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Part A – Policies analysis

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FOREWORD

On 29th June 2016, European Commissioner Elzbieta Bieńkowska, responsible for the Internal Market, Industry, Entrepreneurship and SMEs spoke in front of the representatives of the International Automotive Federation (Fédération internationale de l'automobile, FIA): “*Let’s shift gears early to be ready for the future. [...] A European industry that develops new green technologies faster will win. A European industry that quickly moves from low emission vehicles to zero emission vehicles will win*” (European Commission, 29th June 2016). This speech followed among others the Volkswagen’ emissions scandal that was revealed in September 2015 by the Environmental protection agency of the United States; this scandal raised awareness over the higher levels of pollution being emitted by the vehicles built by a wide range of car makers, which under real world driving conditions are prone to exceed legal emission limits. A study conducted by ICCT and ADAC (ICCT, September 2015) showed the biggest deviations of vehicles from Volvo, Renault, Jeep, Hyundai, Citroën and Fiat, resulting in investigations opening into other potential diesel emissions scandals.

On the other hand, more and more political representatives claim their willingness to promote electric mobility and to ban internal combustion vehicles. In Europe, the latest statements were issued by the French Minister of the ecological and inclusive Transition, Mr. Nicolas Hulot, on 5th July 2017 as he presented the new “Climate action Plan” of the French Government (French Government 2017). By 2040, purchases of internal combustion vehicles will be banned in France; other European countries claimed the same objective during the last couple of years: Austria plans to ban internal combustion vehicles by 2020 (Austrian Ministry of Agriculture and the Environment, April 2016), Norway (*Stortinget* (Norwegian Parliament), June 2016) and the Netherlands (*Tweede Kammer der Staten-Generaal* (Dutch House of representatives), April 2016) by 2025, Germany by 2030, following a decision taken by the Federal Council in September 2016 (*Bundesrat* (German Federal Council), 23rd September 2016).

European countries are dedicated to contribute to the environmental objectives stated in the Paris Agreement of the COP21 and in the various strategies for mobility, environment and climate defined and adopted by the European Union (EU). All in all, electric mobility is increasingly considered as one of the key solutions to achieve low-emission mobility as being as well a key driver of growth, innovation and jobs in Europe (European Commission, Strategy for low-emission mobility, 20th July 2016). This shift is more and more noticeable as growing numbers of electric vehicles (EVs) are registered in European countries, and more and more electric charging stations (E-CS) are installed in both public and private spaces. In Europe, some countries are among the key leaders of electric mobility: Norway, France, the Netherlands, and Germany for instance. But not only Northern and Western European countries are dedicated to the deployment of a robust charging network; for instance, Estonia became the first country to complete the deployment of a nationwide electric car charging network, and as of December 2013, it was the only country with such geographical coverage. The Estonian network has the highest concentration of chargers in Europe. By 2015, Estonian authorities registered 1.100 EVs and 700 E-CS were already installed. The Estonian government and KredEx launched the charging station network project ELMO in 2011, in cooperation with Mitsubishi. The Estonian e-mobility program was launched to increase the share of renewable energy in transportation and reduce CO2 emissions caused by the private transport sector with a budget of 12 million € for the five-year-long project. The nationwide electric car charging network officially opened with 165 fast chargers on 20th February 2013. These chargers that comply with the CHAdeMO standard (cf. part C, Charging infrastructure analysis) were installed in all urban settlements with more than 5.000 inhabitants. In addition, chargers are installed on the all major roads at intervals of no more than 60 kilometres. That makes it possible to reach every point within the country without a supply interruption. Another main point is that all of the chargers are fast-charging, only between 15 and 30 minutes to charge a car's battery up to 80% (Source: ELMO website).

1 INTRODUCTION

1.1 Objective of this report

With regard to low-carbon mobility, two different solutions of electric vehicles are concurring on the markets at that date, with different degrees of TRL (technology readiness level), but also with different technical characteristics: 100% battery driven or plug-in hybrid electric vehicles (BEVs and PHEVs) on the one hand, and fuel cell electric vehicles (FCEVs) on the other hand.

The first mentioned type of vehicles is commercialised since several years in Europe, with a slowly growing market share (in average, national market shares do not exceed 1% of the total purchases of vehicles at the moment). BEVs are characterised by still low autonomies, even if first vehicles reach about 300 km under real conditions now (i.e. up to 400 km theoretically for some models), and long recharging times of generally several hours to completely fill the battery. The batteries are heavy and reduce the possible charging potential of such vehicles. BEVs are generally small vehicles, today used in urban and suburban conditions where energy recuperation can fully be used to optimize the driving range. Today, BEVs do not seem to fit to bigger vehicle types or long distance journeys. BEVs need a recharging infrastructure (the so-called electric vehicles charging stations, E-CS) as well close to the driver's home, where the vehicle will mainly be parked and recharged, as in other public places to recharge occasionally. As E-CS will be blocked for longer periods, a much higher number will be necessary than for other solutions with faster recharging systems in order to foster the development of electric mobility in the world.

FCEVs are quite similar to classic ICE (internal combustion engine) vehicles, with high autonomies of 500-600 km and more, able to power all types of vehicles and to be used without major behaviour changes of citizens. A recharging is done in several minutes, and hydrogen recharging infrastructures can serve many vehicles as doing gas stations today. FCEVs face the "hen and the egg" problem with regard to the deployment of vehicles and recharging infrastructures. At that date, no FCEV is commercialised in Europe, all existing vehicles are part of R&D projects or demonstrators.

This report deals with the presentation of the state of the art and it is the first deliverable of the e-Moticon project that concentrates on electric mobility with BEVs and especially E-CS deployment strategies in the Alpine Space regions. This project aims at developing a trans-national deployment strategy of E-CS for BEVs in the Alpine Space since one could notice that the region is characterized by a low and inhomogeneous deployment of electric mobility (source: presentation of the e-Moticon project). One of the reasons is the low level of interoperability when it comes to the charging networks, which is often due to the limited integration of planning instruments used by the public authorities and their lack of knowledge in technological innovation and business modelling.

The project is addressing mainly public authorities as they are playing a leading and coordinating role in the promotion of electric mobility and the deployment of a broad charging infrastructure. Private operators are also a target of the e-Moticon project, and the results can help them integrating their E-CS into a wider and interoperable system. General objective of the project is to ensure a homogenous development of electric mobility, by combining spatial planning, innovative business models and technologies within the trans-national strategy.

After the analysis of policies, business models and technologies, i.e. the state of the art, e-Moticon will publish a White book on innovative planning of charging stations to respect electric mobility requirements in

the Alpine Space transnational strategy and regional action plans. The project will then provide a toolset to anticipate E-CS network requirements and test it in three different pilot actions.

A state of the art analysis has been conducted with regard to electric mobility to identify the best solutions to be integrated in the deployment strategy. The present report on Electric Mobility Policies is part of a series of three different e-Moticon state-of-the-art reports:

- Part A: Policies Analysis
- Part B: Business Model Analysis
- Part C: Charging Infrastructure Analysis

The present report focus on the various policies defined and adopted at different governance levels: first of all at the European one, then at national and even regional levels of countries and regions in the Alpine Space. Some policies are dealing with low-carbon-mobility in general, and can there be applied to BEVs as well as to FCEVs. Others are clearly oriented to battery-driven vehicles or to the corresponding recharging infrastructures.

1.2 Methodology

This report is the result of a structured information gathering process with the contributions of e-Moticon partners in all Alpine Space regions, as sketched in the following Figure 1.

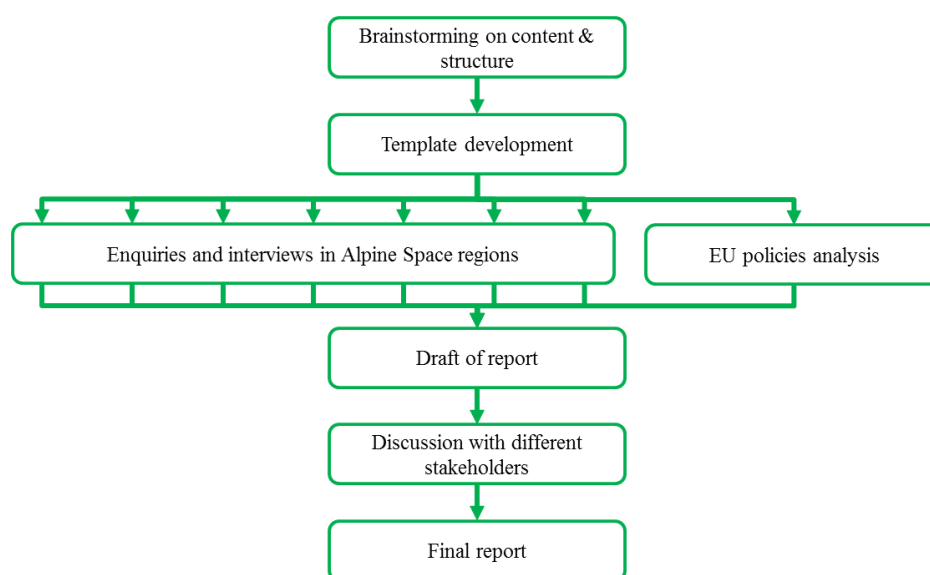


Figure 1: Steps of the Policies Analysis report elaboration

At first, the project partners agreed on the templates' format and on the information that would be provided by each project partner to furnish a structured input for the report. Then, all project partners conducted interviews with the relevant stakeholders and filled in a collection of templates gathering the most relevant results at the local and regional levels focusing on the national situation and national policies in favour of electric mobility, on the local and regional incentives for electric mobility, and on E-CS, mobility, roaming platforms and information platforms operators. The project partners also aggregated data about the E-CS that have been installed in the Alpine Space and their corresponding technical details. The filled templates are published in the appendix at the end of each corresponding part.

The results of this report have been discussed with members of public authorities, EV and not EV fleet operators and other stakeholders to ensure the integrity of the given information.

Pôle Véhicule du Futur as work package leader for the redaction of the state of the art's report used the templates to analyse the current situation of electric mobility in the Alpine Space. To further feed this report, Pôle Véhicule du Futur invited stakeholders involved in the electric mobility sector to the second e-Moticon seminar that was held in Strasbourg (France) on 5th and 6th July 2017; E-CS and mobility operators Freshmile, Cirrantic, ChargeMap and E-CS supplier Hager got the opportunity to present their activities as well as discussing their visions on the future development of electric mobility. Their presentations helped understanding the various business models that can be found in the electric mobility sector, as presented in the corresponding analysis (part B).

State of the art descriptions are not done on a strict national basis but – when it is possible and relevant – focus on a cross-national basis. Since the information gathered by the partners deal with their national and regional frameworks, a cross-national analysis allowed to underline similarities and differences and to consider the Alpine Space as a relative homogeneous territory facing the same challenges and willing to adopt an interconnected strategy for the development of electric mobility through the deployment of interoperable charging networks for EVs, giving an echo to the general objective of the e-Moticon project.

For this part dealing with the policies, the policies adopted and implemented at the European level (European Union) are presented before the objectives and incentives developed by each national and regional public authority in the Alpine Space.

2 EUROPEAN OBJECTIVES, INITIATIVES AND SUPPORT FOR ELECTRIC MOBILITY

2.1 European objectives

The impulse given by the European Commission to the development of electric mobility and the installation of E-CS throughout the EU is a result of the various environmental and energetic strategies adopted by the European institutions.

Three major “Climate and Energy Roadmaps” have been discussed and defined by the European leaders:

- In 2009, the “2020 Climate and Energy Package” sets binding legislation to ensure the EU meets its climate and energy targets for the year 2020.

The package sets three key targets:

- o 20% cut in greenhouse gas emissions (from 1990 levels)
- o 20% of EU energy from renewables: EU member countries have also taken on binding national targets for raising the share of renewables in their energy consumption by 2020, under the Renewable Energy Directive.
- o 20% improvement in energy efficiency: Measures for increasing energy efficiency are set out in the: Energy Efficiency Plan (COM (2011) 0109) and in the Energy Efficiency Directive (2012/27/EU).

- In October 2014, a new roadmap has been defined, namely the “2030 Climate and Energy Framework” (COM (2013) 169). The 2030 climate and energy framework sets three key targets for the year 2030:
 - o At least 40% cuts in greenhouse gas emissions (from 1990 levels)
 - o At least 27% share for renewable energy
 - o At least 27% improvement in energy efficiency: in 2020, this objective will be reviewed and replaced with a 30% objective.

