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Transport poverty and fuel poverty in the UK: From analogy to comparison

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ABSTRACT

The notion of 'fuel poverty', referring to affordable warmth, underpins established research and policy agendas in the UK and has been extremely influential worldwide. In this context, British researchers, official policymaking bodies and NGOs have put forward the notion of 'transport poverty', building on an implicit analogy between (recognised) fuel poverty and (neglected) transport affordability issues. However, the conceptual similarities and differences between 'fuel' and 'transport' poverty remain largely unaddressed in the UK. This paper systematically compares and contrasts the two concepts, examining critically the assumption of a simple equivalence between them. We illustrate similarities and differences under four headings: (i) negative consequences of lack of warmth and lack of access; (ii) drivers of fuel and transport poverty; (iii) definition and measurement; (iv) policy interventions. Our review suggests that there are important conceptual and practical differences between transport and domestic energy consumption, with crucial consequences for how affordability problems amongst households are to be conceptualised and addressed. In a context where transport and energy exhibit two parallel policy worlds, the analysis in the paper and these conclusions reinforce how and why these differences matter. As we embark on an ever closer union between our domestic energy and transport energy systems the importance of these contradictions will become increasingly evident and problematic. This work contributes to the long-term debate about how best to manage these issues in a radical energy transition that properly pays attention to issues of equity and affordability.

1. Introduction

Domestic and transport energy consumption have traditionally belonged to distinct academic and policy silos. Recent developments, however, suggest the need for convergence. The UK is committed to reducing greenhouse gas emissions by 80% by 2050, and reductions have to be achieved across all sectors (HMG, 2010). This includes both transport and domestic energy uses, which together account for most of household emissions (Preston et al., 2013). Strongly connected to this agenda is the need for technological decarbonisation of the private car fleet with a shift to electric vehicles powered through charging from the grid or hydrogen generated from 'green' electricity (OLEV, 2013).

Affordability in both the domestic and the transport sector is a critically important issue, which has high political salience (Lyons and Chatterjee, 2002; Preston et al., 2013; RACF, 2012). However, the approaches to conceptualising energy need and affordability are currently quite different within these two sectors. With an ever closer coupling of domestic energy and energy for mobility these conceptual gaps will become difficult to defend, and this paper, therefore, seeks to explore and propose ways to close that gap.

A reflection on energy affordability is also particularly salient now because, whilst the status quo of affordability is unevenly distributed (Preston et al., 2013), a transition to a new lower carbon system for domestic energy and mobility could imply quite radical shifts in prices (Stern, 2006; Weber and Matthews, 2008) and access to alternatives (Mullen and Marsden, 2016). This has generated an initial literature which raises concern for the vulnerability of different (and especially low-income) social groups to the current energy transition (Bickerstaff et al., 2013; Dodson, 2013; Jouffe and Massot, 2013; Lucas and Pangbourne, 2014), as well as for the accessibility and affordability of energy services across both sectors (Bouzarovski and Petrova, 2015; UN-Habitat, 2013).

This paper begins by situating the debate about energy affordability in the British context, where substantial research traditions exist in both domestic and transport energy consumption. The UK has long established the notion of 'fuel poverty' (Boardman, 1991, 2010; DEFRA, 2001; Hills, 2012), which refers to the affordability of domestic energy and most notably heating. This notion underpins established research and policy

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agendas in the UK, and it influences how these issues are now being framed in an increasing number of countries (e.g. Bafoil et al., 2014; Bouzarovski and Petrova, 2015; Heindl, 2015; ONPE, 2014).

Similarly, the worldwide influence of the UK 'transport and social exclusion' research tradition within transport poverty policy in the UK cannot be understated (Cass et al., 2003; DfT, 2006; Hine and Mitchell, 2003; Lucas, 2004, 2012; SDC, 2011; SEU, 2003). However, this research has focused largely on low mobility individuals and carless households, while transport affordability, the costs of motoring, and vulnerability to fuel price increases have received less attention than in other countries (Mattioli, 2015).

In this context, British researchers and NGOs have put forward the notion of 'transport poverty', building on an implicit analogy between (recognised) fuel poverty and (neglected) transport affordability issues. However, the justification for this analogy, and its implications for how transport affordability should be defined, measured and tackled have rarely been discussed.

This paper aims to fill this gap, by *critically comparing and contrasting* the notions of fuel poverty and transport poverty. In doing so, it questions the assumption of a simple equivalence between the two problems, illustrating how transport consumption is conceptually different from domestic energy and heating consumption in a number of key respects. To the best of our knowledge, this is the first English-language publication to offer a thorough critical discussion of the two problems in a comparative perspective.

The article is structured as follows. Section 2 focuses on domestic energy affordability. After an overview of debates in the UK (2.1), the notion of fuel poverty is discussed under four headings: consequences (2.2), drivers (2.3), measurement (2.4) and policies (2.5). Section 3 focuses on transport affordability, starting with a discussion of the fuel poverty - transport poverty analogy in British debates (3.1), followed by a comparison of the two problems, which is structured under the same four headings (3.2–3.5). In Section 4, we conduct a critical assessment of similarities and differences, and outline directions for future research and discuss policy implications.

