

We are the Netherlands, your partner in E-mobility!



Opening statement

We are the Netherlands: a country of international traders with an outstanding logistics framework, a reputation for cutting-edge design and innovation, and a population that embraces new ideas. We are a country where business, industry, academia and government work together to propel breakthroughs in E-mobility. We have all the know-how, networks and resources required to market your innovation. Let us show you how.



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Foreword

I am delighted to present to you the Netherlands, its regions and cities and its wealth of companies and institutions pursuing electric mobility. The opportunities that E-mobility presents in the Netherlands are very attractive in commercial terms. As you will see, we are primed and ready to market! Our investments into infrastructure, charging and financial services, as well as custom-made vehicles are solid and growing in volume. Our companies in these fields are ready for the international E-mobility markets.

The Netherlands is the gateway to the European Union, characterised by its strategic location, profitable international business environment, superior logistics and technology infrastructure, attractive fiscal climate, highly educated and flexible work force, and excellent quality of life.

Some of the country's regions have considerable E-mobility experience in terms of use, product development, manufacturing, research, new business development and funding models. Interesting projects are being conducted nationally and internationally, funded by companies, knowledge institutes, national authorities and the European Union, among other players.

But please don't take my word for it – see for yourself in this brochure. It's packed with information about the Dutch companies, knowledge institutes and public authorities who are active in the field of E-mobility.

To fully capitalise on the field's strengths and opportunities, we invite you to talk with leading E-mobility companies and institutions. The Netherlands is and always has been a country of knowledge exchange, opportunities and international cooperation. We hope to welcome you into the community and we look forward to mutual exchanges!

Mr Bert Klerk
*Chairman of Formula E-Team, the Netherlands'
platform for E-mobility*



1

Ready to welcome and support

Welcome to the Netherlands! The Dutch market offers attractive opportunities for many types of companies active in E-mobility: electric vehicle (EV) manufacturers,¹ charging-infrastructure companies and suppliers of automotive and E-mobility services. What's more, we have a competitive business climate and we are one of the world's leading EV nations.

Find out all about us in this chapter, or contact the Netherlands Foreign Investment Agency directly (www.investinholland.com).

1.1 Why invest in the Netherlands?

Strategic location

Strategically located at Europe's front door, the Netherlands provides access to 95 percent of Europe's most lucrative consumer markets within 24 hours of Amsterdam and Rotterdam.

International business climate

Ranked in first place on DHL's Global Connectedness Index, the Netherlands has a competitive international climate and is home to 7,000+ foreign companies. In fact, 50 percent of the Dutch GDP is derived internationally.

Superior infrastructure

Ranked number two in the world for overall logistics performance, the Netherlands is home to world-class seaports, centrally located airports, an extensive network of roads and highways and the second-highest quality broadband network in Europe.

Competitive fiscal climate

With one of Europe's most favourable statutory corporate income tax rates – 25 percent (20 percent on the first €200,000) – the Dutch fiscal climate has a number of appealing features for international companies.



Highly educated, multilingual workforce

A model of efficiency and dedication, the Netherlands' highly educated workforce sets the pace for European productivity in a wide range of fields. Plus, 90 percent of Dutch citizens are fluent in English – the lingua franca of international business, science and technology.

¹ In this publication, the terms electric vehicle and EV stand for both battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs and E-REVs).



Creative and innovative environment

Ranked fifth on the Global Innovation Index, the Netherlands is home to an attractive test market, adaptive consumers and an open culture. As one of the world's most multicultural hubs for creative talent, the Netherlands is a great place to bring ideas to life.

Thriving sectors

Fuelled by world-class research institutes and public-private partnerships between academia, industry and government, the Netherlands also has a rich tradition of looking across borders to advance the growth of its thriving agrifood, IT, chemicals, high-tech systems, life sciences and health, creative and other sectors.

Exceptional quality of life

Ranked as the seventh happiest place on Earth by the World Happiness Report, the Netherlands has a high standard of living at a pleasantly low cost of living per capita.

1.2 E-mobility in the Netherlands: Ambition and facts

The Dutch government's ambition for electric driving is to reduce CO₂ emissions, improve energy efficiency and decrease dependency on fossil fuels. Electric driving also reduces noise pollution from traffic while opening up new opportunities for the commercial sector. For these reasons, the Dutch government is

eager to realise a critical mass of 200,000 electric vehicles on the roads in the Netherlands by 2020.

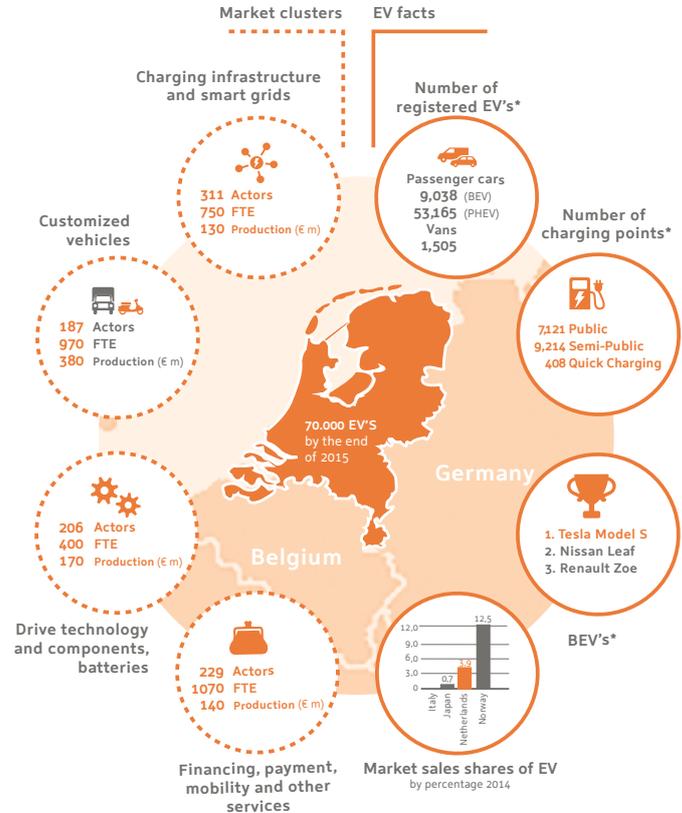
The number of electric cars in the Netherlands has grown dramatically in the past few years. In fact, the Netherlands is a global leader in EV sales. The target for 2015 was to have 15,000 to 20,000 EVs on the road. With over 70,000 EVs on the road at the end of 2015, we can conclude that this target was met and easily exceeded.

The number of companies active in the sector is also increasing. We are home to several world-leading companies in the following market clusters:

- Construction of heavy-duty vehicles
- Driving technologies, components, battery management and battery information systems
- Financing, payment, mobility and other services
- Charging infrastructure and smart grids

Tesla invests in Holland

Tesla is investing in the Netherlands and recently expanded its plant in Tilburg. At the opening ceremony, CEO Elon Musk said, *“We are going to fill this facility up and, in the future, maybe we’d be looking for even more space in the Netherlands. It’s really inspiring to see the windmills in the background and the electric cars in front. You can imagine a bright future, where energy is produced and consumed in a sustainable manner.”*



*Source: RVO.nl | September 30, 2015



1.3 The Netherlands Foreign Investment Agency (NFIA)

The Netherlands Foreign Investment Agency is an operational unit of the Ministry of Economic Affairs. Whether you're considering locating to the Netherlands or you already have existing operations here, this agency can help. The NFIA assists companies at every stage of establishing or expanding a business in the Netherlands.

The services offered by the NFIA include organising fact-finding missions, arranging meetings with relevant partners and providing personalised guidance and counsel on tax, government and permit procedures, location options and business solutions.