- The third roadmap has been adopted in 2011 (COM (2011) 112), it is based on a long-term vision: the roadmap “2050 low-carbon economy” is looking at cost-efficient ways to make the European economy more climate-friendly and less energy-consuming. Its low-carbon economy roadmap suggests that:
 - o By 2050, the EU should cut greenhouse gas emissions to 80% below 1990 levels
 - o Milestones to achieve this are 40% emissions cuts by 2030 and 60% by 2040
 - o All sectors need to contribute
 - o The low-carbon transition is feasible & affordable.

These three roadmaps do not exclusively deal with electric mobility but set objectives for the transport sector which is one of the most high-carbonized industry sectors; for instance, in 2015, the transport sector which is still mainly supplied from oil used more than 30% of the European primary energy and produced about 24% of the CO₂ emissions in the EU (source European Commission).

On 28th April 2010, the European Commission presented “a strategy for clean and energy efficient vehicles” (COM (2010) 186) aimed at encouraging the development and market uptake of these vehicles and enabling the environmental impact of road transport to be reduced, and at boosting the competitiveness of the European automotive industry. BEVs and PHEVs are covered by the strategy and benefited from specific measures outlined by the European Commission, i.e. the standardization of technical rules relating to electric safety for vehicle type-approval. Even if the European Commission put its main focus on BEVs and PHEVs, FCEVs are already considered in this strategy as a part of the solution to reach low-emission mobility; in this Strategy, the European Commission urged to promote and facilitate the emergence and the market breakthrough of both technologies: *“Hydrogen fuel cell vehicles can also deliver similar environmental benefits to battery electric vehicles. [...] The development and deployment of battery and hydrogen fuel cell vehicles is therefore mutually complementary as they share many similar electrical drivetrain components”*.

Besides the “2050 low-carbon economy” roadmap, the European Commission also issued in 2011 a White Paper on Transport: “Roadmap to a Single European Transport Area - Towards a competitive and resource efficient transport system” (COM (2011) 144). Both documents focus on the role of electric cars and alternative fuels in general to achieve the goals set by the EU in terms of reduction of polluting emissions and began to imagine a vehicle labelling matching with the CO₂ emissions.

In 2013, the European Commission issued a specific Communication linked with the transport sector, “Communication for a clean power for transport” (COM (2013) 17). In this communication, the European Commission was underlining the fact that the *“lack of recharging points with a common plug, was a major obstacle to the market uptake”* and that the Member States did not count enough publicly accessible charging points neither announced specific policies and legislation on this topic. This Communication addressed the development of common technical specifications, and before all, the development of a common plug enabling the charging of EVs.

Following the adoption of the Alternative Fuels Infrastructure Directive (2014/94/EU), the European Union published specific objectives linked with the deployment of an effective charging infrastructure for EVs:

- The Member States had to make their targets and their national policy frameworks public by the end of 2016;
- The directive requires Member States to set targets for an appropriate number of publicly accessible recharging points to be built by the end of 2020, to ensure that EVs can circulate at least in urban and suburban areas. Targets should ideally foresee a minimum of one recharging point per ten EVs.
- Moreover, the directive makes it mandatory to use a common plug all across the EU, which will allow EU-wide mobility.
- Member States must ensure that information about the geographical location of publicly accessible recharging and refuelling points is made available in an open and non-discriminatory manner.

The last current strategy published by the European Commission deals specifically with the low-emission mobility and has been issued in July 2016. This Strategy (COM (2016)501) aims at:

- Increasing the efficiency of the transport system by making the most of digital technologies, smart pricing and further encouraging the shift to lower emission transport modes;
- Speeding up the deployment of low-emission alternative energy for transport, such as advanced biofuels, electricity, hydrogen and renewable synthetic fuels and removing obstacles to the electrification of transport;
- The Strategy sets a clear objective concerning EVs: it supports the deployment of 8 million EVs in the EU by the end of 2020 and ensuring the development of electric mobility services.
- Achieving interoperability and standardization for electric mobility: the European Commission states on that issue that “*further effort should be made to foster the creation of an EU-wide electro-mobility services market, such as the cross-border interoperability of payments and the provision of real-time information on charging points*”;
- Moving towards zero-emission vehicles. While further improvements to the internal combustion engine will be needed, Europe needs to accelerate the transition towards low- and zero-emission vehicles.

With this Strategy, the European Commission is also looking into better synergies between the energy and transport systems, for example addressing distribution challenges of electricity at peak times. This would make charging of EVs easier (cf. corresponding part on smart grids below).

According to the European Commission, the promotion of electric mobility matches perfectly with the objectives defined by the EU to achieve the Energy Union (COM (2015) 080....), one of the biggest legislative enterprises of the EU at the moment, since electric mobility contributes to the achievement of each of the five pillars of the Energy Union:

- It helps increasing the energy security;
- It offers new solutions to deepen the achievement of the internal energy market;
- It allows a better usage of the energy;
- Electric mobility is a major driver for decarbonisation;
- It pushes innovation forward: on that point, we can quote the 11th chapter of the Working program for the Horizon 2020 funding program dedicated to “smart, green and integrated transport”. EVs and E-CS benefit from projects EU-wide.

2.2 European initiatives and support for electric mobility

2.2.1 Legislative support to electric mobility

A major support given to electric mobility by the European Union first comes through the definition and the adoption of electric mobility-friendly regulations. The EU legislative packages began to deal with clean fuels and clean vehicles and did not exclusively mention electric mobility:

- The Renewable Energy Directive 2009/28/EC sets the objective of a 10% share of renewable energy sources in motor fuels by 2020.
- The Fuel Quality Directive 2009/30/EC focuses on the reduction of CO₂ intensity of fuels by 6% by 2020.
- The Clean Vehicles Directive 2009/33/EC aims at fostering a broad market introduction of environmentally-friendly vehicles through green public procurements. Energy and environmental impacts, i.e. the energy consumption and the polluting emissions (CO₂, NO_x, particulate matter...), linked to the operation of vehicles over their whole lifetime should be taken into account in all purchases of road transport vehicles, as covered by the public procurement directives and the public services regulations.

The European Union also set mandatory targets for the average CO₂ emissions for vehicles in two Regulations:

- Regulation n°443/2009 (EC) setting emission performance standards for new passenger cars: until 2020, new passenger cars shall not exceed emissions of 130g CO₂/km. From 2020 onwards, the new limit is set at 95g CO₂/km as average emissions for the new car fleet.
- Regulation n° 510/2011 (EU) setting emission performance standards for new light commercial vehicles: This Regulation sets the average CO₂ emissions for new light commercial vehicles at 175 g CO₂/km; from 2020 onwards, the Regulation sets the average CO₂ emissions for this category at 147g CO₂/km.

According to these Regulations, EVs are considered as zero emitters and benefited from an impulse given by the roadmaps and Strategies related to environment protection and fostering of the renewable energy sources issued by the European Commission which allowed the market take-off and the deployment of a larger number of E-CS throughout the EU.

However, one regulation can be considered as the cornerstone for the development of electric mobility and the corresponding charging infrastructure in the EU: the Directive 2014/94/EU on the deployment of alternative fuels infrastructure published on 22nd October 2014.

- As already shown, according to this Directive, Member States should ensure that an appropriate number of publicly accessible recharging points for EVs would be installed in urban, suburban and other dense populated areas by the end of 2020. This objective has to be taken into account in each national policy framework. The average number of E-CS is given by the European Commission: one E-CS for every ten EVs.
- Member States shall take measures to encourage the deployment of recharging points that are not accessible to the public, for instance in the parking lots of private buildings.
- Member States have to make publicly accessible the data on the geographic location of the publicly accessible E-CS.

- EVs' drivers should be able to charge at any E-CS even if they have not subscribed a contract with the specific E-CS operator.
- This Directive also sets the technical standards for plugs and sockets. These standards defined by the European Commission aim at enabling interoperability.
 - o For E-CS delivering a normal-charging power with an alternate current, the standard socket is the Type 2 socket corresponding to the norm EN 62196-2.
 - o For E-CS delivering a high-charging power with an alternate current, the standard socket is also the Type 2 socket (EN 62196-2).
 - o For E-CS delivering a high-charging power with a continuous current, the standard socket is the Combo 2 (CCS) defined by the norm EN 62196-3.
- According to the Directive 2014/94/EU, all E-CS that are installed and replaced in the EU from 18th November 2017 onwards shall be conformed to the European standards and should be equipped with smart metering systems for a smart charging.
 - o However, the other sockets, such as the Japanese standard CHAdeMO for instance are tolerated until 2019.
- E-CS operators should be able to buy the electricity supplying their charging infrastructure from any electricity supplier of the EU.
- Even if it does not belong to the legislative content of the Directive, the EU underlines the need for a coherent and coordinated cross-border continuity of the E-CS installation plans in order to avoid the fragmentation of the E-CS locations throughout the EU.

The decision of the European Commission of introducing a “Clean Energy for all Europeans Package” will have an impact on some of the legislation dealing with electric mobility which will be revised from 2017 onwards, such as the Effort Sharing Directive which regulates the emissions in economic sectors such as transports and buildings, the Renewable Energy Directive, the Energy Efficiency Directive and the Electricity Market Regulation. The Clean Vehicles Directive which regulates green public procurement will also be revised in 2017 according to the European Commission in the framework of the Energy Union Package in accordance with the will to set new post-2020-standards for cars and vans.

2.2.2 Financial support to electric mobility

Besides the legislative framework defined and adopted by the EU in order to foster the development of electric mobility, the EU is further engaged in the financial support to European projects thanks to a broad spectrum of financial tools.

We have given a list of the most important projects that have been financed (partially or totally) in the data collection template that is attached in the appendix.

When it comes to the financial tools of the EU for the support and deployment of electric mobility, we can underline the following:

European Structural and Investment (ESI) Funds (ERDF, ESF, Cohesion Fund)

Alternative fuels can be supported by the ESI funds in accordance to the following objectives and articles:

- Thematic Objective 7 "Sustainable transport" aims at promoting sustainable transport and removing bottlenecks by investing in TEN-T, environment-friendly and low-carbon transport systems and interoperable railway systems;

- Thematic Objective 4 "Low-carbon economy" aims at supporting a shift towards a low-carbon economy by promoting low-carbon strategies, incl. sustainable urban mobility;
- Article 7 of the EBRD (European Bank for Reconstruction and Development) regulation also foresees support to sustainable urban development through strategies for integrated action.

24 Member States are benefiting, including all 15 cohesion countries. The ESI funds are managed in a decentralized way: the Commission and the Member States develop Partnership Agreements on national level and Operational Programmes on thematic level. The funds are then managed by a specific Managing Authority in each Member State. In addition, cities can spend directly 5% of the funds on urban development. Project promoters should contact the Managing Authorities in the countries where they wish to develop projects, to find out about the concrete opportunities in these countries.

As part of the European Regional Development Fund, the Interreg programs can be highlighted following their growing dedication to the financing of projects related to the development of electric mobility throughout Europe, and even with a cross-border perspective:

INTERREG

The INTERREG programs, namely Interreg Europe 2014-2020, Interreg Alpine Space, Interreg North-West Europe, Interreg Upper Rhine and the other local or regional variations of Interreg cooperation co-finance projects where public authorities from different regions work together for three to five years on a shared policy issue. Regular calls are launched. Project promoters should follow up the calls.

For more info:

- <http://www.interreg4c.eu/interreg-europe>
- <http://www.alpine-space.eu/>
- <http://www.nweurope.eu/>
- <http://www.interreg-rhin-sup.eu/>

For more information about ESI Funds

- http://ec.europa.eu/regional_policy/index_en.cfm
- http://ec.europa.eu/regional_policy/manage/authority/authority_en.cfm

Horizon 2020 - "Smart, Green and Integrated Transport"

Horizon 2020 is name of the ongoing EU Research Framework Programme 2014-2020. This framework programme describes several challenges of European interest. H2020 funds research and innovation actions, but no investments in infrastructures or vehicles.

One of these challenges is "Smart, Green and Integrated Transport" with the two calls "Mobility for Growth" and "Green Vehicles". These are probably the main calls for electric mobility topics, but they are also present in other parts of the H2020 work programme.

For more info:

- <http://ec.europa.eu/programmes/horizon2020/en/h2020-section/smart-green-and-integrated-transport>

Connecting Europe Facility (CEF) funds for TEN-T projects

The TEN-T forms the backbone of the European transport system with nine corridors across the EU. Since 2014, there is specific financing for the "urban nodes" i.e. the cities on the core network. There is also

financing for alternative fuels under "innovation" when the projects are located outside of urban nodes. Project promoters should follow up the calls.

