

EU policy framework for e-mobility

Vattenfall Position Paper



Our position in summary

Vattenfall is convinced that e-mobility will play a key role to: reduce GHG emissions, improve air quality, increase energy efficiency, strengthen security of supply, and integrate electricity from renewable sources.

EU Member States *and* the EU Parliament have already agreed that transport emissions should be reduced with 60% by 2050. As a result, various (legislative) initiatives have been initiated at the EU level. More is however required to reach the emission reduction goals for 2030 and 2050. On 20 July 2016 the European Commission therefore presented its [Strategy for Low-Emission Mobility](#). Vattenfall broadly supports the move towards zero emission transport, but emphasizes that steps have to be taken to turn the EU strategy into concrete actions.

In order to speed-up the uptake of e-mobility Vattenfall recommends to prioritize the following actions:

- **Promote the development of charging infrastructure:** Without charging infrastructure e-mobility can – and will – not take off. At the EU level the focus should be on empowering municipalities & cities, so that they can help to deliver on national targets. Next to that the EU should focus on linking the regions where e-mobility is developing. A target to trigger charging infrastructure is needed.
- **Address customer needs by improving interoperability:** Barriers that hinder customers to switch to e-mobility have to be taken away. Especially payment systems and interoperability standards needs to be harmonized at EU level. A task that needs to be taken up with priority.
- **Stimulate the scale and (economic) rational of electric vehicles:** Although rapidly decreasing battery costs drive down prices, electric cars still require high initial investment. To speed-up market uptake, governments can act as launching customers, or deploy purchase rebates (decreasing over time). A continuing focus on strengthened CO2 standards for all vehicles - also after 2020, and in line with the EU's climate ambitions - is necessary to bring more plug-in and fully-electric vehicles on the market.

The benefits of e-mobility

The development of e-mobility solutions can help to tackle a wide range of problems in the energy sector:

- When electric vehicles are powered with electricity from 100% renewable sources they have zero CO2 emissions per kilometre and are 60% more efficient than conventional cars.¹ Even with the current Dutch/German electricity mix, **electric vehicles emit ~25% less CO2 and are 25% more efficient** than their fossil fired counterparts.² These numbers will only improve with when RES and CO2 policies in the electricity sector materialize further. In Sweden, where power generation already is 98% fossil-free, switching to e-mobility, already results in primary energy savings of ~40%.

¹ Internal combustion engines have an average efficiency of about 30%. If you charge an electric car with an cable its final energy efficiency is about 95%. This means 95% of the electric energy used to charge the battery is transformed into motion energy by the electric motor.

² When electric vehicles are not powered by 100% RES electricity, the emissions and efficiency losses from power production also need to be taken into account. Because every country has a different generation mix, these numbers also differ from country to country. In general: the cleaner the electricity, the higher the emission reductions and efficiency improvements. The German Ministry of Environment ([BMU](#)) has calculated that CO2 reductions from switching to EVs already now add up to 23%. Vattenfall estimates show that emission reductions in the Netherlands are ~30% (having a higher share of clean gas generation), while Sweden's low CO2 mix achieves emission reductions >80% and primary energy savings of ~40%

- An increasing penetration of e-mobility also implies a **reduction of oil demand and higher security of supply**. Two thirds of final demand for oil is currently being used for transport, while 88% of all crude oil is imported; mostly from instable regions.
- **Electric vehicles will help to reduce air- and noise pollution in our cities** and ensure that (EU) Air Quality targets are being met. Big improvements can be made when also heavy vehicles like busses are electrified.
- **Electric vehicles can help to increase the flexibility of the power system** when real time market prices reach the customer, *and* distribution tariffs & taxes (which generally make up 2/3 of the electricity bill), move in tandem with the wholesale market price.

Room for action

At Vattenfall electric mobility is an integral part of our energy transition strategy. We however believe that three issues need to be addressed with priority to speed up the uptake of e-mobility and materialize its benefits.

I. Promote the development of charging infrastructure:

Without charging infrastructure e-mobility can – and will – not take off.

