

**Dr Stefan Bouzarovski – Buzar**

School of Geography, Earth and Environmental Sciences

University of Birmingham

[s.bouzarovski@bham.ac.uk](mailto:s.bouzarovski@bham.ac.uk)

## **Energy poverty in the EU: a review of the evidence**

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. 2010). It is similar to the condition of ‘fuel poverty’ (Boardman 2010), which is, however, more often used in reference to the lack of affordability energy for heating. While it has become commonplace to refer to ‘fuel poverty’ in the context of the UK – which has a long tradition of academic scholarship and policy measures to address the issue – systematic research on issues of domestic energy deprivation in the rest of the EU is at a nascent stage. As a result, state policies to address this problem lack a rigorous scientific basis. This paper overviews the existing knowledge on energy poverty in the EU, while introducing some additional evidence of a more recent nature, in order to identify the main geographical locations and socio-demographic groups that are at risk.

Understanding the causes, content and consequences of energy poverty in the EU is all the more pertinent in light of the increasing policy attention that is being paid to the issue within various European institutions. Motivated by the growing body of evidence that inadequate domestic energy services are present in numerous EU countries, energy poverty concerns were integrated within Directives 2009/72/EC and 2009/73/EC of the European Parliament and the Council, ‘concerning common rules for the internal market in electricity and natural gas supply’. Among other points, the directives required member states to adopt a definition of ‘vulnerable customers’. More recently, the European Economic and Social Committee (EESC) proposed the adoption of a EU-wide definition of energy poverty, as well as the harmonization of existing statistics in order to rigorously assess ‘the energy poverty situation in Europe’. While emphasizing that the number of households affected by this condition could increase, EESC has emphasized the need for setting up a European Energy Poverty Monitoring Centre. A European Commission report, published at the end of November 2010, also dealt with energy poverty, while emphasizing that consumers’ interests should be taken into account in energy policy making.

The generic causes of energy poverty in the European context can be inferred from the findings of existing research. It is generally accepted that energy poverty arises out of a combination of low incomes and inefficient homes, although the specific energy needs of a household – expressed via demographic circumstances such as household size, gender, occupation or class – also play a role (Lampietti and Meyer 2002; Buzar 2007a; EPEE 2009). Of additional importance is the nature of housing tenure and heating system, since they may limit the energy efficiency interventions and fuel switching measures that could reduce energy costs (Buzar 2007b; 2007c). Alongside decreasing the quality of life and influencing social attainment, energy poverty has a particularly strong detrimental effect on health (Harrington et al. 2005), often resulting in an increase the rate of seasonal morbidity and mortality.

The incidence and nature of energy poverty has been established by:

- examining the level of energy services in the home (temperature, lighting, refrigeration, cooling etc.) via direct measurement, and comparing the obtained values to a given standard;
- analysing how patterns of household energy expenditure across the population vary in relation to pre-set absolute and relative lines;

- compiling the subjective impressions of households about the level of energy service reached in the home.

The first approach has not been used on a large scale due to the technical impracticalities and ethical issues associated with it. Adding to this are the difficulties of defining adequate energy service standards, due to, in part, cultural specificities: it is known that a home normally considered well-lit and warm in one geographical context may not be seen as such in another (Wilhite et al. 1996). However, national statistical agencies across the EU do gather expenditure data via household budget surveys; combined with census data and information compiled through other research studies, this has allowed experts to identify the social groups and spatial locations suffering from disproportionately high energy costs. Subjective data relevant to energy poverty is also collected by national statistical agencies, as well as Eurostat's Statistics on Income and Living Conditions (SILC) survey, which was preceded between 1994 and 2001 by the European Community Household Panel (ECHP). Both SILC and ECHP also contain a range of objective data about dwelling quality and the material conditions of households. As a result, self-reported views of thermal comfort can be cross-referenced against other built environment and economic strain indicators.

