Carbon Emissions Reduction in the Transport Sector

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Key Findings and Policy Recommendations

This document summarises the key findings from a 30 month study into the implementation of carbon reduction policies in the transport sector in the UK.  

Overview of Sector
The UK, through the Climate Change Act 2008 has committed to a radical 80% reduction in emissions by 2050. Domestic transport emissions account for 20% of UK GHG emissions and 24% of UK CO\textsubscript{2} emissions\textsuperscript{ii}. It is the sector making least progress in carbon reduction with a reduction of just 1.4% since 1990\textsuperscript{iii}. To achieve an 80% reduction in carbon across the UK economy will require action across all sectors. Although reductions do not have to be equal across all sectors or to proceed at similar rates transport must clearly play a significant role in moving to a low carbon economy. This is accepted by governmental and non-governmental actors alike at all scales.

Transport must make a significant contribution to carbon reduction over time
Different sectors have different opportunities to cut emissions, at different costs and over different timescales. It is commonly held that the transport sector is one where it is difficult to achieve early cuts at acceptable costs\textsuperscript{iv}. Nonetheless, in the long-run, the targets imply substantial reductions. The European Commission estimates at least a 60% cut. This requires an almost complete decarbonisation of the car fleet and significant reductions in freight and public transport (see Figure 1).

Figure 1: Projected average new car and van emissions over the first three carbon budget periods and illustrative ranges of average new car and van emissions in the fourth carbon budget period and to 2050\textsuperscript{v}
Aviation and maritime emissions will need to be reduced but complete decarbonisation appears unlikely. Decarbonisation of surface transport is predicated on electricity being generated from renewable sources.

**Technological progress is critical to decarbonisation**

The presence of a carbon target has clearly helped to generate some early action in the sector. In particular, the introduction of voluntary and then mandatory targets for new car CO₂ emissions at a European level has stimulated the adoption of lower carbon vehicles, although average new car emissions were still above 130 g/km in 2012. These measures have been supported by reform to Vehicle Excise Duty. The government has established the Office of Low Emission Vehicles to promote the adoption of low carbon vehicles and associated pilot schemes such as Plugged in Places for electric vehicles. There was widespread acknowledgment and support for technological improvements and associated supporting measures and grant schemes.

**Considerable uncertainty exists about the likely pathways to reduction and the actions required**

Beyond the headlines that carbon reduction is important for the sector and that technological enhancements are necessary there remains considerable uncertainty about the roles, responsibilities and actions for tackling climate change emissions in the sector. We identify three main reasons for this:

1) There is significant uncertainty amongst the range of public and private sector actors we worked with over the nature of the technology pathways (e.g. biofuels blend, electric or hydrogen) and the speed at which such innovations would penetrate the market at acceptable prices.

2) Even if electric vehicles were to become ubiquitous by 2040 as Figure 1 might imply, the benefits of the shift to electric are only fully realized if the energy sector decarbonizes at a sufficient rate. This is out of control of the actors in the transport sector.

3) The policy arena has changed markedly since the 2008 Climate Change Act both through a change of government but, perhaps more significantly, through a change in policy priorities resulting from the banking collapse and economic downturn. There is a clear understanding from decision-makers that funding streams have been aligned with national and local political priorities around job creation.

The total volume of CO₂ released on the pathway to 2050 matters as well as the end state achieved in 2050. If action in decarbonizing the vehicle fleet or the energy sector moves slower than anticipated then other actions would be necessary either within the transport sector or elsewhere to bridge the gap.

**Progress to date has been slow in the transport sector**

The Committee on Climate Change advises the government on setting the five year interim carbon reduction budgets required by the 2008 Act. It also issues an annual monitoring report and further expert advice periodically. In its 2013 report to Parliament, it concluded that The UK has met the first carbon budget and is likely to meet the second carbon budget. However, “without a significant increase in the pace of emissions reduction, starting very soon” the third and fourth carbon budgets (to 2023 and 2038) will not be met. In the transport sector, emissions fell by 1.3% in 2011, to 110
MtCO₂. Early indications are that emissions may have fallen by a further 0.3% in 2012. This results from a combination of improved new car fuel efficiency, high fuel prices and a slow economy which dampens travel demand. Progress on the uptake of electric vehicles has been slower than anticipated and there has also been limited progress on more fuel efficient ‘eco-driving’.

