

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.