

# Climate friendly electric vehicles - Financial barriers to market introduction in Germany



*Energie Impuls OWL (ed.): Klimafreundliche Elektromobilität -  
Finanzielle Hürden zur Markteinführung bis 2020. Bielefeld, May 2010.*

The topic of this study is the presentation of the differential costs and required funding for the introduction of electric vehicles to the German market based on different scenarios. The study also calculates the avoidance of greenhouse gas emissions and savings on import costs of fossil fuel.

## Required funding for electric vehicles

The Federal Government targets a fleet of one million electric (street) vehicles by 2020. To reach this goal, funding has to compensate for additional costs in investment. The funding volume for a fleet consisting of one million electric cars, consisting of light vehicles, conventional cars, plug-in-hybrid vehicles, vans and busses, accounts for approximately 840 million euros until 2020. The calculation is based on the assumption that energy costs reach 200 US\$<sub>2008</sub>/barrel oil and that battery costs reach 300 euros/kWh in 2020. The calculations show that the proclaimed goal can be reached through this funding volume. The differential costs emerging from the acquisition of an electric vehicle versus a conventional vehicle with an internal combustion engine are fully compensated for. The funding volume is not distributed linearly to the years, but is distributed following the availability of the corresponding vehicle classes. This way the focus will lie on the development of light vehicles in the first years, whereupon funding between 2012 and 2014 will shift to the sector of intermediate and d-segment vehicles. Funding will reach its maximum with almost 140 million euros in the year 2015 and may be reduced gradually after that. From 2020 onwards all electric vehicles would be economically profitable.

With a moderate increase in energy costs (100 US\$<sub>2008</sub>/barrel oil in 2020) the funding volume increases up to one billion euros until 2020. Funding will reach its maximum with almost 160 million euros in the year of 2016; funding for electric compact cars would still be necessary in 2020.

If battery costs will not decrease this much, the outlook becomes different. In case of a battery price of 500 euros/kWh and a moderate increase in energy costs up to 100 US\$<sub>2008</sub>/barrel oil in 2020, the necessary funding volume increases up to 2.7 billion euros. Funding of separate vehicle classes will still be necessary after 2020.

Depending on the share of renewable energies in the gross power consumption, one million electric vehicles will avoid between 1.14 and 2.1 million t CO<sub>2eq</sub> greenhouse gas emissions and will save between 320 and 790 million euros/a of fossil energy imports in 2020.

The Renewable Energies Agency (Agentur für Erneuerbare Energien) is supported by companies and associations in the renewable energy industry and the Federal Ministry for Environment, Nature Conservation and Nuclear Safety as well as the Federal Ministry of Food, Agriculture and Consumer Protection.

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