For more info:

- <http://ec.europa.eu/transport/themes/infrastructure/>
- <http://ec.europa.eu/inea/en/connecting-europe-facility/cef-transport>

JASPERS

The JASPERS programme gives technical assistance to prepare high quality major projects to be financed by the European Structural and Investment Funds in the new Member States (Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Greece, Latvia, Lithuania, Hungary, Malta, Poland, Romania, Slovenia, and Slovakia). JASPERS focuses on major projects with total eligible cost exceeding €75 million. JASPERS' assistance may cover project preparation, independent quality review of project, capacity building including a Competence Centre and implementation of the projects. Project promoters with projects in one of the 15 new Member States should contact JASPERS directly.

For more info:

- <http://jaspers.eib.org/>

LIFE programme

LIFE is the EU financing instrument for the environment and climate action. The 2014-2017 work programme includes a thematic priority on "Air quality and emissions, including the urban environment". Calls are published regularly. Project promoters should follow up the calls.

For more info:

- <http://ec.europa.eu/environment/life/about/>
- <http://ec.europa.eu/environment/life/funding/life.htm>

Fuel Cell and Hydrogen Joint Undertaking

The European Commission, the Industry and the Research institutions finance the development of hydrogen as a transport fuel and a source of energy. Calls are published regularly. Project promoters should follow up the calls.

For more info:

- <http://www.fch.europa.eu/>

3 COUNTRY-WISE ANALYSES (ALPINE SPACE COUNTRIES)

3.1 Austria

3.1.1 Stakeholders

The definition of the policies related to electric mobility is mainly driven by the Austrian Ministry for Transport, Innovation and Technology which covers a range of policy fields such as mobility of the future, electric mobility in general and in urban areas in particular, energy research. The Federal Ministry is supported by other national bodies, the Federal Ministry of Agriculture, Forestry, Environment and water management which launched the initiative “Electromobility model regions” with a yearly budget comprised between one and two million €, by the Federal Ministry of Science, Research and Economy but also by two other public agencies, i.e. Austria Tech (the Federal agency for technological measures belongs to the Federal Ministry for Transport) and the Austrian association for advanced propulsion systems (A3PS).

But other stakeholders representing the private hand also play a major role for the promotion of electric mobility, and above all the E-CS operators, the mobility operators and the electricity suppliers that take part in the installation, the maintenance and the operation of a broad network of charging infrastructure. Among these private actors, the main ones are SMATRICES, that operates the largest network of publicly accessible E-CS in Austria, ELLA AG, TIWAG AG, and the regional energy suppliers (Salzburg AG, KELAG for instance).

The promotion of electric mobility is also backed up thanks to the information and roaming platforms that ease the shift towards electric mobility towards the drivers: e-tankstellenfinder is the national information platform, run by KELAG, and Ö-Hub is an Austrian roaming platform, even if other roaming platforms are in operation in Austria (such as Hsubject).

There are three national associations that deal with electric mobility at the federal level:

- The Austrian e-mobility alliance, founded in 2009, which represents the research, mobility and ICT sectors;
- The Austrian Electromobility association (2015), representing national and local energy utilities;
- The Federal initiative eMobility Austria (2013): it is a network for SMEs active in the field of electric mobility, green energy and intermodality.

3.1.2 National objectives, initiatives and support for electric mobility

The Federal Government continuously states that Austria needs a shift when it comes to the mobility policies, with a shared commitment to reach a CO₂-neutral transport sector by 2050, a transition to low- and zero-emission mobility based on renewable sources of energy and a clear focus on electrification as a key solution to achieve clean transport. According to the various scenarios sketched by the Federal Ministry of Transports, the Austrian market for EVs should grow continuously in order to achieve between 66.000 and 174.000 registered EVs by 2020. In the same time, the number of publicly accessible E-CS will continue to grow; between 3.000 and 4.000 E-CS delivering a normal-charging power (up to 22kW) will be installed by 2020, whereas between 500 and 700 fast-charging E-CS (over 22kW charging power) are planned.

However, the Austrian Government already introduced measures committed to the development of electric mobility through the E-Initiative that has been granted with a budget of 72 million € in November 2016, the

budget being provided by the Austrian Government and the car industry. This initiative includes several measures:

- Purchase support for EVs¹
 - o Private persons: 4.000 € / BEV (2.500 € federal funding, 1.500 € bonus of the automobile importers), 1.500 € / BEV (50% federal, 50% importers)
 - o Companies, municipalities, associations: 1.500 € / BEV and PHEV (50% federal, 50% importers)
 - o further purchase support for e-busses and light e-commercial vehicles (only for companies, municipalities, associations) and for two-wheelers (also for individuals)
- Government support for the deployment of publicly accessible charging infrastructure:
 - o 200€ for a wallbox,
 - o 1.000€ for a charging station attached to the ground (up to 22kW),
 - o 2.000€ for a charging station for accelerated charging (22kW to 43 kW) and
 - o up to 10.000€ for quick chargers
- Government support for private wall boxes and smart charging cables:
 - o 200€ from the federal government (only once with the simultaneous purchase of an e-car)
- A specific license plate has been created in order to identify easily the BEVs and the FCEVs; this plate is in use since 1st April 2017;

Other measures that are not enclosed in the E-Initiative are of fiscal nature: BEVs benefit from fiscal incentives and exemptions, such as the exemption from the engine-related insurance tax, and from the standard consumption tax; furthermore, enterprises are entitled to reclaim input tax.

The main strategy of the Austrian Government is to be read in the “General Transport Plan” issued in 2012, that states that “*electric mobility is a major solution for the development of a modern and efficient transport system*”; electric mobility can achieve this sustainable and efficient shift of mobility when it is supplied with renewable sources of energy, and when both public and individual transport systems benefit from electric vehicles. Additionally, the National Strategy on “Clean Energy in Mobility” which has been concluded on 6th December 2016, also focuses on E-Mobility.

The Austrian Government also finances a range of projects and initiatives dedicated to the promotion of electric mobility: R&D projects, pilot projects for electric mobility in urban areas, support for start-ups active in the field, creation of “e-mobility regions” that are especially promoting electric mobility, funding projects driven by cities and municipalities.

3.1.3 The implementation of the Directive 2014/94/EU

The Directive 2014/94/EU on the development of an EU-wide infrastructure for alternative fuels is considered as one of the cornerstones for the development of electric mobility at the European level. The transposition of the Directive began in Austria at the end of 2014 and went on over the year 2015 when the Federal Agency Austria Tech launched an online consultation and created workshops dedicated to the implementation of the Directive.

The objective of national-level infrastructure and regional workshops as well as the online consultation was three-fold:

¹ <https://www.umweltfoerderung.at/>

- To establish a common understanding that the core of AFI focuses on decarbonisation with measures in Austria consequently aiming at mitigating the environmental impact of transport – a perspective that goes well beyond the build-up of AFI;
- To state clearly that the Austrian national policy framework for the development of the market as regards alternative fuels in the transport sector and the deployment of the relevant infrastructure will build on existing national, regional and local strategies. To clarify that the national policy framework will summarize the results of thorough stakeholder consultation as well as planning at different governance levels;
- To establish and confirm a common understanding of necessary policy and administrative measures needed to further clean transport and especially clean vehicles, a process which is on-going at the time of writing.

However, a part of the Austrian legislation already matched with the objectives and the principles contained in the Directive. The purpose of the Directive's implementation in Austria was not to build a policy framework from scratch but rather to reinvigorate existing initiatives on alternative fuels market development in the transport sector and infrastructure build-up, gaining commitments from national, regional and local policy levels, identifying necessary additional measures as well as placing AFI implementation into the broader context of decarbonisation.

An issue that the Austrian Government met during the transposition and the implementation of the Directive was the lack of standardisation for the information related to the charging infrastructure. In general in Austria a lot of information to loading infrastructure for electric mobility is available. The problem is that the information is not standardized and in some cases definitions are different, e.g. to “public access” to loading stations. An important step to implement the Directive 2014/94/EU was to establish standardized information according the requirements of the directive.

3.1.4 Regional and local policies

All Austrian regions (*Bundesländer*) have developed measures to promote electric mobility; the most popular measures are:

- The financial support granted by the *Bundesländer* for the purchases of BEVs by municipalities for their public fleets, by companies and by individuals; for that case, only *Bundesland* Upper Austria has not implemented a financial support for the purchases of BEVs by individuals (as of September 2017).
- Green public procurements are already adopted in two regions, namely Vienna and Vorarlberg; three other regions were busy with the definition and the adoption of a green public procurement legislation.
- The installation of publicly accessible and private E-CS: as of September 2017, five out of the nine *Bundesländer* finance partially the purchase and / or the installation of charging stations, whether by municipalities, companies or individuals.
- The promotion of e-mobility services such as e-car sharing.
- The “soft measures” like informing the citizens about the benefits of electric mobility.
- Increasing the share of EVs in the overall vehicles fleets: for instance, the Region Lower Austria is willing to achieve a 5% share of EVs in the overall vehicles fleets by 2020 and targets a reduction of the individual car traffic up to 25.000 people thanks to electric mobility, whereas the Region Salzburg plans to register 10.000 EVs by 2025 and to install at least one E-CS in each municipality.

The Region Carinthia plans to better connect the e-mobility system to the public transport one and the Region Styria plans to reach a share of 1.4% of EVs in the overall vehicles fleets by 2020 (when compared to the current share of 0.15% as for summer 2017) – which corresponds to around 10.000 EVs, and a share of 8% of new vehicles registrations. The regions are willing to achieve these specific objectives within a short-term period, by 2020.

Municipalities are also active in the field and some of them have decided to grant free parking to EVs; however, it varies from municipalities to municipalities what vehicles are considered as EVs – from BEVs only, to BEVs and FCEVs, and partially, also PHEVs. Other municipalities develop e-car sharing projects, or fund the purchases of EVs by individuals and companies for their fleets. Some municipalities can develop these measures as they are funded by national and regional programs.

- Concerning free parking, the municipalities are free to choose whether or not they grant it for EVs (as noticed in the previous paragraph); we can here underline that not all municipalities have taken such a decision. According to the Austrian National Strategy framework published in June 2017, 21 municipalities in seven *Bundesländer* (States) have implemented free parking.

We could stress that in Austria, the key levels for the fostering of electric mobility and the deployment of a robust charging network are the national and the regional ones, i.e. the one of the *Bundesländer* and of the federal Government, thanks to their financial support to companies, individuals and to the local level but also thanks to their commitment to increase the registrations of EVs within a short-term perspective, as well as by the financial support given to a range of R&D and innovative projects.

3.2 France

3.2.1 Stakeholders

In France, the policies for the development of electric mobility are driven by the Ministry of the ecological and inclusive Transition (former Ministry of the Environment). The Ministry is competent to prepare the legislative texts concerning the extension of the E-CS infrastructures, the incentives for helping people and companies to buy EVs and to adopt the implementation decrees needed in order to apply the laws (that are applicable on the whole territory; some exceptions are tolerated depending on the local specific conditions, on the overseas territories for instance). A second Minister, associated to the Minister of the ecological and inclusive Transition, is in charge of topics specifically related to the Transports.

In order to help the French Ministry of the ecological and inclusive Transition, different national agencies and administrations are competent to monitor and prepare strategies when it comes to electric mobility and its related infrastructures: the General Council of the Environment and sustainable development (CGEDD), the Centre for studies and expertise on risks, environment, mobility and urban planning (Cerema), the French Institute for the sciences of technologies of transport, planning and networks (IFSTTAR), the Agency for the Environment and the control of Energy (ADEME), the different regional Directions of the Environment, the Housing and Planning (DREAL) depending on the Ministry of the Environment.

The Commission for the Regulation of Energy (CRE) is an independent administration authority that takes care of the regulation of the energy market (electricity and gas) but it plays an expertise role when it comes to smart grids and electricity distribution.

More and more French municipalities also contribute to the deployment of a publicly accessible charging infrastructure even some of them delegate the operation of the E-CS to private E-CS operators.

National and regional private energy producers (e.g. EDF, ENGIE, Direct Energie), public suppliers like the departmental energy syndicates (such as SyDed 25, SIEL, SDE07, and others), mobility operators such as ChargeMap and E-CS operators (such as Freshmile, Sodetrel, CNR, Blue Solutions) also play a major role for the installation and the operation of the charging infrastructure as well as its maintenance. France can rely on its national roaming platform GIREVE, created in 2013 by private mobility operators with the support of the French Government.