2

Ready to innovate and create

Exporting goods and services is in our genes! After beginning as small start-ups or pioneering business units in E-mobility, Dutch companies are currently boosting innovation and operating all over the world. This chapter presents some of the Dutch frontrunners in E-mobility.

Interested in collaboration? Contact the Netherlands Enterprise Agency (www.rvo.nl).



A vibrant automotive industry

The Dutch automotive landscape covers the complete value chain from raw material suppliers – such as AkzoNobel, DSM, Sabic and Royal Dutch Shell – through several global tier supply companies to OEMs such as DAF, VDL Bus & Coach and VDL Nedcar. It also includes a broad range of service providers for research testing, engineering and homologation. More than two hundred highly innovative tier suppliers produce a wide range of automotive components and systems for the global industry. Many of them are market leaders in their respective segments, such as NXP, Inalfa, Bosch-VDT, TomTom, Navteq, Power-Packer, Nedschroef and Apollo-Vredestein.

2.1 AutomotiveNL: A highly cohesive industry organisation

The Netherlands has a healthy automotive industry with great potential for growth in the international automotive sector and the capacity to contribute significantly to solving social issues regarding sustainability and mobility. However, the Dutch industry can only achieve its objectives if it can rely on the commitment of all the country's automotive and associated organisations.

Enter AutomotiveNL: a highly cohesive industry organisation that brings the country's automotive players together. AutomotiveNL conducts several activities to stimulate and support the entire Dutch sector. The organisation has established two main foci:

- 1) Providing services to its members and actively maintaining and expanding a world-class, international, collaborative automotive network comprising members from industry, services, education, academia and government. This is divided into three focus areas: Smart Mobility, Green Mobility and First-Class Manufacturing.
- 2) Encouraging research and innovation in industry and academia through the shared development of strategy, roadmaps and projects within the context of the high-tech systems and materials (HTSM) sector. AutomotiveNL's Innovation Programme focuses on four programme lines: Factory 2025, Vehicle 2025, Mobility 2025 and Engineer 2025.

AutomotiveNL's Green Mobility activities can be translated into three programme lines:

ICE Powertrain Combustion engines need to become more efficient through downsizing, and the combustion process and transmission need to be further improved.

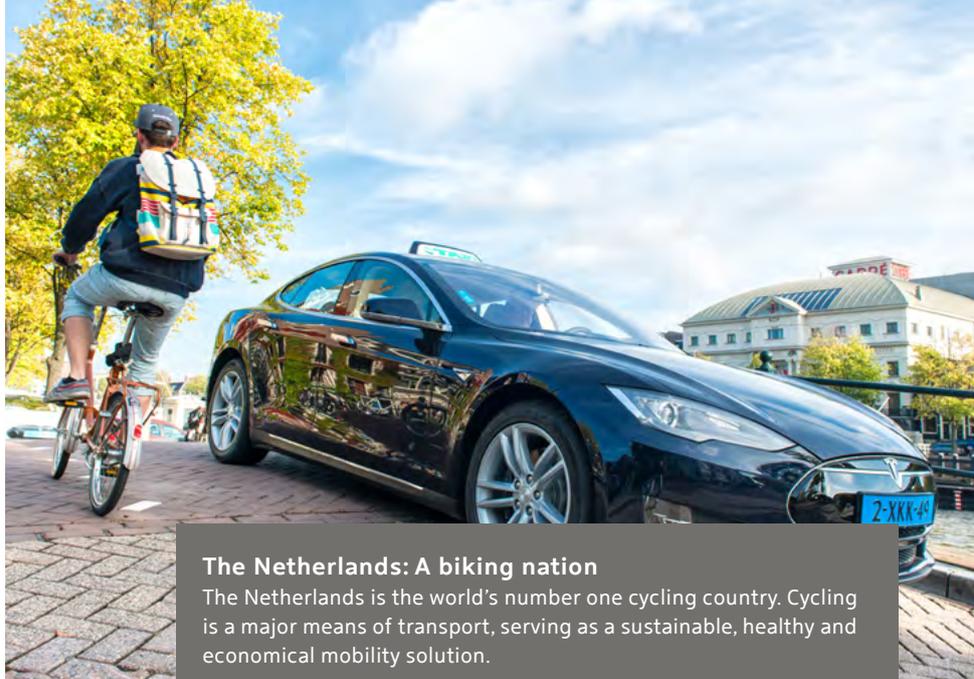
Future Powertrain Electric propulsion will be a major breakthrough technology for vehicles, infrastructure and services, offering excellent opportunities for the Dutch automotive industry.

Energy Savings The above propulsion methods require light vehicles constructed from new materials. This programme matches the profiles of Dutch industry players with major suppliers of raw materials.

2.2 DOET: The industry association for electric mobility

DOET (the Dutch Organisation for Electric Transport) is the largest industry association for electric mobility in the Netherlands. It represents the complete EV value chain. The approximately 80 members of DOET are among the most crucial players in the electric mobility field.

In close cooperation with its members, DOET advises regional, national and transnational government institutions on how to improve regulations and legislation to further support sustainable green development in the area of charging infrastructure, light electric vehicles, smart grids and electric cars.



The Netherlands: A biking nation

The Netherlands is the world's number one cycling country. Cycling is a major means of transport, serving as a sustainable, healthy and economical mobility solution.

The Netherlands has a vast bike-friendly infrastructure that makes cycling a practical and safe way to get around. It also has some of the most innovative bicycle technology and bike manufacturers. One out of every five new bikes sold is electric. It's no wonder that countries around the world are calling on the Netherlands for cycling expertise and technology.

Cycling is a way of life in the Netherlands. In fact, there are more bikes than people. The country's 17 million inhabitants own 18 million bicycles (of which 1.2 million are electric bikes), most of which are made in the Netherlands.

DOET collaborates with partners from knowledge institutes, E-mobility industries, national and international governments and NGOs to bring E-mobility to a higher level. As an industry organisation, DOET has a vast network within different kinds of government institutions and is regarded as the primary dedicated umbrella organisation promoting and lobbying for the development of E-mobility in the Netherlands.

Some of DOET's milestones:

- DOET is a member of the Formula E-Team (FET), an advisory board for the Ministry of Infrastructure and the Environment and the Ministry of Economic Affairs.
- As a FET member, DOET is part of AVERE, the European industry association for E-mobility.
- DOET is a member of the steering committee for the International EV Symposium (April 2016).
- DOET is a partner in and initiator of several Green Deals (public-private agreements that focus on sustainable growth).
- DOET is an initiator of the Zero Emission Mobility Foundation, which supports smaller businesses in finding European subsidies to innovate in the area of zero emissions.
- DOET is an initiator of PIB's East Coast Electric project (see section 5.3).
- DOET is an initiator of the Dutch knowledge platform for charging infrastructure, NKL Nederland.
- DOET is an initiator of the innovation voucher programme for small and medium-sized enterprises (SMEs).

DOET expands and shares the Netherlands' leading E-mobility expertise and innovative knowledge by connecting businesses to key players in the Netherlands and abroad. DOET's main goal is 100 percent electric mobility using renewable energy with an emphasis on E-mobility's commercial potential.

2.3 Frontrunner companies

2.3.1 E-mobility service and infrastructure: The New Motion

The New Motion is the European market leader in charging solutions for electric cars. Since the very beginning of E-mobility, The New Motion has been active in the market, fulfilling a pioneering role in the industry. The New Motion is active in several European countries and is expanding its business worldwide. The company has a diverse customer base. For private and lease car drivers, The New Motion supplies smart charging products for use at home. It also provides systems for companies, from sole traders to multinationals, and it controls a network of over 20,000 charging units for more than 30,000 E-drivers.

