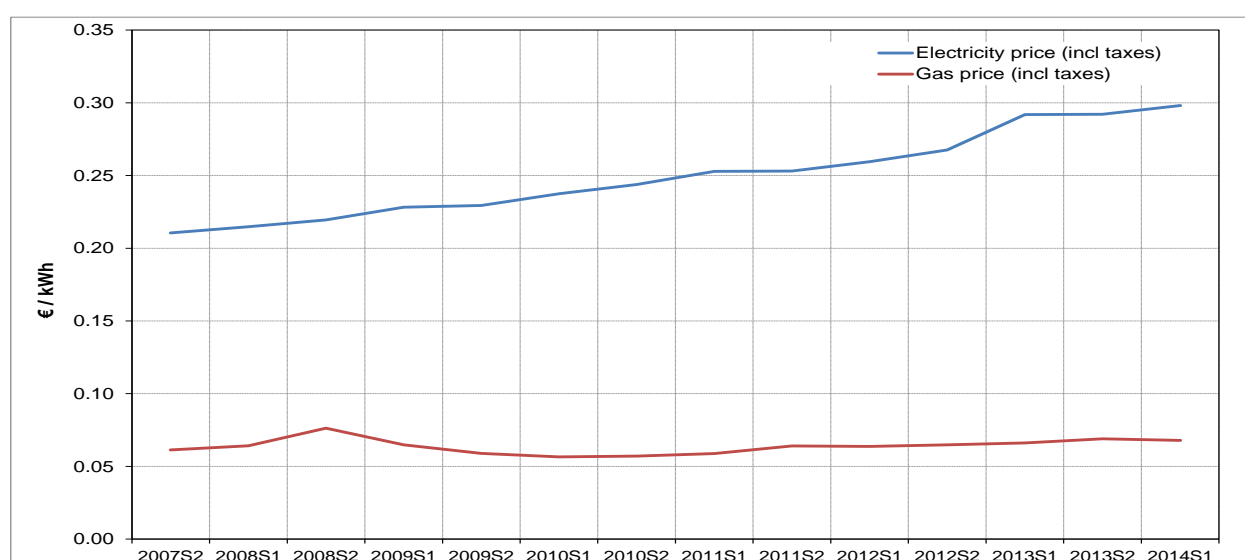
## Factsheet Germany

### General Information

- Number of households (2012): 40 million
- Household fuel mix for heating (2013): Gas 40%, oil 22%, electricity 19%, renewables 11% district heating 7%, coal 1%
- Heating degree days (HDD):

| Year | 2000  | 2001  | 2002  | 2003  | 2004  | 2005  | 2006  | 2007  | 2008  | 2009  |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HDD  | 2 781 | 3 118 | 2 960 | 3 124 | 3 185 | 3 136 | 3 012 | 2 798 | 2 971 | 3 063 |

- Household energy price development (2007-2014)



### Energy / fuel poverty indicators

- Energy consumption per household, household income and distribution of income in society

| Decile net equivalent household income <sup>1)</sup> | Net equivalent household income |                             | Electricity use |                                 |       | Heating energy |             |      |               |        |
|------------------------------------------------------|---------------------------------|-----------------------------|-----------------|---------------------------------|-------|----------------|-------------|------|---------------|--------|
|                                                      | Average                         | highest income (percentile) | Electricity     | Elec. for night-storage heating | Total | Nat. gas       | Heating oil | Coal | District heat | Total  |
|                                                      | Euros per month                 |                             | kWh p.a.        |                                 |       | kWh p.a.       |             |      |               |        |
| Below 5%                                             | 686                             | 855                         | 2 087           | 241                             | 2 327 | 2 810          | 1 576       | 270  | 1 653         | 6 309  |
| 1st decile                                           | 812                             | 1 043                       | 2 130           | 213                             | 2 343 | 3 171          | 1 576       | 208  | 1 816         | 6 771  |
| 2nd decile                                           | 1 193                           | 1 329                       | 2 559           | 315                             | 2 874 | 4 654          | 2 509       | 282  | 1 761         | 9 207  |
| 3rd decile                                           | 1 441                           | 1 552                       | 2 778           | 291                             | 3 069 | 5 469          | 3 154       | 318  | 1 627         | 10 568 |
| 4th decile                                           | 1 659                           | 1 771                       | 2 944           | 268                             | 3 212 | 5 726          | 4 315       | 342  | 1 411         | 11 795 |
| 5th decile                                           | 1 883                           | 1 994                       | 3 038           | 313                             | 3 351 | 6 551          | 4 796       | 306  | 1 204         | 12 857 |
| 6th decile                                           | 2 116                           | 2 244                       | 3 218           | 355                             | 3 573 | 7 042          | 5 050       | 398  | 1 113         | 13 603 |
| 7th decile                                           | 2 396                           | 2 564                       | 3 276           | 395                             | 3 671 | 7 520          | 5 186       | 409  | 858           | 13 973 |
| 8th decile                                           | 2 773                           | 3 021                       | 3 501           | 290                             | 3 791 | 7 963          | 6 544       | 445  | 872           | 15 823 |
| 9th decile                                           | 3 386                           | 3 854                       | 3 629           | 366                             | 3 995 | 8 899          | 6 558       | 448  | 798           | 16 704 |
| 10th decile                                          | 5 385                           | .                           | 3 805           | 399                             | 4 204 | 9 690          | 6 665       | 392  | 990           | 17 737 |
| Average                                              | 2 252                           | .                           | 3 051           | 317                             | 3 367 | 6 532          | 4 506       | 349  | 1 272         | 12 660 |

<sup>1)</sup> Equivalence weighted with new OECD scale

- Gini-coefficient:

The Gini-coefficient is between 1995 and 2013 on the same level (around 29).

- Definition of energy poverty:

Germany does not have an official definition of the 'energy poor'.

#### Existing or planned policies/measures/welfare systems

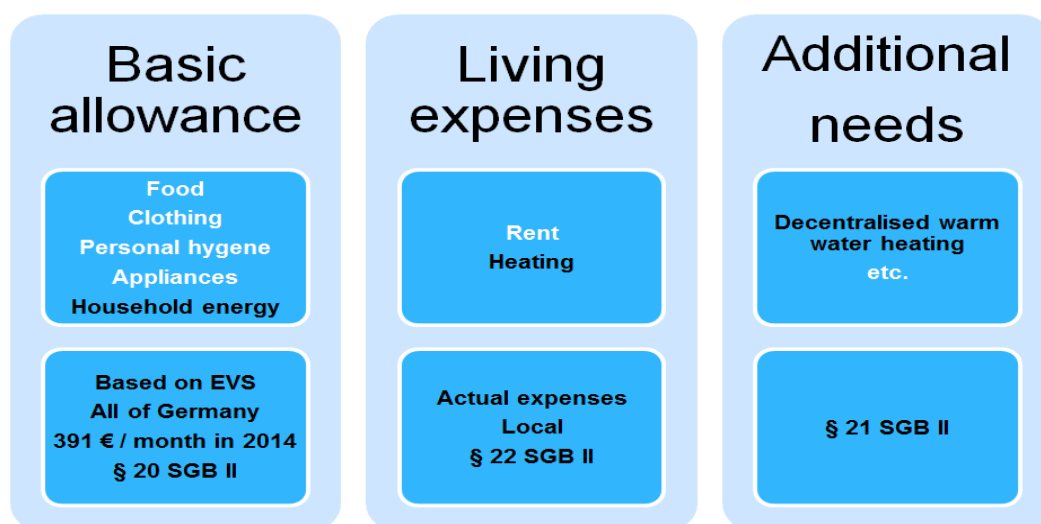
- Energy saving and efficiency policies

The existing Energy saving legislation (EnEV 2013) and its further development planned for 2019, sets minimum efficiency standards for the renovation of existing, as well as for the construction of new buildings. Another important policy in the building sector are the loans and subsidies available from the KfW (Kreditanstalt für Wiederaufbau). These loans and subsidies are accessible for the renovation of existing or construction of new buildings adhering to certain efficiency standards. The National Action Plan on Energy Efficiency (NAPE) sets out a number of new policies to be implemented. In particular, tax incentives for energy-efficient renovations that surpass the standards set out in the EnEV, several consulting programs and a national energy-efficiency label for old heating installations.

