



Transport and climate change

The [Climate Change \(Scotland\) Act](#) sets a target of an 80 per cent reduction in CO2 emissions by 2050.

The transport sector will need to make a significant contribution towards meeting this target.

Domestic transport accounted for 20% of total [Scottish GHG emissions in 2011](#) whilst international aviation and shipping accounted for a further 5% of total emissions.

The Scottish Government's [Climate Change Delivery Plan](#) states that we require:

"Almost complete decarbonisation of road transport by 2050 with significant progress by 2030 through wholesale adoption of electric cars and vans, and significant decarbonisation of rail by 2050".

The Scottish Government recently published its programme of strategic action to move towards a largely decarbonised transport sector in [Low Carbon Scotland: Meeting our Emissions Reduction Targets 2013 – 2027 \(RPP2\)](#).

This strategy focuses on:

- Decarbonising vehicles through action to advance the mainstream adoption of [electric vehicles](#) (EVs);
- Delivering more efficient use of the road network through initiatives such as the application of [Intelligent Transport Systems](#) (ITS);
- Building sustainable communities with greater carbon-friendly travel options, particularly [cycling and walking](#) and
- Engagement with businesses and organisations to promote the transition to low-carbon transport and travel, through measures such as fuel efficient driving, workplace travel planning and freight efficiencies.

Scottish road network climate change study

To ensure Scotland can adapt to the effects of climate change, the Scottish Government , through Transport Scotland, commissioned two studies in 2005.

The first study focused on landslide risks and how they should be assessed, ranked and managed. The second study (published in June 2005) considered the potential trends in climate change in Scotland and how these may affect the road network. In light of the release in 2009 of the latest climate change scenarios (UKCP09) this report has now been updated.

To access the 2009 update Executive Summary and full report see:

- [Executive Summary](#)
- [Scottish Road Network Climate Change Study: UKCP09 Update](#) (Autumn 2011)

The Scottish Government is committed to providing a world class transport system which provides the people of Scotland with efficient travel and which allows the country and its economy to thrive. The road network is central to this and the effect of severe weather is something we are well used to dealing with throughout the year. Climate change will likely increase the effects of this severe weather and end up in more flooding, landslides and high winds.

The 2005 report outlines the historical information available at the time relating to severe weather events and how this is used in the design and operation of the road network. By referring to the UK climate change projections UKCP02, the report then determines how the key weather variables that impact on the road network, such as temperature and rainfall, are predicted to change in the future.

[View the Scottish Road Network - Climate Change Study \(2005\)](#)

The general conclusion is that the climatic changes expected in Scotland in the near future, as represented by the 2020s, are relatively small.

However, even these small changes may be sufficiently significant to warrant adjustment of current practices. While the report notes that these changes are likely to become more marked over the longer term, the degree of uncertainty associated with these predictions increases.

The published report presented a series of 28 recommendations for the design and operation of the road network focussing on responding to climatic changes predicted to occur in the near future.

These are presented in terms of design, operation, further research or policy review, as appropriate to the issue identified. Longer-term recommendations are included in Section 6.

In 2008 a further report was published to assess progress against the 28 recommendations. This report follows the same structure as the original study report and details the progress in implementing each of the recommendations in terms of their relative urgency, sub-divided by weather type and means of implementation. A selection of case studies is also presented highlighting the issues.

[View the Scottish Road Network - Climate Change Study: Progress on Recommendations \(2008\)](#)

In 2009 the UKCP09 climate change scenarios were released. These scenarios are designed to provide improved and more detailed descriptions of the likely climate the UK will experience throughout the 21st century and, as such, they supersede the earlier UKCP02 climate change projections. This identified a need to update the findings of the original 2005 report, including its recommendations of adaptive strategies to minimise future climate change impacts, and has led to the UKCP09 Update report mentioned above.

To find out more about the landslides study see [Scottish Road Network landslide information](#)

Reducing fleet emissions: Report on Proposals and Policies Introduction

On 14 March 2011, the Scottish Government published its climate change Report on Proposals and Policies (RPP) or, as it is more formally known, Low Carbon Scotland: Meeting the Emissions Reduction Targets 2010-2022.

Its publication marks a transition from policy analysis to actual implementation of the various policies and proposals set out in the report. The target for 2050 is a reduction of 80% in emissions over 1990 levels, with an interim target of a 42% reduction by 2020.

The aims of the joint seminar by Transport Scotland and Scotland's 2020 Climate Group were to discuss, at an operational level, how vehicle fleet operators might implement those emission reduction policies and proposals contained within the RPP that relate to fleets, to identify what - if any - barriers to doing might exist, and if there were particular opportunities to pursue.