2. Domestic energy affordability and 'fuel poverty'

2.1. The fuel poverty debate in the UK

Brenda Boardman's book "*Fuel poverty: from cold homes to affordable warmth*" (1991) provided a first and well-known definition of fuel poverty as being "unable to obtain an adequate level of energy services, particularly warmth, for 10 per cent of (household) income" (1991, p.207). The first *UK Fuel Poverty Strategy* (DEFRA, 2001) adopted Boardman's 'ten per cent ratio' definition (TPR in the following) and committed the government to the 'eradication' of fuel poverty by 2016, publishing data and reports annually (e.g. DECC, 2016; FPAG, 2014; DECC, 2009).

Following growing criticism of this definition (Liddell et al., 2012; Moore, 2012), in 2010 the government commissioned an independent review (Hills, 2011, 2012). The outcome was the 'Low-Income-High-Costs' (LIHC) indicator, which was adopted as the new official definition of fuel poverty in England. LIHC defines fuel poor households as those who (i) have "required fuel costs that are above the median level" and (ii) "were they to spend that amount they would be left with a residual income below the official poverty line" (Hills, 2012, p. 9). In 2014, 10.6% of English households (2.38 million) were fuel poor (DECC, 2016).

An important characteristic of the British debate is the ambiguity about which domestic energy uses are considered. While all energy uses within the home are considered in the official indicators, policy and public discourse typically focus on heating only (Simcock and Walker, 2015; Simcock et al., 2016). For simplicity, in this article we refer to fuel poverty as a space heating issue only.

2.2. Health and social consequences

The negative physical health consequences of living in cold and damp conditions have been emphasised (Boardman, 2010; Hills, 2011; Liddell and Morris, 2010; Ormandy and Ezratty, 2012; Simcock et al., 2016), and this magnifies the political salience of fuel poverty in the UK. Living at cold temperatures has been linked to the incidence of cardiovascular events, respiratory problems, rheumatisms and infections (WHO, 1987), and to increased rates of mortality during winters ('excess winter deaths') (Boardman, 2010; Hills, 2011; Liddell et al., 2016). In 2014/2015 "an estimated 43,900 excess winter deaths occurred in England and Wales", 83% of which among people aged 75 and over (ONS, 2015; unpaginated).

Beyond health impacts, fuel poor households face a choice between enduring cold temperatures, incurring debt, and cutting expenditure in other areas (Anderson et al., 2012; Gibbons and Singler, 2008; Hills, 2011, p.86–87), such as food consumption (Beatty et al., 2014).

2.3. Drivers of fuel poverty

In mainstream fuel poverty research, lack of warmth is seen to arise from three factors (Boardman, 2010; Hills, 2011): income, energy prices and energy efficiency.

Fluctuations of *energy prices* over time have been reflected in estimates of the extent and depth of fuel poverty (DECC, 2016). Recent increases in domestic energy prices reflect changes in global energy markets, but also the cost of environmental obligations put by the government on energy suppliers, which are recouped through higher energy prices (Hills, 2011; Preston et al., 2013). The *thermal efficiency* of homes is a second key driver, with fuel poverty rates higher for households in dwellings that are larger, older, poorly insulated and/or not connected to the gas grid (DECC, 2016). At a given moment in time, fuel poverty correlates strongly with *low-income* (Boardman, 2010, p.31–32): in 2014, fuel poverty rates were highest (40%) among the lowest income quintile group (DECC, 2016, p.53).

Research has highlighted two types of 'mismatches' between the drivers of fuel poverty, i.e. situations where they could (or should) offset each other, but they do not (similar mismatches can be observed in the case of transport poverty, as we shall see in Section 3.3):

1. a mismatch *between income and energy efficiency*. Boardman argues that as "the lower the income of the household, the more energy efficient the property has to be to ensure that they are not in fuel poverty (…), the poorest people should have the most energy-efficient homes" (2010, p.35–36). In Britain, lower income households are more likely to live in smaller properties, in flats and in modern or recently renovated social housing, all factors that tend to result in higher thermal efficiency (Hills, 2011, p. 41–42). On the other hand, they are more likely to use expensive fuels and less likely to be able to make capital investments on energy efficiency improvements, and this can leave them "locked-in to high energy costs" (Hills, 2011, p. 39). Overall, the Hills review found no significant differences in thermal efficiency between income groups, after controlling for tenure (2011, p.42)
2. a mismatch *between income and fuel prices*: low income households generally pay higher tariffs, as a result of payment method (higher prevalence of prepayment meters), marginal cost pricing (whereby smaller consumers pay proportionally more) and inability or unwillingness to "shop around for the best deals" (Boardman, 2010, p.81–97; Hills, 2011, p.44–50). Overall, while Boardman argues that the poorest households should have access to the cheapest options (2010, p. 89) the opposite seems to be the case.

2.4. Measurement

There are four key components to the official definitions of fuel