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Accelerating the shift to low carbon transport. Delivering clean, smart, flexible power

1. In parallel with reducing overall carbon dioxide emissions, cleaning up Britain's polluted urban areas is a high priority. Both are strongly related to transport technology, primarily that of road transport, which alone comprises around 30 per cent of all UK energy usage.

2. It appears that the days of the internal combustion engine are numbered, that it is close to the limits of development with regard to emissions controls, and that a revolutionary change to “clean” electric power for road transport is seemingly inevitable. The rapidity of that revolution is surely one of the keys to accelerating a shift to low carbon transport.

3. In considering carbon dioxide emissions and air pollution, with a focus on problem urban areas, it is evident that development of compact, affordable, electric city cars is not a current point of focus for car manufacturers. Electric cars are mostly aimed at the middle and higher of the market, where their contribution to clean urban transport will be minimal. Unless there are plans to totally exclude personal transport from cities, this shortcoming needs addressing, possibly with government intervention. Britain desperately needs clean, compact, affordable and efficient city cars to replace ageing and “dirty” fossil fuel cars.

4. “Going electric” raises issues of grid capacity to supply a substantial and growing fleet of electric cars that could on time add 50 per cent to the total UK electricity demand, although the primary problems are in meeting peak demand than overall capacity. The concept of “Grid Connection” of electric cars to employ their battery capacity for storage at off-peak times, and draw on this stored energy when needed, has been adopted as a partial solution. What may have been inadequately considered is the inefficiency of the energy transfer processes, with the three stage, charge vehicle>draw on stored energy>re-charge vehicle cycle likely to incur losses of 30 per cent of the energy, predominantly as heat to the atmosphere. Consideration of possible technology to minimise these losses is needed.

5. Considerable emphasis is at present being given to “fast charging” capacity for electric cars at filling stations, motorway service areas etc., to facilitate longer journeys. Again, in the context of solving urban pollution problems, this offers very little assistance in cleaning up Britain's urban air. The fast charging process (up to 60kW, and higher) compounds grid capacity problems, and involves significant energy losses that increase as the charging rate increases. Government and local government should arguably play no part in the finance, support, or promotion of such energy profligate fast charging facilities.

6. With Government devolution of urban air quality regulation to local authorities, these have the authority to pursue local transport solutions, along with related local clean energy supply solutions. Examples of technology that could accelerate a shift to Low Carbon Transport and Clean, Smart, Flexible Power, are Combined Heat and Power (CHP) units, trams, trolleybuses, and light rail services. A shining example of energy recovery is the Sheffield City District Heating Network, that burns 120,000 tonnes of municipal waste each year, producing up to 60MW of usable thermal energy and up to19 MW of electrical energy. Other similarly laudable examples include the use of landfill generated gas, primarily the very high greenhouse effect methane, to power industry, such brick manufacture.

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