

Electromobility in the Netherlands

Highlights 2015



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Dutch companies, social institutions, knowledge centres and public authorities are working in national and international partnership to accelerate the growth of electric driving and to capitalise on the associated economic opportunities. And electromobility is thriving! The number of electric cars in the Netherlands has grown explosively in the past year. In an automotive market that grew 15 per cent in 2015, the market share of electric vehicles more than doubled.

Electric driving is an innovation that offers economic opportunities for the Dutch business community. The e-mobility areas in which Dutch companies operate include charging infrastructure, charging services, parts manufacturing and the production of light electric vehicles, including electric scooters. The Ministry of Economic Affairs has tasked the Netherlands Enterprise Agency with the promotion of electromobility in the Netherlands.

Electromobility is one of the alternatives being employed to reduce CO2 emissions in the traffic and transport industry. Led by the Ministry for Infrastructure and the Environment, experts drafted 'A vision on sustainable fuels for transport' in 2015, which describes the opportunities to achieve substantial CO2 reductions in this sector. Vehicle electrification is a very promising option but, especially for heavier vehicles, other alternatives such as LNG, biofuels and hydrogen are also important in achieving this goal.

The past year saw many new initiatives and important achievements in electromobility. This document contains a selection of the year's major events: the highlights of 2015. For additional information and the latest news, please visit www.nederlandelektrisch.nl.

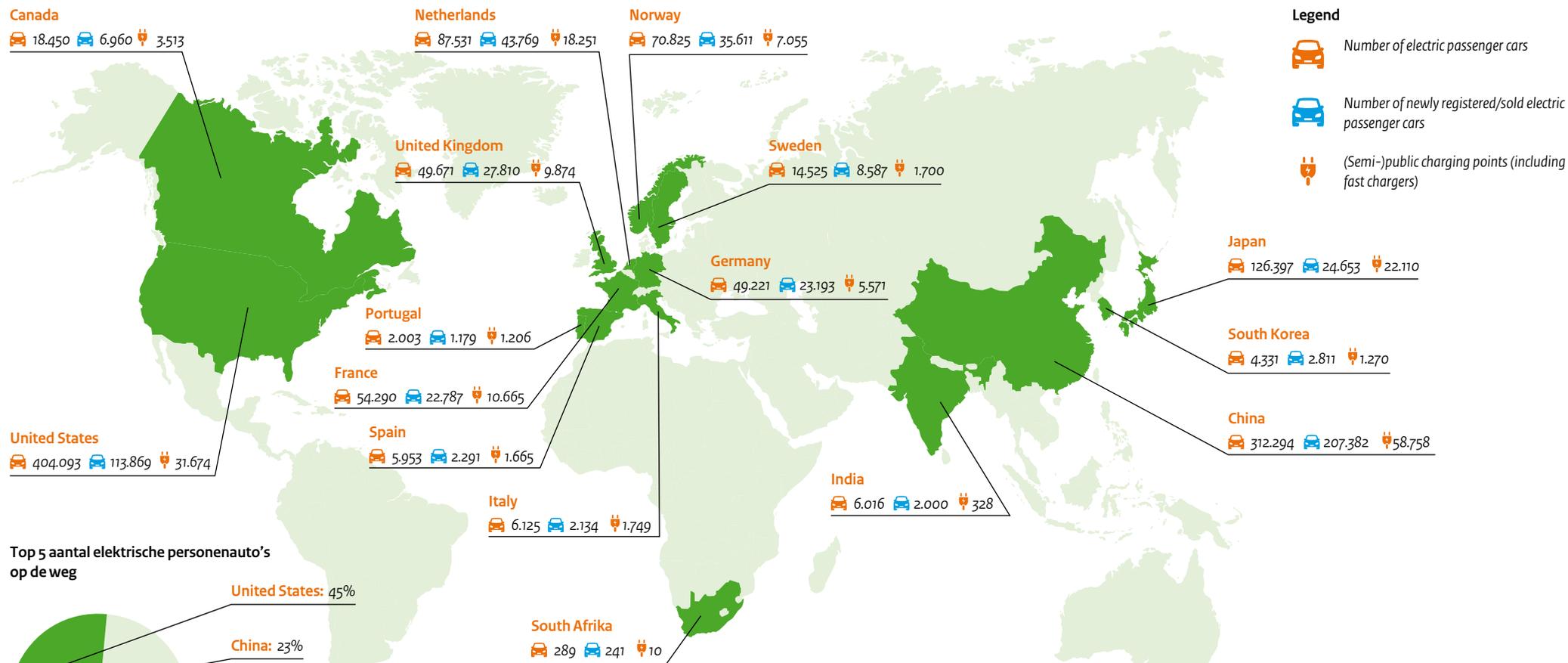


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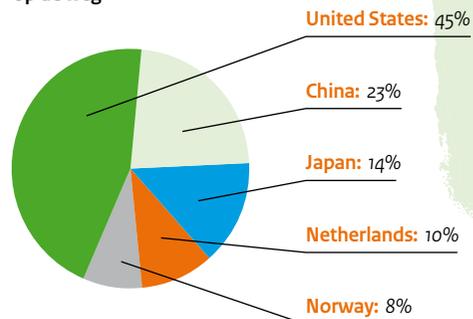
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The year 2015 in pictures and figures

Electromobility: Dutch achievements in an international context



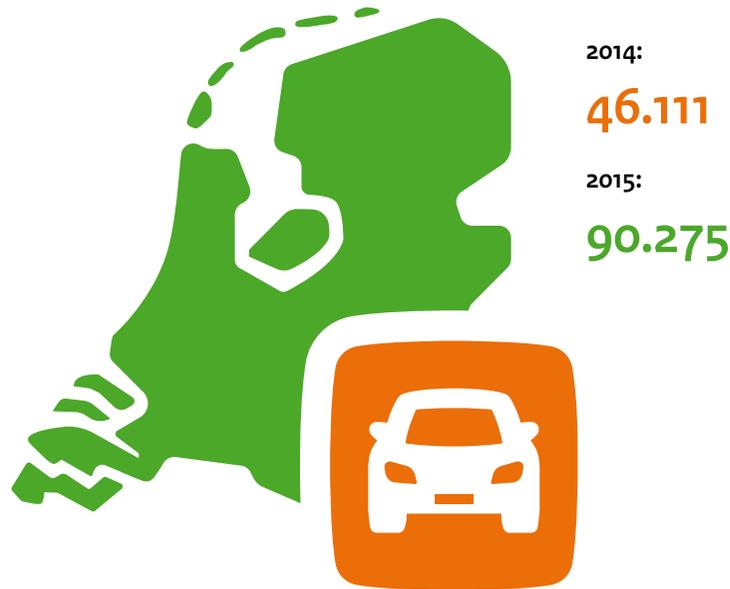
Top 5 aantal elektrische personenauto's op de weg



