Rijksdienst voor Ondernemend Nederland

Opportunity report on electric vehicle charging infrastructure in France

Colofon

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Summary

This report is an initiative from the Netherlands embassy in France in collaboration with the 'Rijksdienst voor Ondernemend Nederland' and the Partner in International Business 'Smart and Green Mobility France' program. The goal of this report is to identify market opportunities for Dutch parties in France within the electromobility world. Dutch organisations have years of experience within the EV market and use this as an added value within a collaboration with French parties. For the report we gathered information through desktop research, through a local partner who helped writing the report and via interviews with Dutch and French parties in the entire electromobility value chain. We've established the current state of affairs regarding the EV market in France and then identified opportunities for Dutch parties. The report focusses on three sections: charging infrastructure, smart charging and consultancy. We also defined three market segments with the most potential for Dutch parties: the public sector, corporations and fleet owners.

There are many market opportunities in France. France has the ambition of having 100.000 charging points by the end of 2021. To reach this goal many more charging points will need to be installed. Dutch experience can certainly help within this matter. Regarding smart charging there are still lots of steps to take in France. But with the rise of EV's the demand for smart charging will also grow. The knowhow and years of experience from the Dutch side can have an important added value. Also for consultancy the years of experience of best and bad practices and the fact that Dutch consultancy groups are worldwide thought leaders regarding EV is an important added value for French parties.

Content

1. Background and motivation for the study

The electrification of the automotive and mobility industry is an unstoppable development. Pressure from society and adaptation of legislation (following the Paris agreement and European emission targets) will lead to the stimulation of a new generation of vehicles. With the emergence of new (battery-electric) vehicles, the demand for suitable charging infrastructure will grow. On top of that the French government decided that by the end of 2021 there must be 100.000 public charging points in the entire country. The count at the moment of writing (November 2020) is at 31.000. This means in the short term there will be an important demand of knowledge and experience on how to organise, install and operate a large number of charging points. The Netherlands is one of the world leaders in the field of (smart) charging infrastructure. Dutch partners are open to share knowledge and cooperate with French (public and private) partners in this field.

In 2019, France showed interest in the Amsterdam demand-driven approach to the installation of charging infrastructure. This resulted in the application of a similar approach in France. However, much is still unknown about the way in which electric transport and charging infrastructure is organised and implemented in France in particular. The Netherlands embassy in France, RAI Automotive Industry NL and DOET see opportunities for Dutch companies in France. For example, the city of Toulouse recently announced a collaboration with Allego to organise charging hubs.

The Netherlands embassy in France and RAI Automotive NL are working together in a so called Partner in International Business Program (PIB) with a focus on smart and green mobility in France. These organisations, among

others, have the desire to become more familiar with the French EV (Electric Vehicle) market and the opportunities it offers for Dutch companies and knowledge institutes. This opportunity report will document opportunities for Dutch companies and knowledge institutes in regard to charging infrastructure, smart charging and consultancy as these are the areas in which Dutch organisations excel.

This opportunity report consists of different sections. The first one introduces the reader in the French context. Then we will discuss global and French tendencies within the EV market. Lastly we will cover our findings, learnings and recommendations regarding the three main segments discussed in this report: charging infrastructure, smart charging and consulting. The findings and results of this study have been gathered through a local expert who helped writing this report and by conducting interviews with parties in the entire value chain of the EV market. A list of the interviewed parties can be found in the appendix.

2. French context and the relevant regions and cities

2.1 Decision powers in France

France is a country with its mainland located in continental Europe and with several overseas territories. This report focusses on opportunities and developments in the European territory of France.

The administrative organisation in France is divided between the central administrative authority and the local authorities. The highest decision power in France is the executive level (government, legislative chambers, national agencies). The central administration (the ministries) delegates competences and decision-making power to the local authorities (regions, departments, municipalities).

Municipalities are governed by the municipal council and their mayor. They are responsible for the city's equipment, social housing, building permits, etc.. Municipalities organise themselves into communities for better cooperation and to work on a more appropriate scale. They thus transfer part of their skills to these communities.

The departments are directed by the department council. They are mainly in charge of assistance and social inclusion, health protection and colleges. There are 101 departments in total (96 in continental France).

The regions group together several departments and are run by the regional council. They are responsible for economic development, regional planning and high schools. In metropolitan France there are 13 regions (Corsica included).

Within the budget for the three decentralized powers (regions, departments and municipalities), the regions only have 13% of the total amount to spend. The departments receive 32% of the budget and the municipalities 55%[1].

Figure 1: Regions and departments of France

2.1.1 Central administrative authority

In France, the power of the state in a political way refers to all the legislative, executive and judicial powers (the President of the Republic is the "head of state").

In an administrative sense, the state refers to a national public authority which constitutes the administrative tools available to the executive power embodied by the government and its ministries. It is at the level of these ministries that the laws adopted by the parliament are detailed, mainly in the form of decrees. An example of a decision made on the national level is the ambition to have 100.000 public charging points (outlets) by the end of 2021.

2.1.2 Regional authority

The regions were established in 1982[2] with the purpose of economic, social and cultural development. There are thirteen regions in mainland France (including Corsica, which is a single local authority exercising the powers of a region), and five overseas regions.

In total 14% of the total budget of the public expenditure is dedicated to the regions. The mission of the regions is to develop its territory on different axes: economy, employment, transport, education, culture, sports, environment and sustainability.

One third of the annual region budget is dedicated to investments. In total 25% of this budget is spent for public transport & mobility making region representatives good stakeholders to sustain electromobility. For instance, the region “Île-de-France” grants, under certain conditions, an additional subsidy of €6.000 to eligible companies for the acquisition of light duty clean

vehicles such as electric vehicles, vehicles on hydrogen and vehicles powered by LPG.

2.1.3 Departmental councils

Departments are responsible for social action, the management of social assistance and the management of departmental roads. The responsibilities of the departments considering the management of departmental roads is among others rural equipment, land consolidation, land development and water and rural road management, taking into account the priorities defined by the municipalities[3].

The departmental council is sometimes involved in managing public charging point infrastructure. This is usually the form of a "syndicat d'énergie". For instance, this is the case for the Sarthe's department (72), well-known for the "24 heures du Mans". Some municipalities of this department have delegated their decision-making power to build charging infrastructure. Thus the department authority is steering installation, maintenance and exploitation by delegating this service to a supplier.

2.1.4 Municipalities

The municipality is the decision maker in the local town planning plans (PLU) and concerted development zones. In some cases, these skills may require the intervention of the intermunicipal association or the metropolis to which the city is attached. It takes care of the maintenance of the municipal roads, on urban planning and sustainable mobility. The city is in charge of school equipment, municipal social actions, local public services communal life, culture and sports equipment and events. As it has the mobility responsibility for the municipal area, it can choose to provide its decision power to the intermunicipal association or to the metropolis or to the energy department public authority.

An example of this is the recent charging infrastructure assignment for the city of Paris. It has just chosen Total for the modernization and expansion of its public charging stations for electric vehicles. A park now made up of 352 stations from the former Autolib'-network comprising 1.900 charging points, 90 stations from the Belib'-network comprising 270 charging points and one station with 9 charging points. In addition, Total plans to install 1.970 new charging points, including 140 dedicated to electric two-wheelers and 1.830 single 7,2kW charging points and 10 hubs of rapid charging stations (50 kW) distributed in 10 underground car parks. In the end, the new network, which will take on the Belib' name, will include 2.329 charging points. Total has made commitments on the quality of service by guaranteeing 95% of charging points availability at all times, as well as a simple and efficient customer journey with the possibility to pay by contactless credit card. Total is committed to supplying this network of terminals with green electricity.

2.2 Other important stakeholders

2.2.1 Energy department public authority – Syndicats d'énergie

The organising authorities for energy distribution (AODE - Autorité Organisatrice de la Distribution d'Energie) are most often intermunicipal associations, but also departments, metropolitan areas or overseas territories. Owners of electricity distribution networks, the AODEs, control the performance of public service missions. Departmental energy unions are AODEs which are responsible for the electricity network delegated by a set of municipalities.

2.2.2 Enedis

In France, the distribution of electricity is a public service under a monopoly. Enedis is thus the manager of 95% of the French electricity distribution

network. Other Local Distribution Companies - known as ELD (Entreprise Locale de Distribution) - such as Électricité de Strasbourg, the Metz Electricity Plant, the Régie des Deux-Sèvres, Soregies), manage the remaining 5% (160 ELDs in France).

On behalf of the AODEs, owners of the networks, Enedis and the ELDs operate, develop and maintain the 1.300.000 kilometres of French power lines. To this end, the Distribution System Operator concludes and manages concession contracts, signed between the granting authority (municipalities or groups of municipalities) and the DSO.

This contract is concluded for a specific period, which can span several decades. It includes specifications specifying the rights and duties of the DSO to the community and users of the public service (connection conditions, quality commitments of electricity supply, maintenance). Over time and according to the desired commitments between the parties, the concession contract may be supplemented with amendments. Each year, the DSO (Enedis and the ELDs) send to the granting authorities a concession activity report (CRAC). This contractual document summarizes their work within that year.

