
Summary:

Competitive Electric Town Transport

Main results from COMPETT – an Electromobility+ project

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The main research question of the Electromobility+ project COMPETT was: “How can e-vehicles come into use to a greater degree?” To answer this question the project:

- Investigated the present status of the e-vehicle (BEV-Battery Electric Vehicles and PHEV-Plug-in Hybrid vehicles) market, i.e. the costs and characteristics of the vehicles, the availability of infrastructure, sales as well as the expected development the coming years. Fuel cell vehicles were not investigated, as they are not on the market yet.
- Investigated the travel behaviour of the population, using results from national travel surveys to estimate the share of transportation that can be accomplished with different types of e-vehicles. Focusing on BEVs, COMPETT has shown how the availability of parking supporting the possibility to recharge at home over night, and how stops during the day, can be used to recharge and extend BEVs range.
- Investigated noise of BEVs to see if noise in cities can be reduced with BEVs.
- Investigated regional cases in Norway and in Austria to understand how e-vehicles are used, focusing on BEVs and consumers, what the barriers and opportunities are, and the way incentives and policies influence markets and support market expansion. BEV owners, Internal Combustion Engine (ICE) vehicle owners and stakeholders were surveyed.
- Developed a model (an improved version of SERAPIS a model originating in Austria) that simulate the automotive markets in Austria and Norway, and how the e-vehicle fleet and government budgets costs evolve with different policies and incentives. The model was used to identify the cost-effectiveness of the EV incentives.

An increasing BEV market share requires dealers and leasing companies to promote BEVs actively, and that consumers and fleets choose BEVs. Consumers will do so if they find it beneficial. The main factors to make consumers interested in BEVs (figure 10.1), are:

1. *Their attitudes and values*, which make them more (environment, technology) or less (traditionalist) interested in BEVs. How these values limit or support a decision to buy a BEV, will be influenced by the other four factors.
2. *Consumers need to know about BEVs*, i.e. be aware of the BEVs characteristics, through reliable information sources (incl. producers, authorities) and testing.
3. *The vehicles need to be practical, reliable, and economically viable* and meet the users' needs. Users must have parking with electricity available. The practicality

- depends on household type (single-/multi-vehicle), availability of types, makes and models, and country specific factors such as driving distances and climate.
4. *The policy framework should be stable over time* to reduce risk for market actors, i.e. consistent in scope and communication, but also flexible to allow for unexpected developments and wide in scope to allow for business creativity.
 5. *Incentives will improve the purchase process* by reducing the price disadvantage, and provide users with relative advantages. Low tax on electricity, high tax on fossil fuels and the low energy consumption of BEVs are parts of the picture. Consumers may think primarily in a short-term perspective, and need to see that BEVs are favourable 3-5 years ahead. Local incentives can provide enough relative advantage to get diffusion started. Public charging stations make life with a BEV easier. This infrastructure may not materialize without incentives in the initial phases.

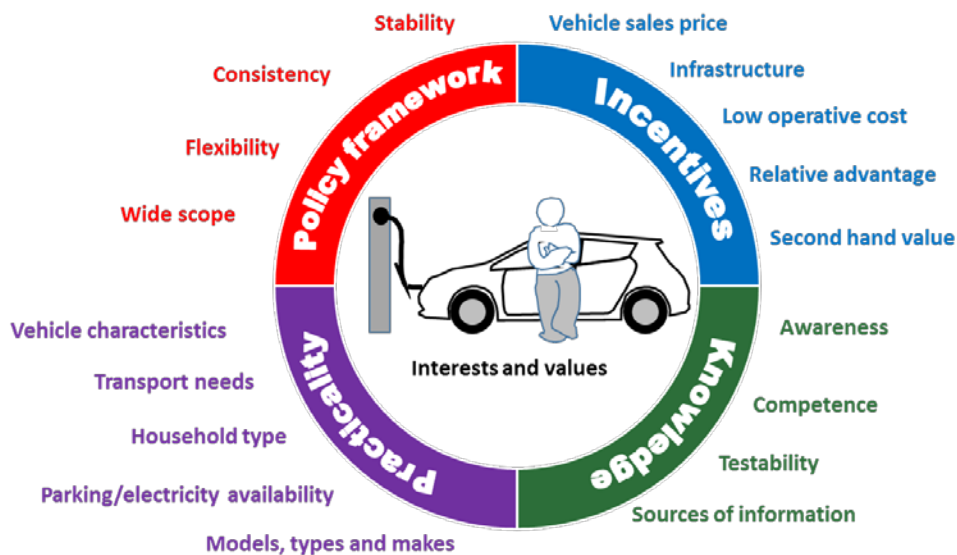


Figure S.1 Main factors influencing the BEV diffusion process.

COMPETT learnings on taking BEVs into use to a greater degree

- Important real barriers to BEV diffusion are range, price, awareness, and the availability of charging infrastructure. Society can support BEV diffusion by introducing flexible policies and incentives that reduce these barriers.
- BEVs can cover a large share of people’s transportation needs. The current selection of BEVs and their characteristics match people’s needs better than before. A larger selection of vehicles will stimulate future diffusion.
- Multi-vehicle households and fleets have the best ability to take BEVs into use.
- BEV owners mainly charge at home in private parking places. Some owners do so at work. Charging in other public locations is rare, and on average, the owners fast-charge 14 times per year. Public infrastructure can extend the range of BEVs and increase their usefulness.
- Government costs will be significant when economic incentives lead to a rapid take-up. Smart policy formulation can reduce the burden on public budgets. Purchase incentives can be offset by progressive taxes on polluting vehicles.

- Awareness raising and schemes to allow testing are important in the early phase of BEV diffusion but will not lead to significant sales unless coupled with incentives. Later in the diffusion process, there are new potential customer groups who have scarce knowledge of BEVs. A national communication strategy will therefore be a valuable tool in speeding up EV diffusion. An important part of such a communication plan will be to spread information about BEV assets such as a comfortable ride, the high energy efficiency leading to low energy costs and the advantages of being able to charge at home.
- User incentives providing BEV owners with a relative advantage, can be very effective in the absence of purchase incentives; an example is access to bus lanes, free parking and free toll roads (or congestion charges).
- Incentives only work effectively when vehicles are available from several manufacturers, and consumers have become aware of the BEV's assets. The neighbourhood effect speeds up diffusion in the early majority group
- Policies should be carefully planned and implemented as a stable national framework involving organisations and industry as well.