

The future of e-mobility

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Abstract:

It is an exciting period of time, where the transition towards a more sustainable mobility via the introduction of electric vehicles is taking place. What are the benefits and barriers for the e-mobility developments? Driving range, charging infrastructure availability and especially cost are perceived as important barriers for the market take-up of electric vehicles. Driving range is defined by o.a. battery performance. The challenge of infrastructure lies in the return on investment (chicken and egg problem). And the cost will evolve by technological improvement, market take-up and in the mean time policy support.

The purchase price of electric vehicles is currently higher than of conventional vehicles, however the driving cost is lower. Based on a Total Cost of ownership (TCO) different vehicle technologies can be compared. Results are strongly depending on the market segment assessed as well as on the incentives put forward by the legislation.

How to compare the environmental performance of different vehicle technologies? Vehicles with lower tailpipe emissions are perceived as cleaner. However, does it make sense to look only to tailpipe emissions? Limiting the comparison only to these emissions denies the fact that there are emissions involved during the production of a fuel. Would it be enough to combine fuel production and tailpipe emissions? Especially when comparing the environmental performance of electric vehicle technologies, the emissions during production of the specific components and their appropriate end-of-life treatment processes should also be taken into account. Therefore, the complete life cycle (LCA) of the vehicle should be included in order to avoid problem shifting from one life stage to another.



Biography:

Joeri Van Mierlo is a key player in the Electromobility scene. He is professor at the Vrije Universiteit Brussels, one of the top universities in this field.

Prof. Dr. ir. Joeri Van Mierlo leads the MOBI – Mobility, Logistics and automotive technology research centre, a multidisciplinary team of over 150 experts.

Prof. Van Mierlo was visiting professor at Chalmers University of Technology, Sweden (2012).

He is expert in the field of Electric and Hybrid vehicles (batteries, power converters, energy management simulations) as well as to the environmental and economical comparison of vehicles with different drive trains and fuels (LCA, TCO).

Prof. Van Mierlo was Vice-president of AVERE (2013-2019), the European Electric Vehicle Association (www.aver.org) and Vice-president (2015-2019) of its Belgian section AVERE-Belgium (<http://aver-belgium.org>). He chairs the EPE chapter "Hybrid and electric vehicles" (www.epe-association.org). He is an active member of EARPA (European Automotive Research Partner Association) and member of EGVA (European Green Vehicle Initiative Association). He is active in Flanders Make.

He is IEEE Senior Member and member of IEEE Power Electronics Society (PELS), IEEE Vehicular Technology Society (VTS) and IEEE Transportation Electrification Community.

He is editor in chief of the World Electric Vehicle Journal and the author of more than 500 scientific publications.