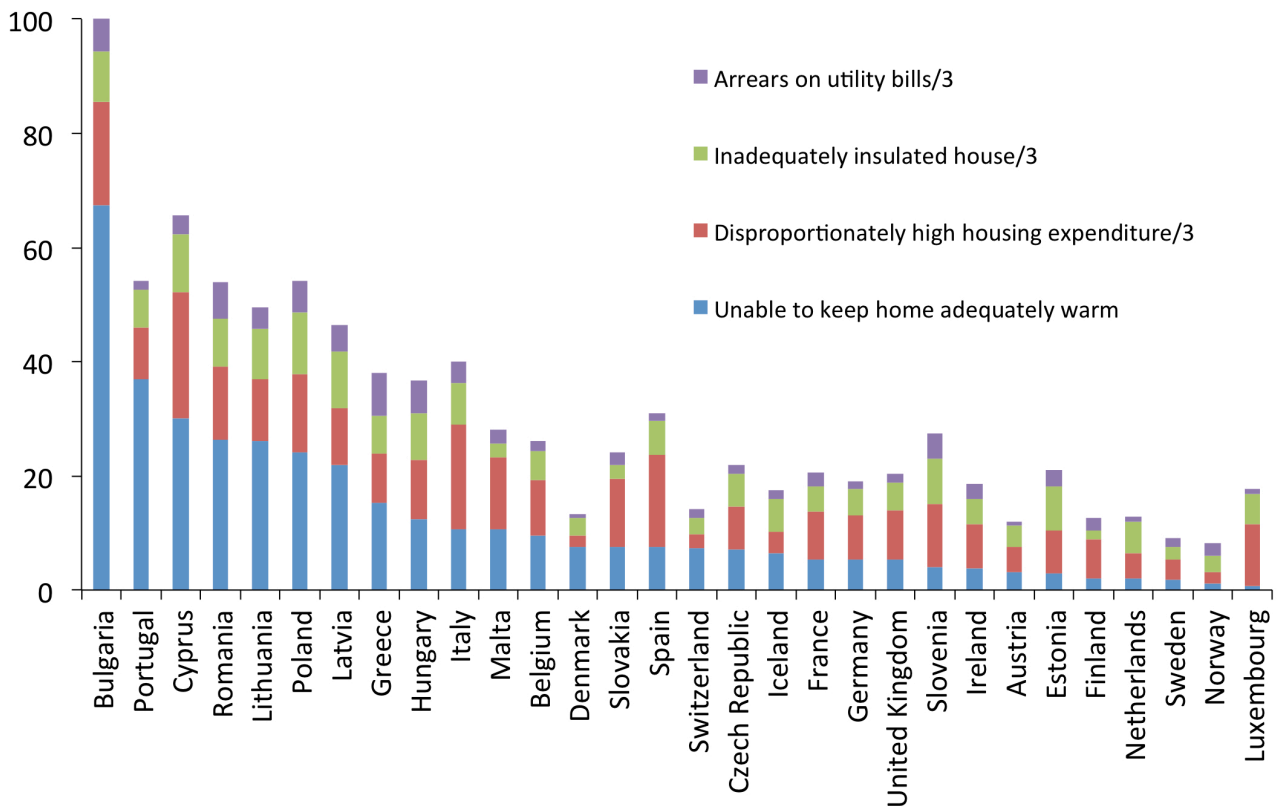
Still, the only directly relevant internationally-comparative tool for judging the extent of energy poverty at the EU scale is provided by the self-reported indicator about the share of population that is 'unable to keep the home adequately warm' within SILC and ECHP. Based on an approach pioneered by Healy (2004), the information generated by this subjective measure can be combined with more objective data about the shares of each EU country's population facing disproportionately high housing burdens, living in low quality dwellings or having arrears on utility bills. Dividing each of these objective indicators by 3 (as they do not necessarily demonstrate energy poverty themselves) and adding them to the more direct subjective measure of the level of domestic heating can provide some general insights into the extent of energy poverty in the EU (Figure 1).