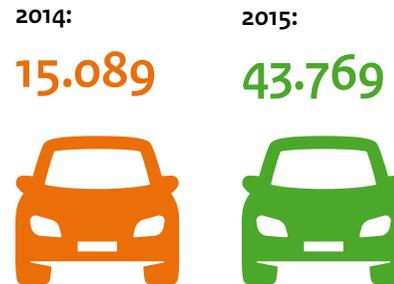
(source: Global EVI Outlook 2016, IEA)

The year 2015 in electromobility figures

Electric vehicles on the road



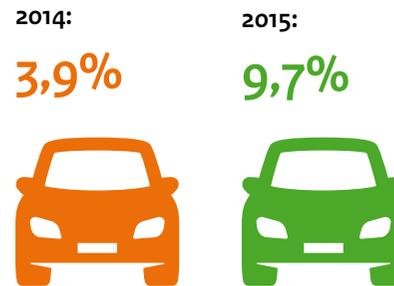
New registered electric vehicles



Full-time job increase



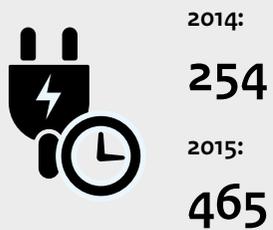
Market share in number of new registrations



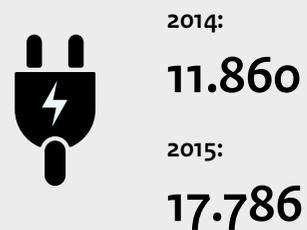
Surcharge on income tax for the private use of battery electric vehicles



Fast-charging points



(Semi-)public charging points



Added value



Exemption of registration and road tax



(source: CBS, RDW, Oplaadpunten.nl; edited by RVO.nl)

Number of electric passenger cars and non-private charging points (fast-charging and regular)

Number of electric passenger cars in 2015



■ BEV 9.790
■ PHEV 78.871
■ Ambitions Market players 2020 200.000

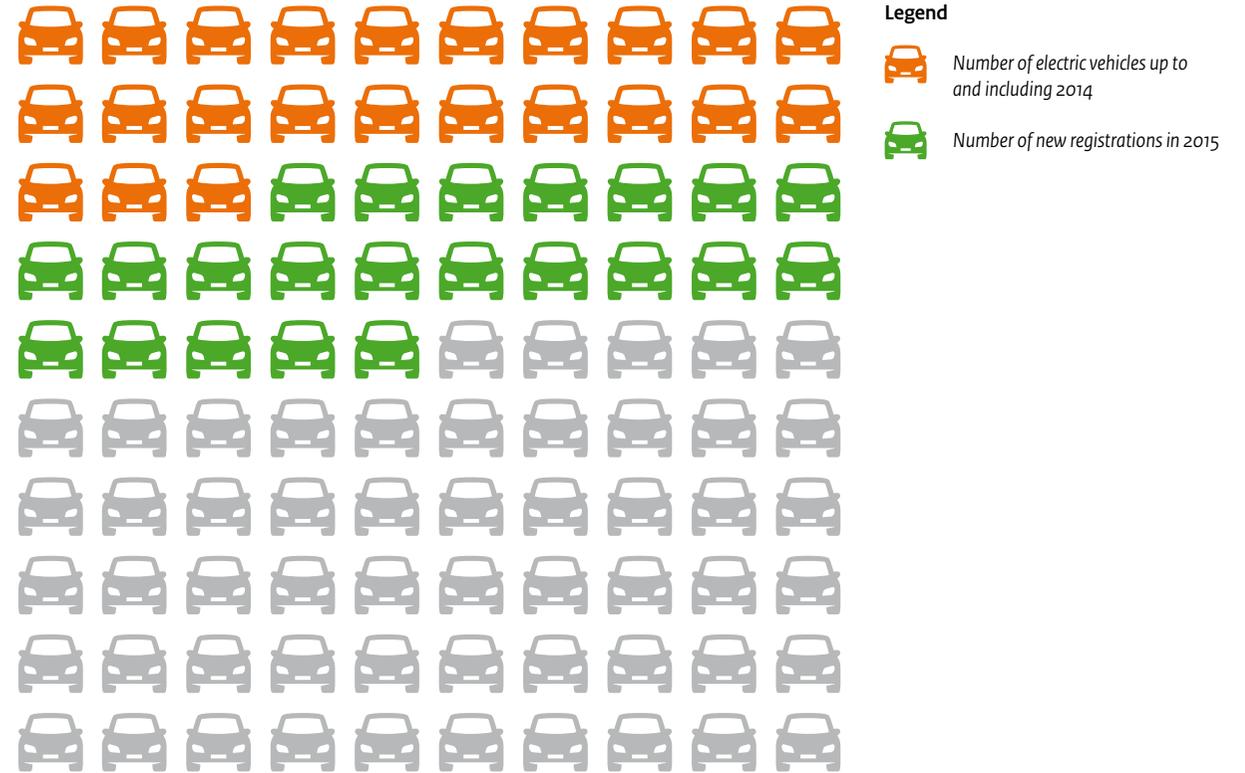
Number of (semi)public charging points (fast-charging and regular) in 2015



■ Number in 2015 17.786
■ Intended number in 2020 70.000

(source: RDW, Oplaadpunten.nl; edited by RVO.nl)

Increase of number of electric passenger cars 2014-2015 as compared to ambitions market players for 2020



(source: RDW; edited by RVO.nl)

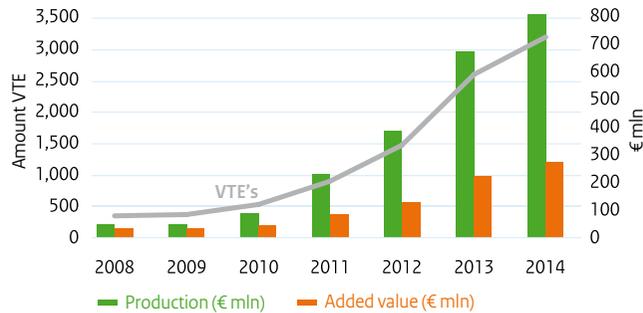
Note: Via the 2015-2020 electromobility action agenda published in 2015, market players indicated their ambition to reach 200,000 electric passenger cars and 70,000 publicly accessible charging points (this number includes both semi-public and public charging points and fast-charging points) by 2020.

Economic growth by Electric Driving in 2015

Electromobility's contribution to the economy is growing

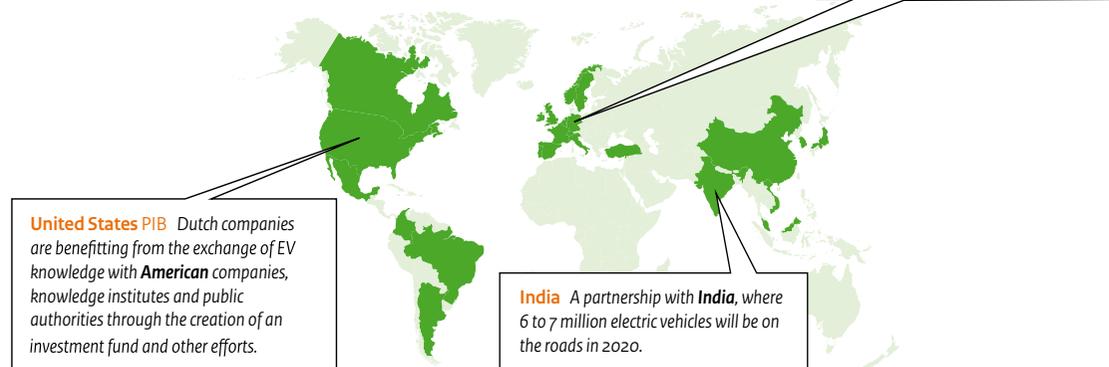
In 2014, electric driving added an estimated 3,200 jobs (FTE), €820 million in production, and €260 million in added value to the Dutch economy.

