e-mobility NSR

The Interreg IVB North Sea Region Programme

# INTRODUCING E-MOBILITY: EMERGENT STRATEGIES FOR AN EMERGENT TECHNOLOGY

## Ambition, Structure, Conduct and Performance

*Background report*


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## 5.3. Findings conduct

### *5.3.1. Belgium*

| ***Policy instruments*** | ***Vehicle-centric' policy (EV Value chain)*** | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | **Fuel Economy Label. (N)** Belgium has introduced a fuel economy label which helps car buyers to assess the impact of different cars on limited change. It is based on a color scale, ranging from green for the lowest CO2 emissions to red for the most polluting vehicles. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) | | | | X |
| Financial | **Tax . (N)** 120% of the purchase costs of a BEV are deductible for companies under corporate tax system. 100% of the purchase costs are deductible for companies for PHEV with less than 60 gram per CO2/km. (http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2012/07/23/elektrisch-vervoer-in-nederland-in-internationaal-perspectief.html) | | | | X |
| | **Subsidy for customers. (R)** Individuals receive a subsidy of 30% of the price of the EV up to 9.190 Euros. (http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2012/07/23/elektrisch-vervoer-in-nederland-in-internationaal-perspectief.html) | | | | X |
| | **Subsidy Public Procurement for local authorities. (R)** In the Walloon region EV's are subsidized by 75% up to 15.000 Euros for passenger cars and up to 25.000 Euros for company cars. (http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2012/07/23/elektrisch-vervoer-in-nederland-in-internationaal-perspectief.html) | | | | X |
| | **Subsidy for customers Walloon Region. (R)** In the Walloon Region, the government was offering a 75% subsidy (up to 25.000 Euros) for electric vehicles bought before July 2010. (http://export.gov/build/groups/public/@eg_main/@byind/@autotrans/documents/webcontent/eg_main_035287.pdf) | | | | X |
| | **Vehicle registration tax. (R)** In Belgium the vehicle registration tax for low emission cars is the lowest of all the taxes in Europe. In the Flemish region EV's are exempt from vehicle registration tax. (http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2012/07/23/elektrisch-vervoer-in-nederland-in-internationaal-perspectief.html) | | | | X |
| | **Ecobonus Walloon Region. (R)** In the Walloon Region EV's are being promoted through an extra subsidy of 3.500 Euros through a bonus malus system. Customers get a discount on the purchase price. (http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2012/07/23/elektrisch-vervoer-in-nederland-in-internationaal-perspectief.html & http://thenewdrive.be/nl/elektrisch-rijden/wat-kost-een-elektrische-auto/subsidies) | | | | X |
| | **CIVITAS demonstration program. (L)** The program has given a subsidy to the city of Ghent for improving the public transport system and developing policy for sustainable development. (http://www.civitas.eu/index.php?id=69) | | | | X |
| Communication | **Practice day. (R)** On September 11, 2012 the Province of West-Vlaanderen has organized a 'practice day' on new mobility. This event provides information to organizations and local governments on new mobility, like what are the financial benefits of a sustainable fleet. (http://www.proeftuin-ev.be/content/praktijkdag-nieuwe-mobiliteit) | | | | X |
| | **Eco Score. (R)** The Flemish institute for technological research (VITO) and other partners (like the University of Brussels) have developed a methodology to | | | | X |

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|---|---|---|---|---|---|
| | **National project EV's – trial Hasselt. (L)** The city of Hasselt launched a trial with EV's. 100 drivers can drive an electric vehicle for free. This initiative is part of the national project Electric Vehicles and has the focus to create experiences with EV's and find out how the inhabitants deal with the new technology on EV's and CI. (http://www.duurzameenergiethuis.nl/mobiliteit/proefproject-met-gratis-elektrisch-rijden-6116.html) | | | | **X** |
| Organization | **Expertise Centrum Automobile Industry. (R)** The Expertise Centrum does research on energy storage, induction charging and electric power systems in cars. This research is funded by regional funds. (http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2012/07/23/elektrisch-vervoer-in-nederland-in-internationaal-perspectief.html) | **X** | | | |

*Table 14. Findings on EV value chain for Belgium*

| ***Policy instruments*** | ***Grid-centric policy (charging-infrastructure Value chain)*** | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | *No legal instruments found.* | | | | |
| Financial | **Tax deduction for customers. (N)** When a customer installs a charging point on the outside of his house they are entitled to 40% tax deduction with a maximum of 260 Euros for the year 2013. (http://www.minfin.fgov.be/portail2/nl/themes/transport/vehicles-electric.htm) | | | | **X** |
| | **Tax deduction for companies. (N)** Companies under the Corporate tax system can deduct 13,5 % of the investment in Charging Infrastructure. (http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2012/07/23/elektrisch-vervoer-in-nederland-in-internationaal-perspectief.html) | | | | **X** |
| Communication | *No instruments of communication found.* | | | | |
| Organization | **Charging points in parking garages. (L)** The city of Antwerp and parking company APCOA have worked together to create charging-infrastructure in Antwerp. APCOA places charging points in all its parking garages and is supported by the city of Antwerp in doing this. The first year parking is free for EV-drivers. The goal is to place 15 charging points per year. (http://www.mobimix.be/inhoud/2010/5/5/1615 & http://www.deelektrischeauto.nl/nieuwsberichten/) | | **X** | | |
| | **Free use of charging stations Hoeilaart. (L)** To promote the use of EV'S, the city of Hoeilaart provides free use of its charging stations. To use these charging stations the citizens need a blue corner card which they can get for free on the cite of blue corner or at city hall. The cards are free for citizens of Hoeilaart, other EV users can buy the card for 15 Euros. (http://www.hoeilaart2012.be/elektrisch-rijden/) | | | | **X** |

*Table 15. Findings on Charging infrastructure value chain for Belgium*

| *Policy instruments* | ***Vehicle & Grid*** |
|---|---|
| Families of instruments | Network |
| Legal | **Local Air Quality Plan (2010-2015). (L)** This plan was set up by the city of Gent and includes 50 measures to ensure a healthier air quality, including the support by the municipality of ecological vehicles in particular EV's or alternative powered vehicles. The plan also includes the development of a network of charging stations. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/) |
| Financial | *No financial instruments found.* |
| Communication | **National Masterplan. (N)** The federal authorities started work on the National Masterplan for the promotion of electric mobility in Belgium. The Masterplan describes the barriers to electric mobility and discusses 13 areas of action with ideas for different measures. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/) |
| | **MOBIMIX. (R)** Mobimix is an initiative of several partners in Belgium, including the Flemish government. This initiative is a digital platform for EV buyers, fleet controller and other professionals on mobility and transport. With information sessions and a free monthly newsletter mobimix reports on changes in eco driving, sustainable fleet controlling, taxes and all that is connected to eMobility. (http://www.mobimix.be/thema/mobimix) |
| | **Living Labs Electric Vehicles. (R)**<br>• **Connect and Drive.** The Living Labs programme has organized an event on march 1st 2012. This event (Connect and Drive) was organized to create opportunities for people who want to learn more on technology on Emobility in the Flemish region. This event also connects knowledge and technology on Emobility. (http://www.proeftuin-ev.be/content/e-mobility-connectdrive) |
| Organization | **ASBE. (N)** ASBE is the Belgian section of AVERE. The purpose of ASBE is to promote the use of battery electric, hybrid and fuel cell electric vehicles and supporting scientific and technological developments. (http://www.asbe.be/nl) |
| | **Belgian Platform on EV's. (N)** This platform was created to inform and bring together all relevant stakeholders from the e-mobility field. Between 2010 and 2011 the platform has organized several events. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/) |
| | **Living Labs Electric Vehicles. (R)** The Living Labs was launched by the Flemish government in 2010 and will run until 2013. This program was established to facilitate and accelerate the innovation and adoption of EV's in the Flemish region through five experimental platforms. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/)<br>• **Volt Air. (R)** Volt Air is one of the experimental programs of the Living labs in the Flemish region. The goal is to support innovations and support the integration of EV's in company fleets and in the company micro grids. The project is coordinated by Siemens. The city of Kortrijk is involved in this project. The project started in 2011 and will run three years with a budget of 2,8 million Euros. (http://www.proeftuin-ev.be/content/volt-air-platf)<br>• **Olympus. (R)** Olympus is one of the experimental programs of the Living Labs in the Flemish region. This project consists of three parts. The first part is an ICT platform on which all information on EV's and CI will be shared. The second part is a trial with EV's and electric bikes in Flemish cities which will be available to users on the train stations. The last part is the integration of the CI with the energy supply in train stations. There are several Flemish cities involved in this project which has a budget of 2,2 million euros and will be coordinated by B Holding. (http://www.proeftuin-ev.be/content/olympus-platform)<br>• **Imove (R).** Imove is one of the experimental programs of the Living Labs in the Flemish region. A large part of this project is subsidized by the government with 4,1 million Euros, the subsidized part consists of 83 passenger cars and 33 company cars and 144 Charging points. The project is coordinated by Umicore. The goal is to strive for a breakthrough in electric vehicle use and sustainable mobility. Therefor a pilot with EV's was started and is one of the largest in Europe. (http://www.proeftuin-ev.be/content/imove-platform)<br>• **EV TecLab. (R)** EV TecLab is one of the experimental programs of the Living Labs in the Flemish region. This platform is the coordination of Punch Powertrain and is a consortium of ten Flemish companies and research institutions and will focus on new technologies for electric heavy-duty vehicles like vans, trucks and buses. The vehicles will be used for freight and public transport in daily operation and will be used in the Imove project. The project received 3,8 million Euros in subsidies from the government. (http://www.proeftuin-ev.be/content/ev-teclab-platform)<br>• **EVA. (R)** Electric Vehicles in Action is the last project of the Living Labs. This project is an initiative of public and private partners to stimulate electric driving. This project is an open platform for researchers, entrepreneurs and governments who here can find support for their innovative initiatives. The project is funded with 3,3 million |

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|---|---|
| | Euros of public funds and consists of the largest CI in the Flemish region with a network of over 200 Charging points, and a large test fleet of 161 EV's. (http://www.proeftuin-ev.be/content/eva-platform) |
| | **Electric Vehicles. (R)** In the Flemish region the project Electric Vehicle started in 2011 and will run until 2014. The budget for this project is 16,3 million Euros. The goal is to put 600 EV's and 600 charging points in place. (http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/) |
| | **Local Air Quality Plan. (L)** In the Local Air Quality Plan the city of Gent states that they will replace as many polluting vehicles in their own fleet with EV's or other eco-friendly cars. (http://www.gent.be/docs/Lokaal%20Luchtkwaliteitsplan%202010-2015.pdf) |

*Table 16. Findings on Network for Belgium*

### 5.3.2. Denmark

| ***Policy instruments*** | ***Vehicle-centric' policy (EV Value chain)*** | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | **Registration Tax. (N)** Vehicles weighing less than 2.000 kg are exempt from the registration tax. This exemption does not apply to hybrid vehicles. (ttp://e-mobility-nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) | | | | X |
| | **Low Emission Zones. (N)** Low Emission Zones (LEZ), 'Miljøzone' in Danish, were introduced in 2010 in Denmark. LEZ are restricted areas for vehicles with low-carbon emissions. Currently, there are five urban areas with LEZ, namely Aalborg, Arhus, Copenhagen, Frederiksberg and Odense. (http://e-mobility-nsr.eu/fileadmin/user_upload/NEWS/Electric_mobility_policies_in_the_North_Sea_Region_countries/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf) | | | | X |
| Financial | **Energy Agreement. (N)** Part of the Energy Agreement of February 21, 2008 on Danish energy policy for 2008-11 is that DKK 10 mill. per year for 2008-2009 and DKK 5 mill. per year for 2010-2012 is to be appropriated for a test scheme for electric cars. The finances are administered by the Danish Energy agency. (http://www.ens.dk/en-us/climateandco2/transport2/Sider/testscheme.aspx) | X | | | |
| | **EV Experimental Programme. (N)** The Danish government has granted 4.7 Million Euros to the Danish Energy Agency for the EV experimental program. This program which promotes demonstration programs for battery powered EV's, runs from 2008 until 2012. (http://www.squarewise.com/downloads/publicaties/201005,_RAPPORT_SQW,_Elektrisch_rijden_Internationale_stand_van_zaken_(DBdV)1.pdf) | X | | | |
| | **Registration Tax. (N)** In Denmark EV's are exempt from registration tax until 2015. That amount is 105 % of the price of the car for the first 10.000 Euros en 180% for the rest of the amount. (http://www.squarewise.com/downloads/publicaties/201005,_RAPPORT_SQW,_Elektrisch_rijden_Internationale_stand_van_zaken_(DBdV)1.pdf) | | | | X |
| | **Annual Tax. (N)** Battery-powered EV's and fuel cell vehicles are exempted from annual tax until the end of 2015. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) | | | | X |
| | **Electric car pilot scheme. (N)** DKK 15 million has been earmarked for the continuation of the electric-car pilot scheme in 2013-2015. (http://www.ens.dk/en/policy/danish-climate-energy-policy --> Energy policy report 2012) | X | | | |
| | **Subsidies. (N)** The Danish Energy Agency, which administers the subsidy scheme, has granted subsidies of DKK 10 mill. to 17 projects. The projects include a total of 44 electric vehicles. (http://www.ens.dk/en-us/climateandco2/transport2/Sider/testscheme.aspx) | X | | | |
| | **Centre for Green Transport. (N) (L)**<br>• 3 Million Euro was granted by the Centre for Green Transport for the ChoosEV project to field-test 300 mass-produced EV's. **(N)** | X | | | |

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|---|---|---|---|---|---|
| | (www.ieahev.org)<br>• 230.000 Euro was granted by the Centre for Green Transport to field-test fuel cell EV's in Copenhagen. **(L)** (www.ieahev.org)<br>• 230.000 Euro was granted by the Centre for Green Transport to gather experiences from EV's in a car sharing project in Copenhagen. **(L)** (www.ieahev.org) | | | | |
| | **Free parking. (L)** In Denmark several cities (Copenhagen) have reduced the parking fee for EV's and in some cities EV's are exempt from paying. (http://www.squarewise.com/downloads/publicaties/201005,_RAPPORT_SQW,_Elektrisch_rijden_Internationale_stand_van_zaken_(DBdV)1.pdf) | | | | X |
| | **Toll Roads. (N)** Free use of toll roads for EV's. (http://www.wsdot.wa.gov/NR/rdonlyres/5559AE0E-8AB5-4E6B-8F8B-DEAA7ECE715D/0/SynthesisEVPoliciesFleetandInfrastructureFINALRev112911.pdf) | | | | X |
| Communication | **Centre for Green transport. (N) (L)**<br>• 28 Million Euro has been allocated by the Danish Centre for Green Transport specifically for "demonstration projects between 2010 and 2013 that promote environmentally aware and energy-efficient transport solutions, including test projects with alternative types of fuels, electric cars, electric buses, and electric trucks". (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/info-pool/)<br>• In cooperation with the Danish Energy Agency, the Centre for Green Transport has established an information center to exchange experiences on EV's between local communities in Denmark. (www.ieahev.org)<br>• Several projects are conducted by the Centre for Green Transport for example a transport certification program for municipalities and companies, an energy-efficient driving campaign, and energy labelling of light commercial vehicles. (http://www.ieahev.org/by-country/demark-on-the-road-and-deployments/ & http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) | | | | X |
| | **Danish EV Promotion program. (N)** The Danish EV Promotion Program started in February 2008. This program promotes demonstration programs for battery powered EV's. The program is being administered by the Danish Energy Agency. The government has granted 4 million Euro to the promotion program. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) | | | | X |
| Organization | *No organization instruments found.* | | | | |

***Table 17. Findings on EV value chain for Denmark***

| ***Policy instruments*** | ***Grid-centric policy (charging-infrastructure Value chain)*** | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | *No legal instruments found.* | | | | |
| Financial | **Energy Agreement. (N)** The Danish energy agreement includes a decision to establish a pool of DKK 70 million in the years 2013-2015 to provide funding for the establishment of more recharging stations for electric cars, infrastructure for hydrogen and for gas in heavy transport. The ministry involved is the Ministry of Climate, Energy and Building. (http://www.ens.dk/en-US/policy/) | | X | | |
| | **EDISON (Electric vehicles in a Distributed and Integrated market using Sustainable energy an Open Networks). (N)** Started in 2009 and ending in 2012, the project is partly financed by the Danish government and focuses on the cooperation of public and private research organizations, international companies (like Siemens and IBM) and local authorities to "create an intelligent infrastructure to fuel a large fleet of electro vehicles on electric energy created by wind parks". The developed technical solutions are real-life tested on the island of Bornholm. (http://e-mobility- | X | X | | |

| | | | | | |
|---|---|---|---|---|---|
| | nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) | | | | |
| Communication | *No instruments of communication found.* | | | | |
| Organization | **Better Place. (N)** Better Place is an international organization which cooperates with the government to create a nationwide charging infrastructure for EV's. In June 2010 the first European battery switch station was inaugurated in Gladsaxe (north to Copenhagen) and in April 2012 the nationwide infrastructure of charge spots and 16 battery switch stations was launched. (www.ieahev.org) | | **X** | | |
| | **Charging Infrastructure. (N)** In 2011, 300 semi-public slow charging and 6 quick charging facilities were planned for installation. This project is financed by ChoosEV and sponsors and is supported by the Centre for Green Transport and the Danish EV Promotion program. (http://www.ieahev.org/by-country/denmark-charging-infrastructure/) | | **X** | | |

*Table 18. Findings on Charging infrastructure value chain for Denmark*

| ***Policy instruments*** | ***Vehicle & Grid*** |
|---|---|
| Families of instruments | Network |
| Legal | **Green Transport Policy Agreement. (N)** Denmark signed a 'green transport policy agreement' in 2009 which has to help to reduce the CO2 emission of the transport sector. This agreement contains the activities to stimulate Electric Vehicles. (http://www.trm.dk/~/media/Files/Publication/English/Freight%20Transports%20of%20the%20Future.pdf) |
| Financial | **Sustainable transport. (N)** The Danish government has granted 75 million Euros for research programs on sustainable transport. (http://www.squarewise.com/downloads/publicaties/201005,_RAPPORT_SQW,_Elektrisch_rijden_Internationale_stand_van_zaken_(DBdV)1.pdf) |
| | **Future Energy Systems. (N)** The Danish government has granted 190 million Euros to research on 'future energy systems'. (http://www.squarewise.com/downloads/publicaties/201005,_RAPPORT_SQW,_Elektrisch_rijden_Internationale_stand_van_zaken_(DBdV)1.pdf) |
| Communication | *No instruments of communication found.* |
| Organization | **CPH 2025. (L)** On August 23rd 2012 the city council of Copenhagen has adopted the CPH 2025 climate plan. All measures in this plan have to contribute to making Copenhagen the first carbon neutral capital by 2025. (http://subsite.kk.dk/sitecore/content/subsites/cityofcopenhagen/) |
| | **Centre for Green Transport. (N)** The Centre for Green Transport was established by the Danish Transport Authority (part of the Danish Ministry of Transport) in April 2009 to "create the framework for a Danish centre in the field of sustainable transport and to manage these initiatives". |

*Table 19. Findings on Network for Denmark*

### 5.3.3. Germany

| ***Policy instruments*** | ***Vehicle-centric' policy (EV Value chain)*** | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | **Low Emission Zones. (N) (L)** LEZ's are areas or roads where the most polluting vehicles are restricted from entering. The vehicles are banned or in some cases charged.<br>• In Germany Low Emission Zones are identified by traffic signs and additional signs. The Thirty-fifth Ordinance on the Implementation of the Federal Emission Control Act (Ordinance on the marking of vehicles) stimulates that vehicles have to be marked with stickers (on the windscreen inside the vehicle) and lays down the criteria vehicles have to meet for the different kinds of stickers. Stickers are valid for all low emission zones in Germany. **(N)** (http://www.bmub.bund.de/en/topics/air-mobility-noise/air-pollution-control/umweltzonen-umweltplakette/low-emission-zone-emissions-control-windscreen-sticker/)<br>• In Germany there are currently several cities participating in the LEZs. Hamburg does not participate. **(L)** (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/) | | | | X |
| Financial | **Annual circulation Tax. (N)** The federal government has decided that the exemption for EV's for the annual circulation tax will be doubled from 5 to 10 years. This exemption is for EV's bought during the period of May 18th 2011 until December 31th 2015. (http://www.spiegel.de/auto/aktuell/keine-kfz-steuer-fuer-elektroautos-zehn-jahre-lang-a-834800.html) | | | | X |
| | **Purchase subsidy. (N)** The German government grants purchase subsidies up to 5.000 Euros for EV buyers. (http://www.squarewise.com/downloads/publicaties/201005,_RAPPORT_SQW,_Elektrisch_rijden_Internationale_stand_van_zaken_(DBdV)1.pdf) | | | | X |
| | **Motor vehicle Tax. (N)** In Germany the motor vehicle tax is determined by the amount of CO2 emission, which is beneficial for EV's. (The German Parliament has adopted a bill in 2012 which will modify the motor vehicle tax act. Newly registered cars which will be registered between 2016 and 2020 will attract a 5 year tax exemption. (http://www.germanenergyblog.de/?p=10701 & http://www.squarewise.com/downloads/publicaties/201005,_RAPPORT_SQW,_Elektrisch_rijden_Internationale_stand_van_zaken_(DBdV)1.pdf) | | | | X |
| | **Storage Battery Programme. (N)** The storage battery programme is founded to build capacities in Germany for implementation throughout the whole supply chain in the production of storage batteries. The programme runs from 2009 until 2012, the government has granted 35 million Euros to this project. (http://www.bmwi.de/English/Redaktion/Pdf/) | X | | | |
| | **Experimental project. (N)** The BMVBS (Federal ministry of Transport, Building and Urban development) funds a project which demonstrates the use of electric vehicles. The project explores the possibilities of new business models through real users from the field. The project runs from 2011 until 2014. (http://www.bmu.de/files/pdfs/allgemein/application/) | X | | | |
| | **Innovation Alliance Automotive Electronics (EENOVA). (N)** Through the BMBF ICT 2020 research for innovation, EENOVA receives 100 million Euros for research on energy management in EV's. (http://www.squarewise.com/downloads/publicaties/201005,_RAPPORT_SQW,_Elektrisch_rijden_Internationale_stand_van_zaken_(DBdV)1.pdf) | X | | | |
| | **Lithium-ION Battery Alliance. (N)** The Lithium ion battery alliance is a project to substantially increase the energy and performance density of lithium ion batteries and to accelerate the possible use in production. The federal government has granted 60 million Euros to this project. The programme ran until the end of 2008. (http://www.squarewise.com/downloads/publicaties/201005,_RAPPORT_SQW,_Elektrisch_rijden_Internationale_stand_van_zaken_(DBdV)1.pdf) | X | | | |

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| | **Electromobility model region Hamburg. (R)** In the years of 2010 and 2011 local projects in the model region Hamburg were funded with 12 million Euros from the federal stimulus package to test EV's in the field. (http://www.elektromobilitaethamburg.de) | **X** | | | |
| | **Parking. (L)** In several cities in Germany EV's have privileges for parking. (http://www.spiegel.de/auto/aktuell/keine-kfz-steuer-fuer-elektroautos-zehn-jahre-lang-a-834800.html) | | | | **X** |
| Communication | **The E Roadshow. (N)** The E Roadshow is one of the initiatives of the BEM. The E Roadshow offers companies, local authorities and other actors the opportunity to demonstrate electric vehicles as a realistic alternative to other mobility. The public can test the EV's so the public will be informed and taught on Electric Vehicles. (http://www.bem-ev.de/) | | | | **X** |
| | **Ecity Logistics. (R)** Ecity Logistics is a project of the model region electromobility Berlin in which the EMO participates. This project has the aim to demonstrate the possibilities of EV's for urban transport. In order to do so the project consists of two parts. The first part is the demonstration of EV's to enhance the introduction of EV's and the second part consists of a field-test with 11 EV's in the city of Berlin. (http://www.e-mobil-bb.de/E_City_Logistik.html) | **X** | | | **X** |
| | **Tag der Technik 2012. (R)** In 2012 the model region Bremen/Oldenburg has cooperated with Mercedes Werk Bremen to create the Tag der Technik 2012. This day was organized with the goal to inform people on the subject of Electric Vehicles and Electric driving. Mercedes Werk Bremen and the model region also cooperate on several other projects on Electric Mobility. (Elektromobilitat im Nordwesten.) | | | | **X** |
| Organization | **Public procurement. (N)** The federal government strives for a 10 % share of vehicles which emit less than 50g CO2 per KM of their new purchased or leased vehicles in 2013. (http://www.bmu.de/files/pdfs/allgemein/application/) | | **X** | | |
| | **Electromobility model regions. (R)**<br>• **Hamburg.** The testing of diesel hybrid buses on lines. Innovative energy storage for rail vehicles. The use and development of electric cars and charging infrastructure. The use of electric vehicles in commercial traffic. These are the priorities of the projects in the model region Hamburg. (http://www.hamburg.de/pressearchiv-fhh/)<br>• **Bremen/Oldenburg.** In the model region Bremen/Oldenburg the cooperation between the University of Bremen and the University of applied science is another building brick in the development in electric vehicle technology. Mercedes Werk will use the scientific knowledge to produce these new technologies. (Elektromobilitat im Nordwesten).<br>• **Bremen/Oldenburg.** The model region Bremen/Oldenburg is coordinated by three partners, the Fraunhofer Institute, IFAM and DFKI. The DFKI provides the scientific fundament for the project. These partners have already tested 100 EV's in the region and over 1.000 test EV users have travelled over 320.000 km with the EV's. (Elektromobilitat im Nordwesten.) | | | | |
| | **Future offensive Electromobility. (R)** In 2008 the Bayern government and industry started a future offensive called Electromobility to concentrate the activities on Electric Mobility. The goal of these two participants is to work together with other partners like academics and government to test future technologies and economic concepts of Electric mobility. (http://www.stmwivt.bayern.de/wirtschaft/industrie/) | **X** | | | |
| | **Hybrid bus. (L)** The city of Stuttgart has replaced some of its conventional busses for Hybrid busses. (http://www.bmvbs.de/SharedDocs/EN/Artikel/UI/electric-mobility.html) | | **X** | | |
| | **Public procurement. (L)** Hamburg has already 60 EV's in its municipal fleet with plans for up to 500 EV's/HEV's by the end of 2005 (http://www.elektromobilitaethamburg.de) | | **X** | | |
| | **EV for rent. (L)** In Berlin it is possible to rent an EV at the large train stations to experience the use of an EV. (http://www.bmvbs.de/SharedDocs/EN/Artikel/UI/electric-mobility.html) | | | | **X** |

*Table 20. Findings on EV value chain for Germany*

| *Policy instruments* | *Grid-centric policy (charging-infrastructure Value chain)* | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | *No legal instruments found.* | | | | |
| Financial | **The second Mobility and Transport research programme. (N)** Funds of approximately 380 million Euros were made available from the federal government budget in the period of 2000 to 2007. These funds to promote research and development in the transport sector were allocated to the budget of the BMBF (Federal ministry of education and research) up to and including 2005 after which they were instead allocated to the budget of the BMWI (Federal ministry of Economics and Technology). (http://www.bmwi.de/English/Redaktion/Pdf/) | X | | | |
| | **Electromobility model region Hamburg (R)** In the years of 2010 and 2011 local projects in the model region Hamburg were funded with 12 million Euros from the federal stimulus package to build charging infrastructure. (http://www.elektromobilitaethamburg.de) | | X | | |
| Communication | *No communications instruments found.* | | | | |
| Organization | **Elektromobilitat Heilbronn-Franken EV. (R)** The region of Heilbronn is one of the model regions. The city of Heilbronn, the University of Heilbronn and the ZEAG Energy AG have worked together to create more charging points in the region. The project is called Elektromobilitat Heilbronn Franken EV. The ZEAG Energy AG will build charging points and an internet portal on EV's with regional relevant information will be created. (http://www.e-mobilbw.de/Pages/) | | X | | |
| | **Ladenetz.de. (N)** Ladenetz.de is a German website which provides information on charging infrastructure. Several public companies like companies in Aachen, München and Springe are partners of this initiative. (http://ladenetz.de/index.php?id=partner) | | | | X |
| | **Elektromobilitat Model Region (Hamburg). (R)**<br>• The testing of diesel hybrid buses on lines. Innovative energy storage for rail vehicles. The use and development of electric cars and charging infrastructure. The use of electric vehicles in commercial traffic. These are the priorities of the projects in the model region Hamburg. (http://www.hamburg.de/pressearchiv-fhh/)<br>• EV drivers who do not have their own charging facilities can charge their EV on 100 charging points in the city. These points are situated at parking spaces on public roads, in municipal car parks and park and ride areas. (http://www.elektromobilitaethamburg.de) | X | X | | |
| | **Charging points. (L)** The energy company EmBW started a project with the goal to build 185 charging points. The city council of Stuttgart was involved in this project. The city council could mark a list of places they thought were suitable for charging points. In September 2012 the build had already started. (Stuttgarter Zeitung, Stadtsausgabe, 05-09-2012, S.I Standorte fur stromtankstellen stehen fest.) | | X | | |

*Table 21. Findings on Charging infrastructure value chain for Germany*

| *Policy instruments* | ***Vehicle & Grid*** |
|---|---|
| Families of instruments | Network |
| Legal | *No legal instruments found.* |
| Financial | **Regierungs programm elektromobilitat. (N)** A concrete elaboration of the NEPE can be found in the 2011 government programme for emobility the ''Regierungs programm elektromobilitat'. The federal government has invested 500 Million Euros research and development of electric mobility. (http://www.bmu.de/files/pdfs/allgemein/application/pdf/regierungsprogramm_emob_bf.pdf) |
| Communication | **Efficiency House Plus. (N)** In October 2011, as part of its building and electric mobility research, the Federal Ministry of Transport, Building and Urban Development will begin with the construction of the follow-up model of the plus energy house which combines building and transport. The idea is that the energy generated by the house is stored in suitable high-capacity batteries and used to recharge electric vehicles. Before the end of this year, the first fully functional and habitable "Energy Surplus House" is to be presented in Berlin. For this, an electric car charging point and an electric vehicle are added to the Efficiency House Plus. This house will be placed in Berlin. (http://www.bmvbs.de/SharedDocs/EN/Artikel/B/energy-plus-house-my-house-my-filling-station.html) |
| | **EV users Meeting. (L)** On the 3rd of December 2012 the fifth meeting for EV users was arranged in Hamburg. This event provides a platform for EV users in the model region Hamburg to obtain information about current projects and concepts and a place to talk about their experiences with EV driving. (http://www.elektromobilitaethamburg.de_) |
| Organization | **The National Platform for Electric Mobility (NPE). (N)** The NPE was founded in May 2010. It is made up of representative of industry, academia, government, unions and society. 7 workgroups were formed each with about 20 members. The workgroups are coordinated by the steering committee which includes mainly the chairs of the workgroups and representatives of the federal government. The NPE was brought into being in order to direct and shape the road map for the realization of the objectives laid out in the National Development Plan for Electric Mobility. (http://www.gtai.de/GTAI/Navigation/EN/Invest/Industries/Smarter-business/Smart-mobility/National-electromobility-development-plan/national-electric-mobility-platform-npe.html?view=renderPdf) |
| | **Electromobility model regions. (N)** In 2009 the federal government started 8 'electric mobility model regions'. This is a funding priority of the Federal Ministry of Transport, Building and Urban Development, and provides a total of 130 million euros to 8 pilot projects. Players from academia, industry and the local authorities involved are cooperating closely in these pilot projects in order to progress the development of an infrastructure and to ensure that electric mobility is firmly embedded in the public realm. The objective of the model regions was the connection of application-oriented research with customer focused daily use of electric vehicles. In the 8 model regions there are over 220 projects. The overall coordination was with the organization for hydrogen fuel cell technology. (www.ieahev.org & http://www.bmvi.de/SharedDocs/EN/Artikel/UI/electric-mobility-pilot-regions.html?nn=37302) |
| | **The third mobility and transport research programme. (N)** The third mobility and transport research programme (BMWI) sets out the goals, for instance to research in drive technology. Special importance is attached to developing new vehicle concepts and technologies for reducing energy consumptions and pollution in road transport. (http://www.bmwi.de/English/Redaktion/Pdf/) |
| | **Bundes Verband Elektromobilitat (BEM). (N)** The BEM is a federation which has the goal to improve the legal framework for the development of electric vehicles and to support the implementation of incentives which will lead to the transition to EV's. To achieve its goals the BEM links players in business, politics and the media. The BEM also is involved in the organization of several projects which are linked to electromobility. (http://www.bem-ev.de/) |
| | **E-Energy research programme. (N)** BMWI and BMU (Federal Environment Ministry) have founded the research programme 'E-Energy' at the end of 2008 which focusses on ICT control and optimization of the energy supply system. Until 2012 BMWI and BMU will invest 60 million Euros. The industry invests another 80 million Euros. (http://www.squarewise.com/downloads/publicaties/201005,_RAPPORT_SQW,_Elektrisch_rijden_Internationale_stand_van_zaken_(DBdV)1.pdf) |
| | **NEPE. (N)** The National Development Plan for Electric Mobility (NEPE) was adopted by the federal government in August 2009. It was developed jointly by four federal ministries and sets out a coordinated policy frame for the national instruments and funds that promote research and development, market preparation and the market introduction of battery powered vehicles in Germany. (http://www.bmu.de/english/mobility/electric_mobility/doc/44847.php) |
| | **Roadmap for sustainable mobility in Baden Wurttemberg 2020. (R)** The Living Lab BW Emobil is part of the Roadmap. This roadmap has the goal to make Baden Wurttemberg a pioneer in sustainable mobility up to 2020 and to achieve this goal all forms of electric vehicles throughout the country will be used. (http://www.e- |

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|---|---|
| | mobilbw.de/Pages/arbeitsfelder/livinglab-bwe-mobil.php) |
| | **The Berlin Agency for Electromobility (EMO). (R)** EMO is the central point of contact for electromobility in the German capital region. EMO links and coordinates the players, acquires new partners for regional, national and international projects in the field of electromobility. (http://www.emo-berlin.de/en/about-us/) |
| | **Show Windows. (R)**<br>• Bayern Sachsen. This show window has the goal to start 60 projects by the end of 2015 with a total budget of 150 million euros. These projects have a systematic approach to stimulate the integration of electric vehicles. The project consists of five themes: long distance mobility, urban mobility, national mobility, international connection and education and training.( http://www.elektromobilitaet-verbindet.de/files/20120921-Flyer-Schaufenster-Elektromoblitaet-Bayern-Sachsen.pdf)<br>• Baden Wurttemberg. The show window in Baden Wurttemberg is called Living Lab BW Emobil. In this show window more than 100 partners (industry and government) work together on more than 40 projects with a total budget of 152 million euros. The goal is to have 2000 EV's on the road by 2015. (http://www.e-mobilbw.de/Pages/arbeitsfelder/livinglab-bwe-mobil.php)<br>• Berlin Brandenburg. In this Show window 74 projects will be implemented with a total budget of 165 million euros of which 75 million is provided for by the private sector and 25 million is funded by the state of Berlin. (http://www.emo-berlin.de/en/news/single/berlin-brandenburg-becomes-an-international-showcase-for-electromobility/)<br>• Niedersachsen. This show window uses the slogan: Our PS are becoming electric. This show window has set 6 goals like 85 % of the citizens have to be informed on this show window and 20% of the new cars in public fleets of local governments have to be EV's of PHEV's. (http://www.braunschweig.de/wirtschaft_wissenschaft/wissenschaftsportal/schaufenster-e-mobilitaet.html) |
| | **Fuel Cell and Electric Vehicles Niedersachsen. (R)** The initiative Fuel Cell and Electric Vehicles Niedersachsen is an initiative of the Niedersachsischen ministry of Environment, Climate change, Economy, Labour and Transport and the ministry of Science and Culture. The goal of this initiative is to bring together relevant expertise in Niedersachsen. To achieve this goal the initiative consists of workgroups and expertise groups where actors can exchange knowledge on the subject of EV's and fuel cell cars. (http://www.brennstoffzelle-nds.de/landesinitiative/) |
| | **The Automotive Northwest (ANW). (R)** The ANW is a network for auto industry and partners which consists of 60 participants. The goal of ANW is to put the Northwest region on the map as the auto centre of excellence and to exchange experiences of the members through workshops, events and transmission of cross industry knowledge. Since 2011 the network formed a workgroup for electric mobility. This workgroup organizes several projects in the field of electric mobility. (Elektromobilitat im Nordwesten.) |
| | **Strategy for EV adoption. (R)** Hamburg has a clear strategy for EV adoption, smart development of urban structures, environmental and climate protection, competitiveness and economic viability. This political approach also includes the implementation of emobility schemes in housing programs, spatial planning and district development. (http://www.cleanenergyministerial.org/Portals/2/pdfs/EV_City_Casebook_LR.pdf) |