The highest shares of populations with inadequate self-reported domestic warmth are concentrated in the EU-10, especially Bulgaria. In such states, the share of population reporting inadequately heated homes has been 20.0, while the value of the composite fuel poverty indicator is 44.5. This is against respective EU-wide averages of 12.8 and 31.7. Also scoring high according to the same criteria are the 7 EU countries that border the Mediterranean sea<sup>1</sup>, where 16.6 per cent of the population has reported being 'unable to keep their home adequately warm', while the composite fuel poverty indicator reaches 43.58. Exploring the same indicators for the most recent available year (2010 in most cases) reveals similar results, with the shares of populations unable to keep their homes adequately warm in the EU-10 and Mediterranean countries registering at 14.8 and 14.6, respectively. The values of the composite fuel poverty indicator are 40.1 and 39.5 in this case (see Figure 2). Most notably, there has been a surprisingly large (and somewhat doubtful) halving of the share of population with inadequately heated homes in Bulgaria.

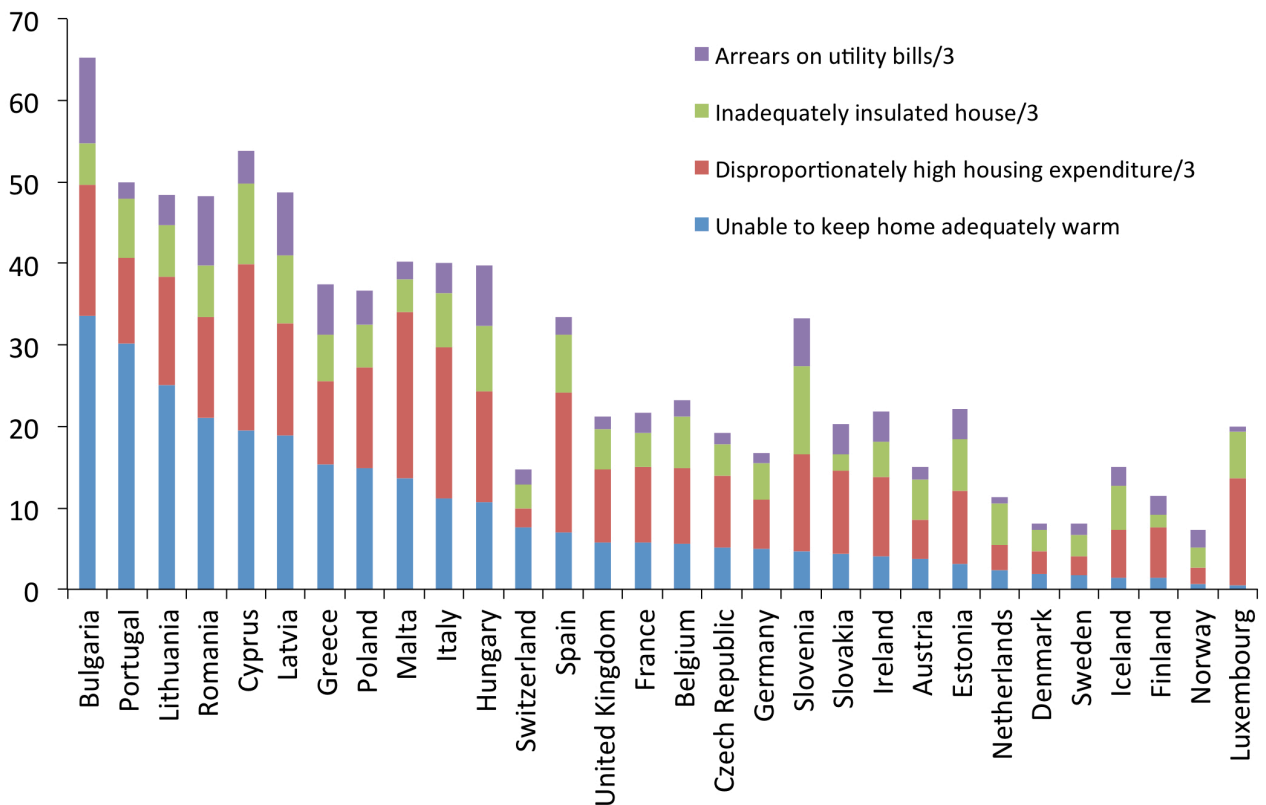
While cultural differences may partly explain the disproportionately high prevalence of self-reported inadequately heated homes in Eastern and Southern Europe, there is little doubt that energy poverty is objectively present in these parts of the continent to a much higher extent than elsewhere. The structural causes of energy poverty in the two regions, however, are markedly different.