Source: CBS Statistics Netherlands.



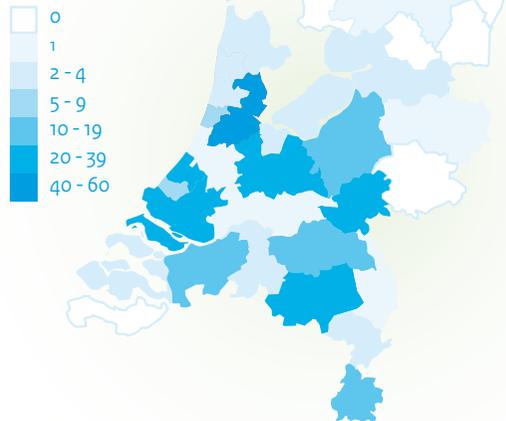
Electromobility is a growing export product

Exports are growing at Dutch companies, as is collaboration with foreign partners. The figure shows the countries with which the Netherlands is exchanging knowledge and expertise through Partner in International Business (PIB) programmes and other projects.



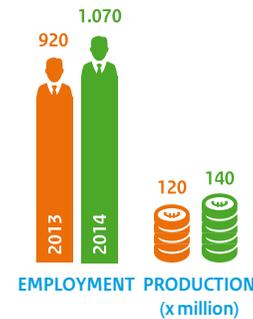
Density of sector players per region

Source: Birch Consultants



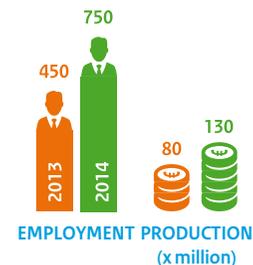
Services

Financing, payment, mobility and other services display a trend toward sustainability in existing concepts. The use of electric shared cars and leased cars is growing. Schiphol is the first airport in the world to deploy 167 full electric taxis.



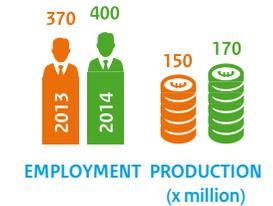
Charging infrastructure

The Dutch charging station network is growing rapidly. As a result, the export of Dutch products and services is growing, too. The innovative Lomboxnet vehicle-to-grid charging point shows that it is possible to use electric vehicles for local energy storage.



Propulsion technology and other components

Developments in propulsion technology, range extenders, energy management systems (EMS), battery management and information systems are largely in the initial development phase. For example, Pampus is exploring whether electric vehicle batteries can make it a self-sufficient island, able to supply all its own energy.



New and converted vehicles

The market for electric buses is growing, thanks to both domestic and foreign demand. Light electric vehicles also show promise, though growth was limited in 2014. The Eindhoven University of Technology has created a true game-changer: Stella, a family car that runs entirely on solar energy.



The Netherlands: attracting companies, exporting products

In 2014, employment in the e-mobility sector grew by 25 per cent compared to the previous year. That is the main conclusion of the Netherlands Enterprise Agency's (RVO.nl) report 'Cashing in on Electromobility's Economic Potential'. The number of fulltime positions (FTEs) rose to 3,200. The gross value added by the sector is €260 million. Major developments are occurring particularly in the domains of new custom vehicle construction, charging infrastructure and smart grids. Companies in the electromobility sector also manufactured €820 million worth of products.



Minister Henk Kamp with Tesla founder Elon Musk in the new plant in Tilburg



One of Gogoro's battery swapping stations

The Netherlands: attracting companies

- **A second Tesla plant in Tilburg:** Tesla has built a second factory in Tilburg for the assembly of its electric cars for the European market. In Tilburg, the cars are fitted with the powertrain and battery pack, among other items. With the addition of the second plant, Tesla has doubled its production capacity from 225 to 450 cars per week.
- **Gogoro's Smartscooter coming to Amsterdam:** Gogoro, which develops and sells electric scooters, has announced that it will launch its product in Amsterdam in the first half of 2016. The company will install special swapping stations for its swappable batteries at petrol stations, toy stores and restaurants. What's more, Gogoro will open an Experience Boutique in the city, where those interested can try out the company's Smartscooter.
- **BYD expanding its European headquarters in Rotterdam:** In two years' time, BYD has doubled the number of employees at its European headquarters in Rotterdam, from 25 to 50. To facilitate future growth, the company plans to move to a new location in 2016. It has announced that it will invest additional funds in a new workplace.



Unveiling the first Dutch charging point in Berlin

VDL's electric bus in Münster

Heliox's fast-charging point for buses

The Netherlands: exporting products

- Dutch charging points in Berlin:** The New Motion, Allego and Alliander AG – the German branch of the Dutch distribution system operator of the same name – have won a concession to install and manage (until 2020) 220 regular and fast charging points in Berlin. In September 2016, the city's administrators will meet with the consortium to discuss a potential expansion of the infrastructure.
- Three new Partners for International Business programmes:** 'green' growth for Netherlands, Inc. through electric driving – that's the idea that underlies the Partners for International Business (PIB) concept in the domain of electromobility. Three new PIBs launched in 2015: 'E-Mobility von Amsterdam nach Berlin', 'E-Mobility in South and West Germany' and 'Supercharging India'. Some 20 Dutch companies and organisations have joined the three new PIBs. Among other things, the programmes aim to facilitate the export of services and products related to charging infrastructure, mobility concepts, buses and other electric vehicle technology.
- Dutch buses with pantographs for Münster:** VDL Bus & Coach has delivered five pantograph-equipped Citea Electrics to Stadtwerke Münster. A robotic arm, which extends from the bus stop roof, automatically makes contact with the bus's charging system. In addition, fast-charging points are located at the bus line's initial and final stops, as well as at the bus station.
- Heliox exports fast-charging system to Sweden:** Via VDL Bus & Coach, Heliox has delivered its fast-charging Combined Charging System (CCS) 700V for electric buses to Swedish transport company Byberg & Nordin. This is the first electric bus that meets the European CCS standard.
- Proov IPT delivers inductive charging system to London:** As part of the European innovation project ZeUS, Proov IPT has delivered its inductive charging system to the city of London. The company uses an electrical outlet system with induction pads mounted in the ground and in the bus. The battery is charged by the magnetic field that arises when the bus comes to a stop.