2.2.3 Highway concession companies

Highways in France are property of the state, but the management thereof is outsourced to private companies through long term concessions. These private companies are called the 'sociétés d'autoroutes'. There are about twenty such companies which together manage the biggest part of France's highway network. These private parties can also choose the tariffs at the toll stations. The tariffs are still somehow regulated by legislative and regulatory provisions, but the private parties can choose their rates within certain boundaries. The highway companies are also responsible for the highway service areas. These areas with usually relatively large car parks are managed by another party via a so-called sub-concession. Unfortunately this means there are a lot of parties involved to install EV-charges on these locations.

At the moment there are too few (fast) chargers along France's highways to accommodate the (future) need. Excluding the Tesla network, FIER Automotive & Mobility found there are on average 9.2 CCS2 fast chargers (> 22kW) per 100km highway in France[4] In comparison: in the Netherlands there are on average 20 CCS2 fast chargers per 100km highway.

Deemed to be dangerous for safety reasons, 189 of the 217 fast charging stations for electric vehicles on major French roads of the Corri-door network were decommissioned at the beginning of 2020. This is the reason why France is lagging behind regarding the number of charging points along the highways. It turns out that at the time it was not a requirement from the authorities to install (fast) chargers. On top of that it seems quite a challenge to install chargers along the highways in general. The first and most important challenge seems to be the willingness of the concession and sub-concession holders to install chargers. There reasoning being that a charger inherently reserves one or more parking spots for EV-drivers. As space and parking spots are quite scarce, the concession holders would rather not 'waste' valuable parking spots for EV-drivers, as for the moment these spaces don't have as high a usage rate as other parking spots and are thus not as profitable. To make the concessions holder more willing to install chargers, it is this important to find a business model for it. This is where Dutch parties can play a role.

On top of the willingness of the concession holders to install chargers, there are also other challenges to face. Mainly the administrative burden and economical and technical challenges. There is no centralized knowledge institution the different stakeholders can turn to, to improve their role within

the chain of charge. This makes it relatively complicated to align all the stakeholders within the process of installing charging stations.

2.3 Example cities and regions

2.3.1 Île-de-France

Organisation

Île-de-France is the most populous of the thirteen regions of France. Often called the Paris Region because it includes the city of Paris. Île-de-France is densely populated and economically important: it covers about 2% of Metropolitan France's territory but 19% of Metropolitan France's population, and accounts for 31% of French gross domestic product. The region is made up of eight administrative departments.

Municipalities are owning the jurisdiction regarding charging infrastructure. Most of the time they delegate it to their local energy department public authority. Paris however keeps its jurisdiction with regard to the complex management of car parks in the city. In the three surrounding departments of Paris, two "syndicats d'énergie" SIGEIF, SIPPEREC and METROPOLE DU GRAND PARIS are already managing around 3.000 public charging points:.

Electromobility Strategy

Since 2017 the region of Île-de-France has spent €9.000.000 to green the fleet of SME's situated in its territory. From 2017 to 2019 more than 2.000 vehicles (two-wheeled, light and heavy vehicles) were renewed within this program[5]. This program allows SME's to receive – under certain conditions – up to €9.000 of subsidies for the acquisition of an electric, plug-in hybrid, hydrogen or CNG vehicle[6].

Public transport

There are 10.000 buses and touring cars in the Region with 120 operational centres. In 2025, all areas with a high density of pollution will be covered with a clean park of public vehicles. In 2030, the entire region will be equipped with a 100% green fleet. The major goal is to organise the energetic transformation of all operational centres.

The objectives are to convert the area of the Grand Paris with 2/3 of electric buses and 1/3 of biogas. For the rest of the region the goal is to have 25% electric buses and 75% biogas (GNV and bio-methanol) buses.

The RATP ("Régie Autonome des Transports Parisiens") committed to these goals by converting its bus depots to electricity and biogas by 2025. In 2018 the first bid to buy between 250 and 1.000 electric buses was launched[7]. With these policies the RATP hopes to reduce its energy consumption by 20% in 2025 compared to 2017[8]. All 4.700 transit buses will be electric and gas powered in the next four years.

Charging infrastructure

General situation

There are 4.561 public charging points in the region of Île-de-France as of November 2020.

In November 2019 it was decided by the regional council that under the "plan de développement de l'électromobilité", 12.000 public charging points need to be available in 2023[9]. The number of charging points will thus almost triple in three years, meaning that at least 45% of Île-de-France residents will have a charging station within a 10-minute walk of their home or place of work, compared to 17% today. The charging points must be secure, geolocated and accessible at reasonable prices.

Regional funding is aimed in particular at municipalities and their Île-de-France groupings, including energy department authorities. SIGEIF has already obtained aides from the Region for the installation of the first 50 charging points in four municipalities and additional strategic studies, SIPPEREC for a first deployment of 80 charging points, and SIARCE has started developing 'a "master plan" for its territory.

Moreover, the charging points installed under this plan will be recognizable through a quality label, ensuring a minimum service level at a 'reasonable' price for the customer[10]. In Seine-et-Marne, this label is already applied to 134 charging points.

The Region will also deploy an online platform to centralize and make available all data relating to electromobility in Île-de-France, especially real-time information on the availability of the charging points.

Networks

In 2018, one of the Parisian networks, Autolib', stopped its operations. Based on that situation, Paris chose to keep the infrastructure to modernize and use it. The goal is to minimize costs for the city. This is the reason why Paris makes the choice for a concession model and asks for market proposals. In November 2020, Total signed with the city of Paris a 10 year concession with control of the charging network, pricing and quality service delivery (according to the contract there is an availability rate of 95% and a hotline available 7/7- 24/24). Interoperability of the network is also one of the major requirements. Total will pay a fix fee of €2.800.000 per year to the City plus a percentage of the annual turnover. The network targets for the coming months are 2.329 charging points, bringing together 270 existing Belib' charging points plus 1.970 new charging points (with a power of 7,2kW).

In the others three neighbouring departments (92-93-94), three public authorities share a global park of 3.000 charging points:

1. Grand Paris, with a public domain occupation Convention of 10 years because of traffic rules limitation (no diesel cars in 2024 and no gasoline in 2030), granted to the METROPOLIS consortium;
2. SIPPEREC, with an operation contract of four years, granted to Bouygues Energies & Services;
3. SIGEIF with an operation contract of four years, granted to Izivia (EDF Subsidiary).

To ensure that electric mobility provides the most suitable service for citizens, the Île-de-France networks are interoperable, but there will be different prices.

Electromobility evolution in the île-de-France

There are 71.033 100% EV's in Île-de-France as of the end of September 2020. The number of electric vehicles per public charging point is currently close to 16.

Public charging only plays a small part in the cities. The main charging usage is at home, especially in collective housing where the inhabitants are mainly living in in the region. Even in Paris 130.000 street side parking places represent only 20% of the parking capacity in Paris. The rest of the parking capacity can be found in public parking lots, social landlords, residential housing, almost everything in the basement (80%). The municipality of Paris recently decided to remove 50% of street side parking places, reserving this area for services. The city of Paris will soon organise the General Estates of Parking to help the population understand what is at stake. The development of accessible charging points available to the public in the

private domain is more agile and faster. Thanks to subsidies, the installation of these infrastructures can be accelerated.

The city of Paris envisions a massive development of underground recharging through three main social landlords which may provide large, underused car park volumes. The APC (Agence Parisienne du Climat - Renovation of buildings) is working with the city on a study showing car parks portraits. This could ease understanding on what could be done regarding charging equipment. This study was presented on the 18th of November 2020. An action plan will be launched in the coming weeks.

Strategy

In our interview with a representative of the city of Paris, the goals for the coming years were laid out. The first goal is to have a service quality close to the one of the gas stations. Secondly, the question of the uniformity of pricing is very important. Of course, the price of recharging in cities cannot be the same everywhere because linked to the price of parking. But communication on pricing structure and level of service are key.

Thirdly, cooperation is really encompassed as a major statement. Collaborations of departments goes in the same direction. The financial power of private sector is also a driving force. Open data policies are already well advanced, must be continued with all players.

There are still too few interactions with academic organisations, but it would be relevant to extend cooperation.

Smart charging can also help avoid investing too much in upgrading the electric local grid.

And last, exchange with other cities must be structured to allow best practices shares and European economic fame for electromobility.

2.3.2 Auvergne-Rhône-Alpes

Organisation

Auvergne-Rhône-Alpes is a region in southeast-central France. The region is now n°2 in term of population, n°3 for the area. Lyon is the “chef-lieu” of the region and the 2nd largest city in France.

The region is diverse with four main cities, Lyon, Grenoble, Saint-Etienne and Clermont-Ferrand and very different in term of geographies (mountains, valleys, rivers…).

Municipalities as Lyon, Grenoble and Saint-Etienne are owning the jurisdiction regarding charging infrastructure. For the rest of the region, it is delegated to their local energy department public authorities.

Electromobility Strategy

Different strategies are deployed in the region. Despite the main municipality’s specificities, either energy department authorities are providing their own charging network or they propose a global network, named Eborn, which manages charging infrastructure for five departments - six more coming soon - across the Auvergne-Rhône-Alpes region and the neighboured one, Provence-Alpes-Côte-d’Azur.