---

<sup>1</sup> Slovenia is not included in this measure as it is already counted within the EU-10

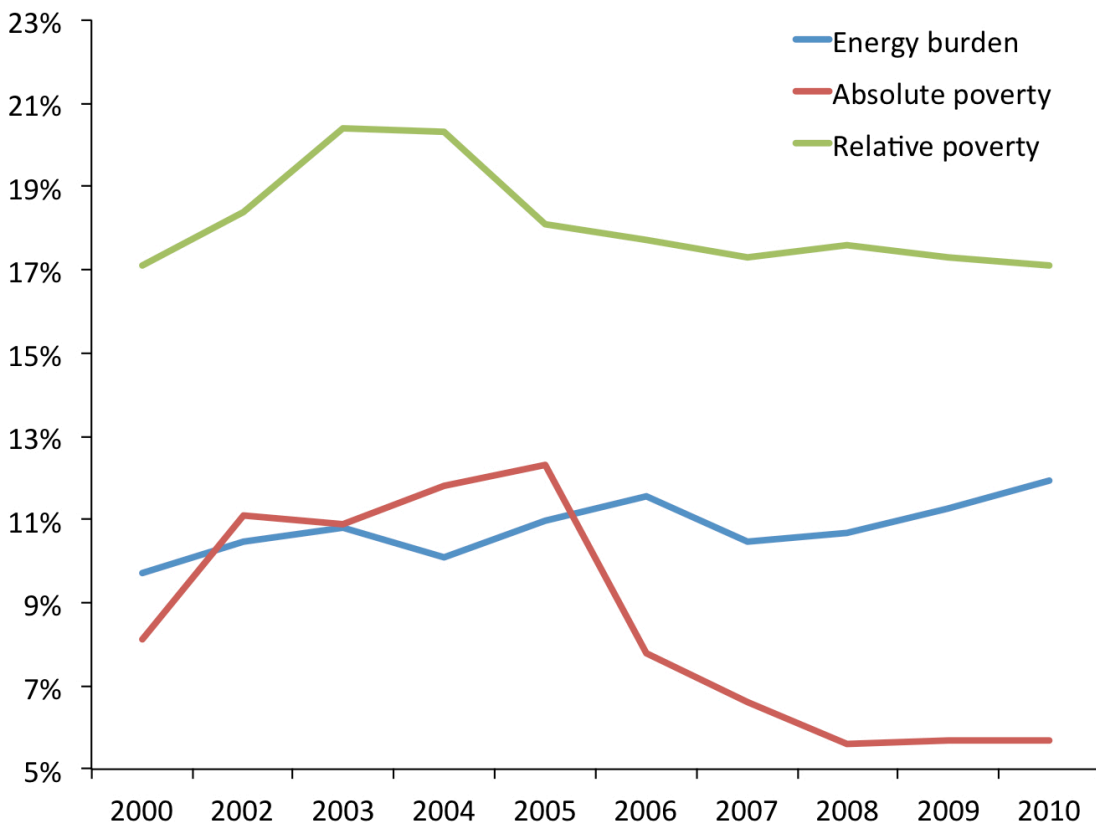


**Figure 1:** A composite fuel poverty indicator based on the shares of populations in different EU countries facing selected energy poverty-related problems, with the values of the three ‘objective’ measures divided by 3 (2003-2009 average, source: SILC).



**Figure 2:** Values of the energy poverty indicators described in Figure 1 for 2010 (extrapolations from 2009 data have been made in cases where 2010 data is not available, source: SILC).

EU-10 states have undertaken dramatic price increases over the past 20 years in order to remove implicit energy price subsidies and to unbundle and privatize energy companies, thus opening the industry up to competition. The concurrent rise in income inequality and overall poverty, alongside the initial lack of concerted efforts to improve the energy efficiency of rapidly decaying housing stocks and energy infrastructures, has meant that energy poverty now includes large parts of the population (EBRD 2003; Velody et al. 2003; Fankhauser and Tepic 2005). In Poland, for example, the average ‘energy burden’ (the share of energy expenditure within total household expenditure) has been steadily increasing between 2000 and 2010, even though both absolute and relative poverty have fallen during the same time. This suggests that energy affordability problems are widespread among the population, and that the expansion of economic prosperity is failing to relieve the pressure of rising energy costs on household budgets.