In the electricity / appliances sector, the two EU Directives on Ecodesign (2009/125/EC) and Labelling (2010/30/EU) of appliances and the installation of smart meters are inscribed in the Energy Efficiency Directive (2012/27/EU) that is currently passed into German law. The NAPE contains additional measures, such as the Top Runner Initiative, which would – at the national level – strengthen the incentives for efficient product design and adequate information on efficient appliances. Furthermore, the NAPE envisages the setting up of competitive tenders for the reduction of electricity consumption in all sectors of the economy. In this context, funds that support the achievement of these reductions would be tendered competitively and bid for by parties representing a program to carry out these reductions. The following table presents the expected reductions of energy consumption at the household level. The numbers are based on the ongoing German research project to be submitted under this year's NAPE submission.

| Category                                   | Policy instrument                                                                                                                                                                                                                               | Energy saving potential until 2020 (TWh) |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| Existing policies buildings                | Energy saving legislation (EnEV 2013)<br>KfW Energy-efficient renovations<br>KfW Energy-efficient construction                                                                                                                                  | -37.2                                    |
| Existing policies electricity / appliances | EU Ecodesign<br>EU Labelling<br>Smart Meter                                                                                                                                                                                                     | -19.2                                    |
| NAPE policies buildings                    | Further development of Energy saving legislation<br>Tax incentives for energy-efficient renovations<br>Quality assurance and optimising of energy consulting<br>Heating check<br>National energy-efficiency label for old heating installations | -14.4                                    |
| NAPE policies electricity / appliances     | Further development of national Top Runner Initiative<br>Competitive tenders (electricity)                                                                                                                                                      | -6.1                                     |

The German social security system also includes provisions for energy expenditure. It consists of three pillars: A basic allowance that includes a component for household energy (i.e. mostly electricity), living expenses are paid for directly by the local authority and include payment of heating costs. Finally, there are provisions for cases with additional needs, if for example water heating takes place decentralised. Whilst actual expenses for heating are covered, it has been noted that the fraction of the basic allowance dedicated to electricity expenditure may be insufficient considering the dynamic development of electricity prices (Neuhoff et al. 2013).



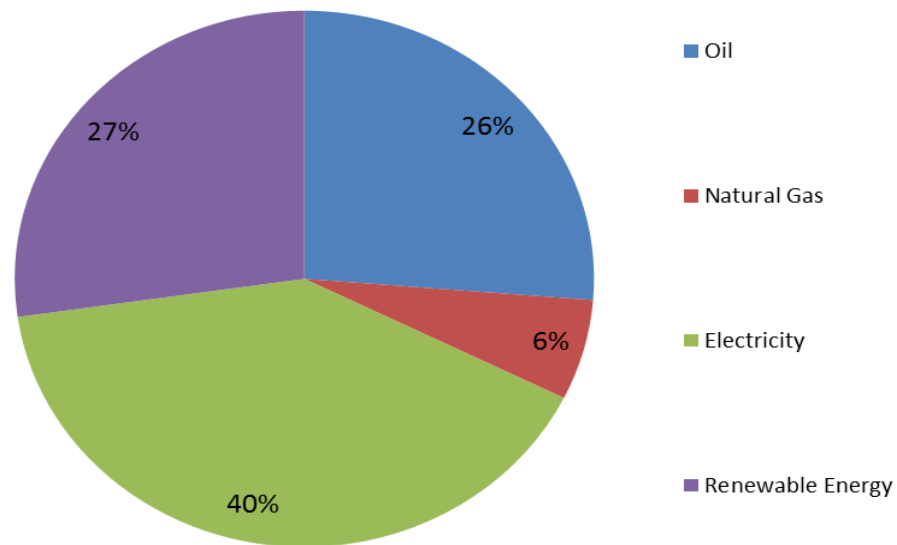
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8. Neuhoff, Karsten; Bach, Stefan; Diekmann, Jochen; Beznoska, Martin; ElLaboudy, Tarik (2013): Distributional Effects of Energy Transition Impacts of Renewable Electricity Support in Germany. In: Economics of Energy & Environmental Policy, Vol. 2, No. 1.

## Factsheet Greece

### General Information

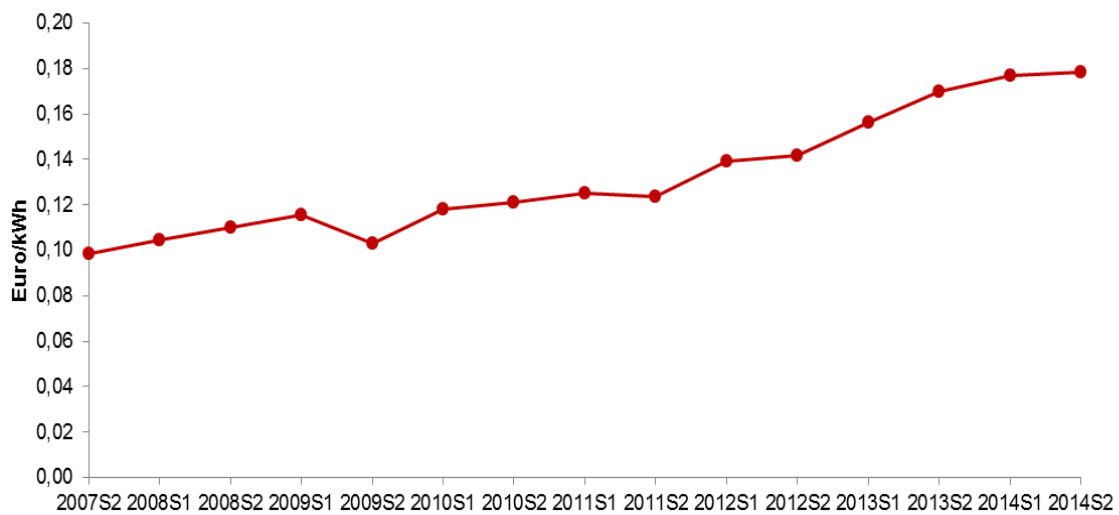
- Number of households (2011): 4,1 Mio.
- Household fuel mix for heating (2013)



- Heating degree days (HDD):

| Year | 2000  | 2001  | 2002  | 2003  | 2004  | 2005  | 2006  | 2007  | 2008  | 2009  |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HDD  | 1 581 | 1 539 | 1 490 | 1 713 | 1 545 | 1 624 | 1 685 | 1 489 | 1 434 | 1 449 |

- Household energy price development (2007-2014)