*Table 22. Findings on Network for Germany*

### 5.3.4. Netherlands

| ***Policy instruments*** | ***Vehicle-centric' policy (EV Value chain)*** | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | **Parking. (L)** In Rotterdam the first 1.000 EV owners receive a parking permit for free. (Meurs, van & Beek, van (red.) (2010). De stad elektrisch: lokaal bestuur en de introductie van elektrisch vervoer. APPM Management Consultants.) | | | | X |
| | **Parking. (L)** In Amsterdam EV's were exempt from paying for parking in the period of 2009 until 2011. (Meurs, van & Beek, van (red.) (2010). De stad elektrisch: lokaal bestuur en de introductie van elektrisch vervoer. APPM Management Consultants.) | | | | X |
| | **LEZ. (L)** Low Emission Zones (LEZs) are areas or roads where the most polluting vehicles are restricted from entering. The vehicles are banned or in some cases charged. The city of Amsterdam is an LEZ. (Meurs, van & Beek, van (red.) (2010). De stad elektrisch: lokaal bestuur en de introductie van elektrisch vervoer. APPM Management Consultants.) | | | | X |
| Financial | **Pilot program EV's. (N)** For the period of 2009-2014 the central government has earmarked 10 million euros for a pilot program on EV's.(http://www.agentschapnl.nl/en/onderwerp/formula-e-team) | X | | | |
| | **HTAS Tenders. (N)** Through two HTAS Tenders, the government contributes 20 million euros to development and research on EV's. (http://www.agentschapnl.nl/sites/default/files/bijlagen/) | X | | | |
| | **Income Tax. (N)** For leased cars, an income tax measure makes EV's and HEV's attractive. A normal tariff of 25% of a leased car's value that is added to the yearly income tax is eliminated for zero-emission cars (less than 50g CO2/km) or will be 14% or 20% according to the fuel type and CO2 emissions if the cars are fuel-efficient. (www.ieahev.org) | | | | X |
| | **Registration Tax. (N)** EV's are exempt from the registration tax and from the yearly road tax. Fuel cell EV's follow the same ruling. (www.ieahev.org) | | | | X |
| | **Innovatie Vouchers Elektrische Mobiliteit. (N)** From January first until 31th of December 2013 entrepreneurs who want to develop a new product in the field of Electric mobility but have insufficient means of knowledge, can get an innovation voucher. These vouchers are worth 5.000 euros and the budget for the total of a maximum of 100 vouchers is 500.000 euros. (http://www.nederlandelektrisch.nl/nc/nieuws/bericht/) | X | | | |
| | **MIA/VAMIL. (N)** Through the MIA and VAMIL regulation of the central government, entrepreneurs can receive a subsidy for purchasing an EV or installing charging infrastructure. (http://www.agentschapnl.nl/programmas-regelingen/mia-milieu-investeringsaftrek-en-vamil-willekeurige-afschrijving-milieu-invest) | | | | X |
| | **Purchase subsidy. (L)**<br>• The city of Amsterdam grants subsidies up to 5.000 euros to purchase EV's which are being used for business and up to 10.000 euros for purchasing electric taxi's and courier cars. (http://www.autoenfiscus.nl/elektrische-auto.html)<br>• The cities of Leeuwarden and Rotterdam grant (additional) subsidies for either purchasing EV's and/or charging points. (http://www.agentschapnl.nl/en/onderwerp/formula-e-team) | | | | X |
| | **Amsterdam Electric. (L)** To stimulate entrepreneurs in Amsterdam to purchase EV's, the city introduced a subsidy scheme of 3 million Euros, of which 2 million is funded by the national government and 1 million is funded by the city. Entrepreneurs receive subsidy when they purchase an EV. The grant is 15.000 euros for EV's in the M1 class, 25.000 euros for EV's in the M2 class and 45.000 euros for electric trucks and taxi's. The maximum of subsidized vehicles per entrepreneurs is 20 with a maximum subsidy of 250.000 euros. (Programma bureau Luchtkwaliteit, January 2010. Amsterdam Elektrisch (het Plan)) | | | | X |

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|---|---|---|---|---|---|
| Communication | **Groene Rally. (R)** The foundation Limburg Elektrisch organizes the ''Groene Rally'' on April 19th until 21st 2013.The rally is open for everybody who drives electric and for everybody who wants to experience electric driving. (http://landvanlimburg.nl/groene_rally) | | | X | |
| | **Amsterdam Electric. (L)** From the start of 2009 the city of Amsterdam organized an information campaign on electric mobility called ''Amsterdam Elektrisch''. The goal of the campaign is to inform customers on EV's and show the customers that EV's are a good alternative for traditional mobility, and introduce the EV. (Programma bureau Luchtkwaliteit, January 2010. Amsterdam Elektrisch (het Plan)) | | | | X |
| | **Battery day. (N)** The consortium of stakeholders organized a Battery day, with 300 participants from the Netherlands and abroad. The event coincided with the opening of the European Electric Mobility Center (EEMC) testing facility for EV's and batteries. In this project the Action Plan was a main catalyst, contributing 1,3 million euros to this foundation. (www.ieahev.org) | | | X | |
| Organization | **EEMC. (N)** The EEMC is a cooperation in which various companies such as TASS, TTAI, Automotive facilities Brainport and TNO cluster their strengths in the field of development test facilities and certification for electric components, powertrains and vehicles. Fundamental aspects are integration, safety, performance and robustment. On January first 2013 EEMC was fully operable. (http://www.tno.nl/) | X | | | |
| | **CEVITTS (Charging Electric Vehicles Infra Tech Trade Show). (L)** CEVITTS an event that focusses on challenges which are connected to creating CI for EV's. This event displays innovative solutions for challenges with CI for public and private domain. This event also consists of a 2 day conference where several experts will discuss these challenges and solutions. The event took place in Amsterdam in March 2012. (http://www.proeftuin-ev.be/content/cevitts-charging-electric-vehicles-infra-tech-trade-show) | | | | X |
| | **Amsterdam Electric. (L)** The city of Amsterdam formulated the goal to introduce 30 electric vehicles in the public fleet in the period 2009-2011. The long term goal is to have an EV for all divisions of the city of Amsterdam. TCA and the city of Amsterdam cooperate on the introduction of electric taxis in the city. At the end of 2009 there were about 30 electric taxis introduced. The goal was to have 50 electric taxis in the city in 2010. (Programma bureau Luchtkwaliteit, January 2010. Amsterdam Elektrisch (het Plan)) | | | | |
| | **Utrecht Electric. (L)** The city of Utrecht already owns electric vehicles in their fleet and they will continue to increase this number. By 2014 the city wants to have replaced at least 60 cars in the fleet by electric cars and also the scooters will be replaced. (http://www.utrecht.nl/images/DSO/Infraprojecten/utrechtelektrisch/Brochure_Actieplan.pdf) | | X | | |
| | **'S-Hertogenbosch. (L)** In the Paleiskwartier district of's-Hertogenbosch, local companies and institutions have created a shared fleet of different types of electric vehicles to increase the durability of the district and test the first smart charging system. This is the first Dutch project with a shared EV fleet. (http://www.cleanenergyministerial.org/Portals/2/pdfs/EV_City_Casebook_LR.pdf) | | | | X |
| | **Noord-Brabant. (R)**<br>• Within the province of Noord-Brabant there will be created experimental areas to gather information and experience on zero emission cars. As a result, companies get the opportunity to explore and improve their EV's use in their own local market. (https://www.brabant.nl/~/media/83F4D659EF114153A2F70E6CF517D9F2.pdf)<br>• The province will make sure that the experiences of the SLIM-ERB 2010-2011 will be used, so the valorization of R&D knowledge is made possible in this phase. (Focus area Noord -Brabant. The province will make sure that the experiences of the SLIM-ERB 2010-2011 will be used, so the valorization of R&D knowledge is made possible in this phase.)<br>• One of the goals of this project is to establish a test center for charging infrastructure and EV's. (http://www.brabant.nl/dossiers/dossiers-op-thema/energie/elektrisch-rijden.aspx) | X | | | |
| | **Action Plan 2009-2011. (N)** In the Action Plan 2009-2011 the government stated: ''The central government and regional and local authorities serve as launching customer and also stimulate other fleet owners, like leasing companies, couriers and (urban) distribution companies '' in driving electric vehicles. The budget for this project (together with two other projects in the action plan) is 55 million Euros. (http://www.agentschapnl.nl/sites/default/files/bijlagen/Action%20Plan%20for%20Electric%20Driving_tcm24-341123.pdf) | | | X | |
| | **AutomotiveCongressNL. (N)** AutomotiveNl organizes several events and one of those is the AutomotiveCongressNL. This Congress will take place on June 11th 2013 and will focus on providing information on innovations on automotive technology and smart mobility, to government, industry and professionals, but also interested students and other people are welcome. (http://www.automotivenl.com/evenementen/404-11-juni-2013-automotivecongress-nl) | | | X | |

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|---|---|---|---|---|---|
| | **AutomotiveHouse. (N)** The AutomotiveHouse is the Center of activities for promoting and strengthening the Dutch automotive industry. Both Physically and programmatically. The AutomotiveHouse forms the central hub within the High-tech automotive Campus and, as such, provides an important stimulus to market based cooperation between government bodies, industry and knowledge institutes in the field of automotive engineering. (http://www.automotivecampusnl.com/automotive-house) | | | X | |
| | **EBUSZ. (L)** Rotterdam is undertaking a two-year pilot with Ebusz (Electric City buses). The goal of this pilot is to test, demonstrate and extend the driving radius of the electric buses and evaluate their effects on society. (www.ieahev.org) | X | | | |
| | **Zero Emission Busfleet. (N)** OV companies, bus manufacturers, financiers, (regional) governments and knowledge institutes have started an initiative to create a zero emission busfleet. The goal is to make the whole fleet of 5.000 busses zero emission. (http://www.rijksoverheid.nl/documenten-en-publicaties/richtlijnen/2011/10/03/bijlage-2-plan-van-aanpak-elektrisch-vervoer-elektrisch-rijden-in-de-versnelling.html) | | | X | |

*Table 23. Findings on EV value chain for the Netherlands*

| ***Policy instruments*** | ***Grid-centric policy (charging-infrastructure Value chain)*** | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | *No legal instruments found.* | | | | |
| Financial | **Pilot Smart charging. (N)** The central government has reserved 16 million euros for pilots with smart charging. Electric mobility is one of the subjects which falls under this category. (http://www.agentschapnl.nl/sites/default/files/) | X | | | |
| | **Cooperation G4. (R)** The municipalities of Amsterdam, Rotterdam, Den Hague and Utrecht (G4) have signed a cooperation agreement in 2012. The agreement (called: Charging points Electric Mobility) concerns public charging points for EV's. The agreement aims to create 3.000 charging points by the end of 2014. The project is funded by the foundation E-laad and the G4. (http://www.rotterdam.nl/samenwerkingsovereenkomstg4oplaadpunten) | | X | | |
| | **MIA/VAMIL. (N**). Through the MIA and VAMIL regulation of the central government, entrepreneurs can receive a subsidy for purchasing an EV or installing charging infrastructure. (http://www.agentschapnl.nl/programmas-regelingen/) | | | | X |
| | **Friesland. (R)** To create more charging points in the province, Drive4Electric introduced a subsidy on the creation of charging points. Customers and companies which create charging points on private space, can get a discount of 500 Euros per charging point. (http://91.205.33.8/Agora/index.php?page=EV_in_Friesland&pid=319) | | X | | X |
| | **Rotterdam Electric Program. (L)** The Rotterdam Electric Program supports the first 1.000 EV owners with an electric charging point. On private property, a charging point is partly subsided. Rotterdam is installing charging points at strategic locations in the city Center and public parking areas. (http://www.cleanenergyministerial.org/Portals/2/pdfs/EV_City_Casebook_LR.pdf) | | | | X |
| | **Free Charging. (L)** In Rotterdam and Amsterdam EV's can recharge for free. (Meurs, van & Beek, van (red.) (2010). De stad elektrisch: lokaal bestuur en de introductie van elektrisch vervoer. APPM Management Consultants.) | | | | X |
| Communication | *No instruments of communications found.* | | | | |
| Organization | **Action Plan 2009-2011. (N)** In the Action Plan 2009-2011 the government stated: '' The central government stimulates the construction of the recharging and energy infrastructure needed for running EV's, including the adaption to the present electricity infrastructure. The Ministry of Transport, Public Works and Water Management has made the construction of this infrastructure part of its policy on filling stations. The budget for this project (together with two other projects in the action plan) is 55 million Euros. | | X | | |

| | | | | | |
|---|---|---|---|---|---|
| | (http://www.agentschapnl.nl/sites/default/files/bijlagen/Action%20Plan%20for%20Electric%20Driving_tcm24-341123.pdf) | | | | |
| | **Noord-Brabant. (R)**<br>• The province will work together with companies to create charging infrastructure. The program which is created to build this infrastructure will run until 2020 and is based on a public private collaboration. In total the investments in charging infrastructure and Smart grids will be 500 million Euros. (https://www.brabant.nl/~/media/83F4D659EF114153A2F70E6CF517D9F2.pdf)<br>• The province of Noord-Brabant started a new project in 2012. One of the goals of this project is to establish a test center for charging infrastructure and EV's. (http://www.brabant.nl/dossiers/dossiers-op-thema/energie/elektrisch-rijden.aspx) | X | X | | |
| | **Amsterdam Electric. (L)** During the period 2009-2011 200 charging points were created in the city of Amsterdam. A part of these charging points were placed in public spaces. A pay system was to be installed with the charging points. During the pilot the energy costs were funded by the project group Electric vervoer. (Programma bureau Luchtkwaliteit, January 2010. Amsterdam Elektrisch (het Plan)) | | X | | |
| | **Utrecht Elektrisch. (L)** The city of Utrecht has launched an Action Plan for Clean Mobility. (The complete plan has a budget of 6 million euros. In this Plan is stated: '' An electric car must be recharged regularly. Therefore in the public space and in the private space (companies) there have to be charging points available. Until the end of 2012 there will be 200 charging points realized. Of these, 150 will be placed in the public space and 50 will be on company terrains. The number of charging points finally realized, depends on the number of individuals and companies in Utrecht purchase EV's. The first public charging points in Utrecht were created in June 2011. (http://www.utrecht.nl/images/DSO/Infraprojecten/utrechtelektrisch/Brochure_Actieplan.pdf) | | X | | |
| | **Eindhoven. (L)** The City of Eindhoven has taken the lead in developing public charging infrastructure and in installing public charging points in conjunction with the E-laad Foundation, a partnership between energy network operators who maintain public charging stations on a nationwide scale. Other cities in the region are following Eindhoven's strategy. (http://www.cleanenergyministerial.org/Portals/2/pdfs/EV_City_Casebook_LR.pdf) | | X | | |

*Table 24. Findings on Charging infrastructure value chain for the Netherlands*

| ***Policy instruments*** | ***Vehicle & Grid*** |
|---|---|
| Families of instruments | Network |
| Legal | **Ancillary Policy. (N)** The central government sees to ancillary policy. The government stated in 2009 that they would provide a clear statement on how electric vehicles will fit into the road pricing system. (http://www.agentschapnl.nl/sites/default/files/bijlagen/) |
| | **Green Deals. (N)** The government closes Green Deals to stimulate local sustainable projects. The Green Deals are not specifically focused on EV's. There are 59 Green Deals made and part of these concern EV's. (http://www.agentschapnl.nl/nl/node/110057) |
| Financial | **Action Plans. (N)**<br>• In 2009 the government published the first action plan for electric driving. In this action plan the government stated: ''this plan contains the central government's contribution to this ambition of up to 65 million euros. The central government supports all efforts by market parties, social organizations and local and regional authorities.''. (http://www.agentschapnl.nl/sites/default/files/bijlagen/Action%20Plan%20for%20Electric%20Driving_tcm24-341123.pdf)<br>• In the Action Plan 2009-2011 the central government stated to contribute to invest (and the associated encouragement of innovation) in research and development and in the production of EV's and/or components for these. (http://www.agentschapnl.nl/sites/default/files/bijlagen/<br>• Since the start, the action plan granted about 18 million euros through a consortium of stakeholders facilitated by the government. (www.ieahev.org)<br>• In the period of 2009-2011 the government wanted to establish and finance a monitored laboratory program. Practical tests and demonstration projects with electric vehicles would be subsidized, monitored and evaluated via a tendering scheme. The budget for this laboratory program is 10 million Euros. (http://www.agentschapnl.nl/sites/default/files/bijlagen/Action%20Plan%20for%20Electric%20Driving_tcm24-341123.pdf)<br>• As a result of the first action plan, the government has developed a second national action plan for electric driving 2011-2015. The slogan of this plan is: Electromobility gets up to speed. This plan consists of measures to stimulate the use of EV's. (www.ieahev.org) |

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|---|---|
| | • The period 2011-2015 is defined as the scaling phase as a result of the first action plan. The goal is to connect the running projects and pilots all over the country. Therefor focus areas were created. The focus areas in 2011 were Metropolregion Amsterdam, Cityregion Rotterdam, Brabant, Utrecht and Friesland. For each region the government wanted to create a specific pack of incentives which is supported by the national government. (http://www.rijksoverheid.nl/documenten-en-publicaties/ |
| | **IPC. (N)** Entrepreneurs who want to start pilots and innovation projects with EV's can get governmental subsidies through the IPC (Innovation Achievement Contracts). In 2012 the ministry of Economic affairs has earmarked 17 million euros for the IPC program. (http://www.agentschapnl.nl/programmas-regelingen/innovatie-prestatie-contracten-ipc) |
| Communication | **Demonstration programme. (N)** For demonstration purposes the government ran a subsidy programme with a budget of 10 million euros in the first quarter of 2010. 9 demonstration projects for testing a total of 231 battery EV's and PHEV'S in a number of applications have been running from 2010 until 2012. (www.ieahev.org) |
| Organization | **Foundation Limburg Elektrisch. (R)** The foundation Limburg Elektrisch is an independent non-profit organization. Her daily task is to collect facts around the sustainable driving debate beyond feelings and opinions. In order to accelerate development the foundation cooperates with the Platform Limburg Electric which consists of Province Limburg, Zuyd Hogeschool and LIOF. (http://www.stichtinglimburgelektrisch.nl/en/about-the-foundation) |
| | **Formula E Team. (N)** The Formula E Team is the ambassador of electric mobility in the Netherlands. The Formula E Team consists of partners from the government, knowledge institutes and business. The Formula E Team inspires partners to cooperate in finding solutions for problems with electric mobility. (http://www.agentschapnl.nl/nl/node/110057) |
| | **RDW. (N)** The RDW (governmental road transport agency) is being encouraged by the ministry of Transport, Public Works and Water Management to advance its leading international position in European type approvals of electric vehicles and to develop testing facilities and knowledge and skills for electric driving. (http://www.agentschapnl.nl/sites/default/files/bijlagen/Action%20Plan%20for%20Electric%20Driving_tcm24-341123.pdf) |
| | **NL Agency. (N)** The NL Agency is part of the ministry of Economic affairs, Agriculture and Innovation and executes programs on innovation, sustainability and international business and cooperation for government organizations. Most programs of the Action Plan are executed by the NL Agency. (www.ieahev.org) |
| | **AutomotiveCampusNL. (N)** The AutomotiveCampusNL is part of AutomotiveNL. The campus provides a home for companies, education institutes as well as public and private research centers and test facilities in the field of automotive technology and smart mobility. It offers an environment where knowledge and business come together in a spirit of cooperation, knowledge sharing and open innovation. (http://www.automotivecampusnl.com/en/about-the-campus) |
| | **AutomotiveNL. (N)** Automotive NL is the cluster organization for the Dutch automotive sector. Automotive NL supports the Dutch automotive sector in its ambition of growing from the present turnover of 17 billion euros to 24 billion euros. It aims to do this by developing innovations into marketable products, achieving an optimally functioning aco system and creating competitive production facilities. (http://www.automotivenl.com/en/about-us) |
| | **RijksWaterStaat (RWS). (N)** RWS launched the 'e-driving' program which focusses on the exploitation of EV's and the needed permits for creating charging points at the highways. RWS also has the ambition to have a 25% share of electric vehicles in their fleet by 2015. (http://www.rijksoverheid.nl/documenten-en-publicaties/richtlijnen/) |
| | **GreenCabs. (R)** In Utrecht the pilot project GreenCabs was launched in January 2011. 40 GreenCabs were introduced in the city. The project has the goal to provide information on battery management, logistics, maintenance and the impact on the electricity network. In 2012 the GreenCab fleet consists of 120 GreenCabs. (http://www.rijksoverheid.nl/documenten-en-publicaties/richtlijnen/) |
| | **Noord-Brabant. (R)**<br>• The province of Noord-Brabant has earmarked 10 million euros to introduce 4 incentives regarding EV's. This was announced in the agreement (Greendeal) the province signed with the national government. This 10 million Euros will be used in 2011 to realize a PPS arrangement in which a total of 60 million Euros will be invested in Electric mobility and Smart grids. (https://www.brabant.nl/~/media/83F4D659EF114153A2F70E6CF517D9F2.pdf)<br>• The province agreed to create focus in the activities by creating a clustering of the activities on Electric Mobility and Smart grids by theme. These clusters will be created around 5 companies, Young inventors, start-ups or small and medium sized companies. (https://www.brabant.nl/~/media/83F4D659EF114153A2F70E6CF517D9F2.pdf) |
| | **BrabantStad. (L)** In cooperation with BrabantStad and other cities, 10 projects started in which innovative products and services are prepared for the market. This varies from the development of inductive charged busses, development of range extenders to a smart grid project with Better Place and ENEXIS. (http://www.agentschapnl.nl/sites/default/files/bijlagen/) |
| | **SLIM ERB (Noord-Oost-Brabant). (R)** The project SLIM ERB started in 2010 and was created to gather information on Electric Vehicles. The knowledge the project gathers is public and therefor useable for all who is involved in Electric Mobility. The project is funded by BOM (Brabantse Ontwikkelings Maatschappij) and the province of Noord-Brabant. (http://www.slimelektrischrijden-brabant.nl/?index=5) |
| | **HyMove. (R)** HyMove is a project being developed the Arnhem-Nijmegen region (province of Gelderland). The project aims to stimulate the use and development of hydrogen in transportation, by bringing hydrogen to people's attention and developing a regional hydrogen infrastructure. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/) |

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|---|---|
| | **Elektrisch vervoer van deur tot deur. (R)** In cooperation of the province, Enexis, Essent, green wheels, Arriva and NS a new pilot was started in Noord-Brabant in 2009, Elektrisch rijden van deur tot deur. The project consists of the EV's of Essent and Enexis, a public charging infrastructure, electric pool cars, green wheels, scooters and 3 electric busses. (http://www.agentschapnl.nl/sites/default/files/bijlagen/) |
| | **Rotterdam electric. (L)**<br>• The city region Rotterdam started a program called: Rotterdam electric. This programme contributes to the implementation of EV's. The programme aims to have 1.000 charging points in the region by the end of 2014. They also stimulate companies to replace polluting vehicles. The programme for instance cooperates with the RET (Rotterdam Elektrische Tram, Transport company) to run trials with hybrid and electric busses and the city aims to have a 25% share of electric vehicles in their own fleet by 2014. (http://www.rotterdam.nl/tekst:programma_rotterdam_elektrisch)<br>• Rotterdam's municipal fleet aims to be clean, a first mover, and to set an example for city inhabitants and other cities. The investment so far has resulted in over 100 EV's/plug-in EV's. By 2014, at least 25 percent (about 400 vehicles) of the fleet should consist of electric or hybrid vehicles. (http://www.cleanenergyministerial.org/Portals/2/pdfs/EV_City_Casebook_LR.pdf)<br>• Rotterdam Tests Electric Vehicles is a joint project of the City of Rotterdam, energy company Eneco, and grid manager Stedin to pilot 75 EV's in Rotterdam with the partners testing and monitoring EV's in their own fleets. The pilot is focused on energy efficiency, environmental impact, user experience and safety. (http://www.cleanenergyministerial.org/Portals/2/pdfs/EV_City_Casebook_LR.pdf) |
| | **Utrecht Electric. (L)** The city of Utrecht cooperates with Green wheels. Green wheels replaced 6 shared cars in 2011 for electric vehicles. Because of this project the city and Green wheels have decided to cooperate on the build of the charging infrastructure needed for this project. (http://www.utrecht.nl/images/DSO/Infraprojecten/utrechtelektrisch/Brochure_Actieplan.pdf) |
| | **Focus area Metropool Region Amsterdam (MRA). (L)** In October 2012, the MRA signed a green deal with the national government. MRA electric is a project team which functions as a knowledge team in which municipalities and provincial governments in the MRA can ask questions and promote initiatives regarding electric mobility. The green deal provides for 300.000 in funds to enhance the project MRA electric. The first goal is to replace diesel cars in the region (such as taxi's and the public fleet). (http://www.noord-holland.nl/web/Actueel/Nieuws/Artikel/Regio-Amsterdam-sluit-Green-Deal-over-elektrisch-rijden.htm) |

*Table 25. Findings on Network for the Netherlands*

### 5.3.5. Norway

| ***Policy instruments*** | ***Vehicle-centric' policy (EV Value chain)*** | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | **Low Emission Zones. (L)** LEZ's are areas or roads where the most polluting vehicles are restricted from entering. The vehicles are banned or in some cases charged. In Norway the cities of Bergen, Oslo and Trondheim are LEZs. (http://lowemissionzones.eu/countries-mainmenu-147/norway-mainmenu-197/bergen) | | | | X |
| Financial | **Domestic Ferries. (N)** EV's have free use of domestic ferries. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) | | | | X |
| | **Free Access. (N)** EV's have free access to public areas. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) | | | | X |
| | **Vehicle fees. (N)** EV's are exempt from non-recurring vehicle fees. (http://www.wsdot.wa.gov/) | | | | X |

| | | | | | |
|---|---|---|---|---|---|
| | **Sales Tax (N)** EV's are exempt from sales tax. (http://www.wsdot.wa.gov/NR/rdonlyres/5559AE0E-8AB5-4E6B-8F8B-DEAA7ECE715D/0/SynthesisEVPoliciesFleetandInfrastructureFINALRev112911.pdf) | | | | X |
| | **Road Tax. (N)** EV's are exempt from annual road tax. (http://www.wsdot.wa.gov/NR/rdonlyres) | | | | X |
| | **Tax. (N)** EV's are exempt from taxation for company car benefit tax from 1 January 2009 (http://www.wsdot.wa.gov/NR/) | | | | X |
| | **Tax. (N)** Norway the registration tax is calculated according to weight, motor power and CO2 emissions. The vehicles are classified by groups per CO2 'tax'. EV's are exempt from this tax. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/) | | | | X |
| | **Tax. (N)** The Norwegian government has reduced tax for leasing EV's. (http://e-mobility-nsr.eu/fileadmin/user_upload/ | | | | X |
| | **Free Parking. (N)** EV's can park for free in public parking places. This measure has been in place since the beginning of the 1990s. (http://www.wsdot.wa.gov/NR/rdonlyres/5559AE0E-8AB5-4E6B-8F8B-DEAA7ECE715D/0/SynthesisEVPoliciesFleetandInfrastructureFINALRev112911.pdf) | | | | X |
| | **Toll Roads. (N)** EV's can use the toll roads for free. (http://www.wsdot.wa.gov/NR/rdonlyres/) | | | | X |
| | **Grants. (N)** The Norwegian government grants subsidies (about 4.000 Euro) to individuals who buy an EV or HEV class N1 or M1. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) | | | | X |
| | **Use of Bus and Taxi lanes. (N)** EV's are permitted in bus and taxi lanes. This measure has been in place since 2003. (http://www.wsdot.wa.gov/NR/rdonlyres/5559AE0E-8AB5-4E6B-8F8B-DEAA7ECE715D/0/SynthesisEVPoliciesFleetandInfrastructureFINALRev112911.pdf) | | | | X |
| Communication | **Zero Rally. (R)** The "Zero Rally 2012" is an annual rally for zero or low emissions cars (EV's, HEV's and PHEV's) that in 2012 will take place at the Green Highway through the grants the government gives to ZERO they support this initiative. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) | | | | X |
| Organization | **Electric Taxis. (L)** The participants of the ''Green highway'' project have also accomplished to set up a project in Trondheim with electric taxi's. Currently there are 6 electric taxi´s in Trondheim. (http://www.nordregio.se/en/Metameny/Nordregio-News/Green-Economy-in-Policy-and-Practice/Green-Highway---a-450-km-Nordic-co-operative-project/) | | X | | |
| | **Gronn Bill. (N)** Gronn Bill (Green Car) was set up by the association of Norwegian energy companies (Energy Norway, Nova Tran, Regional Authorities and ZERO) to facilitate the introduction of 200.000 EV's and PHEV's on Norwegian roads by Energy Norway, Novatran, regional authorities and zero by 2020. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) | | X | | |
| | **RekkEVide. (N)** RekkEVide is a project which tests the use of EV in Northern weather circumstances. (http://www.rijksoverheid.nl/documenten-en-publicaties) | X | | | |
| | **Research Council of Norway. (N)** The Research Council of Norway coordinates the funds for research on efficient and sustainable solutions for transport systems. (http://www.rijksoverheid.nl/documenten-en-publicaties/) | X | | | |

*Table 26. Findings on EV value chain for Norway*

| ***Policy instruments*** | ***Grid-centric policy (charging-infrastructure Value chain)*** | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | *No legal instruments found in this category.* | | | | |
| Financial | **Grants. (N)** The Norwegian government has granted 11,9 Million Euro for new recharging stations. (http://e-mobility- | | X | | |

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|---|---|---|---|---|---|
| | nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) | | | | |
| | **Free use of CI. (N)** EV users can use the public charging infrastructure for free. (http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2012/07/23/elektrisch-vervoer-in-nederland-in-internationaal-perspectief.html) | | | | |
| Communication | *No communicative instruments found in this category* | | | | |
| Organization | **Green Highway. (R) (L)**<br>• The construction of quick charging stations for EV's in municipal centers along the green highway. There are two quick charging stations installed and four more are under construction. The first quick charging station opened April 2011 and the second one opened in January 2012. (http://www.nordregio.se/en/Metameny/Nordregio-News/<br>• The city of Sundsvall (Sweden) and Trondheim (Norway) have created the ''green highway'', together with several businesses who wanted to invest in sustainability, a 447 km long highway with charging stations. The highway opened in 2009. (http://www.nordregio.se/en/Metameny/Nordregio-News/)<br>• 94 charging stations for EV's and more than 240 charging points (slow charging) were placed along the green highway. (http://www.nordregio.se/en/Metameny/Nordregio-News/) | | **X** | | |
| | **Charging points. (L)** The city council of Oslo has put in place 400 charging points from 2008 to 2011. | | **X** | | |

*Table 27. Findings on Charging infrastructure value chain for Norway*

| ***Policy instruments*** | ***Vehicle & Grid*** |
|---|---|
| Families of instruments | Network |
| Legal | **The Norwegian White Paper on Climate Policy. (N)** The White Paper was signed in 2012 and outlines a goal to be a leader in infrastructure for electric vehicles and hydrogen cars, and the favorable condition for zero emission cars to be in place towards 2020. (http://fores.se/assets/763/ZERO_Incentives_zeroemissioncars_in_Norway_ZERO-3.pdf) |
| Financial | *No financial instruments found.* |
| Communication | *No instruments of communication found.* |
| Organization | **Transnova. (N)** Transnova is the public body assigned to reducing CO2 emissions from the transport sector. Transnova was established in 2007 after a suggestion by ZERO. Today Transnova has a budget of NOK 75 million per year. The parliamentary agreement on the Climate Policy White Paper in 2012 has promised to increase this substantially. (http://fores.se/assets/763/ZERO_Incentives_zeroemissioncars_in_Norway_ZERO-3.pdf) |
| | **Electric Mobility Norway. (R)** The Electric Mobility Norway (EMN) project is being developed in the Kongsberg-Drammen-Oslo region. It is led by Kongsberg Innovation with the support of Trans-Nova (which is managed by the Norwegian Public Roads administration) and Buskerud County Council. The main objective is the "establishment of an innovation and knowledge arena in that region''. (http://e-mobility-nsr.eu/fileadmin/user_upload/) |
| | **Norstart. (N)** Norstart is the national department of AVERE. Norstart consists mainly of EV users and Norwegian EV industry and distribution companies. Norstart works on creating the right politics and promoting EV's and renewable energy through campaigns in the market, and will take part in scientific projects funded in Norway of through the EU. The organization was founded in November 1995. (http://www.avere.org/www/staticAdminMgr.php?action=read&menu=1271184950&country=NO) |
| | **ZERO. (N)** Zero Emission Resource Organization (ZERO) is involved since 2002 in activities to reduce the emission of greenhouse gasses. The Norwegian Government supports Zero financially by 20% of the total budget of the organization. (http://www.zero.no/om-zero-en/about-zero) |
| | **Electric Mobility Norway. (N)** The Electric Mobility Norway (EMN) project is being developed in the Kongsberg-Drammen-Oslo region. It is led by Kongsberg Innovation with the support of Trans-Nova (which is managed by the Norwegian Public Roads administration) and Buskerud County Council. The main objective is the "establishment of an innovation and knowledge arena in that region''. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/) |
| | **CATCH MR. (L)** The city of Oslo is involved in an INTERREG IVC project called CATCH MR. Partners are 7 cities with their metropolitan regions throughout Europe. The main focus is |

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| | on Transport related issues including technology development and renewable energy. (2010-05-21 Final EVUE Baseline Study.) |

