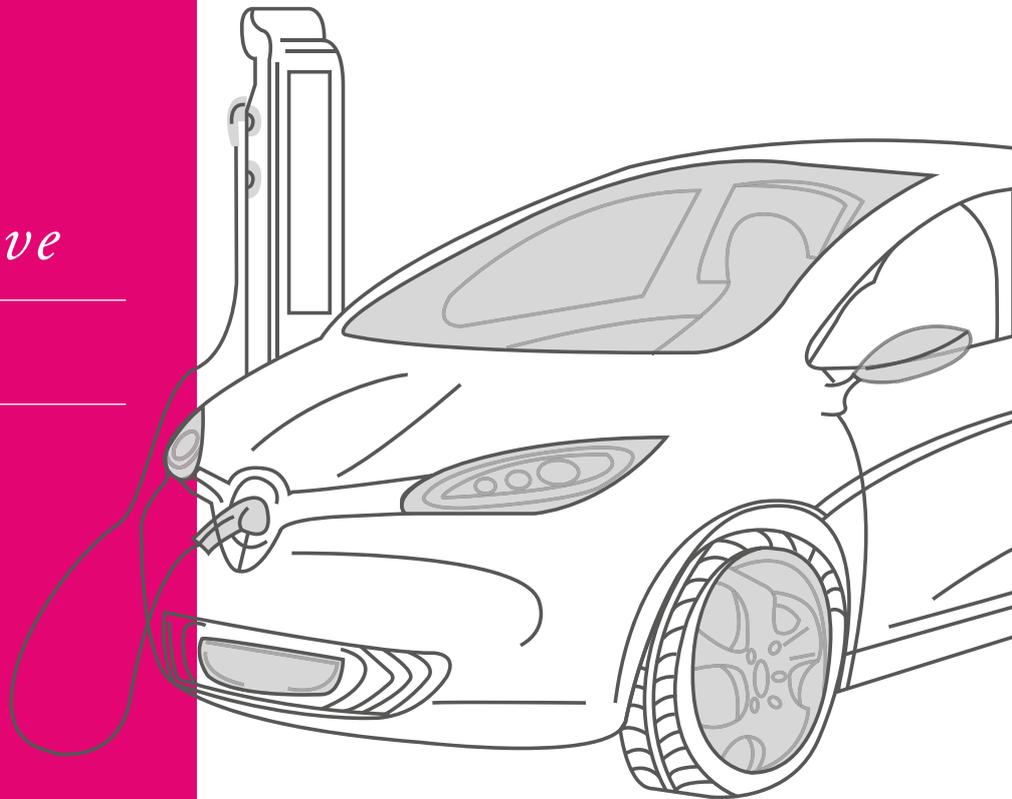
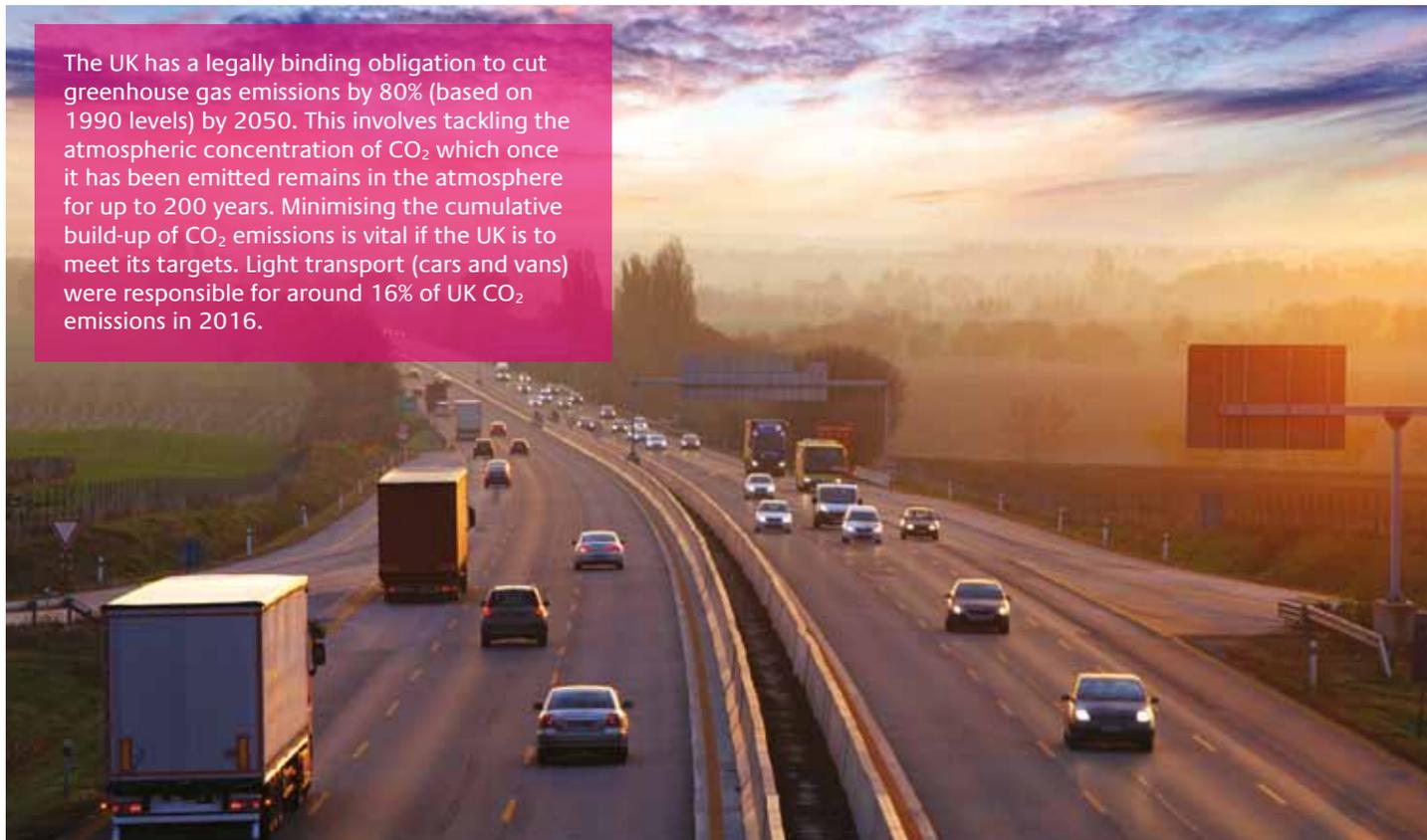