3.2.2 National objectives, initiatives and support for electric mobility

In June 2016, the French Ministry of the Environment adopted its “Strategy for the development of a clean and green mobility” which is a part of a bigger strategy, the “Multiannual Planning of Energy”. This document lists the strategic choices of the Government and defines the priorities of public authorities in the fields of energy in order to meet the objectives planned in the “Energy Transition Act for a green growth” voted in August 2015. For the moment, this multiannual planning runs from 2016 to 2023 and will then run for a period of five years after 2023.

The Strategy for the development of clean and green mobility concerns:

- The development of low emissions vehicles and the development of their related infrastructures;
- The improvement of the energy efficiency of vehicles’ fleets;
- The modal shifts;
- The development of collaborative schemes of transport;
- The increase of the occupancy rate of freight transport vehicles.

It is also stated that the French authorities will have to give a report every three years to the European Commission from October 2019 on, linked to the implementation of its national Strategy and to the measures taken for each objective.

An ambitious goal has been defined in the Energy Transition Act voted in 2015. In order to achieve the objectives of reducing the CO2 emissions by 40% between 1990 and 2030 and the total energy consumption by 50% until 2050, several measures are foreseen, for instance empowering the part of the renewable sources of energy in the French “energy mix”, renovating the ancient buildings and changing them into sustainable buildings, promoting the circular economy.

- ➔ A measure concerns electric mobility and the fostering of the national E-CS network. Indeed it is stated that France should count 7 million charging points by 2030, as well as restricting the access to certain urban areas to the low emission vehicles and promoting the replacement of the public vehicles’ fleets.
- ➔ Another short-term objective has been defined by the Ministry of the Environment: by 2020, 100.000 E-CS should be installed on the French territory.
- ➔ Concerning the energy labels that are to be visible on the vehicles, more than 5 million of these labels have been distributed.

The Government launched the call for tender “territories with positive energy for a green growth” in September 2014; more than 550 territories have been recognised and can finance concrete and innovative projects in favour of energy transition. A chapter of this tender is restricted to sustainable mobility; 3.500 EVs and hybrid vehicles have been bought for the replacement of public fleets and more than 5.500 E-CS have been installed thanks to this public financing.

In the Energy Transition Act, the role of the municipalities is clearly stated; they have to encourage and to promote the installation of charging points, should make financial efforts to replace their fleets and to escort the private initiatives seeking to deploy a network of E-CS that has a national aspect.

Following the European Directive 2014/94/EU, France has to make sure that a certain amount of charging points that are publicly accessible are installed until 31th December 2020 enabling the EVs to charge in larger urban areas and in suburban areas. First role of the charging points is to reassure EVs' drivers that they would find a charging point and charge their EV. Therefore E-CS have to be visible and easy to find.

In order to define a global policy for electric mobility and a roadmap for the development of a E-CS network, municipalities and E-CS operators have to share and exchange information between them but also with the users. The Government underlines that there should be no competition between free and lucrative E-CS in public areas. These must be interoperable as well; interoperability is a *sine qua non* condition for the deployment of an open and public network that can be profitable to the biggest number of people. A second condition of the promotion of a policy for electric mobility is the adaptation of the installation of E-CS to the specific local environment and to the local management of mobility (geographical and socio-economic characteristics, transport offer ...).

On 1st January 2017 the Ministry of the Environment issued the National Roadmap for the development of alternative fuels in the transports sector and the development of the related infrastructures. This Roadmap confirms the "Strategy for the development of a clean and green mobility" and gives a proper overview of the regulations, projects and R&D pilots that have been adopted and that are planned in the field of electric mobility.

Incentives for the development of electric mobility

The French Government has introduced the "ecological bonus" in 2008, which is now ruled with the newest conditions by the decree n° 2016-1980 issued on 30th December 2016. The bonus can be taken by all individuals and companies having an address in France; its value is between 1.000€ and 6.000€ and has to be used to buy a low emission car.

The same decree rules on the conversion bonus that is opened to individuals and companies with the same conditions as the ecological bonus. The amount of the conversion prime is between 1.000 and 4.000€ depending on the emission level of the former vehicle.

➔ In total, people willing to buy an EV can receive up to 10.000€ from the French Government for their purchase.

EVs are exonerated from the payment of the tax for company vehicles; companies can claim a fiscal deduction of 30.000€ on the whole depreciation of the vehicle.

Another measure taken by the Government is the introduction of the emission labels that allow EVs in low traffic zones (Paris, Grenoble and other cities to come).

National incentives and measures for the development of an E-CS network

The French Government introduced a tax exoneration dedicated to the installation of charging points for electric vehicles by individuals. This tax credit represents 30% of the product's price.

The ADEME agency finances public projects for the development of public E-CS through the Investments' Programme for the Future (PIA). Municipalities and agglomerations are concerned with these subventions

for projects that are willing to install at least one charging point for 3.000 inhabitants and whose total cost exceed 200.000€. Thanks to the ADEME's subventions, more than 77 projects have been financed for a total amount of 61.000.000€.

On 14th March 2016 the Government approved the ADVENIR programme ("helping the development of electric vehicles through new charging infrastructures") whose goal is to ease the installation and the partial financing of smart and private (i.e. installed by a private person) charging points with a public or private access (parking spots of factories, of shared housing, parking spots of shopping malls). The ADVENIR programme is supported by the energy supplier EDF and seeks to install 12.000 charging points by 2018.

Private owners of French highways can decide to adapt their tariffs to the categories of vehicles; for instance, they can decide to reduce the toll costs for low emission vehicles.

3.2.3 The implementation of the Directive 2014/94/EU

The French Government transposed the Directive 2014/94/EU thanks to three regulations: the decree n°2017-26 related to the charging infrastructure for EVs, and two ministerial rulings, the first related to the geographical localisation and the technical details of the E-CS and charging points for EVs, and the second related to the identification of the E-CS for EVs.

Even if these regulations do not contain objectives in terms of numbers of EVs and E-CS, the political representatives regularly stated these objectives:

- By 2020, a network of 100.000 publicly accessible E-CS is foreseen to be installed, with a budget of more than 10 million € for the municipalities and public authorities keen on installing new E-CS;
- By 2020, there should be, according to the objectives set by the former Minister of the Environment, a network of 1 million E-CS throughout France, by counting both public (100.000 units) and private E-CS (900.000 units).
- By 2020, the objective in terms of number of registered EVs is to reach 2 million EVs as mentioned to the European Commission.
- By 2030, according to the French Energy Transition Act, there should be 7 million E-CS installed in France.

The decree n°2017-26 issued on 12th January 2017 states the purchase or usage obligations of low emission vehicles that have to be respected by the fleets' operators, the car renters, the taxi companies. More specifically, the French State and the public authorities have to buy a certain amount of low emission vehicles when they want to replace their vehicles' fleets: at least 50% of the new purchased vehicles have to be low emission vehicles; for the municipalities and local authorities, they have to buy at least 20% of low emission vehicles; from 2020, the new buses purchased by the State and public authorities have to be low emission buses; for private actors (taxi companies and car rental companies), they have to replace their fleets with at least 10% of low emission vehicles before 2020.

The decree n°2017-26 issued on 12th January 2017 is also related to the EVs' charging infrastructure and transposes a certain amount of European legislative measures ruled in the European Directive 2014/94/EU dealing with the deployment of an infrastructure dedicated to alternative fuels.

This decree concerns the E-CS but not the wireless and induction E-CS and defines what is to be understood as "EV, charging infrastructure, charging point, or E-CS" according to the French legislation. This decree is important as it standardizes the legal provisions related to E-CS and rules on the interoperability and the roaming issues.

- Normal charging points: normal charging points and E-CS whose power is up to 22 kW have at least one Type 2 socket or plug, as defined with the French norm NF EN 62196-2. But normal E-CS also have to be equipped with a type E plug (domestic plug).
- Fast-charging points: for DC charging points, there is at least one Combo 2 type plug according to the norm NF EN 62196-3. For AC charging points, it has to be equipped with at least one type 2 plug (norm NF EN 62196-2). Until 31th December 2024 fast charging E-CS that are installed or replaced have to be equipped with type 2 plugs (AC), Combo 2 and CHAdeMO plugs (DC).
- Public E-CS have to be equipped with metering and control systems allowing to manage the charging process (intelligent E-CS).
- On roaming:
 - o Each charging point is integrated to the national network of the charging infrastructure dedicated to EVs. A unique ID number is given to each E-CS. This ID Number is given by the French Association for the roaming of EVs' charging infrastructures (AFIREV, according to the ministerial ruling published on 12th January 2017).
 - o An E-CS that is operated by a public or by a private operator uses a supervision system easing the data exchange between the operator and the charging point as well as the real-time management of the charging points' status.
 - o The developer of the E-CS network is entitled to guarantee the access and the payment to all mobility operators that is asking it.
 - o The data related to the mapping of the public charging points and their technical details are published on a public website. The data related to the status and availability of the charging points have to be published in real-time in order to help the users. <https://www.data.gouv.fr/fr/reuses/carte-des-bornes-de-recharge-pour-vehicules-electriques/>
 - o Interoperability platforms are universal intermediaries between the E-CS operators and mobility operators by ensuring the data exchange of the data that are required for allowing the roaming and the affiliated services (searching and booking the charging points). Interoperability platforms take care of the third operators whose activities need an interaction with the E-CS and the mobility operators.
- Technical details and the price of the charging have to be visible on each E-CS.
- It has to be possible to access the E-CS and to charge, i.e. to pay even without registration and subscription to an E-CS operator.
- Installation of the E-CS has to be done by empowered professionals. The electric installation has to be compliant with the security prescriptions. Public E-CS are checked at least once a year.
- ➔ All these prescriptions contained in the decree are valid from 1st January 2017 on and from the 1st July 2017 on for the E-CS with several plugs (until 31th December 2024).

Two Ministries and two Secretaries of State are responsible for the implementation of the transposition's decree, namely the Ministry of the ecological and inclusive Transition, the Ministry of the Economy and Finances, the Secretary of State for commerce, handicraft, consuming and social economy, and the Secretary of State for the industry.

Both ministerial rulings that have been issued on 12th January 2017 deal with the geographical localisation and the identification of each publicly accessible E-CS:

- In order to ease the exchange of data that are needed for a better interoperability of the E-CS, each charging station will be identified with a specific ID number that is unique worldwide. The national French association AFIREV is competent to deliver the IDs to the E-CS operators.
- The data that are provided on the French national platform for the localisation and the technical details of each publicly accessible E-CS are standardised in compliance with the second ministerial ruling that gives the data that are necessary to be published.
- Both ministerial rulings are implemented by the administration of the Ministry of the Economy and its Companies Directorate.

In addition, financial incentives for E-CS installation may be obtained thanks to the public eco-fund mechanism : Programme ADVENIR - <http://advenir.mobi/>

- o Covers purchase and installation costs up to 40% for private companies and public administrations, and 50% for collective housing, depending on overall ceilings for each users target
- o Additional bonus of 360€ for E-CS with smart energy management

3.2.4 Regional and local policies

In France, as stated in the different templates that are attached in the appendix, the most relevant public stakeholders are the national level (the French Government) and the local one, i.e. the municipalities and the energy syndicates, i.e. (group of municipalities, in charge of electricity distribution), that are either shaped on the scale of the “département” (101 in France) or on a smaller scale for some metropolises, namely this of the municipalities’ grouping.

The French regions and the French “départements” (departments) have not played a major role in the definition of the electric mobility policy and have not contributed to the deployment of the charging networks. We can underline that this situation is common to the four new regions that are covered by the Alpine Space programme, namely Grand-Est, Bourgogne-Franche-Comté, Auvergne-Rhône-Alpes, and Provence-Alpes-Côte d’Azur.

Both public authorities have not defined a precise strategy in terms of electric mobility or low-emission mobility in general; more specifically, the French departmental governments do not contribute significantly to the development of electric mobility and to the installation of a solid charging network in the East of France, since this issue does not belong to their competencies. Moreover, since the French regions have been reorganised in 2015, the former political orientations had to be reunited and had to comply with the new political line. E.g., the former Franche-Comté region created financial incentives dealing with the installation of publicly accessible E-CS and with the purchases of EVs for car-sharing services; these incentives were meant to be allocated to the municipalities (installation of E-CS) and to municipalities and to companies for the renewal of fleets with EVs. Even after the merging of both Bourgogne and Franche-Comté regions, these incentives are still offered to the stakeholders. The former region Alsace did also deposit financial support to stakeholders for the promotion of electric mobility but the new Grand Est region decided to cut all the incentives on last 30th June 2017. In the Auvergne-Rhône-Alpes region, the municipalities, municipalities’ groupings and the departmental energy syndicates, the latter being E-CS operators of departmental-wide or local charging networks as well, are the major drivers towards electric mobility expansion, as we will see below.