*Table 28. Findings on Network for Norway*

### 5.3.6. Sweden

| ***Policy instruments*** | ***Vehicle-centric' policy (EV Value chain)*** | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | **LEZ. (L)** LEZ's are areas or roads where the most polluting vehicles are restricted from entering. The vehicles are banned or in some cases charged. In Sweden there are currently seven cities participating in the LEZs. (http://emobilitynsr.eu/fileadmin/user_upload/NEWS/) | | | | X |
| Financial | **Research project EV's. (N)** The government invested SEK 240 Million to partially finance research into environmentally friendly vehicles. The Swedish Energy Agency invested SEK 20 Million. In a press release of the Ministry of Enterprise, Energy and communications and the Ministry of Environment march 14 2008, is stated that one of the projects in which is invested by the Swedish government is a project that is set up to develop and demonstrate PHEV's. (http://www.government.se/sb/d/10123/a/100866) | X | | | |
| | **The FFI. (N)** FFI is a partnership between the Swedish government and automotive industry for joint funding of research, innovation and development concentrating on Climate & Environment and Safety. Initially set to run from 2009-2012 with no definite ending year. FFI has R&D activities worth approx. €100 million per year, of which half is governmental funding. Currently there are five collaboration programs: Vehicle Development, Transport Efficiency, Vehicle and Traffic Safety, Energy & Environment and Sustainable Production Technology. (http://www.vinnova.se/en/ffi/) | X | | | |
| | **Slide in Technique for continuous transfer of energy to electric vehicles. (N)** In 2011 the Swedish Energy Agency granted 24 Million SEK to Volvo Powertrain AB for the project ''Slide in Technique for continuous transfer of energy to electric vehicles''. (http://www.energimyndigheten.se/SiteSeeker) | X | | | |
| | **CO2 Emission Tax. (N)** In Sweden tax must be paid over the amount of CO2 emission. This tax has been raised with 33% in 2011 to stimulate the use of EV's. (www.ieahev.org) | | | | X |
| | **Annual circulation Tax. (N)** Hybrid vehicles with CO2 emissions of 12 G/KM or less and EV's with an energy consumption of 37 kwh per 100 km or less are exempt from the annual circulation tax for a period of five years from the date of their first registration starting on 1 January 2010. (http://www.acea.be/images/uploads/files/Electric_vehicles_overview.pdf) | | | | X |
| | **Tax. (N)** For EV's and Hybrid vehicles the taxable value of the car for the purposes of company car taxation is reduces by 40% compared with the corresponding or comparable petrol or diesel car. (http://e-mobility-nsr.eu/fileadmin/user_upload/NEWS/) | | | | X |
| | **Super Clean Car Rebate. (N)** The super clean car rebate starting on 1 January 2012 will approximately be 4300 Euro. The super clean car is defined as a car that does not emit more than 50 g CO2 per km in mixed driving (http://e-mobility-nsr.eu/fileadmin/user_upload/NEWS/ | | | | X |
| | **Rebate. (N)** A rebate of SEK 10000 to private individuals who bought a 'green car' or EV. This measure was in effect from 1 April 2007 until 31 December 2009. (http://e-mobility-nsr.eu/fileadmin/user_upload/NEWS/Electric_mobility_policies_in_the_North_Sea_Region_countries/3.3_-_E-mobility_policies_in_the_NSR_countries.pd) | | | | X |
| | **Parking. (L)** In about 50% of the 70 cities in Sweden where you have to pay to park EV's get a discount or can park for free. (Parking. In about 50% of the 70 cities in Sweden where you have to pay to park EV's get a discount or can park for free.) | | | | X |
| | **Toll Tax. (L)** EV's bought before 1 January 2009 are exempt from paying toll tax in Stockholm until 2012. Cars bought after 2009 are not exempt. From | | | | X |

| | | | | | |
|---|---|---|---|---|---|
| | August 1 2012 this incentive has been cancelled. (http://www.iea.org/evi/evcitycasebook.pdf) | | | | |
| | **Charging scheme. (L)** A congestion-charging scheme applied in central Stockholm since the summer of 2007. A fee is charged during times of traffic congestion. PHEV's and EV's are exempt. (http://e-mobility-nsr.eu/fileadmin/user_upload/NEWS/Electric_mobility_policies_in_the_North_Sea_Region_countries/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf) | | | | X |
| Communication | *No instruments of communication found.* | | | | |
| Organization | **The Environmental Vehicle Development Program. (N)** This program involves several research projects. The program is part of the FFI and aims to contribute to global leadership within vehicle electronics & software and increase expertise in the efficient design of vehicles. (http://www.vinnova.se/en/FFI---Strategic-Vehicle-Research-and-Innovation/Vehicle-Development/) | X | X | | |
| | **The Swedish Hybrid Vehicle Centre Program. (N)** This program focusses on developing a competitive R&D center for hybrid and electric vehicle technology through continuous cooperation between industry and academia. The SHC was established in 2007 by the Swedish Energy Agency. One third of the funds the SHC receives come from the Swedish Energy Agency. (http://export.gov/build/groups/public/@eg_main/@byind/@autotrans/documents/webcontent/eg_main_035287.pdf) | X | | | |
| | **Energy Systems in Road Vehicles. (N)** Energy Systems in Road Vehicles, a research program for batteries, fuel cells and other components for EV's, was founded. This program is managed by the Swedish Energy Agency. The aim of this program is to work over a ten-year period (2000-2010), together with other national and international players, to arrive at technology which makes two things possible, among others: on the one hand, to reduce the average fuel consumption of cars by 50% and, on the other, for the production of vehicles which run on alternative bio based fuels to be comparable in terms of costs with vehicles running on petrol or diesel. (http://www.transport-research.info/web/programmes/programme_details.cfm?ID=3474) | X | | | |
| | **The vehicle strategic research and innovation program. (N)** The vehicle strategic research and innovation program was started in 2009 as a cooperative effort between the government and the Swedish automotive industry. The program finances common research effort, innovation and development activities. Public funds amount to SEK Million per year (approximately 105 million Euro). (www.ieahev.org) | X | | | |
| | **Driven by the Wind. (N)** Driven by the wind is a project that started in 2008 with the ambition to support and enhance the introduction of EV's driven by electricity provided by wind power. (http://e-mobility-nsr.eu/fileadmin/user_upload/NEWS/) | | X | | |
| | **Contract Stockholm and Vattenfall. (L)** On 1 October 2011 the city of Stockholm and Vattenfall (energy company) coordinated a contract with six vehicle suppliers and 296 other organizations participating. A grant of 5000 Euro was made available for the first 1000 vehicles purchased through the procurement agreement. 850 cars and 400 trucks or vans will be purchased per year. (http://www.globalutmaning.se/wp-content/uploads/2012/06/Swedish-Climate-Policy-Jenny-Jewert-2012.pdf) | | X | | |
| | **Move About. (L)** Move about started in 2008 in Gothenburg. This project drives both open and closed car sharing services for individuals and businesses. (http://e-mobility-nsr.eu/fileadmin/user_upload/NEWS/E) | | | X | |
| | **Public Procurement. (L)** The city of Stockholm is procuring approximately 20 EV's each year for its fleet. (http://www.iea.org/evi/evcitycasebook.pdf) | | | | X |

*Table 29. Findings on EV value chain for Sweden*

| ***Policy instruments*** | ***Grid-centric policy (charging-infrastructure Value chain)*** | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |

| | | | | | |
|---|---|---|---|---|---|
| Legal | *No legal instruments found in this category* | | | | |
| Financial | **The FFI. (N)** FFI is a partnership between the Swedish government and automotive industry for joint funding of research, innovation and development concentrating on Climate & Environment and Safety. Initially set to run from 2009-2012 with no definite ending year. FFI has R&D activities worth approx. €100 million per year, of which half is governmental funding. Currently there are five collaboration programs: Vehicle Development, Transport Efficiency, Vehicle and Traffic Safety, Energy & Environment and Sustainable Production Technology. (http://www.vinnova.se/en/ffi/) | **X** | | | |
| | **Research program on power grid. (N)** In 2011 the Swedish Energy Agency granted 200 million SEK to a research program on power grid. The infrastructure needed to support introduction of all types of vehicles which need charging from this power grid. (http://www.energimyndigheten.se/SiteSeeker/) | **X** | | | |
| Communication | **The Green Highway Buyers Guide. (R)** The Green Highway organization published a complete '' Buyers guide for electric and plug in hybrid cars'' which is updated every year. (http://www.nordregio.se/en/Metameny/Nordregio-News/ | | | **X** | |
| Organization | **The vehicle strategic research and innovation program. (N)** The vehicle strategic research and innovation program was started in 2009 as a cooperative effort between the government and the Swedish automotive industry. The program finances common research effort, innovation and development activities. Public funds amount to SEK Million per year (approximately 105 million Euro). (www.ieahev.org) | **X** | | | |
| | **Green Highway. (R) (L)**<br>• The construction of quick charging stations for EV's in municipal centers along the green highway. There are two quick charging stations already and four more are under construction. The first quick charging station opened in April 2011 and the second one in January 2012. **(R)** (http://www.nordregio.se/en/Metameny/Nordregio-News/Green-Economy-in-Policy-and-Practice/Green-Highway---a-450-km-Nordic-co-operative-project/)<br>• 94 charging stations for EV's and more than 240 charging points (slow charging) were placed along the green highway. **(R)** (http://www.nordregio.se/en/Metameny/Nordregio-News/Green-Economy-in-Policy-and-Practice/Green-Highway---a-450-km-Nordic-co-operative-project/)<br>• The city of Sundsvall (Sweden) and Trondheim (Norway) have created the ''green highway'', together with several businesses who wanted to invest in sustainability, a 447 km long highway with charging stations. The highway opened in 2009. **(L)** (http://www.nordregio.se/en/Metameny/Nordregio-News/Green-Economy-in-Policy-and-Practice/Green-Highway---a-450-km-Nordic-co-operative-project/) | | | | **X** |
| | **Parking. (L)** In September 2011 Stockholm's newest parking garage ''Hogalidsgaraget'' was opened. It features 200 parking places equipped with EV charging units. (http://www.iea.org/evi/evcitycasebook.pdf) | | | | **X** |

*Table 30. Findings on Charging infrastructure value chain for Sweden*

| ***Policy instruments*** | ***Vehicle & Grid*** |
|---|---|
| Families of instruments | Network |
| Legal | **LAW. (N)** The Obligation to supply renewable fuel obliges fuel stations that sell more than a certain volume of fuel to offer pumps with renewable fuels. This law is applied in five stages and came into force on 1 April 2006. (http://www.cleanvehicle.eu/info-per-country-and-eu-policy/member-states/sweden/national-level/) |
| | **Strategy. (L)** In Stockholm the strategy for EV's is part of a broader plan for green transport, the clean vehicle project which has been up and running since 1994. Not only EV's but other green vehicles are supported by local measures. (Meurs, van & Beek, van (red.) (2010). De stad elektrisch: lokaal bestuur en de introductie van elektrisch vervoer. APPM Management Consultants.) |
| Financial | *No financial instruments found.* |
| Communication | **LEVE. (N)** In the beginning of 1996 the Department of Electrical Engineering and Automation at the Lund Institute of Technology was charged by the KFB (Now KFB is part of VINNOVA) with constructing and maintaining a database which contains information on EV activities. This project is entitled LEVE: Lund Electric Vehicle Evaluation. |

| | |
|---|---|
| | (http://www.kfb.se/pdfer/R-00-22.pdf) |
| | **Demonstration Programs for EV. (N)**<br>• The demonstration programs for electric vehicles has the objective to create and convey the knowledge necessary to understand the methods, technology and what incentives can practically be used in Sweden to facilitate a large scale EV introduction. (www.ieahev.org)<br>• Demonstrating rechargeable vehicles and charging infrastructure. (www.ieahev.org)<br>• Establishing independent information channels on both research findings from the program and questions of general interest about electrification of the vehicle fleet. (www.ieahev.org) |
| | **Hyperbus. (L)** The hyperbus will run until 2014 and is a partnership between the city of Gotenburg traffic and transport authority, Gotenburg Energy, Volvo and vasttrafic. Its goal is to demonstrate the use of hybrid busses and charging points. (http://e-mobility-nsr.eu/fileadmin/user_upload/NEWS/) |
| | **Research on stimulating the use of EV's and the grid. (N)** In 2009 the government ordered the Swedish Energy Agency to research the development and accessibility of the EV's and the grid and advise what measures could be useful to stimulate the use of EV's. (http://www.seai.ie/News_Events/Press_Releases/Measures_to_Stimulate_uptake.pdf) |
| Organization | **BASREC. (R)** Sweden participates in the Baltic Sea Region Energy Cooperation (BASREC) which is a forum for cooperation between energy ministers and the European Commission. This dialogue helps to pave the way for more efficient implementation of EU policies or for the development of energy policies in the region. (http://www.ens.dk/en-US/policy/international-cooperation/basrec/Sider/Forside.aspx) |
| | **Network of Swedish clean vehicle cities. (L)** Stockholm is part of the network for Swedish clean vehicle cities which make joint procurement decisions, lobby national government to change obsolete legislation and carry out joint studies on behavior, safety, emissions etc. |
| | **Mobilel. (L)** The Mobilel project consists of 5 Plug in Hybrid Electric Vehicles which are tested and electronically monitored for two years to see actual driving and charging behavior. The city of Stockholm is involved in this project. |

*Table 31. Findings on Network for Sweden*

### 5.3.7. United Kingdom

| ***Policy instruments*** | ***Vehicle-centric' policy (EV Value chain)*** | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | **LEZ. (L)** LEZ's are areas or roads where the most polluting vehicles are restricted from entering. The vehicles are banned or in some cases charged. The city of London is a LEZ. (Meurs, van & Beek, van (red.) (2010). De stad elektrisch: lokaal bestuur en de introductie van elektrisch vervoer. APPM Management Consultants.) | | | | **X** |
| Financial | **Demonstration Program. (N)** In 2009 the Ultra-low Carbon Vehicle Demonstrator Program operated by the TSB made £25 million of funding available to consortia of major and niche vehicle manufacturers, local authorities, power companies and universities for LCV real world testing. (http://wwwm.coventry.ac.uk/researchnet/surge/Documents/Working%20Paper%20Series/Working%20Paper%203.pdf) | **X** | | | |
| | **Low Carbon Vehicles Innovation Platform. (N)**<br>• In 2007 £200 million was set aside for a range of R&D projects associated with LCV (Low Carbon Vehicles-). Technology by the TSB under the Low Carbon Vehicles Innovation Platform. These R&D projects fall under The Integrated Delivery Program. The first 14 projects funded by the Low Carbon Vehicles Innovation Platform resulted from a collaborative research & development (CR&D) competition in September 2007, | **X** | | | |

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|---|---|---|---|---|---|
| | representing £23m of joint Technology Strategy Board/Department for Transport (DfT) funding and total funding, including investment from the companies involved, of £52m. The projects focus on bringing forward low carbon vehicle technologies that are relatively near to being ready to launch on the market and that could be viable candidates for commercialization or fleet procurement initiatives over the next 5-7 years from the start of the projects. (http://wwwm.coventry.ac.uk/researchnet/surge/Documents/Working%20Paper%20Series/Working%20Paper%203.pdf)<br>• The Low Carbon Vehicles Integrated Delivery Program is a key tool that the innovation platform uses to achieve its goals over the period 2009 - 2014. The program has over £200m of joint government and industry investment, and co-ordinates the UK's low carbon vehicle activity from initial strategic academic research through to industry-led CR&D (Collaborative Research and Development). The Integrated Delivery Program is guided by an industry-led advisory panel that will help shape the technological direction and priorities for the program. (http://www.innovateuk.org/_assets/pdf/Corporate-Publications/LowCarbonVehicles2ndedition_Sept09.pdf)<br>• The first CR&D competition under the Integrated Delivery Programme, 'Ultra-Efficient Systems for the Market Advancement of Electric and Hybrid Vehicles', offered £10m of funding from the DfT (Department for Transport), Technology Strategy Board (TSB), ONE (One North East) and the ESPRC (Engineering and Physical Sciences Research Council). This competition recognized R&D in the electrification of road transport as critical to achieving the longer term vision of decarbonisation of vehicles. Launched in June 2009, the second Integrated Delivery Program competition allocated £15m to fund highly innovative collaborative research and development projects and proof-of-concept studies. The Low Carbon Vehicle Innovation Program has also been working closely with the EPSRC (Engineering and Physical Sciences Research Council), which is managing a £3m strategic research competition. The competition targets small-scale, short-term, basic research feasibility projects exploring future technologies that might contribute to the reduction of CO2 emissions from the UK vehicle market and so help support the uptake of low carbon vehicles. (http://www.innovateuk.org/_assets/pdf/Corporate-Publications/LowCarbonVehicles2ndedition_Sept09.pdf) | | | | |
| | **Scrappage scheme. (N)** In the UK a scrappage scheme was introduced in 2009, offering a £2,000 cash incentive (half supplied by the government, half supplied by manufacturers) to trade in old for new vehicles. (http://wwwm.coventry.ac.uk/researchnet/surge/Documents/Working%20Paper%20Series/Working%20Paper%203.pdf) | | | | X |
| | **Vehicle Excise Duty (UK's Circulation Tax). (N)** Electric vehicles exempt (for tailpipe emissions < 100 g CO2 per km. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) | | | | X |
| | **Company Car Tax. (N)** Employees and employers exempt from income and national insurance contributions. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) | | | | X |
| | **Van Benefit Charge. (N)** Employees and employers exempt from income and national insurance contributions. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) | | | | X |
| | **Fuel benefit Charge. (N)** Electric Vehicles exempt. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) | | | | X |
| | **Enhanced capital allowances. (N)** 100% first-year allowance: business can relieve entire cost of an electric car or van against taxable profits in the year of acquisition. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) | | | | X |
| | **Low Carbon Vehicle Public Procurement Program (LCVPPP). (N)** Phase 1 was has provided funding to support the trial of over 200 electric and low emission vans in a range of public fleets. The LCVPPP is allowing for the collection of 'real-world' data about the vehicles' performance and usage, helping to drive on-going technological development; as well as demonstrate the existing capabilities of these. (LCVPPP is for demonstration purposes 'collection of real-world' data - http://www.cenex.co.uk/programmes/lcvpp) | | | | X |
| | **BSOG. (N)** The Department of Transport (DfT) modified the Bus Service Operators Grant (BSOG) for community / public transport in 2009 to provide greener buses through rewarding gains in fuel efficiency and the introduction of low carbon buses. In July 2010 the DfT launched the "green bus fund", | | | | X |

| | | | | | |
|---|---|---|---|---|---|
| | enabling makes awards available to private bus operators to introduce hybrid electric buses for public transport. (WP3A. Work Page 3. Activity 6: Micro to macro Investigation) | | | | |
| | **Plug-In Car Grant. (N)**<br>• Subsidy program to bridge the gap between the more expensive PHEV and EV's in order to encourage consumer uptake of such vehicles until the technology improves and prices fall. The purpose of this consumer grant program is to enable the purchase of ultra-low carbon vehicles which would otherwise have been unaffordable. The consumer should also benefit from lower running costs over the lifetime of the vehicle. This Subsidy program has a £43m consumer incentive scheme for EV's and PHEV's, up, up to 2015. (Berkeley. N, The application of Green Technologies in the automotive industry. Coventry University: UK.)<br>• Aimed at light truck (N1) vehicles that fulfil qualifying criteria, these grants will enable purchasers to receive 20% off the cost of a van up to a maximum of 8000 pounds. The first eligible vans were announced on February 21, 2012. (WP3A. Work Page 3. Activity 6: Micro to macro Investigation.) | | | | X |
| | **Green Bus Fund. (N)** 68 million pounds fund supporting bus companies and local authorities in England to help them buy new low-carbon buses. Its main purpose is to support and hasten the introduction of hundreds of low-carbon buses across England. To date, 526 hybrid-electric and 16 all-electric buses have been purchased under the initiative (Jan. 2012). | | | | X |
| | **Low Carbon Economic Area (LCEA)**<br>• **North East. (R)** In 2009 the North East Region was announced the first Low Carbon Economic Area (LCEA) in the UK. The LCEA North East was designated as the provider of EV expertise. To reach this goal the national and EU governments granted funds to the region. In addition ONE North East invested some £30m in the sector. These investments have played a major role in convincing Nissan to choose its Sunderland plant as the location for the development of its electric battery, also positioning the region as one of the leading contenders for the manufacture of the actual vehicle. (http://www.investnortheastengland.co.uk/in-focus/low-carbon-technology-sector-report.html)<br>• **Midlands. (R)** In 2010 the Midlands became a Low Carbon Economic Area (LCEA) for Advanced Automotive Engineering and received £19.5 million of governmental funding to invest in a program that will accelerate the development and introduction of next generation low carbon vehicles. Through the LCEA, regional development agencies Advantage West Midlands (AWM) and East Midlands Development Agency (EMDA) delivered a program of projects, partnering with industry and universities, developing low carbon solutions for key technologies such as motors and aerodynamics. (http://www.greenwisebusiness.co.uk/news/19m-for-midlands-as-its-named-economic-area-for-low-carbon-vehicles-1143.aspx) | X | | | |
| | **Grants. (L)** Funding through the Local Sustainable Transport Fund (LSTF) will replace the Local Transport Plan funding stream, with £560m available for 2012-15. (WP3A. Work Page 3. Activity 6: Micro to macro Investigation.) | | | | X |
| | **Parking Charges. (L)** Some local authorities provide exemptions or a reduced charge for electric cars. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) | | | | X |
| | **London congestion charge. (L)** 100% discount for EV's (tailpipe emissions < 100g CO2 per km). (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) | | | | X |
| Communication | **Nationwide Advice Service. (N)** A Nationwide advice service was already in operation providing domestic energy efficiency advice from 48 advice centers in the UK. After receiving EU funded TREATISE training, three of the centers began also to provide cleaner transport advice, in particular by cross-selling transport advice to people that called for energy efficiency advice. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) | | | X | |
| | **Fuel Economy label. (N)** The UK is one of the few EU countries having introduced a fuel economy label, developed by the Low Carbon Vehicle Partnership with support from the Retail Motor Industry Federation, the Society of Motor Manufacturers and Traders and the Government. This label is voluntary | | | X | |

| | | | | | |
|---|---|---|---|---|---|
| | initiative for dealers and, helps car buyers easily assess the impact on climate change of different cars based on a colored scale. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) | | | | |
| Organization | **Automotive Council. (N)** In response to the production of the NAIGT independent report in 2009, the Automotive Council was established with the support of senior executives from major vehicle manufactures and component suppliers operating in the UK, alongside BIS and DFT representatives. (Begley, J. & Berkeley, N. Up policy and the low carbon vehicle sector. Local Economy 2012 nr 27: SAGE found on http://lec.sagepub.com/content/27/7/705) | | | X | |
| | **Low Carbon Vehicle Innovation Platform (LCVIP). (N)** Launched in September 2007, was designed to deliver the Government's funding on low-carbon vehicles. The platform is now running around 70 projects and has engaged with over 200 UK companies. The LCVIP is run by setting up competitions to fund collaborative research and development. The competition criteria are set jointly with input from industry and Government (through the Automotive Council and TSB's Low Carbon Vehicle Steering Group). Project bids from industry are then assessed independently by a panel of automotive experts. (http://www.innovateuk.org/_assets/pdf/Corporate-Publications/LowCarbonVehicles2ndedition_Sept09.pdf) | X | | | |
| | **CENEX. (N)** The Centre of Excellence for Low Carbon and Fuel Cell Technologies (CENEX) was established in 2005 with a £6.5m grant from the then Department of Trade and Industry (later Business, Enterprise and Regulatory Reform - BERR - before being superseded by BIS). CENEX´s remit was to promote UK market development in low carbon and fuel cell technologies for transport applications, principally by focusing on market transformation projects linking technology providers and end users. (http://wwwm.coventry.ac.uk/researchnet/surge/Documents/Working%20Paper%20Series/Working%20Paper%203.pdf) | X | | | |
| | **NAIGT (New Automotive Innovation and Growth Team). (N)** NAIGT is a quasi-governmental though independent group which was established to explore the potential for LCVs (Low Carbon Vehicles). The NAIGT was formed in April 2008 by BERR (Business, Enterprise and Regulatory Reform). (Begley, J. & Berkeley, N. Up policy and the low carbon vehicle sector. Local Economy 2012 nr 27: SAGE found on http://lec.sagepub.com/content/27/7/705) | X | | | |
| | **OLEV (Office for Low Emission Vehicles) (N).** Established in 2009. Cross-government effort to manage the programmatic and regulatory efforts to decarbonize UK road transport. This includes development of ultra-low emission vehicles through research, development, and demonstration efforts, as well as promoting consumer uptake of such cars. OLEV includes staff and personnel from DfT, BIS, and also the Department of Energy and Climate Change (DECC). OLEV has oversight of programs worth £400m. (http://www.automotivecouncil.co.uk/low-carbon-technology/grants-and-incentives/) | X | X | | |
| | **Institution of Engineering and Technology (IET). (N)** The IET is one of the premier societies for professional engineers with over 150,000 members worldwide. The IET acts as the voice of the profession, making submissions to government and providing advice. In 2012 The IET made three recommendations to the government concerning EV implementation: there is need for a more holistic incentive package, Better information and education and Flexibility of ownership and integrated journeys. (http://www.politics.co.uk/opinion-formers/institution-of-engineering-and-technology/ & Berkeley. N, The application of Green Technologies in the automotive industry. Coventry University: UK.) | | | X | |

*Table 32. Findings on EV value chain for the United Kingdom*

| ***Policy instruments*** | ***Grid-centric policy (charging-infrastructure Value chain)*** | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | *No legal instruments found.* | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Financial | **Grants. (N)** As part of its Program for Government, the Coalition Government set out its commitment to a national recharging network for electric and plug-in hybrid vehicles. Even though many other budgets for research and development were affected by the Public Spending Review austerity, the budget for EV infrastructure was protected through to 2013. (WP3A. Work Page 3. Activity 6: Micro to macro Investigation.) | | | | X |
| Communication | *No instruments of communication found.* | | | | |
| Organization | **ESPRC (Engineering and Physical Sciences Research Council). (N)** The ESPRC was formed in 1994. EPSRC is the main UK government agency for funding research and training in engineering and the physical sciences, investing more than £800 million a year in a broad range of subjects. One of these subjects are Low Carbon Vehicles. Therefor the ESPRC cooperates with the Low Carbon Vehicles Innovation Platform. (http://www.epsrc.ac.uk/about/Pages/default.aspx). | X | | | |
| | **Code of Practice. (N)** The Technical Regulations team at the Institution of Engineering and Technology (IET), together with a committee of experts from the automotive, energy and electrical industries, Government and regulatory bodies launched a Code of Practice for Electrical Vehicle Charging Equipment Installation in February 2012. (WP3A. Work Page 3. Activity 6: Micro to macro Investigation) | | | X | |
| | **Road Map Charging Infrastructure. (N)** The UK Government's Transport Minister Norman Baker and Business Minister Mark Prisk announced on November 11th 2012, that a National Chargepoint Registry would be developed by POD Point – a UK-based chargepoint manufacturer – will be a publicly-accessible database of charging points across the UK. (WP3A. Work Page 3. Activity 6: Micro to macro Investigation) | | | X | |
| | **Central Whitelist. (N)** A new system the 'Central Whitelist' will be created to make it easier for motorists to access each chargepoint without having to sign up to new schemes each time they charge in a different location. (WP3A. Work Page 3. Activity 6: Micro to macro Investigation) | | | X | |
| | **PIP (Plugged-In-Places). (N)** Intends to support the development and consumer uptake of ultra-low carbon vehicles by creating electric car hubs in six key British cities or hubs with the installation of charging points in various locations. The PIP program expects the eight projects to install an additional 8.900 charging points during years two and three. This will take the PIP program total to 9.700. Charging infrastructure will be installed in homes, at workplaces, on street, and in private and public car parks. The projects will be testing various business and operation models and different technological approaches. The resulting insights will be used to inform the developing UK national strategy for infrastructure roll out. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/) The PIP program is supporting 8 Plugged in Places regions. The East of England, Greater Manchester, London, Midlands, Milton Keynes, North East England, Northern Ireland and Scotland. Greater Manchester, Northern Ireland and Scotland have been announced as regions but have not yet launched their scheme. (http://www.pod-point.com/wp-content/uploads/) | | X | | X |

*Table 33. Findings on Charging infrastructure value chain for the United Kingdom*

| ***Policy instruments*** | ***Vehicle & Grid*** |
|---|---|
| Families of instruments | Network |
| Legal | *No legal instruments found.* |
| Financial | **Community Challenge. (N)** The Community Challenge is a yearly initiative, launched by the Low Carbon Vehicle Partnership and Energy Saving Trust, designed to "stimulate local action towards lower carbon journeys". The initiative offers prizes of up to £5,000 for community based projects promoting at least one of three categories: low carbon vehicles and fuels; smarter/ eco driving; reducing car use. (http://e-mobility-nsr.eu/fileadmin/user_upload/downloads/info-pool/3.3_-_E-mobility_policies_in_the_NSR_countries.pdf.pdf) |

| | |
|---|---|
| | **Low Carbon Vehicles Technology program. (R)** Advantage West Midlands announced in 2011 that it would invest £19.5 million in a new Low Carbon Vehicles Technology (LCVT) program that is estimated will create between 3,000 and 11,500 jobs in the UK by 2020. The program funds technological advances in areas such as batteries, motors and aerodynamics and is backed by a number of players in the automotive industry, including Jaguar Land Rover, Tata Motors, Zytek and Ricardo.( http://www.greenwisebusiness.co.uk/news/19m-for-midlands-as-its-named-economic-area-for-low-carbon-vehicles-1143.aspx) |
| Communication | *No instruments of communication found.* |
| Organization | **Fuel Cells and Hydrogen Demonstration program (N**). In the budget of 2009 the Government had announced that the Government has allocated funding for stimulating low carbon technologies in the UK. As part of this package, the Department of Energy and Climate Change has allocated a total indicative budget of £7.2m for capital funding for a Fuel Cells and Hydrogen Demonstration program, which is delivered by the Technology Strategy Board. (http://www.innovateuk.org/competitions/fuelcellsandhydrogendemonstrationprogramme.ashx) |
| | **RDAs. (N**) Eight Regional Development Agencies (RDAs) were established in England under the Regional Development Agencies Act 1998 and were launched in April 1999.The RDAs were abolished in June 2010 and ceased operation on March 31st 2012. At the time the RDAs were abolished their statutory purposes were to further economic development and regeneration, promote business efficiency, investment competitiveness and employment, enhance development and application of skill relevant to employment and contribute to sustainable development. The 8 RDAs were Northwest Regional Development Agency, Yorkshire Forward, East Midlands Development Agency, South West RDA, South East England Development Agency, East of England Development Agency, Advantage West Midlands (AWM) and One North East (ONE). AWM and ONE cooperated with the Low Carbon Vehicles Innovation Platform. (http://www.nationalarchives.gov.uk/webarchive/regional-development-agencies.htm) |
| | **TSB - Technology Strategy Board. (N)** Non-Governmental organization sponsored and funded by Department for business, Innovation and Skills (BIS) Focusses on innovation and sustainability. |
| | **UKH2Mobility. (N)** The UK recognizes that there will be a portfolio of solutions for the decarbonisation of rad transport. This is why UKH2Mobility brings together the Government and industrial participants from the utility, gas, infrastructure and global car manufacturing sectors. UKH2Mobility will evaluate the potential for hydrogen as a fuel for ultra-low-carbon vehicles in the UK before developing an action plan for an anticipated roll-out to consumers during the time period of 2015-2015. It aims to:<br>- Analyze in detail the specific UK case for the introduction of hydrogen fuel cell electric vehicles as one of a number of solutions to decarbonize road transport and quantify the potential emission benefits<br>- Review the investments required to commercialize the technology, including refueling infrastructure; and<br>- Identify what is required to make the UK a leading global player in hydrogen fuel cell electric vehicle manufacturing thereby paving the way for economic opportunities for the UK through the creation of new jobs and boosting of local economies. |

***Table 34. Findings on Network for the United Kingdom***

### 5.3.8. Austria

| ***Policy instruments*** | ***Vehicle-centric' policy (EV Value chain)*** | | | | | |
|---|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | *No legal instruments found.* | | | | | |
| Financial | **Electric Mobility Model Regions Program. (N)** The project is conducted under the funding programs of the Climate and Energy Fund and has a 2011 budget of €2.5 million (US$ 3.3 million). The Model Regions Program provides a framework for market-ready technologies to be tested within new business models and to increase public awareness. (http://www.ieahev.org/assets/1/7/IA-HEV_2011_annual_report_web.pdf)<br>• **Eisenstadt. (L)**The concept for the model region in Eisenstadt foresees the shift of taxi services to electric vehicles as well as the implementation of E-car sharing and E-carpooling business models. This project was approved for 2011–2013 and is funded with €560,000. (http://www.ieahev.org/assets/1/7/IA-HEV_2010_annual_report_6MB.pdf) | X | | | |
| | **NoVA. (N)** The purchase of EV's is exempted from the NoVA (Normverbrauchsabgabe) tax for new vehicle purchases; in Austria, this tax can increase a vehicle's price by a maximum of 16% (of the vehicle's value). Vehicles that are exclusively powered by electricity are also exempted from the motor-based insurance tax. (http://www.ieahev.org/assets/1/7/IA-HEV_2011_annual_report_web.pdf). In July 2008, a bonus-malus (credit and penalty) taxation system on purchases of new vehicles (NoVA) began, and since January 2011, a stepwise increase in the NoVA tax has been applied for each additional gram of CO2, as follows: Emissions over 160 g CO2/km: Tax increase is €25 (US$33)/g CO2. Emissions over 180 g CO2/km: Tax increase is €50 (US$66)/g CO2. Emissions over 220 g CO2/km: Tax increase is €75. This tax will be followed by a further tax increase for each additional gram of CO2 that will be implemented starting in January 2013. | | | X | |
| | **Fuel consumption Tax and monthly vehicle Tax. (N)** Electric vehicles are exempt from the fuel consumption tax and from the monthly vehicle tax. (www.oeamtc.at/elektrofahrzeuge) | | | | X |
| | **Motor-based insurance. (N)** Exclusively electrically-powered vehicles are also exempted from the motor-based insurance. (http://www.ieahev.org/assets/1/7/IA-HEV_2011_annual_report_web.pdf) | | | | X |
| | **Increased gasoline taxation. (N)** In January 2011, taxes on gasoline/petrol increased by 9%, and taxes on diesel increased by 14%. | | | | X |
| | **KLUP. (N)** The Province of Salzburg uses the framework of the Climate and Environment package (KLUP) the purchase of up to two electric vehicles a conveyor advertisers. The promotion heights are per car € 2.000, - when using electricity from conventional energy sources, € 3.000, - when using electricity from renewable sources or € 4.000, - in proof of the creation of additional green power capacity (photovoltaic system). € 1.000, - for a hybrid. (http://e-connected.at/content/f%C3%BCr-kommunen & http://www.oeamtc.at/?id=2500,1137548,,) | | | | X |
| | **Rebates Burgenland. (R)** 30% of the cost (up to 750 EUR) with purchase of a new electric car or conversion to all-electric operation at 30% of the cost (up to 350 EUR) with purchase of a new electric mopeds and electric motorcycle. 30% of the cost (up to 250 EUR) with purchase of a new electric scooters for pensioners and disabled persons will be considered with main residence in Burgenland only natural persons. The funding amount is limited to EUR 300,000 (for electric vehicles and vehicles with natural gas or biogas drive). The promotion ends with the consumption of funds no later than 31.12.2013 Burgenland Energy Agency. (http://www.oeamtc.at/?id=2500,1137548,,) | | | | X |
| | **Rebates. Lower Austria (Nieder Österreich (NO)). (R)** The purchase of electric scooters and bicycles is subsidized by a maximum of 20% of the vehicle's value or €300 per vehicle. This measure was also planned to be funded until the end of 2011. (http://e-connected.at/content/f%C3%BCr-betriebe & http://www.oeamtc.at/?id=2500,1137548,,) | | | | X |

| | | | | | |
|---|---|---|---|---|---|
| | **Rebates Nieder Österreich (NO). (R)** NO-vehicle alternative drive-promotion (electric vehicles) for taxi companies and driving schools, grant in the amount of € 2.000, -. For individuals a non-repayable grant or 1.400 euros per vehicles when buying new ones (electric, plug-in hybrid). The promotion is valid until 31.12.2013. (http://www.oeamtc.at/?id=2500,1137548,,) | | | | X |
| | **Rebates KÄRNTEN. (R**) 12% of each sale price for electric cars (including battery-rent for 60 months, unless batteries are not included in the purchase price), but a maximum of 3,500 euros. The electricity demand must be generated from renewable energy sources CO2 neutral: through participation in a civil power station or by the establishment of a single photovoltaic plant. Hybrid vehicles and range extenders are not supported. The promotion is limited to 66 electric cars. (http://www.oeamtc.at/?id=2500,1137548,,) | | | | X |
| | **Rebates Vienna. (L)** The purchase of electric bicycles, mopeds, and motorcycles is subsidized by a maximum of 30% of the vehicle's value or €300 (US$395) per vehicle. This measure was planned to be funded until the end of 2011. (http://www.ieahev.org/assets/1/7/IA-HEV_2011_annual_report_web.pdf) | | | | X |
| | **Rebates Steiermark. (L)** Steiermark requires 250 euro for buying a new dual electric vehicle that no regulatory compliance and in particular supporting the mobility of elderly people and people with disabilities is used. Be encouraged individuals who use the vehicles exclusively private. The promotion campaign ends 30.06.2013. (http://www.oeamtc.at/?id=2500,1137548,,) | | | | X |
| | **Subsidy EV's Graz. (L)** The Graz city council include a subsidy of €1,500 for electric vehicles for taxis or social and delivery services. Vehicles for driving schools are eligible for up to €1,000. The "Municipal Energy Concept Graz 2020" includes a section for electric mobility and sets a target of 15% of new registrations for electric vehicles by the year 2020. (http://www.ieahev.org/assets/1/7/IA-HEV_2010_annual_report_6MB.pdf) | | | | X |
| Communication | **IV2Splus PROGRAM. (N)** The IV2Splus strategy covers efforts from basic research to demonstration and pilot projects. The A3plus program line within IV2Splus is the most relevant with regard to electric mobility because it promotes research, development, and demonstration (RD&D) of innovative propulsion technologies and alternative fuels. A3plus supports cooperative proposals involving industrial, university, and non-university research to increase the competitiveness of Austria's automotive industry. (http://www.ieahev.org/assets/1/7/IA-HEV_2011_annual_report_web.pdf) | X | | | |
| Organization | **VECEPT - All Purpose Cost Efficient Plug-In Electric (Hybridized) Vehicle. (N)** The aim of the project is the development and testing of an everyday use, inexpensive plug-in hybrid vehicle (PHEV) as a solid model for the world market. (http://www.klimafonds.gv.at/unsere-themen/e-mobilitaet/l | X | | | |