Public transport

Most of the public transportation is provided with almost 1.500 trains. But hundreds of buses are also used in the region. They are currently powered with gasoline but the first assessments toward an ecological transition have started. In this region however hydrogen seems to play an important role in this ecological transition.

Charging infrastructure

General situation

There are 2.964 public charging points in the region as of November 2020. Despite the stop of the Lyon's network Bluely, the charging infrastructure is growing in the different areas.

Networks

Created in 2015 by five energy unions (Drôme, Ardèche, Isère, Hautes-Alpes and Haute-Savoie), the network of charging stations for electric vehicles Eborn will extend its scope to six other departments by early 2021: Allier, the Alpes-de-Haute-Provence, the Loire, the Haute-Loire, the Savoie and the Var. The entire network offers a single tariff. Through a public service delegation, Easy Charge (Vinci Group) operates from August 2020 the Eborn network as well as its densification and extension.

Eborn is made of 1.200 existing charging stations and around 100 additional ones will be installed by 2022. The Eborn network will thus have a charging point every 30 kilometres within the geographic area covered.

The other departments built local networks around several hundred charging points each, especially thanks to a subsidy coming from Ademe in 2014 and 2015.

In Lyon, Izivia is building the Izivia Grand Lyon service. Over a 15-year contract, more than 640 charging points from 7,2kW to 150 kW will be available in all the municipalities of Greater Lyon in the coming months.

Private local network, as CNR Move In Pure, are also building a network with a strong attention on the localization of the charging points to ensure the best availability.

Grenoble granted Bouygues Energies and Services to manage its city network, mainly to be used as car-sharing stations.

Last but not least, Saint-Etienne Métropole designed with Enedis, Demeter and Renault a charging station on-demand program. At the end of 2020, they aim to propose 120 charging stations on its area.

Electromobility evolution in the Region

There are 36.865 100% electric vehicles in Auvergne-Rhône-Alpes as of the end of September 2020. The number of electric vehicles per public charging point is currently close to 12.

The on-demand program of Saint-Etienne should be ended in next June. It remains modest in comparison with other ones: 18 charging stations installed; six months duration between request to installation. But clearly, their experience will be very helpful for further roll-out.

Strategy

As this is a region with a dense network of highways, the focus of fast charging infrastructure needs to be a priority along the highways. APRR and Fastned will cooperate to install and provide nine charging stations between Paris and Lyon. These chargers will be installed in 2021.

2.3.3 Pays-de-Loire and Brittany

Organisation

Pays de la Loire is in western France, bordered by Brittany on the northwest. Pays de la Loire groups five departments: Loire-Atlantique, Maine-et-Loire, Mayenne, Sarthe, Vendée. The main metropolis is Nantes.

Brittany is the farthest west of the regions of Metropolitan France. Only four departments make up the region: Ille-et-Villaine, Morbihan, Côtes d'Armor, Finistère. The capital is Rennes.

Public transport

Pays-de-Loire was one of the first region to use 100% zero-emission electric transit buses (express line 40 in Mayenne) on its public interurban network.

Charging infrastructure

Pays-de-Loire, at the exception of Nantes metropole, decided to organise as a whole their EVSE network, with the same sub-contractor for operation & maintenance and the same tariffs. Despite its green politics, the charging network of Nantes still remains under-developed.

In Brittany, Morbihan Energies manages its own department network, but the three other departments are working together under the Ouest Charge umbrella (500 charging stations).

At both region's scale, discussions have started to propose a single charging points experience. The number of electric vehicles per public charging point in Pays-de-la-Loire is currently between 10 and 12. The number of electric vehicles per public charging point in Brittany is currently close to eight.

2.3.4 Hauts-de-France

Organisation

Hauts-de-France is the most northern region of France. Its capital is Lille. It is the third most populous region in France and the second most densely populated. This region is number one for the French automotive manufacturing market.

Public transport

Several 100% electric coaches, manufactured by the BYD company in Allonne (plant of the region) near Beauvais (60), are in service and serve the Beauvais-Compiègne line. Four lines of the Amiens' network, called Némo, operate today electric buses (on-board wi-fi, USB sockets, etc.).

Charging infrastructure

The Hauts-de-France region itself has developed a charging service for electric vehicles, called "pass pass electrique". Except for Aisne, Oise and Somme departments, all municipalities are providing their services under this regional trademark.

Aisne is still developing its own USEDA charging network, Oise promotes its Mouv'Oise network and Somme as well. The main characteristic for those three networks is their common operator, easing the inter-department roaming.

The number of electric vehicles per public charging point in Hauts-de-France is currently between eight and ten.

2.3.5 Grand Est

Organisation

Grand-Est is a region in north-eastern France. It superseded three former administrative regions, Alsace, Champagne-Ardenne, and Lorraine.

The region shares borders with Belgium, Luxembourg, Germany and Switzerland. The capital and largest city is Strasbourg.

Public transport

Alstom Alptis and Irizar buses are deployed at Strasbourg. The objective is to reach a zero-emission bus fleet by 2025.

Charging infrastructure

The Grand Est region is developing the deployment of electric charging infrastructure. Through the Climaxion[11] program, in partnership with ADEME and the French Administration, it supports electric charging infrastructure network roll-out.

For municipalities and their intermunicipal association, they subside deployments of 1.000 charging points open to the public, including 46 fast charging stations. For companies, they support the installation of 1.000 charging stations for employees in regional companies. For co-owners and social landlords, another program gives access to 1.000 charging infrastructures to residents in vertical housing.

Not many charging networks in this region. The main one is managed by the energy department authority in Aube. The network named Modulo – operated by Virta - is also present in Marne and Haut-Rhin. For all other charging infrastructures, it's only municipalities or their intermunicipal structure which are available. Grand-Est region remains under-equipped at this stage. The number of electric vehicles per public charging point shows this lack of coverage with a figure between ten and twelve.

2.4 Cultural differences between France and the Netherlands

Even though France and the Netherlands are close, there are some cultural differences within the business world that deserve to be shortly highlighted.

On the Dutch side respecting deadlines and agreements is very important. On the French side, there is more flexibility towards the agreed timeline.

The French like to talk and think. The Dutch mainly want to make decisions. In meetings, the Dutch easily take the floor to express their disagreement without ambiguity. Arbitrarily imposing one's will is not in Dutch culture. Division of opinion and hierarchy is much less strong than in France:

- In Dutch companies, decision-making is usually more consensual with flat organisations.
- For government institutions, it is rather the coalition approach with different opinions, unlike France where the director validates the choice.

Each party must recognize its own values to understand its partner. The differences in perspective are real but relevant from both points of view.

The focus of this report is not on cultural differences and similarities. The short introduction above gives a short overview of some of these cultural elements. We recommend to be aware of the similarities and differences, respect them and act on them.

3. Tendencies and developments regarding electric transport

3.1 Global EV trends

Bloomberg New Energy Finance (BNEF) predicts in their report 'Electric Vehicle Outlook 2020' that the price of an electric vehicle in Europe will be similar to the one of a thermic vehicle by 2022[12]. This is mainly due to the larger segment of cars consumers are used to in Europe. For smaller cars, the price differential might only hit parity around 2030. BNEF suggests that until this tipping point is reached, policy support is necessary to accommodate or accelerate the introduction of the electric vehicle. The figure below shows that in 2019 the market share of new electric vehicles in Europe was almost 4%. In France also the market share of electric vehicles was almost 4% in 2019.

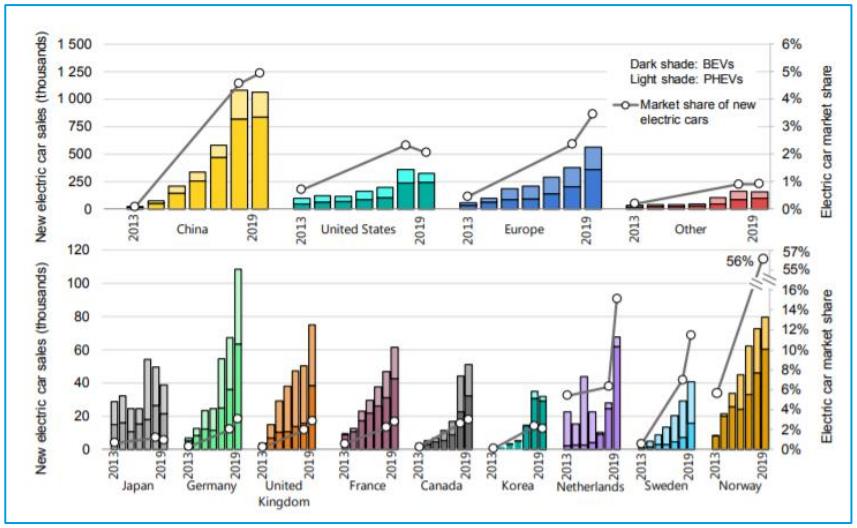

Figure 2: Passenger electric car sales and market share[13]

This positive trend regarding electric vehicles and by extension zero emission vehicles will likely continue in the years to follow. By 2022 for example it is expected to globally have more than 500 models of electric cars. Although, the rise of electric vehicles really depends on policy decisions by local authorities. In their report 'Global EV Outlook 2020', the International Energy Agency (IEA) makes a distinction between two scenarios[14]: the stated policy scenario (STEPS) and the sustainable development scenario (SDS).