The role of the departmental energy syndicates

In France, a large majority of departments count a departmental energy syndicate, which is independent from the departmental political authorities and has its own administration; energy syndicates usually gather all the municipalities of the department which delegate their municipal competence to the energy syndicate. Its main traditional tasks are the supply of electricity, the operation of the power grids and their maintenance, the control over the concessionary company (such as ENEDIS or GRDF) with objectives in terms of quality of the electricity supply. But more and more, the energy syndicates have undertaken the promotion of renewable energies and the fostering of electric mobility.

In the former Franche-Comté region, the energy syndicates are implementing direct initiatives, i.e. the development of an interoperable network of publicly accessible E-CS. Only in the Jura department, the departmental political authority is responsible for the installation of publicly accessible E-CS (that took place in 2015). These networks will be connected to the French roaming platform GIREVE and benefit from the financing of the national ADEME agency. The situation in the departments of the former Franche-Comté region will soon change, since the energy syndicates received the funding from ADEME at the beginning of 2017 and will start the installation of the E-CS in the second semester of 2017; all in all, more than 100 interoperable E-CS will be installed by 2018. These E-CS will be operated by specialised third parties. For example, it will be the case for the energy syndicate of Doubs department, the SYDED 25, which will install its charging network by the end of 2017 and will delegate its operation to Freshmile.

In the Auvergne-Rhône-Alpes and Provence-Alpes-Côte d'Azur regions, some departmental energy syndicates undertake the same tasks as the other energy syndicates and are also active stakeholders in the field of electric mobility through the installation of a publicly accessible charging network. However, these energy syndicates in both regions have not delegated the operation of the E-CS to a specialised E-CS operator but they do operate the E-CS by themselves; they have defined a proper business model, they have printed access cards and developed smartphone apps enabling the users to charge their EVs. One of the main initiatives for the deployment of a charging network has been undertaken by five energy syndicates that cooperate within the so-called EBORN network that has been financially supported by the French Agency for the environment and the energy management (ADEME); the objective is to install one E-CS every 10 kilometres and to charge the EV drivers 3€ maximum per charging session. The EBORN charging pass also allows the EV drivers that subscribed to the offer to charge abroad thanks to roaming agreements.

The large majority of the E-CS that have been installed by these operators (and not only within the EBORN network) are connected to the roaming platform GIREVE and are therefore interoperable. We will focus on the specific business model(s) of the energy syndicates in the corresponding part of the state of the art's report (Part B – Business models analysis) thanks to the eight templates that have been filled in by the French project partners.

The role of the municipalities and municipalities' groupings

Municipalities and municipalities' groupings share some objectives when it comes to electric mobility: promotion of low-emission mobility, reduction of the polluting emissions, protection of the environment are the main reasons addressed in the several roadmaps that have been defined and adopted by the local authorities. A large majority of the municipalities and groupings that have been analysed in the templates have implemented local actions fostering electric mobility: installation of publicly accessible E-CS by the public hand, purchases of EVs to renew the public fleets, creation of electric mobility services (electric shuttles in the city centres, e-car sharing for companies and the individuals), advice given to local companies in order to shift towards EVs (mobility management).

However, we could underline a distinction in the role that is undertaken by the cities between Alsace and Franche-Comté; in the former region Franche-Comté, the municipalities' groupings have not played a major role in the promotion of electric mobility; only some cities, and among them the biggest, Besançon, which is the "main city" of Franche-Comté, are keen on fostering electric mobility and installing publicly accessible E-CS. The other ones rely on the actions undertaken by the departmental energy syndicates. In the former Alsace region, the municipalities and municipalities' groupings can be seen as more active and involved in this field; they install much more publicly accessible E-CS and have purchased more EVs to renew their public fleets. For instance, both main cities, Strasbourg and Mulhouse, are dedicated to new experiments and innovative mobility schemes; they are also involved in local and European projects in order to extend the publicly accessible charging networks. In both regions, some of the E-CS that have been installed, and thus in smaller cities, are owned and operated by the municipalities or groupings themselves; in larger cities, the E-CS are owned by the local authorities but are operated by specialised E-CS operators.

In Auvergne-Rhône-Alpes and Provence-Alpes-Côte d'Azur regions, all E-CS that have been installed by the municipalities and municipalities' groupings are operated by third parties, i.e. specialised E-CS operators (private hand or departmental energy syndicates that are also E-CS operators in this part of France), even if the ownership is still undertaken by the municipality. But in Auvergne-Rhône-Alpes and Provence-Alpes-Côte d'Azur, only fewer E-CS have been installed by the municipalities themselves, the large majority being deployed by the private networks and the departmental energy syndicates.

The municipalities are also committed to the definition of new mobility schemes, especially in bigger cities; e.g., the City of Lyon has defined a comprehensive mobility strategy where electric mobility is one of the solutions to reach objectives linked with the protection of the environment, the reduction of the pollution and a better quality of life. The municipality backs up the private operators that are willing to install new E-CS, as the set objective foresees the installation of 900 publicly accessible E-CS by the end of 2020. These E-CS will be deployed on the whole territory of the Metropolis of Lyon (Lyon and 58 other municipalities). Moreover, the municipal authorities are willing to create a restricted traffic area that would be open to low-emission vehicles only and the operator of public transports of the city will renew its fleet of buses with 200 e-buses by 2019.

3.3 Germany

3.3.1 Stakeholders

The Federal German Government has different federal Ministries in place dealing with the topics related to electric mobility: the Federal Ministry of Transport and digital Infrastructure (BMVI) is the key driver of the electric mobility policies, followed by the Federal Ministry for Economic affairs and Energy. The "National platform for electric mobility" (NPE) that has been founded in 2010 is a connected body to the federal Ministries. The NPE drives the development of electric mobility at the national level and brings more than 150 representatives from the industry, research and sciences, politics, unions and associations sectors to engage strategic discussions. The NPE delivers recommendations to the political representatives and to the economic sector.

As Germany is a federation of States, the regional level is also to be taken into great consideration when it comes to the definition and implementation of environmental and transport-related objectives. The German *Länder* (States) of Bade-Wurttemberg and Bavaria and their Ministries define a regional-wide electric mobility policy, adapting the federal objectives to the regional context.

Germany benefits from the initiatives of major private players: E-CS operators and roaming platforms that are among the big European players, like Hubeject, EVBox, be energised, Heldele, EnBW AG. But the electric mobility landscape in Germany is also driven by local or regional actors that gained a good reputation, such as the different regional electricity suppliers and E-CS operators.

3.3.2 National objectives, initiatives and support for electric mobility

Until 2020, Germany aims at being lead supplier and lead market: that is the joint goal of the industrial sector, politics, science, civil society and unions. German manufacturers are technological pioneers across the entire value chain – from batteries to internet-based services regarding electric mobility. The aim is (or has been until recently) to reach the number of one million electric vehicles on German roads until 2020.

The market in Germany targets international brilliance through attractive products and services within a user-oriented system for electric mobility

The federal cabinet approved the national strategy framework for the deployment of infrastructure for alternative fuels (*Nationaler Strategierahmen für den Aufbau der Infrastruktur für alternative Kraftstoffe*, NSR) on 09th November 2016. This national framework lays down federal goals and measures for the setup of infrastructure for the alternative fuel technologies electricity, hydrogen and natural gas. Doing this Germany fulfilled one major requirement of the EU-directive 2014/94/EU.

Central goal of the German federal government concerning charging infrastructure for electric vehicles is the setup of a demand-driven nationwide net of public charging points. Based on different studies the federal government assumes that until 2020, 36.000 charging points for normal charging and 7.000 charging points for fast-charging will be needed. For the hydrogen supply of fuel cell vehicles the setup of a network of 100 fuelling stations until 2020 and 400 stations until 2025 is the stated goal. (Source: German national framework for the creation of an alternative fuels infrastructure, *Nationaler Strategierahmen über den Aufbau der Infrastruktur für alternative Kraftstoffe*, 2017).

3.3.3 The implementation of the Directive 2014/94/EU

The implementation of the Directive 2014/94/EU by the German Government followed the adoption of two major regulations at the national level:

- The Electric mobility Act, published on 12th June 2015 that grants EVs specific privileges when it comes to parking spots, restraint access to urban areas, and registration. This Act is committed to convince people of the benefits of a shift towards electric mobility.
 - o EVs benefit from reserved parking spots equipped with E-CS on publicly accessible parking lots.
 - o EVs can benefit from reduced parking fees.
 - o EVs can be exempted from the access restrictions to certain urban areas.
- The Regulation on electric charging stations, issued on 17th March 2016, that states that the standardised E-CS, either delivering a normal-charging or a fast-charging power, have to comply with the European standards (DIN EN 62196-2 and DIN EN 62196-3) in order to allow interoperability of charging. E-CS operators have to grant the punctual charging to all EVs' drivers, even if the individuals do not have a contract with the specific E-CS operator. It is also stated that E-CS delivering a low-charging power (up to 3.7kW) are not taken into account by the regulation.

According to the German national platform for electric mobility (NPE), the objectives in terms of E-CS installations and EVs registrations are the following:

- By 2020, 1 million EVs should be registered; on 15th May 2017, Mrs. Angela Merkel, Chancellor of the German Federal Republic, declared that this objective could not be achieved in the near future;
- By 2020, 70.000 publicly accessible E-CS are previewed, as well as 7.100 fast-charging E-CS (so called “super-chargers”).

At the national level, both Ministry for Transport and digital Infrastructure and Ministry for the Environment, protection of nature, construction and reactors’ safety are responsible for the implementation of this transposition’s regulations.

National Financing Schemes :

- Federal programme for the electrification of the urban traffic and the expansion of public charging infrastructure – “Saubere Luft”²
 - The German Federal Government has decided upon a 1 billion € funding programme (until 2020) to promote a number of measures to improve the air quality in cities with high NOx emissions, including the electrification of the urban traffic (buses, taxis, carsharing vehicles), the deployment of a charging infrastructure and municipal electric mobility concepts.
- Promotion of electric vehicles in public fleets³
 - The Federal Government aims to increase the share of electric vehicles purchased by the public hand to a minimum of 20 % until 2019. Funding volume: 100 million €

3.3.4 Regional and local policies

Two regional public authorities are involved in the e-Moticon project: the *Land* Baden-Württemberg and the *Land Bayern* (Bavaria).

Baden-Württemberg

The policies linked to electric mobility are driven by the Ministry of Transport which is supported by the State’s agency for electric mobility, e-mobil BW that actively shapes the establishment of the electric mobility system in the whole region. The agency backs up the energy transformation and promotes the industrialisation and market launch of sustainable mobility solutions. The Agency was involved in the project “*Schaufenster Elektromobilität*” (Showcase region for electric mobility) that ended in 2016 and was one of the first federal though regional implemented initiatives in favour of electric mobility.

The State’s Government aims at making Baden-Württemberg the leading market for electric mobility and the leading supplier for alternative drives, innovative use concepts and for the connected and resource-friendly mobility.

A State initiative, so called “State initiative for electric mobility III” has been launched in June 2017 that aims inter alia at investing specifically in charging infrastructure and innovations in the fields of electric mobility and other alternative drives and to make Baden-Württemberg the leading German State when it comes to electric mobility. This strategy covers:

- The installation of 2.000 E-CS that should be installed every 10 km with a budget of 10 million €;

² <https://www.bmvi.de/SharedDocs/DE/Artikel/DG/sofortprogramm-saubere-luft-2017-2020.html?nn=14462>

³ <https://www.bmwi.de/Redaktion/DE/Dossier/elektromobilitaet.html>

- The funding of public and companies' fleets and their replacements with EVs (for driving schools, taxis, car renting companies, for instance);
- Electric driven logistics in smaller urban areas;
- The funding of new e-bikes sharing services in smart urban centres;
- More than 10 million € are dedicated to the financial support to R&D;
- Around 5 million € will be invested to help SMEs to shift towards electric mobility.

The State of Baden-Württemberg has already implemented incentives and political measures to foster the development of electric mobility:

- Direct funding for the State's vehicles fleets, for the charging infrastructure, for e-buses and e-trucks, e-taxis, e-car sharing and e-bikes;
- The State is willing to build an interoperable State-wide public charging infrastructure for EVs.
- The City of Stuttgart will introduce an access restriction for Diesel vehicles which do not comply with the Euro VI standard from 2018 on. Permanent traffic restrictions are planned from 2020 to include fuel-driven vehicles that do not respect the emission limits foreseen at least by the Euro III. EVs are exempted from these restrictions.

