



Original research article

Capturing the multifaceted nature of energy poverty: Lessons from Belgium

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ABSTRACT

Energy poverty is a major societal issue with both economic impacts and solidarity implications. Although its main drivers (e.g. insufficient income, bad quality housing, high energy prices) are widely recognised, there is no common definition of energy poverty at the European level, let alone a common way of measuring the phenomenon. The energy poverty barometer for Belgium has been developed accordingly. It draws on a set of complementary indicators with the aim of grasping the multifaceted nature of energy poverty: excessive energy bills compared to available income (*measured* energy poverty), restriction in energy consumption below basic needs (*hidden* energy poverty) and self-reported difficulties to heat the housing correctly (*perceived* energy poverty). This paper presents and discusses the methodology followed to design this new tool in the Belgian context and its main findings.

1. Introduction

Having (secure) access to a sufficient amount of energy services is key to experiencing a decent quality of life [1]. However, in recent years, there has been a growing concern in many EU countries about the inability of some households to afford a sufficient amount of energy, and to satisfy basic energy needs [2]. The phenomenon of energy poverty raises some critical challenges for policy-makers as it has both economic and social justice implications [3,4]. It is also a critical issue in ensuring an inclusive energy transition [5,6] that does not leave the most vulnerable people behind.

Energy poverty is widely discussed by governmental and non-governmental bodies across Europe, but less frequently addressed by specific policy measures [7]. This is probably due, at least partly, to energy poverty being a multifaceted notion [8–10]. According to Butler and Sherriff [11: 965], energy poverty is indeed “a multifaceted experience that is shaped by costs, income, housing and personal and social circumstances”.

Definitions vary widely, and can result in a range of impacts on households: including *affordable warmth* [12], and non-heat impacts [13], as well as looking at the problem as more or less dynamic (changing over time): witness the concept of energy vulnerability [9], or multifaceted (affecting different people in different ways): witness

the concept of *précarité énergétique* in the French political discourse [14]. This diversity also results in different emphases on the various facets of energy poverty, each country focussing on specific drivers, impacts and dynamics according to national priorities (see for e.g. [15]).

In this paper, we attempt to translate our analytical starting point (i.e. understanding energy poverty as a multifaceted phenomenon) into a set of quantitative measures (we call this a ‘barometer’). In doing so we draw on insights about how energy is experienced in real life, both in fuel poor households [10] and more generally [16].

Accordingly, in this paper, we outline a new way of measuring energy poverty developed in the Belgian national context. The energy poverty barometer represents a deliberately broad use of data from the EU SILC survey, already mentioned by the European Commission in its Third Energy Package for monitoring energy poverty [17]. We do this by drawing on a combination of objective and subjective measures, as well as by using both extent and depth measurements, to give a nuanced picture of the complex state of energy poverty in Belgium. The design of this new set of measurements is intended to capture the multifaceted nature of the problem, and to explore the idea that different people are affected by different kinds of energy poverty (e.g. feeling the cold, paying too much for energy, under consumption of energy) building on insights in the literature on the lived experience of

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fuel poverty. Note that such a starting point mirrors similar efforts in French energy poverty policy [18,14].

The paper is structured as follows. Part 2 consists of a review of existing energy poverty indicators, as well as an introduction to the Belgian context. In part 3, we describe both approach and methodology we followed to set up a Belgian energy poverty barometer and present its first results. Part 4 will discuss different points regarding both the barometer methodology and its main results, as well as the overlaps between the different forms of energy poverty, while part 5 will synthesize main conclusions.

2. Background

2.1. What is energy poverty?

Energy poverty has no common definition within the EU but benefits from a consensus recognising it as a major and increasing societal challenge that goes beyond an economic imbalance in the household's budget [19,7]. Energy poverty is in fact linked to several exclusion and/or impoverishment issues and is part of a wider bundle of shortages which spreads across the individual and collective life of the persons suffering from it [20]. This can have far-reaching consequences among which the occurrence of severe health issues [19,21–25]. As recently summarised in Sovacoal [26: 362], energy poverty 'extends well beyond defaulting on energy bills, and can threaten personal wellbeing and modern notions of equity, justice, and fairness'.

Energy poverty is a dynamic and complex process. The socio-economic situation of the household, the energy performance of the dwelling and energy prices are important drivers of energy poverty. These are widely viewed as the classical determinants of energy poverty [21], to which the recent Commission proposal to define energy poverty refers explicitly and exclusively.² However, there are other factors that increase households' vulnerability to energy poverty. For instance, the composition of the household (e.g. presence of an older person or young children), the professional status of its members (e.g. unemployed, working part-time, self-employed working at home, etc.), and their health conditions, directly impact the need for heating and lighting. Being a tenant increases households' vulnerability as rented dwellings are, on average, less energy-efficient [27], but also because tenants have less opportunities to adapt their infrastructure to better suit their requirements [28]. The term energy vulnerability aims to emphasise those factors that increases 'the precariousness of particular spaces and groups of people' ([9: 37]; see also [10]).

