New dimensions of vulnerability to energy and transport poverty

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Summary: *As we decarbonise societies, we need to consider how such transitions interconnect energy and transport systems. In this Commentary, we argue that we need a better understanding of who may be vulnerable in low-carbon transitions. Current energy poverty definitions and metrics focus overwhelmingly on energy service consumption within the home, yet similar issues in the transport sector are often neglected. Failure to account for the intersections between energy and transport poverty may deepen structural forms of deprivation and worsen social and material inequalities, therefore preventing equitable transitions.*

Keywords: energy poverty, fuel poverty, transport poverty, low-carbon transitions, justice

Introduction

There is an urgent need to decarbonise domestic energy and transport if we are to address climate change. This must, however, be done in a way that avoids worsening inequality; by reducing the most carbon intensive forms of consumption that cause the most emissions, while also paying attention to the differentiated impacts for those who are vulnerable in society. Energy poverty generally refers to the inability to attain socially and materially necessitated levels of domestic energy services,[1] such as heating, lighting and hot water. Yet, while much research has focused on domestic energy poverty, significantly less attention has been paid to 'transport poverty', i.e. the inability to attain socially and materially necessitated levels of transport services.[2] Energy and transport services have direct impacts on people's wellbeing, life chances and the ability to fully participate in society. Living in energy poverty, for example, can mean not having access to or being able to afford the required technologies or appliances to keep a home at a comfortable temperature or cook hot meals. Someone experiencing transport poverty, meanwhile, may not be able to afford or access essential transport services, restricting their ability to travel for fundamental needs, such as employment, education or healthcare.[2]

Energy and transport poverty have largely been treated in isolation from one another in both research and policy, and are often seen as having their own causes and consequences. Almost all energy poverty studies, for example, have focused on domestic energy services, even though the ability to use energy for transport is also vitally important to wellbeing and life chances. While not all aspects of transport poverty are directly related to energy consumption, many of them are, and yet they remain largely overlooked in energy poverty debates. This could be reflective of entrenched disciplinary boundaries, whereby energy research sees 'energy demand' as something that occurs inside the home (or the office etc.), while the consumption of motor fuel, for example, falls under a separate 'transport studies' tradition. Similarly, the governance of energy and transport has traditionally taken place through distinct policy areas, jurisdiction, budgets, and R&D projects, with limited capacity to design and implement overarching policies across different departments. This siloed approach contributes to different scholars and policy makers focusing on each of these domains, with the connections and similarities between them often missed.

In this Commentary, we argue, first, that as we decarbonise societies, such transitions[3] can mean new forms of integration between domestic energy and transport systems – with implications for domestic energy and transport poverty. We also argue that to develop equitable low-carbon societies,[4] we need better recognition of those acutely vulnerable groups that are at greatest risk of experiencing *both* energy and transport poverty simultaneously, and of the way the two issues are interlinked. It is therefore vital to break down traditional disciplinary silos to conduct research, and develop policy, that helps better understand, and address, these linkages.

Intersections between energy poverty and transport poverty

Taken together, the household and transport sectors consumed 56.6% of the final energy in the EU-28 in 2018 and low-carbon transitions are likely to see increased integration and connection between energy and transport systems. There are several reasons why we should not neglect transport poverty in energy poverty debates—here we focus specifically on affordability and access.

As different indicators are used in different countries, there is no single statistic to show how many people live in energy and transport poverty. Europe has some level of comparative statistics available on expenditure and consumption. In 2018, on average EU households spent 13.2% of their income on transport and 24% on housing, water, electricity, gas and other fuels.[5] The average share of household expenditure on the 'operation of personal transport equipment' is higher than that on 'electricity, gas and other fuels' within the home in the majority of the EU-28 (6.5% vs. 3.9%).[5] Based on official statistics, an estimated 44.5 million people lived in energy poverty in the European Union in 2016 (EU).[6] Yet analogous statistics for transport poverty do not exist, illustrating how transport affordability issues are not widely recognised. While EU countries are increasingly adopting official indicators of energy poverty, currently France is the only EU member state with an official transport poverty indicator. Based on this official measure, an estimated 10.2% of households in France were in transport poverty in 2014 (vs. 14.6% in energy poverty),[7] but alternative indicators suggest that transport poverty may well affect an even greater number of French households (21%) than energy poverty (18%).[8]