The seminar was attended by a range of public and private sector vehicle fleet operators, companies involved in the manufacture of low carbon vehicle technologies, those organisations represented in the Transport Sub-Group of the 2020 Climate Group and representatives from Transport Scotland and the Scottish Government.

2020 Climate Group
Transport Scotland

April 2011

The aim of the [2020 Climate Group](#) is to help all sectors of Scotland's economy and civic society to contribute fully to achieving the Climate Change Delivery Plan over the next decade and is convened by Ian Marchant, Chief Executive of Scottish and Southern Energy.

Transport Scotland is the national transport agency for Scotland. It is an agency of the Scottish Government and is accountable to Parliament and the public through Scottish Ministers.

Opening Remarks

Ian McKay, Director of Scottish Affairs, Royal Mail and Chair, 2020 Transport Sub-Group

Ian welcomed delegates and thanked Transport Scotland for facilitating this important event. The event was designed to allow debate in the area of climate change and carbon reduction, to move beyond the areas of policy and financial responsibility within companies and public sector organisations, and to engage with those who would face the task of actually delivering the targeted reductions.

Participants in the seminar had been invited on the basis of their hands-on experience and important knowledge of transport issues in Scotland, and to hear their practical advice on how best to achieve progress in this important area for the benefit of all fleet operators and in the interests of reducing the risks posed by climate change.

Referencing the events in Japan the previous week, Ian stressed the importance of not relying on as yet unknown technological advance in order to achieve carbon reduction. Rather, it was important to explore the options available now and, through discussion and comparison of experience, to set a forward course of direction.

Ian hoped they would enjoy their day and asked that delegates also provide feedback on other areas that might be addressed at a future time.

Donald Cammichael, Director of Transport Policy, Transport Scotland

Today, the Scottish Government publishes its climate change Report on Proposals and Policies (RPP) or as it is to be formally known Low Carbon Scotland: Meeting the Emissions Reduction Targets 2010-2022. Its publication marks a transition policy analysis to the actual implementation of the various policies set out in the RPP. The final target for 2050 is a reduction of 80% in emissions over 1990 levels, with an interim target of a 42% reduction by 2020. While we are already half way towards meeting the interim target, emissions in the transport sector have increased by 9% since 1990.

The 2020 and 2050 targets are set in law in the Climate Change (Scotland) Act 2009. The commitment underpinning the legislation will not waver much, if at all. There is political commitment at EU and UK levels too. Consequently, we have to live with the reality of EU and national regimes prescribing ever tougher emission standards and more environmentally responsible procurement practices. So we need to make a reality of the transport initiatives. Success will depend on technology, behaviour change and partnership. We need all three. Groups like this, under the 2020 Climate Change banner, must play a pivotal role.

John Curtis, Head of Low Carbon Vehicles, Transport Scotland

While Scottish emissions overall have been reducing since the 1990 baseline year, this is not the case for transport emissions which – apart from a dip in 2008 – have continued to increase. The public and private sectors can show leadership in reducing emissions by the way they operate their vehicle fleets. The RPP has four measures directly applicable to fleets: eco-driving, low carbon vehicles, freight efficiencies and van efficiencies.

Eco-driving is a proven success. Average fuel savings of 7% can be expected for cars and 10% for HGV scheme. Eco-driving training is commercially available across Scotland for HGVs and van drivers. The Energy Savings Trust has provided training and information to car drivers. The question before us is how do we increase uptake? We consulted on Low Carbon Vehicles (LCVs) and have already made investment. We can expect to see up to 150 LCVs added to the public sector fleet in the months ahead. About 50 hybrid buses will be added to bus fleets. And current funding will see about 375 charging points provided in various central belt locations. For the future, we need to develop forward strategies for the widespread adoption of LCVs with the public and private sectors. This is not something Government could or should do on its own. We need to hear your views on the key steps that we need to take with the 2020 Climate Group and other stakeholders.

At a seminar in March 2010, freight and local authority delegates told us they were aware of alternative fuels such as bio-fuel, hydrogen cells and electric vehicles. They were then waiting to see which option was going to be most sustainable in the long term before investing. Is the long term soon enough? The EU has reached agreement on new standards for new van emissions. What other steps can we take to encourage more sustainable van use by fleet operators?