**Action is both desirable and necessary at a local level**
The emphasis of national carbon reduction policy in the transport sector is largely but not exclusively focused on technology in the transport sector. The Committee on Climate Change notes that local authorities are critical actors with “significant scope to influence emissions in buildings, surface transport, and waste, which together account for 40% of UK greenhouse gas emissions”. It estimates that opportunities to influence travel behaviour make up 20% of abatement potential in the sector. The principal support mechanism for this from the English and Scottish national governments has been the Local Sustainable Travel Fund (£600m in England) and the Scottish Smarter Choices Smarter Places scheme (£15m).

**Yet there is a significant risk that local authorities will not take sufficient action**
The Committee on Climate Change concluded however “There is currently a significant risk that local authorities will not develop and implement sufficiently ambitious low-carbon plans, following the removal of the national indicator framework and given the highly constrained fiscal situation.” Our findings concur with this suggestion but the reasons for that are far more complex and the implications more far reaching than the Committee on Climate Change implies as set out below.

**Mixed messages undermine a real commitment to carbon reduction**
It is apparent that the changing economic climate has had a major impact on the priorities both locally and nationally as highlighted above. This has filtered through the system in a number of ways, for example with funding streams being realigned to growth agendas (including the Local Sustainable Travel Fund), resource allocation for transport in England shifting to Local Economic Partnerships and an enhanced infrastructure spend to stimulate jobs and growth. Whilst some of these investments are clearly consistent with promoting low carbon futures (such as rail electrification and new tram schemes) others (such as new roads) are not. These contradictions are clear to local decision-makers and are seen to undermine the development of carbon targets that have real traction.

**There is an unnecessarily fuzzy accountability chain which reduces the impetus to act**
The Climate Change Act and the Climate Change Act (Scotland) act as important focal points for carbon reduction out to 2050. Underneath this headline however interpretation becomes difficult. The adoption of indicative pathways and policy programmes by the Scottish and English governments does not provide clarity over what is required from the transport sector and, more specifically, what is required of local government in tackling carbon emissions from transport. The key arguments in support of the current approach related to uncertainty over the right policy pathways and a desire to avoid distortive effects of targets.

However, the lack of clear accountability leaves local authorities to make their own decisions about whether to adopt a target (as the Committee on Climate Change suggests) or not. To set ambitious targets implies a resourced delivery plan to achieve a step change in emission reduction. Yet the signals from national government are that this is not desirable or likely. The Local Sustainable Travel
Fund focuses on expanding choice of travel means to accommodate growth - which is different from setting out to cut carbon emissions.

The lack of guidance is also deeply problematic on a practical level. As Figure 2 shows, there is a significant variation in the start point and issues facing different parts of the country. There are different opportunities to cut emissions in different places which will come at different costs per tonne saved. Whilst local authorities did not want to have targets set for them, the absence of debate about who should do what, when and how undermined the local debate on target setting.

![Figure 2: Road transport fuel consumption for freight and personal use by region, 2011](image)

The outcome is a patchwork approach to local target setting with a number of authorities establishing targets which they acknowledge are too ambitious whilst others are yet to set a target.

There is a very significant contrast to be drawn between the fuzziness of carbon policy and the clear legal requirements surrounding the responsibility of local actors for air quality. Both air quality and carbon reduction require actions from European to Local scale which suggests that more effective accountability for carbon could be established if there was a will to do so. We suggest from the research that, despite the globally leading target and legislation, there is a comparatively weak politics of climate change. An appropriate accountability framework could be designed if there was the will and resources committed to do so.
Carbon reduction needs to be part of a long-term city vision and planning framework

Many different policy objectives exist beyond carbon reduction including promoting road safety, employment growth, healthy travel, air quality improvement and congestion reduction. Focussing on any one objective at the expense of others was seen to be leading to missed opportunities for synergy. Most policies also have an impact across several objectives (e.g. promoting cycling has health, economic and environmental impacts) and the importance of developing a mix of policies that had dear local political support was underlined. Local authority participants felt strongly that it was necessary to articulate a clear vision for the city which integrated climate reduction policies was essential. In Scotland much greater emphasis was also given to the integration of planning and transport which was seen to be important and comparatively lacking in England. As noted earlier however, the presence of a vision and ambitious targets is not sufficient. The action plan needs to be coherent across spatial scales and deliverable.

Local resources to tackle climate change have been radically reduced and this will slow progress

The backdrop for carbon reduction policies has been one of significant governmental retrenchment. Nationally, there has been a reduction in the scope of technical support for environmental policy and locally the participating authorities described staffing levels of a half or a quarter of previous levels for some parts of their operations. A necessity to focus on ‘core’ statutory responsibilities has reduced significantly the human resources available to focus on carbon emissions reduction (see Figure 3).