In terms of affordability, public debates on energy and transport costs loom large in many countries, especially as carbon taxes, which may mean higher fuel prices that affect the cost of both energy and transport services, are introduced. This was demonstrated, for example, by the 2018-2019 Yellow Vests movement in France (see Figure 1) which originated as a protest against fuel price increases introduced as part of climate change policies. The disproportionate impact of rises in fuel prices on low income households was central to many of the protesters' concerns, although it quickly grew to include a wider range of social and political issues. Europe is not unique in facing such protests. The Myanmar government removed state subsidies on natural gas and diesel in 2007, leading to a doubling of domestic prices for bus fares and automobile fuel which later spilled over into an increase in the price of basic commodities such as rice, beef, fish, milk, and eggs - hitting rural and poor households the hardest, and leading to protests and a reactive state crackdown involving violent deaths. Plans to raise LPG prices for mobility (used primarily by two-wheeled motorcycles and scooters) in India in 2000 were later abandoned after they provoked mass demonstrations; in the same year, farmers boycotted and blockaded petrol stations in the United Kingdom as the price of petrol had been raised to 80p/litre.

Figure 1: The 2019 Yellow Vest Protests in Paris, France. The protests affected the capital city for weeks, with insurance companies paying out 89 million euros ($100 million) to cover thousands of cases of reported damage. The government also responded with 38 million euros ($43 million) financial aid for workers who had been put on reduced work hours due to the anti-government protests.

Source: Agence France Press, used under a creative commons license.

Movements such as these in France, Myanmar, India, and the UK have a strong resonance with the energy community, as climate mitigation measures, such as carbon taxes, ultimately impact household costs for both energy and transport, and typically affect some communities and groups disproportionately. This demonstrates a need for alternative forms of pricing design and related policy implementation that can ensure fairness.[9]

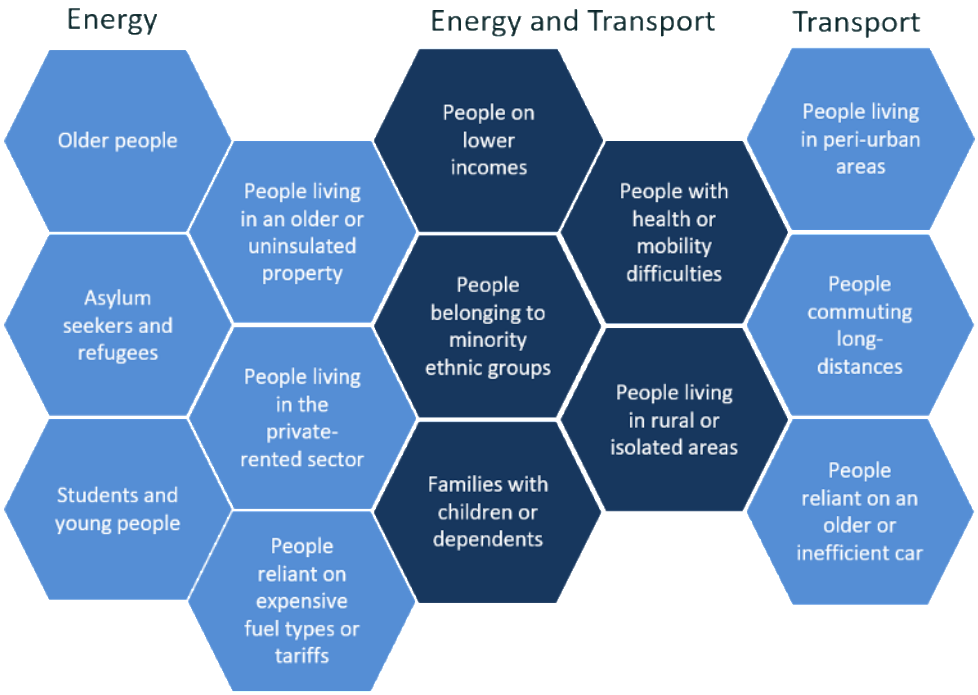
A further overlap between energy and transport poverty is the increasing evidence of a 'double vulnerability' phenomenon, whereby some social groups are at greater risk of experiencing poverty of both energy and transport services simultaneously[10, 11] (see Figure 2). Those on low incomes can be hit particularly hard as energy and transport costs take up a greater proportion of their incomes and they often lack financial resources to invest in the most energy efficient appliances or vehicles. Single-parent households, and people belonging to ethnic minority groups can be at greater risk, partly as they tend to be over-represented in low-income groups and may be living in poorer-quality housing with fewer transport options. Households with children can also encounter relatively high energy and transport costs caused by, for example, increased space heating or space cooling demand, greater appliance use, and a higher frequency of journeys to transport children which often induces car ownership. Those with chronic health conditions, disabilities or mobility problems have a higher likelihood of experiencing both energy and transport poverty simultaneously, due to lower incomes combined with increased energy and transport requirements. These can include, for example, a combined need for keeping higher room temperatures, running medical equipment, and making frequent trips to medical services. Finally, living in geographically isolated areas also increases the risk of both energy and transport poverty, primarily due to the need to travel longer distances to access key services and a reliance on expensive domestic energy and motor fuel.

