
Greenhouse gas emissions reduction potential in the Scottish transport sector from recent advances in transport fuels and fuel technologies

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1 Abstract

Element Energy, with support from the University of Aberdeen, was commissioned by Transport Scotland to assess the potential for greenhouse gas (GHG) emissions reductions in the Scottish transport sector to 2032, particularly in the context of recent progress in battery and fuel cell technologies. This was in order to assess transport's potential contribution to Scotland's ambitious targets for GHG emissions reductions, and the future implications for the Scottish transport sector.

We found that significant emissions reductions are achievable from light vehicles, through widespread electrification of cars and vans (on top of continuing efficiency improvements / hybridisation of petrol and diesel powertrains). This would require a broad package of ongoing financial and convenience incentives for uptake of ultra-low emission vehicles, as well as widespread charging infrastructure deployment. There is also some potential for emissions reductions from buses and smaller trucks through policies aimed at encouraging electrification. However, there are very few policies available at a Scottish level for long-haul trucks, marine, and aviation. As such, despite some expected efficiency improvements, increases in demand mean that annual emissions from these sectors to 2032 are expected to remain roughly constant.

Approach: We conducted a literature review to determine cost and efficiency trends for a wide range of vehicle types and powertrains. We then constructed a model of the Scottish vehicle fleet, to assess the expected impact on GHG emissions in the base case. Desk-based research and consultations with industry and local authorities were used to develop a range of policy options and assess their feasibility in Scotland. The expected impact of these policies on uptake of vehicles with alternative powertrains was assessed using our in-house consumer uptake model. The resulting uptake scenarios were fed through our fleet model to determine the resulting GHG emissions from transport in each scenario.

2 Availability of Paper

Please see the published report: <https://www.transport.gov.scot/media/10168/j202258.pdf>

3 Availability of Presentation Slides

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