2.3.2 Innovative E-bus manufacturer: VDL

VDL Bus & Coach is a global player that develops and manufactures a wide range of buses, coaches and chassis modules. The company also offers sales and after-sales service on its products. VDL's electric buses are on the road in Germany, Belgium,



**World premiere:
The VDL Citea SLFA Electric**

The new Citea SLFA Electric is the world's first electric articulated bus, 18.1 metres long with an innovative, futuristic BRT (Bus Rapid Transit) design.

The VDL Citea SLFA Electric is the first in a series of eight buses ordered by the Cologne passenger transport company KVB (Kölner Verkehrs-Betriebe). The bus is fitted with a 250-kW opportunity charge system that takes around 5-10 minutes to top up the charge. The batteries are fully recharged at night.

Scandinavia and the Netherlands. The company's products are supported by a worldwide network of corporate-owned sales offices, importers and agents in more than 30 countries.

2.3.3 Innovative technology for smarter cars: NXP

NXP Semiconductors N.V. creates solutions that enable secure connections for a smarter world. Building on its expertise in high-performance mixed signal electronics, NXP is driving innovation in the areas of connected cars, security, portables and wearables and the Internet of Things. The world's first solar-powered electric family car, Stella, uses NXP's innovative Car2X technology to send warning signals to other cars about potential collisions and other traffic dangers. NXP has operations in more than 25 countries.

2.3.4 Market leader in electric scooters: QWIC

QWIC is the bestselling E-scooter brand in the Benelux, the market leader in the fast-growing electric scooter market and a top-ten E-bike seller. From its Amsterdam offices, the Dutch brand develops, produces and sells lightweight electric bikes. Targeting urban areas, QWIC's products aim to play a key role in personal mobility (now usually held by cars). The company's innovative electric bicycles are distributed to around 350 shops in the Netherlands, Belgium, Germany and France.

3

Ready to test and demonstrate

The Dutch automotive sector is driven by knowledge and innovation, supported by our leading universities and research institutes. This knowledge is essential for accelerating innovation in the E-mobility sector. This chapter provides an overview of projects, collaborations and companies involved in generating knowledge.

Contact the Eindhoven University of Technology for more information (www.tue.nl).



“The Netherlands is home to leading research institutes in the field of E-mobility. The Stella car is an example of a game-changing, disruptive innovation that emerged from the intensive combination of education, research and business in the Netherlands.”

Prof. dr. M. Steinbuch,
*professor of automotive technology,
Eindhoven University of Technology*

3.1 Universities

The attention paid to sustainable mobility at Dutch universities has risen significantly over the past decade. In particular, the three technical universities (Delft University of Technology, Eindhoven University of Technology and University of Twente) have structurally embedded sustainable (and therefore electric) mobility in their curricula and research priorities. Through a joint collaboration called 3TU, these three universities help to strengthen and pool knowledge and creativity in the technology sector, exploiting it to maximum effect. 3TU's aim is to produce sufficient numbers of highly qualified engineers and technical designers. The universities also conduct outstanding and socially relevant research of a world-class standard and promote cooperation between research institutes and businesses.

In addition, the Eindhoven University of Technology has a unique, specific automotive signature. This adopted specialisation has resulted in a bachelor's, master's and post-master's programme in automotive science. Every year, a vast number of international students enrol, coming to the Netherlands especially for this educational programme. The Delft University of Technology and the University of Twente focus on integrating E-mobility with other disciplines. Other universities and knowledge institutes across the Netherlands have also included electric mobility in their curricula and research.



Student teams

At present, the Netherlands has 18 globally successful student race teams. These teams, formed at the Netherlands' universities of technology, have achieved impressive results in recent years:

- The Eco-Runner team from the Delft University of Technology (DUT) won first place at the 2015 Shell Eco-marathon. Their Ecorunner V design turned out to be the most fuel-efficient vehicle in the hydrogen category.
- DUT's Formula Student team won the 2015 Formula Student Competition in the electric class for the second time in a row, maintaining its number one position in the world rankings.
- In the autumn of 2013, the Solar team at the Eindhoven University of

Technology (TU/e) sent its solar car, Stella, on a ten-week trip through the United States as part of the World Solar Challenge. Stella took first place and became the first family car to run on solar energy. The team expanded on this success in 2014.

- In February 2015, TU/e's Solar team won the prestigious Crunchy award in the Best Technology Achievement category. The occasion was the presentation of the team's newest model: the Stella Lux. This intelligent family car runs on solar power and promises to produce more energy than it consumes.
- In 2017, TU/e's STORM team plans to participate in an 80-day race around the globe with the world's first long-distance electric motorcycle.

3.2 Research institutes

3.2.1 TASS International: Serving the automotive industry

Electric mobility is a relatively new trend. It's essentially a blend of technological ingredients – batteries, inverters, electric motors and power electronics – developed and manufactured by a mix of players from the traditional automotive industry and other sectors, such as the battery industry. Given this mix, integration is an essential aspect of vehicle development.

As one of five divisions, the TASS International Powertrain Centre (TIPC) responds to this need by offering a comprehensive range of development, validation and certification services for manufacturers of full and hybrid electric vehicles, systems and components.

The level and quality of integration among a vehicle's components and systems is crucial for the vehicle's performance, efficiency, safety and robustness. For this reason, the TIPC service portfolio focuses on these technical aspects, drawing upon the thirty-year international track record of Dutch scientific research organisations TNO and TASS International.

Another priority is improving the energy and power density of traction batteries for hybrid and battery electric vehicles. The challenge lies in simultaneously maintaining or improving the batteries' intrinsic safety. Also, the TIPC believes that the range performance of

full electric vehicles must improve in order for them to truly take off. That's a tall order, given the current energy density of lithium ion batteries and the need to also draw auxiliary power from the battery pack. The TIPC provides testing expertise and facilities to enable development, validation, engineering, and certification programmes targeting vehicle efficiency and performance.

3.2.2 Dutch-INCERT: Dutch Innovation Centre for Electric Road Transport

Founded in 2008, Dutch-INCERT is a partnership of knowledge institutes working to link scientific research, technological innovation and education with the transition to electric transport on Dutch roadways. The organisation is a platform supporting rapid knowledge transfer and mutual innovation and collaboration projects.

Dutch-INCERT brings together the Netherlands' three universities of technology in Eindhoven, Delft and Twente. The Rotterdam, Arnhem-Nijmegen and Fontys universities of applied sciences are also part of this platform. These institutions provide the expertise to conduct thorough feasibility studies and deliver on-going insight into the latest social and technological developments. Dutch-INCERT is open to knowledge institutes and innovative companies working on technological solutions for electric mobility. The organisation's approach is precompetitive and focused on independent knowledge and technology development.



3.3 Frontrunner projects

3.3.1 Pampus: A self-sufficient island, using batteries from end-of-life EVs

The Netherlands was the first to prove the operability of a second-life test case with discarded EV batteries. A set of these batteries has been installed in a test configuration at an off-grid location in order to monitor the changes in power over time. This location, called Pampus, is an island fortress that was built between 1887 and 1895. Pampus used to rely on a diesel generator for its energy supply and is currently investigating opportunities for energy storage and self-sufficiency.

3.3.2 Inductively charging passenger cars

Inductive charging technology is in an advanced stage and is already in small-scale use for electric bus projects (for example, at Proov in Utrecht). The City of Rotterdam launched the very first pilot on inductive charging for electric passenger cars in 2015, supported by a subsidy from the Rotterdam Metropolitan Area. The City of Rotterdam, EVConsult, knowledge and innovation centre ElaadNL, and the technical universities of Delft and Eindhoven are working closely together to accelerate the technology in this test case, based on two converted electric cars.

