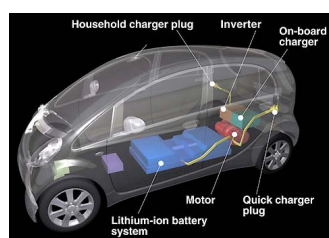


Electric Road Transport policies in Europe till 2015: opportunities, experiences and recommendations

Results of an international study on electric vehicle user requirements funded by ERA-NET

This leaflet presents a summary of the research performed in the project Electric Road Transport policies in Europe till 2015: opportunities, experiences and recommendations (May 2010-May 2011).

The project has been funded by the countries Austria, Finland, the Netherlands and Norway, who set up the trans-national research call ENT19 Electric Mobility.



Need for a practical roadmap offering recommendations to (local) policy-makers

The large-scale use of electric and plug-in hybrid electric vehicles (EVs and PHEVs) that rely on renewable sources of electricity has great potential to reduce the emissions of greenhouse gas (GHG) by the transportation sector significantly.

The first phase of introducing electric road transportation is presently taking place. It is characterized by national action plans and 'learning by doing', frequently by means of demonstration pilots at a local level. Up to now there is little alignment of national policies, action plans and (local) initiatives, this leads to an ambiguous and fragmented market for electric road transport.

The aim of the study was to contribute to the alignment of national and local initiatives and to encourage large scale market development of electric road transport in Europe, by:

1. Defining the potential market for electric and electric-hybrid vehicles.
2. Providing guidelines to policy-makers on how to meet the market potential and make a broad implementation of electric driving happen.

The supply side of electric driving is gearing up

For the time being, the EV will be a sellers market. The emphasis in the EV market is on both small city vehicles as well as on bigger far more expensive models. Manufacturers approach electric driving in different ways: the plug-in hybrid electric vehicles (PHEV) and the battery electric vehicles (BEVs). Batteries will remain costly in the next 5 to 10 years and (really) fast charging will be an option within 5-10 years. Information and mobile communication technology will reduce range anxiety. The expectation is that smart grids and smarter connected vehicles will revolutionize the way we use electricity. Also, battery switching may be an attractive alternative.

Market for P(H)EV still small, yet (potentially) booming

The market share of BEVs is still very small, since they are more expensive than conventional cars despite tax rebates and since they have a limited range. Operating costs (energy costs, maintenance) however are less costly. Experience from Norway shows that the total cost of ownership of electric vehicles may be lower when besides a big difference between the gasoline/diesel price and the electricity price a mix of incentives is in place, like exemptions of road taxation, free parking and other privileges for EV drivers such as permission to use bus lanes allowing for easier access to city centres and thus faster commuting.

Partners and subcontractors:

- Austrian Institute of Technology (Austria)
- Ramboll (Finland)
- Hermia (Finland)
- Norwegian University of Science and Technology (Norway)
- TNO (Netherlands)

Lead partner:

- DHV B.V. (Netherlands)

Users value the following (B)EVs unique selling points:

- no noise
- no (local) emissions
- single gear

However, EVs still suffer from some major drawbacks (also in 5-10 years from now) that may interfere with large scale adoption of electric driving, such as:

- a substantial higher purchase price
- limited choice of models
- limited range (in case of BEV)
- limited (public) charging facilities



Future volumes of EVs are difficult to predict, yet sales volumes up to 10.000 EVs per year from 2020 seem to be in reach for most countries that have participated in the research. The actual volume, however, is highly dependent on the implementation strategy of the automotive sector over the next years and the contribution of public authorities, charging infrastructure providers and the service industry such as leasing companies and providers of new service concepts.

Fleet owners are the most likely early adopters

Looking at the characteristics of these potential early adopters, *professional fleet owners appear to be the most likely early adopters.* (Large) fleet owners are used to make large investments in their fleet and to base cost calculations on the total cost of ownership (TCO) rather than just on the cost of purchase. They also have larger marketing budgets to spend on a favorable and green image, and have often committed themselves to social corporate responsibility. Due to the larger fleet, they have the possibility to organize their transport in such a way that the EVs can be fitted in despite their limited range. Presently, by far most EVs are company cars.

End-users should not be neglected, however. After all, they are the key to mass use as they constitute the vast majority of all car users. Also, end-users may appreciate the above mentioned unique selling points.