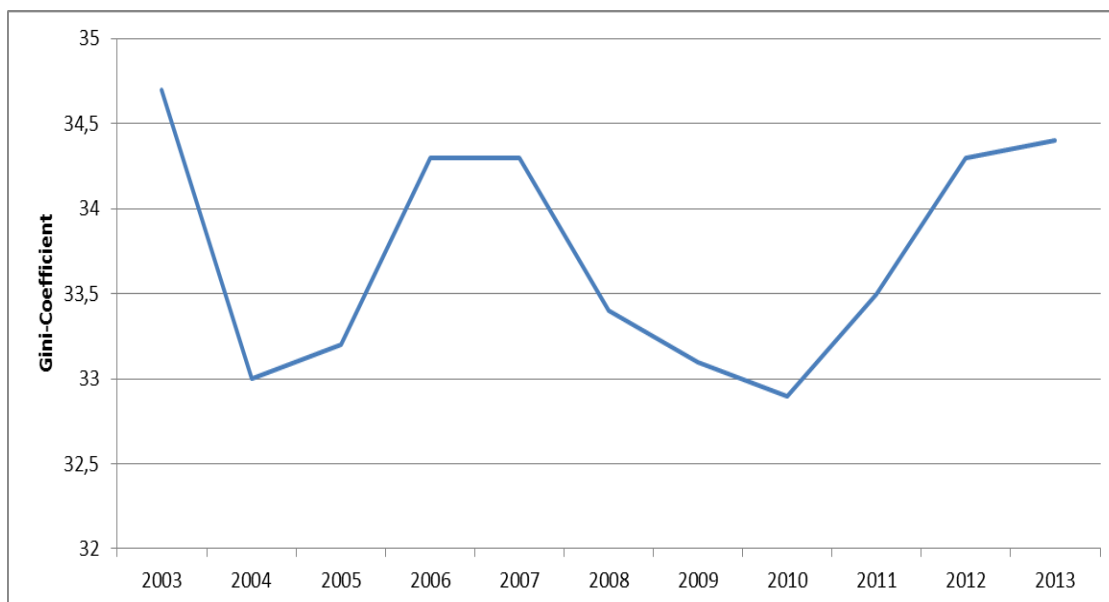
### Energy / fuel poverty indicators

- Energy consumption per household, household income and distribution of income in society

In 2012, the average Greek household consumed 13 994 kWh of energy. 73 % of this consumption was dedicated to thermal energy such as heating (86%), cooking (10%) and domestic hot water production (4%) (10 244 kWh) and 3 750 kWh for electricity consumption.

- Gini-coefficient:

Households' equivalised disposable income in Greece in 2013 was € 10 066. From 2003-2013, trend towards more equally distributed income could be observed, as indicated by the Gini coefficient which is approximately constant by 34.4. Greece belongs to the Member States with the highest inequality of income distribution.



- Share of households in energy poverty

The percentage of energy poverty in Greece is close to 36%. Almost 20% of the population lives in low income housing while it is reported that almost 28% of the population lives in houses with leaking windows and 26% of the low income population in Greece cannot afford to cover the expenses for heating while the national average is close to 8%.

- Definition of energy poverty:

There is no standard quantitative definition of energy poverty in Greece.

### Existing or planned policies/measures/welfare systems

- Policies and measures to prevent energy poverty

The government introduced social electricity tariffs for residential consumers. These give a discount of up to 42% on annual consumption of up to 5000 kWh, compared with the normal household bill.

The Greek Parliament has adopted in March 2015 a law introducing free delivery of electricity in the amount of up to 300 kWh per household in 2015 who are not able to pay their energy bills. The reason could be that this incapability of customers to pay

their electricity bills has created important liquidity problems for the Public Power Corporation. The debts due to unpaid bills declined within one year about 45%. Up to 30 000 households should get housing allowances of 70 – 200 Euro per month. This is a short-term measure.

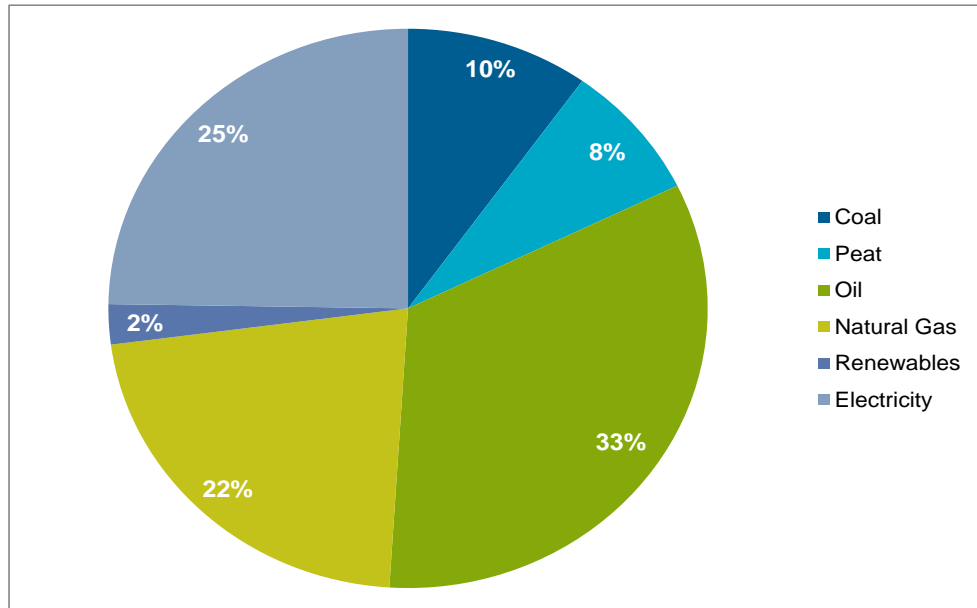
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3. Dagoumas, Athanasios; Kitsios, Fotis (2014): Assessing the impact of the economic crisis on energy poverty in Greece. In: *Sustainable Cities and Society*, 13, p. 267–278.

## Factsheet Ireland

### General Information

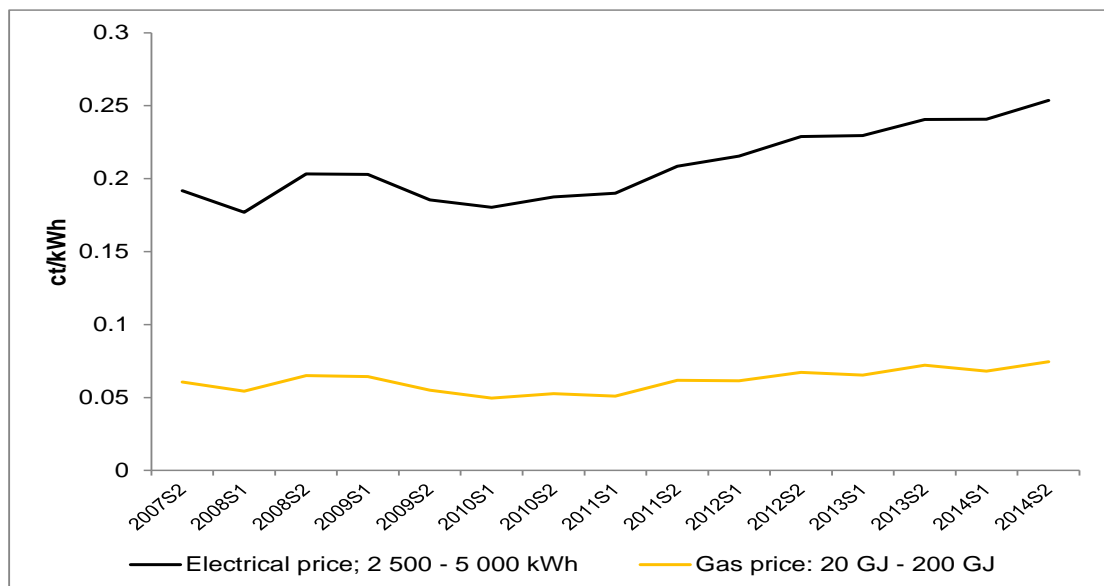
- Number of households (2013): 1.6 Mio.
- Household fuel mix for heating (2013)



- Heating degree days (HDD):

| Year | 2000  | 2001  | 2002  | 2003  | 2004  | 2005  | 2006  | 2007  | 2008  | 2009  |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HDD  | 2 815 | 2 826 | 2 734 | 2 661 | 2 721 | 2 623 | 2 623 | 2 552 | 2 826 | 2 841 |

- Household energy price development (2007-2014)



### Energy / fuel poverty indicators

- Energy consumption per household, household income and distribution of income in society