*Table 35. Findings on EV value chain for Austria*

| ***Policy instruments*** | ***Grid-centric policy (charging-infrastructure Value chain)*** | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | *No legal instruments found.* | | | | |
| Financial | **Lighthouse Projects Initiative (LPTI). (N)** The project is conducted under the funding programs of the Climate and Energy Fund. The budget of the LTPI is approximately €6 million (US$7.9 million) in 2011. The objective of these programs is to demonstrate new technologies in the area of electric mobility. The programs cover the demonstration and implementation of large-scale proposals that can involve various required infrastructure facilities and people, including developers, producers, downstream operators, and future users. The LTPI funds R&D and demonstration projects in the field of electric mobility for technologies that are still not ready for the market. (http://www.ieahev.org/assets/1/7/IA-HEV_2011_annual_report_web.pdf) | X | | | |
| | **Sonderaktion E-Ladestation. (N)** A special initiative within this program ("Sonderaktion E-Ladestation") will operate until July 2012, providing funds for the installation of charging stations, with the maximum number of stations being 50 per project and 1,000 in total. (http://www.ieahev.org/assets/) | | X | | |
| | **Rebates KÄRNTEN. (R)** E-Charging station promotion for businesses. When buying a "life Kärnten" - charging station companies are supported with a 20% promotion. (http://e-connected.at/content/f%C3%BCr-betriebe) | | | | X |

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|---|---|---|---|---|---|
| | **PV Stromtankstellen-Förderun Nieder Österreich (NO). (R)** NE PV power stations funding for northeast communities, depending on the variant subsidy up to 75% of the net investment cost and max. € 7.500, -. The promotion is valid until 31.12.2013. (http://e-connected.at/content/f%C3%BCr-kommunen) | | | | X |
| | **Mobility card Vienna. (L)** A "mobility card" specific for this model region is expected to shift demand from private vehicles to public transport and E-car sharing service. (http://www.ieahev.org/assets/1/7/IA-HEV_2010_annual_report_6MB.pdf) | | | | X |
| | **Graz lanes. (L)** Graz will be also focus on the optimization of the regional transport system and the integration of 500 electric two-lane and 2000 single-lane vehicles from 2011–2013 with a funding of €1.6 M. (http://www.ieahev.org/assets/1/7/IA-HEV_2010_annual_report_6MB.pdf) | | X | | |
| | **E-LOG Klagenfurt. (L)** Setting up a decentralized logistics center and a workshop hall on the outskirts of Klagenfurt for a fleet management of commercial vehicles, E-200. The e-vehicles will be leased to logistics and service companies in and around Klagenfurt, including a cargo box. 3 innovative CityLogs (transport trains) with hydrogen fuel cell bus commute between center and downtown. (http://www.klimafonds.gv.at/unsere-themen/e-mobilitaet/modellregionen/e-log-klagenfurt/) | | | X | |
| | **Mobility card Rheintal - Vlotte (Vorarlberg). (L)** The customer gets a "mobility card" for approximately €350 a month (exact price depends on vehicle type). The mobility card includes, apart from the car lease, maintenance costs of the electric parts, a free pass for the Vorarlberg public transit system, and free charging at public charging stations. After four years the cars can be purchased by the customer for a residual value of 25% of the initial purchase price. | | | X | |
| Communication | *No instruments of communications found.* | | | | |
| Organization | **Electric Mobility Model Regions Program. (N)** The Electric Mobility Model Regions Program aims for the progressive installation of a charging infrastructure, its corresponding supply from renewable energy sources, and the development of new business and mobility models. Since the program's launch in 2008, five model regions are being developed: Rheintal–Vlotte (Vorarlberg), Salzburg, Vienna, Graz, and Eisenstadt. (http://www.ieahev.org/assets/1/7/IA-HEV_2011_annual_report_web.pdf)<br>• **Vlotte. (L)** In 2008, Vorarlberg was awarded funding to become the first e-mobility model region in Austria (www.vlotte.at). It has been subsidized by Austria's Climate and Energy Fund with €4.7 million (US$6.2 million) for phase one and €551,000 (US$725,000) for phase two, which began in 2010. (http://www.klimafonds.gv.at/unsere-themen/)<br>• **Graz. (L) (**The installation of 140 charging stations with 950 charging points is planned. The additional energy demand will be partially supplied with new photovoltaic units. In total, a yearly saving in CO2 emissions of approximately 1000 tons is expected (source: http://www.graz.at/cms/beitrag/10156096/2767074/). (http://www.ieahev.org/assets/1/7/IA-HEV_2010_annual_report_6MB.pdf)<br>• **Vienna. (L)** Hundreds of charging stations in place and electric vehicles on the road by 2012 are planned to be supported by funding of €1.3 M. The "E-mobility on demand" concept for this model region consists of the integration of electric vehicles into company and car sharing fleets. A "mobility card" specific for this model region is expected to shift demand from private vehicles to public transport and E-car sharing service. (http://www.ieahev.org/assets/1/7/<br>• **Salzburg. (L)** The three-year target for this region is 2,000 electric vehicles that will include 1,000 passenger cars. The vehicles are leased under a subscription and returned after a certain period of time. Currently 300 clients have subscribed using a card that allows free recharging of the vehicles at any of the charging points installed by the consortium. These charging stations are exclusively supplied with renewable energy. (http://www.ieahev.org/assets/1/7/IA-HEV_2010_annual_report_6MB.pdf) | | X | | |
| | **Smile -Smart Mobility info & ticketing system Leading the Way for Effective E-Mobility Services. (N)** Development and testing of a prototype of a multimodal, integrated, web-based information, booking and payment system ("Smart Mobility Platform"), the public transport and other mobility services in particular linked to the Intelligent electric mobility. (http://www.klimafonds.gv.at/unsere-themen/) | X | | | |
| | **eMORAIL - Integrated eMobility Service for Public Transport. (N)** The aim of the project is to design an innovative, environmentally friendly and costly friendly solution for commuters. For this purpose the integrated transport services for commuters in two regions (hunchback world, Leibnitz) and an intermodal eCarsharing / eBike offer in 2 cities (Vienna, Graz) is implemented and tested. (http://www.klimafonds.gv.at/unsere-themen/e-mobilitaet/leuchttuerme/emorail-integrated-emobility-service-for-public-transport/) | X | | | |
| | **Electro Drive Salzburg. (L)** Starting in 2012, Electro Drive Salzburg concentrated on its core competency - the charging infrastructure for electric cars. Electro Drive Salzburg cooperates strongly with the car trade, because the electric cars will continue to buy from the respective dealership. Electro Drive | | X | | |

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| | Salzburg cares about the safe and green power to the vehicle. (http://www.klimafonds.gv.at/unsere-themen/e-mobilitaet/modellregionen/electrodrive-salzburg/) | | | | | |

*Table 36. Findings on Charging infrastructure value chain for Austria*

| ***Policy instruments*** | ***Vehicle & Grid*** |
|---|---|
| Families of instruments | Network |
| Legal | *No legal instruments found.* |
| Financial | *No financial instruments found.* |
| Communication | *No instruments of communications found.* |
| Organization | **Klimaaktiv. (N)** The Klimaaktiv mobil initiative, which was launched in 2004 by the Federal Ministry of Agriculture, Forestry, Environment and Water Management in the context of the Austrian Federal Climate Strategy. Klimaaktiv mobil supports measures that focus on mobility management, including alternative vehicles and renewable energy, intelligent multimodal mobility, eco-driving, cycling, walking, demand-oriented public transport, and the raising of public awareness. (http://www.ieahev.org/assets/1/7/IA-HEV_2011_annual_report_web.pdf) |
| | **The Lighthouse Project EmporA. (N)** Combines a consortium of Austrian companies (composite, Magna, AVL, Siemens, Raiffeisen Leasing, etc.), which in Austria in the development of an integrated System solutions for electric mobility work. (http://www.empora.eu/das-projekt) |
| | **CMO - Clean Motion offensive. (N)** The Clean Motion Upper Austria (CMO) of the Upper Lands cluster project has as its primary objective to make the company fit for suppliers of electric mobility. The development of cost-saving components for suppliers in Upper Austria is of great importance. With know-how advantage in those areas that have been neglected by the car manufacturers and energy suppliers, our operations can score around the world. The project cost components for the automotive industry and ease of use of the infrastructure to be developed. (http://www.clean-motion.at/) |
| | **Platform "e-connected". (N)** Network of actors for electric mobility and sustainable Energy supply vehicle manufacturers, infrastructure providers, utilities, Fleet operators, SME Focus. E-connected is an initiative founded by the Federal Ministry of Agriculture, Forestry, Environment and Water Management and the Austrian Climate and Energy Fund. The initiative shall provide information for potential market participants and foster information exchange. Besides the website www.e-connected.at, which provides all relevant information to the public, e-connected consists of several expert groups on the following topics (the expert groups are currently not active) (http://www.e-connected.at/content/about-e-connected) |

*Table 37. Findings on Network for Austria*

### 5.3.9. California

| ***Policy instruments*** | ***Vehicle-centric' policy (EV Value chain)*** | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | **Low Emission Vehicle (LEV) Standards. (N)** Any new light-duty passenger car, light-duty truck, or medium-duty passenger vehicle sold, leased, imported, delivered, purchased, or acquired in New York State must be certified to the California emissions standards. 1% must meet ZEV standards, which includes battery electric or fuel cell vehicles. (http://www.afdc.energy.gov/laws/law/NY/4627) | | X | | |
| | **High Occupancy Vehicle (HOV) lanes. (N)** An EV can use this lanes with Clean Air sticker regardless of the number of occupants. (Assembly Bill 2405, 2012. http://www.arb.ca.gov/msprog/carpool/carpool.htm) | | | | X |
| | **State Transportation Plan. (N)** The California Department of Transportation (Caltrans) must update the California Transportation Plan by December 31, 2015, and every five years thereafter. The plan must address how the state will achieve maximum feasible emissions reductions, taking into consideration the use of alternative fuels, new vehicle technology, and tailpipe emissions reductions. (http://www.afdc.energy.gov/fuels/laws/3270/CA) | | | X | |
| | **High Occupancy Toll (HOT) lanes. (N)** EV's with Clean Air Sticker are exempt from toll charges on HOT lanes, unless prohibited by federal law. (Assembly Bill 2405, 2012. http://www.arb.ca.gov/msprog/carpool/carpool.htm) | | | | X |
| | **Fleet Vehicle Procurement Requirements. (N)** When awarding a vehicle procurement contract, every city, county, and special district, including school and community college districts, may require that 75% of the passenger cars and/or light-duty trucks acquired be energy-efficient vehicles. (http://www.afdc.energy.gov/fuels/laws/3270/CA) | | X | | |
| | **EV Charging Requirements. (N)** New EV's must be equipped with a conductive charger inlet port that meets the specifications contained in Society of Automotive Engineers (SAE) standard J1772. EV's and PHEV's must be equipped with an on-board charger with a minimum output of 3.3 kilovolt amps. (http://www.afdc.energy.gov/laws/laws/CA/tech/3270) | | X | | |
| Financial | **Develop new batteries EV. (N)** Envia Systems, Inc. will create a low cost, high energy density, high performance battery system for electric and plug-in hybrid electric vehicles. Grant amount $9 million from CEC & $4 million from American Recovery and Reinvestment Act (ARRA). (http://www.energy.ca.gov/drive/projects/ARV-09-004.html) | X | | | |
| | **Advanced Vehicle Research & Development. (N)**<br>• Advanced cells and design technology for electric drive batteries. This project will develop next generation, high-energy lithium ion cells leveraging silicon anodes, doubling the capacity of state of the art vehicle batteries. $4,986,984. (http://www.doe.gov/articles/)<br>• Advanced cells and design technology for electric drive batteries. This project will develop high-energy cells using a lithium metal anode and a proprietary solid polymer electrolyte that significantly reduces battery cost and size, and improves life and safety. $4,874,391. (http://www.doe.gov/articles/)<br>Advanced cells and design technology for electric drive batteries. This project will develop next generation high-energy lithium ion cells leveraging, high voltage composite cathode materials and silicon based anodes doubling the capacity of state of the art vehicle batteries. $4,840,781. (http://www.doe.gov/articles/) | X | | | |
| | **EV Readiness. (N)** With funding from the U.S. Department of Energy (DOE) and CEC, California's major regions are assembling PEV Readiness plans. The Luskin Center is the prime research contractor. This research is aimed at informing the strategic development of public and other charging infrastructure necessary to effectively support a transition to PEV's in Southern California. Additional related projects include examining PEV parking policies. | X | | | |

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| | (http://luskin.ucla.edu/content/pev-readiness) | | | | |
| | **Sales Tax Exclusion: Advanced Manufacturing (CAEATFA program). (N)** Provides a Sales and Use Tax Exclusion Program for advanced manufacturing projects. Effective since January 1, 2013. (http://www.treasurer.ca.gov/caeatfa/) | | X | | |
| | **American Recovery & Reinvestment Act (ARRA) 2009. (N)**<br>• Loans to help companies build 3 battery electric vehicles (BEV) factories (1 in California) $2,4 billion. (http://www.ieahev.org/by-country/united-states-industry/)<br>• Tax credits for purchasing electric vehicle (between $2,500 & $7,500 per vehicle, depending on battery capacity). (http://www.recovery.gov/News/featured/Pages/TaxCredits.aspx)<br>• A credit equal to 10% of cost up to a maximum of $4,000 is available for kits that will convert a standard vehicle to plug-in EV. (http://www.recovery.gov/News/featured/Pages/TaxCredits.aspx) | | X | | X |
| | **Alternative and Renewable Fuel & Vehicle Technology Program. (N)** CEC administers the program to provide financial incentives to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the state's climate change policy objectives. (http://www.energy.ca.gov/drive/investing/) | | | X | |
| | **Clean Fuels Program. (R)** Provides funding for research, development, demonstration, and deployment projects that are expected to help accelerate the commercialization of advanced low emission transportation technologies. South Coast. Approximately $10 million annually. (http://www.afdc.energy.gov/fuels/laws/) | X | | | |
| | **Drive Clean! Rebate program. (R)** The program provides rebates for the purchase of eligible new, clean-air vehicles for residents and businesses of the San Joaquin Valley Air Pollution Control District. Clean Vehicle Rebate Project offers rebates for the purchase or lease of qualified vehicles. Rebates up to $2,500 per vehicle. (http://www.afdc.energy.gov/fuels/laws/3270/CA) (http://www.valleyair.org/grant_programs/) | | | | X |
| | **Public Benefit Grant Program. (R)** San Joaquin Valley Air Pollution Control District provides funding to cities, counties, special districts for the purchase of new AFV's. Maximum of $20,000 per vehicle, with a limit of $100,000 per agency per year for this component. (http://www.valleyair.org/Grant_Programs/) | | | | X |
| | **Employer Invested Emissions Reduction Funding - South Coast. (R)** The Air Quality Improvement Program (AQIP) provides funding to allow employers within SCAQMD's jurisdiction to make annual investments into an administered fund to meet employers' emissions reduction targets. The revenues collected are used to fund alternative mobile source emissions/trip reduction programs, including alternative fuel vehicle projects, on an on-going basis. Programs such as low emission, alternative fuel, or zero emission vehicle procurement, and old vehicle scrapping may be considered for funding. (http://www.afdc.energy.gov/laws/law/CA/4219) | | | | X |
| Communication | **PEV Infrastructure Information Resource. (N)** The CEC, in consultation with the Public Utilities Commission, must develop and maintain a website containing specific links to electrical corporations, local publicly owned electric utilities, and other websites that contain information specific to PEV's. (http://www.afdc.energy.gov/fuels/laws/3270/CA) | | | X | |
| | **ZEV Promotion Plan. (N)** All state agencies must support and facilitate the rapid commercialization of ZEV's in California. In particular, the California Air Resources Board, CEC, Public Utilities Commission, and other relevant state agencies must work with the ePEV Collaborative and the California Fuel Cell Partnership to establish benchmarks to achieve targets for ZEV commercialization. Goals achieved in 2015. (http://www.afdc.energy.gov/fuels/laws/3270/CA) | | | X | |
| | **e-CarFest. (R)** Bringing the Electric Car Experience to You. Join the leading electric car makers, charging providers and local utilities for the latest innovations and trends in the eCar Marketplace at the Electric Lodge in Venice. The eCarFest is an informative display of electric vehicle innovations and lifestyles and is about electric vehicles, design, battery technology, charging infrastructure and financial incentives for owning an electric vehicle. (http://www.socaltech.com/calendar/eventid/19566) | | | | X |
| Organization | **Vehicle Technologies Program (VTP). (N)** Advanced Energy Storage technologies research programs. Research portfolio is focused on battery module development and demonstration of advanced batteries to enable a large market penetration of Electric Driven Vehicles (EDV) within 5 to 10 years. (http://www1.eere.energy.gov/library/ | X | | | |

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| | **Advanced Power Electronics and Electric Machines. (N)** Subprogram within the DOE VTP provides support and guidance for many cutting-edge automotive technologies now under development. Research is focused on developing revolutionary new power electronics and electric motor technologies that will leapfrog current on-the-road technologies. (https://www1.eere.energy.gov/vehiclesandfuels/pdfs/program/2010_apeem_report.pdf) | X | | | |
| | **Office of Science. (N)** Fundamental basic energy research on enabling materials for batteries through the Energy Frontiers Research Centers. (http://www.ieahev.org/by-country/united-states-research/) | X | | | |
| | **Applied Research Projects Agency - Energy (ARPA-E). (N)** Transformational research on revolutionary, "game-changing" energy storage technologies. EDV-related projects include metal-air, lithium sulfur, magnesium ion, advanced lithium-ion, and solid state batteries, as well as ultracapacitors. (http://www.ieahev.org/by-country/united-states-research/) | X | | | |
| | **Grid Energy Storage & Battery Secondary Use. (N)** The Luskin Center is developing innovative strategies to enhance PEV value through secondary use of PEV batteries. This includes both vehicle-to-grid power (V2G) and post-vehicle repurposing of used PEV batteries ("second life") into stationary energy-storage appliances (B2G). (http://luskin.ucla.edu/content/energy-storage) | X | | | |
| | **LA Cleantech Incubator (LACI) Update. (L)** LACI helps accelerate the commercialization of their clean technologies in addition to accelerating new products developed by independent entrepreneurs. (http://laincubator.org/about/) | X | | | |

*Table 38. Findings on EV value chain for California*

| ***Policy instruments*** | ***Grid-centric policy (charging-infrastructure Value chain)*** | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | **PEV Infrastructure Evaluation. (N)** The California Public Utilities Commission (Commission) & CEC & California Air Resources Board (CARB), electrical corporations, and the motor vehicle industry, must evaluate policies to develop infrastructure sufficient to overcome barriers to the widespread deployment and use of PEV's. (http://www.afdc.energy.gov/fuels/laws/3270/CA) | | | X | |
| | **State Agency EVSE Installation. (N)** California state agencies must actively identify and pursue opportunities to install EVSE, and accommodate future EVSE demand, at state employee parking facilities in new and existing agency buildings. (http://www.afdc.energy.gov/fuels/laws/3270/CA | | | X | |
| | **PEV Parking Regulation. (N)** An individual may not stop, stand, or park a motor vehicle, or otherwise block access to parking, in a stall or space designated for the exclusive purpose of charging a PEV unless the vehicle displays a valid state-issued zero emission vehicle (ZEV) decal and is connected for electric charging purposes. (http://www.afdc.energy.gov/laws/law/CA/9577) | | | | X |
| | **Alternative Fuel Vehicle (AFV). (N)** Parking Incentive Programs. The DGS and California DOT must develop and implement AFV parking incentive programs in public parking facilities operated by DGS with 50 or more parking spaces and park-and-ride lots owned and operated by DOT. The incentives must provide meaningful and tangible benefits to drivers, such as preferential spaces, reduced fees, and fuelling infrastructure. (http://www.afdc.energy.gov/fuels/laws/3270/CA) | | | X | |
| Financial | **PEV Readiness plan. (N)** With funding from the U.S. DOE and CEC, California's major regions are assembling PEV Readiness plans. The Luskin Center is the prime research contractor. This research is aimed at informing the strategic development of public and other charging infrastructure necessary to effectively support a transition to PEV's in Southern California. Additional related projects include examining PEV parking policies. (http://luskin.ucla.edu/content/pev-readiness)<br>• The Southern California Plug-in Electric Vehicle Readiness Plan and Atlas will help nearly 200 cities assess their PEV readiness and meet demand | X | | | |

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|---|---|---|---|---|---|
| | for PEV charging. **(R)** (http://luskin.ucla.edu/content/pev-readiness) | | | | |
| | **Clean Fuels Program. (R)** Provides funding for research, development, demonstration, and deployment projects that are expected to help accelerate the commercialization of advanced low emission transportation technologies. South Coast. Approximately $10 million annually. (http://www.afdc.energy.gov/fuels/laws/3270/CA & http://www.aqmd.gov/tao/Demonstration/index.htm) | X | | | |
| | **Bay Area Electric Vehicle (EV) Corridor Project. (R)** Install charging infrastructure throughout the nine-county Bay Area Region. Goal = 423 charge points. Grant amount $1,493,165. (http://www.energy.ca.gov/drive/projects/ARV-10-032.html) | | X | | |
| | **ChargePoint America. (R)** ChargePoint America program offers EVSE at no cost to individuals or entities in the San Jose, San Francisco Bay, Sacramento, and LA metropolitan area. To be eligible for free home charging stations, individuals living within the specified areas must purchase a qualified plug-in electric vehicle. In most cases, installation will be paid for by the EVSE owner; some cities, states, and utilities, however, will provide funding towards installation costs. All participants in the ChargePoint America program must agree to anonymous data collection after installation. (http://www.afdc.energy.gov/laws/law/CA/8631) | | X | | |
| | **Southern California Regional Collaborative Plug-in EV Charging Installation and Upgrade SoCal EV Ready Project. (R)** 315 upgrades and new chargers for fleets, workplace and public locations. Grant amount from CEC $840,750. (http://www.energy.ca.gov/drive/projects/ARV-10-045.html) | | X | | |
| | **Charge California. (R)** The project will install charging stations for public and fleet use, and for private consumers who buy electric vehicles. 1,290 networked EV charging stations in San Francisco, Sacramento & LA areas. Grant amount $3,417,000 from CEC. $3,354,000 of ARRA. (http://www.energy.ca.gov/drive/projects/ARV-09-007.html) | | X | | |
| | **The Update of Existing Electric Vehicle Infrastructure. (R)** The goal of this project is to provide a low cost and low risk option to upgrading existing electric vehicle infrastructure in California. Grant amount $2,3 million. (http://www.energy.ca.gov/drive/projects/ARV-10-001.html) | | X | | |
| | **Nissan Electric Drive Vehicle Demonstration and Vehicle Infrastructure Project. (R)** The project's goal is to support electric vehicles with a widespread network of charging stations. 1,000 residential chargers, 1,450 commercial level 2 EVSE & 60 level 3 fast chargers. Grant amount 8,000,000 from CEC. DOE $39.350.127. (http://www.energy.ca.gov/drive/projects/ARV-09-005.html) | | X | | |
| | **EV Connect LLC. (R)** Install 20 publicly accessible charging stations for EV at 5 different public transportation hubs in LA County Metropolitan. Grant amount $415,185. (http://www.energy.ca.gov/drive/projects/ARV-10-006.html) | | X | | |
| | **Zero Emission Vehicle Network-Enabled Transport (L)**. In support of this program install 12 level 2 & 2 DC public EV chargers. Grant amount from CEC $122,500. (http://www.energy.ca.gov/drive/projects/ARV-10-046.html) | | | X | |
| | **EV Project (R).** ECOtality offers EV Supply Equipment at no cost to individuals in the Los Angeles and San Diego metropolitan areas. 1,786 EVSE in California installed. 2,785 in total project. Value project is $230 million. (http://www.afdc.energy.gov/fuels/laws/ | | | | X |
| | **PEV Charging Rate Reduction – SCE. (R)** Southern California Edison (SCE) offers a discounted rate to customers for electricity used to charge PEV's. Two rate schedules are available for PEV charging during on- and off-peak hours. (http://www.afdc.energy.gov/laws/law/OR/6143) | | | | X |
| | **PEV Home Charger Deployment Program. (R)** Also known as the EVSE Incentive. Provides incentives for up to 2,750 residents who purchase a new plug-in electric vehicle and install Level 2 EVSE from qualifying vendors in Bay Area. (http://www.bayareapevready.org/funding/homechargers/) | | | | X |
| | **Transportation center. (L)** Reedley (CA) is building a Leader in Environmental Design facility that will house, repair and maintain a fleet of green vehicles. Grant amount $480,000. (http://www.energy.ca.gov/drive/projects/ARV-10-004.html) | | | X | |
| | **ChargeUp LA. (L)** LADWP now provides rebates to residential customers for the cost of EV chargers and installation. The rebate will cover up to $2,000 of your out-of-pocket. (https://www.ladwp.com/ladwp/faces/ladwp/residential/r-gogreen/r-gg-) | | | | X |
| | **PEV Charging Rate Reduction - Sacramento Municipal Utility District (SMUD). (L)** This rate option is for residential customers who own or lease licensed passenger electrical. (https://www.smud.org/en/residential/environment/plug-in-electric-vehicles/PEV-rates/index.htm) | | | | X |
| | **Charger Installation Rebate. (L)** Los Angeles Department of Water and Power (LADWP) provides rebates of up to $2,000 to the first 1,000 residential customers who purchase or lease a qualifying EV and install a rapid, Level 2 charger and a separate time-of-use meter at their home. Program expires June 30, 2013. (https://www.ladwp.com/ladwp/faces/) | | | | X |
| | **PEV Charging Rate Reduction – LADWP. (L)** The LADWP offers a $0.025 per kilowatt discount for electricity used to charge PEV's during off-peak times. The discount is only applicable to the first 500 kilowatt-hours used per month. (http://www.afdc.energy.gov/laws/law/CA/6142) | | | | X |

| | | | | | |
|---|---|---|---|---|---|
| Communication | *No instruments of communications found.* | | | | |
| Organization | *No organizational instruments found.* | | | | |

*Table 39. Findings on Charging infrastructure value chain for California*

| ***Policy instruments*** | ***Vehicle & Grid*** |
|---|---|
| Families of instruments | Network |
| Legal | **Alternative Fuel and Vehicle Policy Development. (N)** The California Energy Commission (CEC) must prepare and submit an Integrated Energy Policy Report (IEPR) to the governor on a biannual basis. The IEPR provides an overview of major energy trends and issues facing the state, including those related to transportation fuels, technologies, and infrastructure. The IEPR also examines potential effects of alternative fuels use, vehicle efficiency improvements, and shifts in transportation modes on public health and safety, the economy, resources, the environment, and energy security. The primary purpose of the IEPR is to develop energy policies that conserve resources, protect the environment, ensure energy reliability, enhance the state's economy, and protect public health and safety. (http://www.afdc.energy.gov/laws/law/IL/5681) |
| | **Advanced Transportation and Alternative Sources Manufacturing Sales and Use Tax Exclusion Program. (N)** Authorizes the California Alternative Energy and Advanced Transportation Financing Authority (CAEATFA) to provide eligible projects financial assistance in the form of a sales and use tax exclusion on property used for the "design, manufacture, production, or assembly" of either advanced transportation technologies or alternative energy source products, components or system, as defined. (http://www.treasurer.ca.gov/caeatfa/sb71/index.asp) |
| Financial | **Sales Tax Exclusion (CAEATFA program). (N)** Green Manufacturing Sales and Use Tax Exclusion Program for companies that design, manufacture, produce or assemble advanced transportation technologies or alternative source products, components or systems. (http://www.treasurer.ca.gov/caeatfa/) |
| | **Emission Reduction Incentive Program Group. (R)** The Emission Reduction Incentive Program Group is responsible for the development, implementation, and on-going administration of all District grant and incentive programs, including the Heavy-Duty Engine Incentive and REMOVE II Programs. (http://www.valleyair.org/grant_programs/grantprograms.htm) |
| | **San Joaquin Valley Plug-in Electric Vehicle Coordinating Council (SJV PEVCC). (R)** The San Joaquin Valley Air Pollution Control District approved the funding of two grants, one from the California Energy Commission and the US. DOE, totaling $275,000, to increase zero-emission and clean vehicle awareness and deployment and the strategic planning for PEV's and public and private charging infrastructure, also known as EVSE in the San Joaquin Valley. (http://energycenter.org/index.php/outreach-a-education/plug-in-a-get-ready/sjv-pevcc) |
| Communication | **Executive Workshops on Strategies and Best Practices for State Departments of Transportation to Support Commercialization of EV and Infrastructure Research in Progress; California Department of Transportation. (R)** Several states will serve as the test-bed for electric vehicle technologies. At a minimum, the departments should immediately collaborate to share information, relevant research, policies and practices to assist other states that are (or will soon be) involved in transportation electrification efforts. At least $400m has been dedicated to this in several states. (http://rip.trb.org/browse/dproject.asp?n=27741) |
| Organization | **Clean city. (N)** A national network of nearly 100 Clean Cities coalitions brings together stakeholders in the public and private sectors to deploy alternative and renewable fuels, idle-reduction measures, fuel economy improvements, and emerging transportation technologies. (http://www1.eere.energy.gov/cleancities/about.html) |

*Table 40. Findings on Network for California*

### 5.3.10. France

| ***Policy instruments*** | ***Vehicle-centric' policy (EV Value chain)*** | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | *No instruments found in this category.* | | | | |
| Financial | **R&D and demonstration projects. (N)** The France government announced to dedicate € 400 million for R&D and demonstration projects over 2008-2012 on low carbon vehicles. This budget covers many R&D and demonstration activities for the development of vehicles and charging infrastructure. (http://www.icarsnetwork.eu/download/NewsEvents/itre_ep_report_electric_cars.pdf) | X | | | |
| | **Project Investments for the future. (N)** Several projects under the investment for the future plan are coordinated by ADEME (The French Environment and Energy Management Agency). Project aimed at developing future vehicles include 1 billion Euros for research into road, rail and marine vehicles. (www.ieahev.org) | X | | | |
| | **National Strategy 2009. (N)**<br>• Renault will establish a lithium-ion battery factory in Flins that will produce 100.000 batteries a year. The investment here will be 625 million Euros, of which 125 million will be provided for by the French government and the government will also loan Renault 150 million Euros for this project. (http://www.thegreencarwebsite.co.uk/blog/index.php)<br>• A group of companies including La Poste, EPA, Air France, EDF Energy, France Telecom and more and the French government, will commit to buying electric vehicles with a range of at least 150km. It is hoped to have 100.000 vehicles by 2015. (http://www.thegreencarwebsite.co.uk/blog/index.php/2009/10/05/france-unveils-14-point-plan-for-electric-cars/) | | X | | |
| | **Subsidy. (N)** There was a 5.000 euros cash incentive for any electric car sale in France, no matter if the buyer is an individual or a company. In 2012 Grants for electric cars increased from 5.000 to 7.000 Euros and up to 4.000 Euros for hybrid vehicles, increased from 2.000 Euros and benefitting both private buyers and company car customers. This decision is part of the Automotive Plan which runs until the end of 2012. The government than will decide if the measures will be extended into 2013. (http://www.thegreencarwebsite.co.uk/blog/index.php/2012/07/26/france-looks-to-ev-and-hybrid-cars-to-boost-ailing-car-industry/) | | | | X |
| Communication | **The association Espace Mobilités Electriques (EME). (N)** The association Espace Mobilités Electriques (EME) was set up in 2010 by Electricite de France (EDF) in 1997, the French electricity utility company, and the City of Paris, in order to provide information about all types of electric vehicles. (Tsang, F., Pedersen, J. S., Wooding, S., & Potoglou, D. (2012). vehicle to the mass Market, a review of barriers, facilitators. RAND Europe.) | | | X | |
| | **Twizy Way. (L)** In June 2012 Renault started testing a car-sharing program in France with the automaker's Twizy urban electric vehicles, HybridCars reports. The program, called Twizy Way, takes place in Saint-Quentin-en-Yvelines, France, about 20 miles southwest of Paris, where about 200 people are allowed to sign up for access to Twizy EV's. The trial period ran through September, after which the service was opened to the public. (http://green.autoblog.com/2012/06/15/twizy-way-brings-renaults-tiny-ev-car-sharing-in-france/) | | | | X |
| Organization | **Agreement Renault and CEA. (N)** Renault has teamed up with the CEA (French Alternative Energies and Atomic Energy Commission) to work on electric vehicles, new energies and cleaner combustion engines. The CEA is funded by the French government with a focus on technological research across three fields: energy; information and health technologies; and defense and security. This agreement was made in 2010. The two will co-operate at several sites and will identify areas of synergy as well as approving a three-year research and development program. (http://www.thegreencarwebsite.co.uk/blog/) | X | | | |
| | **Project de loi Grenelle 2. (N)** Government focus on EV charging infrastructure deployment, support for requests and help for vehicle purchase. Car | | X | | |