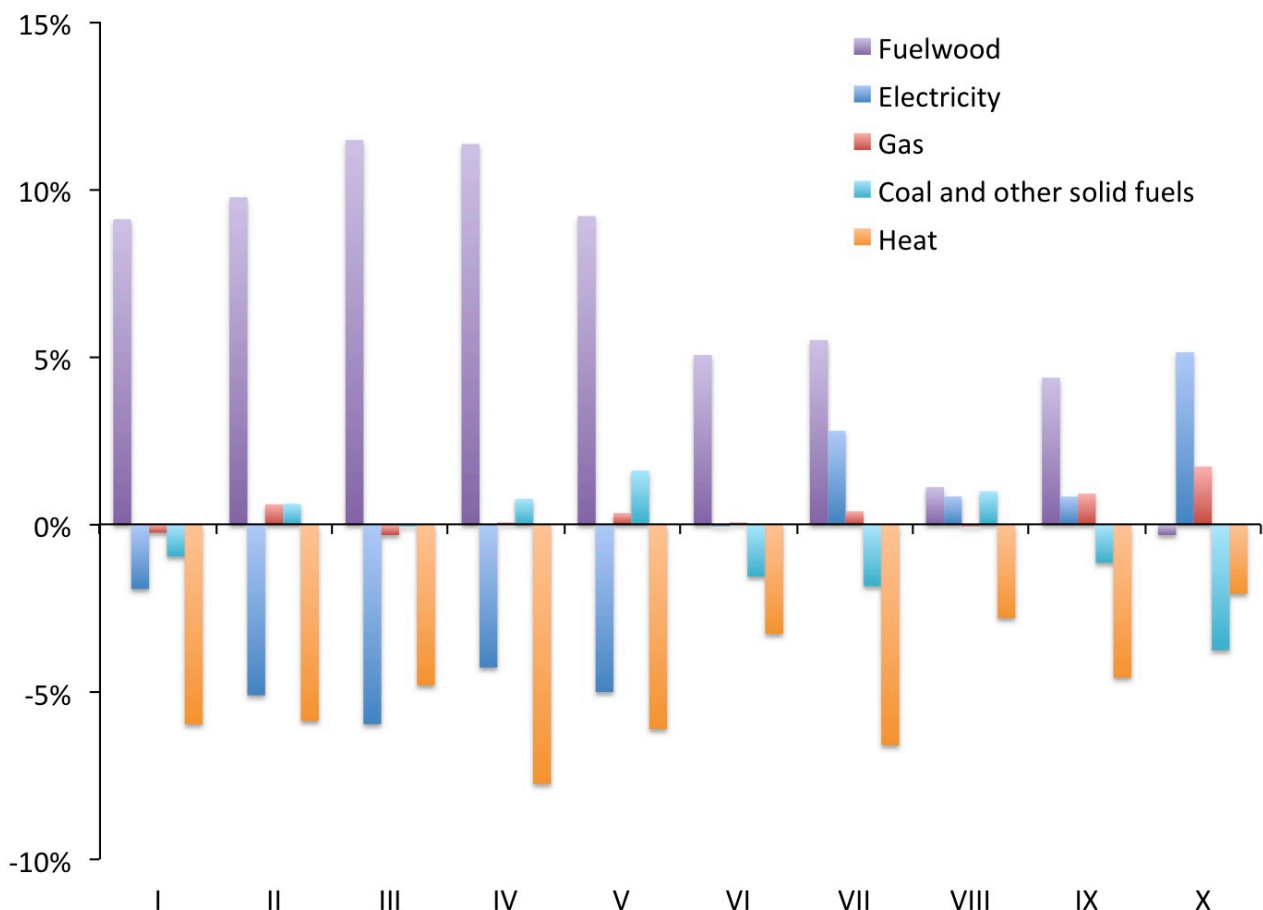


**Figure 3:** Changes in the energy burden vs. relative and absolute poverty in Poland between 2002 and 2010 (source: Central Statistical Office, *Household Budget Surveys in 2010*).