STEPS takes into account existing and already announced policy decisions to predict the development of EV vehicles, whereas SDS is based on three pillars:

1. ensure universal energy access for all by 2030;
2. bring about sharp reductions in emissions of air pollutants;
3. meet global climate goals in line with the Paris Agreement.

Both scenarios naturally predict different uptakes of the electric vehicle by 2030. In the STEPS scenario two- and three-wheel drives as well as buses will have a market share of new sales of more than 40%. These will mostly by battery electric vehicles (BEV's). In the SDS scenario the two and three wheel drives have a market share of almost 80% by 2030, while the buses are around 50%. On the other hand the light duty vehicles (these include passenger cars and light commercial vehicles) will have an uptake of around 30% by 2030 in the STEPS scenario with a considerable share of PHEV's. in the SDS scenario the uptake will be around 50% by 2030, also with a considerable share of PHEV's.

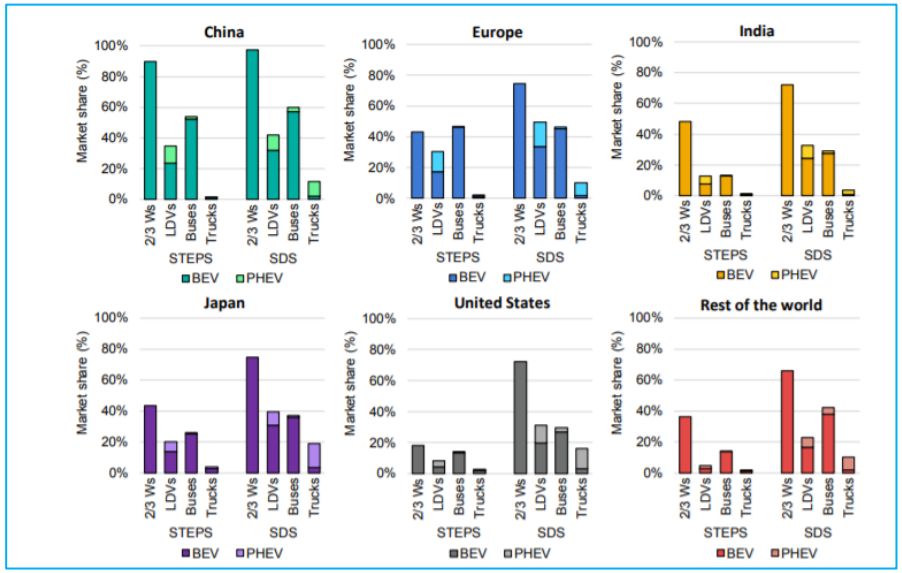

Figure 3: EV share of vehicle sales by mode and scenario in selected regions, 2030[15]

3.2 EV trends in France

The latest reports indicate a total of 413.352 battery electric and plug-in hybrid electric vehicles in France (October 2020)[16]. On a monthly basis more than 10.000 EV's and more than 10.000 PHEV's are registered. Also in the categories of two-wheel drives and light commercial vans, there is a surge in registrations. The goal for 2020 is to have 170.000 new registrations in the EV and PHEV category. Currently there have been 137.787 registrations (January through October 2020). This means that despite the COVID-19 pandemic, the goal will likely be achieved. It is also interesting to note that in all vehicle categories there has been a decline in new sales due to the pandemic, except for EV's and PHEV's. The ultimate objective in the midterm is to have a total of 1.000.000 registered EV's and PHEV's by 2022. To achieve this goal, it is necessary to have 230.000 new registrations in 2021 and 300.000 in 2022. By 2030 the Boston Consultancy Group (BCG) expects a share of 39% of new sales in France for electric vehicles[17]. Mainly legislative measures such as financial aides and requirements regarding charging infrastructure will drive this steep increase in the sales of electric vehicles. Also the price of the vehicles (and mainly the batteries) will have an impact on new sales. By 2030 it is expected that the battery costs drops to around 100$ per kWh compared to 200$ per kWh in 2020[18].

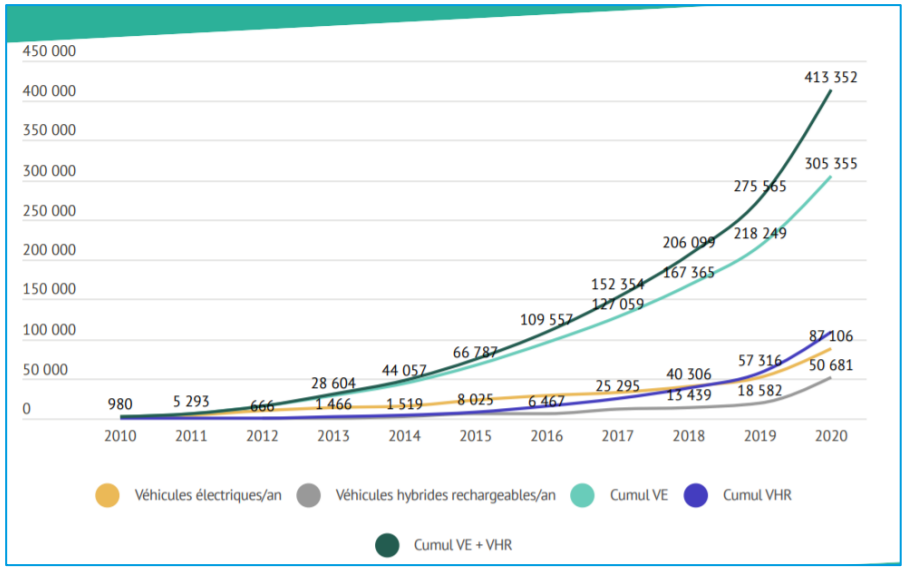

Figure 4: evolution of EV's and PHEV's in France

Next to the number of vehicles, the French government as well set some important goals regarding the number of publicly available charging points. By the end of 2021 the government hopes to have 100.000 public charging points (notice the difference between charging points (sockets) and charging stations) available. Currently there are 31.000 charging points in operation. To achieve this ambitious goal, all stakeholders need to contribute. Publicly accessible places held by private companies (such as shops, malls, car parks, etc.) need to allocate a part of their places with charging infrastructure for their customers. Also municipalities, regional authorities and departmental councils will need to commit to installing charging equipment in 2021. It is thus expected that in 2021 lots of tenders will be published. Along highways, new (fast charging) infrastructure is needed. Recently the Dutch company Fastned and the motorway and toll group Autoroutes Paris-Rhin-Rhône (APRR) announced a collaboration

regarding the installation of fast chargers on nine locations along the highway from Paris to Lyon, on the route to Switzerland, and around Dijon[19]. Each charging station will be able to recharge sixteen vehicles simultaneously, which means an addition of 144 charging points along French highways. These charging stations will be installed in 2021.

3.3 National policies

In May 2020, the French president Emmanuel Macron announced an €8.000.000.000 aid package for the automobile industry, following the 1st lockdown of the COVID-19 pandemic. In his speech announcing the aid package Macron said the following:

"we need a motivational goal: Make France Europe's top producer of clean vehicles by bringing output to more than 1.000.000 electric and hybrid cars per year over the next five years."[20].

France is already working for several months to transform its legislation to foster the transition toward a low-carbon mobility. After many months of works, involving all the ecosystem, a major law on Mobility named – Loi d'Orientation des Mobilités (LOM) – was issued the 24th of December 2019. This text gathers different rules and many of them have strong impacts on electromobility development.

In France, a law only takes effect when it has been confirmed via a decree. The next paragraphs present an overview of the different rules and incentives which apply for electromobility at national level.

Vehicles

On a national level there are two main incentives: the ecological and the conversion bonus. Currently the Finance Budget 2021 is under validation. The last decision regarding the bonus amounts will be soon taken. Both for the ecological and conversion bonus, the exact amount of the subsidy depends on several different conditions. For the most updated information we suggest visiting following websites:

- https://www.service-public.fr/particuliers/vosdroits/F35354
- https://www.economie.gouv.fr/particuliers/bonus-ecologique

For the first six months of 2021, the French government has announced the extension of the current scales of the ecological bonus and the conversion bonus.

For the purchase of an electric car of less than €45.000, the ecological bonus remains at €7.000. For a price between €45.000 and €60.000, the ecological bonus goes down to €3.000 and if the price is greater than €60.000 is only applicable for light commercial vehicles and hydrogen cars.

Same pattern for owners of hybrid vehicles who can once again benefit from a bonus of €2.000. It will simply be necessary to note a few conditions: the vehicle must have a range greater than 50 km and the purchase price must be less than €50.000.

For the conversion bonus it is possible to receive up to €5.000 for the purchase of second hand or new BEVs and PHEVs if you scrap your diesel car (first registration before January 2011) or gasoline car (first registration before January 2006)[21]. This conversion bonus is linked to your revenue cap. If a resident lives in a low-emission zone, they can add a complementary bonus, always linked to your revenue cap, today at €1.000.

The French government also introduced a new layout. It allows you to retrofit your old internal combustion engine into an electric vehicle. For that, an incentive[22] has been designed depending on your revenue and the car category.