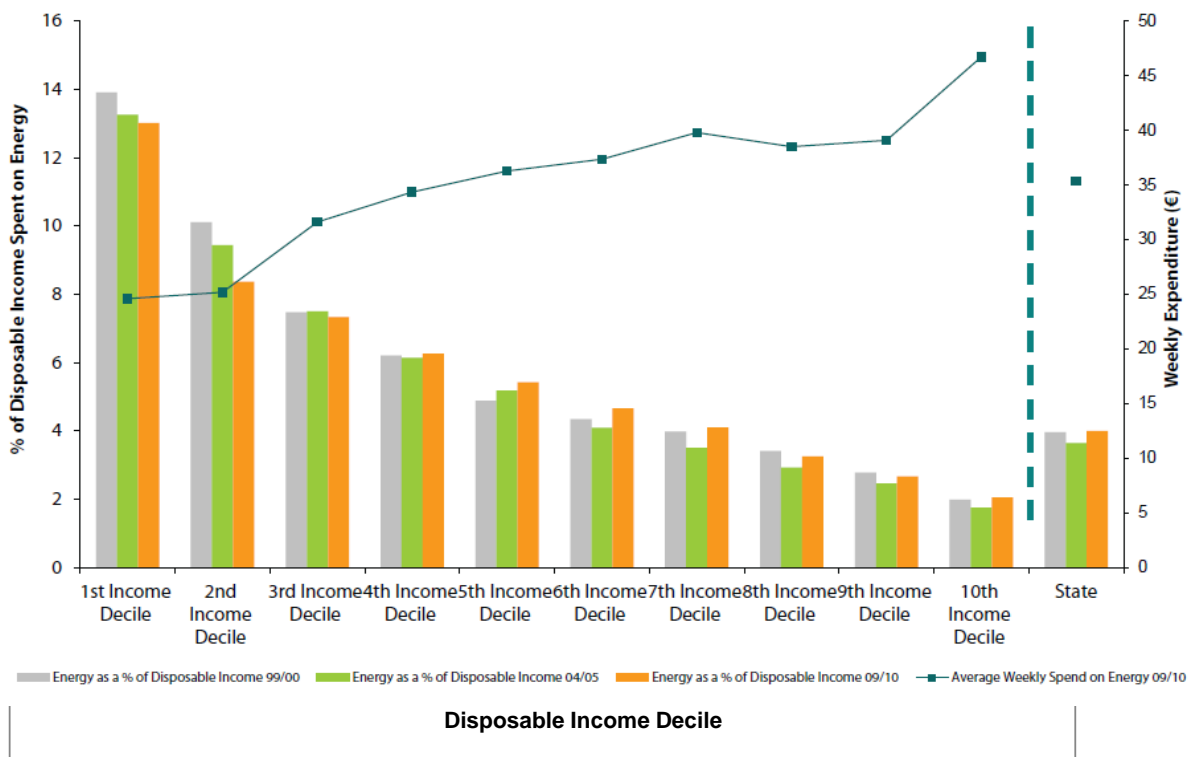
In 2011, the average dwelling consumed 20 000 kWh energy. Of this, electricity accounted for approximately 25 % and non-electrical consumption for 75 % accounted. Households on average consumed 166 kWh final energy per square meter per year (124 kWh non-electrical energy, 42 kWh electricity).

Household equalised disposable income in Ireland in 2011 was € 21 440. The income distribution of income in society can be measured by the Gini coefficient. Perfect income equality equals a Gini coefficient of zero. The higher the Gini coefficient, the more unequal the income distribution. The Gini coefficient in Ireland for the period 2004-2011 is given provided by the table below

- Gini-coefficient:

| Year             | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|------------------|------|------|------|------|------|------|------|------|
| Gini-coefficient | 31.8 | 32.4 | 32.4 | 31.7 | 30.7 | 29.3 | 31.6 | 31.1 |

- Share of living costs (including rent) and share of rent of disposable household income



- Definition of energy poverty:

Since 1990 and in the Warmer Homes Act (2011) energy poverty is defined via the expenditure approach. A household is deemed:

In energy poverty if it spends more than 10% of its income on energy

In severe energy poverty if it spends more than 15 % of its income on energy



In extreme energy poverty if it spends more than 20 % of its income on energy

This definition is currently under review and a consultation process is initiated to derive the appropriate definition /methodology on energy poverty in Ireland. Further there is a 2007 definition from the National Action Plan for Social Inclusion 2007-2016: *fuel poverty has been described as the inability to afford adequate warmth in a home, or the inability to achieve adequate warmth because of the energy inefficiency of the home.*

In 2011 it was estimated that 20 % of the Irish households experienced energy poverty in 2009. 151 000 of those households were considered to have faced severe energy poverty and 83 000 were considered having experienced extreme energy poverty.

#### Existing or planned policies/measures/welfare systems

- Energy saving and efficiency policies

To help those considered energy poor two branches of action can be considered necessary: 1) Energy saving and energy efficiency. This is important because citizens at risk of energy poverty are more likely to live in homes with poor energy efficiency standards. 2) Financial support to make ends meet. This branch is specifically important in colder months where citizens in energy poverty may have trouble keeping their homes adequately warm.

Considered the primary mechanism to support low-income households with respect to energy efficiency is the Better Energy Warmer Homes Scheme. This scheme is part of the wider Better Energy Program and funds energy efficiency measures in low-income households. It is administered by the Sustainable Energy Authority of Ireland and funds energy efficiency measures such as attic insulation, draught proofing, energy efficient lighting and cavity wall insulation.

- Policies and measures to prevent energy poverty

Ireland has two main schemes directed to support those who are considered energy poor: The Household Benefits Package (HBP) and the Fuel Allowance (FA) scheme.

The HBP provides support to eligible households by providing monthly allowances for electricity and natural gas. The monthly allowance is a €35 cash credit. Eligible persons are all those over 70 years of age, but also younger persons in case they meet eligibility criteria (such as the receipt of state pension, living alone, receipt of disability or invalidity payment).

Further, via the FA scheme, eligible applicants receive a weekly support to enable them to appropriately heating their homes. The FA is paid to a household and comprises of €20 for 26 weeks of the year.

- Transparency and Information on such policies

Information on these policies, the eligibility criteria and how to apply is provided online via the Citizens Information Board website<sup>21</sup>.

Better Energy Warmer Homes Scheme:

[http://www.citizensinformation.ie/en/housing/housing\\_grants\\_and\\_schemes/warmer\\_homes\\_scheme.html](http://www.citizensinformation.ie/en/housing/housing_grants_and_schemes/warmer_homes_scheme.html)

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<sup>21</sup> The Citizens Information Board is the national agency responsible for supporting the provision of information, advice and advocacy on social services and for the provision of the Money Advice and Budgeting Service. (see: <http://www.citizensinformationboard.ie/> )

HBP:

[http://www.citizensinformation.ie/en/social\\_welfare/social\\_welfare\\_payments/extra\\_social\\_welfare\\_benefits/household\\_benefits\\_package.html](http://www.citizensinformation.ie/en/social_welfare/social_welfare_payments/extra_social_welfare_benefits/household_benefits_package.html)

FA:

[http://www.citizensinformation.ie/en/social\\_welfare/social\\_welfare\\_payments/extra\\_social\\_welfare\\_benefits/fuel\\_allowance.html](http://www.citizensinformation.ie/en/social_welfare/social_welfare_payments/extra_social_welfare_benefits/fuel_allowance.html)