A charging point along a canal in Amsterdam Brabant is working with Enexis on affordable charging points

Regional incentives

Amsterdam presents a plan to triple the number of charging points

At the end of 2015, Amsterdam had a public charging network of roughly 1,500 charging points. In mid-2015 the city put out a call for tender to expand this network to 4,000 charging points, to be completed by 2018. The tender is unique in terms of size, and on top of that the management and operation of the existing charging points are included in the contract. The points of attention are ease of use, effective service and technological innovations such as ‘smart charging’. This last concept aids in aligning the supply and demand of renewable energy. Nuon and Heijmans will jointly install, manage and operate the charging points.

Utrecht wants 10,000 electric cars within five years

The city of Utrecht has announced its ambition to have the highest number of electric cars per inhabitant in the Netherlands – namely 10,000 cars – by 2020. To reach this number, the city wants to significantly expand its public and private charging network for electric vehicles. In addition, the city wants to support initiatives by residents and companies. The plans are part of a broader initiative to make the city more sustainable. Sustainability should be visible across all forms of mobility, from public transport to electric scooters, and from electric boats to electric cars. The city’s incentives are intended to spur further market

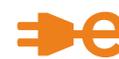
development and make companies and residents aware of the opportunities that electromobility offers. The city is also stimulating bundled and clean freight transport through its ‘Freight Transport Action Plan 2015-2020’. By 2020 the city centre and by 2025 the entire city must be supplied fully emissions-free. To that end, the city has joined the Zero Emission Urban Distribution Green Deal.

Province of Brabant installs additional public charging points

At the end of 2015, the province of Brabant had a public charging network of roughly 600 charging points. The provincial government wants to add another 300 public charging points to this number. In the project ‘Smart charging, Brabant style’ the province and distribution system

operator Enexis are developing innovative and affordable charging points. More than 250 public charging points were installed during phase A of the project. In 2015 the province started preparations for phase B. Brabant has joined with the neighbouring province of Limburg to purchase 1,240 charging points.

Brabant has also launched a pilot programme for flexible charging rates. The people behind this initiative believe that cheaper charging can be achieved by enabling e-drivers to choose from among the rates of multiple suppliers at the charging point. In the pilot, service providers offer e-drivers the option to delay their charging session until the price of electricity is low. This is the first time that a pilot at this scale has been conducted in Europe.



One of Ergon's electric cars The Dutch animal protection society's electric fleet APM Terminals' new electric cars

Electromobility in practice

More and more companies, public authorities and not-for-profit organisations are electrifying their vehicle fleets. Here, we list a few of the most striking high-fliers in electromobility, grouped by market segment.

Passenger vehicles

- **Ergon replaces a quarter of its fleet with 100 per cent electric cars:** The sheltered employment agency in Eindhoven will acquire 45 electric cars through 2017. At 200 company vehicles, Ergon has one of the largest fleets in the Eindhoven area. Ergon says there is 'absolutely no excuse not to drive 100 per cent electric cars'.
- **Dutch animal protection society buys 30 electric vehicles:** A donation from the Dutch Postcode Lottery has given Dierenbescherming, the Dutch animal protection society, the chance to purchase 30 full electric animal transport vehicles. In addition, infrastructure has been installed – comprising 624 solar panels, 27 regular charging points and 3 fast-chargers – so that the full electrified fleet uses solar energy and renewable electricity.
- **35 electric cars for transshipment service in Rotterdam:** APM Terminals will be using 35 electric cars that run on wind energy and renewable electricity. The Nissans are intended for the company's employees in the office and on the docks, who will use them to traverse the 86-hectare grounds of Maasvlakte 2.

Other electric passenger car news in 2015:

In October 2015, the Netherlands welcomed its **100,000th electric vehicle** with two or more wheels (note: this excludes electric bicycles). | The **Vereniging Elektrische Rijders (VER)** has launched – an association for electric-car drivers that serves as an information and networking platform for its 1,500 members. | The **Rotterdamse Taxi Centrale (RTC)** is expanding its electric taxi fleet from three to 25 units. | The electric shared-car company **eCARSHARE** in Sittard-Geleen is expanding its fleet from fifteen to 50 vehicles.



The new vans for auxiliary public transport



Supermarket Picnic's electric delivery van



One of TNT's electric delivery vans

Commercial vehicles

- **100 vans for Amsterdam's public transport:** Public transport provider Connexxion will be putting 100 electric vans into service to provide auxiliary public transport in Amsterdam.
- **Picnic swaps supermarket buildings for electric vans:** In Amersfoort and Leusden, online supermarket Picnic has started delivering groceries using 25 electric delivery vans. Plans to expand to Utrecht and Almere are on the horizon. The company manufactures the vans itself in Lochem.
- **TNT delivers mail by electric vehicle in Amsterdam and Rotterdam:** Postal delivery company TNT has started using seven electric delivery vans to deliver packages in downtown Amsterdam and Rotterdam. To enable the use of electric transport, the municipalities have exempted TNT from parking bans and granted the electric delivery vans access to areas that are normally closed to traffic.

Buses

- **35 electric buses at Schiphol:** Amsterdam Airport Schiphol has put 35 electric buses into operation to transport travellers from their aeroplane to the gate. The buses are charged using solar energy.



A BYD bus at Schiphol

Each bus has its own charging point at the airport, making Schiphol the largest electric bus charging location in Europe.

- **40 electric buses for southeast Brabant:** VDL Bus & Coach has started assembling 40 electric buses in the Netherlands for the concession in southeast Brabant that it will jointly operate with Hermes. The buses are part of the province's ambition to transition to emissions-free public transport in the 2016-2025 period. As part of this process, bus traffic in Eindhoven should be fully electric by 2020.

Other electric bus news in 2015: Since 2015, concessions for electric bus transport in the Netherlands may last longer (12 to 15 years) than regular concessions (8 to 10 years). The change was submitted to the European Commission for approval and accepted. | VDL Bus & Coach has scored a global first with its electric articulated bus, the 18.1-metre Citea SLFA Electric; eight units have already been exported to Cologne.

Trucks

- **Lidl begins pilot project in Amsterdam:** Lidl has started a pilot project in the capital city, in which its supermarkets are supplied using a full electric truck. Lidl intends to supply all of its locations inside the A10 motorway ring around Amsterdam using emissions-free transport by 2025.
- **Simon Loos and Heineken expand to seven electric trucks:** After a successful pilot project, Simon Loos and Heineken have decided to expand their electric truck fleet from one to seven units. The electric trucks will be manufactured in the Netherlands and used for hotel, restaurant and catering distribution in downtown Amsterdam. Heineken aims to achieve 100 per cent emissions-free deliveries in the city centres of the Randstad region by 2020.

- **First New Cool trailer running on solar energy with e-cooling engine:** Transport company Coenen Boxmeer has taken the first New Cool refrigerated trailer into operation. This refrigerated trailer, sporting an electric engine, was jointly developed by Twan Heetkamp Trailers and five Dutch partners. The trailer depends solely on its electric engine, which runs on the energy generated by the vehicle’s brakes and the solar panels on the trailer’s roof.

