

The Rt Hon Michael Fallon MP, Minister for Business & Enterprise Minister of State for Energy  
and Baroness Kramer, Minister of State for Transport  
Office for Low Emission Vehicles  
Great Minster House  
33 Horseferry Road  
London  
SW1P 4DR

10<sup>th</sup> January 2014

Dear Michael and Baroness Kramer

**CCC response to call for evidence on Government measures to support uptake of ultra low emission vehicles from 2015-2020**

Ultra low emission vehicles have a key role in decarbonising surface transport and in contributing to achievement of the UK's overall climate change targets. In order to fulfil this role, significant deployment is required by 2030. A Government package is essential in supporting market development. We therefore welcome the Government's announcement to facilitate deployment with further funding for a package of support measures.

Our analysis has shown that electric vehicles (EVs) are a cost-effective abatement option and they should reach parity with conventional cars on an economic basis in the 2020s, as technology costs continue to fall and significantly lower running costs outweigh the higher capital costs<sup>1</sup>. It has also highlighted barriers related to consumer motivation which will need to be addressed.

We recently commissioned a study<sup>2</sup> to examine the main factors influencing purchase of EVs, to review their current and projected supply and characteristics and to assess their likely uptake with different measures in place to address key barriers. The study provides a strong evidence base to underpin the design of a support package to incentivise EV uptake, the key elements of which should include:

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<sup>1</sup> Element Energy (2012) *Cost and performance of batteries for EVs*; AEA Technology (2012) *A review of the efficiency and cost assumptions for road transport vehicles to 2050*

<sup>2</sup> Element Energy, Ecolane Consultancy and University of Aberdeen (2013) *Pathways to high penetration of electric vehicles*

- Financial support to overcome the higher up-front costs of EVs, together with softer measures (e.g. access to parking) valued by consumers.
- A network of rapid charging points given the value consumers place on range, charging times and access to charging.
- An information campaign to raise awareness and exposure to EVs.
- Stimulating the supply of the EV market to increase brands choice across the range of consumer segments.

We consider these in more detail in the attachment.

We will set out our analysis of appropriate support for EV market development in our 2014 Parliament Report.

Yours sincerely



David Kennedy

Chief Executive, Committee on Climate Change

## ATTACHMENT

### Financial and non-financial support

Key elements of a package to incentivise consumers to take-up of ULEVs are: the need to bridge their higher up-front costs; the role of softer measures such as preferential access to parking; and the need for support across different types of ULEVs, including hydrogen fuel cells:

- Vehicle price is the key factor affecting purchase decisions. Running costs also play a role; however consumers have short pay-back periods – they value upfront costs much more than running costs which they discount heavily, which means they are typically looking for pay-back periods, not currently achieved, of around four years. This gap must be bridged if EVs are to reach mass market deployment. Options to achieve this include up-front grants or more innovative financing and ownership models such as battery leasing or car clubs, with the added benefit in many cases of removing consumer concerns regarding component degradation and residual values. Consideration should be given to how these options could be supported.
- Uptake can be cost-effectively supported through non-financial measures which are valued by consumers (such as free/preferential access to parking and bus lanes, and other soft benefits), as has been proven in countries where uptake of EVs is much higher than in the UK. Non-financial measures also have the advantage of playing a key role in supporting the used EV market. Local and national government will need to coordinate and standardise such local measures across the UK.
- High penetration of EVs by 2030 is likely to be most efficiently achieved through a combination of technologies (e.g. as PHEVs enjoy greater acceptance among private buyers, and don't suffer from range limitations, while BEVs, where range compatible, can offer lower overall costs for economically rational fleet buyers)<sup>3</sup>. Measures to address purchase cost and other barriers are therefore recommended for all vehicle types in the near to medium term, including hydrogen fuel cell vehicles (FCVs) which could help address the most difficult vehicle segments to electrify<sup>4</sup>.
- Our analysis has shown the potential for EV costs to continue to fall with mass deployment and technology learning. It is important, both to ensure the cost-

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<sup>3</sup> Achieving a high penetration of EVs overall (including PHEVs) is preferable to achieving a lower penetration with BEVs only in order to 'normalise' plug-in technology. Our analysis assumed a PHEV range of 20 miles, and average emissions of 50gCO<sub>2</sub>/km in 2020 on a test cycle basis.

<sup>4</sup> E.g. large car segments and vans with high duty cycles

effectiveness of EVs and to deliver value for money for tax-payers, that the support package is designed to incentivise this.