Amsterdam: The best-used public charging network in the world

Monthly figures:

- 5,000 unique users
- 1,500,000 zero-emission kilometres
- 35,000 charge sessions
- Almost 25 percent (15,000) of all Dutch electric drivers charged at least once on the Amsterdam public charging network

3.3.3 Monitoring charge behaviour in Amsterdam

In 2013, the Urban Technology research programme at the Amsterdam University of Applied Sciences (HvA) began analysing charge behaviour on the City of Amsterdam's public charging network, at the City's request. The Cities of Rotterdam, Utrecht and The Hague joined this research project in 2014 and are sharing their charge data with the HvA in the interest of furthering this analysis.

3.3.4 ACE

The Automotive Centre of Expertise (ACE) is a specialist centre of knowledge for applied automotive research and education. ACE emerged from collaborative projects between the universities of applied sciences of Arnhem-Nijmegen, Fontys and Rotterdam, as well as many companies from the automotive sector. The centre's aim is to facilitate consistency between education and the fast-changing needs of industry in order to generate a constant, adequate outflow of graduates to work in the E-mobility sector.

3.3.5 Hybrid and electric driving demonstration projects

As part of the National Action Plan for Electric Driving, the Dutch government decided to stimulate the electrification of road transport through a pilot programme called 'Proeftuinen elektrisch rijden'. The nine national demonstration projects, which were implemented from 2011 to 2015, have been analysed in a broader perspective and reported on by Dutch-INCERT in the report 'Analysis of national and international electric vehicle projects: Key factors driving success and failure'. In addition, recommendations on the lessons learnt and next steps for EV pilots have been formulated. Below is a synopsis of the outcome:

- 1 EV pilot projects are very diverse in circumstances and deployment; they are hard to compare one to one.
- 2 Impact, image, charging and comfort are most conducive to success, while total cost of ownership, range and reliability are the greatest risks for failure.
- 3 EV developments are moving fast, but are still not fully developed; heavy commercial EVs are still primarily converted or prototype vehicles.
- 4 It is recommended that future (application) pilots focus on, facilitate and stimulate commercially attractive EV product-market combinations.
- 5 It is recommended that future (development) pilots facilitate and stimulate the further OEM development and deployment of new EVs.



4

Ready to charge and go

The Dutch infrastructure for the supply of electric energy is of high quality and superior performance. It reaches every building and every room in the country. The EV charging infrastructure is also well organised. The public and private sectors are cooperating to roll out a vast charging-infrastructure network. In addition, Dutch companies are increasingly including EVs in their daily business.

Learn more about our charging infrastructure in this chapter, or contact ElaadNL (www.Elaad.nl).



4.1 The charging pyramid

The roll-out of the national charging station network must be realised in the most cost-effective way possible. To achieve this, Dutch stakeholders — national and regional governments, the automotive sector, network operators and power companies — are supporting the so-called ‘charging pyramid’ approach. This approach prioritises less expensive solutions (such as private stations, ‘open’ private stations, semi-public stations on company sites, and so on) in implementing charging infrastructure.

Only in cases where these options are not possible will more expensive public charging infrastructure be installed. The options will be examined during the allocation process for a public charging point. The charging pyramid contains three charging solution levels, as seen from the perspective of the E-driver:

- 1) Park and charge your car on your own property.
- 2) Park and charge your car at a private station in a public space.
- 3) Use a public charging station.

In addition to regular charging, a network of more than 200 fast chargers is being rolled out across the Netherlands by the company Fastned.



4.2 Government and business share the cost of charging points

In five years, the number of public charging stations in the Netherlands grew from zero to over 7,000. Large cities such as Amsterdam, Rotterdam, The Hague and Utrecht are organising tenders for the installation and operation of public charging infrastructure. Since most public charging stations are still not commercially viable, public authorities and the business community have used shared financing to create new charging stations. The national government is helping to remove financial barriers in the form of a Green Deal for charging infrastructure; making €5.7 million available to grow the public charging network. Additional financing will come from local governments and private entities.

4.3 Interoperability in the Netherlands: Setting the standard for the world

Between 2009 and the beginning of 2014, the E-Laad Foundation established a network of more than 3,000 public charging stations for electric cars across the Netherlands. This effort stimulated the uptake of EVs and formed the basis for an interoperable charging network.

The E-Laad Foundation has since been divided into ElaadNL and EVnetNL. ElaadNL is the knowledge and innovation centre for smart charging infrastructure in the Netherlands. EVnetNL manages the existing charging stations in coordination with the relevant municipalities. This innovative network serves as a living lab for the development of smart charging.

Smart charging

More and more electricity is being generated by the power of the sun and wind. This growth means that there will be times where there is more supply than demand for electricity. To fully use this abundance of power, storage is necessary. What could be better than using the growing fleet of electric cars to charge at the best possible moments via smart charging? With innovative techniques we can make sure electric cars are charged efficiently and effectively. It's ElaadNL's mission to make sure smart charging is available for every EV driver in the future.

International cooperation

ElaadNL is active in several practical international initiatives such as E-clearing.net and the Open Charge Point Protocol (OCPP).

E-clearing.net

E-clearing.net is the international solution for cross-functional charging of electric vehicles. The core of this solution is a platform with the purpose of exchanging roaming authorisation, charge transaction and charge-point data. Since its launch in October 2014, smartlab (from Germany) and ElaadNL have been

running the platform as a non-profit organisation. Nine important market players are using E-clearing.net as an E-roaming platform. Today, more than 100,000 customer contracts and over 6,000 charging points are already connected to the platform via its partners.

OCPP

OCPP was developed in the Netherlands and is currently the de facto global standard for connecting diverse charging stations using different management systems. OCPP is now managed by the Open Charge Alliance, a global consortium of public and private EV infrastructure leaders, also initiated by ElaadNL and international partners.

OCPI

The Open Charge Point Interface (OCPI) was developed in the Netherlands and enables a scalable, automated decentral roaming setup between charge point operators and service providers. It supports authorisation, charge-point information exchange (including transaction events), charge detail record exchange and the exchange of smart-charging commands.

eViolin

eViolin is the branch organisation for EV charging infrastructure organisations in the Netherlands. eViolin manages and promotes the interoperability and usability of EV charging stations from different operators and service providers.



4.4 Frontrunner companies: Charge!

Lomboxnet: A pioneering vehicle-to-grid project

A living lab in Utrecht's Lombok district is introducing the world's first solar smart charging station, the first step in making intelligent solar charging accessible worldwide. In tandem with the Dutch government, authorities and businesses in the Utrecht region are exploring the general outlines of new smart regulations for accelerating the energy transition and increasing economic opportunities. The Lomboxnet smart charging station can both charge and discharge (vehicle-to-grid, or V2G), establishing the foundation for a local energy system based on local energy sources and local storage. More of these charging stations will be placed in the city in the coming years.

Fastned: The world's first network of fast-charging stations

The rapid growth in fast chargers is attributable in part to Fastned's new stations. The company is currently installing one new fast-charging station per week at rest areas along Dutch highways. The goal is to have more than 200 fast-charging stations. Fastned is also expanding its business to other countries. The European Union has granted Fastned €2 million to install a corridor of 94 fast-charging stations for electric cars along major Northern European motorways in Germany and other countries.

Allego: Rolling-out out large numbers of charging stations

Allego is building charging stations in the Netherlands and throughout Europe. Together with the automotive industry, government agencies, service providers and network managers, Allego is developing uniform charging standards for electricity connections and payments. Allego, together with The New Motion and Alliander AG, won the tender to install and manage 220 charging stations in Berlin. It has also provided charging solutions for electric buses.

