



Assessing the equity of carbon mitigation policies for transport in Scotland



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ABSTRACT

Different social groups exhibit diverse travel behaviours and will thus experience very different outcomes in adapting to any changes to the transport system. This paper is concerned with making more transparent the equity implications of transport policies that are designed to change people's travel behaviours; explicitly those designed to mitigate the carbon impacts of the domestic transport sector. This is a relatively new area of transport policy delivery within the United Kingdom and elsewhere and, as yet, social equity considerations appear to be largely absent from the policy debate. This is in part due to a lack of suitable policy appraisal tools to identify their social consequences of such policies at the national and local level.

To this end, we have developed an evaluation framework to test the social equity effects of the carbon mitigation policies for transport. The paper offers an example analysis of three policy measures that selected from Scotland's strategy for mitigating climate change in the transport sector. The case study has been chosen because the necessary strategy and policies are already well developed and so sufficient information is available to evaluate its likely behaviour changes outcomes. The paper concludes that there is a significant gap in both scientific and policy knowledge in this area and that a universal lack of data (i.e. not only in Scotland but internationally) is a major barrier to the robust analysis of the equity impacts of climate change mitigation measures. It also identifies some potential avenues for future research.

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1. Introduction

The aim of this paper is to explore the likely social equity implications of carbon mitigation in the domestic transport sector using the example of policies proposed for Scotland within the United Kingdom (UK). The paper is set in the wider context of the global imperative to reduce the total energy use and carbon intensity of our everyday social practices. As Anable et al. (2012) have noted, there is currently general failure amongst policy-makers to recognise the potential inequities and potential social exclusion implications that are embedded within the policies adopted in the UK to reduce transport-related carbon. We would argue that one of the key reasons behind this failure to identify the

potential equity implications of carbon mitigation measures for domestic transport lies in the absence of suitable methods to systematically identify the social and distributional impacts (SDIs) of different policy measures. Despite the considerable attention of the academic environmental justice literatures, formal social impact appraisal (SIA) has no statutory status in the UK and is used very rarely within policy appraisals (Walker, 2010), though the UK Equality Act 2010 prohibits unfair treatment in the exercise of public duties (Government Equalities Office, 2011). Furthermore, a study for Friends of the Earth which evaluated 16 different tools for policy impact assessment noted that all the current methods used were weak on establishing the distributional of effects of policies across different groups and areas (Walker, 2007).

This is becoming an increasingly important policy agenda not only in the UK but worldwide in light of the recent announcement by the Head of the World Bank that climate change will lead to battles over water and food over the next ten years unless more radical policies and measures are put in place to mitigate and adapt to its impacts (The Guardian, 3 April 2014). The domestic transport sector is likely to become a focus for such policies because people's current

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transport practices are extremely carbon intensive. However, the risk of social inequities arising from the implementation of these policies is very high because of the already extremely uneven distribution of transport 'goods' and 'bads' (Social Exclusion Unit, 2003; Dimitriou and Gatenheimer, 2011). For example, within the UK roughly half of all lowest income quintile households in the UK do not have access to a car, and people living in carless households make half as many journeys as those in car-owning households (DfT, 2011). These inequities are often geographically specific in many instances, concentrating in social housing estates on the urban periphery (Sterrett et al., 2012; Power, 2012) and in older, more isolated rural settlements (Owen et al., 2012; Velaga et al., 2012), that are less well-served by public transport.

It is within this wider social context that we place our paper with the aim of offering policymakers a simple but effective way to evaluate the potential SDIs of their carbon mitigation policy interventions. Although we have used a Scottish example within the paper, the framework should be broadly transferable to other geographical contexts and is applicable at either local or national scales. It is also relevant beyond the climate change mitigation policy arena and could be used to evaluate the potential SDIs of transport projects and programmes targeting other objectives (which also may be a subset of the measures for carbon mitigation), such as major infrastructure investments, parking policies or pricing mechanisms.

2. Determining the equity implications of climate change policies for transport: policy context

To assess the equity implications of climate change policies for transport, it is first important to understand the nature and scale of the problem posed by transport in relation to climate change. Globally, transport accounts for about 19% of total energy use and about 23% of energy-related CO₂ emissions. This is because transport is almost completely dependent on fossil fuels: in OECD countries nearly 60% of oil consumption fuels mobility, which is a significant driver of increasing oil demand. The International Energy Agency (IEA) predicts that transport energy use and associated CO₂ emissions will have increased by 50% by 2030, and by more than 80% by 2050 on current trends (IEA, 2009). Policy reliance on technological optimism assumes that efficiency will improve, but in the UK the current trend is that transport is increasing in energy intensity (up 3% between 1970 and 2010) (DECC, 2011). To reverse this trend will be challenging and potentially unpalatable policy frameworks will be required.