There are also tax benefits when purchasing electrical vehicles. For fully electric, hydrogen and PHEV's vehicles, the car registration is free.

For companies buying low-carbon vehicles, they can benefit a fiscal deduction[23] of their depreciation.

An employee and its employer can both deduce 50% of their tax expenditures below the limit of €1.800 as benefits in kind if they use an electric car.

Moreover, benefits in kind[24] are equal to zero for worker using a home charging point paid by the company for non-professional purposes.

Fleet[25]

Vehicle fleet greening measures apply to companies with a fleet of more than 100 light vehicles (less than 3,5 metric tons). From January 1st, 2022, these companies will have to integrate 10% of electric vehicles during renewals. The percentage will gradually increase to reach 50% in 2030.

For public fleets, percentage of vehicle renewal are even higher regarding categories of vehicles. From July 1st, 2021, 30% of car's renewal must already be done with a car with less than 60g CO_2 emission.

At this moment a decision regarding the percentage of renewal with low-carbon vehicles for taxi fleets is in preparation, but already drivers with lease cars have to apply the same rule as company fleet of more than 100 light vehicles.

Charging Infrastructure

Incentive for owners

French government promotes the installation of private charging point through a maximum tax credit of €300. This mechanism is now replaced, with a new funding available until December 31st, 2023, with the same amount but now available for two charging points if the taxable household is composed of two adults.

ADVENIR[26]

Created in 2016, the ADVENIR program is based on "energy saving certificates" mechanisms, to fund public and private initiatives to support the development of charging infrastructure.

The system offers financial support for the deployment of charging points on the road (including recharging points dedicated to two wheels), in enterprises (private parking for fleets, private parking open to the public) and for residentials (individual, shared, collective infrastructure).

Renewed from 2020 - 2023, the ADVENIR program v2 is a budget of €100.000.000 with the objective to fund more than 45.000 new charging points by the end of 2023.

Standards and mandatory rules

The decree of the 12th of January 2017[27] is guiding the implementation of charging infrastructure:

1. Electrical sockets;
2. Plug connectors;
3. Installation by a qualified professional;
4. Energy management.

The condition to obtain a vast majority of incentives refers to the strict application of the decree's rules. A next decree will precise the sanctions if the different implicated parties do not comply with the rules.

Rights and duties for construction

Tenants and owners living in condominiums with enclosed and covered car parks have a right to plug, meaning that they could install a charging point after an information to the other residents. This right is currently built under strict conditions which are pretty hard to apply.

Residential buildings must be equipped or pre-equipped of charging infrastructure at a ratio depending on the date of construction. All the conditions are described in the "Code de la construction et de l'Habitat" in the articles R 111-14-2 à R 111-14-5 and R. 136-1 to R. 136-4.

Rights and duties for public charging

Several rules are also built for managing the installation of public infrastructure. Most of them are initiated in the decree of the 12th of January 2017[28] but new detailed rules are coming in next coming texts. These rules are about:

1. Relationship with the electric grid operator;
2. Energy management;
3. Identification;
4. Open data;
5. Supervision;
6. Interoperability;
7. Maintenance.

Regarding the charging infrastructure for highways, a dedicated text[29] is guiding installation and operation for the concessions.

Local incentives

Many regions or public local authorities are adding incentives in addition to the previous ones. Theses supports regularly change, but we can right now mention organisations which offer at least one plan. To find the plans active at the moment of writing, this government website is a useful tool: https://jechangemavoiture.gouv.fr/jcmv/aide-achat.html?content=aides-locales

1. Grenoble-Alpes Métropole
2. Région Auvergne-Rhône-Alpes
3. Métropole de Lyon
4. Région Franche-Comté
5. Syndicat Départemental d'Energies de l'Yonne
6. Ville de Saint-Maur
7. Métropole du Grand Paris
8. Territoire Paris Ouest La Défense
9. Région Ile-de-France
10. Ville de Drancy
11. Ville de Villejuif
12. Ville de Paris
13. Région Normandie
14. Département du Lot
15. Alès Agglomération
16. Région Occitanie
17. Département des Bouches-du-Rhône
18. Métropole Nice Côte d'Azur
19. Région Provence Alpes Côte d'Azur

4. Market opportunities

In this chapter we will discuss our findings, learnings and recommendations to Dutch parties. The goal for this chapter is to create a clear picture of the current state of affairs within the segments we've defined and where we believe opportunities lay for Dutch parties.

The French market offers multiple opportunities to Dutch e-mobility companies. The opportunities are categorised in three key market segments: the public sector, companies and fleet owners:

- Public sector: Dutch parties can look into tenders published by municipalities, syndicats d'énergie and regional authorities. In the appendix we've listed the different platforms where parties can find tenders.
- Companies: Dutch parties could concentrate on opportunities with commercial centres at property asset management level, charging hubs, public car parks, etc and develop *channels* such as automotive companies, energy companies, highway concession companies and installation parties to access business to business and business to customer markets. Ideally, they can cooperate with a local partner (for example Total, PSA, Renault, EDF, Engie, Park n Plug, etc.). Within the 'companies' segment we are mainly looking at private parties who have a publicly accessible parking space.
- Fleet owners: for the fleet owner segment, there are some big opportunities because companies with large fleets (more than 100 vehicles) need to follow certain quota regarding the renewal of their vehicles (authorized loaded weight is less than 3,5 metric tons): starting from January 1st 2022 10% of the renewed vehicles need to be electric (EV and/or PHEV). As of 2024 this percentage shifts to 20%, in 2027 to 35% and in 2030 to 50%[30]. These government set

goals will result in a big shift towards electric vehicles and the need to charge them in the coming years.

In the following paragraphs we have consistently differentiated the opportunities for Dutch organisations according to these defined market segments. Other market segments such as the private business to customer market are not considered in depth in this report because these markets are still developing markets. We expect to have interesting opportunities for Dutch companies in these markets in the mid and long term.

In general it is recommended for Dutch parties to find a local partner to cooperate with. Especially for opportunities in the public sector. The French market has some key specificities – as briefly laid out in the previous chapters – which only local partners will fully understand. On top of that some basic but very difficult hurdles to cross are in place for Dutch companies. It is important for Dutch parties to find a solution to this barrier through a local partner or via an employee which is familiar with the French market and speaks French. Otherwise there is also the phenomenon that in France business is often done through personal contacts. Naturally, when companies want to enter a new market, they don't have those contacts yet. This is another important reason why Dutch parties should try to find a French partner to collaborate with. At least in the short term this is the easiest way to penetrate the market. There are examples like Allego, Greenflux, NewMotion and EVBox where the companies have set up an office in France, with local employees. That, however is a secondary stage when penetrating the market. For instance, EV BOX started to open a single office at the end of 2015 with a country sales manager; After six months of presence, thanks to a new product line, the company was confident for its French development. The acquisition by Engie at the beginning of 2017 hastened the volumes of sales. The 2018's EVtronic takeover validated EVBox anchoring, making this EVSE manufacturer one of the leader of the French market.

4.1 Charging infrastructure

4.1.1 Public sector

<u>Learnings and findings</u>

The French government set the ambitious goal of having 100.000 publicly available charging points by the end of 2021. The public sector and all public parkings of private parties have a key role in the realisation of this goal. On top of that, all parties we've interviewed agree that the service quality of the current publicly accessible charging points is subpar. Many charging points will need to be retrofitted, replaced or even relocated to be able to offer a better service to the customer. Other issues with current public charging points are gaps in the network, poor interoperability and poor transparency in pricing.

Regarding the network, there are still large portions of the country where there are not enough charging points. Especially the centre parts and north western parts of the country. Many of the parties we've interviewed during our research are worried about a disconnection between the number of publicly available charging points and the number of electric vehicles in France. Currently there are more or less ten vehicles per publicly accessible charging point. This is also the recommended ratio by the European Union. However, the interviewees agreed that the sales of new electric vehicles happens faster than the deployment of public charging infrastructure. Regardless of the trend that there will be a disconnection or not, it is definitely necessary for public authorities and private parties to act fast. This phenomenon in itself will automatically expand the market drastically and open up opportunities for Dutch parties.

Interoperability is often also not guaranteed between different networks and MSP's, even though interoperability has been mandatory from January 2017. This is a result of a roll-out of multiple networks before 2017, and the inertia of public and private parties to adapt to shift to interoperable networks and because different local authorities worked with different private partners. This is an issue which is still very important and needs to be addressed, but with new and improved regulations the situation will improve drastically in the coming years. It is expected that the French government will publish a new decree regarding interoperability in the beginning of 2021. The decree will include requirements on the technical and the practical side of interoperability. In short this decree will set specific terms regarding communication between the charger and the vehicle, regarding payment methods and technical aspects regarding the charging procedure. All public chargers installed after July 2017 must be financially obliged to adhere to these rules and retrofitted if necessary. As the decree is not published yet at the time of writing, we cannot comment further on the details.

The transparency in pricing also needs to be addressed to be able to offer a better service to the customers. The interoperability decree, described in the last paragraph, covers this issue as well. The decree will require operators to inform consumers on tariffs, in order to make them easily and clearly comparable, transparent and non-discriminatory. All chargers installed after July 2017 will need to follow these rules.