Other electric truck news in 2015: Cargohopper Amsterdam has reached the magic number of **1 million electrically delivered packages** and wants to expand its fleet with another two electric vehicles. | Ginaf in Veenendaal is building an **electric tractor** for Van Boonstra Transport with a maximum combination weight of 44 tons for use in downtown Groningen.



One of Lidl's electric trucks in Amsterdam



Additional electric trucks will be put into operation



The first New Cool trailer



Pieter van Vollenhoven in one of Frisian Motors' electric utility vehicles

Light electric vehicles

- **Leiden deploys 20 e-scooters:** The city of Leiden has put 20 electric scooters into operation. The scooters are replacing not only their conventional counterparts, but also a variety of petrol-based cars. The two-wheelers will be used for law enforcement and control.
- **Companies in Utrecht deploy 200 e-scooters in city centre:** 125 Utrecht-based companies have put 200 electric scooters into operation. The companies represent a broad range of activities, including real estate sales and management, retail, cleaning services and home healthcare.

- **Factory in Friesland manufactures 200th electric utility vehicle:** Frisian Motors has surpassed the 200 mark in its production of Leffert FM-50 electric utility vehicles. The vehicle is manufactured in Bakkeveen and exported to several countries including Belgium, Germany, Romania, the Czech Republic and Costa Rica.

Other light electric vehicle news in 2015:

In July the 30,000th electric moped was registered in the Netherlands. | In September King Willem-Alexander officially opened the new **Gazelle Innovation & Production Center** in Dieren, where electric bicycles are developed and manufactured.

Charging infrastructure

- **The New Motion, Comfort Partners and BAM install 5,000 new charging points:** A consortium comprising The New Motion, Comfort Partners and BAM has begun the installation of 5,000 extra charging points throughout the Netherlands. The three companies are using a strategic partnership as a way to share knowledge and to innovate.
- **Charging points at every IKEA in the Netherlands:** IKEA Netherlands is installing charging points for electric cars at all of its Dutch locations. Zwolle and Utrecht are the first sites, each of which has acquired four charging points. New Motion is assisting in the charging points' installation.
- **First fast charger for electric tour boats:** Allego, Heliox and Blue Boat Company have developed, manufactured and deployed the Netherlands' first fast charger for electric tour boats. The fast charger has been installed on Stadhouderskade in Amsterdam. The Dutch capital city wants all tour boats to be emissions-free by 2025 at the latest.

Other charging infrastructure news in 2015:

Eneco start-up Jedlix is launching a **special app to smart-charge** electric cars. | The Lombok neighbourhood in Utrecht has Europe's **first Vehicle2Grid energy storage system:** the solar energy storage system charges and discharges electric cars to ensure that homes receive electricity when demand is high. | At the end of 2015 Fastned opened its **49th fast-charging station** along the Dutch highways; the 50th will follow in January 2016, in the province of Zeeland.



The first fast charging point for tour boats is lifted into place



Charging points for electric cars at IKEA in Barendrecht

Dutch student teams conquer the world (education)

2015 will be remembered as a record year for the Dutch student teams and their electric vehicles.

Competitions

- **The Netherlands takes all the winning slots:** In the biannual World Solar Challenge in Australia, the Dutch teams were able to claim all of the event's top prizes. The World Solar Challenge is a race among student-built electric cars running on solar energy. Delft University of Technology's Nuon Solar Team won the regular race with its Nuna 8, and Solar Team Twente's Red One took second place. Solar Team Eindhoven from Eindhoven University of Technology won the Cruiser Class with its Stella Lux. Stella had already earned thE-Team from Eindhoven a Crunchy – viewed by many as a 'technology Oscar' – in the spring of 2015. The Technical Innovation Award

won by thE-Team from Twente for its SABINE during the closing ceremony was the icing on the cake. Using SABINE – which stands for Solar Array Balancing Interface Not Expected and which was fully designed and developed by thE-Team itself – Red One was able to extract extra energy during the race at moments when the solar panel was in shadow.

- **Delft reigns on Formula 1 racetrack:** TU Delft students have won the Formula Student design and racing competition on Germany's Hockenheim track. Formula Student is viewed as an unofficial world championship, because all the world's leading teams take part – more than 700 teams from around the globe.



The Nuon Solar Team celebrates its victory in the World Solar Challenge 2015



The TU Eindhoven team during the awards ceremony at the World Solar Challenge 2015

TU Twente's award-winning and innovative SABINE

TU Delft's Formula Student car

New vehicles

- **The student team STORM Eindhoven from the TU/e presented its electric touring motorcycle in October.** The STORM Pulse is the first electric motorcycle in the world that can drive long distances – up to 380 kilometres – without recharging. In 2016 thE-Team will travel around the world in 80 days during its ‘STORM World Tour’, to demonstrate the potential of sustainable transport. Television presenter and motorcyclist Rick Nieman has joined the project as its ambassador.
- **TU/e students revealed the world’s first modular car in the spring.** Nova is an electric three-person car with cargo space and, according to the student’s calculations, drives at 1880 miles per gallon, converted to comparable petrol-car fuel consumption.



The first electric motorcycle that doesn't have to recharge: STORM Pulse

The first modular car: Nova

Financial incentives

A variety of fiscal benefits were in force in 2015. That translated into enormous growth in the number of electric vehicles.

Fiscal incentives package 2015

The fiscal incentives package was as follows in 2015:

- exemption from the BPM purchase tax for full electric vehicles (0 grams of CO₂ emissions) and €6 per gram of CO₂ for vehicles with CO₂ emissions between 1 and 81 grams per kilometre
- exemption from the MRB monthly road tax for electric vehicles with CO₂ emissions at or below 50 grams per kilometre
- 4% addition to taxable income for lease-car drivers of full electric vehicles (BEVs) and 7% addition for lease-car drivers of plug-in hybrid electric vehicles (PHEVs, CO₂ emissions of 1 to 50 grams per kilometre)
- an environmental investment allowance (MIA) of up to 36% of a maximum investment of €50,000.

Autobrief 2.0

In June 2015, State Secretary Wiebes sent the Second Memorandum on Fiscal Policy for Vehicles ('Autobrief 2.0') to the Dutch House of Representatives. The memorandum is still a policy proposal at this point, in which

the Cabinet outlines its plan to better align automotive taxes for 2017-2020 with the modern era. For electric cars, the proposal's main consequence would be as follows:

- There will be a gradual transition to two addition-to-taxable-income categories: 4% for zero-emissions cars and 22% for all other passenger cars, including plug-in hybrids (PHEVs).
- The fiscal incentive for full electric cars will remain in full force. These vehicles will continue to be exempt from BPM and MRB tax.

Subsidies

Subsidies were available in 2015 in municipalities including Amsterdam, Rotterdam, Utrecht and Tilburg for the purchase of a personal or company electric passenger car, light commercial vehicle or taxi. In addition, several municipalities made subsidies available for charging points and the disposal of polluting passenger and delivery vehicles.



Green Deals

The Dutch government is helping local authorities, citizens, companies and organisations to achieve sustainability initiatives that are difficult to get off the ground. One way in which it does so is to close a Green Deal with the initiators of sustainable projects and ideas. This year saw the signing of one new electromobility Green Deal.