Based on the experience in the four participating countries and on the current characteristics of the EV's, the following user groups may be qualified as early adopters:

- Public (local) authorities, as launching customer
- Utility and energy companies, as electric driving will increase demand for electricity significantly
- (Other) professional fleet owners:
 - Taxi operators
 - Delivery services
 - Large companies (with focus on Corporate Social Responsibility)
- End-users: City dwellers / commuters, green conscious and flexible.

User requirements are generally limited to lower costs, more choice and larger range

Users would like EVs to fulfill the same requirements as the conventional fossil fuelled cars. Requirements are defined in relation to the characteristics of existing BEVs:

1. A *lower TCO* is considered crucial, comparable to the TCO of the conventional vehicles.
2. *More choice of vehicles and models*, such as mid-size passenger cars, vans and light trucks.
3. A *larger range or the possibility of fast charging* (however, a larger range is requested more often).

The Netherlands: green

procurement. DC-TEC is a Dutch consortium for the purchase of electric cars. It's a joint public/private initiative of about 25 companies and authorities that has invited international tenders for different types of EV classes. By uniting the purchasing power of many companies they ensure a major push for EVs at a competitive price.

Finland: regional initiative. The T3 area project is a local joint public/private initiative with partners from local authorities and industries (energy and automotive). By developing a concentration of EVs, charging infrastructure, and knowledge about use and maintenance they will act as a starting point for market penetration.

Norway: strong national support . Norway aims to achieve 10% EVs of annual sales before 2020. Demand for EVs is encouraged in order to push technology development, by incentives such as: reduced road tax, exemption from tax and VAT upon purchase, free passage on state road ferry-links and toll roads, use of bus lanes and free public parking. Norway has by far the most electric cars in the EU.

Austria: national subsidy

ElektroDrive Salzburg is a private initiative funded with national subsidy. The goal of Elektrodrive Salzburg is to replace part of the traffic of the city Salzburg with all kinds of EVs by offering EV lease contracts and by realizing the necessary infrastructure for the region using 100% sustainable energy. Customers are companies (B2B and B2C) with CSR ambitions.

National and local evidence

The participating partners in this study come from the EU countries Austria, Finland and The Netherlands, supplemented with data from Norway and the UK. Together the experiences from these countries serve as a good basis for suggesting a road map for the implementation of 'Electric Road Transport' policies in Europe. However, it is important to note that *the* common European road map, irrespective of the context of country and culture, is not a viable proposition. Hence, *all* initiatives may offer interesting lessons on their own, and particularly in relation to each other.

The initiatives studied may be grouped as follows:

- *National action plans*, that promote electric driving through strong national support, by bringing authorities and industry together and define optimal (testing) paths and EV introduction.
- *Regional or local public / private initiatives*, to demonstrate electric driving and providing infrastructure building, either driven by environmental and/or economic objectives, to facilitate the business case for electric driving.
- *Private initiatives, oriented at joint green procurement*, by bringing together vehicle procurement of various companies in order to achieve a minimum demand level for EVs and bring down prices.
- *Initiatives of public authorities and big companies to act as role model*, introducing EVs into their own fleet.

Lessons learned and recommendations

1. *A consistent and dependable long term policy is needed:*
 - a. Policies at the various policy levels (EU, national) should give a clear message about the political will to support transition to electric mobility.
 - b. National policies are needed to involve local authorities as key stakeholders.
 - c. National policies are needed to facilitate alignment between actors and between national authorities and to facilitate coalitions that will create a market pull for e-mobility.
 - d. To search for the optimum between the market leading the way and government incentives or regulation.
 - e. Policies are also needed to promote R&D, especially for advanced energy storage.
 - f. Clear targets will enable national action plans to be (cost) effective.
2. *Policy measures should:*
 - a. Focus on high potential user-groups (early adopters).
 - b. Not favour particular technologies but promote good performance.
 - c. Tackle first the initial shortcomings of the electric mobility system, such as cost-equivalence between EVs/PHEVs and similar ICE vehicles .
 - d. Be oriented at building a future-proof charging infrastructure and gain experience with smart grids.
3. *Unequivocal communication is required to align the actors at large and at different levels to work together towards the introduction of electric mobility:*
 - a. Accurate knowledge, practical evidence and demonstrations are needed to raise confidence, share experiences and create enthusiasm, to learn from more experienced initiatives or actors in order to avoid wasting time and resource on reinventing the wheel over and over again.
 - b. Authorities should act as role models and 'market shapers' to gain real life experiences and introduce electric cars to the streetscape, which will seduce early movers.

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