Currently, one of the biggest blind spots regarding charging infrastructure in France are highway locations. Due to electrical safety issues almost 200 fast chargers from the Corri-Door network recently had to be shut down. But even if they will reopen after maintenance works, the low power level (50kW) won't be sufficient enough to cover current demands. The highway networks is starting to be equipped at all service areas to allow for long distance trips within France. The highway service areas are held under a concession model. Lots of these concessions are due to end within the next five years. Private parties are thus not interested to invest in infrastructure without having the certainty to be able to operate them long enough to make it profitable. Concession holders are in negotiation with public authorities to extend the duration of the concession to be able to make those investments. It is expected that the public authorities will grant those expansions with some guarantees regarding the installation of charging infrastructure. The details of those agreements aren't clear as of yet. The French distribution service operator (DSO) Enedis confirmed in their interview that it takes more or less one year between the initial demand for a new grid connection until the installation of the connection. Enedis also confirmed that more or less 20% of service areas along the French highways already have the necessary grid connection to install fast and high power chargers. For instance, Fastned just signed a contract for the equipment of 9 HPC stations on APRR highways. Ionity is pursuing its network construction and all major petrol retail networks as Total, Shell, BP and others announced to launch their own charging stations.

<u>Opportunities and added value from Dutch parties</u>

In the paragraphs above we have mentioned the need for public authorities to act fast regarding the deployment of charging infrastructure. It turns out however that in general French administrations have much less experience in deploying charging infrastructure in their city or region that Dutch administrations have. Some cities currently work with a system which is called 'borne à la demande', comparable with 'paal volgt wagen', where citizens can request the city council to install a charger near their home. This is a very reactive way of providing a service to citizens, and does often not incentivise the transition to electric vehicles as citizens will need to wait for at least several months before they have the certainty of being able to

charge near their home. On top of that only very few charging points have been installed through this system. In the Netherlands however it is more common to have a clear and defined strategy for the coming years regarding the planning and installation of charging points. Also, Dutch cities have experience with deploying charging infrastructure on a data driven basis. Utrecht and Amsterdam are making a next step into a data driven approach in the role out of public charging infrastructure. This level of planning and intelligent deployment of charging infrastructure is often not present in French local administrations.

Dutch parties have a lot of experience in the topics mentioned in the paragraph above. The installation, maintenance and interoperability issues aren't new to Dutch companies and organisations. Especially because multiple Dutch private actors where convinced of a charging market model, based on open standards and interfaces. This is one of the reasons they have been leading with regard to interoperability in Europe. The OCPP, OCPI and OSCP standards are the offspring of multilateral collaboration between Dutch governments, knowledge parties and private players. These protocols have been in place for a long time in the Netherlands. Dutch parties not only have experience implementing them, but also have the hardware and software necessary to be able to implement it quickly and efficiently. The added value from Dutch organisations is really the fast trouble-free implementation of these protocols, as soon all new charging points will need to follow interoperability rules (see decree which will be published in 2021) and some existing charging infrastructure will need to be retrofitted at the risk of suffering penalties.

One of the big issues regarding public charging infrastructure in France is maintenance. Unfortunately lots of charging stations are just out of order due to a lack of maintenance, in many cases because of the way the financing is set up. Dutch expertise in maintenance and especially predictive and proactive maintenance of the chargers can be an asset for Dutch companies to enter the French market.

Recommendations and suggestions

One of the first steps to take for the French public sector is to have a clear vision regarding the EV market in their city or region. Where do they need to invest? What do they need to focus on in the coming years? Etc. As Dutch public services have more experience in the field of EV, we recommend organising (recurring) events and platforms where the exchange of experience and information between Dutch and French public authorities is possible. It is important, especially for French cities, to be able to talk to their peers regarding size and density of cities. The embassy of the Netherlands in France could have a leading role to organise such events.

The Dutch ecosystem of consultancy on electric mobility is highly professional. Companies like APPM, EV Consult, Over Morgen, HetEnergieBureau and FIER Automotive have years of experience in strategy, planning and project management of (public) charging infrastructure. They support as well the national and regional governments as cities and municipalities in this field. Their focus is worldwide and with more than ten years of experience these companies are worldwide thought leaders which could provide French public authorities, corporations and fleet owners with their knowledge of best and bad practices. Dutch parties planning to do business in France should actively be on the lookout for new and changing regulation. The new decree regarding interoperability which is expected in the beginning of 2021, will be published by the French government and can be found on https://www.legifrance.gouv.fr/ as soon as it gets published. It is also important for Dutch parties to at least understand more or less the French context. Which levels of government are responsible for what? Who do Dutch parties need to approach for questions

or issues they might encounter? We thus recommend to start with reading and understanding the first part of this report where this has been laid out in detail.

We do recommend Dutch organisations to look out for some kind of partnership with French peers, especially in the public sphere as it is not easy for foreign parties to enter the French public market. Dutch parties can certainly bring a lot of expertise and it is important to have a local partner who has experience navigating the French context. We suggest to find partnerships where the different parties complement each other. French companies and organisations certainly have already a lot of knowhow regarding the EV market, Dutch parties in turn need to try to complement this with their rigorous and detailed knowledge about their own experiences. To be able to convey French parties to a collaboration, we also suggest to demonstrate in a very practical manner the offered solution by the Dutch party.

4.1.2 Corporations

Learnings and findings

Companies will also have an important role to play when it comes to achieving the goal of 100.000 charging points by the end of 2021. Through the ADVENIR programme these private corporations can benefit from aides from the government when they install publicly accessible charging points[31]. Within this programme charging hub projects will also be eligible to receive funding. Per charging point, companies claim a maximum of €9.000 of aides. The exact amount depends on the planning, the type of charging point and the total costs[32].

In France, initiatives often come from local authorities. Private companies are usually reacting towards a tenders or certain regulations. The government has a lot of power in that regard. In comparison: in the Netherlands private companies dare to take the leap forward and even challenge government if necessary. This difference in culture also has an impact regarding the deployment of charging infrastructure in semi-public locations. These are locations owned by a private party but publicly accessible such as commercial centres, public car parks, etc. Based on the interviews we find that only few corporations are truly interested in making large commitments regarding the installation of charging infrastructure at their locations. Some commercial centres do see the interest in having some charging facilities as this might attract a few customers, but at the moment this is not a broadly held view. We can consider this impasse a little bit like the chicken and egg problem: which came first? As it seems that electric car sales in France continue to grow, this might not truly be a chicken and egg problem, but more an opportunity for those corporations and by extension Dutch parties.

Without going to much in detail, we can report that for newly constructed buildings it is mandatory to also provide the necessary grid connections to be able to install charging infrastructure, based on the European alternative fuel infrastructure directive. As the rules often change, we won't lay them out in detail in this paragraph. It is worthy to note however that the French government imposes rules which show the direction they want to go in, and this is the one where electric vehicles are promoted and supported by the government.

Opportunities and added value from Dutch parties

It is clear that the French government wants to install lots of charging points. Also at semi-public locations. Although corporations might not yet be the most demanding parties to install charging infrastructure on their property, Dutch parties might be able to help. The most difficult barrier to cross for

corporations seems to be the financial investment and a clear business case. In the Netherlands there are years more experience in this area and different types of business models have been worked out. Dutch companies need to bring in this expertise lead the way for French corporations on how to have a sustainable business model when installing and operating charging infrastructure. Also the option of photovoltaic panels linked with the charging infrastructure (or other innovative solutions) needs to be brought to the attention of corporations.

In the Netherlands it is easier to experiment than within the complex French administrative process. In Utrecht for example there is an innovative pilot regarding vehicle to grid charging (LomboXnet). There are of course many other examples we could list, but the point is that Dutch parties, like Greenflux and Last Mile Solutions can offer innovative solutions to issues French parties might encounter as they already had the chance to experiment and try out different opportunities. The Dutch company Streetplug introduced an underground charging point.

Recommendations and suggestions

The experience of Dutch EV companies to roll-out packaged solutions would be of high value to accelerate the way that projects are delivered today. Of course, they need to comply with local regulation's specificities and grid, connection process. After those settings achieved, going quicker with and industrialised solution could have positive economic impact for French tenders.

Another approach could be to provide new business models. For instance, the charging-as-a-service Mccharge offering might interest many French corporations.

Organising events to share knowledge from experienced projects could be another positive way to encourage the dialog and ease further cooperation.

4.1.3 Fleet owners

Learnings and findings

As mentioned above, fleet owners have obligations regarding the renewal of their fleet. As of 2022, at least 10% of their renewed light duty vehicles need to be electric. Of course, this also brings forth the need for charging infrastructure. Especially for professional fleets smart charging is of big importance. More on that in chapter 4.2.3. Next to the private fleet owners, also public services need to electrify their fleets. The rules for public services are a bit different, but without going too much into detail the idea here as well is that a transition needs to take place and that public authorities need to have an example role regarding the greening of their fleets.