Publicly accessible charging infrastructure

On 9 June, twelve parties signed the 'Publicly accessible electric charging infrastructure' Green Deal. This Green Deal gives concrete substance to the agreements in the Energy Agreement for Sustainable Growth designed to remove the obstacles to rolling out public charging infrastructure.

The business case for public charging infrastructure is not yet profitable, making government or private funding a necessity. Through the Green Deal, the Dutch government will make €5.7 million available to financially enable the installation of additional public charging points.

To make the business case for public charging infrastructure profitable, it will be necessary to cut costs through innovation and upscaling. The NKL national knowledge platform for charging infrastructure is among the actors working to achieve a profitable business case.

Subnational authorities – municipal, provincial or regional – can apply to the Netherlands Enterprise Agency (RVO.nl) to be considered for supplementary funding. In 2015 the metropolitan Amsterdam area electric initiative MRA-e was the first to submit such a request, aimed at the installation of 360 charging points in the provinces of Noord-Holland, Flevoland and Utrecht.



Formula E-Team

The Formula E-Team is a public-private partnership uniting the business community, knowledge centres and the Dutch government. The Formula E-Team ensures that electric driving further evolves in the Netherlands and aligns with developments in other countries and opportunities for sustainable growth.

'On the road to electric mobility 2015-2020'

In January 2015 the Formula E-Team, working with the leading stakeholders in the electric mobility sector, published the action plan and status document for 'On the road to electric mobility 2015-2020'. The action plan contains a great many ambitions for 2020: 200,000 electric passenger cars, 32,000 electric delivery vans, 1,000 electric trucks, 500 electric buses, 150,000 light electric vehicles, 2,200,000 electric bicycles and 10,150 fulltime jobs in the e-mobility sector.

House of Representatives passes motion to develop plan to encourage e-driving by individuals

Via a motion proposed by Dutch Labour Party representative Ed Groot, the Dutch House of Representatives has asked the Cabinet to work with the Formula E-Team to develop a plan to encourage private citizens to adopt electric driving. The plan, which is expected in 2016, should make electric driving appealing and accessible to individuals.

Seize opportunities for sustainable growth

The Formula E-Team is calling on the Dutch government to seize the opportunities for electric transport with both hands. The catalyst is the report 'Cashing in on Electromobility's Economic Potential' published in mid-2015. If the Netherlands hopes to maintain its global number-one position in electromobility and monetise the sector's economic potential, everyone involved will have to expend greater effort, says the Formula E-Team.

Formula E-Team's continuation recorded in new Green Deal

The Formula E-Team will continue to promote the evolution of electromobility in the Netherlands beyond 2015. The partnership and its ambitions will be captured in the 'Electromobility 2016-2020' Green Deal in the spring of 2016.



The 'On the road to electric mobility' action plan for 2015-2020



The renewed website for NederlandElektrisch.nl



The NKL's digital electromobility help desk



National Test Drive Day with Charles Tanahatoe

Communication, research en publications

Communication

- Renewed website for *Nederlandelektrisch.nl*:** The renewed website NederlandElektrisch.nl was launched at the Ecomobiel trade fair. The website is a digital portal for electric transport and reflects the dedication and effort being exerted by all the Formula E-Team partners to promote electromobility in the Netherlands. The website targets consumers, e-drivers, companies and public officials, thereby reaching the commercial, private and government markets.
- EV Atlas:** The Netherlands Enterprise Agency (RVO.nl) has conducted a survey of Dutch municipalities in the context of the national government's electromobility policy. 72 per cent of Dutch municipalities completed the survey. One of the most striking results is that nearly half (44 per cent) of Dutch municipalities indicated that they had one or more electric cars in their fleets. Moreover, 40 per cent of municipalities that already have an electric vehicle in their fleet are considering expanding to more.

- Digital help desk first NKL accomplishment:** The NKL National Knowledge Platform for Public Charging Infrastructure has launched a digital help desk for municipal governments. Municipalities can submit all their questions about electromobility to the digital help desk. The help desk was publicised during the NKL's 'knowledge tour' of Dutch municipalities.
- Test Drive Day a rousing success:** 2,000 test drivers and 150 showrooms: that was the result of the national Test Drive Day organised by the Natuur & Milieu foundation. The test drivers, all private individuals, were able to take another person's electric car for an exploratory spin, with the goal of expanding the consumer market.

Research en publications¹

‘Employment in electric transport in 2020’

The Netherlands Enterprise Agency (RVO.nl) commissioned research consultants CE Delft to roughly estimate expected employment in the Dutch e-mobility sector in 2020. The report predicts that sector employment in 2020 will be equivalent to 10,150 fulltime jobs, most of them in charging infrastructure and smart grids.

‘Policies and good practices to foster electromobility roll-out at the local, national and European level’

In this report – part of the European Green eMotion project – the Dutch energy research centre ECN investigated what is required to convince Europeans to adopt zero-emissions vehicles en masse. According to ECN, policy makers must stimulate adoption at the local, national and European levels.



‘An analysis of charging-point use in Amsterdam’

The City of Amsterdam and the Amsterdam University of Applied Sciences have analysed

the use of charging points in Amsterdam. The city will use the data to further develop its charging network.



‘Deployability of zero-emission buses in the Netherlands’

Research by TNO on behalf of the Ministry of Infrastructure and the Environment reveals that electric buses still have a limited opportunity for use, but the technology can quickly change that. The study investigated four

different types of buses that use an electric motor: hybrid, plug-in hybrid, full electric and hydrogen electric.



‘Opportunities for the Dutch business community in electric vehicle battery technology’

Research by DNV GL and ARN on behalf of the Netherlands Enterprise Agency (RVO.nl) reveals that there are opportunities for the Dutch business community in batteries. The phases

of ‘manufacture and distribution’, ‘use’ and ‘end-of-life’ are particularly promising, the researchers say.

‘SNM Project A15 study – electric driving’

KIEN has published a study – conducted on behalf of Project A15 and the Natuur & Milieu foundation – that shows that one in three Dutch citizens expects to be driving an electric car in ten years. Project A15 aspires to get as many Dutch drivers as possible into shared e-cars. According to the study’s authors, the price of an electric car is consumers’ greatest obstacle to e-driving.

‘Maurice de Hond’s study on electric driving’

If electric cars were the same price as ‘regular’ ones, 51 per cent of Dutch drivers would seriously consider buying an electric car. Without purchasing incentives, 30 per cent are still interested, but only 4 per cent are certain. So found a study conducted by Maurice de Hond on behalf of the VER association for e-drivers, which surveyed 2,000 Dutch drivers.



‘We are the Netherlands, your partner in e-mobility’

The Netherlands Enterprise Agency (RVO.nl) has published the brochure ‘We are

the Netherlands, your partner in e-mobility’. This brochure positions the Netherlands as a major player in the EV sector. It is intended to help create opportunities for the Dutch electromobility sector.