The ministry of transport in Baden-Wuerttemberg is financing electric vehicles for taxi companies driving schools, car sharing and car rental companies, nursing services as well as local and regional public authorities. For fully electric vehicles in regions with emissions over the EU limit the funding is 5.000 €, in other regions 3.000 €. ⁴

Bavaria

The Bavarian Government issued in November 2008 the "initiative for the electric mobility" that is committed to shape the topic of electric mobility as future-oriented and environmentally friendly technology, to make Bavaria a leading player for electric mobility, to support innovative suppliers, energy suppliers and the research partners to become a pioneer in electric mobility. This regional policy is a part of the national policy.

The initiative of 2008 has been further sketched in 2010 as the Bavarian Government set the framework conditions for making Bavaria the lead market and leader for electric mobility. Bayern Innovativ GmbH took the lead and supported electric mobility from market preparation to the mass market. Bayern Innovativ hosts the Competence centre eMobility Bavaria that is a central technology partner for electric mobility, infrastructure, and smart mobility and is located at the crossroads between energy, digitalisation and logistics. Bayern Innovativ is also considered as a cooperation partner for the municipalities as well as a network node for the Bavarian and international projects for businesses and science.

Like the Baden-Württemberg' State Agency e-mobil BW, Bayern Innovativ took the lead in the definition and the implementation of the project "*Schaufenster Elektromobilität*" jointly with the State of Saxony and its Energy Agency from 2009 on until the end of the project in 2016. One of the most known projects that had been funded is the creation of a high-power charging network on the A9 highway in Bavaria.

⁴https://vm.baden-wuerttemberg.de/fileadmin/redaktion/mmvi/intern/Elektromobilit%C3%A4t_Kampagne/Flyer_PDF/180313_F%C3%B6rderung_E-Fahrzeuge.pdf

On the local level, since 1st October 2008, the City of Munich has created a low-emission zone that bans high-emission vehicles to drive into the city centre; the creation of this restricted traffic zone has introduced the labelling of vehicles linked with the emission levels defined by the EU standards.

The Berchtesgaden district's authorities have issued the local energy action plan in 2013, in which electric mobility plays a key role. It is identified as one of the measures to reach the objectives for energy efficiency. Ten E-CS have been installed by the district to foster electric mobility and further initiatives for the deployment of a broader charging network are currently discussed.

Like in Austria, both federal and regional (i.e. the one of the *Länder*) levels are the most relevant in Germany when it comes to the deployment of charging infrastructures and the support to electric mobility. The Federal Government gives the impulse for some legislative frameworks and the financing of some projects but these are implemented and further defined at the regional level, allowing a better concentration of financial resources and caring for subsidiarity, meaning that the decisions are taken at the scale which is the nearest to the citizen. Moreover, as the Federate States benefit from a relative high level of independence and also have a legislative competence in Germany, they can define and adopt specific regulations allowing them to boost their commitment to foster electric mobility without being restrained by the Federal Government. The German Federate States are backed up by States' Agencies dedicated to the topic of electric mobility that cluster the industrial, academic and economic stakeholders enabling them the management of several R&D and innovative projects.

In addition to the national funding the state of Bavaria is financing its own state development programme for electromobility. The aim is to build 7.000 public accesible charging stations until 2020. Private individuals, legal entities and public authorities are eligible for a funding.⁵

3.4 Italy

3.4.1 Stakeholders

The public bodies active in the definition and the implementation of the Italian strategies dedicated to electric mobility are: the Italian Ministry of Infrastructures and Transport, the Italian Authority for electricity, gas and water (AEEGSI) and in the past the Misteg Technical group composed by representatives of the Italian Ministry of Infrastructures and Transport, of the Ministry of Economic Development, of the AEEGSI regulatory authority and of the Ministry of the Environment, Territory and the Sea.

Italy counts major players committed to the development of electric mobility within the private sector, like the E-CS operators A2A, Enel Energia, Duferco Alperia and Repower (all also electricity suppliers), Route 220, GARDAUNO (e-mobility service provider) and E-CS Supplier (SCAME, ABB, S&H, Tecnolario, Ducati Energia...).

Italy does not have a national roaming platform but the largest E-CS networks and e-mobility service providers have subscribed agreements with the German platform Hubeject, one of the largest roaming platform worldwide.

⁵ <https://www.stmwi.bayern.de/service/foerderprogramme/ladeinfrastruktur/>

3.4.2 National objectives, initiatives and support for electric mobility

The Italian Government updated in 2015 its national strategy for the Infrastructures dedicated to the charging of EVs (PNIRE in Italian, i.e. *Piano nazionale infrastrutturale per la ricarica dei veicoli alimentati ad energia elettrica*) which foresees the evolution of the EV market up to 2020 and sets the roadmap for the public authorities:

- By 2020, between 4.500 and 13.000 normal-power publicly accessible E-CS would be installed and operated;
- By the same year, between 2.000 and 6.000 high-power charging E-CS would be installed.
- In terms of purchases of EVs, the Italian Government forecasts to have registered between 18.000 and 54.000 EVs in total, representing between 1 and 3% of the total sales of vehicles in the country.

The latest version of the PNIRE roadmap issued in 2016 contains explicit references to the Directive 2014/94/EU. In PNIRE is also foreseen the development of a national charging points registry PUN (in Italian *Piattaforma Unica Nazionale*), directly managed by Italian Ministry of Infrastructures and Transport, to provide information to stakeholders and actors involved in the development of electric mobility. In particular:

- the control and the monitoring of charging infrastructure (for e-Mobility provider);
- The information on energy recharged, duration and the cost of the recharging (for the users).

3.4.3 The implementation of the Directive 2014/94/EU

Major Italian contribution is the Dlgs 257/2016 (*decreto legislativo*) published on 16th December 2016 that transposes the European Directive. At the national level, the Ministry of Infrastructures and Transport is competent for the transposition of the European legislation and its implementation, but also for the definition and the implementation of the national strategy, the PNIRE (infrastructural national plan for the recharging of electric vehicles). This national framework has been updated in June 2016 and is constantly referring to the Directive 2014/94/EU.

The decree deals with the construction and management of an infrastructure for alternative fuels, it also identifies fuels for which introducing measures is a priority. In particular, it sets the mandatory objectives for E-CS installation and registrations of electric vehicles:

- By 2020, following the AFID Directive prescriptions, between 4.500 and 13.000 E-CS delivering a normal charging power and between 2.000 and 6.000 fast-charging E-CS should be installed;
- By 2020, between 18.000 and 540.000 EVs registrations are expected by the Italian Government, what would represent between 1 and 3% of the total fleet of registered vehicles in Italy.

To safeguard consumers' interests, information obligations are also envisaged.

At the national level, subsidies of 9.6 M€ were approved for **electric heavy truck** (equal to or above 3.5 tons) purchasing and suitable devices buying for ICEs conversion to electric ones.

Subsidies for the installations of E-CS : the **National e-CS Plan** is a call for tenders that finances 35% of projects for the construction of normal power systems and 50% for high-power systems. The government makes available 28 million euros by creating investments for 80-90 million euros about e-CS.

In accordance with the national laws in force all over the national territory all cars, motorcycles and two-, three- or four-wheeled mopeds, powered by an electric motor, are **exempt from paying car taxes** for five

years to starting from the date of first registration; at the end of this period, a tax equal to one quarter of the amount for ICE vehicles must be paid for e-vehicles. The exemption for 5 years and the 75% discount on future payments have been applied in all regions except in Lombardy and Piedmont which have decided to extend the exemption from the payment of the car tax for electric vehicles to life.

3.4.4 Regional and local policies

In Italy, the different regions could be considered as the interface and the transmission belts, playing an active coordination role between the objectives set by the Government in its National Plan of Electric Recharging Infrastructure (PNIRE) and the projects that municipalities are planning. For instance, the Lombardy Region has issued its guidelines for the EVs charging infrastructure, the Piedmont Region, following consultations with the relevant stakeholders (Local Authorities, Power Suppliers and Recharging Services, etc.), approved in May 2016 its own plan for accessing the PNIRE funds made available by the Ministry of Transport, which was consequently submitted and is currently under evaluation by the Ministry, the Liguria Region participates actively to the PNIRE platform (infrastructural plan for the recharging of EVs) which makes the signature of a memorandum of understanding between all the stakeholders, i.e. regions, municipalities, and local / regional energy suppliers, mandatory in order to receive the national funding. Regarding the specific region of Valle d'Aosta, the region has undertaken an active E-CS installation and interoperability policy since these E-CS are located at strategic places to be easily connected to the other Italian regional networks and even with the networks of neighbour countries.

But the regions do also take into consideration electric mobility as a key solution to reach the environmental and innovative mobility targets and they implement direct initiatives such as the past and planned installation of E-CS by themselves (around 100 E-CS have been installed by the regional authorities involved in the e-Moticon project, according to the templates, cf. appendix).

When it comes to municipalities, these have deployed measures that are comparable to the measures taken by the municipalities of the other countries: installation of publicly accessible E-CS with the financial support of the regions (like in Lombardia), creation of restricted traffic areas where EVs are exempted from this restriction (e.g. Turin), definition of a parking policy with the installation of E-CS on public parking lots and the free parking time, creation of e-bike- and e-cars-sharing services. The city of Alessandria adopted a new building code that states that new buildings shall be equipped with E-CS in order to ease the home recharging.

Public procurement "green"

- **Piedmont:** co-financing up to 90%, the renewal of public transport fleet with BEV buses, thanks to funds of national Ministry of Environment for improvement of air quality
- **Friuli VG region:** All region owned vehicles will become electric since 2019 (NeMo project). The action will provide the installation of related 660 e-CS

Access to restricted traffic zones, reserved parking & environmental limitations

- **At municipal level:** reserved parking spaces, void of parking fees, access to limited traffic areas in some towns
- **Veneto:** permission to circulate during time periods with violation of pollution limits (CO, NO_x, SO_x, PM₁₀, PM_{2,5})

Subsidies for the purchase of vehicles BEV

- **Veneto:** approved bonuses up to 3.500 € to replace old vehicles with hybrid and electric cars
- **Friuli VG:** approved bonuses of up to 5.000 € to replace old vehicles with natural gas, LPG, hybrid and electric cars
- **South Tyrol:** approved bonuses up to 4.000 € (8.000 € for transport companies and taxis)

Subsidies installations E-CS

- **Lombardy:** calls for tenders about e-C infrastructures in large towns (~ 20M€)
- **Veneto:** call for tender supporting the realization of private (domestic) and public e-CS with contributions from 35 to 50%.
- **South Tyrol:** approved bonuses up to 1000 € for each private eCS (max 3)
- **Trentino:** Contribution of 60% of the expenditure with a maximum of 1500 euros for the purchase of charging stations for electric vehicles, within the limit of 5 stations for each applicant; The benefit is applied to a) persons and private bodies, resident in Trentino, with or without legal residence, among non-profit organizations of social utility (ONLUS); b) companies, consortia of companies, business networks, organizations and associations for business activities, as well as the trade associations.
- **At municipal level:** Municipality of Torino will soon launch a call where operators who wants to install public E-CS at their own expenses will be exempted from paying public space occupation tax for a certain number of years.

3.5 Liechtenstein

3.5.1 Stakeholders

When it comes to the promotion of electric mobility, two Ministries are competent: the Ministry for Home Affairs, Education and Environment and the Ministry for Infrastructures, Economy and Sport are responsible to drive the policies in this field of action. Both Ministries can count on their administrations to implement and monitor the legislation, i.e. the Office for the Environment and the Office for the national Economy. The Office for Statistics that is under the responsibility of the Ministry for Finance gives once a year updated statistics concerning for instance the vehicles' registrations.

Two other players can be highlighted for their active promotion of electric mobility in the country: the national electricity supplier LKW (Liechtensteinische Kraftwerke) and the NGO LIFE Climate Foundation which created the "impulse programme electric mobility" in March 2016.

3.5.2 National objectives, initiatives and support for electric mobility

In 2008 the Government of Liechtenstein adopted the "Strategy for the Energy 2013" that defined the main objectives the Government wanted to achieve by 2013; main axes were the energy efficiency of buildings and the stabilisation of the energy consumption.

