Reducing your carbon bootprint - electric vehicles for countryfolk

October 9 2014

Electric vehicles in towns and cities are not the answer to pollution problems and climate change, but they might help country folk reduce their carbon bootprints. Researchers in the UK are questioning the received wisdom regarding the promotion of electric vehicles in towns and cities. Writing in the International Journal of Automotive Technology and Management, they suggest that the evidence of benefits in terms of energy usage and emissions points to electric vehicle use in sub-urban and rural settings as being much stronger.

Peter Wells, a professor in the Logistics and Operations Management section of Cardiff Business School at Cardiff University, UK, and colleagues Paul Nieuwenhuis and Daniel Newman, working with engineers Ceri Donovan and Huw Davies, are questioning the drive to establish electric vehicles as an alternative to the internal combustion engine for cities. Their findings based on case study information from electric vehicle trials under the ENEVATE research programme into drivers of electric vehicles, suggests that the transition away from conventional vehicles only has strong benefits when usage is intense. This, they found, is not viable in urban areas with the exception of light delivery and service vehicles.

The study covers North West Europe and the team's interpretation of the data points to a need to shift the focus from towns and cities and to convert rural and sub-urban drivers more stridently to electric vehicles. The nature of urban driving means that too many of the advantages of electric vehicles over petrol and diesel are lost by the very nature of

driving involved in this environment.

However, the team finds an important caveat to electric vehicle use even in rural areas. While domestic fuel poverty affects some four million households in the UK, who must spend more than 10% of their income on powering their homes, this figure is dwarfed by the 21 million households that spend over 10% on transportation. Electric vehicles are currently a lot more costly than conventional vehicles, which means less affluent citizens in rural areas must continue to use conventional vehicles or face social exclusion. The team suggests that any policy change that penalises traditional drivers without offering an adequate replacement will affect poorer country dwellers significantly.

That said, the team also gleaned from the driver data that electric vehicles can serve the needs of users with travel needs more diverse and unpredictable than the simple urban commute or shopping trips. The team points out that from the technical and thermodynamics perspective, non-urban commuter ranges are typically those that are ideally suited to the capacity of the typical electric vehicle with perhaps 30 to 80 km round trips. This fits much more snugly with the discharge-recharge cycle of an electric vehicle's battery rather than the endless stop-start of countless short urban journeys. Moreover, non-urban dwellings more often than not have exterior space on which a vehicle can be safely parked while its batteries are recharged from the home's domestic supply, something that would be untenable for people in towns and cities with distant or restricted parking. Additionally, the average speeds of non-urban roads are commonly more suited to efficient driving of an electric vehicle, not accounting for fast motorways and low speed limit urban routes.

"Electric vehicles are said to be suited to urban applications because they have zero emissions at point of use, are relatively quiet in operation, do not require power when stationary (i.e., due to traffic congestion) and

have reasonable acceleration," the researchers report. Their study suggests the electric vehicle revolution should more appropriately be taking place in the countryside and the suburbs rather than our towns and cities.

More information: Newman, D., Wells, P., Donovan, C., Nieuwenhuis, P. and Davies, H. (2014) 'Urban, sub-urban or rural: where is the best place for electric vehicles?', *Int. J. Automotive Technology and Management,* Vol. 14, Nos. 3/4, pp.306–323.

Provided by Inderscience