‘The charging card for today and tomorrow’

Today, drivers in the Netherlands charge their electric cars and plug-in hybrids using a charging card. But will that continue, or will it also become routine to pay for vehicle charging with a debit card, smartphone or text message? ElaadNL investigated the various identification methods. The charging card and a smartphone app appear to be the most suitable options for the near future.

¹ Not all publications are available in English.

‘Exploring the energy and environmental aspects of electric passenger cars’

On behalf of the Netherlands Enterprise Agency (RVO.nl), TNO has collected the currently known facts on electric vehicles in a brief study and presented them in the report ‘Exploring the energy and environmental aspects of electric passenger cars’. The report focuses primarily on the topics of greenhouse-gas emissions during vehicle manufacture and use, air pollutant emissions from vehicle use, and the production of electricity.



‘Analysis of national and international electric vehicle projects’

Dutch-INCERT and the Netherlands Enterprise Agency (RVO.nl) have jointly analysed the ‘Hybrid and electric driving demonstration projects’ programme and supplemented this

analysis with the latest insights based on a study of national and international electric mobility projects. A fact sheet condensed from the full analysis of the demonstration projects programme, which ran from 2010 to 2015, is available in English. It bears the title ‘5 years of “hybrid and electric vehicles” living lab projects (in words and images)’.



‘Monitoring plug-in hybrid vehicles (PHEVs) from April 2012 through March 2015’

On behalf of the Ministry of Infrastructure and the Environment, TNO and the Formula E-Team have investigated how many electric kilometres plug-in hybrid cars actually cover. The answer turns out to be 47 per cent. At least 75 per cent of PHEV drivers charge their cars once a day on average. 25 per cent of all drivers make maximum use of the opportunity to drive electric.



‘Electric mobility charged to maturity’

This study – conducted by Accenture, Greenflux, Antea Group, the Netherlands Enterprise Agency (RVO.nl) and Natuur & Milieu – shows that electric-car drivers are eager to ‘drive green’. They would love to know where the electricity they

use comes from, and are prepared to pay up to 10 per cent more for renewably-sourced electricity.



‘Cashing in on Electromobility’s Economic Potential: the situation in mid-2015’

Employment in the e-mobility sector grew by 25 per cent from 2013 to 2014. That is the chief conclusion in the report ‘Cashing in on Electromobility’s Economic Potential’ published by the

Netherlands Enterprise Agency (RVO.nl). The number of fulltime jobs (FTEs) rose to 3,200 in this period. The sector’s gross added value is €260 million.

‘Fact sheet on the export of passenger vehicles’

The Netherlands Enterprise Agency (RVO.nl) and TNO have jointly drafted a fact sheet on the export of passenger vehicles. Its primary conclusion is that fiscal incentives for electric vehicles occur largely during the vehicle’s use in the Netherlands. What’s more, in 2015 relatively few electric vehicles were exported compared to the number of new registrations, in contrast to what reports in diverse media may suggest.

‘Cheaper electricity by smart-charging EVs’

The strong growth in electric vehicles raises the existing peak demand for electricity, and the growth of solar and wind energy in the energy sector causes larger fluctuations in its supply. Intelligently combining these trends can harness the benefits of synergy. The Netherlands Enterprise Agency (RVO.nl) has asked consulting firm CE Delft to investigate the nature of those synergistic advantages and make a first-order estimate of their impact for the Netherlands.

Electromobility growth in figures

Growth in vehicle types and numbers

National Action Plan for Electric Driving goals and actual vehicle numbers²

Goal	Electric vehicles on the road (three wheels or more)
2015	15,000 tot 20,000
2020	200,000
2025	1,000,000
Actual	
2011-12	1,579
2012-12	7,311
2013-12	30,086
2014-12	45,915
2015-12	90,007

At the start of 2015, there were 45,915 electric vehicles (with three wheels or more) registered in the Netherlands. By the end of 2015 this number had nearly doubled, to 90,007.

Number of electric vehicles per type

Vehicle type	Number as of 31-12-2011	Number as of 31-12-2012	Number as of 31-12-2013	Number as of 31-12-2014	Number as of 31-12-2015
Passenger car (FEV)	1,124	1,910	4,161	6,825	9,368
Passenger car (E-REV, PHEV) #	17	4,348	24,512	36,937	78,163
Commercial vehicle < 3500kg	158	494	669	1,258	1,460
Commercial vehicle > 3500kg	22	23	39	46	50
Bus *	68	67	73	80	94
Three-wheeled	181	469	632	769	872
Motorcycle	88	99	125	196	268
Total**	1,658	7,410	30,211	46,111	90,275