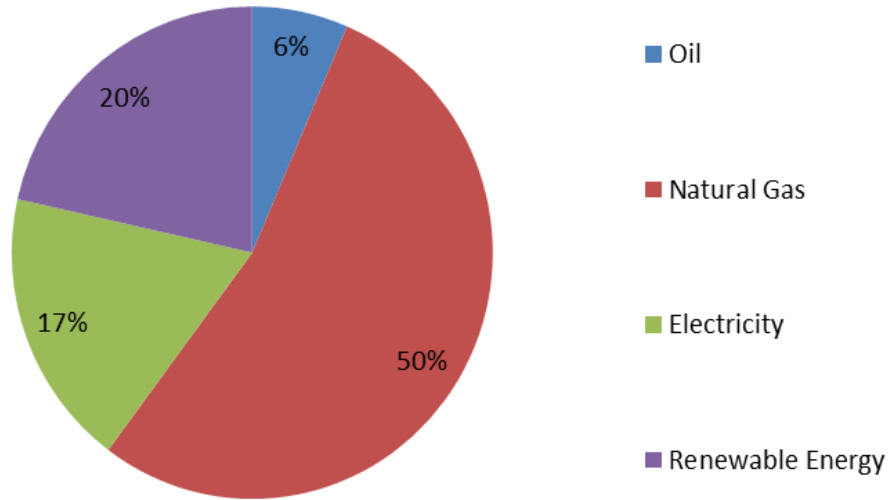
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## Factsheet Italy

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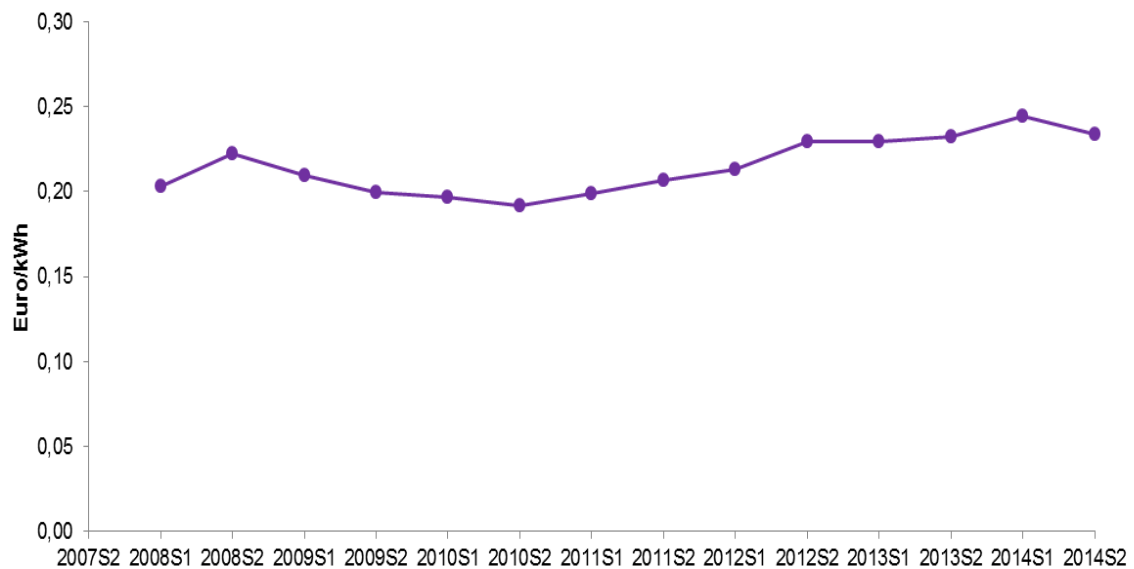
- Number of households (2013): 24 Mio.
- Household fuel mix for heating (2013)



- Heating degree days (HDD)

| Year | 2000  | 2001  | 2002  | 2003  | 2004  | 2005  | 2006  | 2007  | 2008  | 2009  |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HDD  | 1 695 | 1 767 | 1 711 | 1 913 | 1 883 | 2 051 | 1 824 | 1 715 | 1 776 | 1 829 |

- Household energy price development (2007-2014)



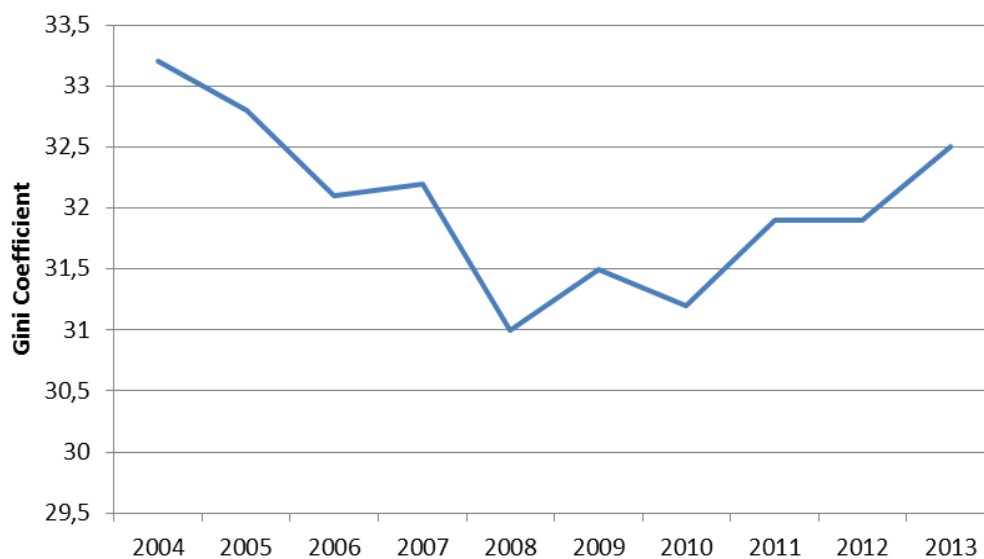
## Energy / fuel poverty indicators

- Energy consumption per household<sup>1</sup>, household income and distribution of income in society

The total household final energy consumption amounted in 2012 to 31 million toe. The energy use of households increase about 1.3 percent since 1990. In 2012, the average Italian household consumed 15 022 kWh of energy with approximately 5 000 kWh for electricity. Italians consume per capita less energy than other MS. This is due to relatively high power prices and the legacy of the economic crisis. More than 20 households out of 100 use wood for energy purposes (consuming 3.2 tons on average per year), while only 4.1% uses pellets. The firewood consumption is higher in mountain municipalities (over 40% of households).

- Gini-coefficient:

From 2004-2013, the trend as indicated by the Gini coefficient is approximately constant by 32. Italy ranks in the middle due to inequality of income distribution within the Member States. Households' equivalised disposable income in Italy in 2013 was € 17 285.



- Share of households in energy poverty:

In 2012 approximately 20% of the households got energy rebates with 286 Euro on average per year. Banca D'Italia estimates, that 9% of households live in energy poverty.

- Definition of energy poverty

According to the Warm Homes and Energy Conservation Act of UK a person is said to be in fuel poverty "if he is a member of a household living on a lower income in home which cannot be kept warm at a reasonable cost".

## Existing or planned policies/measures/welfare systems

- Policies and measures to prevent energy poverty

The Government launched an energy rebate for electricity and gas ("bonus gas" in 2008 and "bonus elettrico" in 2007). The program is funded through specific components in transmission or distribution prices, paid by all consumers.