Workshop Discussions

The workshop participants are listed under [Attendees](#)

Eco-driving

Most fleet operators present at the seminar had used eco-driving training to encourage fuel savings but the range of experience was varied. One reported extensive experience where 75% of HGV drivers were receiving training, while another was working in partnership with vehicle manufacturers to further improve efficiencies, and a minority were dipping their toes into eco-driving for the first time.

Benefits & Recognition

Where an organisation's fuel spend is counted in £ millions annually there is a strong financial incentive to improve efficiency. Consequently, there is a strong management role in investing in behaviour change measures such as eco-driving. In addition to savings in fuel costs, other noted benefits include reduced maintenance costs, and a reduction in accident rates of around 21%. In addition, eco-driving supports the Certificate of Professional Competence (CPC) requirements of HGV and Public Service Vehicle (PSV) drivers.

One fleet operator present recognised driver performance in staff awards and competitions and operates a green points scheme whereby savings are shared with drivers, while also noting that driver unions ought to be involved in recognition and competition arrangements.

Monitoring & Review

There was strong support for the view that the impact of eco-driving information in the absence of training is highly doubtful and that, to be most effective, training needs to be supported by systems that monitor both vehicle and driving behaviours on an ongoing basis. One fleet operator attributed 15% fuel efficiency savings to performance tracking telematics. Another identified on-board telematics as a simple RAG (red, amber, green) means to communicate with drivers on fuel efficiency, and as a means to identify training needs. In reply to a question on which telematics system might best be used, the suggestion offered was to ask the manufacturer of the vehicle.

Data monitoring also led one operator to have vehicle modifications made to maximise fuel efficiencies through, for example, gradual acceleration, while others had incorporated vehicle and engine speed limiters in their fleets, so that they operate closer to their optimum efficiency, and had installed devices that cut off engines after 10 minutes idling. One public sector body had adopted a 'driving at work' policy for employed drivers, including training and daily vehicle checks to also ensure road safety and road worthiness as a key element of the organisation's risk management regime. One participant thought these 'hard' measures to be more effective and direct than training investment.

A delegate suggested that operators should be obliged to publish mileage and fuel use and that investment in eco-driving ought to become a regulatory requirement for fleet operators.

Obstacles

Despite the clear financial incentives of engaging in eco-driving activities, experience suggests that 'investing to save' can be difficult within organisations. Local authorities were described as increasingly cost driven, and often guilty of short-termism as a consequence of electoral issues, while companies are 'run by accountants'. Was there scope for a common policy approach to eco-driving across all local authorities?

It was also evident that changing driver behaviours is not easy, particularly where delivery timetables are tight. And, while drivers are professionals and eco-driving is therefore part of their job, the evidence is that they need to see the benefits to accept the need for change. In organisations where they had, a positive competitive culture between drivers has emerged.

A reluctance to invest in training because of staff turnover levels was also raised.

Other Issues

Issues arising in discussion included how organisations with large 'grey fleets' (in which drivers use their own cars to drive for work purposes) might stimulate drivers to undergo eco-driver training, and how the key messages from the seminars might be communicated to the many smaller fleet operators.

Low Carbon Vehicles and Infrastructure

Most operators at the seminar seemed to have some but varying experience of LCVs. Their current high costs, the maintenance they require, and reliability (actual or perceived) issues are huge disincentives. Making a business case for LCV procurement is extremely difficult.

High Costs & Reliability Issues

Purchase costs can be as much as three times that of a conventional vehicle and in the order of £125,000 for a low carbon refuse vehicle. Moreover, fuel efficiencies gained do not cover the additional procurement costs. There was also the issue of residual values and the extent to which a meaningful return is likely to be had on disposal.

From the supply perspective, it was reported that without increased demand, manufacturers' unit costs have to stay high. However, it was also reported to participants that Scotland Excel (the procurement centre of excellence for the public sector), received a nil response from manufacturers to a tender specification for LCV supply.

In addition, there were continuing concerns about reliability and vehicles having to be pulled from service. Breakdowns were up by 45% in one fleet and the cost of downtime was reported as £600 per day. The negative impact on LCV performance on customer service could not be ignored. The weight of vehicle batteries also reduced the amount of vehicle load capacity.

Future Procurement

Further uptake of LCVs is likely to occur only where there is an appropriate subsidy in place. However, participants also heard that hybrid Ford Transits were currently available at only 10% additional cost.

Procurement officers in organisations needed to be better informed and give greater recognition to the environmental imperatives of the climate change legislation. It was also suggested that a model LCV specification might be useful across local authorities and/or the benefits of centralised procurement could be considered.