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|---|---|---|---|---|---|
| | manufacturers aim to have 60.000 EV's for commercial use in 2011-2012 (with minimum range of 150 km). A group of about 20 public and private buyers, led by la Poste (the French postal service), has been assembled that will initially purchase 50.000 EV's. (Tsang, F., Pedersen, J. S., Wooding, S., & Potoglou, D. (2012). vehicle to the mass Market, a review of barriers, facilitators. RAND Europe.) | | | | |
| | **Automotive Plan. (N)** The French government unveiled measures aimed at shoring up the country's struggling auto industry without digging a deep hole in France's public finances or infuriating European antitrust authorities in July 2012. The plan centers largely on boosting French car sales by raising subsidies for electric and low-emission vehicles and penalizing gas guzzlers. (http://online.wsj.com/article/SB10000872396390443477104577548610207797268.html) | | X | | |
| | **Public Fleet. (N)** The French state will look to set the example in the drive to be greener by ensuring 25% of the cars it buys each year are electric or hybrid. Following that rule, the state will acquire between 40.000 and 50.000 of low- or zero- emission vehicles over four years (2012-2016). (http://online.wsj.com/article/SB10000872396390443477104577548610207797268.html) | | | | X |
| | **Cite VU Antibes – self-service system. (L)** The city of Antibes started a self-service system (Cite VU Antibes) to rent electric cars with cards. There are no designated parking stations, instead registered users can locate the nearest available vehicle by using their phone. The cars possess a GPS unit that makes the location available to the system. Users then have to pass a user badge and start rolling. The service includes 5 cars. The cars are quadricycles (that is, you need no driver's license to drive them). The car can't run on highways or national roads. (http://green.autoblog.com/2007/09/25/cite-vu-the-city-car-for-everybody/) | | | | X |
| | **Mopy - carsharing. (L)** The carsharing project Mopy was introduced in Neuilly-sur-Seine in 2010.This service is particularly focused at professionals but will also be open to individuals. Launched by Bruno Flinois, Mopy was developed in collaboration with GDF-Suez. Three cars were to be available from the first of March 2010. Mopy has the goal to grow with ten vehicles a month. Access is possible via Mopy. There are three services the project offers, sharing within a company, sharing with other professionals and hourly rental station. (http://www.cleantechrepublic.com/2010/01/11/mobilite-propre-mopy-neuilly/) | | | | X |
| | **Autolib Paris. (L)** In 2011 the project Autolib in Paris was launched. The project consists of a fleet of 3.000 electric vehicles that customers can pick up and drop off at rental stands located around the city of Paris. (www.ieahev.org) | | | | X |
| | **Electric Minis (Paris). (L)** EDF and its partners BMW France, Veolia Environment and INRETS started electric Mini field trials in Paris in the autumn of 2010. A total of 50 Mini EV's was tested by private individuals and companies. 50 volunteer candidates were recruited via the www.MINI.fr. The Mini E pioneer users will pay €475 a month for six months to take part in the field trial. This leasing fee includes insurance and accounts for the restrictions due to the trial. (http://research.edf.com/pioneering-projects/electric-mobility/) | | | | X |

*Table 41. Findings on EV value chain for France*

| *Policy instruments* | *Grid-centric policy (charging-infrastructure Value chain)* | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | *No legal instruments found.* | | | | |
| Financial | **R&D and demonstration projects. (N)** The France government announced to dedicate € 400 million for R&D and demonstration projects over 2008-2012 on low carbon vehicles. This budget covers many R&D and demonstration activities for the development of vehicles and charging infrastructure. (http://www.icarsnetwork.eu/download/NewsEvents/itre_ep_report_electric_cars.pdf) | X | | | |
| | **Strategic vision to deploy CI. (N)** To deploy nationwide Charging Infrastructure, the French government set up a strategic vision. This vision includes the funding by the central government of half of the cost for local governments that install public Charging Infrastructure and reserving a quota of parking areas in work places and shopping areas for electric vehicles and charging spots. (www.ieahev.org) | | X | | |
| | **ADEME Pilot Scheme (Investments for the future). (N)** The French government is convinced that the only way to create a national strategy on Charging Infrastructure is to stimulate the build of charging infrastructure through support (financial) by the state. Therefor 7 pilots were selected by ADEME in September 2012, which would receive a governmental funding of 900,000 Euros up to 3,8 million Euros. Because of the cooperation between the state and French companies, the total budget is 40 million Euros of which 16 million is invested by the government. (http://nost-france.org/2012/11/06/)<br>• **Infini Drive. (R)** Infini Drive is a project of La Poste and ERDF which wants to develop a standard charging device for car fleets of companies and local governments. ADEME funds 3.4 million to a total budget of 9.09 million Euros. Other participants are for example G2 Mobility, Ecole des Mines de Nancy and the Universities of Nice and Toulon. The experiment started in September 2012 in Nice but will be spread to Grenoble, Nantes and Paris. (http://nost-france.org/2012/11/06/)<br>• **Mov'eo TREVE. (R)** The project Mov'eo TREVE is coordinated by LCIE Veritas for the development of a global supply of tests and certifications for Charging Infrastructure and started at the end of 2012. The goal is to create a platform at the site of IFSTTAR (knowledge center) in Versailles, which will create one place which provides the opportunity to test, certificate and industrialize Charging Infrastructure. In the beginning the label 'EV Ready' will be used (develop by Renault and Schneider Electric). The budget is 9.8 million Euros of which 3.9 is provided for by ADEME in subsidies and/or loans. (http://nost-france.org/2012/11/06/zeven-franse-oplaadinfrastructuurpilots-krijgen-financiering/)<br>• **TELEWATT. (R)** TELEWATT is coordinated by Citelum. The project aims at creating a Charging Infrastructure through the existing public light network in a city. When the Charging infrastructure is connected to the light infrastructure, there is no need for large scale building infrastructure because the infrastructure is already there. It only has to be adapted to be used as Charging Infrastructure. ADEME funds 1.6 million Euros of the total budget of 3.5 million Euros. This Pilot will take 18 months and will be executed in the area of Aix-en-Provence. (http://nost-france.org/2012/11/06/zeven-franse-oplaadinfrastructuurpilots-krijgen-financiering/)<br>• **VERT. (R)** VERT has the goal to test the Charging Infrastructure on the island of Réunion which runs on solar energy. According to the French law, is the island allowed to be dependent on sustainable energy for only 30 percent so they can make sure that there is always enough supply for the island. This project uses the solar energy directly and not through a network. Partners of the project are Renault, Total, Schneider Electric and the University of Réunion. ADEME funds 1.6 million Euros of the total budget of 3.7 million Euros. The project started in 2012. (http://nost-france.org/2012/11/06/zeven-franse-oplaadinfrastructuurpilots-krijgen-financiering/)<br>• **EVER. (R)** The EVER project runs in La Rochelle and is coordinated by Veolia Environment. The project has the goal to create fast charging points which will be used by local governments for car sharing systems. With three large fleet companies (EDF, ERDF and VeoliaTransdev) new business models are tested. Other partners involved in this project are Citelum, Bertin Technologies, EVTronic and the EIGSI school. The budget | X | X | | |

| | | | | | |
|---|---|---|---|---|---|
| | is estimated at 3.7 million Euros of which 0.9 million is funded by ADEME. The project will run for 3 years. (http://nost-france.org/2012/11/06/zeven-franse-oplaadinfrastructuurpilots-krijgen-financiering/)<br>• **EGUISE. (R)** The project EGUISE is coordinated by the company DBT which is the leader on the French Charging Infrastructure market. The goal of the project is to develop a smart system with which it is possible to predict the need for services and energy for Charging Infrastructure for EV's. The project aims to create an ecosystem with several technologies with different goals. Like charging points with an energy exchange system (two ways), wireless and cable, loading through induction and other technologies. Within the EGUISE project, three pilots started in Bretagne and Pays-de Loire, one fleet for local government, one fleet for a company and a car sharing system. Partners of the project are Induct, Shrepa Engineering, Loustic and Telecom Bretagne. The total budget of the project is 4.7 million Euros. ADEME funds 2.1 million Euros of the total budget. (http://nost-france.org/2012/11/06/zeven-franse-oplaadinfrastructuurpilots-krijgen-financiering/) | | | | |
| Communication | *No instruments of communication found.* | | | | |
| Organization | **Strategic vision to deploy CI. (N)** To deploy nationwide Charging Infrastructure, the French government set up a strategic vision. This vision includes the requirement that builders of multi-unit residences must install charging facilities at parking places upon request of the inhabitants. (www.ieahev.org) | | **X** | | |
| | **The Recharge Infrastructures Working Group for electric vehicles (GT IRVE). (N)** The Recharge Infrastructures Working Group for electric vehicles (GT IRVE), placed under the supervision of the Ministry for Industry, is responsible for consultation and coordination with sector professionals. (http://www.invest-in-france.org/Medias/Publications/1615/cp-low-carbon-vehicles-france.pdf) | | | **X** | |
| | **SAVE (Seine Aval Véhicules Electriques). (R)** In the Yvelines department west of Paris, the fleet test SAVE was started in April with a number of 200 charging stations. The total budget of the program was 23 million Euros. (www.ieahev.org) | **X** | | | |

*Table 42. Findings on Charging infrastructure value chain for France*

| ***Policy instruments*** | ***Vehicle & Grid*** |
|---|---|
| Families of instruments | Network |
| Legal | **Vision. (N)** The French Government, represented by the Ministry for the Environment, Energy, Sustainable Development and the Sea, has proposed the widespread use of BEV's and PHEV's as a means of addressing concerns about the climate, local air pollution as well as mitigating the effects of an increasing number of vehicles on the roads. Combined with the largely decarbonized electricity produced in France, EV use is seen as a boon for the environment by the French government. (Tsang, F., Pedersen, J. S., Wooding, S., & Potoglou, D. (2012). vehicle to the mass Market, a review of barriers, facilitators. RAND Europe.) |
| Financial | **National Strategy 2009. (N)**<br>• In 2009, former French Sustainable Development Minister Jean-Louis Borloo launched a strategy aimed at fostering a domestic electric vehicle market. The government pledged 1,5 billion Euros to replace two million combustible engines with EV's and Hybrids and to build an EV recharge network compromising 400.000 public and four million private terminals by 2020. The funding, spread across a 14 point plan, was to be deployed from 2010-2015. (www.ieahev.org)<br>• One of the 14 points in the national strategy plan 2009 was that in 2010, ADEME would establish mobility solutions looking at developments in transportation based on new technology and service – this has a budget of 25million euros. (http://www.thegreencarwebsite.co.uk/blog/index.php/2009/10/05/france-unveils-14-point-plan-for-electric-cars/) |
| | **Eleven Research Projects. (N)** In June 2009 eleven research projects aiming to lower the carbon emissions of cars were chosen as part of a first call for expressions of interest in the demonstration fund that the Ademe are supporting with 57m euros. This research effort is preparing the way for the emergence of low CO2 cars. (http://www.developpement-durable.gouv.fr/IMG/pdf/Grenelle_Loi-2_GB_.pdf) |
| | **Project Investments for the future. (N)** In 2010 the program Investments for the future was created under the National Loan Plan. This research is designed to go beyond demonstration by providing companies with the support they need to pilot new technology into the experimental phase and validate it prior to commercialization. The total budget for the Investments for the future plan were 35 billion Euros. (www.ieahev.org) |

| | |
|---|---|
| | **ADEME Pilot scheme CROME. (R)** Crossborder Mobility for EV's. This project which started in 2011 and will run until the end of 2013 consists of two parts. The first part focuses on the preparation to have the vehicles and the underlying infrastructure in place, the second part performs the actual operational field test, with more than 100 EV's in place. Because mobility is not locked within the borders of one country, the French and German government have set up this project in the Elzas and Baden-Wurttemberg. ADEME funds 1,5 million Euros of the total budget of 6,4 million Euros. The project will run for three years. (http://blog.bosch-si.com/crome-emobility-rolls-cross-border/) |
| Communication | *No instruments of communications found.* |
| Organization | **Automotive Clusters. (N)** France has four automotive clusters which have the goal to develop cooperation and create synergies. They also have the aim to develop regional competitiveness of businesses through innovation. The cluster is the regional grouping together of companies, research centers and Training centers. The four clusters in France are: Mov'eo, ID4Car, Vehicles for the future and Lyon Urban Truck and Bus. (http://www.id4car.org/en/aboutus.aspx)<br>• **ID4Car. (R)** ID4Car is one of the four automotive clusters in France and was founded in 2006. The goals of the cluster are: to develop the employment with high added value, support the competitiveness of the Vehicles sector by increasing the effort of innovation, consolidate on the territory activities with high technological content or of creation and to increase the attractiveness of the territory, thanks to a national visibility. To do this, iDforCAR introduces and supports the projects concerning these goals. The cluster has financed 42 projects, certified 75 project and has 170 members. (http://www.id4car.org/en/aboutus.aspx)<br>• **Véhicule du Futur. (R)** The purpose of the Véhicule du Futur cluster is to grow jobs in its regions in the automotive and mobility sectors. The cluster was established in 2005. The strategy of the cluster is to create solutions for tomorrow's vehicles and mobility systems with a view to achieving sustainable development for the territories. The key priorities of the cluster are innovation, competencies and international networking. The cluster has funded over 100 project for a total budget of 307 million Euros. The cluster was involved in 19 European projects and has 9 premium members. (http://www.vehiculedufutur.com/EN/the-cluster/objectives-strategic-positioning.html)<br>• **Lyon Urban Truck and Bus. (R)** Founded in 2005 Lyon Urban Truck & Bus is, in Europe, the only cluster focused on the key environmental, societal and economic issues formed by the system of people and goods transport in urban areas. The division develops LUTB dynamics of innovation by bringing the industry players, research and education together while strengthening the sharing of skills, knowledge and equipment. The cluster has 175 members, approved 133 projects and financed 64 projects. (http://lutb.fr/?lang=en)<br>• **Mov'eo. (R)** With the aim of becoming a world reference competitiveness cluster in automobile and public transport R&D, Mov'eo forecasts developments in clean technologies, decarbonized vehicles and life cycle assessment. The cluster was founded in 2006 and is based in the Lower and Upper Normandy and Greater Parisian area (Ile-de-France). The cluster has registered 291 R&D projects of which 148 have received public sector support to the amount of 310 million euro and has 333 members. (http://www.pole-moveo.org/EN/index.php) |
| | **The Rouen Region. (R)** The Rouen Region has made the first step towards the introduction of electric vehicles on the road. The Rouen Region signed a deal with Renault, Schneider Electric, ERDF (electricity network manager), EDF and E. Leclerc (Supermarket Leclerc) for a pilot. Renault will provide for 23 EV's. Several charging points will be created. The region is being prepared for the introduction of the EV at the end of 2011. (http://www.agentschapnl.nl/nieuws/frankrijk-renault-start-grootste-test-tot-nu-toe-met-elektrische-voertuigen) |
| | **Renault-Nissan and EDF Energy cooperation. (R)** Renault-Nissan and EDF Energy started a trial project. The project, which will receive 6.5million Eurosin funding from ADEME (the French Environmental and Energy Management Agency), will see 100 Renault and Nissan vehicles tested by individual customers and professionals with users provided with charging infrastructure at home and in the workplace, as well as on public roads, in car parks and with battery switch stations from Better Place and will run in the department Les Yvelines. Schneider Electric will also be involved. It will build the charging infrastructure and related energy management mechanisms; while Better Place will install and manage the battery switch stations and test the associated commercial offerings. The deal between Renault-Nissan and EDF Energy was signed in 2010. (http://www.thegreencarwebsite.co.uk/blog/index.php/2010/04/15/electric-vehicle-trial-to-take-place-in-france) |
| | **Auto Bleue Nice. (L)** Auto Bleue is a public service operated by a delegate appointed by the Urban Community of Nice Côte d'Azur following a tender. The service is operated by VENAP, a subsidiary of the Veolia Transport and EDF groups. Auto Bleue is a system that lets their members rent a self-service car, quickly and easily, 24 hours a day, 7 days a week, available by making a reservation online, at the agency or by phone. Auto Bleue has 42 stations and 126 cars throughout the Metropolis Nice Côte d'Azur. New Auto Bleue stations will be built soon and the members will shortly have access to 70 stations and 210 cars. (http://www.auto-bleue.org/index.php?option=com_content&view=category&layout=blog&id=2&Itemid=2&lang=en) |
| | **Yelomobile La Rochelle. (L)** In 1999 the first self-service electric car project started under the name Liselec. Since 2006 this service is provided by PROXIWAY (part of the group Veolia Transport). In May 2010 all the mobility services were grouped together under the name Yelo. At the same time Liselec became Yelomobile and the service was improved. In |

| | |
|---|---|
| | 2010 Yelomobile service has 450 users and 50 electric cars and 7 charging stations. In 2011 6 new stations were build and the fleet was renewed. (http://www.finpro.fi/documents/) |
| | **Strasbourg. (L)** In Strasbourg in 2010 a project was started. This project tested 100 Toyota Prius plug-in electric vehicles with 135 recharging spots. The program is financially backed by the French Environment and Energy Management Agency (ADEME). (www.ieahev.org) |

***Table 43. Findings on Network for France***

### *5.3.11.Italy*

| ***Policy instruments*** | ***Vehicle-centric' policy (EV Value chain)*** | | | | | |
|---|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | **Low Emission Zones. (R)** LEZ's are areas or roads where the most polluting vehicles are restricted from entering. The vehicles are banned or in some cases charged. In Italy many cities and region participate in the LEZ's. For example Rome and Genova. (http://nl.lowemissionzones.eu/) | | | | X |
| Financial | **Industry 2015 Project. (N)** The INDUSTRY 2015 project launched in 2008 to fund industrial innovations and reached fully operational status in 2010. At the end of 2010, 29 projects involving a variety of technologies in the transport sector were finally approved and granted with a total budget in excess of €450 million, of which about €180 million came from public funding. The topics of individual three-year projects include the electrification of vehicles of different sizes, ranging from 2-wheeled vehicles up to public transport buses. (http://www.ieahev.org/by-country/italy---research/) | X | | | |
| | **LIVE. (N)** The LIVE project is coordinated by IVECO, one of the largest European manufacturers of heavy-duty vehicles and commercial vans. The project involves the development of light-duty transport vehicles with different drivetrains, including one with a hybrid configuration. The total budget is close to €31 million. (http://www.ieahev.org/by-country/italy---research/) | X | | | |
| | **ZEROFILOBUS. (N)** This project, coordinated by Breda Menarini, aims at developing and validating an innovative approach to public buses, integrating them into a complete transport system. Electric buses are charged at stations during each temporary stop using fast storage systems (supercapacitors or high-power batteries). The total budget is close to €12 million. (http://www.ieahev.org/by-country/italy---research/) | X | | | |
| | **Subsidy. (N)** The incentive for purchasing a new car running on electricity is f € 1.500. This is increased to € 3.000 if it emits exactly 120 g/km and to € 3,500 if it emits less than 120 g/km. (http://www.acea.be/images/uploads/files/20091014_EV_incentives.pdf) | | | | X |
| | **REBATE. (N)** The Italian government has set out subsidies for electric cars, with a three-year plan to give fleet buyers a purchasing incentive of up to 5.000 euros. It's timely, because European electric car sales haven't exactly shot out of the gate. It is estimated that the incentive would cost a total of EUR420m in the three years. The incentive will run until 2015. (http://www.plugincars.com/big-italian-subsidy-could-jump-start-slow-ev-sales-123535.html) | | | | X |
| | **Vehicle circulation Tax. (R)** Five years exclusion from vehicle circulation tax for the purchase of an electric vehicle is in place in Lombardia and Piomont. After these five years Eva owners get a 75 % tax reduction. (http://www.teslamotors.com/incentives/IT/) | | | | X |
| Communication | *No instruments of communication found.* | | | | |
| Organization | **KEMET. (N)** Since 2008 the company KEMET is producing PHEVS battery assembly systems. The company is producing battery equipment since 1986. KEMET is a partner in the Greenlion project which is a Large Scale Collaborative Project within the FP7 leading to the manufacturing of greener and cheaper Li-Ion batteries for electric vehicle applications via the use of water soluble, fluorine-free, high thermally stable binders, which would eliminate the use of VOCs and reduce the cell assembly cost. (http://greenlionproject.eu/homepage) | X | | | |
| | **CUNA. (N)** CUNA (Commissione Tecnica di Unificazione nell'Autoveicolo) provides support to standards definition for EVs, HEVs and battery modules and | | | | X |

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| | systems at the International Organization for Standardization level. (http://www.ieahev.org/by-country/italy---research/) | | | | |
| | **MUSS. (N)** The MUSS project, coordinated by Piaggio, one of the leading manufacturers of scooters and motorbikes, aims at clean and safe small vehicles, also using electric and hybrid drivetrains. The total budget is close to €21 million. (http://www.ieahev.org/by-country/italy---research/) | | | | **X** |

*Table 44. Findings on EV value chain for Italy*

| ***Policy instruments*** | ***Grid-centric policy (charging-infrastructure Value chain)*** | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | **Urban plan and buildings. (N)** In Italy all new (and restored) not residential sites with more than 500m2 size must install EV charging points. All local laws must also be updated to comprehend EV charging points as a priority installation within public and private buildings. http://www.cars21.com/news/viewprintable/4830 | | **X** | | |
| Financial | *No financial instruments found.* | | | | |
| Communication | *No instruments of communication found.* | | | | |
| Organization | **ENEL DRIVE. (N)** Enel Drive is a series of pilot projects looking to develop a 'smart' charging infrastructure network. Enel's smart meter technology was placed at the heart of the charging infrastructure, making it as efficient for user and provider as it is for the 32 million Italian households using the system at home. | **X** | | | |
| | **E-Mobility Italy. (N)** The objective of E-mobility Italy is to support the diffusion of electric vehicles by providing cities with the adequate infrastructure to develop more sustainable urban mobility. In 2008 Enel and Daimler launched the project which involved 140 Smart For two Electric Drives, vehicles that use lithium-ion batteries capable of covering 135 km, to meet the mobility needs of citizens in urban areas. The project, which was first implemented in Pisa, Rome and Milan, is now gradually reaching other cities in Italy. (http://www.enel.com/en-GB/innovation/smart_grids/electric_vehicles/emobility_italy/) | | | | **X** |
| | **Memorandum of Understanding. (R**) In December 2010 Enel signed a Memorandum of Understanding with the Emilia-Romagna region and Bologna, Rimini and Reggio Emilia city councils, which was broadened in 2012 to include the cities of Piacenza, Cesena, Ferrara, Forli and Ravenna. This agreement will see the installation of a charging station system, complete with interoperability technology, that does not bind customers to charging stations in their own city or run by their electricity supplier. In April 2012 Enel signed another Memorandum of Understanding, this time with Acea and Rome City Council that will see the installation of 200 charging columns, of which half will be installed by Enel and the rest by Acea. They will be equipped with technology that ensures interoperability between the two companies' infrastructures, and will be the largest urban charging network in Italy. | | **X** | | **X** |
| | **PRIME Project. (L)** In 2011 a new Electric Vehicle project through the P.R.I.M.E. Project was announced. The €1,300,000 project is being overseen by Mercedes-Benz Italia, Enel Ingegnerie a Innovazione and the University of Pisa. The goal of the project is to develop the e-mobility platform which is testing innovative recharging infrastructure in the cities of Rome, Milan, Pisa | **X** | | | |
| | **E-Moving. (L)** The pilot project, "E-Moving," represents the first electric vehicle (EV) experimentation in Italy and will begin in June 2010 in the cities of Milan and Brescia, and is scheduled to run for one year. According to the press release, the two cities will be the first in Italy to gain a complete, innovative charging infrastructure with 270 charging points for the mobility of EV's. | | **X** | | |
| | **Autosole. (L)** The project Autosole was established in Italy by several participating city councils. This project involved building a parking garage of which the roof consists of solar panels with which Electric Vehicles can be charged. | | **X** | | |

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| | **Milan E-Moving. (L)** The Milan E-Moving project is a joint project of Milan and Brescia municipalities together with electric utility A2A and Renault-Nissan. 200 recharging points will be installed in Milan and 70 in neighbor city Brescia. The pilot phase of the project ends in June 2011: 60 electric cars with lithium batteries. During the pilot phase A2A will offer for the user's unlimited flat subscription for recharging. After the pilot phase the recharging stations will be municipality's property. | | | | **X** |

*Table 45. Findings on Charging infrastructure value chain for Italy*

| ***Policy instruments*** | ***Vehicle & Grid*** |
|---|---|
| Families of instruments | Network |
| Legal | *No legal instruments were found.* |
| Financial | **Industry 2015. (N)**<br>• Easy rider is a System for the integration of road infrastructures, vehicles and services to improve info mobility and road safety as a support to sustainable mobility. This project was funded through the Industry 2015 project.<br>• Pegasus is a Project for the management of mobility with info-telematics systems for urban context, aimed at passenger, vehicle and goods safety. The project is funded through the Industry 2015 project.<br>• Log on is an innovative platform for mixed management, between public administration and private subjects, of local public services for logistics in metropolitan areas. This project was funded by the Industry 2015 project. |
| | **ISERNIA. (N)** The goal of the ISERNIA project is to demonstrate, under real field conditions, new telecommunication technologies aimed at testing a series of Smart Grid technologies (including storage systems). The project is funded by ENEL with 6,9 Million Euros. |
| Communication | *No instruments of communications found.* |
| Organization | **CIVES. (N)** CIVES (The Italian Electric Road Vehicle Association) is the national member organization of AVERE. CIVES is a non-profit organization, incorporated as a Special Commission of the Italian Electro technical Committee. The organization is responsible for the Italian technical standards in the electro technical field and electronics. |
| | **Italian Electrified Mobility Technological Platform. (N)** A National Platform for the Electric Mobility was started in 2010 with the participation of about 100 stakeholders (industries, research organizations, and academia) with the scope of elaborating a strategy and long-term actions. The Italian Electrified Mobility Platform aims to proactively define the innovation needs for effective urban mobility, to help Italian industry provide new products and national infrastructures, and to coordinate European national efforts. The plan would be implemented over the next 5 to 10 years. |

*Table 46. Findings on Network for Italy*

### 5.3.12.Spain

| ***Policy instruments*** | ***Vehicle-centric' policy (EV Value chain)*** | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |

| | | | | | |
|---|---|---|---|---|---|
| Legal | **Energy classification system of vehicles. (N)** Spain has introduced a so-called energy classification system of vehicles. The system is based on the European Directive 1999/94 CE and its adoption of the national legislation. Article 3 of this Royal Decree establishes the compulsory affixing of a label to official fuel consumption and CO2 emissions clearly visible in each new passenger car model. According to that, there is a classification in seven classes (from A to G) related to the relative consumption compared to other vehicles of the same category (the category is set up by size in terms of area). (http://www.cleanvehicle.eu/de/institution/member-states/spain/national-level/) | | | | X |
| Financial | **Registration Tax. (N)** In Spain the registration tax is based on CO2 emission. Rates are classified as follows: 0% up to 120 g/km CO2 emission, 4.75% between 121 g/km and 160 g/km CO2 emission, 9.75% between 161 g/km and 199 g/km CO2 emission, 14.75% equal and higher 200 g/km CO2 emission. (http://www.cleanvehicle.eu/de/institution/member-states/spain/national-level/) | | | | X |
| | **Loan. (N)** Purchasers of a new car emitting maximum 140 g/km and costing maximum 30.000 EUR can obtain an interest-free loan up to 10.000 EUR if they have a car that is 10 years old and more (or has a mileage exceeding 250,000 km) scrapped simultaneously. (http://www.cleanvehicle.eu/de/institution/member-states/spain/national-level/) | | | | X |
| | **Grant. (N)** The so called Plan 2000E was launched by the Spanish government in May 2009. Its aim is stimulating the motor industry. The government has set aside 100m EUR for a 12 month period to boost sales and manufacturing in the car industry. Purchaser of new cars emitting less than 149 g/km CO2 receive an incentive of 2,000 EUR (50% of which is paid by the car manufacture) if they have a car that is 10 years old and more (or has a mileage exceeding 250,000 km) scrapped simultaneously. 500 EUR of the grant comes from the government, 1,000 EUR from the manufacturer and 500 EUR from the Spanish automobile club CCAA. At the beginning of February 2010 the project listed 268.793 car sales. The government has extended the project until the end of 2010 with a budget of additional 40m EUR. (http://www.cleanvehicle.eu/de/institution/member-states/spain/national-level/) | | | | X |
| | **Rebate. (N)** Municipalities having more than 50,000 inhabitants (145 cities) have 20% subvention in the acquisition of electric cars (max. 6.000 € / EV). This implies a total amount of 240 million Euros. (http://www.finpro.fi/documents/10304/1f7f5cd7-8911-4624-abe5-6639361f7ceb) | | | | X |
| | **Movele Electrical Mobility. (N)** In 2010 the Ministry of Industry, Tourism and Trade has announced a plan for stimulating the purchase of electric vehicles with a budget of 8m EUR. The aid will range between 750 and 20,000 EUR depending on the type of vehicle (motorcycle, car, bus or truck). The fund will cover between 15% and 20% of the price of cars depending on their energy efficiency. To qualify for this aid buyers must contact a seller or choose any of the vehicles stated in the catalogue published on the website of the Institute for Diversification and Saving of Energy. (http://www.cleanvehicle.eu/de/institution/member-states/spain/national-level/) | | | | X |
| | **Rebate. (R)** In Andalusia buyers of EV's receive a 70% rebate when purchasing an EV. (http://www.cleanvehicle.eu/de/institution/member-states/spain/national-level/) | | | | X |
| | **Rebate. (L)** In Aragon, Asturias, Baleares, Madrid, Navarra, Valencia, Castilla la Mancha, Murcia, Bastilla y Leon buyers of EV receive 2.000 EUR for purchasing a Hybrid and 6.000 EUR for electric vehicles. (http://www.cleanvehicle.eu/de/institution/member-states/spain/national-level/) | | | | X |
| Communication | *No instruments of communications found.* | | | | |
| Organization | **CENIT VERDE. (N)** Cenit Verde is a technological collaboration of 15 companies and 14 universities with the goal to develop the technologies and components of hybrid and electric vehicles. The total budget of this project is about 40 million Euros. (http://www.rijksoverheid.nl/documenten-en-publicaties/) | X | | | |

*Table 47. Findings on EV value chain for Spain*

| Policy instruments | Grid-centric policy (charging-infrastructure Value chain) | | | | | |
|---|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | *No legal instruments found.* | | | | |
| Financial | **Movele. (L)** The Movele project also provides for 1,5 million Euros in funds for installing infrastructure in Madrid, Barcelona and Sevilla. (http://www.agentschapnl.nl/sites/default/files/) | | X | | |
| | **SUPER VALLEY. (N)** The national government has created a "super valley" tariff to promote re-charging at night. (http://www.finpro.fi/documents/10304/1f7f5cd7-8911-4624-abe5-6639361f7ceb) | | | | X |
| Communication | *No instruments of communications found.* | | | | |
| Organization | **E4. (N)** The national governments institute for Diversification and saving of Energy (ID AE) and Spanish regional administrative governments made agreements to support actions that improve improves energy efficiency in various sectors. One of these agreements concerns charging infrastructure. (www.ieahev.org) | X | | | |
| | **Collaboration. (N)** In 2011 and 2012 the IDAE (Instituto para la Diversificacion y Ahorro de la Energia) and regional governments support the implementation of charging infrastructure. (http://www.rijksoverheid.nl/documenten-en-publicaties/) | | X | | |

*Table 48. Findings on Charging infrastructure value chain for Spain*

| Policy instruments | Vehicle & Grid |
|---|---|
| Families of instruments | Network |
| Legal | **Privileges. (L)** Privileges for urban use: (provided and financed by municipalities with population of + 50.000 (guidance by IDAE & MOVELE): Preferential lanes and parking, Permitted to circulate in otherwise restricted areas, Larger time frame for re-charge/discharge, Decreased traffic tax, Dedicated spaces for rapid re-charge of public emergency vehicles (police, ambulances, etc.) and Dedicated spaces for re-charging of taxis. (http://www.finpro.fi/documents/10304/1f7f5cd7-8911-4624-abe5-6639361f7ceb) |
| Financial | **E4 strategic Projects. (N)** In 2003, Spain's policies to promote electric vehicles have been developed within the framework of its commitments to meet international goals. In consideration of these commitments, the Spanish strategy for Energy savings and Efficiency 2004-2012 (E4) was set up. This plan includes the promotion of alternative fuels and alternative vehicle technologies as a key strategic line. The Spanish government has earmarked 120 million Euros to strategic projects. (http://www.ieahev.org/by-country/spain-policy-and-legislation/) |
| | **Official Credit Institute (ICO). (N)** In 2009 the Ministry of Development signed an agreement with the Official Credit Institute (ICO) to implement the funding line of Bus Plan VIVE 2010. The plan aims to encourage the replacement of vehicles ten years and older with newer, safer and cleaner vehicles that are more energy efficient and accessible for people with reduced mobility. Since September 2009, when the first operation was performed credit, 271 operations under this Plan have been carried out, involving an investment of 48.4m EUR with a contribution of nearly 32 mill EUR from the Ministry of Development. (http://www.cleanvehicle.eu/de/institution/member-states/spain/national-level/) |
| | **INNO PLANS. (N)** From 2009, seven projects linked to Electric vehicles program Inno Plans of the Ministry of Science and innovation started with a total budget of 13.8 million Euros. This framework was called INNO PLANS**.** 4 projects are within the framework of supporting programs for collaborative activities between research entities and private companies (INNOPACTO). One project within the framework of supporting programs for technological centers (SGCTDE) and 2 projects are within the framework of supporting programs for |

| | |
|---|---|
| | strategic projects (SGECCP). (http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2012/07/23/elektrisch-vervoer-in-nederland-in-internationaal-perspectief.html) |
| | **Plan Avanza. (N)** The promotion of information and communication technologies (ICT)-related EV's is considered within the framework of ''Plan Avanza'' through incentive programs and financing support. Twelve projects related to EV's were supported in the period 2009-2010. The incentives amounted to a total of 2,8 million Euros. (https://www.planavanza.es/informaciongeneral/executive/Paginas/ExecutiveSummary.aspx) |
| Communication | **Conference. (N)** On June 30th 2010 AVELE organized an Electric Vehicle Power Conference. ( http://www.avele.org/index.php?view=details&id=4%3Apower-conference-vehiculo-electrico&option=com_eventlist&Itemid=14) |
| Organization | **AVELE. (N)** AVELE is the national organization which is part of the worldwide organization AVERE. Through its collaboration with AVERE (European Association for the Promotion of Electric Vehicles), AVELE involved in the construction of a network of knowledge and exchange of ideas and experience on the development of electric and hybrid vehicles in Europe. One AVELE objectives is to inform politicians of the latest developments in the industry and make significant progress in infrastructure and support this technology. (http://www.avele.org/index.php?option=com_content&view=article&id=1&Itemid=16) |
| | **Integral plan for the promotion of electric vehicles in Spain. (N**) The integrated Strategy for EV promotion established an initial target of 70.000 EV's being on Spanish roads by the end of 2012 and 250.000 being by 2014. These could be charged at 343.510 charging points throughout Spain. In April 2010, Spain s national government presented the integral plan for promotion of electric vehicles in Spain, which includes an ''Integrated Strategy for EV promotion in Spain 2010-2014, and ''Action plan 2010-2012 (plan Movele), which establishes a budget, responsibilities, and objectives for the short term. (www.ieahev.org) |
| | **ENDESA. (N)** Endesa is the leading company in the Spanish electricity sector and the largest private electricity multinational in Latin America. Endesa is fully involved in the government's E-Mobility Plan (MOVELE). (http://www.endesa.com/en/aboutEndesa/businessLines/principalesproyectos/Endesayelvehiculoelectrico) |
| | **ZEM2ALL. (N)** Málaga is the place where the international ZEM2ALL (Zero Emissions Mobility to All) project is being launched. This four-year, 60 million euro project spearheaded by Endesa in Spain will enable the mass market rollout of the new e-mobility services and benefits. The project aims to make e-mobility a reality through new services like recharging management, dual directionality of the load from the grid to the vehicle and back (V2G) and strategically-placed rapid charging points, all of which globally interconnected. (http://www.endesa.com/en/aboutEndesa/businessLines/principalesproyectos/Endesayelvehiculoelectrico) |
| | **COMPRO. (L)** The EU funded project COMPRO describes the joint procurement of hydrogen buses (engine with internal combustion) involving public transport of seven Spanish cities (Madrid, Barcelona, Valencia, Màlaga, Santa Cruz de Tenerife, San Sebastiàn and Pamplona). Each participant organization has agreed on to buy one or two buses. As the manufacture MAN was the only one building this technology there was no competition over the choice of the manufacturer. In terms of organization, each operator signed an agreement of principle to purchase the buses and the management of the consortium was delegated to one person appointed for the task for the cost of which was shared by the partners. (http://www.cleanvehicle.eu/de/institution/member-states/spain/national-level/) |