Figure 3: Cuts to local government service spending 2009-10 to 2011-12 (Source: IFS)
There has also been a substantial reduction in local and national government funding available for transport. Whilst spending has subsequently rebounded to some degree (e.g. Spending Review 2013) this is largely focussed on new infrastructure and maintaining the existing networks. Although authorities were encouraged by the availability of Local Sustainable Travel Funding they noted that much of this was backfill for other cuts and indicated that the priority for spending was on job creation more than carbon reduction. The bidding process was also seen as administratively burdensome.

The Stern review noted that carbon reduction was likely to have an additional cost to government but that this cost, if action was taken in the short run, would be lower than deferring action to the future. It was suggested that there are not enough ‘win-win’ policies out there to deliver the progress required. Even in London, the competing demands on funding to accommodate population and economic growth means additional funding would be required to deliver current levels of ambition.

**The private sector will contribute but seems unlikely to lead**

The private sector was seen as an important potential contributor to carbon reduction but within limits. Whilst some authorities had established substantial private sector partnership working there were limits to the extent to which Corporate Social Responsibility would drive change and, as with the public sector, only a limited number of win-win policies which cut carbon and saved money.

Transport operators noted that their investment decisions for new vehicles were of the order of a decade for buses and thirty years for rolling stock. Cleaner vehicles were not seen as a major driver of patronage growth and so any additional costs beyond the commercial pay back period needed to be subsidised. Uncertainty on the future technological landscape also acted as a brake on uptake of innovation as companies sought to avoid investing in technologies that did not take off.

Concerns were raised about the adoption of different standards and approaches in different local authority areas although this currently seems more pertinent to air quality than climate change emissions. A clear signal was requested for carbon emission reduction to be a major feature in rail franchise bids to ensure that long-term environmental interventions are not dominated by short-term price considerations in franchise renewal.

**There is a lack of public engagement in climate change and a lack of coherent messages**

The public is not very engaged with climate change mitigation policy in general. In the transport sector, part of this picture is a series of mixed messages which suggest that there is not a clear national commitment to carbon reduction. These include above real-terms rail fare increases, debates about raising the speed limit on motorways, cuts in evening and weekend bus services, major road building and a loosening of planning policy. Whilst the effectiveness of policy has to be seen in the round, it is easy to undermine an already weak commitment to travel behaviour change.

**Governance structures do not matter as much as these other issues**

The study explored four distinct governance settings in England and Scotland. Whilst we identified differences in carbon target ambition, there was very little difference in policies in action on the ground. The governance reforms in Greater Manchester offered the potential to provide a more integrated and ambitious approach to carbon reduction, although this had yet to emerge. London is held up as a model of integrated policy making, yet discussions with Transport for London suggest...
that whilst the level of resources available in London is radically different so is the nature of the transport problem. Many of the same issues of uncertainty, risk and responsibility that have been highlighted above apply in London. Understanding the right level of ambition, the resources required to deliver that, and the relative role of national and local government are critical to effective carbon policy delivery. These appear more important than do the differences in implementation environment on the ground, at least at this stage.

**Avoiding picking winners or avoiding looking for them?**

It was oft quoted that government had a poor track record of picking technology winners and should therefore be relatively hands-off with regards innovation. Nonetheless, the scale of technological uncertainty demands some bold experimentation to try to understand what the right policy pathways might be. Plugged in Places is one such example although even here the balance between public infrastructure and incentives to adopt vehicles is challenging. Other, less technologically dominated experiments might also be conceived building on the Local Sustainable Travel Fund. Different pathways are likely to be appropriate in different places as we note above. It was suggested that national resources and support would be required to encourage local political leaders to take on the risk of experimentation and it is at a local level where experiments need to happen.

**In summary**

The next decade will require more radical action to kick start the carbon reduction pathway for the transport sector. This requires a greater integration of carbon into the policy making arena, greater coherence of policy development and the production of green growth strategies that really do cut carbon. Importantly this requires joining up across spatial scales in ways which are currently deemed too difficult or unnecessary but in reality are critical. As Stern suggests, it may necessary to invest now to save in the future. Arguing for greater funding in the current environment may seem forlorn yet it appears necessary to stimulate additional and more radical experiments to tackle the emissions reduction challenge that has been set.