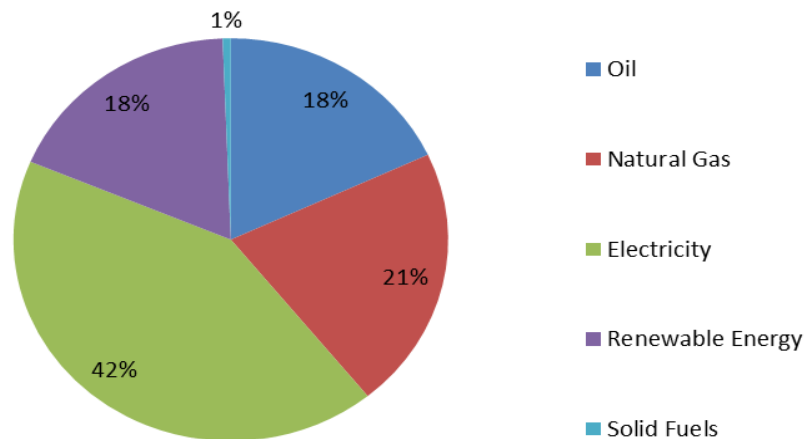
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## Factsheet Spain

### General Information

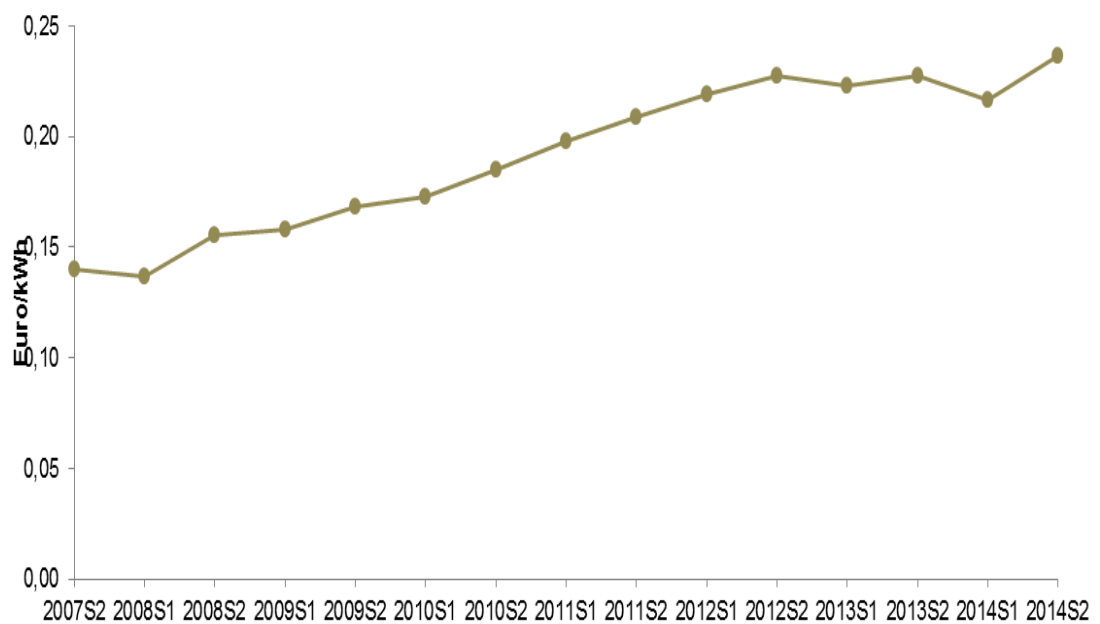
- Number of households (2011): 18 Mio.
- Energetic standard of the building stock: specific energy use for heating (kWh/m<sup>2</sup>)
- Household fuel mix for heating (2013)



- Heating degree days (HDD)

| Year | 2000  | 2001  | 2002  | 2003  | 2004  | 2005  | 2006  | 2007  | 2008  | 2009  |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HDD  | 1 806 | 1 751 | 1 632 | 1 754 | 1 896 | 1 937 | 1 655 | 1 789 | 1 829 | 1 686 |

- Household energy price development (2007-2014)



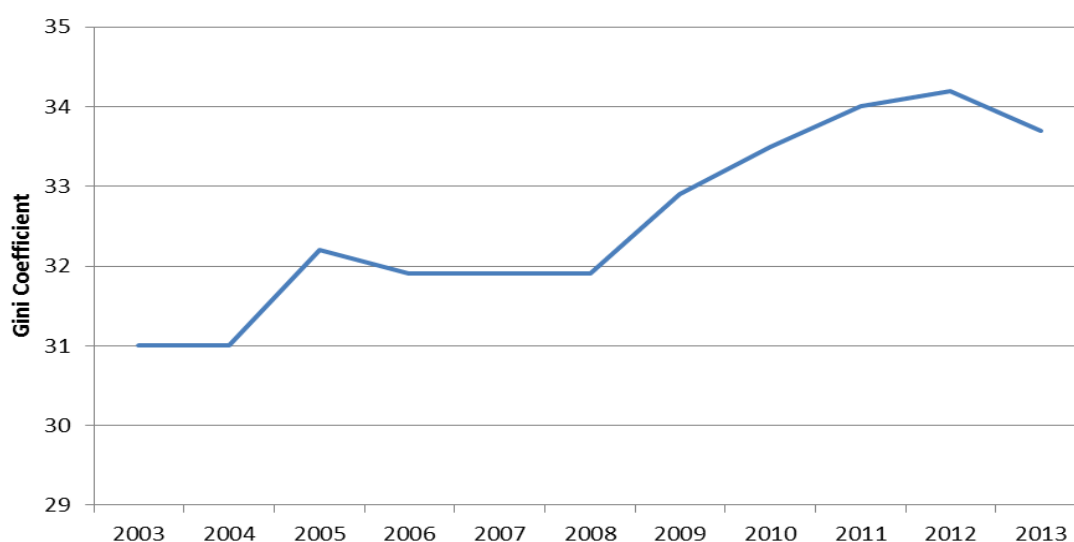
## Energy / fuel poverty indicators

- Energy consumption per household, household income and distribution of income in society

The average consumption of a Spanish household is 10 521 kWh a year, with a predominance of fuels in terms of final energy, 1.8 times higher than electric power consumption. 62% of the electric consumption is related to household appliances, and to a lesser extent, to cooking, heating and hot water services. 47% of energy consumption is for heating .

- Gini-coefficient:

Households' equivalised disposable income in Spain in 2013 was € 16 474. From 2004-2013, trend towards more less distributed income could be observed, as indicated by the Gini coefficient which is approximately decreasing from 31 in 2003 to 33.7 in 2013.



- Share of households in energy poverty

Approximately 10% of Spanish households live in energy poverty, mostly due to low incomes . Especially in the winter time Spain has excess mortality rate, among the highest in Eu-ropo . There is no standard quantitative definition of energy or fuel poverty in Spain. There is a used indicator for poverty measure: A household is in poverty if the equalized disposable house-hold income < 60% Median .

- Definition of energy poverty

According to the Warm Homes and Energy Conservation Act of UK a person is said to be in fuel poverty "if he is a member of a household living on a lower income in home which cannot be kept warm at a reasonable cost".

## Existing or planned policies/measures/welfare systems

- Policies and measures to prevent energy poverty

Spain is still missing a fuel poverty strategy, even though some policies, measures and elements of the legal framework like the social tariff for electricity consumers are mitigating. This tariff is temporarily and only for electricity consumers. Particularly relevant is the unsolved issue of the electricity tariff deficit (i.e., the difference between what utilities are paid for the electricity they sell and their reported cost of producing power). The deficit has been accumulating since the early

2000s until reaching the 24 billion Euros in 2012 (with a foreseen increase of 5 Billion Euros per year in the coming years if measures are not adopted), which has threatened the long-term sustainability of the Spanish power generation system and motivated electricity tariff increases above inflation rates since 2007. Electricity prices probably are a key reason why fuel poverty has increased in Spain since 2008. Spain has the problem in fuel poverty due to relative excess winter mortality rates. It is estimated that fuel poverty may be the cause of between 2,300 and 9,300 excess winter deaths.