In 2013 the Government pursued its policy by revising the former Strategy and by adopting the "Strategy for the Energy 2020". This new roadmap is linked with the latest objectives defined by the European Union, especially within the "20-20-20" goals:

- Liechtenstein is willing to maintain the level of the energy consumption at the level of 2008;
- By 2020, Liechtenstein's energetic mix should count 20% produced from renewables energies;
- The country is willing to reduce by 20% the polluting emissions by 2020.

Within the Strategy adopted in 2013, the mobility and transports sector is clearly identified as one of the biggest energy intensive sectors of the country (around 30% of the national yearly energy consumption).

- ➔ The Government is willing to introduce the conditions making the evolution towards low-carbon mobility possible and to promote a sustainable mobility, the new motorisations, such as electric mobility, the transition from individual transport to public transport.

When it comes specifically to electric mobility, it is clearly stated that the energy should be produced from renewable sources of energy in order to make electric mobility really sustainable and green.

The Government stresses on the fact that the development of electric mobility has to go through different levels: first, the introduction of hybrid vehicles (battery with gasoline), then the introduction of PHEV and finally the promotion of a BEV's fleet. The development of electric mobility has also to be linked with works on the infrastructures (charging infrastructures with the deployment of a network of E-CS accessible to the public, roads, power grids) and a new urban planning in order to conciliate mobility and energy consumption.

For instance, the national electricity supplier LKW has bought 2 EVs in order to propose a renting service to the population since November 2015. This measure is linked with the Strategy for the Energy 2020. LKW has also installed 2 E-CS accessible to the public delivering a fast-charging power and equipped with Type 2 sockets (European norm).

- ➔ In the "Strategy for the Energy 2020", the Government has adopted one goal for the development of electric mobility: by 2020, 14% of the registered vehicles in Liechtenstein should be either electric (BEVs) or hybrid (PHEVs) vehicles, which represents around 5.000 vehicles.
- ➔ In the latest annual study related to the "national concept for mobility" published in August 2016, it is stated that the price of EVs and the current range are at the moment obstacles to the development of electric mobility. The Government of Liechtenstein imagines conciliating in the future the development of electric mobility with the development of the intelligent and connected mobility as well as with the roads and infrastructures planning.

A financial incentive has been created in order to foster the development of electric mobility in the country: In March 2016, the national electricity supplier LKW and the NGO LIFE Climate Foundation created the "impulse programme electric mobility" (*Impulsprogramm e-Mobilität*) that got the support of the Government of Liechtenstein. This initiative consists in subsidies linked with the purchase or the renting of an EV that is registered in Liechtenstein.

Each year, 50 purchases are co-financed thanks to the "impulse programme". The price of the EV has to exceed 20.000 CHF (monetary union between Switzerland and Lichtenstein) or the person has to contract a leasing offer for at least three years in order for the person to become a subsidy of 3.000 CHF. The subsidy decreases accordingly for cheaper EVs models. Subsidies are directly paid by LKW.

3.5.3 *The implementation of the Directive 2014/94/EU*

Even if Liechtenstein is not a member of the European Union, it adopts the European standards and norms; for instance, the E-CS installed by the national electricity supplier LKW are equipped with Type 2 sockets complying with the norm EN 62196-2.

However, as a non-member State of the EU, Liechtenstein does not have to transpose and implement the principles contained in the Directive 2014/94/EU. The Government of Liechtenstein has not adopted a specific legislation concerning electric mobility neither charging infrastructure.

3.5.4 *Regional and local policies*

The initiatives for the development of electric mobility and the deployment of a publicly accessible charging infrastructure are taken at the national level and not at local one (Liechtenstein counts eleven municipalities in total); the local level relies on the measures of the State.

3.6 Slovenia

3.6.1 *Stakeholders*

The public stakeholders involved in the definition of the electric mobility policies in Slovenia are the Ministry of Infrastructure with its Energy Directorate, the Ministry of the Environment and spatial planning, the national Energy Agency of Slovenia, the national Energy Chamber linked to the Chamber of Commerce and industry.

The national ecosystem for electric mobility is well developed in Slovenia, at that point that there are more E-CS that are installed than EVs actually registered! The regional electricity suppliers are well organised and some of them are E-CS and mobility operators as well. We can count up to seven E-CS operators in the country, each of them playing a major role for the deployment of the current charging network.

3.6.2 *National objectives, initiatives and support for electric mobility*

The Slovenian Government introduced specific objectives in order to support the development of electric mobility in the country, linked with the will of the Government to achieve a secure, sustainable and competitive energy supply, the increase of the use of renewable sources of energy:

- The development of an E-CS infrastructure on the national highways that is foreseen by the Energy Act. 26 E-CS are already installed on the highways which already grants a certain density of the E-CS network in regards to the size of the country;
- From 2055 onwards, private and public transport should be fully electric driven, as stated in the Slovenian Energetic concept.

Existing measures committed to the promotion of electric mobility are of fiscal and political natures:

- On the fiscal level, EVs benefit from a lower tax rate on motor vehicles, whose amount is set at 0.5%;
- BEVs are exempted from the payment of the annual fees related to the use of roads (this tax depends on the volume of the motor), according to the “Annual Fee on the Use of Motor Vehicles Act”;

- The Slovenian Government is keen on allocating financial incentives for energy efficient vehicles thanks to the public eco-fund mechanism. The purchase incentive of the Government is of 7.500€ for a new passenger EV for physical persons; subvention is available also for retrofitting. The Government also grants municipalities, with subsidies in order to invest in E-CS that will be located in protected natural areas and labelled Natura 2000 areas: 3.000€ per AC E-CS and 5.000€ per DC E-CS. Funding for the granting of non-refundable financial incentives is provided under the Decree on the Program for the use of the Fund for Climate Change funds in 2017 and 2018. The total amount of funds under this public invitation is EUR 400,000.⁶
- The Slovenian Government also created ecological loan schemes dedicated to individuals and companies that are willing to buy vehicles whose emissions levels do not exceed 110g CO₂/km.
- Low interest rate loans are also available for the private sector for the purchase of e-vehicles.

The most important national regulations concerning the development of electric mobility are the following:

- Energy Act (2014), which transposes a number of EU directives concerning electricity and gas markets, energy efficiency and renewable energy sources. It lays down the principles of energy policy, principles and measures in order to ensure security of supply, as well as it regulates the area of energy infrastructure and heat distribution.
- Decree on renewable energy sources in transport (2012): this decree lays down the obligation to reduce greenhouse gas emissions in the life cycle of fuels used for transport; sustainability criteria for biofuels; verification of compliance with the sustainability criteria for biofuels; methodology of calculation of greenhouse gas emissions in the life cycle of biofuels used for transport.
- Transport development strategy of Slovenia (see below);
- National strategy on alternative fuels development (see below).

According to the prescriptions contained in the Directive 2014/94/EU, the Slovenian Government has announced its quantitative objectives in terms of E-CS and EVs in its National Strategy for alternative fuels development. We present here both optimistic scenarios sketched by the Slovenian Government:

- By 2020, the Government plans the installation of 1.200 E-CS throughout the country;
- By the same year, 5.311 registered EVs are previewed by the Government.

The Slovenian Government has issued and adopted the following strategies which aim at fostering the development of electric mobility in the country thanks to the installation of new publicly accessible E-CS:

- The Transport Development Strategy: this Strategy promotes the use of alternative energy sources and the introduction of hybrid and electric vehicles, as well as the construction of a network of charging stations (the related charging infrastructure). According to the environmental requirements at the national level, the encouragement for the purchase of EVs will have to be initiated and a network of charging stations will have to be build, so that by 2030 there will be at least 15% transport work done without greenhouse gas emissions on Slovenian roads. It is necessary to provide financial incentives that will encourage individuals to purchase vehicles with environmentally friendly motor fuels.
- The Spatial Development Strategy: The document doesn't mentions implementation of EVs into the transportation systems but it addresses all the other means and systems: public traffic, air, motorway (land), sea; reduction of use of personal transport means, enhancement of public transport, bicycling

⁶ <https://www.ekosklad.si/pravne-osebe>

and walking. Under the point 5 “Integrated and Harmonized Development of Transport and Settlement Networks and the Construction of Public Infrastructure Facilities”, page 27: “When constructing new infrastructure and modernizing the existing one, support shall be given to the construction of those energy generation and distribution facilities which enable a high-quality and reliable energy supply for Slovenia. When determining the location of new energy generation or distribution facilities, their optimal inclusion in the Slovenian energy network shall be ensured and excessive environmental impacts prevented while respecting the principles of sustainable spatial development.”

- The Resolution on transport policy: the Resolution clearly states that the Government is committed to promote the use of more sustainable vehicles and urges the Government to achieve a better coordination to ensure the *“implementation of electric mobility systems within the infrastructure or supporting electric mobility is not explicitly stated; electric mobility should be integrated into the national policies more explicitly and in more details”*.

On the local level there are two important documents that facilitate the implementation of the Directive:

- Regional Development Programme (RDP) foresees development and implementation of the projects of alternative means of transport – including e-mobility, e-infrastructure, smart mobility systems and similar on a regional level.
- The Sustainable Urban Mobility Plans (SUMP) for municipalities: the Ministry of Infrastructure introduced a public tender for municipalities for financing development of municipal integrated transport strategies. It can be added that the municipalities that applied to the public tender need to have:
 - at least one settlement with the city status⁷
 - Do not have SUMP or the existing SUMP is older than 2 years.

According to the research within the e-MOTICON, the majority of the municipalities that prepared SUMPs included actions of implementation of e-mobility.

3.6.3 The implementation of the Directive 2014/94/EU

On 13th July 2017, the European Commission reminded Slovenia for the second time to present its national strategies concerning infrastructure for alternative fuels (e.g. charging stations, H2 stations) to comply with EU regulations, since the 2014/94/EU Directive had to be transposed into the national legislations by 18th November 2016. The Slovenian Government now has until mid-September 2017 to carry out its duty, if not the Commission can appeal to the European Court of Justice in order to sentence (fine) the country. The European Commission considers that the strategies adopted by the Government are not sufficient to be considered as transposition measures of the Directive 2014/94/EU.

3.6.4 Regional and local policies

According to the templates that have been sent by the Slovenian project partners, it seems that the municipal level is the most relevant one when it comes to the development of electric mobility and the deployment of charging networks. Several Slovenian municipalities, and among them, the biggest ones, are committed to the promotion of low-emission mobility; these municipalities have adopted “Sustainable urban mobility

⁷ The city status is defined according to 4 different criteria, taking into account several aspects; from number of citizens, to city’s gravitational area, number of jobs, settlement pattern and density, etc.

plans” between 2015 and June 2017 that underline the need for a mobility shift and stating that electric mobility is one of the best solutions to achieve the environmental goals set by the local authorities.

The municipalities have adopted a range of direct measures, combining them according to the local priorities:

- Installation of new publicly accessible E-CS by 2022: several E-CS are forecast in each municipality;
- Purchases of EVs for the public fleets and the public transport; some cities are willing to achieve a 20% objective of EVs in their public fleets and public transport fleets by 2022 or 2025.
- Incentive parking policy: parking spots will be equipped with E-CS, some municipalities are keen on granting free parking for EVs, like the cities of Ptuj and Novo Mesto, Ljubljana and municipalities in Gorenjska.
- E-mobility services such as e-car sharing will be introduced by the city of Ptuj, and is already implemented in Kranj and Ljubljana city.

In Slovenia, combining the national actions and incentives with the local ones enables the country to have a robust publicly accessible charging network.

3.7 Switzerland

3.7.1 Stakeholders

At the federal level, the Federal Council relies on its administration of the Federal Department of the Environment, Transport, Energy and Communications (Ministry-like) and more specifically, on the Federal Office for Roads which is responsible for all topics related to electric mobility (implementation of the policy, reporting recommendations, assessment, monitoring). The Federal Office for Energy is monitoring the “energy-label” whose criteria have been strengthened from 1st January 2017; all electric vehicles are ranked either in the “A” or “B” categories but the hybrid vehicles are not necessarily ranked in the top categories and can be identified as polluting vehicles.

The private sector also plays a major role in the development of electric mobility in Switzerland, as the country counts a lot of regional though robust and pro-active electricity suppliers, mobility operators and E-CS operators. The largest network of publicly accessible E-CS is operated by the MOVE network which gathers different regional electricity suppliers that are E-CS operators at the same time. Other relevant E-CS operators are GOFAST (network of fast-charging E-CS on the Swiss highways), and SwissCharge. The Swiss Government once supported the creation of a national roaming platform to enable interoperability between the Swiss Cantons; this EVRoam platform is not active anymore, though.