Opportunities and added value from Dutch parties

In general, Dutch companies have a lot of experience with the introduction of electric vehicles in fleets. As this is somehow out of scope we won't go further into detail regarding this aspect of the electric transition. Dutch companies and organisations do also have experience with the fast and smart deployment of scalable charging infrastructure. Many Dutch manufacturers have the hardware and/or software on hand to install innovative and smart charging solutions (for example linked with photovoltaic panels). As the smart and efficient deployment of infrastructure is important, Dutch companies can add value with their expertise in transitional thinking, process management and change management. Last but not least, Dutch parties have quite some experience with turn key solutions, financing included, which can lower the barrier to

French fleet owners. And two Dutch companies, Sycada and ViriCity offer a cloud-based monitoring system to improve electric vehicle operations like busses and fleets.

Recommendations and suggestions

Just like other countries, Dutch parties could cooperate with certain channel partners, such as leasing companies, OEM's, project developers or distributors. But also in the heavy duty market segment Dutch parties can try to cooperate with French partners. Heliox for example is an important Dutch player on the heavy duty charging infrastructure segment. To address the business to business, business to customer and business to government segments, these channels can act as a front office or as a lead generator. As often large fleet owners have pre-established collaborations with leasing companies, OEM's and distributors, it would be an enormous advantage for Dutch companies to have a preferred partnership with them. They can then introduce their Dutch partner in this market segment. The pitfall for Dutch companies when working directly with fleet owners might 'simply' be the linguistic barrier. Maybe one or more local employees can offer a solution.

The robustness and the volumes of existing Dutch solutions are providing serious advantages to compete with new entrants. With a local representative and these turn key solutions, customers will find accurate answers to their green projects. One of the main features interesting to promote is the interoperability protocol we can find in Dutch products.

Existing collaborations

In the summer of 2020, the Renault Group launched Elexent, its new wholly-owned subsidiary, dedicated to supporting professionals looking for solutions for recharging their fleet of electric or plug-in hybrid vehicles. For charging stations, Elexent collaborates with the Dutch company Alfen.

4.2 Smart charging

In France most of the territory is already fitted with a tri-phase 400V electricity network. This is a very robust type of infrastructure which is well fitted to recharge electric vehicles. It is possible to draw large amounts of power from the network. France is also mostly supplied with nuclear energy (70%) which is a stable form of power production. These two factors combined mean that smart charging was unnecessary until now. The rapid evolution of electric transport does raise the need for smart charging in France as well, to optimise local energy consumption (*behind the meter*), avoid net congestion on the distribution net (*before the meter*) and offer grid balancing to the transmission net. The need is not acute yet, but will be in a few years when millions of electric vehicles will drive on French roads. The French energy player EDF wants to become a European leader within this field[33].

Energy users are tariffed based on energy consumption and the power capacity of the net connection. The capacity tariff is one of the enablers for a business case for smart charging.

Vehicle to grid (or to X) is also a smart charging option, but is considered as a last step within the smart charging pyramid. Neither the vehicles or the grid is currently equipped to be able to support this type of smart charging. V2G seems to be something which still needs to develop further before being able to implement it. Flexitanie, as part of the regional Occitanie "Innovation Contract" scheme, is an innovative project based on Vehicle-to-Grid technology. EDF Group is deeply involved in the project. Many other projects may be launched with the same ambition. Thanks to their experience, Dutch players could propose experimentation in that field, especially in an area where a significant EV volume is available. The French manufacturer Renault

is also developing Zoe's for vehicle to grid applications. They are being tested in the Netherlands in the so called 'We drive solar" project.

4.2.1 Public sector

Learnings and findings

As laid out in the introduction to this chapter, smart charging is not that common yet in France. This results in a lack of knowhow at different stages in the value chain. The public sector is definitely one of them. Also parties advising and working together for public authorities generally lack top notch knowhow regarding smart charging. Enedis (DSO) however actively invests in knowhow and advises their clients on smart ways to manage their grid connections. When Enedis needs to install a new grid connection, they will investigate possibilities to deliver less power than asked for with the possibility for the client to occasionally (when necessary) take more power than agreed upon.

Opportunities and added value from Dutch parties

Smart charging at public charging points currently is not part of charging infrastructure at this the moment in France. We expect it will remain a small market in France. Generally speaking, when users charge on public space they either want to fast charge and go on their way as soon as possible (e.g. highways) or the operator doesn't want the client using the infrastructure longer than needed as this means a loss of revenue (charging pole in the street). The one aspect of smart charging where Dutch parties really can have an added value within this segment is load balancing. For example at charging hubs.

Other aspects where Dutch parties can have an added value is smart charging in cities and their experience in monitoring and software regarding smart charging. For the first point Dutch companies need to clearly show how a smart way of deploying and using the chargers in densely populated areas can have an advantage for cities.

Recommendations and suggestions

Again, we would recommend collaborating with a French player in this segment. For Dutch parties it could also be helpful to contact one of the companies listed in the next paragraph. In the segment there are already some collaborations between Dutch an French parties.

Existing collaborations

Some Dutch organisations already work together with French parties regarding smart charging. Enedis and ElaadNL, and Renault and Jedlix for example. In the case of Enedis and ElaadNL the purpose is really to exchange information and experience with each other to learn from it. Jedlix and Renault have a partnership where Jedlix is more the expert regarding smart charging and Renault the party which needs this expertise. Although Renault of course has much experience with other aspects in the EV value chain.

4.2.2 Corporations

Learnings and findings

Just like public authorities, the majority of French corporations managing semi-public parking lots, don't have experience and business insights regarding smart charging in France. As laid out in the previous chapter, it is already a challenge to convince those corporations to install chargers, when it comes to smart charging the challenges are even greater. These parties generally speaking do not have any experience regarding smart charging and definitely lack the knowhow to implement it in their business model.

Opportunities and added value from Dutch parties

As for the installation of chargers for corporations, Dutch parties here also need to show how these corporations can make a business model out of smart charging. Again being able to offer innovative solutions such as linking the chargers with photovoltaic panels is really an asset for Dutch parties. The years of experience in this market also is definitely a positive for Dutch companies. They really need to play that card.

Recommendations and suggestions

It would be interesting for Dutch parties to bring their years of expertise and knowhow to corporations which own and operate semi-public charging stations to guide them within this relatively new and uncharted territory. Again, also here it is really important for the Dutch organisation to show how they can bring added value to a potential French partner. The years of experience and the smart solution Dutch companies can offer need to the focal point of their pitch.

4.2.3 Fleet owners

Learnings and findings

Regarding private companies there are 4 main price differences when it comes to the electricity bill. Intraday there are differences depending on the availability of electricity. Energy prices drop when there is much power available. Usually this is when there is peak in renewable energy production (wind or solar). Also between winter and summer there is a price difference. As in winter there is more need for electricity, the price will be higher. Especially the intraday changes in price can be useful to fleet owners to charge their vehicles at an interesting rate. Currently smart charging is not widely spread within those fleets and if there is some form of smart charging, it is usually an a very basic level.

As mentioned above, Enedis is open to and actively promotes innovative ways of using charging infrastructure. They will most certainly be glad to support the transition to smart charging.

Opportunities and added value from Dutch parties

For companies and organisations with large fleets, there are only positives when it comes to introducing smart charging. French organisations will need to replace their old vehicles with a certain percentage of electric vehicles in the coming years (see earlier paragraphs). This means there are opportunities with regard to the installation of charging infrastructure, but also smart charging needs to be taken into account. French operators and manufacturers of charging points are not very familiar with smart charging, whilst Dutch parties already have loads of experience within this field as well on the hardware as well as on the software. Companies like Greenflux and Last Mile Solutions provide this technology

Dutch parties clearly are familiar with the hardware, but naturally they also have experience managing the vehicles and infrastructure through back office software solutions. They can share and use this knowledge to their advantage towards collaborating with French organisations.

Recommendations and suggestions

Leasing companies, OEM's and distributors have good contacts with owners and operators of large business fleets. However, usually they do not install charging infrastructure as part of their service. Dutch parties can try to collaborate or even be the preferred partner of those companies when it comes to the installation of (smart) charging infrastructure. Again, Dutch parties need to clearly be able to show their added value towards the

company they want to collaborate with. Also regarding the smart management of the fleet Dutch parties can collaborate with leasing companies.

Regarding smart charging, fleet owners are clearly the segment with the biggest opportunities. They have the most possible gains to make when it comes to smart charging. For parties wanting to penetrate the French market with solutions regarding smart charging, we do recommend looking at this segment in particular. The public and corporate segments do not offer the same opportunities yet and will be more difficult to enter in.

4.3 Consultancy

The Dutch ecosystem of consultancy on electric mobility is highly professional. Companies like APPM, EV Consult, Over Morgen, HetEnergieBureau and Fier Automotive have years of experience in strategy, planning and project management of (public) charging infrastructure. They support as well the national and regional governments as cities and municipalities in this field. Focus is worldwide and with more than ten years of experience these companies are worldwide thought leaders which could provide French public authorities, corporations and fleet owners with their knowledge of best and bad practices.

5. Interesting events

For Dutch organisations it could be helpful to participate to events regarding the EV market in France. Either to share knowledge directly or to familiarise themselves with the French context of to find a local partner. We've listed a few events which might be interesting to visit. Also for Dutch public authorities these events might be interesting to share their knowledge and learn more about the French approach to the EV transition.

