

Capturing the Transition to Electric Vehicles in Official Statistics

The transition to electric and plug-in hybrid vehicles will have many positive impacts on the quality of our life and on the environment e.g. greenhouse gas emissions and air pollution will be greatly reduced. The impacts and benefits will be varied but they could be brought together in a thematic statistical report. A small set of indicators would bring data from diverse domains such as energy, transport, emissions, international trade, environment taxes and subsidies, charge point network, waste statistics and a circular economy, and climate indicators into an integrated statistical focus such as the holistic view envisaged by global climate agreements, the Sustainable Development Goals, and the European Green Deal. National level data would show the countries which are converting more rapidly and the relative balance between number of vehicles and number of public and domestic charging points.

Air quality

Real-time data from air quality monitoring stations will provide an evidence base of an improvement in air quality as the transition to electric vehicles progresses. Measurements during peak commuting periods should show the most marked improvements. The cleaner air will create a safer environment for persons with respiratory and cardiovascular difficulties.

Greenhouse gas emissions

The transition from internal combustion engines to electric vehicles will be vital for countries to make more rapid progress towards a low carbon economy and meeting their greenhouse gas emissions reduction targets.

The transition will bring a much greater focus on the fuels used to generate electricity. The net decrease in emissions will be higher if increased proportions of renewables are used to generate the electricity to meet the increase in demand. It may be possible to offer incentives for charging vehicles in periods of high availability of renewable resources so that the excess generation capacity can be stored in vehicles for future use.

The installation of smart electricity meters in homes will enhance the options for differential pricing to spread the demand between peak and off-peak times so as to reduce the need for increased total generating capacity.

Odometer readings from vehicle test data could be used for various purposes including comparing distances travelled by electric, petrol, and diesel vehicles.

International trade statistics will show the transition from fossil fuel imports.

Financial supports and tax revenue

Environment tax statistics will provide information on the reduction in government revenue from excise and carbon taxes on petrol and diesel. More generalised road use charges may be introduced to replace the decrease in energy taxes and these may need to be incorporated into the definition of environment taxes.

Rural dwellers typically have less public transport options and may require more support to make the changeover.

National vehicle and driver registers contain detailed information on fuel type and engine capacity as well as information on the age, gender, and location of owners. The socio-economic data can be used to analyse the profile of electric vehicle owners and to identify communities and segments where there is a slower take-up. Some families may not be able to afford an electric vehicle even if faced with increased restrictions on their use of diesel and petrol vehicles. Capital grants towards the purchase of electric vehicles and grants for installing home chargers are options to stimulate an increase in the take-up of electric vehicles. Households with no off-street charging options may be dependent on Local Authorities to finance the installation of accessible charge points in their neighbourhood.

Charging network

The availability of a reliable and wide-spread charging point network is crucial to gain consumer confidence. A diversified network comprising a street charge point network, motorway forecourts, business parks and other workplaces, shopping centres, hotels, apartment blocks, and other domestic charging will be necessary to accelerate the transition. The geographical distribution and mix of charging speeds of this roll-out should be obtainable from the electricity utility companies and other operators responsible for installing and upgrading the network. Development of regional charge point networks will be required to meet seasonal tourism peak demands.

Fast chargers need to be located where there is a high demand for a quick charging time. The number of charging points, their location, charging speed, and upgrades in the charging speed need to be collected for statistical purposes. In Europe the Alternative Fuel Infrastructure Directive may provide a basis for centralised data collection on the charge point network.

Waste statistics and a circular economy

Waste statistics can provide information on the balance achieved between recycling and discarding batteries. The change from petrol and diesel engines may result in a substantial increase in the number of unwanted petrol and diesel vehicles. Countries that transition more slowly may be left with a heavier disposal burden if they import these vehicles at lower prices.

Electric vehicle batteries require a supply of scarce raw materials in their manufacture. Material flow analyses can contribute to understanding the demand from producers for these rare earth minerals and in the recycling of them as batteries become obsolete.

Conclusions

Many of the statistics needed to fully understand the nature and pace of the transition are already available. By beginning work early to get access to the various data sources needed to create a holistic view of the transition to electric vehicles, statistical offices will be providing information that can inform as well as document the change.