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## **UK power infrastructure has capacity for significant rise in use of electric and plug-in hybrid vehicles**

**According to the results of simulation studies announced today by a consortium including Ricardo, Jaguar-Land Rover, E.ON and Amberjac Projects, a substantial medium-term rise in the number of electric and plug-in hybrid vehicles would have a much lower impact on the UK national power grid than has previously been estimated**

The research study has been carried out by the consortium as part of the Range Extended Hybrid Electric Vehicle (REHEV) project, which is led by Jaguar-Land Rover and part-funded by the Technology Strategy Board. The study marks completion of the first stage of the REHEV project and has focused on a range of vehicle charging scenarios and levels of market penetration in order to predict the likely increase in national energy usage. Four vehicle fleet charging scenarios were simulated, comprising uncontrolled domestic charging, uncontrolled off-peak domestic charging, 'smart' domestic charging and uncontrolled public charging throughout the day – for example, by commuters who recharge their vehicles while at work. Charging was assumed to be single phase AC as this is the most likely near-term solution, but the study also considered fast charging scenarios as for a large number of vehicles the energy demanded over a time period is likely to be the same and distributed evenly.

Assuming a 10 per cent market penetration of plug-in hybrid electric vehicles and pure electric vehicles in the UK vehicle parc (a proportion representing approximately 3 million passenger and light goods vehicles) the study showed a daily peak increase in electricity demand of less than 2% (approximately 1GW) for the scenario of uncontrolled domestic charging – the 'worst case' in terms of peak power demand. Other scenarios are less challenging: off-peak domestic charging, for example, increases electricity consumption throughout the night but has no impact on the peak daily demand. Since it will be a number of years before a 10 per cent level of market penetration is achieved even with the recently announced UK government incentive plans, grid capacity at a national scale should be adequate for this significant electrification of the vehicle fleet. While the national impact is shown to be manageable, the

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research team emphasise that local improvements may nevertheless be necessary – for example, where local network capacity is marginal or where particularly high concentrations of electric or plug-in vehicles occur.

Further work is ongoing to look at the timeline for reduced power station CO<sub>2</sub> emissions which is the key enabler for electric and plug-in hybrids to reach true ultra low carbon status. Future reports of the REHEV project will look at fast charging infrastructure which would offer significant consumer benefits in the use of electric and plug-in hybrids.

Commenting on the results presented by the REHEV project, Neville Jackson, Ricardo group technology director (and recently appointed chair of the Low Carbon Vehicle Partnership), said:

“The increasing electrification of road vehicles is likely to be a key enabler for future significant reductions in transport related CO<sub>2</sub> emissions. While the provision of publicly accessible street level infrastructure in the form of recharging points remains a challenge, the research findings published today by the REHEV project show that existing UK power grid capacity will be sufficient in the medium term to support a significant expansion of plug-in hybrid and electric vehicle use and is therefore not a constraint on implementation.”

Ricardo CEO, Dave Shemmans, added:

“The initial findings of the REHEV project together with the recent UK government policy announcements in support of electric and plug-in hybrid vehicles are a further vindication of Ricardo’s strategy of focusing on future clean and low carbon vehicle technologies. We have already successfully delivered well in excess of 100 hybrid and electric vehicle programmes and I look forward to further success from the REHEV team as it continues with this highly valuable research.”

The REHEV project consortium is now continuing its work, which will see the development of a modular electric and electric/diesel powertrain, suitable for several different vehicle types. This will initially be tested on a large premium sport utility platform, delivering 120 to 130 g/km and with significant zero



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emissions potential. Future passenger and commercial variants could have an all electric range of in excess of 20 miles, meaning that the majority of typical vehicle trips could be completed with zero tailpipe emissions. Longer range travel would still be accommodated with the internal combustion engine removing the range anxiety issues often associated with pure electric vehicles.

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## NOTES TO EDITORS:

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