Energy poverty is thus an urgent issue. Tackling it adequately requires better understanding, defining and measuring of this cross-cutting and multifaceted phenomenon. The analysis performed by Holzemer et al. [29,30] shows that this definition should ideally be based on a deep analysis of the different realities at play. This is necessary to meet social objectives and allow more enlightened political choices as regards their impacts on energy poverty. It highlights also that data availability for measurement has to be taken into consideration (see also [31,8,32,7]).

Bearing these considerations in mind, the research presented in this paper started with a rather large definition to include as many existing situations as possible: "Energy poverty refers to a situation where a person or a household faces particular difficulties to satisfy his/her basic energy needs in his/her dwelling" [20]. The term includes all in-house uses of energy³ and do not explicitly refer to any kind of causal

² Households in energy poverty have an "inability to afford basic energy services, such as adequate warmth, cooling, lighting and the energy to power appliances, due to a combination of low income, high energy expenditure and poor energy efficiency of their homes" [53: 8].

³ Note that this definition thus purposely excludes the energy costs related to transportation. This decision was taken in order to avoid adding even more complexity to this multifaceted and cross-cutting understanding of energy poverty. The researchers recognise that mobility, the location of the dwelling and their related costs are intrinsically

determinants.

2.2. How can we measure energy poverty?

For the purpose of policy making, the most important challenge is to find a good balance between the choice of a conceptual definition that appropriately accounts for the multiple and interrelated causalities at play, and the feasibility of translating the chosen definition into operational terms.

As regards the measurement of energy poverty, the work of Brenda Boardman [12,62] has had a major impact. She elaborated the *Fuel Poverty Ratio* (FPR) which is still widely used today⁴ due to its apparent simplicity and ease of interpretation. The FPR calculates that a household is fuel poor when the required expenditure on energy services within the home is at least 10% of household income. It is likely that many have lost sight of the fact that the 10% ratio was derived from UK statistics in the early 90's to approximate a twice-median required energy expenditure.

Whereas the idea of a 10% threshold is simple to grasp, the FPR is a lot more difficult to compute as it builds on complex modelling of what a given household should spend on energy services to reach a minimum level of comfort (e.g. 21°C in living rooms and 18°C in the rest of the house). This modelling exercise is highly contestable as it rests on many assumptions which, by definition, could be contested (e.g. setting the comfortable temperature 1°C lower would exclude some individuals from the statistics of energy poverty).

However, starting from objective needs rather than from actual expenditures allows us to include those individuals who self-restrain their consumption below basic needs. Several studies have shown that households confronted with financial difficulties restrain their energy consumption below a certain level of comfort [20,33–36]. The idea of using 'modelled' levels of consumption has been preserved in later measures including those put forward by authors criticising the approach derived from Boardman (such as [37]). Although we agree with the importance of accounting for *hidden* energy poverty, modelling, as in the FPR, does not allow us to distinguish between two types of energy poor (those who self-restrain and those who spend too much). This constitutes a strong shortcoming in terms of policy guidance.

The FPR has been widely criticised (see [37] and associated references). The arguments often raised are the outdated and highly specific nature of the UK statistics and data used to determine the ratio, as well as the fact that the ratio is fixed and very sensitive to energy prices. Based on those elements, several alternative indicators have been put forward (see Table 3 in [31: 7503] for a list of some of those indicators with respect to the dimension through which energy poverty is comprehended). Among those, there are the "Energy Affordability Gap" [38], the "précariTER" tool [39] and "Low Income High Costs" [40], the latter having replaced the FPR in England (see for example [41]). Subjective measures of energy poverty, based on whether someone feels they are able to service their energy needs, are also widespread (see for example [14,39,35,42]). These allow for easy comparison across geographical scales [7], but risk hiding differences in expectation and cultural norms of comfort, both within and between nations [43].

In their recent review of the many indicators of energy poverty, Thomson et al. point out that all of these alternatives also have their limits, especially when seen through a broader lens of energy vulnerability [44]. Critiques of LIHC in the UK, for instance, find that certain households are excluded from the definition ([8]: smaller homes), that energy prices no longer have an impact on the indicator despite recent increases [8,15] and that LIHC plays a convenient political role in

(footnote continued)

related. Moreover, if electric vehicles are widely adopted in the domestic sector in the future, it will become more difficult to distinguish household energy consumption dedicated to the dwelling or to transportation.

⁴ See for example: ONPE [14].

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