#### Data Sources

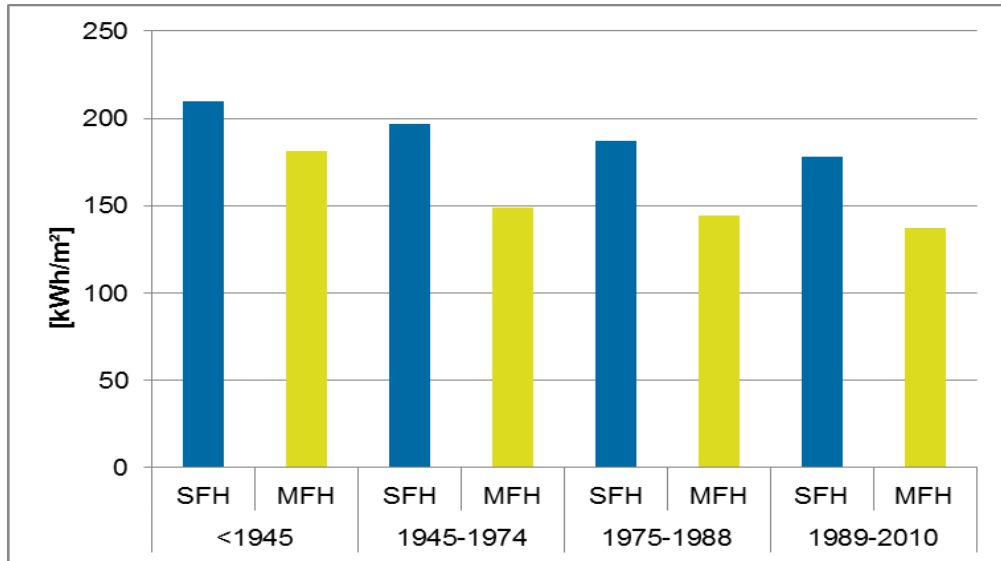
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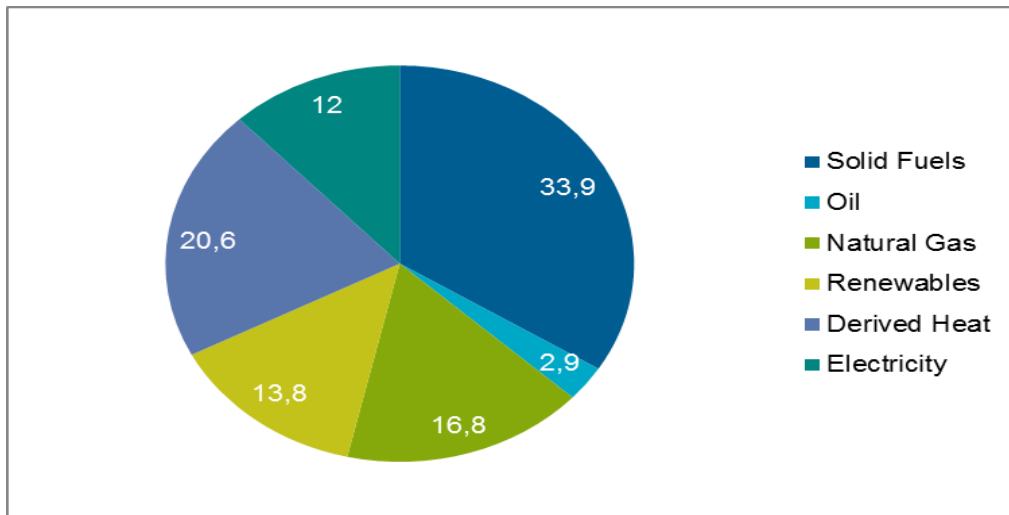
## Factsheet Poland

### General Information

- Number of households (2011): 13.6 Mio.
- Energetic standard of the building stock: specific energy use for heating (kWh/m<sup>2</sup>)



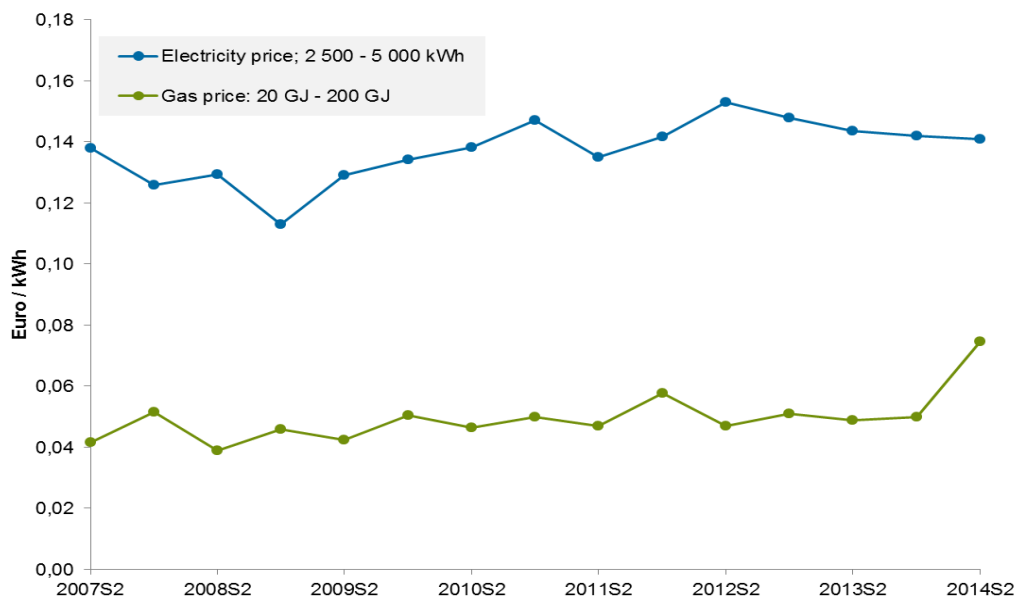
- Household fuel mix for heating (2013)



- Heating degree days (HDD)

| Year | 2000  | 2001  | 2002  | 2003  | 2004  | 2005  | 2006  | 2007  | 2008  | 2009  |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HDD  | 3 092 | 3 581 | 3 337 | 3 594 | 3 510 | 3 547 | 3 454 | 3 222 | 3 164 | 3 439 |

- Household energy price development (2007-2014)



### Energy / fuel poverty indicators

- Energy consumption per household, household income and distribution of income in society

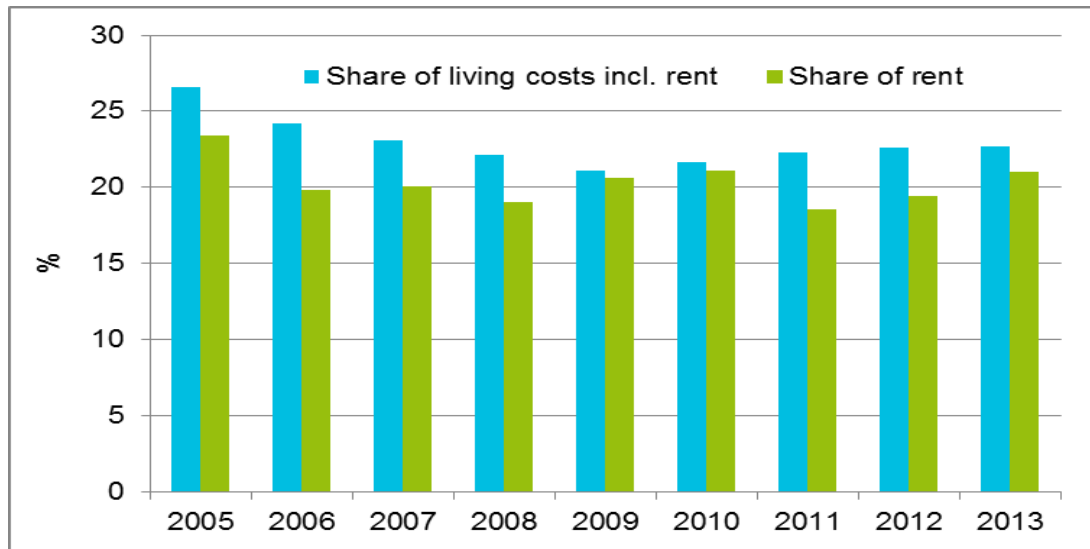
In 2013, the average household consumed about 12 310 kWh/yr. energy for heating, warm water and lighting.