4.5 Frontrunner companies: Go!

Electric taxi market is growing

Since October 2014, travellers can take an electric taxi at Schiphol Airport. BBF Schipholtaxi and BIOS-group have been awarded a concession to provide passenger transport in almost 200 Tesla Model S sedans. With so many Teslas and access to several dozen charging points, Schiphol can rightly call itself the electric taxi paradise among European airports. In the city of Utrecht, 20 electric Kia Soul taxis are being used to transport schoolchildren. In Amsterdam, the taxi company Taxi Electric is driving more than 30 Nissan Leaf and Tesla Model S cars throughout the city and Connexion is using 100 Nissan ENV200 vans for contracted taxi transport.

Delivery service is using electric scooters

Since the end of 2014, home meal delivery service Thuisbezorgd.nl is using 200 electric GOVECS scooters in the city of Utrecht. The subsidiary of Takeaway.com counts more than 5,000 member restaurants in the Netherlands. Hungry customers can order meals at these restaurants using the company's website or app. Thuisbezorgd.nl's members deliver more than one million orders each month in the Netherlands. Member restaurants can lease the use of an electric scooter for a fixed daily amount.





Heineken is driving down emissions

Since 2014, the Heineken brewery's hotel, restaurant and catering customers have received their deliveries by electric lorry. Heineken and the City of Amsterdam are participating in the European FREVUE project to stimulate electric freight services in cities. In the coming years, Heineken will deploy at least four electric lorries in the capital city. The goal is to reduce emissions to zero for all hospitality-industry transport in the major cities and the Randstad region by 2020.

Electric buses are running at Schiphol Airport

At Amsterdam Schiphol Airport, 35 electric buses are operating to transport passengers from aircraft to gate. Each bus has its own charging point at the airport, making Schiphol the biggest charging station for electric buses in Europe. The buses were designed especially for and in collaboration with the airport. The buses have a smaller battery tailored for the required action radius at Schiphol, allowing for spacious seating and additional baggage space.

Multinationals are encouraging EV leasing

Large multinationals such as Deloitte, Cap Gemini and ING are encouraging their employees to drive an EV. When employees choose a PHEV, for example, they receive both a fuel card and a charging card. However, there are restrictions on the ratio of petrol vs. electricity. Employees are fined when they use more than a certain amount of petrol. In addition, a charging station at home is compulsory.

eGreenLastMile is electrifying container transport

The eGreenLastMile project aims to electrify container transport in a range of 50 km around Greenport Venlo in Limburg. The technical, economic, logistical and financial feasibility have been investigated in a comprehensive feasibility study. The study showed that electric container transport is already feasible from a technical and logistical perspective. It is expected to be economically feasible in three to five years in niche applications. The project's partners are currently assessing the development a first pilot project with six to ten electric trucks, which aims to bridge the economic feasibility gap.

Electric car sharing is gaining ground

Car2go came to Amsterdam in 2011 and made electric driving accessible to a wide audience. Through the service, 350 electric Smart cars are available for spontaneous rental without the need for reservation, or the need to return them to a specific place or at a specific time. Amsterdam is the only European city with a 100 percent electric shared-car club.



eCARSHARE is a corporate E-car sharing project with 15 EVs in southern Limburg, launched in October 2014 and initiated by the City of Sittard-Geleen and The Limburg Electric Foundation in cooperation with FIER Automotive. The aim is to develop a sustainable business case for E-car sharing. As of October 2015, 250 users had driven over 75,000 electric kilometres – for both business and private use, which is a critical success factor. The fleet is expected to grow to 20 EVs in 2015 and 50 EVs in 2016.

5

Ready to collaborate

The Dutch automotive sector is innovative, ambitious and well organised with a strong international orientation and a global scope. Collaboration is the key to successful innovations, and the Netherlands actively uses its central location in Europe for cross-border cooperation. This chapter presents the country's most outstanding collaborative ventures on the local, European and even global scales.

For more information, visit www.nederlandelektrisch.nl.

5.1 Cooperation in the Netherlands

5.1.1 Formula E-Team: The national public-private platform for E-mobility

In the Netherlands, the Formula E-Team serves as an ambassador for electric transport. The team brings together business, universities and government to kick-start electric driving in the Netherlands. The Formula E-Team discusses progress and provides substantial advice to the government and other stakeholders on various aspects of electric driving. The team inspires these stakeholders to work together to devise creative solutions to problems that arise. The cornerstones of the Formula E-Team's agenda are as follows:

- Stimulate policies for zero-emission mobility including renewable energy
- Stimulate the development of a basic network of public charging stations
- Stimulate E-mobility to move from niche towards consumer markets

5.1.2 NKL: Stimulating green growth

The National Charging Infrastructure Knowledge Platform Foundation (NKL) was founded at the end of 2014. It is a partnership to stimulate cooperation between organisations involved in the public charging of electric vehicles in the Netherlands. The NKL's goal is to lower the cost of public infrastructure for all stakeholders through shared projects. To that end, the NKL is active in improving knowledge transfer, conducting research and supporting new initiatives.





Working group to monitor plug-in EVs

In 2014, the Plug-in Coalition — an initiative of the Formula E-Team comprising lease-company umbrella organisation VNA, the RAI Association, The New Motion, DOET and Nature & Environment — began setting up a monitoring system for PHEVs. A pilot project is using refuelling data, monthly bills, driver groups and vehicle types to gain useful insights into the use of plug-in hybrids. To minimise variable expenses for these vehicles, it is crucial to monitor and analyse real-world PHEV user data for use in decision-making.

Through its efforts, the NKL helps to advance the EV sector in the Netherlands and enhance the country's international position in this field. An example of an NKL project is optimising the installation process for a public charging station, which involves the distribution system operator, the charging point operator and the municipality.

5.1.3 Nature & Environment: An independent environmental organisation

During the 2012–2015 period, Nature & Environment and Friends of the Earth conducted ProjectA15, supported by the Dutch Postcode Lottery. The project launched a variety of initiatives to promote electric vehicles powered by solar and wind energy along the A15 motorway. All of these initiatives were designed to introduce people to the experiences of driving electric and car sharing, as well as to lower the threshold for E-driving. With projects such as 'Instapdag' (peer-to-peer experience), 'Testdrivers' (car sharing) and 'Nu Elektrisch' (private lease), they introduced electric mobility to many consumers in the Netherlands.

Instapdag

Nature & Environment wants to acquaint as many people as possible with electric driving, in order to eliminate preconceptions and enable people to discover the advantages of E-driving for themselves. And who can better convey this message than existing E-drivers? So Nature & Environment organised the first national

Instapdag ('National Day of the Electric Car'). Electric car owners in the Netherlands invited neighbours and friends to their homes to see and test-drive their electric vehicles. With 200 participating EVs, the initiative provided an 'electric' experience to 2,500 potential new E-drivers.

5.2 Cooperation in the EU

Horizon2020, EFRO, KP7 and Interreg

The Netherlands is involved in numerous European projects. These projects are part of the Horizon2020, EFRO, KP7 and Interreg programmes, in which Dutch companies and governments work together with more than 250 foreign partners in Europe. Four new projects in which the Netherlands is participating were initiated in 2014 and the first half of 2015.

The ECOCHAMPS project in the KP7 programme is currently working on new types of hybrid drive technologies, and the Horizon 2020 programme started three new projects involving Dutch parties. Other valuable projects include the following:

- FABRIC², focused on on-road (or wireless) charging of vehicles
- EU-elabus 4.0, enabling a second life for diesel buses
- Themotion, an E-traction technology including direct-drive in-wheel motors, inverter technology, controllers and power distribution systems



AVERE

The Formula E-Team is a member of AVERE, the European association for battery, hybrid and fuel-cell electric vehicles. AVERE's main objective is to promote the use of these vehicles – individually and in fleets – in order to achieve greener mobility in Europe's cities and countries.