*Table 49. Findings on Network for Spain*

### 5.3.13. Portugal

| ***Policy instruments*** | ***Vehicle-centric' policy (EV Value chain)*** | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | **EV Access. (N**) Special EV access to priority lanes and exclusive circulation areas (defined at city level) (http://www.internationaltransportforum.org/Proceedings/Lisbon2009/3-Duarte.pdf) | | | | **X** |
| Financial | **Public Procurement. (N)** Annual renewal of state fleet with 20% of EV's from 2011 onwards. (Public Procurement. Annual renewal of state fleet with 20% | | **X** | | |

| | | | | | |
|---|---|---|---|---|---|
| | (http://www.internationaltransportforum.org/Proceedings/Lisbon2009/3-Duarte.pdf) | | | | |
| | **Corporate tax. (N)** Corporate tax deduction for fleets that include EV's (http://www.mobie.pt/en/veiculos) | | | | X |
| | **Vehicle acquisition and circulation tax. (N)** Exemption of EV's from vehicle acquisition tax and circulation tax (http://www.mobie.pt/en/veiculos) | | | | X |
| | **Scrappage Incentives. (N)** Incentives for buying an electric car may be as high as 6.500 euros if the new electric car replaces an end-of-life vehicle. (http://www.mobie.pt/en/veiculos) | | | | X |
| | **Subsidy. (N)** Direct incentive for EV acquisition of 5000 euro. Private customers that buy one of the first five thousand electric cars from 2010 onwards will be entitled to an incentive of five thousand euros. This incentive will be deducted directly by electric vehicles sellers without requiring any involvement by the buyer. (http://www.mobie.pt/en/veiculos) | | | | X |
| | **Municipal Fleet. (L)** Annual renewal of municipal fleet with 20% of EV's from 2011 onwards. (http://www.ieahev.org/by-country/portugal-policy-and-legislation/) | | X | | |
| | **Parking. (L)** Preferential parking areas for EV's in Urban centers. (http://www.internationaltransportforum.org/Proceedings/Lisbon2009/3-Duarte.pdf) | | | | X |
| Communication | **MOBILES. (N)** To create ICT-based solutions to support electric mobility; in particular, mobile-based applications with navigation systems for support. (http://www2.inescporto.pt/ip-en/news-events/press-releases/) | | | X | |
| Organization | **MOBI.CAR. (N)** Flagship project within the competitiveness pole for the mobility industries, which aims to fully engineer and design a light electric vehicle that embodies the green car revolution. (http://www.ieahev.org/by-country/portugal-research/) | X | | | |
| | **Nissan Leaf BEV's. (R)** In 2012 the Portuguese police recently purchased 8 Nissan Leaf BEV's (battery electric vehicles). They are to be operated by Polícia de Segurança Pública (PSP), which is responsible for policing large urban areas in the country. According to Nissan, it is the first police force in the world to utilize a fleet of electric vehicles. (http://cleantechnica.com/2012/07/23/portugese-police-adopt-8-nissan-leaf-electric-cars/) | | | | X |

*Table 50. Findings on EV value chain for Portugal*

| ***Policy instruments*** | ***Grid-centric policy (charging-infrastructure Value chain)*** | | | | |
|---|---|---|---|---|---|
| Families of instruments | Instrument | R&D | Production | Services | Customer |
| Legal | **LAW. (N)** Mandatory installation of electric mobility charging infrastructure in parking areas of new buildings from 2010. (http://www.internationaltransportforum.org/Proceedings/Lisbon2009/3-Duarte.pdf) | | X | | |
| Financial | *No financial instruments found.* | | | | |
| Communication | **App charging infrastructure. (N) The** 100% Portuguese application for the Android Smartphone will tell drivers where their closest battery changing or charging station is in real-time. The software can compare prices and import pre-defined routes. The application aims to help electric vehicle drivers, particularly on long haul journeys when the electric car will have to be charged. (http://www2.inescporto.pt/ip-en/news-events/press-releases/aplicacao-portuguesa-para-android-simplifica-carregamento-de-veiculos-eletricos/) | | | | X |
| | **LEMnet. (N)** The website LEMnet.org sites all charging stations in Europe. Therefore it is easy for customers to find a charging station in the area. The charging stations in Portugal are also added to the website. (https://play.google.com/store/apps/details?id=de.ralfz.android.lemnet&hl=nl) | | | | X |
| Organization | **MOBI.E Pilot Project. (N)**<br>• Research project for the full development of a large-scale national demonstrator with the following components: normal, fast, and home | X | X | | X |

| | | | | | |
|---|---|---|---|---|---|
| | charging solutions and an ICT platform for full network management (http://www.reuters.com/article/2010/10/19/us-portugal-renewables-cars-idUSTRE69I4G420101019)<br>• The nationwide pilot network included 976 recharging stations (968 normal and 8 fast chargers) for EV's spread across 25 cities as of end of 2011. (http://www.reuters.com/article/2010/10/19/us-portugal-renewables-cars-idUSTRE69I4G420101019)<br>• The MOBI.E charging network will include 1.300 normal and 50 fast charging stations at shopping centers, car parks, petrol stations and hotels in 25 towns and cities around Portugal. (http://www.reuters.com/article/2010/10/19/us-portugal-renewables-cars-idUSTRE69I4G420101019)<br>• Charging an electric vehicle through the MOBI.E charging network requires the use of a MOBI.E card, which will provide access to the charging stations. (http://www.mobie.pt/en/)<br>• The users of the MOBI E charging network can find the locations of the charging stations on the website of MOBI E. all charging stations in Portugal are listed on the website. (http://www.mobie.pt/en/postos-de-carregamento) | | | | |
| | **MERGE (N).** Development of a management and control concept that will facilitate the actual transition to electric vehicles; adoption of an evaluation suite of tools based on methods and programs enhanced to model, analyze, and optimize electric networks. (http://www.internationaltransportforum.org/Proceedings/Lisbon2009/3-Duarte.pdf) | **X** | | | |
| | **Siemens/Portugal. (N)** In 2011 Siemens has received a major order for its model Charge CP700A charging point from Portugal. As part of the Portuguese program to promote electromobility (MOBI.E), Siemens Portugal concluded a framework agreement for delivery of up to 300 charging points. A binding order for 100 of these charging points was placed immediately by the customer INTELLI, as the coordinator of the Portuguese program. (http://www.siemens.com/press/en/pressrelease/?press=/en/pressrelease/2011/power_distribution/epd201108096.htm) | | **X** | | |
| | **INOVGRID. (N)** INOVGRID aims at replacing the current LV meters with electronic devices called Energy Boxes (EB), using AMM (Automated Meter Management) standards. These EB are integrated in an automated third generation electrical grid (smart grid) in which network devices are placed (DTC) that will manage the EB through new TI/SI solutions by aggregating the gathered information and providing new services to consumers. INOVGRID started in 2007 and ran until 2011. (http://www.smartgridsprojects.eu/map.html) | | **X** | | |

*Table 51. Findings on Charging infrastructure value chain for Portugal*

| ***Policy instruments*** | ***Vehicle & Grid*** |
|---|---|
| Families of instruments | Network |
| Legal | **Zero Emission Mobility Agreement. (N**) On July 8th 2008 the Presentation of "Zero Emission Mobility "agreement between the Portuguese government and the Renault-Nissan alliance took place. (http://www.internationaltransportforum.org/Proceedings/Lisbon2009/3-Duarte.pdf) |
| | **Program for Electric Mobility in Portugal. (N)**<br>• On February 5th 2009 A Resolution from the Council of Ministers establishes a "Program for Electric Mobility in Portugal", managed under the responsibility of the Ministry for Economy and Innovation. The "Program for Electric Mobility in Portugal "will define the concepts, the service and business models for Electric Mobility, an adequate legal and regulatory framework, as well as the guidelines for the technical solution of the charging network and management system. (http://www.internationaltransportforum.org/Proceedings/Lisbon2009/3-Duarte.pdf)<br>• In the Program for Electric Mobility in Portugal was decided that the Government directly purchased 20 Electric Vehicles for awareness and advertising purposes. (http://www.internationaltransportforum.org/Proceedings/Lisbon2009/3-Duarte.pdf) |
| Financial | **Subsidy. (N)** Financing of pilot network infrastructure. (http://www.ieahev.org/by-country/portugal-policy-and-legislation/) |
| Communication | **APVE. (N**) APVE was involved in the Organization of the Road Show "VE2001 Portugal, Vehicles of Tomorrow... Today! ". In this road show, about 20 cities were visited, with local seminars and vehicle demonstration. (http://www.apve.pt/upload/conteudo_index/bus/docs/evs18.pdf) |

| | |
|---|---|
| Organization | **APVE. (N**) APVE is the Portuguese division of AVERE. APVE is a non-profit, nationwide association founded in 1999. Its mission is to promote the use of electric vehicles (Battery, Hybrid and Fuel Cell), an integrated transport policy and sustainable mobility. (http://www.avere.org/) |
| | **European Car Free Day. (N**) APVE actively participated in the organization of the event "In town, without my car!" which took part on September 22, 2000, in seven cities in Portugal (Lisbon, Oporto, Aveiro, Leiria, Beja, Évora and Sintra). In all above cities APVE was present, directly and also with its associate members, with EV's that were displayed and used by the public, and by central and local government officials. In addition, APVE officials also participated in conferences held in same cities, where EV's and alternative fuels and propulsion systems were analyzed, discussed and promoted. (http://www.apve.pt/upload/conteudo_index/bus/docs/evs18.pdf) |
| | **MOBI E. (N)** MOBI.E is coordinated by the Office for Electric Mobility in Portugal, GAMEP, and is supported by INTELI, a public think-tank. Many private companies, as EDP, Efacec, Novabase, Critical Software, Siemens and other stakeholders, have also contributed with the skills from their core businesses for the development of the MOBI.E Program. (http://www.automovilclubcr.com/pdf/MOBIE_explanation.pdf) |

*Table 52. Findings on Network for Portugal*

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# EPITOME: AN OVERVIEW OF OUR FINDINGS IN THE NSR-REGION

**This chapter provides an overview of the most important findings on the *ambition*, *structure*, *conduct* and *performance* of each studied NSR-country.**

## 1.1. Belgium

*Ambition*

Belgium's national government stated a short-term ambition to have 600 EV's in 2015. No ambitions for the charging infrastructure (short or long term) were found. According to the 'Masterplan for stimulating e-mobility,' this responsibility is left to local initiative.

*Structure*

The scores for structural conditions show favourable conditions for the introduction of e-mobility. The market environment and the operating environment score high-average. R&D intensity and energy prices are low under such conditions. Consumer readiness is also relatively high. However, low infrastructure-readiness makes introduction less favourable. The investments required in smart grids and sources for renewable energy, combined with the nation's relatively unreliable electricity grid and resulting outages, create unfavourable structural conditions for encouraging EV use in Belgium.

*Conduct*

One-third of policy actions in Belgium are financial in nature. Financial policy is often conducted by both the national government and regional governments. Most financial instruments are fiscal (i.e. bonuses for registrations based on emissions, income-tax measures and options for businesses to relieve cost of an EV against taxable profits). Most policy actions in Belgium are initiated by the regional governments of Walloon and Flanders. This differs from other countries studied where, in most cases, national governments initiate the larger share of policy actions. The Belgian national government initiates only one-third of all instruments (mainly financial / fiscal).

**Example: Mobimix.be.**
Digital platform for EV buyers, fleet controllers and other professionals: free information sessions, network meetings and newsletter on e-mobility, fleet management, fiscal instruments and smart mobility. Mobimix is an initiative of the Flemish government (regional level).

*Performance*

Compared to the other countries studied, both EV performance and infrastructure performance are lagging. Belgium scores below average on these indicators. In 2012, 730 vehicles were on the road in Belgium. This is the lowest number amongst all other EU-countries. EV introduction and EV sales-share are also below average in Belgium. Compared to other countries, the quantity of publicly available charging-stations is very low, numbering only 200 (2012). With 20 fast chargers, Belgium scores average.

## 1.2. Denmark

*Ambition*

Denmark has set ambitious goals for the future. In 2020 Denmark aims for 80.000 EV's. No (corresponding) ambition for the charging infrastructure was found.

*Structure*

The scores on the structural conditions show favourable conditions for the introduction of e-mobility. Consumer readiness and infrastructure readiness score above average. For instance, Denmark has more wind power per capita than any other country in the world. The operating environment and the market environment both score about average. However, the small automotive industry could mean that internal market gains from introducing EV's are small at best.

**Example: Low Emission Zones.** Low Emission Zones (LEZ's), 'Miljøzone' in Danish, were introduced in 2010 in Denmark. LEZs indicate that heavy-duty vehicles either have to meet the stipulated Euro standards or install particle filters. EVs have free access to these zones. Currently, there are five urban areas with LEZs, Aalborg, Arhus, Copenhagen, Frederiksberg and Odense.

*Conduct*

Overall, the policy in Denmark is mostly vehicle oriented. This vehicle-oriented policy is apparent from the high number of fiscal benefits. In addition, a large share of policy instruments focus on the research and development of e-mobility. Most policy measures are initiated by the national government; few are introduced by local governments.

*Performance*

The scores for EV performance (based on a comparative analysis with the other EU-countries) show a below-average score. Denmark's EV numbers and its EV sales-share lag behind other NSR countries. PHEV's have marginal sales in Denmark whereas, in the Netherlands for example, most EV sales are PHEV's. The Renault Fluence ZE sold relatively well throughout 2012 (making it the most-sold EV in Denmark). However, due to the Better Place program's bankruptcy, sales diminished in 2013. Better Place had been expected to install charging / swapping points all over the country. The exact number of realized charging stations isn't available. However, based on our records, Denmark had 280 charging stations available by the end of 2012.

## 1.3. Germany

*Ambition*

Germany has expressed strong ambitions. The goal is 1 million EV's by 2020 and 6 million EV's by 2030. Taking into account the current number of EV's, the nation will have to experience a strong, exponential growth in the years ahead. No ambitions for chargers were stated. However, given Germany's ambitious goals for increasing the number of EV's in use by 2020 and 2030, the number of anticipated chargers appears to fall short.

**Example: Show Windows Electromobility**. On April 3, 2012, the German government announced the four selected show windows that will each receive a maximum of € 50 million per region. The total public budget is 180 million Euros for the next 3 years. The show windows are structured with large demonstrations, along with testing of innovative developments on Electric Mobility. The show windows are follow-ups to the eight model regions for electric mobility. They are part of the Regierungsprogramm Elektromobilitat (national level).

*Structure*

The structural conditions in Germany are mostly favorable for the introduction of e-mobility. This is especially the case with regard to infrastructure readiness and consumer readiness, both of which are favorable. Germany has a considerable automotive industry, making it the largest producer of automobiles in all of Europe. These manufacturers have knowledge and expertise on vehicles and crucial parts for EV's like batteries. The situation is a win-win for Germany; for the German government, investing in

R&D corresponds with investing in the national economy and e-mobility.

*Conduct*

'Tax exemption' is regularly used as a policy tool in Germany. Despite the country's decentralized character, many national tools are being employed to support the introduction of e-mobility. In Germany, many steering instruments that support the infrastructure value-chain focus on the establishment of organizations and research programs. For instance, there exists a number of 'organization tools' at the regional level. This regional activity-level can be explained by the relatively high autonomy of the German 'Bundesländer' compared to other decentralized governments. The tools that German authorities employ most focus on costumers, research and development. Both national and decentralized governments are active policymakers. The conditions for the introduction of e-mobility are good, but given the nation's ambitious policy goals, receptive conditions alone will not make the task any easier.

*Performance*

On January 1, 2012, there were 4.541 EV's on the road. In 2013, an additional 6.711 EV's were sold. Like Denmark, the majority of EV's sold in Germany are BEV's (with the Smart for Two ranking highest on the nation's EV-sales chart). PHEV's have marginal sales numbers. However, taking into account car-sales totals in Germany, the sales-share for EV's is low compared to that of other countries. The same is true of the nation's general EV market penetration. As of January 1, 2012, there were 1.324 (semi-)public chargers and 613 private chargers installed in Germany, accounting for less than half of the nation's EV population.

## 1.4. Netherlands

*Ambition*

In its National Action Plan for Electric Mobility (2011-2015), the Netherlands sets goals to increase the 'number of EV's' and the 'number of charging stations' in the country. The Dutch government does not distinguish between BEV's and PHEV's in its plan for action. Its objective, by 2015, is to have 20.000 EV's. By 2020, the country hopes to have increased that number to 200.000, and then again by 2025, to 1 million EV's. Short-term ambitions are possibly threatened, however, by a recently ended exemption from 'additional tax liability' that applied to BEV's and PHEV's. As of January 1, 2014, when the exemption ended, a reduced tariff of 7% will apply instead. For 2013, the goal was to realize 10.000 public charging stations and 50 rapid charging stations. No long-term ambitions are indicated for the charging infrastructure.

**Example: National Action Plan for Electric Mobility (2011-2015).** In its plan, the Dutch government calculated the positive effects of reaching its goals, including the reduction of MTON's of CO2 emissions, air quality improvement, a reduction in the required number of oil barrels, etc.

*Structure*

The nation's operating environment and consumer readiness are especially favourable. The Netherlands is a relatively small country with little land-relief and a very dense population. The degree of urbanization is very high, the GDP per capita is amongst the highest in the EU and, due to tax measures, the Netherlands already has a high number of HEV's on the road (and hence familiarized consumers). Obstacles the nation faces include its (very) limited renewable energy production, its small automotive industry, and its R&D expenditure. But in spite of such threats, structural characteristics for mass market adoption seem solid. The greatest obstacle the nation faces for introducing e-mobility and encouraging mass market adoption lie primarily in its low R&D

expenditures and small automotive industry. This prompts questions of whether 'the market' is big enough to fully grow into prominence. In addition, barely any electricity in the Netherlands is generated from renewable sources. Although EV's don't emit tailpipe emissions, using 'dirty electricity' to power them could marginalize the total environmental benefits.

*Conduct*

Overall, the policy in the Netherlands is mostly vehicle-oriented. A great deal of steering instruments focus on connecting stakeholders in the EV / infrastructure value-chain (network). For example, one such instrument intensifies contacts between different stakeholders, in order to improve value-chain alignment and promote more efficient functioning for the entire value-chain. This high number of 'network instruments' is explained by the large number of project organizations / demonstrations projects in the Netherlands. Most steering instruments in the EV value chain focus on the 'customer'. Most policy-instruments found in the value-chain focus on the installation of (semi-)public charging points. Different levels of government are concerned with the installation of charging points. For instance, the four largest cities in the Netherlands signed an agreement to install 3.000 chargers between them.

In surveying the use of governmental tools in the Netherlands, 30% were determined to be financial in nature. Financial policy is often conducted by the national government and is mostly fiscal in nature (registrations-bonus based on emissions, income tax measures and opportunities for businesses to relieve the cost of an EV against taxable profits). These financial measures are based on C02 emissions and therefore target both PHEV's and BEV's:

| Financial incentive | Business | Private owner |
|---|---|---|
| MIA 36% (relieve cost of an EV against taxable profits | X | |
| KIA (relieve cost of an EV against taxable profits) | X | |
| VAMIL 75% (relieve cost of an EV against taxable profits) | X | |
| Exempt from Private Motor Vehicle and Motorcycle Tax | X | X |
| Exempt from additional tax liability (7% additional tax liability from 2014) | X | X[1] |
| Local subsidies (for instance in Amsterdam) | X | X |

***Table 1. Financial incentives in the Netherlands***

*Performance*

Together with Norway, the Netherlands shows a rapid growth in the number of EV's sold. By the end of 2012, about 7.500 EV's were registered. By the end of 2013 more than 30.000 EV's were registered (in the month of December, 25% of the cars sold were EV's). However, as mentioned previously, BEV's and PHEV's lost their tax-exemption status for 'additional tax liability' on January 1, 2014. As a result, we expect EV's total market-share to decrease. Given the relatively small number of cars in the Netherlands, EV penetration is very high. However, the total number of BEV's currently registered amounts to approximately 1/6 of the total number of 'EV's'. The number of charging-stations is high compared to other countries. However, when taking into account the 2013 goal for 10.000 publicly accessible charging stations and 50 rapid charging stations, we note that the number of (semi-)public

[1] Lease car drivers don't have to pay the additional tax liability for their car.

chargers is lagging (especially given the number of EV's sold). By the end of 2013, approximately 5.000 (semi-)public chargers were available.

## 1.5. Norway

*Ambition*

The Norwegian goal for 2020 is to have 200.000 EV's registered. Norway plans to have 5.000 Charging stations installed in the 'realization phase'. No long-term ambitions for charging infrastructure are set.

**Example: Gronn Bill**. Gronn Bill (Green Car) is an organization which was set up to facilitate the introduction of 200.000 EVs and PHEVs onto Norwegian roads by Energy Norway, Novatran, regional authorities and ZERO by 2020.

*Structure*

The structural conditions in Norway are among the least favourable of the countries studied. For each structural variable, at least one or more indicator scored below average. The operating environment takes into account weather conditions, the population density and the land relief; these indicators are unfavourable for the structure. The absence of an automotive industry, the high level of air quality and pollution, and the low level of investment into smart grid projects are considered unfavourable structural conditions. Also, there is an absence of the automotive industry and a low R&D intensity. This poses question as to whether 'the market' is big enough to grow in prominence. Norway, much like the Netherlands and Denmark, doesn't have a large automotive industry (compared to, for instance, Germany of France) which could benefit from the introduction of EV's. On the other hand, these countries don't have any large industry that might be threatened by the introduction of EV's, and consumer readiness in Norway appears favourable for the introduction of EVs. The GDP per capita is amongst the highest in the EU and, due to tax measures, Norway already has a high number of HEV's on the road.

*Conduct*

Overall, the policy in Norway is mostly vehicle-oriented. A quarter of policy action focuses on the infrastructure and another quarter on the network. Also interesting is the Norwegian government's involvement in partnerships with companies, research centres and governments to stimulate, promote, and support e-mobility. One such example is Norstart, the national department of AVERE. Norstart consists mainly of EV users and Norwegian EV industry and distribution companies.

*Performance*

Compared to the other countries studied, Norway scores well above average with 5.755 EVs sold in 2012. In 2013, 8.666 EV's were sold. The Nissan Leaf and the Tesla Model S where amongst the best selling cars in Norway in 2013 (the Nissan outsold the VW Golf in certain months). Again, unlike the Netherlands, most EV's sold were BEV's.

## 1.6. Sweden

*Ambition*

The ambition for the number of EV's in 2020 is 18.000. Sweden aims at the replacement of all cars by EV's in 2030.

**Example: launching customership and PPS.** In Sweden the government is very involved in the stimulation of electric vehicles. There is not just a specific energy agency (Vinnova) in which the Swedish government and the automotive industry cooperate. The Swedish government also stimulates the use of EVs through public procurements and sets an example through buying EVs for their own fleet.

*Structure*

Looking at the scores, we conclude that the structural conditions in Sweden are largely favourable for the introduction of e-mobility. However, the operating

environment is unfavourable for introducing the structure required. The low population density, the weather conditions and the below-average daily commute mileage could pose a threat to the introduction of EV's. Otherwise, the foundation and environment for mass market adoption appear established. Consumer readiness is especially favourable in Sweden. Average wealth and GDP per capita are above average. The R&D intensity and the propensity for governments to intervene received the highest score possible. Historically, Sweden also has a relatively high likelihood for government intervention. Sweden is amongst the highest NSR countries ranked on R&D intensity.

*Conduct*

Overall, Swedish policy is mostly vehicle-oriented. The focus on charging infrastructure is a quarter of expenditure totals. The focus on the network comes in last. Most steering instruments in the EV value-chain and the charging infrastructure focus on the 'customers'. The instruments are set by regional and local governments. It's striking to note that the absence of any focus on production. In other countries, governments focus on installing infrastructure in order to therefore encourage production. The Swedish government doesn't have any such instruments that focus on production.

*Performance*

In Sweden, the number of EV's sold is considerably lower than its neighbor, Norway. In 2012, approximately 1.200 EV's were sold. In 2013, the sales-share appeared to increase to approximately 1.900 EV's sold. Like the Netherlands, mostly PHEV's were sold over 2012 and 2013. The total number of EV's sold is not known. Very positive numbers are available, but include HEV's and are therefore biased. The number of charging-stations in Sweden is not available.

## 1.7. United Kingdom

*Ambition*

The Coalition Government in the UK has set goals to make the road-transport sector greener and more sustainable, with tougher emissions standards and support for new transport technologies. The 'extended ambition' scenario dictates that, by 2020, 5% of the total UK car fleet and 16% of all new cars on UK roads will be electric and plug-in hybrids. Supporting the UK's early market for low-emission vehicles is stated as one of the Coalition Government's key priorities. This means that approximately 1,4 million EV's should be on the road in 2020.

*Structure*

Compared to the other countries studied, the structural conditions in the UK are moderately favourable for the introduction of e-mobility. CO2 emissions per capita are above average compared to other countries in the EU, which is positive for the introduction of EVs. The UK has a high level of automotive industry presence (including the European production of the Nissan Leaf in Sunderland). Expenditures for R&D are relatively low and as a result less favourable. Consumer readiness in the UK appears very favourable for the introduction of EVs because air quality and pollution levels are high. The popularity of efforts to reduce CO2/NO2 emissions and improve (local) air quality may encourage policy makers to stimulate and facilitate the introduction of e-mobility. The infrastructure readiness scores unfavourable. Electricity in the UK is barely generated from clean or renewable sources. Although EV's don't have any tailpipe emissions (allowing them to contribute to meeting local CO2/NO2 standards), using 'carbon

**Example: Plugged-In-Places (PIP) program.** The national government has invented the PIP program. The PIP program intends to support the development and consumer uptake of ultra-low carbon vehicles by creating electric car hubs in six key British cities.

electricity' to power them could mean that the total environmental benefits are marginal.

*Conduct*

Most steering instruments in the EV value-chain focus on research and development. This is remarkable, because the UK scores low on R&D intensity and average on investments in smart grid projects. An example that includes the use of more instruments is the Low Carbon Vehicles Innovation Platform. In 2007, £200 million was set aside for a range of R&D projects associated with LCV (Low Carbon Vehicles). In addition, many instruments focus on the 'customer'. The focus on customers is explained by the large number of financial incentives introduced by different levels of government. Almost all steering instruments in the EV-value chain focusing on customers are financial in nature. With regard to the charging infrastructure value-chain, most instruments focus on services. This includes, for example, the Road Map Charging Infrastructure. Customer instruments are also classified under the 'production' label. A lot of policy instruments focused on production are focused on the installation of (semi-) public charging stations including, for instance, the Plugged-in-Places program.

*Performance*

In January 2011, there were 2.600 electric cars registered in the UK. In 2012, almost 3.000 cars were sold. In 2013, 3.739 EV's were sold. Although sales numbers seem to be rising, the UK is lagging in sales compared to other countries studied. In spite of this, EV sales-share is larger than EV penetration, indicating that the market is still developing. The locally produced Nissan Leaf (BEV) was the best-selling EV (1.800) in 2013, followed by PHEV's, such as the Ampera, Prius and Volvo V60. The UK currently has the largest number of public charging points available (approximately 8.600) among the countries studied. The number of charging points currently available exceeds even the number of EV's.

# 1. INTRODUCTION

This project is based on an interaction between research and practice. The aim of the project is to apply the perspective of public administration theory to the introduction of e-mobility in order to expand the repertoire of policy makers.

> *This project analyzes the variety of policy-strategies that governments pursue to stimulate, support, and regulate the introduction of e-mobility.*

Our study provides three types of insight:

1. Insight into e-mobility strategy-as-practice: an overview of the strategies that different governments follow in their attempts to support the introduction of e-mobility; **an overview of strategy as it emerges in practice**, 'out there';
2. Insight into various patterns of policy-strategies: relations between different strategic options and actions that are often used together, patterns in strategic actions, and basic principles that seem to underlie these different strategic options (e.g. pro-active versus re-active; vehicle-centered versus infrastructure-centered; economic-incentive focused versus regulation-centered); an **overview of promising and/or recurring strategic patterns and principles**;
3. Insight into performances of policy-strategies: over time, as more information about the actual results of strategic policy interventions becomes available, we will be able to link outcomes to policy-inputs; this may help discern relationships between structural elements and successful policy strategies; **insight into the effects of strategy and what works best under a variety of different circumstances**.

The latter two are addressed in our main report. This background report provides an overview of our data on the strategies that have emerged in practice.

*Embedded in the Interreg e-mobility North Sea Region (E-Mobility NSR) Programme*
The project is part of an EU funded project led by the University of Hamburg of Applied Science with stakeholders and partners from Sweden, the UK, Belgium, Denmark, Germany, Norway and The Netherlands. The project called North Sea Region Electric Mobility Network (E-Mobility NSR) was launched in April 2011. It aims to create favorable conditions to bring forth the common development of e-mobility within the North Sea region. For more information visit: http://e-mobility-nsr.eu/

*Project scope: Electric vehicle type*

**The fleet of EV's consists of many categories of motorized vehicles.[i] The label 'EV' covers a wide variety of highly diverse vehicles, drive trains and concepts. It is therefore very important to explicitly state the focus of research.**

First, this research focuses on *passenger vehicles*[ii] and *multipurpose passenger vehicles*[iii]. We have chosen these categories because they are the most common forms of personal motorized transportation addressed by policy. We focus on policy interventions aimed at accelerating the mass introduction of electric mobility through promotion to individual consumers – or business concepts intended to accomplish the same goal (lease-concepts, car-sharing, clubs, et cetera).

Second, we focus on a specific sub-set of the electrified drive-trains. Of the most commonly-used types of EV's - hybrid electric vehicles (HEV's)[iv], plug-in hybrid electric vehicles (PHEV's)[v] and battery electric vehicles (BEV's)[vi] – we focus on *PHEV's* and *BEV's*. When this report refers to EV's, we address only the aforementioned vehicles and drive-train categories. HEV's are not part of this research, although we do

see a potentially positive relationship between a high concentration of HEV's and the adoption of PHEV's and BEV's.

*Outline of this report*

The research model is presented in chapter 2. The ASCP-model (*Ambition-Structure-Conduct-Performance*) is the principal framework for our analysis. In the chapters that follow, results will be presented for each country, in comparison with one another (chapter 3: ambition, chapter 4: structure, chapter 5: conduct, chapter 6: performance).

# 2. RESEARCH FRAMEWORK: AMBITION – STRUCTURE – CONDUCT–PERFORMANCE CATEGORIES

The ambition – structure – conduct – performance categories are used to analyze and compare the policy instruments in use by different countries and regions to influence and support implementation of an adequate charging-infrastructure for electric vehicles (EV's), and encourage greater use of EV's in general. The ASCP-categories are used as a guidebook for this background report. First, we will introduce the categories and the way they are used.

- **Ambition**

The term ambition refers to the goals set by a country / region regarding the introduction of e-mobility. These goals are usually set in terms of the 'number of electric vehicles' and the 'number of charging-stations'. The number of charging stations can be differentiated by type: fast and normal chargers, and public and private chargers.

- **Structure**

The term structure in the ASCP-model refers to the research subject's structural characteristics. It allows us to analyze and compare countries / regions with regard to their respective 'starting lines' for introducing e-mobility.

- **Conduct**

The term conduct refers to government policy interventions regarding e-mobility. We analyze the different tools of government used by the country or region by means of an analytical framework that is explained further in paragraph 2.3.

- **Performance**

Performance refers to the research subjects' achievements in supporting the introduction of e-mobility. A number of performance indicators regarding EV performance and infrastructure performance have been identified.

*Background: SCP paradigm*

The ASCP categories presented in this paper is based on the SCP paradigm developed by Edward Mason and Joe Bain in the 1940s and 1950s. The SCP Paradigm was a principal approach to study the industrial organization during the second half of the 20$^{th}$ century and is recognized as one of the most efficient and reliable means to analyze an industry. Basically, SCP method implies a relationship between the three components of this paradigm: the way in which market structure, conduct and performance interact so that the performance of an industry is influenced by the behavior (conduct) of other players in the industry, which is in turn determined by those players' power (structure). Fair enough. But why have we chosen this model from the field of Industrial Organization, which was designed to analyze an industry, and adapted it as a model for analyzing government-steering in the introduction of e-mobility? We believe that our research framework is of paramount importance, and should allow us to establish an overview of the complete system in which the introduction of e-mobility is embedded. This is important because the transition towards e-mobility is a systemic and disruptive innovation and is therefore embedded in a wider context. As a result, a holistic interpretation of the diverse factors influencing the introduction of e-mobility is necessary. Analyzing the governmental role in the introduction of e-mobility (conduct) in isolation would leave us with more or less meaningless results; contextual factors (structure) are of critical importance in analyzing government steering. Structure and conduct present us with a certain output of 'achievements' in supporting the introduction of e-mobility

(performance). We have added the category of ambition because policy instruments are usually shaped based on ambitions, and ambition itself can be seen as an intervention creating favourable conditions for the introduction of e-mobility, this could shape both conduct and performance. In the following paragraphs, we distinguish between and analyze the different characteristics of structure, conduct and performance.

### *Causation & Correlation*

In this research, we do not measure causal effects of policy, but rather look at the *correlations* between ambition, structure, conduct and performance. Also, our study does not *measure* the effects of policy, but rather maps and categorizes the variety of steps taken by policy-makers as part of the introduction of EV's. Performance-scores suggest the progress a country or region is making, not the effectiveness of the policies that country or region has set out.