In 2008, the UK government set a binding commitment to decrease greenhouse gas (GHG) emissions by 80% (on 1990 levels) by 2050 through the Climate Change Act (Great Britain Parliament, 2008). It was the first nation state to respond with such a firm policy commitment and is still unique in this respect. The UK has a devolved political structure, and London, Scotland, Wales and Northern Ireland have their own policy frameworks in place to meet the UK commitment. In England, responsibility for delivery of carbon mitigation in transport policy has been passed to local transport authorities via the Carbon Plan (HM Government, 2011). To support transition in England (not London, Scotland and Wales), the UK Government has earmarked a total of just under £1 billion, spread across a mix of consumer incentives, the Local Sustainable Transport Fund for active travel and public transport measures, small local transport improvement schemes, and a Green Bus Fund to stimulate purchase of low carbon buses.

To assess the likely equity impacts of this new focus in transport policy, it is important to understand the context of the current *status quo* in the distribution of travel behaviours in the UK. Analysis of the 2007 UK Family Expenditure Survey (FES) confirms that households in the highest income group spend a larger

proportion of their weekly budgets on transport than those in the lowest income group – 16% compared with nine per cent (Dainton, 2008). However, for low-income car-owning households, the impact of travel expenditure is much higher. Analysis of the FES has shown that car-owning households in the lowest income quintile may spend as much as a quarter of their weekly budgets on maintaining car mobility (Lucas et al., 2001; Sustainable Development Commission, 2011). Roughly half of households in the lowest income quintile now own at least one car (Department for Transport, 2011). As fuel prices have started to rise significantly, recent analysis by the RAC Foundation (2012) estimates that as many 21 million UK households (i.e. 80%) could be described as being in 'transport poverty' through spending more than 10 per cent of their income on transport. The concept of transport poverty has been borrowed from the long-established concept of 'fuel poverty', which was formerly defined as existing if a household expends 10% of its income on maintaining an acceptable level of heat in the home. Obviously, 10% for a high income household is much more affordable than 10% of income for the poorest household. The new definition of fuel poverty used by the UK government states that fuel poverty exists if a household pays more than the national median level for domestic fuel and paying those higher costs leaves household residual income below the official poverty level. In 2010 2.5 million English households were in fuel poverty by this Low Income High Costs indicator (DECC, 2013). In relation to mobility, there is no official definition of transport poverty, and setting a percentage level would have the same drawbacks as was the case for fuel poverty. More conservatively, Sustrans estimate that 1.5 m people are *at risk* of some kind of transport poverty (in England), using an appraisal method that overlays areas with low incomes, areas with a high population more than a mile from a public transport route and areas where it takes more than an hour to access essential goods and services by public transport, walking or cycling (Sustrans, 2012).

Therefore, at the very least transport policies that increase the cost of everyday travel by car put low-income car dependent households at risk of social exclusion. Whilst it is usually still possible to access employment and other key activities by public transport within most UK metropolitan areas, at least during the day, public transport privatisation outside of London during the mid-1980s has played a role in reducing levels of accessibility for non-car owning households outside the major conurbations. Consequently, access to a car has become almost essential to reach a wide range of essential and leisure activities (Power, 2012). To relate this back to carbon mitigation policies for transport, at the other end of the income spectrum research shows that the richest ten per cent of the population may be responsible for more than 80% of the total greenhouse gas emissions from personal travel in some parts of the UK (Brand and Boardman, 2008). This is clearly important in terms of evaluating the equity of carbon mitigation policies because it highlights that it would be both fairer and more efficient to introduce policies that target these higher consumers.

3. Past research on the equity effects of transport policies

The concept of equity relates to how social benefits and disbenefits are distributed across society and space. However, there are mutually exclusive principles of what constitutes equity; for example, utilitarian, equal shares, Rawlsian, egalitarian, minimum floor and maximum range (Thomopoulos and Grant-Muller, 2013). For the purposes of this paper we are agnostic about the underlying principle by which equity should be decided, as our aim is that our framework should transparently disaggregate the distribution of impacts. It is for policy-makers to decide on what principle should be used to decide on equitability. For the purposes

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