Crucially, for vulnerable households the problem goes beyond simply experiencing energy and transport poverty simultaneously – there are also likely to be mutually reinforcing causal links between the two conditions. In terms of affordability, high transport costs reduce the disposable income people have available to pay for energy bills, and vice versa. For these households, expenditures on energy and transport are often traded off against each other in daily life, and they must either sacrifice spending on transport to pay for home energy services, or ration their energy use to afford journeys that many take for granted.[2,12]

In terms of access, a low-carbon transition could see some households having onsite energy generation and storage technologies coupled with EV chargepoints, thus enabling them to participate in new 'flexibility' and 'vehicle-to-grid' markets. Who can *access* and *benefit* from such systems, in addition to who can *afford* them, are key questions going forward. A continued neglect of transport poverty in these initiatives could have adverse policy effects, as could, for example, the development of energy-efficient housing in areas where there are limited low-carbon or public transport options, such as car-dependent periurban locations. In such cases, people may be living in newly built homes

that consume less energy, but still have to rely on energy-hungry and expensive private transport to obtain vital services due to poor access to public transport.[2] In some contexts where racial segregation is especially deep-rooted, such as South Africa and parts of the USA, transport and energy poverty can also reinforce the spatial marginalisation of minority ethnic groups, who can be relegated to areas with both poor transport and housing infrastructure.

Figure 2: Groups at risk of energy and transport poverty*



Source: Authors. **Note that these groups are not mutually exclusive but often overlap and intersect.*

Recommendations and Conclusion

There are substantial connections between energy and transport poverty, with some people and places at heightened risk of experiencing both problems simultaneously and in a mutually reinforcing manner. Without carefully designed policies to address these as one problem, we run the risk of one issue exacerbating the other. This highlights the need for a greater understanding of these links and risks, particularly if we are to achieve a just and equitable low-carbon transition and address high levels of consumption without causing new vulnerabilities. Previous research has shown that energy and transport poverty are not experienced equally, but can affect particular communities and geographies more than others. We should pay attention to the spatial and temporal aspects of the role of transport within energy poverty debates, and subsequent impacts on life chances across places and generations. Further understanding is therefore required, especially on how transport and energy costs are traded off against each other in the everyday lives of the most vulnerable in our societies. Future research should also examine the co-benefits of energy and transport poverty reduction, and what that may mean, for example, for education and employment opportunities.

As energy poverty has begun to receive significant policy attention in the UK and the EU, the next step for policy makers is to recognise that transport poverty also exists, and that it has an important energy dimension. There are few policies that recognise the connections between energy and transport systems, but areas and communities that could be exposed to the double vulnerability phenomenon would benefit from low-carbon policies that address both energy and transport poverty simultaneously. Inevitably, decarbonisation policies and initiatives, be it the rollout of electric transport, the creation of new energy efficient housing, or moves towards electrification and domestic energy system integration, are relevant to both sectors. Once policymakers have recognised transport poverty as an issue, they can move towards more compositive and integrative metrics that grapple

with its intersections with energy poverty and capture the risk of double vulnerability. This could help facilitate more targeted policy interventions in the areas and communities that are most susceptible to this double energy vulnerability we have outlined here. Ultimately, if decarbonisation policies are not designed effectively to address both energy and transport poverty, there is a risk that policies will be unable to adapt to new vulnerabilities as they emerge. In building decarbonised societies, we must ensure that as emissions from homes and transport are simultaneously reduced, they do not come at the expense of worsening patterns of inequality.

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