EVI

The Netherlands is a member of the Electric Vehicle Initiative (EVI) of the International Energy Agency, a global partnership of countries focused on electric transport. The EVI provides a forum for global cooperation to develop and deploy electric vehicles.



5.3 Partners for International Business programme

Partners for International Business (PIB), a programme that targets groups of companies and governments that want to collectively enter a foreign market and create a tailored strategy rather than pursuing isolated activities, has achieved many successes.

PIB in the United States

Coast to Coast: Electrifying Holland – West Coast!

The PIB-funded Coast-to-Coast EV Connection is a partnership between the US West Coast and the Netherlands that has generated new opportunities for Dutch companies. Multiple conferences and a series of workshops have been organised. Two-way missions between California and the Netherlands have also been conducted for companies, knowledge institutes and governments. The project's efforts have also resulted in dozens of new contacts, all contributing to the opportunities available to Dutch companies and helping to ease their entry into the market.

East Coast Electric

The PIB project East Coast Electric has organised several energy-related government-to-government missions, including the New York Energy Week. These missions have resulted in a concrete list of action items for further international collaboration between the Netherlands and the American East Coast.

MOU California

The PIB's mission to California, with the Netherlands represented by minister for foreign trade and development Liliane Ploumen, was a successful one. The mission resulted in a Dutch pledge to establish a €24 million Electric Vehicle Investment Fund (EVIF).

EV-Box, for example, has started operations in the US with the local production and sale of charging units for American customers.

PIB in Germany

E-mobility in South and West Germany

The PIB project E-mobility in South and West Germany is a partnership between companies, knowledge institutes and the sector association DOET. Its aim is to stimulate and establish cooperation between the Dutch and German E-mobility sectors by combining Dutch E-mobility strengths with the opportunities in Germany's pioneering E-mobility regions. Opportunities for this partnership lie, for example, in the marketing and deployment of charging infrastructure, car and bike sharing concepts and inner-city distribution.

E-mobility von Amsterdam nach Berlin

There are many opportunities in the field of charging infrastructure and mobility in the triangular region between Amsterdam, Berlin and Hamburg. Dutch companies can contribute to both heavy and light electric vehicles in the sustainable city-logistics field. Project members can also focus on electrifying the highway between Amsterdam and Berlin.



PIB in India

Supercharging India

The EV market in India is about to launch. The Indian government has great ambitions in this area and aims to realise six to seven million electric vehicles in India before 2020. Dutch companies can get on board and respond to market opportunities in the field of charging infrastructure and services. In the coming years, Dutch efforts will be vital to conduct pilot projects and strengthen the ties between the Dutch and Indian governments.



IA-HEV

The Netherlands is a member of the international Implementing Agreement for co-operation on Hybrid and Electric Vehicle Technologies (IA-HEV) run by the International Energy Agency. The Netherlands and Belgium are heading up an IA-HEV project launched in 2014 and running through 2015, which will capture the E-mobility value chain in several countries and determine where national and international opportunities lie.

5.4 International missions and conferences

Besides annual events such as the Electric Vehicle Symposium & Exhibition and the Hannover Messe, E-mobility is a fixed item at international trade missions, conferences and fairs. EV was on the agenda at trade missions to the US, India, Japan, Korea, China and Mexico. Many countries from all over the world seek contact with Dutch companies, the national government or municipalities in order to learn about the successes of EV in the Netherlands.

The Netherlands was asked to present its best practices in sustainable mobility at the COP21 climate summit in Paris. Our country is considered a frontrunner in this field. The progress we have accomplished in terms of electric driving is an encouraging example for other countries.

Dutch research institutions, authorities and companies are regular contributors to leading conferences such as the Electric Vehicle Symposium, where you can find Dutch EV experts in our Holland E-mobility House.

6

Ready to support

The Netherlands has adopted an active policy to stimulate electric mobility. With financial incentives on the local and national scales, we have created an environment that should help to accelerate electric mobility.

For more information, contact the Netherlands Foreign Investment Agency (www.investinholland.com).



6.1 National policy

6.1.1 National Energy Agreement for Sustainable Growth

Over 40 parties representing public authorities and market operators have signed the National Energy Agreement for Sustainable Growth. The agreement gives voice to the willingness of many parties to work on making the Netherlands' society and economy sustainable. The agreement contains a specific chapter on mobility, whose most important target is to reduce CO₂ emissions in the mobility sector by 17 percent in 2030 and by 60 percent in 2050.

6.1.2 Vision on sustainable fuels for transport

To complete the mobility agenda in the National Energy Agreement, a vision on sustainable fuels for transport was drafted. This vision document states that in 2035 all newly sold vehicles need to be capable of driving emissions-free. In addition, the document predicts that the electrification of bus transportation and specific niches in the inland shipping and transportation sector will play a major role in reaching this target. Alongside cleaner air and the reduction of CO₂ emissions, the aim of this transition is to reach 10,150 fulltime jobs in the EV sector by 2020.

Based on the vision, the Formula E-Team has drafted intermediate goals. A nationwide network of charging points should be realised in the short term. On the vehicle side, the Formula E-Team identified three goals:

- EVs should become more attractive to the consumer market.
- PHEV drivers should be encouraged to drive 'E-kilometres' as much as possible.
- In 2025, 50 percent of newly registered cars should have an E-drivetrain, of which 30 percent should be BEVs.

6.1.3 Public Charging Infrastructure Green Deal

Through Green Deals, the Dutch government helps local authorities, citizens, companies and organisations to stimulate environmental initiatives. Green Deals are available to the initiators of sustainable projects and ideas. Several electric mobility Green Deals have been signed in recent years. Most recently, 12 parties signed the Public Electric Charging Infrastructure Green Deal in June 2015, which works to achieve the goals in the National Energy Agreement by removing the barriers to realising public charging infrastructure. The national government has made €5.7 million available for this project. The Green Deal aims to increase the availability of public chargers (from 6,000 charging units to 14,000 charging units). This extension is essential to the market development of electric driving and the optimal utilisation of plug-in vehicles' battery capacity.

6.2 Financial incentives in the Netherlands

6.2.1 Business climate

With one of Europe's most favourable statutory corporate income tax rates – 20 percent on the first €200,000 and 25 percent for taxable profits exceeding €200,000 – the Dutch tax system has a number of attractive features for international companies. In fact, the Tax Foundation's 2014 International Tax Competitiveness Index ranks the Netherlands in second place among countries in Western Europe and in first place overall in the International Tax Rules category.

These features include a broad tax treaty network to avoid double taxation and reduce withholding taxes on dividends, interests and royalties, a favourable participation exemption regime, no statutory withholding tax on outgoing interest and royalty payments, a 30 percent personal tax income advantage for qualified, skilled migrants, and clarity and certainty in advance of future tax positions.

As a hub for logistics and distribution, the Netherlands takes a practical and proactive approach to facilitating international trade and optimising customs procedures. In fact, Dutch tax law provides complete VAT deferment until the filing of the quarterly VAT return, in order to prevent cash-flow complications upon import.

6.2.2 Stimulating EVs

Several tax benefits are aimed at ensuring that the number of electric vehicles in the Netherlands continues to grow in the years to come.

- Partial exemption from BPM (motor vehicle purchase tax)
- Partial exemption from MRB (motor vehicle road-use tax)
- 4 percent company-car addition to taxable income for people leasing BEVs and 15 percent addition for people leasing PHEVs with 1–50 grams of CO₂ emissions in 2016; 22 percent from 2017 onwards
- A maximum MIA (environmental investment allowance) of 36 percent, to a maximum of €50,000

The government has made a plan for the gradual transition to updated tax rates. The new agreements are currently being formulated and will go into effect in 2016.

