

Powering the Future - sector pages

Transport

Transport consumes about 26% of UK fossil fuel and emits around 22% of CO₂

Petrol and diesel dominate consumption and will need to be substantially replaced by alternatives in the future. Because of the size and consumption of the sector, any strategy for change will have a major impact on the UK economy and road users.

Significant report findings - transport:

Changes in travel habits to cut car use, combined with a large-scale and rapid switch to electric vehicles, will be necessary for the transport sector to make adequate contributions to the required reduction in CO₂ emissions. Large-scale development in public transport will make an important contribution to reduce road vehicle use and help curtail growth in road transport.

Eighty per cent of road fuel consumption must be displaced by electric cars and vans by 2050. This will require an extensive new nationwide battery charging infrastructure expected to deliver half of all electricity production by 2050.

The use of electricity via battery or plug-in hybrid cars and LGVs is found to offer the largest potential CO₂ reductions.

Vehicle efficiency improvements alone cannot provide the levels of energy reduction necessary in this sector, but they are an important short-term transition measure.

Heavy goods vehicles are responsible for 5% of UK CO₂ emissions. Neither hydrogen energy storage nor batteries are likely to be able to store sufficient energy to provide HGVs with an acceptable journey range. However, the benefits of mitigating emissions from HGVs are found to be considerable and urgent work is required to develop alternative means of delivering low-carbon energy to them.

Overnight off-peak electricity can only meet demand for charging vehicle batteries until about 2025. After this date, battery charging will need to be distributed across the 24 hours to avoid new demand peaks overloading generation, transmission and distribution systems.

The substitution of carbon-neutral biofuels for petrol and diesel can achieve substantial reductions of CO₂ emissions. Although the quantities of biofuels available are limited, a 5% reduction in CO₂ emissions by substitution of biofuels is likely to be sustainable.

Irrespective of the method of production, hydrogen used to power vehicles is found to require a costly network of large-scale production facilities. Hydrogen production from electricity would require at least twice the electricity generation capacity needed for battery electric vehicles, while production from coal or hydrocarbons is complex, requiring large-scale CO₂ separation and geological storage. In addition a new large-

scale network for hydrogen distribution and vehicle filling would be necessary. This large additional infrastructure is unlikely to be viable given the inferior saving in CO₂ emissions compared with electric battery vehicles.

Further work – transport:

Identify issues and opportunities for transition of road transport from petroleum fuel to electricity; prepare a strategy and timeline for the changes required, including economic, social, environmental and infrastructure issues.

Prepare a strategy to increase the capacity and use of public transport networks in order to reduce road transport for passengers and freight.

Evaluate the potential application of CO₂ emission reduction measures to aviation and marine transport to enable an appropriate strategy for emission reduction to be developed consistent with international best practice.

Evaluate the impact of electric vehicle adoption on UK road transport infrastructure and facilities; define a strategy to promote implementation of the necessary changes at each level of the system.

Investigate further potential options to radically reduce CO₂ emission by the HGV fleet, including assessment of alternative fuels, hybrid vehicle concepts and direct electricity supply.