The high prevalence of energy poverty in Mediterranean countries has been attributed to the lack of adequate heating systems, as well as the overall poor quality of residential dwellings, which has resulted in insufficient thermal insulation. For example, Healy (2004) reported that only 12, 8, 6 and 16 per cent of Greek households had, respectively, cavity wall insulation, double-glazing, floor insulation and roof insulation in their homes. The situation was even worse in Portugal, where the corresponding figures were 6, 3, 2 and 6 per cent. Nearly a quarter of Portuguese households stated that they had rotten window frames, while a third revealed that they had patches of condensation on the indoor walls of their home (both of these conditions are considered good indicators of poor energy efficiency). The presence of indoor damp was also high in Spain (22 per cent of households), Greece (19 per cent), France (16 per cent), Belgium (14 per cent) and the UK (13 per

cent). Moreover, the same author reported that 16, 19 and 11 per cent of households in, respectively, Greece, Portugal and Spain are suffering from leaking roofs, indicating the absence of adequate roof insulation. An additional problem in Mediterranean states is posed by the need for cooling. According to SILC data, 30 per cent of the population in the 8 states bordering the Mediterranean sea have reported that they are unable to keep their homes adequately cool in summer. Almost two thirds of such households are considered income poor, while 70 per cent of them are above 65 years of age.

Energy poverty has assumed a pervasive nature in Southeastern Europe, since millions of households in this part of the EU are likely to be suffering from a lack of adequate domestic energy services. The limited extent of certain types of networked energy infrastructures (particularly gas) means that, in addition to inefficient residential stocks and affordability issues, energy deprivation is also predicated upon the spatial and technical limitations associated with switching towards more affordable fuel sources in the home (Kovačević 2004; Buzar 2007a; 2007b; 2007c). The demise of district heating systems – associated with spiralling supply costs and vicious cycles of disconnection (Poputoaia and Bouzarovski 2010) – coupled with rapidly rising electricity prices, has meant that some parts of the population have had no option other than using fuelwood for heating. This is particularly evident in Bulgaria, where switching towards this source of energy has a clear income dimension (Figure 4).



**Figure 4:** Percentage point change between 2002 and 2009 in the share of different fuels within total household energy per income decile in Bulgaria (Source: data supplied by the National Statistical Institute).

The academic literature has found above-average rates of energy and fuel poverty among older people, families with children, and households with disabilities, long-term illness, or infirmity (Wright 2004; Buzar 2007a; Boardman 2010). In the Irish context for instance, ‘two-thirds of fuel-poor householders demonstrate cold strain, and over half of elderly households endure inadequate ambient household temperatures during winter’ (Healy and Clinch 2002: 329). Healy (2004) maintains that the group most vulnerable to persistent energy poverty in the EU-15 is single parents, followed by lone pensioners. He notes that households living in multi-family apartment blocks are more likely to be suffering from energy poverty if they live in Northern as opposed to Southern Europe, partly due to income differentials. Tenure has also shown to be an important predictor of energy poverty, with households living in rental homes more vulnerable to the condition.

The height of the energy burden is often a good predictor of the socio-demographic groups suffering from energy poverty. In Poland, for example, disproportionate expenditure on energy is correlated to household size among pensioners, with lone pensioners facing particular difficulties (Table 1). Above-average rates of energy expenditure can also be found in the case of all households headed by ‘manual’ workers and farmers. On average, large households are more likely to suffer from this condition compared to medium-sized households. Similar trends can be found across other Eastern European states (Freund 1996; Bouzarovski et al. 2010; EPEE 2009).