6.3 Local and regional incentives

6.3.1 Low-emission zones

An increasing number of municipalities are creating 'green' zones: dedicated urban areas, particularly in the city centre, that are not accessible to vehicles that produce emissions or noise above permitted levels. Electric vehicles are ideal for transport in these areas, and the growing number of green zones is a significant stimulus for urban electric driving. Some cities also give priority to owners of electric vehicles when allocating parking permits.

6.3.2 Cities as launching customers

Several Dutch municipalities are spearheading the transition to electric driving, and their number keeps growing.

By 2040, the City of Amsterdam expects almost all its vehicular traffic to be electric, powered by green electricity from windmills, solar panels and biomass plants. Electric boats will be the primary mode of canal transport. All cargo, whether transported by road or by water, will use electric power.

The City of Rotterdam deployed 40 EVs (E-cars and E-vans) in a groundbreaking pilot project. Rotterdam aspires to add a further 350 EVs to its municipal fleets. Public transportation company RET has announced that all public transport in Rotterdam will be 100 percent electric by 2025.

The Province of Utrecht is also working on growing the share of zero-emission buses in its region. Its aim is to have zero-emission public transport by 2028. The Province of Limburg has launched a zero-emission bus transportation pilot for electric buses in the city of Maastricht.

EV service providers

The number of companies eager to relieve drivers of all their electric-car cares keeps growing in the Netherlands. These service providers can take care of the entire process, from vehicle purchase or lease to installing charging stations, issuing subscriptions and charging cards, handling power company contracts and doing the invoicing: a true one-stop shop for existing and potential electric vehicle drivers.



7

Ready to discover

E-mobility is developing rapidly all over the Netherlands. In large cities, metropolitan areas, rural regions and the smallest municipalities, EVs and charging stations can be spotted everywhere. This chapter introduces some of the frontrunner regions in the Netherlands, which are an example for the rest of the country, Europe and the world.

Contact the Netherlands Enterprise Agency for more information (www.rvo.nl).

7.1 Amsterdam

7.1.1 Successful policy

The Amsterdam Electric programme focuses on reducing emissions from commercial kilometres to help keep Amsterdam an attractive, pleasant city to live in. With its demand-driven public charging network, the city has cleared the way for electric vehicles. Amsterdam is superbly suited for the growth of electric transport, as evidenced by the rapidly growing percentage of electric vehicles, as well as the many companies who consider Amsterdam the perfect business location for electric mobility.

The opportunity for citizens, companies and visitors to charge their vehicles on the one hand and the stimulation of business travellers to purchase electric vehicles on the other has resulted in the rapid growth of the share of electric cars in the city. This growth couldn't exist without close collaboration with a diverse range of partners in the city. Many of these partners have grown into major international players on the electric mobility market.

The demand-driven realisation of a public charging network has resulted in well-used charging units. This in turn enhances public support and confidence regarding electric mobility in the city. The use of data generated by the public charger makes this approach even more efficient.



The city has a subsidy scheme available for 'high urban kilometre' companies who replace standard vehicles with electric ones. The subsidy gives businesses the opportunity to practise corporate social responsibility and to realise significant savings on fuel expenses.

Amsterdam's programme focuses on four vehicle types:

- Electric delivery vans
- Electric taxis
- Electric lorries
- Electric passenger cars logging above-average numbers of kilometres in the city (or high inner-city mileage).

7.1.2 Frontrunner projects

- The share of electric taxis in the city of Amsterdam is large: roughly 400 of the total 3,500 taxis are electric. The City coordinates closely with the sector to enlarge this proportion, with the ambition to realise a zero-emission taxi market in 2025. Some examples of agreements between the City and the sector are subsidies for the purchase of electric vehicles, priority for clean taxis at taxi stations, privileges and an environmental zone starting 1 January 2018.
- Car2go has launched the first 100 percent electric car-share programme in the world, with 350 cars and over 30,000 members.
- Thanks to Amsterdam's international reputation as a frontrunner in electric mobility, BMW chose the city for the global launch of its electric i3 car in October 2013.
- Public transport in the city of Amsterdam must be completely emissions-free in 2025. To accomplish that, the City and municipal public transport operator GVB signed an agreement at the beginning of 2015. What's more, GVB intends to generate a large share of the energy it uses sustainably.

“Amsterdam has asserted itself as an international leader in the field of electric mobility and is determined to continue filling that role in the coming years.”

Abdeluheh Choho – *Alderman for Sustainability and Public Space*



7.1.3 Invest in Amsterdam

The Amsterdam region has what it takes to help your business excel. It provides access to a large labour pool of talented, highly motivated, well-educated and multilingual potential employees. The Amsterdam metropolitan area is a magnet for talent from many cultures and over 178 different nationalities. The area is a thriving tech hub with trade routes that give you full access to a single European market of some 500 million potential customers.

Over 2,500 international companies, such as Tesla, have invested in the Amsterdam metropolitan area. Thanks to the city's focus on electric mobility, many companies have started businesses related to this field in Amsterdam. These companies, which include EV-Box, ViriCity, The New Motion, EVConsult and Fastned, are now internationally active businesses leading the field of electric mobility.

7.2 The BrabantStad metropolitan area and surrounding province

With strong technological leadership and a logistically strategic location, Brabant is a gateway to Europe. The region covers five thousand square kilometres (two thousand square miles) and accounts for 14.8 percent (2.4 million) of the total Dutch population.

7.2.1 Successful policy

Brabant: A triple helix of innovation

Local testbeds are the key to Brabant's successful approach. They create an early market for innovations in which the 'triple helix' of industry, knowledge institutes and government work together to develop expertise and knowledge in an open innovation environment. This approach enables regional actors and other stakeholders to thoroughly test the market introduction and commercialisation of new products and services, thereby helping them to develop a strong export position. In the coming years, Brabant will increase its focus on involving citizens in further innovation, through initiatives such as the Free Choice Supplier pilot. But cooperation with international stakeholders is also important. As evidenced by groundbreaking innovator Tesla's move to the area, the province is an appealing location for external companies.

The BrabantStad metropolitan area supports the development and implementation of electric mobility solutions not only by creating demand, but also by incorporating the support of a technology-driven industry. With its strong background in electro-mechanics, semiconductors and industrial automation, BrabantStad is the ideal site for suppliers in the electric mobility industry to develop new technologies.

7.2.2 Fronrunner project: The Brabant testbed

- 1) The High-Tech Automotive Campus in Brabant provides a home for companies, educational institutions, public and private research centres, laboratories and test facilities in the field of automotive technology and smart mobility. It offers a challenging and inspiring environment where knowledge and business come together in a spirit of cooperation, knowledge sharing and open innovation.
- 2) The regional capital, 's-Hertogenbosch, and the cities of Eindhoven and Helmond are creating testbed markets for varying forms of electric vehicle technology, such as conductive and inductive charging in inner-city zones and the introduction of hydrogen technologies. The primary focus has been on relatively small vehicles, and is now shifting to standard-sized buses in public transport. In return, the City, the local bus company and other businesses gain knowledge on issues such as system failures, cost, maintenance, and system transition.

“Electric vehicles contribute to sustainability, open innovation and smart solutions for mobility.”

Bert Pauli – *Deputy for Economy and Innovation*



7.2.3 Invest in Brabant

Brabant believes in the economic opportunities offered by EVs and the region has built a strong position in the electric vehicle field. Through its many companies and research institutions, the region fully supports the electric mobility industry. Companies interested in doing business in Brabant will benefit from the province's concentration of bright minds and its high-tech profile.

