

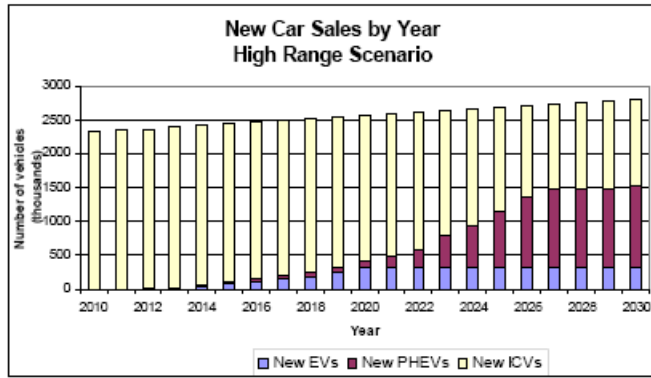
**Briefing paper: ARUP/Cenex study for BERR/DfT**  
**'Investigation into the Scope for the Transport Sector to**  
**Switch to Electric Vehicles and Plug-In Hybrid Vehicles'**  
**30 October 2008**

**Background**

BERR and the Department for Transport have published a study into the electrification of road transport by Cenex, the UK Centre of Excellence for Low Carbon and Fuel Cell, and technologies and engineering consultants Arup. The study considers a wide range of issues relevant to the development and roll out of electric vehicles. It discusses different uptake scenarios for EVs, lifecycle emissions, battery technology, the charging infrastructure, electricity generation and grid impacts, UK business opportunities, barriers and incentives and adoption routes.

**Key findings of the study**

- EVs have the potential for significant CO<sub>2</sub> savings compared to conventional combustion engines. Even on the current UK grid mix CO<sub>2</sub> savings of up to 40% can be achieved.
- With demand properly managed and targeted at off-peak periods through variable electricity tariffs, the current generating capacity is sufficient to cope with EV uptake.
- The existing national transmission network is sufficient to cope with the demand from vehicles, but the impact on local networks and infrastructure has to be further studied through pilot and demonstration projects.
- EV and PHEV technology provides an opportunity for the UK autosector to take a lead.
- EVs and PHEVs will first be introduced into the UK as demonstrators or in very low volume. Mass production and volume availability is not likely to occur before 2014/2020.
- What needs to happen to prepare for a widespread roll out of EVs/PHEVs?
  - Increased consumer confidence and education;
  - Improvements in battery performance and cost;
  - Charging infrastructure has to keep pace with demand;
  - Stimulation of market through appropriate incentives for the uptake of low carbon vehicle.
- Mainly due to the large cost of batteries, EVs and PHEVs will be more expensive. In the medium term, whole-life running costs will be lower primarily due to lower fuel cost (electricity vs petrol/diesel)
- Pilot and demonstration projects will be critical to address concerns of all stakeholders and provide evidence base for possible future wider roll out of vehicles.



Car type	2010	2020	2030
EV	4,000	1,200,000	3,300,000
PHEV	1,000	350,000	7,900,000

### 13 Recommendations

1. Create a forum for the development of the UK's EV industry and market.
2. UK should take a lead role in promoting work on robust international standards and international learning and experience with EVs.
3. EU has to set vehicle efficiency standards for 2020 and beyond to drive technological innovations.
4. Develop a 20 year roadmap for ongoing EV/PHEV development.
5. Create 'healthy manufacturing base' for EVs/PHEVs in the UK to kick start the process of drawing in suppliers, expertise and funds for R&D. This should 'complement the existing automotive industry' and be pursued by further developing relationships with existing manufacturers as well as attracting new manufacturers and high value engineering to the UK.
6. Focus research on
  - batteries
  - internal combustion engines for hybrids
  - electric motors
  - controls systems
  - energy scavenging systems
  - battery recycling
 'and ensure that this does not damage other areas of UK expertise and ongoing development such as powertrain'.
7. Further investigate potential environmental issues associated with lithium-ion batteries and methods of mitigating them.
8. Facilitate pilot and demonstration studies to be carried out. They should grow in size to test scale and capability.
9. Seek to ensure deployment of refuelling infrastructure remains ahead of vehicle uptake (i.e. sufficient charging points).
10. Further work needs to be done to assess the capacity, technical challenges and business case for EVs to act as 'distributed energy storage systems'.
11. Consider complementary policy measures to drive local uptake of EVs.
12. Educate the public about whole life operating costs to enable EVs/PHEVs to compete on level playing field with internal combustion engine.
13. Raise public awareness about journey profiles to help them make informed choices on vehicle requirements and selection.

To view the full Cenex/Arup study, please go to <http://www.berr.gov.uk/files/file48653.pdf> or contact Konstanze Scharring, [kscharring@smtt.co.uk](mailto:kscharring@smtt.co.uk) on 020 7344 9223.