- Gini-coefficient

Household equalised disposable income (ppp) in Poland in 2013 was € 10 615. The income distribution of income in society can be measured by the Gini coefficient. Perfect income equality equals a Gini coefficient of zero. The higher the Gini-coefficient, the more unequal the income distribution. The Gini-coefficient in Poland for the period 2000-2013 is given by the table below.

| Year             | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|------------------|------|------|------|------|------|------|------|------|------|
| Gini-coefficient | 35.6 | 33.3 | 32.2 | 32   | 31.4 | 31.1 | 31.1 | 30.9 | 30.7 |

- Share of living costs (including rent) and share of rent of disposable household income



- Share of households in energy poverty

In 2006 there have been 785 000 households, these are 8,6% of all households in 2006, suffering from fuel poverty in Poland. Depending on the increase of energy prices in the future the percentage of households in fuel poverty could rise to 11% (10% energy price increase) to 17,4% (30% energy price increase)<sup>5</sup>

- Definition of energy poverty: none

#### Existing or planned policies/measures/welfare systems

- Energy saving and efficiency policies
- Policies and measures to prevent energy poverty

Policies addressing fuel poverty in Poland include financial support measures such as governmental support through allowances, and system solutions such as VAT and tax reduction. Apart from social subsidies provided by the state, energy companies took steps, based on a formal agreement, to avoid socially vulnerable consumers being disconnected from the grid. The company support includes installation of pre-payment meters, instalment payments, back interest exemption, shifting in terms of payment, and special agreements with Social Help Centres.

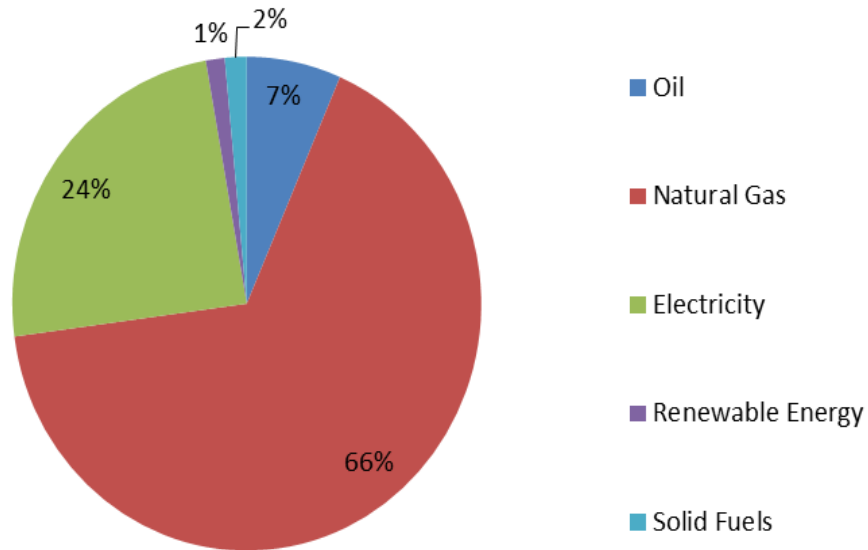
#### Data Sources

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## Factsheet United Kingdom

### General Information

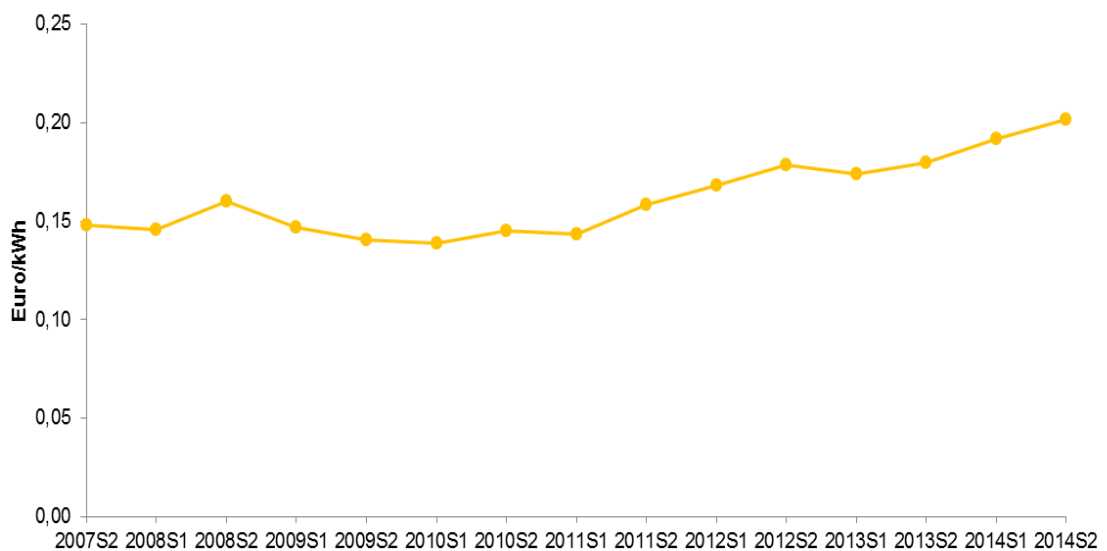
- Number of households (2013): 26 Mio.
- Household fuel mix for heating (2013)



- Heating degree days (HDD)

| Year | 2000  | 2001  | 2002  | 2003  | 2004  | 2005  | 2006  | 2007  | 2008  | 2009  |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| HDD  | 2 978 | 3 092 | 2 883 | 2 880 | 2 881 | 2 879 | 2 813 | 2 817 | 3 043 | 2 989 |

- Household energy price development (2007-2014)



### Energy / fuel poverty indicators

- Energy consumption per household<sup>1</sup>, household income and distribution of income in society  
Energy consumption per household: 15 MWh/year; below-average building performance among EU-15
- The equalized household income in 2013 was 19 492 Euro (in PPP). Since 2007 the income decrease slightly. Households pay 22% of their incomes for living cost including electricity and heating.
- Gini-coefficient:  
The Gini-coefficient decreased between 1995 and 2013 from 32 to 30.
- Share of households in energy poverty:  
4.1 million fuel-poor households with high variability (19% England, < 15% Southeast, 42% Northern Ireland)
- Definition of energy poverty  
A household is in energy poverty if their net income, after deducing the fuel costs necessary to maintain an adequate heating regime, would be below the official poverty line ("Low Income, High Costs"). Nb: Not actual fuel costs, but modelled hypothetical fuel costs used for estimation. Methodologies in devolved administrations differ.

### Existing or planned policies/measures/welfare systems

- Energy saving and efficiency policies  
Green Deal: modernisation grants for homeowners (small effect)  
British Energy Company Obligation: support to low-income households and/or neighbourhoods (Home Heating Cost Reduction Obligation, Carbon Emissions Reduction Obligation, Carbon Saving Community Obligation)
- Policies and measures to prevent energy poverty  
Over time, focus has shifted towards making utilities responsible for alleviating energy poverty. The Energy Company Obligation is now the most important instrument against fuel poverty in mainland Britain. It is not targeted at fuel poor households specifically, but obliges utilities to help those with low incomes improve inefficient homes.  
Grants for improving the energy efficiency of buildings (Warm Front Scheme, Affordable Warmth Programme, Energy Assistance Package, and others)  
Winter Fuel Payment for pensioners: lump sum payment (technically not a fuel poverty policy, but politically framed as such)
- Sub-national and regional programmes (e. g Northern Ireland: Warm Homes & Warm Healthier Homes Schemes)

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### Section 1

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