An ETI Perspective

The route to a low cost, low carbon
light vehicle transition





The UK has a legally binding obligation to cut greenhouse gas emissions by 80% (based on 1990 levels) by 2050. This involves tackling the atmospheric concentration of CO₂ which once it has been emitted remains in the atmosphere for up to 200 years. Minimising the cumulative build-up of CO₂ emissions is vital if the UK is to meet its targets. Light transport (cars and vans) were responsible for around 16% of UK CO₂ emissions in 2016.



Light vehicles will remain central to UK mobility in 2050, so transforming the fleet to more low carbon solutions is important and so is building the right energy infrastructure to support such a move.

Analysis of the energy system as a whole shows that cutting transport carbon emissions is expensive when compared to other sectors. Developments in other parts of the UK energy system which allow for the decarbonisation of the power and heat sectors first, will mean that some fossil fuel could still be used in light vehicles out to 2050 but to play its part, the provision and fuelling of light vehicles will need to change.



THE CHALLENGE



The scale of change is huge. Today electric vehicles account for less than 1% of vehicles in the UK. Whilst transition costs will be impactful ongoing costs are likely to be modest when compared to the cost of a 'do nothing' approach. Some form of government support will be required to smooth the impact of transition costs.

Developing a public network infrastructure of vehicle recharging is a very high risk investment and our analysis would suggest it is not needed to meet the 2050 targets. Our research points to focusing on locating charging points at home and work locations. This is where vehicles are stationary for longer and a 3kW charge rate, the power rating of a standard domestic socket, will be sufficient for most users' needs. Any large scale public charging structure will be difficult to implement, so to appeal to a mass market of motorists the charging solution should come to them, making it more convenient and enticing for the end user. The UK should look to invest in rapid charging (replenishing batteries in minutes rather than hours) as an additional medium term option, and this is where the motorway service station network could be best utilised.

Hydrogen is often talked of as another fuel source solution for light vehicles. ETI analysis suggests that this should be viewed as an "insurance option" and will likely be more prominent in the energy system beyond 2050. Today the UK hydrogen industry is in no position to meet the scale needed to serve mass market transport use. A hydrogen path is also likely to be slower to deliver emissions reductions, resulting in higher atmospheric CO₂ concentration due to the cumulative emissions build-up by mid-century.

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COMPONENTS OF A LEAST RISK, LEAST COST TRANSITION



- There needs to be continued ambition in emissions legislation for light vehicles so low carbon technology is incentivised to – including the use of carbon linked taxes to create a level playing field with established, (lower cost) high carbon technologies. At present this legislation is EU led but the global supply basis for the industry means post UK Brexit arrangements are likely to benefit from continued alignment.
- There needs to be a rapid increase in the efficiencies of conventional vehicles – including hybridisation (a 50% improvement by 2030 is potentially achievable).
- To make the most efficient use of the natural balance of compounds in crude oil and minimise energy intensive fuel processing and refining.
- The UK needs to upgrade its oil supply system to increase resilience and balance its petrol, diesel and other product outputs from refineries with demand.
- There needs to be growth in the volume of plug-in hybrid electric vehicles available to the market.
- Electricity distribution regulations need to adapt to allow for efficient network upgrades to manage increased demand.
- Long-term biofuel sustainability regulations need to be established to provide industry with confidence to invest in innovation and deployment.
- Markets need to develop and systems evolve to allow for the inclusion and operation of "smart" energy demand management.
- There needs to be the targeting of zero emissions from electricity generation at a systems level by 2030.
- UK vehicle energy supply research and development should focus on advanced sustainable biofuels.
- The definition of a clear fuel standard should be introduced that will allow the management of a transition to high blend biofuels combined with the ability to enable today's vehicles to run on high blend biofuels by the mid-2020s.
- The creation of long term stability in automotive decarbonisation policy to provide investors with confidence to invest in any transition.
- Ensuring policy strikes an equitable balance for different segments of society who rely on light vehicles.

MANAGING THE SOCIAL IMPACT



The final point of the component list is very important. For any large-scale transition to work the social impact has to be fully understood. Any increase in efficiency and electrification of supply will reduce the level of liquid fuel sales. This will undoubtedly threaten the market viability of the current “universal coverage” of petrol filling stations across the UK. And not everyone will be able to afford access to electric vehicles. This would make this particular section of society sensitive to liquid fuel prices which because of the reduced volumes would most likely begin to carry scarcity price premiums.

Also the least affluent in society will be the ones that will depend on older, higher carbon emitting vehicles, and during any transition will become the section of society who will be most susceptible to any carbon based taxes on fuels. This has to be managed carefully.



FURTHER READING



An affordable transition to sustainable and secure energy from light vehicles in the UK

<http://www.eti.co.uk/library/lhv-an-affordable-transition-to-sustainable-and-secure-energy-from-light-vehicles-in-the-uk>



Consumer responses to electric vehicles literature review

<https://trl.co.uk/reports/PPR728>





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