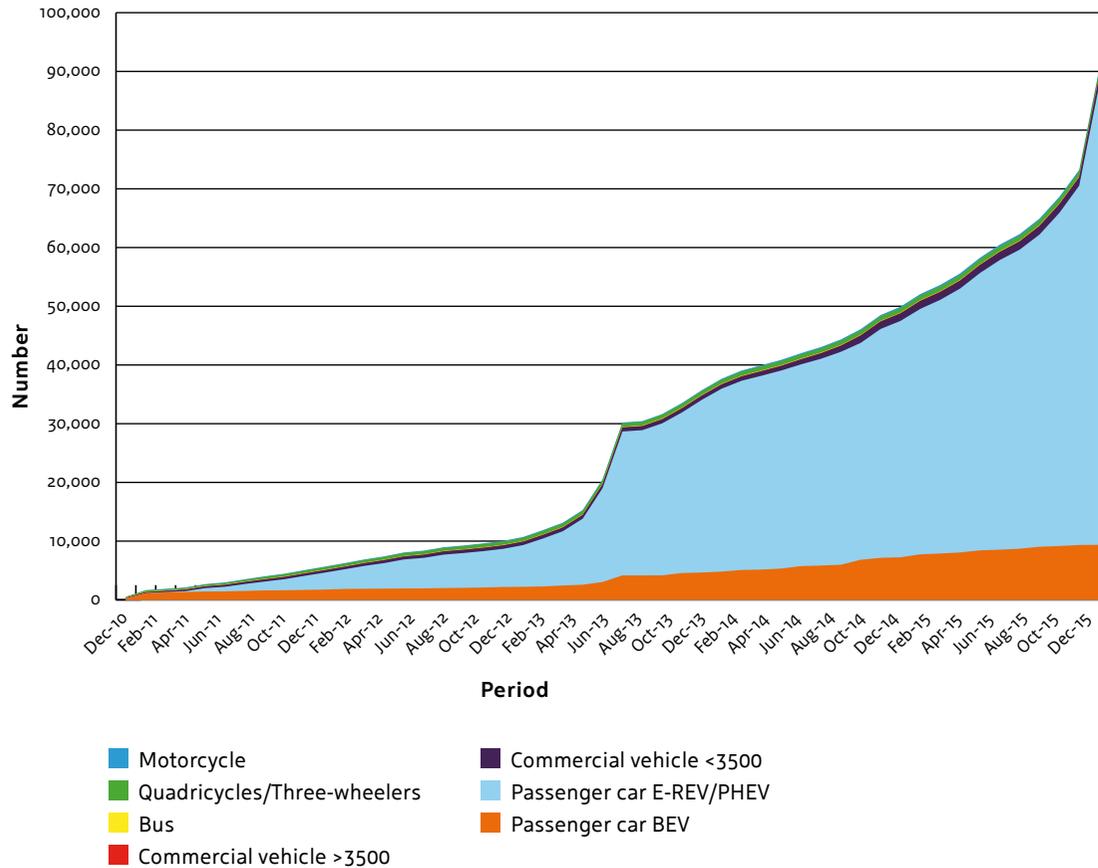
* Including trolleybuses

** This total includes motorcycles

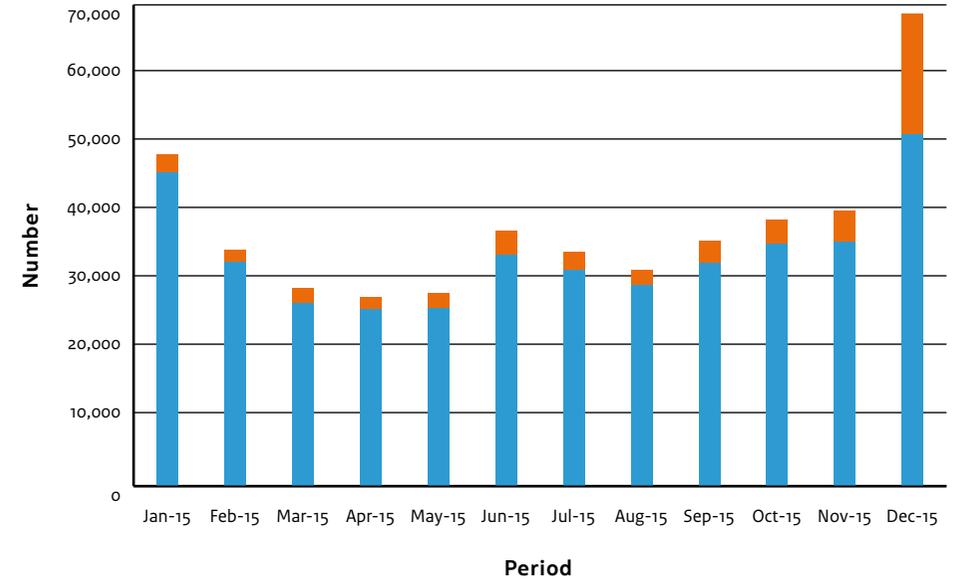
Excluding full hybrid vehicles

² Plan van aanpak 2011-2015 'Elektrisch rijden in de Versnelling'

Electric vehicle growth curve from the end of 2010 through the end of 2015



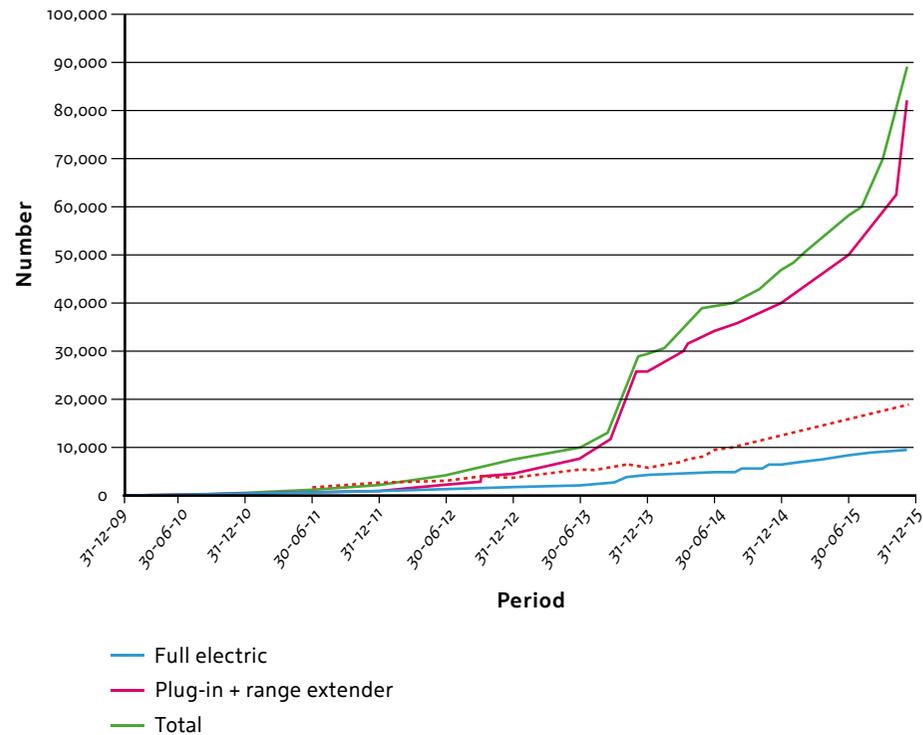
The figure below displays the monthly change in new registrations as a bar chart.



■ New BEV and PHEV registrations
 Source BOVAG/RAI via www.bovag.nl
■ New passenger car registrations excluding BEV and PHEV
 Source RDW/RVO.nl

Thanks to the strong growth of electric vehicles in 2015, the share of electric cars in the total national fleet has grown substantially. Where in 2014 an average of 3.86 per cent of new purchases were electric (full electric and plug-in hybrid together), that number rose to 9.7 per cent for the 2015 calendar year. In concrete terms, that means that 43,769 of the 449,350 newly registered passenger cars has an electric powertrain.

The diagram below compares the change in new full electric passenger car registrations with those for plug-in hybrid vehicles (including range-extended vehicles).



Source: RDW, edited by RVO.nl

Number of electric vehicles compared with total Dutch fleet (per segment), as of 31-12-2015

Vehicle category	Number full electric	Number plug-in hybrid	Total number of vehicles in the Netherlands	Electric as percentage of total
Bicycles (numbers 2014)	1,200,000	-	20,500,000	5.9%
Scooters (including mopeds)	32,069	-	1,148,000	2.0%
Motorcycles	268	-	653,000	0.02%
Passenger cars	9,368	78,163	8,193,000	1.07%
Delivery vans	1,460	-	885,000	0.16%
Public transport buses *	94	-	5,000	1.9%
Lorries	50	-	137,000	0.04%

* Including trolleybuses (59 in total). Source: RDW, CBS, RAI/BOVAG and RVO.nl

Number of charging stations

Number installed as of	31-12-2011	31-12-2012	31-12-2013	31-12-2014	31-12-2014
Charging stations					
Public (freely accessible 24/7)	1,250	2,782	3,521	5,421	7,395
Semi-public (limited public access)	576	829	2,249	6,439	10,391
Private (estimated)		4,500-5,500*	18,000**	28,000**	55,000**
Fast-charging stations Semi-public	14	63	106	254	465

* Based on research conducted in 2012

** Based on research conducted in 2012, plus estimated increase based on number of electric vehicles registered

The number of charging stations is steadily growing. In addition to the public and semi-public charging points that are easy to monitor, there are private charging points. The Netherlands has approximately 0.8 charging stations per vehicle.



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