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1. The research was based on desktop analysis, interviews with fifty one stakeholders and five workshops. The research adopted a case study based approach examining implementation in travel to work areas surrounding Leeds, Manchester, Glasgow and Edinburgh allowing national implementation differences to be analysed. Stakeholders were also interviewed at national and European levels. Whilst the findings and recommendations are the interpretations of the authors, they are based around the views of the participants.


viii CCC (2012) How local authorities can reduce emissions and manage climate risk, Committee on Climate Change, p8-9
viii DECC (2013) Sub national road transport fuel consumption statistics 2011, Department of Energy and Climate Change
Annex: details of project publications

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Abstract The UK Climate Change Act 2008 commits to a reduction of 80% in national greenhouse gas emissions by 2050 compared to 1990 levels. This article explores what happens next where these top level aspirations are expected to be turned into radical action. It does so through examination of the transport sector, which is a highly complex, fragmented and multi-level delivery environment. The research draws on cases studies of four major cities with different governance structures within the two distinct, yet connected, national contexts of England and Scotland. It integrates a range of theoretical legacies, namely ‘muddling through’, multi-level governance, and positional analysis, to look across governmental layers and out to non-governmental actors at all levels. Underneath the 80% target, the framework for action remains unclear. Lower tiered authorities report difficulties in acting in a more comprehensive or rapid manner than upper tiers of government, largely because of the potential costs involved and a significant resource dependency on national governments. Ambition is also tempered by conflicts with economic growth objectives and the difficulties in aligning the objectives of the myriad of public and private organisations that need to take action.

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Abstract Prospects for mitigating climate change require decarbonisation of the energy sector over relatively short time periods, coupled with significant changes to the way we consume energy. This is particularly true in the transport sector given the current levels of transport related greenhouse gas emissions, the heavy dependence on fossil fuels, and the uncertainty surrounding transition pathways to ultra-low carbon vehicles. There are policy responses aiming to reduce carbon emissions by changing travel behaviour, but prominent approaches share a common theme of seeking to change behaviour by focusing on the individual and their choices. These are the object of critics who maintain that effective change requires collective action at social, economic and cultural levels.

This paper questions whether decision-makers are relying on these choice-based approaches to change travel behaviour and, if so, how effective they expect them to be. We address this through analysis of over 50 interviews with policy stakeholders in England and Scotland. We find dominant policy approaches do focus on individual choices, but significantly it is not because decision-makers have faith in their effectiveness. These approaches persist in policy on carbon reduction for two reasons. One is appeal to a politically powerful, but incoherent, discourse of individualism. The second is that decision-makers do not want significant behavioural change. There is an imperative of economic growth and a firm belief that a strong economy is linked to higher traffic levels, and that to reduce the demand for travel is to risk economic damage. We argue that these beliefs about the relation between travel demand and prosperity are narrowly defined and contestable for empirical and normative reasons. If there is to be a significant change in the approach to intervening in travel demand there is an urgency to engage in the politics of behaviour change – a meta-level behaviour change challenge.
Text available at http://dx.doi.org/10.1111/1467-856X.12040

Abstract The Climate Change Act 2008 received global acclaim for embedding an ambitious set of targets for the reduction of carbon emissions in legislation. This article explores the policies and institutional frameworks in place to deliver transport-related carbon reductions as part of the subsequent Carbon Plan. A detailed methodology involving institutional mapping, interviews and focus groups combined with a theoretical approach that combines the theory of multi-level governance with the literature on ‘blame avoidance’ serves to reveal a complex system of ‘fuzzy governance’ and ‘fuzzy accountability’. Put simply, it reveals there are no practical sub-national implementation levers for achieving the statutory targets. Apart from symbolic or rhetorical commitments, the emphasis of policy-makers at all levels in the delivery chain has switched from carbon management and reduction to economic growth and job creation. This raises fresh research questions about the pathologies of democratic competition and future responses to the climate change challenge.

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Abstract This paper seeks to understand how the UK government’s headline climate change targets are translated into action at the local level in the transport sector drawing on the findings of research in two English regions. In doing so, these headline targets are identified as a symbolic meta-policy that results in little action on the ground and which challenges established conceptions of policy implementation. Both the 'meta' and 'symbolic' aspects of the policy offer part of the explanation for the lack of substantive action on the ground. As a meta-policy, the headline targets across government require the elaboration of other policies at other levels such as targets for government departments and local authorities, but these are largely absent, leaving the meta-policy without teeth. Over time, these headline targets have developed into a symbolic policy, serving political goals but having little practical effectiveness.