Brabant offers EV start-ups an entire chain of financing for each stage of early development, from pre-seed and proof-of-concept financing to seed and growth funding.

7.3 Rotterdam and The Hague

7.3.1 Successful policy

With over two million citizens, the dynamic and innovative coastal metropolitan area of Rotterdam and The Hague is committed to a sustainable future. To this end, the municipalities are working together with citizens, companies and institutes.

By implementing sustainable mobility through stimulating electric transportation, for example, the cities will become cleaner, healthier and economically stronger.

The Rotterdam-The Hague metropolitan area is a national and international frontrunner in the field of electric transportation and the required charging network. A transparent focus and enthusiastic drivers have created esteem for the cities in this new sector.

Many innovative projects have been initiated and successfully completed in the past three years. The two cities will continue to advance E-mobility by creating a full-coverage public charging network for their citizens, putting additional effort into cleaning up their own fleets and collaborating with companies to work towards zero-emission logistics in Rotterdam.



7.3.2 Frontrunner projects

The City of Rotterdam is committed to hastening the growth of the still young and vulnerable electric transport market and is currently involved in 24 international, national and local innovation programmes related to EV. Examples include the use of electric TukTuks, the EBUSZ (electric public transportation bus) project and the QWIC Electric Scooter Factory. In addition, the Chinese EV manufacturer BYD (Build Your Dreams) recently opened its European headquarters in Rotterdam. The City of The Hague is creating strategic maps in order to roll out an effective public charging network for its citizens.

“Rotterdam is a healthy, innovative city with a strong economy. The city is providing more space for pedestrians, cyclists and public transport, and is also investing in cleaning up its car traffic.

In realising 1,400 charging stations throughout the city, we’ve taken an important first step in stimulating electric mobility.”

Pex Langeberg – *Alderman for Mobility, Sustainability and Culture*



7.3.3 Invest in Rotterdam and The Hague

The metropolitan area of Rotterdam and The Hague, together with entrepreneurial partners, has undertaken several initiatives to stimulate sustainable mobility. Because innovation in charging-infrastructure technology helps to accelerate the acceptance of electric mobility, and thus of cleaner air for everyone, the two cities invite smart and innovative entrepreneurs to test and scale their groundbreaking ideas in the region.

7.4 Utrecht

Utrecht is the beating heart of the Netherlands. Located in the middle of the country, the city is home to more than 300,000 citizens.

7.4.1 Successful policy

Environmental zone

On 1 January 2015, the City of Utrecht introduced a low-emissions zone for diesel passenger cars and vans. Diesel cars manufactured before 2001 are no longer allowed inside the environmental zone. Since 1 May 2015, drivers run the risk of a €90 fine when entering the city centre with an older diesel car. The introduction of the environmental zone helps to improve air quality for the city's residents and visitors. Healthy air is particularly vital for the elderly and children. The environmental zone encompasses the inner city of Utrecht, the area surrounding Central Station, the Jaarbeurs centre and several adjoining roads.

Electric vehicles

Because a good urban environment is important to quality of life, Utrecht is growing its network of public charging stations. City residents usually need a parking permit to park their cars at home; however, those who drive an electric vehicle can park for free at a charging station. The City is also providing subsidies for charging stations in private and semi-public locations.

Electric scooters

Electric scooters are the future. Utrecht is stimulating this means of transport by providing subsidies for specific target groups.

7.4.2 Frontrunner projects

Utrecht is home to the country's largest electric scooter fleet (200+) that delivers home meals, as well as three electric public buses that use induction charging at Central Station. The city will be expanding its public charging network to more than 500 charging stations in the coming years, and it is home to the first vehicle-to-grid charging stations that run solely on solar energy.



“The vehicle-to-grid system being introduced in Utrecht could possibly save forty to sixty billion euros in the Netherlands, because it means that investments in the energy grid can be reduced.”

Lot van Hooijdonk – Alderperson for Traffic and Mobility, Sustainability and Environment

7.4.3 Invest in Utrecht

The Utrecht region has one of the most favourable outlooks for economic growth of all the urban regions in Western Europe, thanks to its knowledge-based economy and young, well-educated population. Utrecht is known for its world-class universities and research institutions and boasts the most highly educated workforce in the Netherlands. Forty-four percent of Utrecht’s workers have a university degree and 85 percent of its residents speak at least three languages. Furthermore, its location is ideal: more than 170 million consumers – more than half the population of the European Union – live within a 500-kilometre radius.

8

Ready for the future

To be ready for future developments, the Netherlands is keeping a close eye on emerging technologies and innovations in the EV sector. The country is eager to explore bold ideas and contribute to the development of potential breakthroughs that could widely serve the EV market.

For more information, contact the Netherlands Enterprise Agency (www.rvo.nl).

8.1 The first projects using inductive charging are underway

In the cities of Utrecht and Den Bosch, electric public buses from Proov and Emiss that use an innovative inductive charging system have been driving successfully for several years. The buses run on inner city routes, and therefore have a significant impact on cutting harmful emissions and pollution. The buses in Utrecht are constantly being monitored by smart technology from ViriCiti in order to evaluate vehicle performance, acquire in-depth insights, and optimise the buses' use.

At the end of 2015, the City of Rotterdam started a pilot for the wireless charging of electric passenger vehicles. Charging-infrastructure specialist Cofely won the tender for the construction of the charge pad that transfers power through an electromagnetic field. Inductive charging's future prospects will be significantly improved if the test in Rotterdam reveals opportunities to use the technique with passenger cars. The test's primary purpose is to discover inductive charging's efficiency level, ways to arrange payment, the extent to which these wireless charging systems are interoperable, how to integrate the technology with the public electricity network, and the areas of concern when installing a charge pad in a public space.

8.2 Sustainable mobility powered by hydrogen

Besides focusing on electric mobility, the Netherlands is also paying a great deal of attention to mobility using hydrogen-powered vehicles. Several developments are underway, and the first hydrogen fuel stations have already been realised. The Ministry of Infrastructure and the Environment recently awarded a subsidy to five projects using hydrogen-powered buses. These pilots – situated in the city of Eindhoven, the city of Rotterdam, the province of Groningen, the Arnhem-Nijmegen metropolitan area and the province of Zuid-Holland – are currently being prepared and will begin in 2016.



8.3 The Netherlands is paving the way for self-driving vehicles

The Netherlands wants to play a pioneering role in paving the way for self-driving cars on public roads. The Ministry of Infrastructure and the Environment wants to create a legal framework in order to perform large-scale testing on self-driving vehicles on Dutch roadways. A Dutch consortium comprising research institute TNO, DAF, the Port of Rotterdam and Transport & Logistiek Nederland has already submitted the first application, to test autonomous lorries that drive in convoys. The consortium's aim is to bring technology that will enable logistics companies to use such lorries on public roads to the market within five years. "The age of self-driving cars has arrived," explains the minister of Infrastructure and the Environment. "Self-driving cars will improve the flow of traffic and the safety of our busy road network. Moreover, self-driving cars are more economical, which is good for us as well as the environment. Before self-driving cars are ready for safe large-scale use, all the automated functionality must be tested in practice. To make testing on public roads legally possible, existing regulations have to be amended." The Dutch minister also wants to take the international initiative to amend regulations to enable the large-scale introduction of self-driving cars.



9

Contact information

Have we piqued your interest in working with Dutch partners? This chapter provides you with selected contact information. Feel free to contact any of the organisations at any time; we look forward to speaking with you!

Netherlands Enterprise Agency

www.rvo.nl

Netherlands Foreign Investment Agency

www.investinholland.com

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