Alternative Fuels

The seminar heard that hybrid buses purchased by one operator under Transport Scotland's Green Bus Fund were registering 25-30% fuel savings. It was unclear whether the savings would cover the additional upfront costs of purchase. Waste-derived B100 and B30 bio-fuel blend was also used in some buses while six others ran on bio-methane. It was noted that although hybrid engines are suitable for buses they are much less so for heavier vehicles.

More generally, the seminar heard that repairs and fuel processing associated with bio-fuels may be cancelling out the benefits of their use. Problems with hydrosopic fuels through water contamination were also reported. A further issue around warranties was widely articulated (i.e. some vehicle manufacturers are refusing to honour engine warranties at high proportions of biofuels are used. There were also concerns around higher bio-fuel volumes and the need to minimise degradation.

One operator reported looking at all the available low carbon options a few years ago. SAAB biofuel vehicles were ultimately bought but biofuel was not being used because no bio-fuel is available. Scottish Water was reportedly producing bio-methane, but would it be available for vehicle use? One operator lamented the ending of a previous EU gas conversion scheme. More positively, the seminar also heard from delegates that technology currently exists for vehicles to produce their own hydrogen fuel from water. It was noted that EU vehicle engine standards introduced to improve air quality actually reduced fuel efficiency, thus increasing CO2 emissions.

Suggested Approaches

It was suggested that a more joined-up strategic approach to alternative fuels and infrastructure is needed, that legislation is required to encourage improved industry standards, that the UK Govt should be lobbied to incentivise use of alternative fuels through fuel taxation, and that the benefits of area-wide pilots might be worthwhile testing. In this respect, what could we learn from London's experience of Low Emission Zones?

Freight Efficiencies

Rail Freight

One operator spoke of a desire to see more freight move by rail but, in Fife, this was unlikely because of track access difficulties, and because there are no rail links to St Andrews (or to Kirkcaldy). Another advised of the potential for waste to be transported to the central belt from Highland if not for track access difficulties (Attention was made of a report into rail freight in the Highlands). A national operator also voiced doubts about the rail network's capacity to take more freight whilst another noted that rail wasn't suitable for transporting its goods because it did not have the special equipment required.

Supply Chain Development

One participant advised that his organisation was proactive in supply chain partnerships and worked with both shipping and rail operators to scope various transport options. The seminar heard that IKEA too was a good example of an environmentally minded international organisation which operated a very thorough process with suppliers to make sure they fulfil particular environmental requirements.

Other

In addition to eco-driving and LCV issues already discussed, it was noted that 45% of home deliveries result in non-delivery adding considerably to fuel use. Also that in the current economic climate, empty running in return trips from continental Europe was more or less constant for operators. It was additionally suggested that new warehouse infrastructure should be equipped for LCV use.

Key Messages

Eco-driving

- Corporate leadership is essential to its successful uptake
- Eco-driving produces operating efficiencies of an order suggesting costs, corporate investment in training has a significant net benefit in reducing fuel and other operating costs, particularly where this is supported by ongoing monitoring, through telematics systems, and review
- Changing driving behaviour is easier once drivers themselves see the benefits, leading to an improvement culture
- Organisations with large grey fleets ought to encourage their drivers to undertake eco-driving training, and
- The advantages of eco-driving needed to be communicated to the large number of smaller fleet operators to encourage them to invest in training and monitoring.

Low Carbon Vehicles & Infrastructure

Currently the development of a persuasive business case for the procurement of LCVs was compromised by:

- High purchase costs
- Uncertainty over fuel efficiencies being sufficient to balance additional purchase costs
- Their reliability and its impact on customer service, maintenance and downtime costs
- Potentially low residual values, and that
- Consideration might be given to the benefits of a common approach on LCV procurement across local authorities, or to a national LCV procurement framework, perhaps via Scotland Excel.

For the time being at least, continued subsidy would be required to incentivise increased uptake. The seminar also noted that:

- Government and/or the 2020 Climate Group should show provide leadership and direction on alternative fuels to reduce uncertainty and financial risks
- Industry standards needed to be improved, perhaps by legislation
- The UK Government might be lobbied to incentivise use of alternative fuels through fuel taxation; and
- Area based low emission initiatives could be considered by the public sector.

Freight Efficiencies

- Road congestion added to fuel consumption. More road and rail infrastructure investment might complement the roles of eco-driving LCVs and alternative fuels in reducing emissions
- Rail track access was a substantial issue in moving freight from roads.

2020 Climate Group
Transport Scotland

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Liam Kelly	Scottish Government
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