### *A way to order and reproduce complexity*

The ASCP-categories enable a systematic analysis of the activities and conditions relevant for the introduction of electric mobility in the consumer-market (including fleets and company-cars); it provides a *whole picture*, although the categories are highly dependent on the availability if accessible and comparable data. We takes into account the variety of factors involved in the introduction of EV's, place them in a framework to see relations between variables, and categorize the different relevant factors. The framework allows the researchers to collect bundles of policies, combine them with structural characteristics, and place them in the perspective of measured performances; not to produce causal clarity, but to reproduce the complex social reality and present it for analysis by researchers or policy-makers. *Figure 1* shows the ASCP-categories. In the following paragraphs we will sum up how we have translated the different elements into operational categories for data-collection.

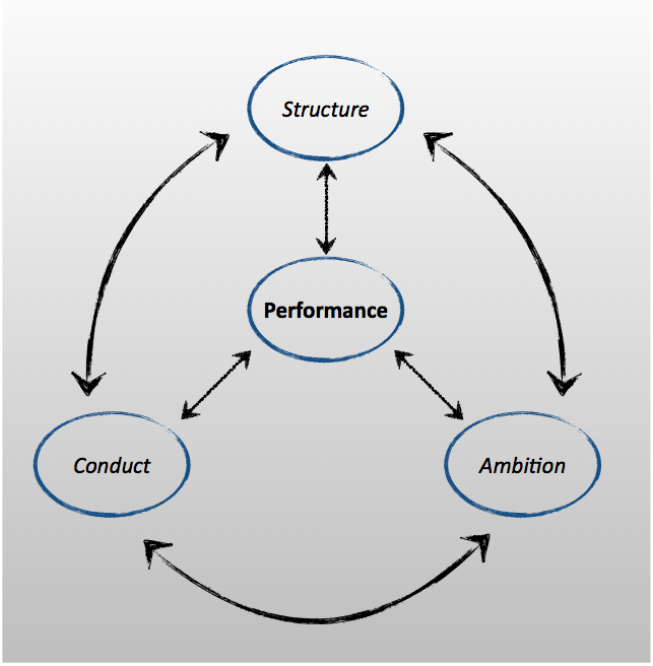



***Figure 1. Framework ambition, structure, conduct, performance.***

## 2.1. Ambition

Ambition refers to the goals stated by the country / region regarding the introduction of e-mobility. These goals are usually set in output measures such as 'number of electric vehicles' and 'number of charging-stations'. To describe *ambition* we conducted a qualitative analysis of stated policy goals in different countries.

## 2.2. Structure

Based on a meta-analysis of research reports on the introduction of EV's, along with expert judgment, we have established a large number of structural characteristics that are likely to influence the introduction of e-mobility. We use four categories to group the structural characteristics (indicators): [vii]

1. Market environment
2. Infrastructure readiness
3. Consumer readiness
4. Operating environment

Table 2 explains the different categories and their indicators.

| **Category 1: Market environment** | **Category 2: Infrastructure readiness** |
|---|---|
| 'Market characteristics' that facilitate, require or otherwise incentivize EV's. This category is built-up by three indicators.<br>1. Presence of automotive industry<br>2. R&D intensity: Gross domestic expenditure on R&D (% share of GDP - GERD)<br>3. CO2 / GHG emissions per capita | Infrastructure readiness enables the operation and impact of e-mobility. This category is built-up by three indicators.[viii]<br>1. Investments in Smart Grid projects<br>2. Electricity reliability and outages<br>3. Electricity generated from renewable sources (% of gross electricity consumption) |
| **Category 3: Consumer readiness** | **Category 4: Operating environment** |
| Consumer readiness generates and secures the demand for electric vehicles and is therefore viewed as a key driver for the introduction of e-mobility. Consumer readiness is built-up from three indicators.[ix]<br>1. Air quality and pollution levels<br>2. Penetration of HEV's and PHEV's<br>3. Wealth (GDP per capita in PPS) | The operating environment ensures the practical application of EV's and is largely immune to typical (short term) policy efforts. As EV and charging technologies improve, some elements of the operating environment will become less critical and others will increase in importance. The operating environment is comprised of five indicators.[x]<br>1. Energy prices and payback period<br>2. Weather conditions<br>3. Degree of urbanization<br>4. Population density (inhabitants per km2)<br>5. Land relief |

***Table 2. Indicators structure***

## 2.3. Conduct

In this research, all of the policies and instruments that governments use for the introduction of e-mobility are categorized as **Conduct**.

### *2.3.1. Types of steering instruments - Tools of government*

Based on Hood & Margetts (2007)[xi] classic "tools of government"-study we recognize four types of government tools for the introduction of e-mobility. The table below explains these four categories.

| Tools of government | |
|---|---|
| **Legal** | All of the rules and directives designed to mandate, enable, incentivize, limit or otherwise direct subjects to act according to policy goals.<br>E.g.: legal requirements, local parking legislation, European legislation for standards for charging-station accessibility, limited access to urban areas or roads. |
| **Financial** | The policy instruments involve either the handing out or taking away of material resources (cash or kind), in order to incentivize or disincentivize behavior by subjects. The difference between financial and legal measures is that those affected are not obliged to take the measures involved, but are incentivized to do so by economic means.<br>E.g.: purchase grants, tax benefits for consumers of EV's, government funding for battery research, subsidies on home chargers, or free electricity for public charging. |
| **Communication** | Instruments that influence the value-chain of e-mobility through to the communication of arguments and persuasion, including information and education.<br>E.g.: education in schools, government information campaigns. |
| **Organization** | Actions by government that provides the physical ability to act directly, using its own forces to achieve policy goals rather than others. This includes the allocation of means, capital, resources, and the physical infrastructure needed to act.<br>E.g.: government acting as a launching customer, buying an own fleet of EV's, government installing public chargers. |

***Table 3. Tools of government***

Tools of government are used at different levels of government. For many countries, the mix of tools and instruments differs at various levels. For example, some countries will have few instruments at the national level, but very active policies at the regional and/or local level. In this research the following levels of government are taken into account:

- **National** - Policy instruments conceived by a country's national government.
- **Regional** - Policy instruments conceived by regional governments.
- **Local** – Policy instruments conceived by city governments.

### *2.3.2. Impact of government steering – Electric vehicle and charging-infrastructure Value-Chain*

Following earlier research[xii] [xiii] we use a *value chain approach* to analyze the use of governmental tools. We consider both the value-chain of the electric vehicle (vehicle-perspective) and the value-chain of the charging-infrastructure (grid-perspective). A third value chain is referred to as the 'network'; this includes steering instruments that focus on connecting all stakeholders in the EV / infrastructure value-chain. We recognize four segments in the value-chains.[xiv] The tables below explain these segments of the value chains.

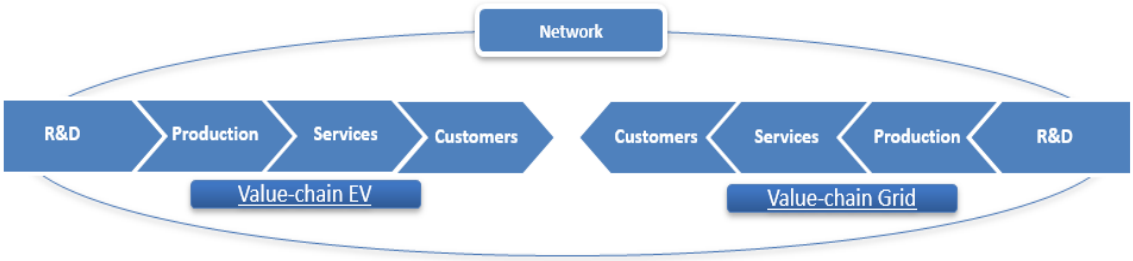



*Figure 2. Value chain*

| Value chain – electric vehicle | |
|---|---|
| **R&D** | Instruments focused on influencing the research and design of electric vehicles and EV components. |
| **Production** | Instruments focused on influencing the production of electric vehicles and vehicle components such as batteries and other hardware (original equipment manufacturers). This segment of the value-chain also recognizes the software used in electric vehicles. |
| **Services** | Instruments focused on influencing service-providers for electric vehicles. Different service providers are recognized, such as car dealers, mechanics, insurance companies, etc. |
| **Customers** | Instruments focused on influencing customers of EV's. We recognize individual consumers (end-users), but also fleet-owners (leasing companies) and government agencies (promoting consumerism). |

*Table 4. Electric vehicle value chain*

| Value chain – charging infrastructure | |
|---|---|
| **R&D** | Instruments focused on influencing the research and design of the complete charging-infrastructure. |
| **Production** | Instruments focused on influencing the production of charging-stations and components such as the electricity network, energy production, etc. |
| **Services** | Instruments focused on influencing service-providers for charging-stations. Different service providers are recognized, such as energy suppliers, power plants, grid managers, software developers, etc. |
| **Customers** | Instruments focused on influencing customers of charging-stations. By 'customers' we refer both to users (consumers) and owners (consumers, companies, government). The different types of charging-stations (private, public, fast, normal) require different types of steering by governmental units. |

*Table 5. Infrastructure value chain*

| Value chain – Network | |
|---|---|
| **Network** | These are all of the instruments that focus on connecting stakeholders in the EV / infrastructure value-chain. For instance, efforts intended to intensify contacts between different stakeholders, in order to improve value-chain alignment and a more efficient functioning of the entire value-chain. In addition to the value-chain, this includes other policy measures aimed at the e-mobility ecosystem, which are taken into consideration. For instance, policy measures aimed at realizing Smart Grids, Smart economies and Smart mobility Beeton (2012)[xv] |

*Table 6. Network value-chain*

## 2.4. Performance

Based on a meta-analysis of research reports on the introduction of EV's and expert-judgment we have established a number of performance indicators, which can be influenced by the available governmental steering instruments. Since the focus of this research is on the influence and contribution of government steering towards implementation of an adequate charging-infrastructure and the introduction of EV's, we have selected EV performance and infrastructure performance as overarching output categories in which we group performance indicators. Table 7 explains the different categories and their proposed indicators.

| Category 1: EV performance | Category 2: Infrastructure performance |
|---|---|
| EV performance refers to the achievements of the introduction of electric vehicles which can be influenced by government steering.<br>This category is composed of three performance indicators:<br>● Number of electric vehicles<br>● EV penetration<br>● EV sales share | Infrastructure performance refers to achievements regarding the introduction of an adequate charging infrastructure which can be influenced by government steering.<br>This category is composed of three performance indicators:<br>● Number of charging-stations<br>● Number of fast chargers<br>● Carbon intensity of energy supplied by charging-stations |

*Table 7. Categories performance*

## 2.5. Operationalized categories

Below an overview of the operationalized categories.

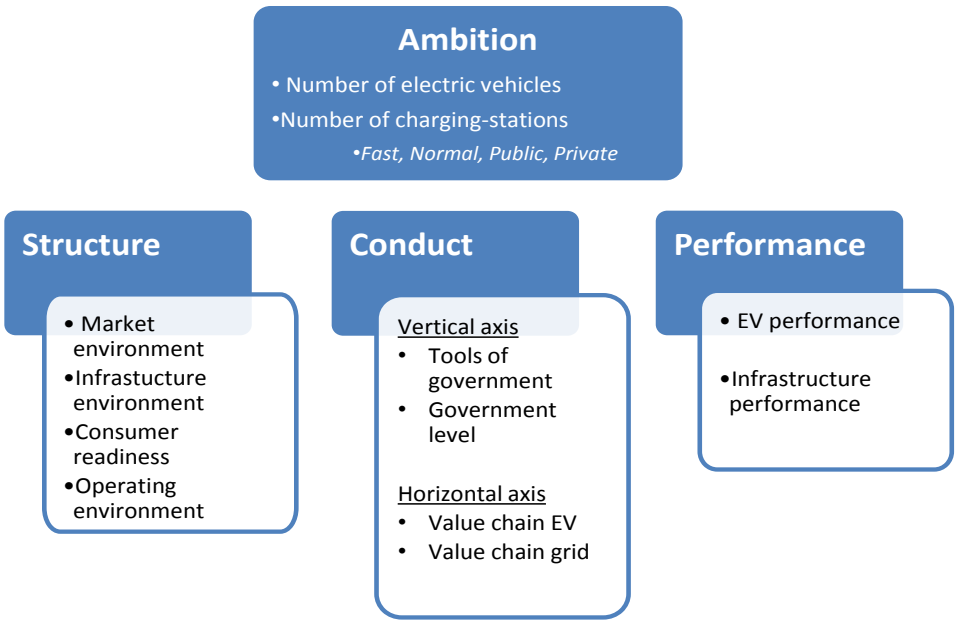



*Figure 3. The operationalized ASCP-model used to analyze government steering on the introduction of e-mobility*

# 3. AMBITION

Ambition refers to the goals established by a country / region regarding the introduction of e-mobility. These goals are compared using the stated output measures.

## 3.1. Findings

| NSR-countries | Ambitions | References |
|---|---|---|
| **Belgium** | ● Pilot project with 600 EV's and 250 chargers in 2015.<br>● No ambitions were found for charging infrastructure. | http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2012/07/23/elektrisch-vervoer-in-nederland-in-internationaal-perspectief.html |
| **Denmark** | ● 2014: double number of EV's (1-1-2014: 1.300 EV's).<br>● 150 battery swap stations in 2012. No further ambitions were found for charging infrastructure. | |
| **Germany** | ● 500.000 EV's and 500.000 fuel-cell vehicles in 2020. 6 million EV's and fuel-cell vehicles in 2030.<br>● No ambitions found for charging infrastructure. | |
| **Netherlands** | ● 20.000 EV's in 2015, 200.000 EV's in 2020 and 1 million EV's in 2025.<br>● 10.000 public charging stations (50 rapid charging stations) in 2013. | |
| **Norway** | ● 200.000 EV's in 2020.<br>● In the realization phase (2015) Norway plans to have 5.000 charging stations. | |
| **Sweden** | ● 18.000 EV's in 2020. All cars replaced by EV's in 2030.<br>● No ambitions found for charging infrastructure. | |
| **United Kingdom** | ● 5% of the total UK car fleet and 16% of all new cars consist of EV's and PHEV's.<br>● No ambitions found for charging infrastructure. | http://www.ieahev.org/assets/1/7/IA-HEV_2010_annual_report_6MB.pdf (p. 323) |
| **Other countries** | **Ambitions** | **References** |
| **Austria** | ● 2,5% market share of electric vehicles in 2020. 5% BEV and 5% PHEV in sales share (approximately 200.000 vehicles) in 2020.<br>● No ambitions were found for charging infrastructure. | http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2012/07/23/elektrisch-vervoer-in-nederland-in-internationaal-perspectief.html |
| **France** | ● 4.000 EV's in 2012, 100.000 EV's in 2015 and 2 million EV's in 2020.<br>● 400.000 charging points in 2020. | http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2012/07/23/elektrisch-vervoer-in-nederland-in-internationaal-perspectief.html |
| **Italy** | ● 130.000 PHEVs and BEVs in 2015.<br>● 125.000 charging sites in 2020. | http://europa.eu/rapid/press-release_MEMO-13-24_en.htm?locale=FR |
| **Spain** | ● 250.000 PHEVs and BEVs in 2015. 2.500.000 EV's in<br>● 10.500 charging sites in 2020. | http://www.rijksoverheid.nl/documenten-en-publicaties/rapporten/2012/07/23/elektrisch-vervoer-in-nederland-in-internationaal-perspectief.html |
| **Portugal** | ● 200.000 EV's in 2020.<br>● 25.000 charging sites in 2025. | |
| **California (USA)** | ● 200.000 EV's in 2020. 1.5 million zero-emission vehicles by 2025.<br>● No numerical ambition found for charging infrastructure. However, the Zero-emission vehicles action plan states that the provided infrastructure should be sufficient to support up to 1 mln. ZEV's by 2020. | http://opr.ca.gov/docs/Governor's_Office_ZEV_Action_Plan_(02-13).pdf |

*Table 8. List of ambitions that were formulated by NSR and other countries*

## 3.2. Observations

Ambitions differ in the countries analyzed. Based on our analysis we observe the following:

- **Countries differ in their levels of ambition:**

Sweden and Belgium seem reticent (at least in the short term). California, Germany and the Netherlands have set ambitious long-term goals that expect an exponential growth over the coming years. The United Kingdom has an extended ambition scenario, which says that 5% of the total UK car fleet and 16% of all new cars on the UK roads in 2020 consist of electric and plug-in hybrids. Based on calculations from the UK's car fleet in 2011, converting 5% of the total fleet towards EV's would mean that the country is hoping for 1.4 million electric and plug-in hybrids on the road by 2020.

**Meeting ambitions – an example:**
In 2012 Germany registered 8.174 EV's. Meeting the ambition requires a growth to 500.000 EV's in nine year. This means an average growth in the number of EV's of more than 50.000 cars per year. At the moment this goal looks difficult to reach, given the EV sales share of 0,26% on the total sale of vehicles (3.082.504) in 2012. This means that approximately 1.6% of the total yearly car sales should be EV's in the period 2013-2020.

- **Countries differ in how they state ambitions**:

Some countries established gradual ambitions to reach what is often referred to as a 'mature market', while others state just one 'long-term' goal. California's ambition is technology neutral (ZEV's). Other countries target EV's specifically, though the majority do not differentiate between PHEV's and BEV's. Germany's ambition focuses on both EV's and fuel cell vehicles. In the Netherlands, researchers calculated the effects of introducing 200.000 EV's, and how the anticipated contributions of 200.000 EV's would affect public interests. Various public interests were analyzed to anticipate the intended effects of the stated ambition.[xvi] A similar analysis was not found in other countries.

- **Most countries do not state (long-term) ambitions regarding charging-infrastructure:**

Ambitions regarding the charging-infrastructure are usually more ambiguous than EV-ambitions. In none of the analyzed countries, ambitions regarding the charging-infrastructure are equivalent to ambitions for the number of EV's. In the NSR-countries Denmark, Germany, Sweden and the United Kingdom, no ambitions were found for charging infrastructure. Some countries have set short-term ambitions regarding the number of chargers. Norway's ambition is to have 5.000 charging stations installed in 2015 and the Netherlands is aiming to have 10.000 public charging stations in 2012[2].

[2] This ambition was not met in the Netherlands: in 2012 a total number of 3611 (semi-)public chargers and 63 public chargers were installed.

# 4. STRUCTURE

The structural conditions provide insight on the characteristics of the researched country or region. This is important because the transition towards e-mobility is a systemic innovation and therefore embedded in a broader context. We distinguish four types of structural characteristics, namely:

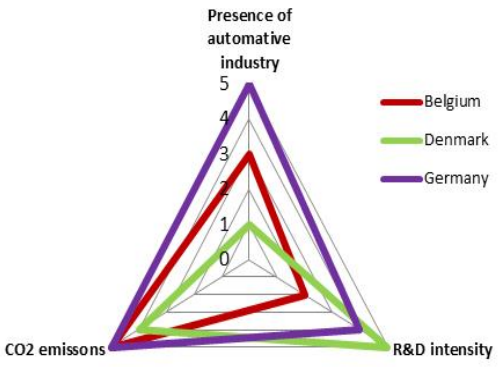
- **Market environment**; characteristics that facilitate, require or otherwise incentivize EV's (paragraph 4.1).
- **Infrastructure readiness**; this condition enables the operation and impact of e-mobility (paragraph 4.2).
- **Consumer readiness**; these characteristics generate and secure the demand for electric vehicles (paragraph 4.3).
- **Operating environment**; this condition ensures the practical application of EV's and is largely immune to typical (short term) policy efforts (paragraph 4.4).

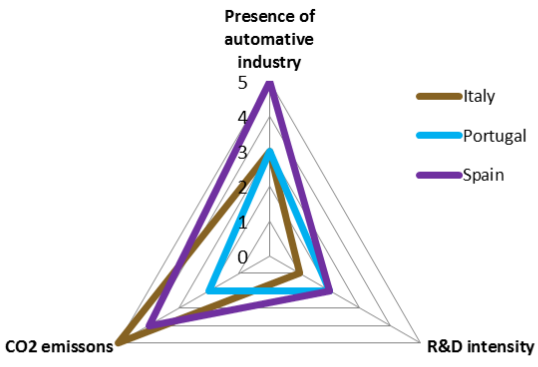
In the following paragraphs we will present conclusions on the structural characteristics of our research framework. To allow for comparison, the findings are scored and visualized in 'radar charts'.

**Scoring structural characteristics:**
The structural characteristics are scored on a scale ranging from 1 – 5. If a characteristic scores '1' it is likely to have a highly negative effect on the introduction of e-mobility. Likewise, if it scores 5 it is likely to have a highly positive effect. The scores are based on a document analysis and explained in the tables that follow the figures below. These scores allow us to establish and compare the structures of different countries, which then provide us with an insight in the 'starting positions' of different countries when introducing e-mobility. The scores are explained in the tables that follow the figures below.

## 4.1. Findings Market environment

Germany has the largest automotive industry in Europe. We regard this as a positive contextual factor for the introduction of EV's there (indicating the likelihood for internal market gains). Spain and California also have large automotive industries. Denmark and Norway have low scores due to their small automotive industries. Germany also scores relatively high on 'R&D intensity'. Together with Sweden and Denmark, it has one of the highest R&D expenditures calculated as percentage of GDP. This indicates that these countries are more likely to invest (upstream) in research and development regarding e-mobility. Countries in the south of Europe like Italy, Portugal and Spain have a relatively low R&D expenditure compared to GDP. Germany, Belgium, Italy, Spain, California and the Netherlands have high CO2 emissions per capita. Hence, these countries also score high in this category; e-mobility is often seen as a driver to lower CO2 emissions per capita.



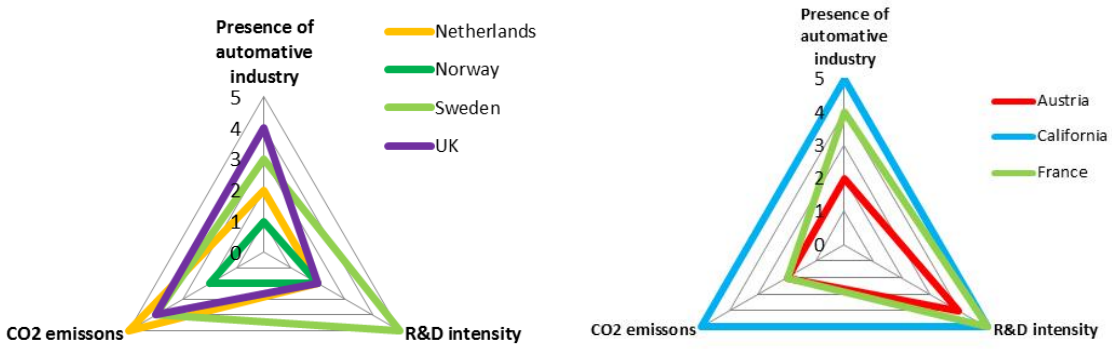


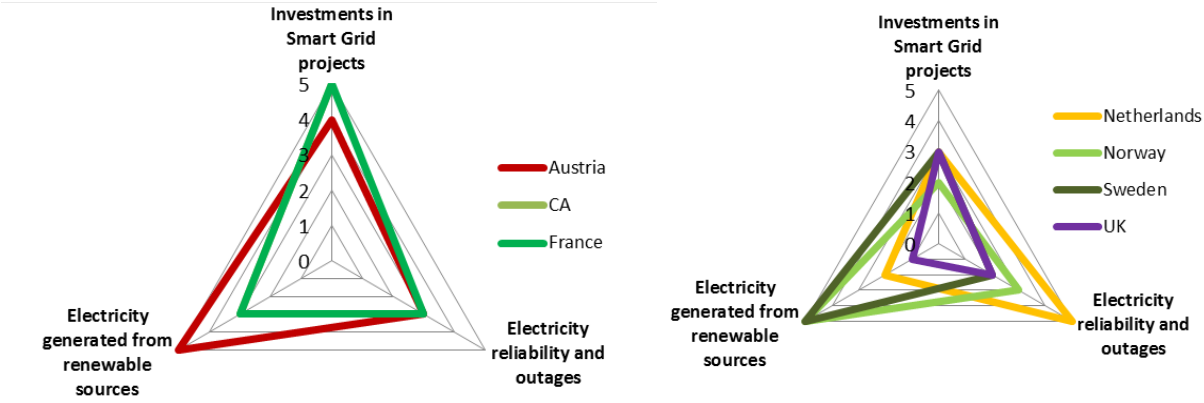

*Figure 4. Findings on market environment in NSR and other countries*

| Market environment - scoring | |
|---|---|
| **Presence of automotive industry** | Of the top 50 countries included in the production-ranking of Organisation Internationale des Constructeurs d'Automobiles (OICA),[xvii] countries that don't make the list score 1. The scores of countries included in the list are judged in comparison with their ranking. |
| **R&D intensity** | Research and development (R & D) intensity for a country is defined as the R&D expenditure[xviii] as a percentage of gross domestic product (GDP)[xix].<br>• The average GERD in euro countries is 2.06%.<br>• The highest ranking countries (highest R&D intensity) are Finland, Sweden and Denmark (> 3%)<br>The ranking is based on 2010 numbers (most recent) by Eurostat. [xx] |
| **CO2 emissions** | The average per capita CO2 emission in Europe is 6.84 tons, according to the International Energy Agency (IEA).[xxi] Data on CO2 emissions per country from the World Bank are used in our comparison.[xxii] |

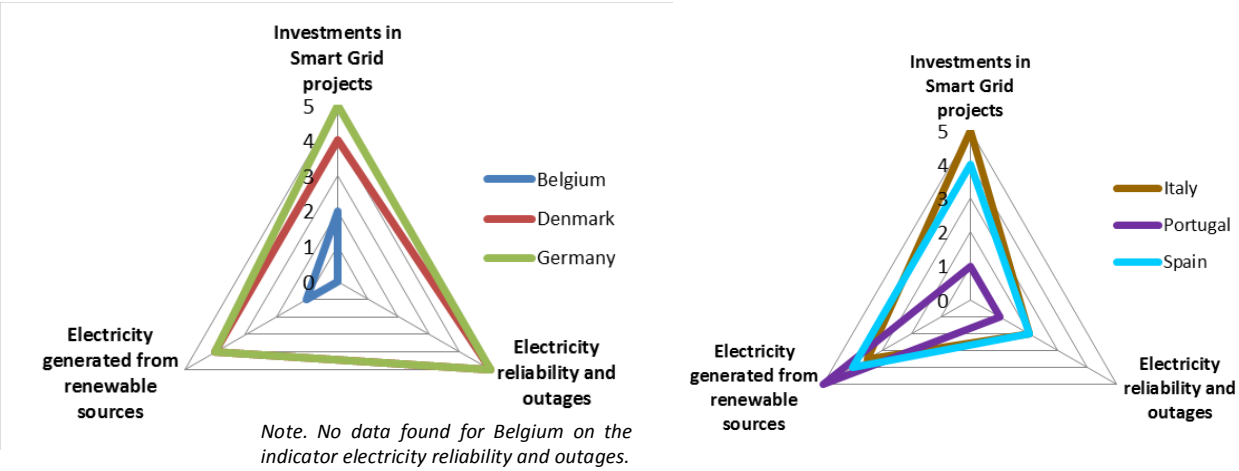
*Table 9. Operationalization of market environment*

## 4.2. Findings Infrastructure readiness

Investments in smart-grid projects are low in Portugal, Belgium and Norway. Electric vehicles can make the electricity system more flexible and therefore 'smarter'. Investments in smart grid projects are therefore seen as mutually beneficial when paired with investments in e-mobility. The other countries score average or above average. Electricity reliability and frequency of outages score high in the Netherlands, Germany and Denmark. The other countries score average or below average. The electricity generated from renewable sources scores high in Scandinavian countries and (much) lower in countries like Belgium, the Netherlands and the UK. The emissions of electric vehicles are dependent on the way in which electricity is generated. Cleaner electricity means cleaner e-mobility and is therefore seen as an important contextual factor.




*Note. California has identical scores as France on Investments in Smart Grid projects and Electricity generated from renewable sources.*




*Note. No data found for Belgium on the indicator electricity reliability and outages.*

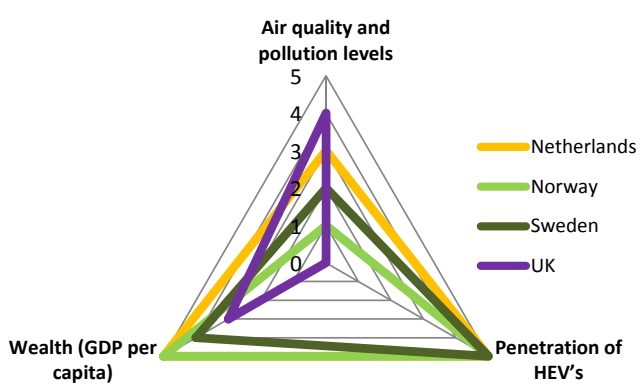
*Figure 5. Findings on infrastructure readiness for NSR and other countries*

| Infrastructure readiness - scoring | |
|---|---|
| **Investments in Smart Grid projects** | Based on the JRC's (Joint Research Center) first complete catalogue of EU Smart Grid projects (2011).[xxiii] |
| **Electricity reliability and outages** | Electricity reliability is measured by two indicators:<br>● SAIDI — system average interruption duration index<br>● SAIFI — system average interruption frequency index<br>The scores are based on the 5th CEER (Council of European Energy Regulators) benchmarking report on the quality of electricity supply 2011.[xxiv] |
| **Electricity generated from renewable sources (% of gross electricity consumption)** | The distribution by Eurostat[xxv] is used to score this variable. This presents us with the following scores:<br>1 = < 6,97%<br>2 = 6,97% - 12.83%<br>3 = 12.83% - 22.23%<br>4 = 22.23% - 33.13%<br>5 = >33.13% |

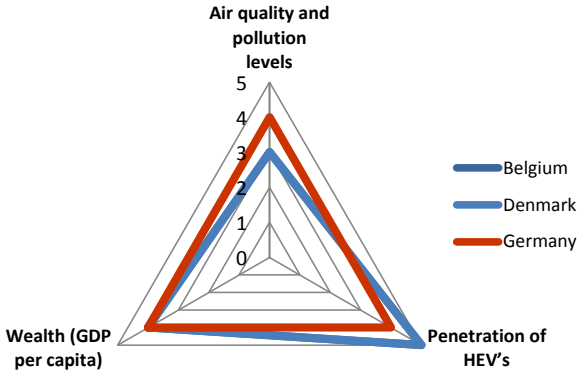
*Table 10. Operationalization of infrastructure readiness*

## 4.3. Findings Consumer readiness

The structural characteristic 'air quality and pollution levels' has a low score in Austria, Portugal, Spain and Norway. We hypothesize that countries with low air-quality and high pollution levels are more likely to stimulate and facilitate the introduction of e-mobility in order to (locally) improve air quality. The UK, Germany and Italy have the worst air-quality in terms of greenhouse gas emissions and thus have the highest score for this characteristic (highest urgency). The penetration of HEV's and PHEV's is highest in Norway, Sweden, Denmark and the Netherlands. Consumers in these countries are therefore most likely to be familiar with 'battery powered vehicles'. Wealth (GDP per capita in PPS) shows little variation between the NSR-countries. Most score high on this characteristic.




*Note. No data found for UK on the penetration of HEV's*




*Note. Belgium and Denmark score identical.*

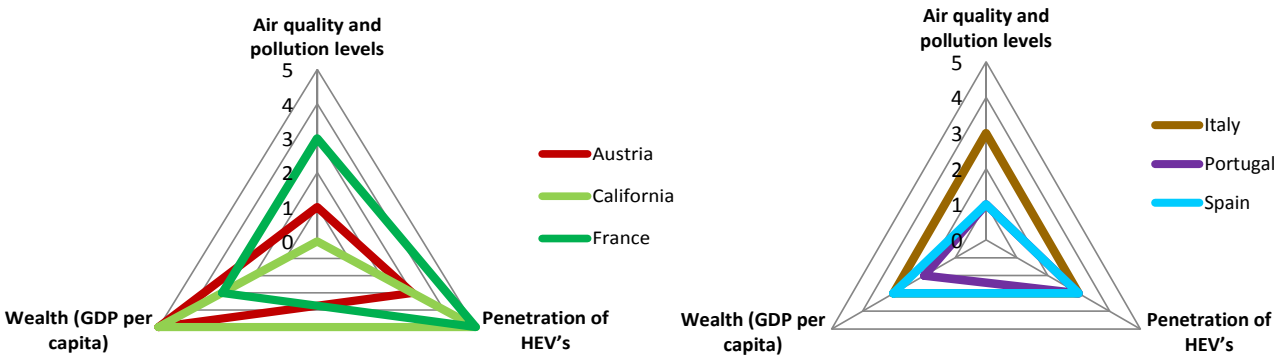



*Figure 6. Findings on consumer readiness for NSR and other countries*

| Consumer readiness - scoring | |
|---|---|
| **Air quality and pollution levels** | Countries' overall air quality can be compared by indexing the greenhouse gas emissions (base year = 100). Total Greenhouse Gas Emissions (in CO2 equivalent) indexed to 1990. This indicator shows trends in total man-made emissions of the "Kyoto basket" of greenhouse gases. It presents annual total emissions in relation to "Kyoto base year". This indicator is scored based on the distribution made by Eurostat[xxvi]. This presents us with the following scores:<br>1 = 108 – 168<br>2 = 99.0 – 108.0<br>3 = 89.0 – 99.0<br>4 = 64.0 – 89.0<br>5 = 42.0 – 64.0<br>EU27 average = 85<br>EU15 average = 89 |
| **Penetration of HEV's and PHEV's** | The penetration of HEV's and PHEV's is different for each country. Several sources have been used.[xxvii] |
| **Wealth (GDP per capita in PPS)** | GDP per capita in PPS (purchasing power standard) is the indicator of wealth used by Eurostat (European Commission).[xxviii] GDP index EU27 = 100. GDP per capita in PPS:<br>1 = <70<br>2 = 71 – 90<br>3 = 91 – 110<br>4 = 111 – 130<br>5 = >131 |

*Table 11. Operationalization of consumer readiness*

## 4.4. Findings Operating environment

Due to relatively low fuel-prices and high electricity-prices, the characteristic 'energy prices and payback period' is scored as low in Belgium, Austria and Spain (which lengthens the payback period for EV's). There are numerous countries which score average and Norway has the highest score (highest fuel prices in Europe and relatively low electricity prices). Climate conditions in the Scandinavian and southern Mediterranean countries score average or below average due to the possibility of more 'extreme' weather conditions. Both very hot and very cold weather influence the range of batteries available for an EV. The population density has high scores in most NSR countries, which is viewed as a favorable condition for the introduction of e-mobility. Only Norway and Sweden have scored '1'. Land relief is favorable in most NSR countries because altitude differences are relatively small. Norway and Austria score lowest because of the large differences in terrain altitudes.