Household members	Average	Employed		Farmers	Self-employed	Pensioners
		Manual	Non-manual			
1	14.4%	14.0%	9.2%	-	-	17.8%
2	12.5%	13.1%	8.8%	15.5%	9.7%	16.1%
3	10.8%	12.3%	9.0%	13.8%	9.6%	14.3%
4	10.8%	12.1%	8.9%	12.4%	10.8%	14.3%
5	12.3%	12.5%	10.6%	12.0%	11.8%	14.2%
6+	12.0%	13.0%	10.6%	10.5%	11.5%	13.6%

**Table 1:** Energy burdens among Polish households according to household size and occupational profile in 2010 (source: Central Statistical Office, *Household Budget Surveys in 2010*)

Clearly, energy poverty is a growing problem in Europe, and is likely to expand in coming years as a result of anticipated energy price increases. At the same time, however, there are significant opportunities to address the issue via demand-side energy efficiency policies – mainly in the form of deep building retrofits and appliance market transformations. Such measures are clear win-win solutions in the case of energy poverty, as they can also assist the broader process of poverty alleviation. Given the major social and geographical differences in the incidence of energy poverty within the EU (Healy 2004; Buzar 2007; EPEE 2009), it can be argued that these policies are best delivered at the regional scale. A possible approach to achieve such a goal might be the development of a regional level-indicator of energy poverty, whose value might then be tied to EU assistance for residential energy efficiency. Given the scarcity and fragmentation of scientific evidence regarding the constituent dynamics and regional distribution of energy poverty, the execution of an EU-wide review such as the one conducted by Professor John Hills in the UK might be beneficial in this regard.

*Birmingham, 19<sup>th</sup> November 2011. Please do not cite without permission.*

## References:

**Boardman B** 2010 *Fixing Fuel Poverty: Challenges and Solutions* Earthscan, London

- Bouzarovski S, Sarlamanov R and Petrova S** 2011 *The Governance of Energy Poverty in Southeastern Europe* French Institute for International Relations, Brussels
- Buzar S** 2007a *Energy Poverty in Eastern Europe: Hidden Geographies of Deprivation* Ashgate, Aldershot
- Buzar S** 2007b When homes become prisons: the relational spaces of post-socialist energy poverty *Environment and Planning A* 39 1908-1925
- Buzar S** 2007c The 'hidden' geographies of energy poverty in post-socialism: between institutions and households *Geoforum* 38 224-240
- European Bank for Reconstruction and Development (EBRD)** 2003 *Can the Poor Pay for Power? The Affordability of Electricity in South East Europe* EBRD and IPA Energy, London
- European Fuel Poverty and Energy Efficiency (EPEE)** 2009 *Project Fact Sheet* [http://www.fuel-poverty.org/Documents/EPEE\\_factsheet.pdf](http://www.fuel-poverty.org/Documents/EPEE_factsheet.pdf), Accessed on 10/02/10
- Fankhauser S and Tepic S** 2005 *Can Poor Consumers Pay for Energy and Water?* EBRD, London
- Freund C L and Wallich C I** 1996 The welfare effects of raising household energy prices in Poland *The Energy Journal* 17 53-77
- Harrington B E, Heyman B, Merleau-Ponty N, Stockton H, Ritchie N and Heyman A** 2005 Keeping warm and staying well: Findings from the qualitative arm of the Warm Homes Project *Health & and Social Care in the Community* 13 259-267
- Healy J D** 2004 *Housing, Fuel Poverty and Health: A Pan-European Analysis* Ashgate, Aldershot
- Healy J D and Clinch J P** 2002 Fuel poverty, thermal comfort and occupancy: results of a national household-survey in Ireland *Applied Energy* 73 329-343
- Kovačević A** 2004 *Stuck in the Past: Energy, Environment and Poverty in Serbia and Montenegro* United Nations Development Programme, Belgrade
- Lampietti J and Meyer A** 2002 *When Heat is a Luxury: Helping the Urban Poor of Europe and Central Asia Cope with the Cold* World Bank, Washington, D.C.
- Velody M, Cain M J G and Philips M** 2003 *A Regional Review of Social Safety Net Approaches in Support of Energy Sector Reform* US Agency for International Development, Washington, D.C.
- Wilhite H, Nakagami H, Masuda T, Yamaga Y and Haneda H** 1996 A cross-cultural analysis of household energy use behaviour in Japan and Norway *Energy Policy* 24 795-803
- Wright F** 2004 Old and cold: Older people and policies failing to address fuel poverty *Social Policy & Administration* 38 488-503