### Infrastructure provision

Our evidence shows that consumers value range, access to charging, and short charging time. While most UK buyers will have access to overnight parking which can deliver the majority of charging, a charging infrastructure is required to extend mobility and address range anxiety:

- Overnight charging (at home or workplace), and/or at work during the day, is preferred, and use of (3-7 kW) public charging networks is currently low. However buyers often demand more public charging infrastructure, to support perceived range requirements.
- Charging time is consistently reported as a barrier. Utilisation of rapid (50 kW) chargers in other countries, and relatively high sales of EVs with DC charge ports, confirm the value placed by buyers on reduced charging time.
- Most (70%) UK buyers have access to overnight parking and this could be used to deliver the majority of charging, at low cost. While the driving range of BEVs is improving year-on-year, there is still a need for a charging infrastructure to extend the mobility offer of BEVs (particularly for company cars/vans). National coverage could be most efficiently provided through a relatively limited (c. 2000 sites) network of rapid chargers<sup>5</sup>, rolled out between 2020 and 2030 – from an initial seeding in urban areas, connected by trunk roads – at a cost of around £300-530 million<sup>6</sup>.
- Other infrastructure solutions will be needed in moving to a 100% zero-emission fleet, potentially including emerging technologies alongside on-street residential charge points and wide deployment at work / public car parks. Battery swapping is unlikely in the short to medium term, given required standardisation and costs, but could be useful in the longer term, initially serving the commercial vehicle market, before supporting BEV car uptake.
- FCVs could offer a valuable alternative to BEVs in some segments, suggesting support for hydrogen, including refuelling infrastructure, would be a sensible hedging strategy for delivering a 100% ZEV fleet.

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<sup>5</sup> This compares to around 8,600 liquid fuel stations in the UK currently

<sup>6</sup> Capital and installation. Other analysis suggests costs associated with electricity network impacts would also be manageable (CCC analysis based on DECC (2013) *Electricity Generation Costs 2013*; Imperial College and Element Energy (2014) *Infrastructure in a low-carbon energy system to 2030: Transmission and distribution*)

## Awareness and acceptance raising

Consumer research suggests overall acceptance of EVs is currently low, reflecting concerns around reliability, safety, battery degradation, residual values, and, for some consumers, the symbolic associations of EVs. However, only around 20% of UK drivers are ‘very familiar’ with EV technology<sup>7</sup>, so concerns reflect a lack of awareness. Responses to direct exposure to EVs (trials, test drives etc.) are generally very positive.

A pre-requisite for mass market uptake of EVs is a shift in awareness and acceptance<sup>8</sup> of EVs which is likely to need a mix of measures from strong marketing campaigns, exposure through test drives, public procurement, and personalised information:

- A large scale, coordinated and sustained promotional campaign should draw on the experience of large scale marketing and go well beyond information provision, and make use of digital platforms.
- Direct consumer exposure to EVs can be provided through test-drives, short-term hire, EV taxi fleets, vehicle rental and car clubs. These options should be supported, e.g. through smart and targeted taxation<sup>9</sup>. City-based schemes could provide exposure to a high number of potential buyers, offering an efficient way to increase awareness and acceptance.
- As a significant fleet purchaser, government at all levels can play an important role in improving the visibility of EVs by increasing numbers on the road, as well as leading by example to demonstrate the benefits of the technology to local communities and businesses.
- Provision of real-world EV performance metrics, fleet-specific EV information and development of easy-to-use software tools can help consumers assess the benefits of EVs for their particular circumstances.

## Stimulating supply

Higher penetration of EVs will require the supply base to develop across all classes and brands. EU production capacity will need to grow significantly to meet targets already

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<sup>7</sup> European Commission, Joint Research Centre, Institute for Energy and Transport (2012) *Attitude of European car drivers towards electric vehicles: a survey*

<sup>8</sup> i.e. not rejecting EVs on the basis of concern over new technologies, perceived (vs. actual) performance, or identity issues linked to EV symbolism

<sup>9</sup> Incentives for lease fleets, for example, have proven effective in other countries such as the Netherlands in supporting the early EV market

announced across many countries. There is a role for government to support innovation and R&D in the UK which could help develop the manufacturing base here and provide export opportunities in the longer term.

- Good segment and brand supply is important to consumers, reflecting both practical (size, comfort etc.) and more emotional (perceived reliability, symbolism etc.) factors.
- In order to support high penetration of EVs by 2030, a good representation of both BEVs and PHEVs in all segments is likely to be needed, with FCVs in specific segments. Support and incentives should therefore stimulate a range of technologies in the near term, although, in the longer term, achieving a 100% ZEV fleet will require more targeted policies.
- The UK should also continue to push for ambitious, long-term EU new cars CO<sub>2</sub> targets which provide a significant market driver.
- EV production capacity will need to grow significantly to meet ambitions for uptake announced by a number of countries, including the UK, but this is credible given historic growth rates, current spare capacity and manufacturers' announcements.
- Government support over the last decade (establishment of a number of agencies, technology centres and other bodies, and significant levels of investment) has helped attract significant industry investment along the supply chain<sup>10</sup>. Government should continue to encourage development of production capacity in the UK, through continued support for innovation and the manufacturing base, and through the provision of effective demand side incentives.

More detailed findings and information on the supporting evidence base are available in the study report, available on the CCC website<sup>11</sup>.

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<sup>10</sup> e.g. Nissan's vehicle and battery plants in the North East, and associated suppliers such as Vantec

<sup>11</sup> [http://www.theccc.org.uk/wp-content/uploads/2013/12/CCC-EV-pathways\\_FINAL-REPORT\\_17-12-13-Final.pdf](http://www.theccc.org.uk/wp-content/uploads/2013/12/CCC-EV-pathways_FINAL-REPORT_17-12-13-Final.pdf)