

Impact on Electric Drive train configuration

Electrification of the vehicle drivetrain is a viable technical alternative to the internal combustion engine (ICE) and has been identified as a key technology in reducing the energy consumption and emissions from the transport sector. The focus of this article is to evaluate the impact upon energy consumption and emissions of differing strategies for electrification of the vehicle drivetrain. The technical structure of an electric drivetrain is described, clarifying that it is a relatively simple compared to an ICE. Measurements of the energy consumption and emissions show a threefold increase in energy efficiency is possible, whilst revealing a significant greenhouse gas (GHG) emissions advantage based on the current UK electricity generation mix (with benefits to air quality also noted). It is also noted that improvements in energy efficiency and GHG emissions in the electricity-generating sector can be achieved through controlled vehicle charging. The one issue is that regulation has failed to keep step with changes in policy and diversification of vehicle drivetrain strategies. A proposal for a standardised test and measurement procedure is being developed by the international community to address this, although intrinsic differences in intensity and type of use of vehicles nationally may ultimately slow such activity.