3.7.2 National objectives, initiatives and support for electric mobility

In May 2015 the Federal Council has published a report reacting to the motion that had been discussed by the Swiss Parliament in 2013. This report can be seen as a roadmap, stating that electric mobility can contribute to a more sustainable mobility and allows fulfilling challenging objectives for an energy and climate policy. Electric mobility should get higher market shares thanks to the renewables sources of energy.

Concerning electric mobility, Switzerland has a range of policies and measures that can be listed as following:

1. For the technology and components

- a. R&D projects for the development of new vehicles and innovative components
 - b. Pilot projects and prototyping
 - c. Introduction on the market thanks to Suisse Energie
2. Frame conditions
- a. Incentives (pull): energy label, tax exemption for electric vehicles: To promote the electric mobility, electric vehicles that are imported or bought in Switzerland are freed from the federal tax on mineral oils and are not subject to the federal tax on vehicles' purchases which represents 4% of the vehicle's value. Imported BEVs are not taxed as well.
 - b. Restrictions (push): limitations for CO2 emissions
 - c. Charging infrastructures: the federal level is active as it plans and coordinates the deployment of the E-CS; however, the federal authorities let the private hand installing and operating the E-CS. There is no national public financing for the deployment of a publicly accessible charging infrastructure.
3. Other measures
- a. Confederation as a model: green public procurements. The federal administration is more and more considering buying electric vehicles for the civil servants or at least vehicles whose energy labels are in the classes A or B. But this objective is counter-balanced with budget restrictions, there has to be an arbitrage for each acquisition.
 - b. Strategic guidance: market analysis, energy monitoring
 - c. Information and advice: better information for electric mobility

In this report it is explicitly stated that the development of business models by operators or suppliers is an issue for the public sector only. The evolution of the electricity market evolving to a market of energetic services has to happen within competition.

R&D and pilot projects

Switzerland co-finances networks for the R&D in the field of energy and new mobility: the Swiss Competence Centres for Energy Research (SCCER) which are working on 7 different topics, including mobility in cooperation with the Federal Polytechnic School of Zurich. This SCCER has a yearly budget of CHF 10 M for the years 2014-2016. This SCCER is working on the development of new systems and new technologies in order to improve energy efficiency of mobility with the perspective of implementing the outcomes of research in the market. This SCCER is also working on the charging infrastructure.

Switzerland has another research program: the service centre for an innovative and sustainable mobility that is supporting new projects that are complementary with the federal transport policy.

Charging infrastructure

Switzerland has chosen the international standard IEC 62196 for the charging stations. The Confederation will play an active role by coordinating the development of a fast-charging E-CS network. Regarding public E-CS, their maintenance and operation are taken by the private association e'mobile. There is no public financing of E-CS in Switzerland. Switzerland lets the private operators developing a network of traditional and fast-charging E-CS through the country.

The Federal Office for Roads published in December 2016 recommendations for the development of fast-charging E-CS on national roads and it outlined the standards that should equip all E-CS in Switzerland.

The minimum charging power for a fast-charging station has to be 50kW in order to foresee the future technical developments that will require more robust E-CS (150kW, some already speak of needs of 350kW for some upmarket vehicles).

3.7.3 The implementation of the Directive 2014/94/EU

Switzerland is a non-Member State of the EU, meaning that the country is not legally bound to transpose and respect the regulations contained in the Directive 2014/94/EU; however, Switzerland decided to adopt the Type 2 standard complying with the European standard EN62196-2 to plug-in an EV to an E-CS delivering a normal-charging power. The sockets have to respect the current norms and standards. Each E-CS shall be equipped with the three main sockets systems: CHAdeMO (DC current), Type 2 mode 3 (AC current) and type 2 CCS (DC current).

3.7.4 Regional and local policies

The Swiss Cantons play an active role in the promotion of electric mobility through several action means: first of all, they have the fiscal competence and can decide to create new taxes or to exempt some products from the payment of the taxes; when it comes to electric mobility, several Cantons have decided to fully exempt or to reduce the amount of the motor vehicle's tax (following tax rates from 50, 75, 80 or 100%), whether for a couple of years or for the whole EVs' lifetime. Swiss Cantons are also keen on undertaking a "model role" by renewing the public fleets and the public transport fleets through the purchases of EVs.

Besides this promotion role, Swiss Cantons also undertook a coordination role for the development of electric mobility in Switzerland by "softer" means: the Canton of Geneva set the objective of 10% of EVs that would be registered by the authorities by 2030; some Cantons back up the local or regional electricity suppliers for the installation of the publicly accessible charging networks by stating the best locations and numbers of E-CS that would be installed. A few Swiss Cantons are engaged in a parking policy that will create specific publicly accessible parking spots for EVs that are equipped with E-CS and that will force the construction industry to build housings whose parking lots are equipped with E-CS in order for the people to charge at their place.

Cities and municipalities are also engaged in the development of electric mobility but they imitate the action means of the Cantons: for instance, the City of Sankt-Gallen created financial incentives for the purchases of EVs by individuals and companies: the city grants 5.000 CHF for the purchase of an EV and covers half of the installation costs for a private E-CS. Other cities are engaged in the promotion of zero-emission mobility by financing e-bike-sharing initiatives (the city of Lausanne for example).

However, key stakeholders remain the local and regional energy suppliers (that are partially financed by the Cantons and / or the municipalities but are private companies for the majority of them) when it comes to the installation of new charging networks; these energy suppliers can closely cooperate with the public authorities in order to define the best shape of the charging networks (locations of the E-CS, number of E-CS, technical specifications). These energy suppliers, some of them being also E-CS operators, will be analysed further in the Business models analysis (Part B of the report).

4 CONCLUSION

To conclude this first part of the state of the art's report, we will summarize the measures taken at the European, national and regional levels related to electric mobility and specifically those complying with the Directive 2014/94/EU on the development of alternative fuels infrastructures, since this cornerstone Directive is widely acknowledged as having driven the adoption of the national strategies related to electric mobility in the countries of the Alpine Space (for the Member States of the EU above all), and therefore the deployment of charging networks over the past years.

We will focus on some items to present at a glance what we developed above about the policies defined and adopted by the Alpine Space countries concerning electric mobility, this presentation being useful for the second step of the e-Moticon project, namely the definition of the strategy.

	GENERAL OBJECTIVES AND NATIONAL MEASURES	TRANSPOSITION OF DIRECTIVE 2014/94/EU	PLUGS STANDARDS	NUMBER OF PLANNED E-CS BY 2020	NUMBER OF PLANNED EVs by 2020	MAIN REGIONAL AND LOCAL MEASURES	MAIN DECISION-MAKING LEVEL(S)
EU	Cuts in greenhouse gas emissions; Rising the share of renewable energies; Energy efficiency; (Technical) Standardisation; Interoperability to be achieved; Need for cross-border and coherent continuity of E-CS installation plans; Lack of E-CS as obstacle to the EV market uptake;	Definition and adoption of the Directive by the European institutions	Definition of the standards: IEC EN 62196-2 and 62196-3, Directive 2014/94/EU	<i>"Appropriate number of E-CS to be built"</i> , left to the Member States Set average of 1 E-CS for 10 EVs	8 million EVs	<i>Not relevant</i>	European Commission, European Institutions

	Member States to make available information about E-CS location.						
AT	Reaching CO2-neutral mobility sector by 2050; Ban of ICE vehicles by 2020; Purchase support by State for EVs and E-CS Fiscal measures EV license plate Support to R&D	Yes	IEC EN 62196-2 and IEC EN 62196-3	Between 3.000 and 4.000 normal-charging E-CS Between 500 and 700 fast-charging E-CS	Between 66.000 and 174.000 EVs	Purchase support for EVs; Green public procurements; Parking policy for EVs (free parking); Financing the installation of E-CS; Fiscal measures; EVs registrations quota	National and regional (<i>Bundesländer</i>) levels
FR	Development of low-emission vehicles and of their related infrastructures; Improvement of vehicles' energy efficiency; Development of collaborative schemes of mobility; Ecological bonus up to 10.000€; Emission labels; Green public procurements; Unique E-CS ID	Yes	NF EN 62196-2 and NF EN 62196-3	35.000 publicly accessible E-CS 900.000 private E-CS	960.000 EVs	Installation and (sometimes) operation of the charging points, by municipalities, departmental energy syndicates; Purchase of EVs for public fleets; Electric mobility services	National and local (municipalities and energy syndicates) levels
DE	By 2020: being the lead	Yes	DIN EN 62196-2	70.000 normal-	1 million EVs	Installation of E-CS;	National and

	supplier and the lead market for electric mobility; Setup of demand-driven charging network; Parking policy for EVs: reserved parking spots equipped with E-CS, reduced parking fees; No access restrictions		and DIN EN 62196-3	charging E-CS 7.000 fast-charging E-CS		Funding of public and companies' fleets; Financial support to R&D; Encouraging SMEs to shift towards electric mobility; Restriction for diesel-driven vehicles; Labelling of vehicles; Interoperable state-wide charging networks	regional (<i>Bundesländer</i>) levels
IT	Ecological and environmental objectives; Development of national charging points registry: control and monitoring of the infrastructure, technical details about E-CS; Identification of priority alternative fuels	Yes	IEC EN 62196-2 and IEC EN 62196-3	Between 4.500 and 13.000 normal-charging E-CS Between 2.000 and 6.000 fast-charging E-CS	Between 18.000 and 54.000 EVs	Coordination role of the regions; E-CS installation; Interoperability policy; Restricted traffic areas in municipalities; Parking policy; e-mobility services (e-bike and e-car-sharing); Buildings equipped with E-CS	National and regional levels
LI	Promotion of sustainable mobility and of new motorisations; Transition from individual to collective transport; Electricity from	No (No EU-Member State, no obligation to transpose)	IEC 62196-2 and IEC 62196-3	<i>No data</i>	Around 5.000 EVs by 2020 (10% of the total registrations)	<i>Not relevant</i>	National level

	renewable energies for E-CS; Purchase incentive for 50 EVs a year						
SI	Development of charging infrastructure on highways; From 2055 onwards, transport should be fully electric; Fiscal measures; Purchase incentives; Ecological loan schemes	Yes	IEC EN 62196-2 and IEC EN 62196-3	1.200 planned E-CS	5.311 EVs registrations	Installation of E-CS; Purchases of EVs for public fleets; Incentive parking policy; e-mobility services (e-car-sharing e.g.	National and local (municipalities) levels
CH	Financing of R&D; Fiscal measures; Energy labelling; Coordination of the deployment of E-CS; Green public procurements; No public financing of E-CS	No (No EU-Member State, no obligation to transpose)	IEC 62196-2 and IEC 62196-3	<i>No data</i>	<i>No data</i>	Fiscal measures of Cantons; Renewing public fleets with EVs; Coordination role of Cantons; Parking policy; Purchase incentives for EVs and E-CS by some municipalities	Regional level (Cantons and regional energy suppliers)

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6 APPENDIX

6.1 Glossary

AC	Alternating current
ADAC	<i>Allgemeiner Deutscher Automobilclub e.V.</i> , German automobile club association
AFID	Alternative fuels infrastructure Directive (2014/94/EU)
BEV	Battery Electric Vehicle
CCS Combo	Combined charging system
CHAdEMO	Charge de MOve
CHF	Swiss Frank
CEN	<i>Comité européen de normalisation</i> , European committee for standardisation
CENELEC	<i>Comité européen de normalisation électrotechnique</i> , European Committee for Electrotechnical Standardization
CNR	<i>Compagnie nationale du Rhône</i> (French energy supplier)
COM	Text issued by the European Commission
COP	Conference of Parties
DC	Direct current
DIN	<i>Deutsches Institut für Normung</i> , German Institute for standardisation
€	Euro (currency)
EC	European Commission
E-CS	Electric Vehicle Charging Station
EN	European norm
EP	European Parliament
EU	European Union
EV	Electric Vehicle, here: Battery Electric Vehicle
FCEV	Fuel Cell Electric Vehicle
GOFAST	Gotthard Fast Charge
ICCT	International Council on clean transport
ICE	Internal combustion engine
ID	Identifier
IEC	International Electro-technical Commission
kW	Kilowatt
NF	<i>Norme française</i> , French norm
NGO	Non-governmental organisation
PA	Public authority
PHEV	Plug-In Hybrid Electric Vehicle
PNIRE	<i>Piano nazionale infrastrutturale per la ricarica dei veicoli alimentati ad energia elettrica</i> , National infrastructural plan for the recharging of EVs
R&D	Research and Development
TRL	Technology readiness level

6.2 PA Policies details (collection of templates)