Market potential of Battery Electric Vehicles

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Abstract

The transition from internal combustion engines to electric vehicles is one of the most challenging tasks of our modern society. Electric vehicles offer significant advantages such as the potential to reduce greenhouse gas emissions, lower noise pollution and greater independency of oil. Although there is a lot of public attention to electric mobility and car manufacturers keep on presenting prototypes and show cars, the actual market share of electric vehicles is negligible in all passenger vehicle markets today.

This thesis analyses both the advantages and barriers for this new technology and investigates the market potential of electric vehicles. Success factors for the transition to electric mobility are put forward. Based on actual data, customers' total costs of ownership for current and future electric cars are compared with costs of conventional vehicles. In a scenario outlook to 2020, possible future developments of electric vehicles' cost competitiveness are discussed.

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BMBF	Bundesministerium für Bildung und Forschung
CARB	California Air Resources Board
CEO	Chief executive officer
CO2	Carbon dioxide
CTO	Chief technical officer
EU	European Union
EUR	Euro (1.3 USD = 1 EUR)
EV	Electric vehicle
FCEV	Fuel Cell Electric Vehicle
G2V	Grid-to-Vehicle
GBP	Pound sterling
GHG	Greenhouse gas
GM	General Motors
HEV	Hybrid Electric Vehicle
HFCV	Hydrogen fuel cell vehicle
ICE	Internal combustion engine
ICEV	Internal combustion engine Vehicle
Km	Kilometre
Km/h	Kilometres per hour
kWh	Kilowatt-hour
LPG	Liquefied petroleum gas
mpg	Miles per gallon
Mph	Miles per hour
NiMH	Nickel metal hydride battery
OEM	Original Equipment Manufacturer (an auto company)
PHEV	Plug-In Hybrid Electric Vehicle
SOC	State of Charge
TCO	Total costs of ownership
USD	US Dollar (1.3 USD = 1 EUR)
V2G	Vehicle-to-Grid
Wh	Watt-hour
WWF	World Wildlife Fund