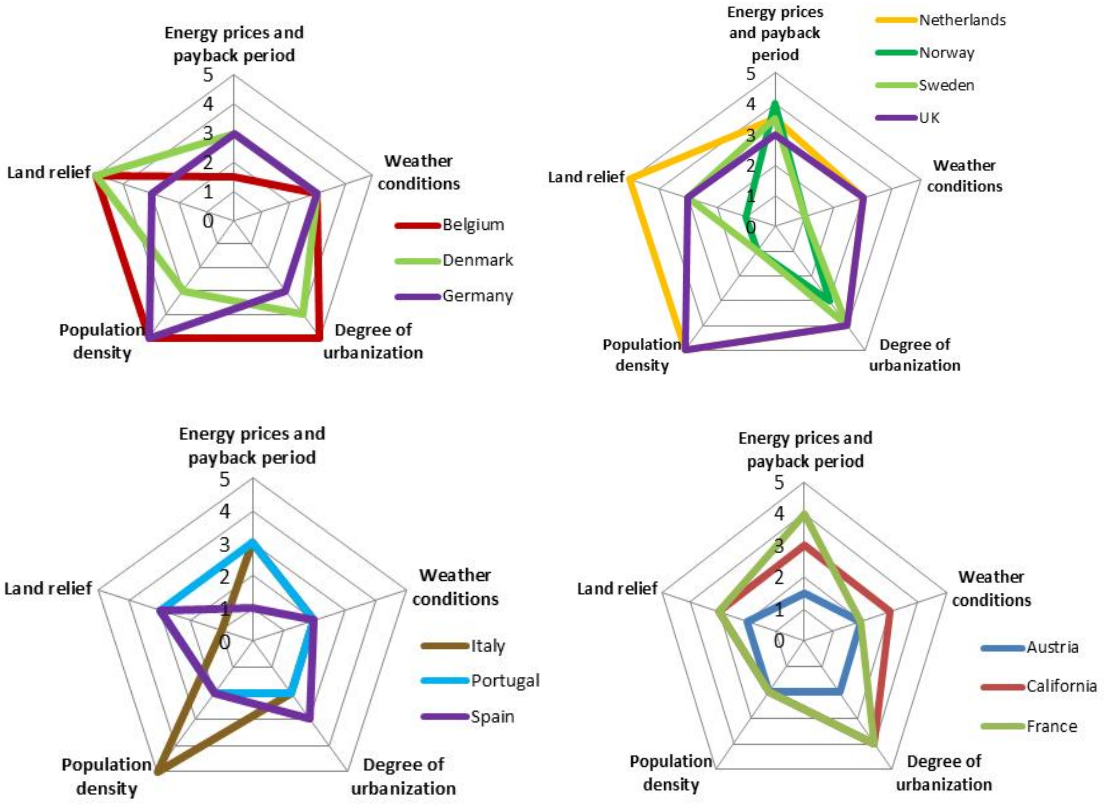



*Figure 7. Findings on operating environment for NSR and other countries*

| Operating environment - scoring | |
|---|---|
| **Energy prices and payback period** | Low electricity prices for household consumers and high fuel prices are favorable conditions for the introduction of e-mobility.<br>Fuel prices[xxix] (EUR per liter)<br>The lowest fuel prices are found in Russia (0.736 per liter). Norway has the highest fuel prices (2.057 per liter)<br>1 = < 1.60<br>2 = 1.60 – 1.70<br>3 = 1.70 – 1.80<br>4 = 1.80 – 1.90<br>5 = > 1.90<br>Electricity prices for household consumers (EUR per kWh)[xxx]<br>EU27 average = 0.1281<br>1 = > 0.1500<br>2 = 0.1400 – 0.1500<br>3 = 0.1200 – 0.1400<br>4 = 0.1000 – 0.1200<br>5 = < 0.1000<br>The average score from these two variables is the score. |
| **Weather conditions** | The European climate is a temperate, maritime climate. Except for the North of Norway, Sweden and Finland, and the southern regions of the Mediterranean countries, differences are small. This makes it difficult to establish differences regarding this indicator. Countries in our research are very likely to show similar scores. However, the countries that are most likely to show 'extreme temperatures' (either very hot or cold) score 1 because this is unfavorable for the introduction of e-mobility. |

| | |
|---|---|
| **Degree of urbanization** | EU countries hardly show any differences regarding this indicator (most score between 80% - 85%).[xxxi] Incorporating this indicator therefore doesn't allow for much variance in rewarding the scores. |
| **Population density (inhabitants per km2)** | EU27 average = 116.6 (2010)xxxii<br>1 = < 80<br>2 = 81 - 120<br>3 = 121 - 160<br>4 = 161 - 200<br>5 = > 201 |
| **Land relief** | Land relief in Europe shows great variations within relatively small areas. This makes scoring this indicator on country level difficult. Countries with very little land relief show an advantage for EV usage because the range can be estimated more precisely. In countries with greater land relief the range of EV's is far more difficult to predict.<br>1 = Very large differences between highs and lows<br>2 = Considerable differences between highs and lows<br>3 = Moderate differences between highs and lows<br>4 = Small differences between highs and lows<br>5 = Very little to no differences between highs and lows |

*Table 12. Operationalization of operating environment*

# 5. CONDUCT

**Instruments to support and contribute to the introduction of e-mobility are referred to as 'conduct': *policy-actions by agents*.**

## 5.1. Framework

Conduct refers to the policy actions that government uses to support and contribute to the introduction of e-mobility. These policy-actions can be categorized as instruments that focus (1) on the grid (charging-infrastructure), (2) on the EV value chain, or that focus on (3) the network.

In order to analyze and compare the various policies we use an analytical framework. An example of this framework is presented in table 12. In paragraph 5.3, policy actions are categorized per country using this framework. For each country, three tables are included. The first focuses on the EV-value chain, the second on the grid value chain and the third on the network itself.

| ***Policy instruments*** | | | | | |
|---|---|---|---|---|---|
| **Families of instruments** | **Instrument** | **R&D** | **Production** | **Services** | **Customer** |
| Legal | **Policy action. (Government level: National, Regional or Local)** | | | | **X** |
| Financial | | **X** | | | |
| Communication | | | **X** | | |
| Organization | | | | **X** | |

***Table 13. Analytical framework for government steering – example***

## 5.2. Observations

In this research the policies governments use are defined as *conduct*. Below we analyze and compare the policy-actions used by different government levels in different countries. In order to create an overview of focus and balance between various types of policies in different countries we assigned scores to the policies that were used. We use the scores to see what the focus of the policy is and how different countries have different priorities and different focus. The scores are not objective measures, but were assigned in an inter-subjective and interactive process that consisted of four steps.

*Step 1: data collection*
In order to collect our data we first gathered all the documents we could find for the NSR-countries and the other case-countries. To collect the documents we "snowballed" our way through the policy-documents and websites. Many documents contained references to other studies and sources that we than looked up and included in our model.

*Step 2: first review*
We loaded all of the data into our model and finalized it as a first draft of our desk-research. We created a separate analysis of the policies of each different country and asked local resource persons to take a critical look at the document; we asked them to correct the document where necessary and sent us links to or copies of other relevant documents. We analyzed this second set of documents and improved our country-analysis on the basis of the feedback from the local resources.

*Step 3: expert judgment and validation in local feedback-sessions*

As a third step we organized feedback sessions with representatives (experts, academics, policy-makers, stakeholders) of the various countries. In a 'feedback session'-format, we presented the findings that were relevant to the particular audience (country) and discussed if they recognized these. After that, there was an hour-and-half to talk about the implications of the findings and provide local insights and coloring to the analysis. Each of the feedback sessions indicated recognition of our findings and provided us with information to further develop our findings.

*Step 4: assigning scores*

We have established the focus (the number of +'s) of the policies in a twofold process. On the one hand we have categorized and *counted* the different instruments. However, this "flat count" of policies does not represent the actual "weight" of policies and therefore we needed a second step to be able to put the policy-focus in perspective. We added "weight" to the policy instruments by taking into account distinctive characteristics of the policy instruments. The following factors establishing the "weight" of policy instruments were taken into account:

- **Budget.** Financial resources are scarce. Therefore, more weight is attributed to policy instruments with a larger budget (for instance the total available budget for financial incentives such as rebates, subsidies and fiscal policy). We have also taken into account the amount individuals (business and consumer) can receive.
- **Fte's.** Like financial resources, people (fte's) are scarce 'resources' of organizations. The number of people deployed in (carrying out) a policy instrument is an indicator of the apparent weight of the instrument; if a policy "costs" many fte's,it is probably considered important by the policy maker, as otherwise the would not allocate that amount of resources to it.
- **Scope.** We also looked at the scope of a policy. We have looked at the geographical scope of the instrument (does it target one small municipality or a whole region) and the target audience (who portion of the relevant population is targeted? Businesses, consumers or both?).
- **Duration.** The time a policy instrument is in effect accounts for the weight of the instrument. A ten year tax deduction provides more security / stability than a short-term measure or a measure for which no duration has been established.
- **Compulsory vs non-committal.** Rules and regulations can differ in the amount in which they are compulsory. In our count, more compulsory rules and measures weigh heavier than those that are non-committal or voluntary.

Based on this twofold analysis the accents were established:

- 0 = Limited information found / available
- \+ = Limited focus
- ++ = Strong focus
- +++ = Prevalent focus area

In order to weigh the instruments we are dependent on the available information provided by the policy documents. Not all of the factors are known for each of the different instruments.

### 5.2.1. *Type of instruments*

**Most of the studied countries focus strongly on financial and organizational instruments (figure 8).**
Countries seem to adopt very similar financial policies. Financial policies are often conducted by the national government and are mostly fiscal in nature (registrations bonus based on emissions, income tax measures and opportunities for businesses to relieve the cost of an EV against taxable profits). Also, governments apply a considerable number of organizational-instruments. Especially at the regional and local levels we see a lot of 'organization tools'. Local and regional governments install many local project organizations that, for instance, carry out grant applications and launching consumer initiatives. This generates extra dynamics to the incentives and benefits set out by the national government.

The focus on legal and communication instruments in most NSR-countries is very limited compared to financial and organizational instruments. However, Norway, California, Spain and Portugal seem to focus more on regulatory tools. An example of such an intervention found in many countries is the introduction of *Low Emission Zones* (LEZ's). In these zones, high emission vehicles are restricted from entering the area, or are required to pay a fee. Many legal instruments are also accompanied by financial consequences, such as tax benefits for EV use, exemption from parking fees or a reduction of annual road tax.

| **Type of policy actions** | | | | |
|---|---|---|---|---|
| **NSR-countries** | **Legal** | **Financial** | **Communicative** | **Organizational** |
| Belgium | + | ++ | + | +++ |
| Denmark | + | +++ | + | ++ |
| Germany | + | ++ | + | +++ |
| Netherlands | + | +++ | + | +++ |
| Norway | ++ | +++ | + | ++ |
| Sweden | + | ++ | + | +++ |
| UK | 0 | ++ | + | ++ |
| **Non NSR-countries** | | | | |
| *Austria* | 0 | +++ | 0 | + |
| *California* | ++ | +++ | + | + |
| *France* | + | ++ | 0 | ++ |
| *Italy* | + | + | 0 | ++ |
| *Spain* | + | ++ | + | ++ |
| *Portugal* | ++ | + | 0 | ++ |
| 0 = Limited information found / available<br>+ = Limited focus<br>++ = Strong focus<br>+++ = Prevalent focus area | | | | |

***Figure 8. Types of policy actions that countries use to stimulate electric driving***

### 5.2.2. *Governmental level*

**In most NSR-countries policy measures are initiated by the national government (figure 9).**
This observation needs to be explained further. Often, when taking a closer look at these national policy measures, we find that they actually effect change on a local or regional scale. For instance, the 'Green Deals on e-mobility' policy in the Netherlands was founded by the national government, in order to stimulate and support bottom-up innovation aimed at sustainability. There are a number of Green Deals focusing on e-mobility. Typically, these deals are initiated by local or regional governments (for instance, Green Deal Metropolitan Region Amsterdam Electric and Green Deal Zero-emission public buses, which

is overseen by the provinces of Brabant, Limburg, Utrecht and the city region of Eindhoven).[3] In Germany we see a similar example in the 'Electric Mobility Model Regions' and Denmark relies heavily on local initiatives such as in the Copenhagen area. The objective of the eight selected model-regions in Germany was to connect application-oriented research with customer-focused daily use of electric vehicles. €115 million Euros was made available and then divided across the 8 model regions into 220 projects. This is an example of how a large national government program is effectively carried out and put into practice at the regional and local projects.

| **Government level** | | | |
|---|---|---|---|
| **Country** | **National** | **Regional** | **Local** |
| Belgium | + | +++ | + |
| Denmark | ++ | ++ | ++ |
| Germany | ++ | ++ | ++ |
| Netherlands | ++ | ++ | ++ |
| Norway | +++ | + | + |
| Sweden | ++ | + | + |
| UK | ++ | ++ | ++ |
| **Non NSR-countries** | | | |
| *Austria* | ++ | ++ | ++ |
| *California* | ++ | ++ | ++ |
| *France* | ++ | ++ | ++ |
| *Italy* | +++ | + | + |
| *Spain* | +++ | 0 | + |
| *Portugal* | +++ | 0 | + |
| 0 = Limited information found / available<br>+ = Limited focus<br>++ = Strong focus<br>+++ = Prevalent focus area | | | |

***Figure 8. Governmental level of policy focus.***

### 5.2.3. Focus area

**In most NSR-countries, policy shows a strong vehicle-oriented focus.**

Policy instruments mostly focus on the EV-value chain; e.g. most financial policies focus on EV's. This focus is consistent with the findings regarding the ambitions that generally prioritize vehicles over chargers.

A large share of policy interventions is focused on connecting stakeholders in the EV / infrastructure value-chain (network). For instance, policies attempt to intensify contacts between stakeholders to improve value-chain alignment. EV-adoption requires different parties to collaborate and coordinate efforts, whereas they often do not see each other as natural partners or even as a part of the same value chain. 'Network instruments' primarily consist of project organizations and demonstrations projects. These often focus on both vehicle and electric grid. However, most programs focus on vehicle (for instance demonstration projects for EV-driving), with charging as a by-product.

We also found steering instruments without specific focus on EV's or the electric grid in the network category provided that, in the opinion of the researcher, the instrument had the capacity to stimulate and facilitate the introduction and increased use of e-mobility in general or as a "whole". One example of such an instrument is the *Formula E-team* in The Netherlands (a team of ambassadors for the introduction of e-mobility founded by the national government).

[3] The national government supports these 'Green Deals' by subsidies, launching customership, giving access to capital markets, directing the different initiatives and changing (when possible) laws and regulations which form bottlenecks.

### 5.2.4. EV-value chain

**The countries studied differ in their focus on the EV-value chain. However, most policies seem to be focus either upstream (R&D) or downstream (customers) of the value chain (figure 10).**

*Upstream*

Germany is one of the countries with a strong focus on R&D in EV policy. This could be explained by the presence of major vehicle manufacturers in Germany (which collectively comprise the largest automotive industry in Europe). Sweden also has a strong focus on R&D. Over one-third of the policy instruments found in Sweden focuses on stimulating Research and Development. In France Renault has teamed up with the CEA (French Alternative Energies and Atomic Energy Commission) to work on electric vehicles, new energies and cleaner combustion engines.

*Downstream*

Most countries focus their policies downstream in the value chain; they adopt a large number of financial incentives, at different government levels (tax incentives, rebates, subsidies, local benefits, etc.). In Denmark, one-third of the steering instruments in the EV value chain focus on consumers. Austria has the strongest costumer-oriented focus. The Austrian policy, on all government levels, focuses primarily on financial instruments, like rebates and subsidies.

| Policy focus in the EV-value chain | | | | |
|---|---|---|---|---|
| **Country** | **R&D** | **Production** | **Services** | **Customer** |
| Belgium | + | + | + | ++ |
| Denmark | +++ | 0 | + | ++ |
| Germany | +++ | ++ | + | +++ |
| Netherlands | + | ++ | + | +++ |
| Norway | ++ | + | + | +++ |
| Sweden | ++ | + | + | ++ |
| UK | ++ | + | + | ++ |
| **Non NSR-countries** | | | | |
| *Austria* | + | + | + | +++ |
| *California* | +++ | ++ | + | ++ |
| *France* | + | + | + | +++ |
| *Italy* | ++ | ++ | 0 | + |
| *Spain* | + | ++ | + | ++ |
| *Portugal* | 0 | + | + | +++ |
| 0 = Limited information found / available<br>+ = Limited focus<br>++ = Strong focus<br>+++ = Prevalent focus area | | | | |

***Figure 10. The division of policy focus within policies that focus on the EV value chain***

### 5.2.5. Charging infrastructure value chain

**Grid-oriented policies seem less customer-focused than EV-policies, and tend to focus more on production and services (figure 11).**

*Production*

The focus on production can be explained by the relatively large number of policies that focus on the installation of (semi)-public charging points (mostly by regional and local governments). Many of those instruments focus on the installation of (semi-) public charging points. The UK national government has initiated the PIP (Plugged-In-Places) program. It intends to support the development and consumer uptake of ultra-low carbon vehicles by introducing electric-car hubs in six key British cities.

In Austria, the majority of steering instruments found in the charging infrastructure focuses on production. Most of them are concerned with the installation of charging points. A majority of the policy instruments established in Norway are focused on the installation of (semi-)public charging points. Different governmental levels concern themselves with the installation of charging points. However, closer examination of the data shows that most of the funding for the charging infrastructure comes from the national government.

*Services*

A significant number of instruments in the UK focus on services, e.g. the Road Map Charging Infrastructure. In 2012, the UK Government's Ministers of Transport and Business announced that a National Chargepoint Registry would be developed by POD Point – a UK-based charge-point manufacturer – and will include a publicly accessible database of charging points across the UK. An example of a policy instrument that focuses on service is EDISON. The Danish government finances part of the EDISON project, which links a pool of EVs to charging stations powered by wind energy. Most steering instruments in Sweden that are found in the charging-infrastructure focus on the 'customers'.

| **Policy focus in the charging infrastructure value chain** | | | | |
|---|---|---|---|---|
| **Country** | **R&D** | **Production** | **Services** | **Customer** |
| Belgium | 0 | + | ++ | ++ |
| Denmark | ++ | + | + | ++ |
| Germany | ++ | ++ | + | + |
| Netherlands | + | +++ | + | + |
| Norway | + | ++ | + | ++ |
| Sweden | ++ | + | + | + |
| UK | + | ++ | ++ | ++ |
| **Non NSR-countries** | | | | |
| *Austria* | + | + | + | ++ |
| *California* | + | ++ | + | ++ |
| *France* | ++ | ++ | + | + |
| *Italy* | ++ | ++ | 0 | + |
| *Spain* | + | ++ | + | + |
| *Portugal* | 0 | + | + | + |
| 0 = Limited information found / available<br>+ = Limited focus<br>++ = Strong focus<br>+++ = Prevalent focus area | | | | |

***Figure 11. The division of policy focus within policies that focus on the Charging infrastructure value chain***

# 6. PERFORMANCE

In our model, performance consists of six indicators, grouped in two categories.

- *EV performance*
  - Number of EV's registered
  - EV sales share
  - EV penetration
- *Infrastructure performance*
  - Number of charging stations
  - Number of fast charging stations
  - Carbon intensity of electricity supplied by charging-stations

The scores allow us to compare the performance of different countries and regions. performance indicators on a scale from 1 – 5. If an indicator scores '1' the performance on tl is very poor. If an indicator scores '5' the performance is considered very good. To determine we (1) *ranked* countries, and (2) awarded points for their performance. The performance is by a literature study and expert judgment; all scores are based on a ranking of the performa the in our data-set countries.

The data used for the EV- and charging infrastructure comparisons comes from two sources Global EV Outlook 2013 published by the International Energy Agency's Electric Vehicle In EVI).[xxxiii] The EV Outlook consists of data on the number of EV's and charging-stations, which from government agencies in different countries (all NSR-countries except Norway joined Vehicle Initiative). Secondly, data from the European Association for Battery, Hybrid an Electric Vehicles (AVERE) is used.[xxxiv] AVARE collects primary data on the number of EV's a infrastructure across Europe.[xxxv] In sum, the combination of data sources provides us with a picture of *all* NSR-countries (for instance, EVI doesn't include Norway, AVERE doesn't include

Our comparison is based on the data from AVARE and the EV Outlook. Data used for the co therefore updated until the end of 2012.

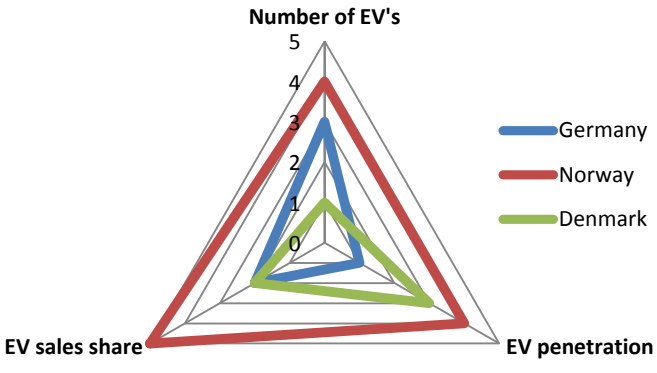
## 6.1. Findings EV Performance

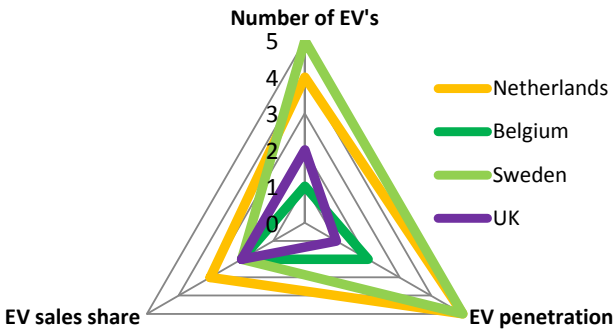
The table below shows our findings with regards to EV-performance. The number of EV's s ranks the countries.

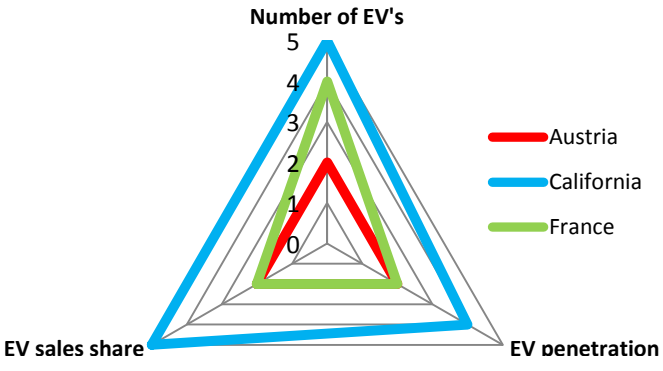
| Country | Findings |
|---|---|
| **Netherlands** | In January 2013, about 7.500 BEV's and PHEV's were registered in the Netherlands. The goal set for 2015 is to have 20.000 'electric vehicles' registered. This goal was already reached at the end of 2013. Due to the high number of registered EV's and the relatively low number of total cars registered, the Netherlands has the highest EV-penetration (number of EV's per 100 cars) of all studied countries. The EV-sales share over 2012 is 1,03%. This is higher than most NSR-countries. However, Norway's EV-sales share is three times as high (3,1%). In conclusion, EV performance in the Netherlands is very high. However, when considering the type of car registered, it is important to note it is mainly PHEVs. These cars are also petrol powered and thus less dependent on the charging |

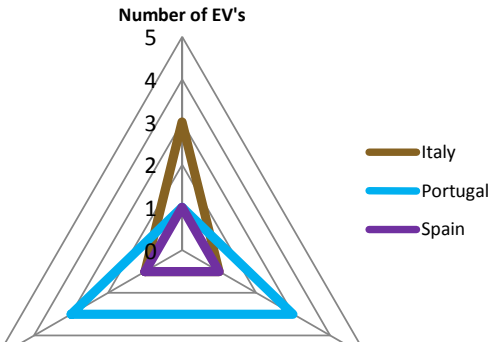
| | | |
|---|---|---|
| | infrastructure. | |
| **Norway** | The scores for EV-performance show a very positive image for Norway. The number of EVs on the road in July 12, 2012 was 7.220. This is a high number compared to the other countries. The EV penetration was 0,17% on January 1, 2012. The EV-sales share is higher, which indicates that the market is still developing. The EV-sales share is 3,1%, which is the highest sales share from the NSR-countries. Compared to the Netherlands, the number of BEV's is much higher. In the Netherlands, mostly PHEV's are sold, whereas in Norway it's the other way around. | **8.666** (486 PHEV's) |
| **Germany** | In Germany, on January 1, 2012, 4.541 EV's were on the road, more than its goal for 2012 of 2.200. Sales have increased since. In 2012, more than 5.000 EV's have been sold. Due to the large number of conventional cars on the road, Germany has one of the lowest EV-penetrations of all studied countries. However, BEV sales share seems to be on the rise again in 2013. | **6.711** (445 PHEV's) |
| **UK** | In January 2011, there were 2.600 electric cars registered in the UK. In 2012 almost 3.000 cars were sold. The goal set for 2020 is to have approximately 1.400.000 'electric vehicles' registered (5% of the car fleet). This goal looks unachievable at the moment. The scores on the indicators forming EV-performance show a negative image. The EV-sales share is 0,11%. This is lower than most NSR-countries. However, the EV sales share is larger than EV penetration, which indicates that the market is still developing. Like Germany, the UK also has a very low EV-penetration. | **3.739** (1.102 PHEV's) |
| **Sweden** | The observations for Sweden on EV performance are positive because of the number of EVs and the EV penetration. However, the EV sales share, however, lags behind other countries. No clear numbers prior to 2013 have been found. In the data found on the number of EV's in Sweden, eco-cars also counted as EVs. The definition of eco cars is unclear. Therefore, EV performance is less reliable. | **1.906** (1.103 PHEV's) |
| **Belgium** | Belgium scores below average on EV-performance. In 2012, 730 vehicles were on the road in Belgium. The number of vehicles is the lowest among the countries studied. The EV penetration and the EV sales share is also average or below average. | **824** (210 PHEV's) |
| **Denmark** | In Denmark, in January 2013, 1.274 vehicles were on the road. Compared to the year before, this number is almost doubled. The EV penetration on January 1, 2012, is average compared to other countries. The EV sales are slightly below average with a percentage of 0,31%. | **522** (7 PHEV's) |

*Table 48. EV-Performance NSR countries*



| EV performance - scoring | |
|---|---|
| The scores below are awarded by a relative comparison of the EV-performance of the different countries. This means that scores are rewarded based on the performance compared to other NSR-countries.<br>*Electric vehicles are defined as passenger car plug-in hybrid electric vehicles (PHEV) and battery electric vehicles (BEV's).* | |
| **Number of EVs:** | Total number of EV's registered.<br>1. <1.000<br>2. >1.000 – 3.000<br>3. >3.000-6.000<br>4. >6.000 – 10.000<br>5. >10.000 |
| **EV penetration** | Number of EV's registered as a percentage of the total number of passenger cars registered.<br>1. <0,015%<br>2. >0,015-0,030%<br>3. >0,030-0,050%<br>4. >0,050-0,085%<br>5. >0,085% |
| **EV sales share** | Number of EV's sold as a percentage of the total number of passenger cars sold.<br>1. <0,1%<br>2. >0,1-1%<br>3. >1-2%<br>4. >2-3%<br>5. >3% |

*Table 49. Scores on EV performance based on country comparison*

## 6.2. Findings Infrastructure performance

Findings regarding infrastructure-performance are shown in the table below. The data on the number of charging-stations is more ambiguous than data on the number of EV's. Partly because data is often incomplete, but also because countries use different methods and metrics for registration (some countries only count public charging stations, others also count semi-public chargers).

| Country | Findings |
|---|---|
| **Netherlands** | The Netherlands has the highest number of charging stations installed (5.000 in homes and offices, 4.000 in public areas). In 2012 there were 4.867 publicly accessible charging stations. The number of fast chargers is rapidly increasing with 102 (public and semi-public) fast chargers currently installed, representing the largest number found in this research. The Dutch National Government also estimates there were around 18.000 private chargers installed by the end of 2013. The scores on the indicators forming EV-performance show a very positive image. Compared to other countries, the number of publicly available charging-stations is very high. The Netherlands are the first EU country where it is possible to charge an EV on the highway. In the Netherlands, as in the UK and Belgium, the carbon intensity of the electricity used to charge EV's is very high. |
| **Norway** | In Norway, the scores on the indicator infrastructure performance show an overall positive image. Norway installed 957 publicly accessible charging stations (semi-public excluded). There are also 39 fast chargers installed, which is above average compared with other countries. When taking into account the 2020 goal of 5.000 publicly accessible chargers, the number installed appears to be on schedule. In Norway, the carbon intensity of the electricity used to charge EV's is very low. |
| **Germany** | By the end of 2011, Germany had one of the highest number of charging stations installed (1.324 public, 613 private). This trend continued. By the end of 2013 approximately 10.000 public and private charging points were installed (distribution between private and public is not known). |
| **UK** | The UK has a large number of chargers installed. In fact the UK currently has the largest number of public charging points available (approximately 8.600). The number of charging points even exceeds the number of EV's. However, the scores of the carbon intensity indicator present a negative image. In the UK, as in the Netherlands and Belgium, the carbon intensity of the electricity used to charge EV's is very high. |

| | |
|---|---|
| **Sweden** | For Sweden no observations can be made, for there are no numbers available about the number of charging stations and number of fast chargers. The carbon intensity scores high because the share of renewable energy at final energy consumption is 47,9 percent |
| **Belgium** | Compared to other countries, the number of publicly available charging-stations is very low. The number of fast chargers is average. In Belgium, just as in the Netherlands and in the UK, the carbon intensity of the electricity used to charge EV's is very high. |
| **Denmark** | The realized number of charging stations isn't available. According to the data found, Denmark had only 280 public charging stations available by the end of 2012. This is partly explained by the initial focus on battery swap stations (Better Place). The number of fast charging stations is also below average. |

*Table 50. Infrastructure performance NSR countries*

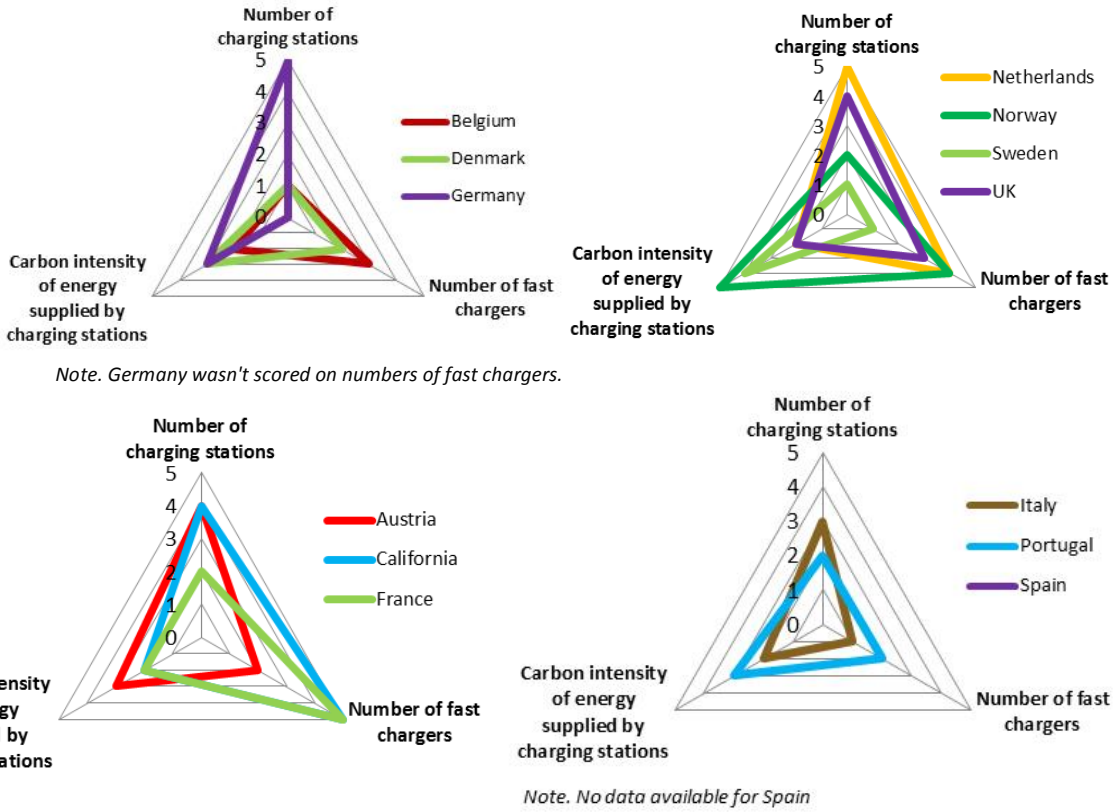



*Figure 14. Findings on Infrastructure performance for NSR and other countries*

| **Charging Infrastructure performance - scoring** | |
|---|---|
| The scores below are awarded by a relative comparison of the charging-infrastructure performance in the different countries. This means that scores are rewarded based on the charging infrastructure performance compared to other NSR-countries.<br>Charging stations are defined as non-residential "slow" and "fast" electric vehicle supply equipment (based on EV Outlook 2013) .<br>- "Slow": This type of charging (most common) provides alternating current to the vehicle's battery from an external charger. Charge times can range from 4 to 12 hours for a full charge.<br>- "Fast": Also known as "DC quick charging", fast charging stations provide a direct current of electricity to the vehicles battery from an external charger. Charging times can range from 0.5 to 2 hours for a full charge. | |
| **Number of charging stations** | 1. <200<br>2. >200-1.000<br>3. >1.000-3.000<br>4. >3.000-8.000<br>5. >8.000 |
| **Number of fast chargers** | *1.* <5<br>*2.* >5-10 |

| | |
|---|---|
| | 3. >10-20<br>4. >30-50<br>5. >50 |
| **Carbon intensity of electricity supplied by charging stations** | The distribution by Eurostat[xxxvi] is used to score this variable (percentage of electricity generated from renewable sources). This presents us with the following scores:<br>1 = < 6,97%<br>2 = 6,97% - 12.83%<br>3 = 12.83% - 22.23%<br>4 = 22.23% - 33.13%<br>5 = >33.13%<br>*Note. We did not find comparable data on the carbon intensity of the electricity supplied by charging stations in the NSR-countries. Therefore aggregated data on the carbon electricity on national level is used. The researchers do note that several examples of 'green certification' of charging stations were found. However, the definitions of green/renewable/sustainable differ and are hence not suited for comparison.* |

***Table 51. Scores on infrastructure performance based on country comparison***

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[ii] Vehicle with a designated seating capacity of 10 or less.

[iii] Vehicle with a designated seating capacity of 10 or less that is constructed either on a truck chassis or with special features for occasional off-road operation.

[iv] HEV has the ability to operate all-electrically, generally at low average speeds. At high steady speeds such a HEV uses only the engine and mechanical drivetrain, with no electric assist. At intermediate average speeds with intermittent loads, both electric and mechanical drives frequently operate together. (IEA, IA-HEV).

[v] A HEV with a battery pack with a relatively large amount of kWh of storage capability, with an ability to charge the battery by plugging a vehicle cable into the electricity grid. (IEA, IA-HEV).

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NORTH SEA REGION ELECTRIC MOBILITY NETWORK

e-mobility NSR

## About E-Mobility NSR

The Interreg North Sea Region project North Sea Electric Mobility Network (E-Mobility NSR) will help to create favorable conditions to promote the common development of e-mobility in the North Sea Region. Transnational support structures in the shape of a network and virtual routes are envisaged as part of the project, striving towards improving accessibility and the wider use of e-mobility in the North Sea Region countries.

www.e-mobility-nsr.eu

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