- Paris Motion Festival, every two years, is a worldwide fair of the automotive sector. Electric vehicles are taking more and more place in this exhibition.
- Next Spring, Electric-Road Congress will take place at the Exhibition Centre of Bordeaux. This event gathers car makers, service and transport providers, infrastructure manufacturers and public organisations.
- EVER Monaco is an annual exhibition and conference event showcasing the latest renewable energy technology with a focus on vehicle design.
- The "salon des maires et des collectivités" is happening in the mid-fall period every year. All representatives of public authorities are attending this event to understand the market and source the suppliers.
- AVEM association is organising its fourth edition of the AVEM Electro-Mobility Days, which will take place in Cagnes-sur-Mer in September 2021. This event will allow players in the electric mobility value chain to present and analyse recent market developments and technologies.
- Val d'Isère EV show is planned in July 2021 with its 6th edition.

- The Electric Vehicle and Alternative Mobility Show in Anjou takes place every September in the Maine-et-Loire organised by the Intercommunal Energy Syndicate SIEML.
- The energy department SyMÉnergie05 will organise the 3rd edition of the Ecomobil' Fair at the Embrun Water Plan (Hautes-Alpes) on Saturday 27 and Sunday 28 March 2021. The event is structured around themes like carbon-free mobility and clean local energy production.
- Energy for smart mobility in Marseille (E4SM) is dedicated to innovative energy solutions for smart mobility, making a natural bridge between mobility and energy sector. This event is happening in October with high-level decision-makers.

6. Conclusions and recommendations

This report focussed om market opportunities for Dutch parties in the French EV sector. The results of this report have been gathered through desktop research, the knowledge of a local partner who helped writing this report and through interviews with Dutch and French companies through the entire electromobility value chain. In this report we focussed on opportunities in the three following market sections: charging infrastructure, smart charging an consultancy. We have divided the opportunities in three segments: the public sector, corporations and fleet owners. We believe that these are the market segments with the most opportunities for Dutch companies.

Our research demonstrated that the French EV market is still growing fast and will continue to do so in the coming years. This is mainly due to the current state of the EV market in France. With regard to charging infrastructure there is the goal of having 100.000 charging points by the end of 2021. To reach this, many more charging points will need to be installed. On top of that the service quality of the chargers is currently insufficient. Dutch parties have lots of experience with the strategy, planning and project management of installing charging infrastructure. This can certainly help French organisations to reach the goal of 100.000 charging points.

Regarding smart charging the French market only has very few experience. This is mainly due to the fact that until now they didn't need it as the electricity network is very robust and in France most electricity is nuclear which is a very stable and steady form of electricity supply. However, with growing number of EV's, the demand for smart charging solutions is rising. Again, Dutch parties have a lot of experience within this field. The added value in the smart charging section is mainly to help find a business model regarding the use of smart charging infrastructure.

For the consultancy sections, all the interviewed organisations were fairly satisfied with the level of knowhow within the French ecosystem. However, Dutch consultancy firms have more than 10 years of experience and are worldwide thought leaders which could provide French public authorities, corporations and fleet owners with their knowledge of best and bad practices.

It is also important to note that however there are lots of opportunities for Dutch parties, we do recommend finding a local partner to work with. The French market is difficult to penetrate for different reasons. One of them being the very practical manner of language. At least in the short term it seems easier and more straight forward for Dutch organisations to have a collaboration with a French partner.

The table on the next page gives a general overview of the biggest opportunities for Dutch organisations per market segment. This table is only a summary of what is discussed in the previous chapters and should be treated that way.

Opportunities / added value	Public Sector	Corporations	Fleet Owners
Charging infrastructure	One of the biggest opportunities in this market segment is collaboration between Dutch and French municipalities. French cities could learn from the experience of Dutch cities regarding the installation of charging infrastructure. Dutch parties have a lot of experience with the installation, maintenance and interoperability queries. They have been leading with regard to interoperability in Europe. They need to use this experience as an added value.	The biggest issue for corporations seems to be finding a business model for the installation of charging infrastructure. In the Netherlands different types of business models have been worked out. Dutch companies need to bring in this expertise and lead the way for French corporations on how to have a sustainable business model when installing and operating charging infrastructure	Dutch companies and organisations have experience with the fast and smart deployment of scalable charging infrastructure. Dutch companies can add value with their expertise in transitional thinking, process management and change management for the smart an efficient installation of charging infrastructure. Dutch parties have quite some experience with turn key solutions, financing included, which can lower the barrier to French fleet owners.
Smart charging	The aspect of smart charging where Dutch parties can have an added value within this segment is load balancing. For example at charging hubs. Other aspects where Dutch parties can have an added value is experience in monitoring and software regarding smart charging.	Dutch parties need to show how these corporations can make a business model out of smart charging. The years of experience in this market also is definitely a positive for Dutch companies. They really need to play that card.	Dutch parties clearly are familiar with the hardware, but naturally they also have experience managing the vehicles and infrastructure through back office software solutions. They can share and use this knowledge to their advantage towards collaborating with French organisations.
Consultancy	The years of experience of Dutch consultancy companies is their biggest added value. They are seen as thought leaders within the EV market around the world. With their expertise they could provide French public authorities, corporations and fleet owners with their knowledge of best and bad practices.		

7. Appendix

7.1 Abbreviations

AODE	Autorité Organisatrice de la Distribution d'Energie
APC	Agence Parisienne du Climat
APRR	Autoroutes Paris-Rhin-Rhône
BEV	Battery Electric Vehicle
BNEF	Bloomberg New Energy Finance
CNG	Compressed Natural Gas
CRAC	Comptes Rendus Annuels d'Activité de Concession
DSO	Distribution Systems Operator
ELD	Entreprise Locale de Distribution
EV	Electric Vehicle
EVSE	Electric Vehicle Supply Equipment
IEA	International Energy Agency
LOM	Loi d'Orientation Mobilités
LPG	Liquid Petroleum Gas
OCPI	Open Charge Point Interface
OCPP	Open Charge Point Protocol
OEM	Original Equipment Manufacturer
OSCP	Open Smart Charging Protocol
PHEV	Plug-in Hybrid Electric Vehicle
PIB	Partner in International Business Program
PLU	Plan Local d'Urbanisme
RATP	Régie Autonome des Transports Parisien
SIGEIF	Service Public du Gaz, de l'Electricité et des Energies Locales en Île-De-France
SIPPEREC	Syndicat Intercommunal de la Périphérie de Paris pour l'Electricité et les réseaux de communication
SDS	Sustainable Development Scenario
SME	Small and Medium size Enterprise
STEPS	Stated Policy Scenario
USEDA	Union des Secteurs d'Energie du Département de l'Aisne

7.2 List of platforms to find tenders

- boamp.fr
- centraledesmarches.com
- dematis.com
- francemarches.com
- marchesonline.com
- e-marchespublics.com

7.3 Interviewed parties

Organisation	Activities	Date of the interview
ElaadNL	ElaadNL is the knowledge and innovation centre of the Dutch grid managers and developer of the now worldwide standards of open protocols, necessary for the smart charging of electric vehicles.	26th October 2020
Total Mobility	Total Mobility offers professionals solutions, services and new energies for mobility to companies.	12th November 2020
EDF	EDF include low-carbon electricity supply and charging solutions (thanks to IZIVIA).	12th November 2020
Mairie de Paris	Capital of France, centre of the densest urbanized area in France, facing high challenges for mobility.	13th November 2020
Enedis	Enedis manages the public electricity distribution network for 95% of continental France.	16th November 2020
Avem	L'association pour l'Avenir du Véhicule Électrique Méditerranéen was created in 1997 and aims to disseminate any action that contributes to the development and use of the electric vehicle.	16th November 2020
PFA	The Automotive Platform (PFA) brings together the automotive industry in France. It defines and implements, on behalf of all stakeholders (OEM, equipment manufacturers, subcontractors and mobility players), the sector's strategy in terms of innovation, competitiveness, employment and skills.	17th November 2020
Park‘n Plug	Park’n Plug is an operator which installs and manages charging stations for residential housing and for companies.	17th November 2020
SIEML	Created in 1925, the Maine-et-Loire (Siéml) Intercommunal Energy Union operates throughout the department and counts as members almost all the municipalities and inter-municipal authorities. Historically active in electrification, it has broadened its skills and now supports communities in their efforts to promote energy transition.	18th November 2020
AVERE France	Avere-France is the national association for the development of electric mobility. It aims to represent the entire ecosystem of electromobility.	18th November 2020
RAI Automotive Industry NL	RAI Automotive Industry NL is the cluster organization of the Dutch automotive industry, mobility sector and related knowledge and education centres with 200 members.	19th November 2020

Bouygues Energies & Services	Bouygues Energies & Services designs, installs, maintains and operates technical systems and tailor-made services around 3 major businesses: energy and digital networks ; electrical, climatic and mechanical engineering ; facility management.	23rd November 2020
DOET	DOET is a branch organisation for electric transport in the Netherlands.	25th November 2020
Schneider	Schneider Electric SE is a French industrial group with an international dimension, which manufactures and offers electricity management products, automation and solutions.	30th November 2020

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