- By November 18th 2017, EU Member States will have to hand in their national action plans under the *Alternative Fuels and Infrastructure Directive*. The review of the directive, which is planned for 2017, should ensure that these national best practices are put to use. Next to that, Member States should be triggered to develop charging infrastructure by a target at EU level. The Alternative Fuels and Infrastructure Directive currently does not include such a target; it only indicates that Member States should ‘strive for at least 1 charging point per 10 vehicles by 2020’. The goal of a target at EU level should be to develop charging infrastructure in line with the (actual & expected) amount of electric vehicles on the road, so that the availability of charging infrastructure is not a bottleneck for EV uptake. Infrastructure development should be addressed with priority in locations where e-mobility is already developing. Especially in urban areas - where consumers don’t have the possibility to charge at home - the development of infrastructure in the public space is crucial. The proposed changes to article 8 of the Energy Performance of Buildings Directive are supported, but would only address the development of charging infrastructure in the build environment³, which means that extra action is needed for public charging.
- Due to the high (capital) cost involved in developing charging infrastructure (especially fast- & ultra-fast charging), it would be helpful if available EU financing (e.g. the *European Fund for Strategic Investments*) is put to use as an investment enabler. This is especially true in rural areas, where demand for charging infrastructure is currently low, so that it is difficult for commercial actors to invest. The focus of EU infrastructure funds (e.g. the *CEF* and *TEN-T*) should be on linking the regions where e-mobility is developing; with a charging possibility every 50-200kilometer.
- At the national level municipalities need to be able to rely on national funding to finance local and regional tenders for normal charging. A (temporarily) lower connection- and tax tariff for e-mobility charging also helps to increase deployment. This approach, which has also been taken in the Netherlands will help to quickly develop the market for charging infrastructure and reach a scale that no government support is needed.
- Finally, clarity should be given on the role of the grid operator. With rising numbers of electric vehicles, grid operators will have to prepare the system for higher loads and enable bi-directional flows. This requires a DSO framework that supports these investments. Secondly, the power requirements of EVs and the rising generation of fluctuating power from solar and wind must be brought together. This intelligent control of loading operations depends on the availability of the

³ Article 8 of the Energy Performance of Buildings Directive includes proposals that would require new- and renovated buildings to include infrastructure for recharging points (i.e. cables that can deal with the higher loads). In addition, by 2023 every 10th parking space should be equipped with a recharging point. This would help to develop charging infrastructure in the build environment, but not in public spaces, where it is needed the most.

right data. Roles and responsibilities, as well as data availability should be addressed under the *EU Market Design Initiative*. The market can then take care of charging infrastructure, deployment, operation, interoperability and end-customer services in a cost effective way. For this to happen, real time wholesale market prices need to reach the customer including smart meters and online charging.

II. Address customer needs by improving interoperability:

Barriers that hinder customers to switch to e-mobility have to be taken away. Just as everyone can buy fuel at every gas station, EV users should be able to get (and pay for) electricity at every charging station.

- Especially *payment systems* need to be harmonized. Here short-term action at EU level is needed. This is key for customers and the longer it takes, the more difficult it gets to organize. The Commission should take measures to enable customers to use the same authentication/payment system for all operators. In the Netherlands this is already the case. While we believe that one common standard is more important than a specific type of standard, we recommend on the basis of our experiences in Sweden and the Netherlands a system of interoperable charging passes, with credit card payments (which have higher handling cost), as a fall-back option.
- Next to that, further steps need to be taken to harmonize *interoperability standards*. Just as there should be 1 type of charging plug that works on all charging infrastructure, also ultra-fast charging for e-buses and wireless (inductive) charging should have 1 open and common standard.
- Finally, it needs to be ensured that consumers in all Member States are well informed on where, when and against which price they can charge. Also across borders.

III. Stimulate the scale and (economic) rational of electric vehicles.

Although rapidly decreasing battery cost drive down prices, electric cars still require a high financial investment. Vehicles with a high yearly mileage however (like taxis), already have a positive total cost-of-ownership. The following actions will help to trigger both the supply and the demand for electric vehicles, so that their prices continue to drop and they come available for a wider public:

- The regulatory framework should give car manufacturers a clearly defined path for the development of less CO₂-emitting vehicles, in line with the EU's climate commitments.⁴ Tighter emission standards under the *CO₂ Standards Regulation* have proven to be one of the most effective measures to trigger that change and bring cleaner vehicles on the road. This policy should not only continue post 2020, but also be expanded to vans and heavy vehicles such as trucks and busses. Furthermore, ongoing attention to *Real Life Driving Test* is necessary to ensure listed emissions are in line with actual emissions.
- National purchase rebates (decreasing over time) and tax breaks that bridge the price-difference between electric- and conventional cars have proven to be an effective tool to overcome the high investment cost of electric vehicles, both for private and business customers. They should however be closely coupled to actual emissions. Governments that act as launching customer will equally help to create economies of scale and make e-mobility mass-market capable. For private customers, reducing the risk of the second hand value is important.
- In most of the countries where Vattenfall operates, taxes on electricity are higher than taxes on petrol/ diesel and this has a big effect on the cost-efficiency of EVs. This makes e-mobility unnecessarily expensive. A disadvantage that needs to be addressed, starting by making it visible. A good example of this are the low taxes on diesel, and high levies on electricity in Germany. In order to create a level playing field between conventional and electric cars the taxes should be the same per unit of energy.

⁴ The European Union has committed itself to greenhouse gas emission reductions of 20% in 2020, 40% in 2030 and 80/95% in 2050; all compared to 1990 levels. For the transport sector, emission reduction targets have been agreed of 20% in 2030 and 60% in 2050; also compared to 1990 levels. As emissions in the transport sector have risen with about 20% since 1990, this means a 40% emission reduction will need to be achieved in the next 15 years. [EU Commission, 2016](#)

IV. Enable the development of smart & sustainable cities:

Many cities and municipalities want to 'greenify' their fleet and public transportation. They however need technical assistance which enables them to do so.

- This mainly relates to knowledge that helps to make well-funded decisions between technologies and guidance on the steps that need to be taken to implement those solutions. Changes to the *Clean Vehicle Directive* that provides a framework for procurement, should be used to harmonize tender procedures at the municipality/regional level with recommended criteria for energy-efficiency, noise and local emissions.
- In order to be able to adequately compare different transport alternatives (gasoline, biofuels, electricity, hydrogen etc.) a comparison of the energy usage per kilometre over the whole value chain (well-to-wheel) is needed. This can be achieved under the *Car Labelling Directive*. If used across the whole sector, it has the capacity to incentivize efficiency in all transport modes. Valuation of noise and air pollution must equally be made transparent and harmonized. This is equally relevant for potential retail- and business customers.
- Car sharing programs that create synergies from the benefits of electro-mobility and digitalisation are a great way to reduce congestion in urban areas and easily make people familiar with e-mobility.

In short, it should be the task of the EU to simplify the growth of e-mobility and other low-emission forms of transport. This can be achieved with: financing options (for both charging infrastructure and electric vehicles), technical cooperation (harmonization of interoperability standards), and information (that demonstrates the benefits of e-mobility and help decision-making).

At the national level e-mobility should be tested in limited geographic areas; preferably in cities. Here, policies to facilitate market introduction should preferably be temporary and tailored to the national situation. Next to the availability of charging infrastructure, policies like: low-emission zones, purchase rebates and free parking have proven to be effective.

About our E-mobility solutions

In order for e-mobility to achieve a breakthrough, the expansion of charging infrastructure is key. Vattenfall offers simple- and smart **charging boxes** to both retail and business customers.

In the Netherlands and Germany, Vattenfall operates more than 2.600 **public electric vehicle charging** stations, mainly in Amsterdam, Berlin and Hamburg. These stations provide electric vehicles with over 600.000 kWh of renewable electricity per month, corresponding to 1mln kilometre driven with 0 direct emissions.

In Sweden we operate more than 30 **fast-charging stations** in Stockholm and Uppsala. At these stations, an EV battery can be charged from 0% to 80% in 20 minutes. Together with Volvo Buses and Scania we are testing the deployment of **electric busses**. In the EU funded ZeEUS project eight electric-hybrid buses, for which we supplied the fast charging stations, operate on the standard public transport network (route 73) in Stockholm. As of autumn 2016 we will test **wireless (inductive) charging in Södertälje, south of Stockholm**.

About Vattenfall

Vattenfall is a one of Europe's bigger, integrated energy utilities. The company is 100% owned by the Swedish State with operations concentrated in the Nordic countries, Germany, the Netherlands and the UK. Vattenfall is one of Europe's largest generators of both electricity and heat. The company has 6.2 million electricity customers, 4.3 million network customers and 1.9 million gas customers.