

# Moving mobility ahead

Accelerating sustainable and smart mobility



NL

Netherlands

# Charging into the future

Making transport safer, more sustainable and efficient is a complex but urgent challenge. It requires bold choices and smart solutions, making the most of technological innovations. As this brochure illustrates, the Dutch are keen to exploit this potential, working with partners around the world to create solutions for a zero-emission mobility system, that can facilitate both economic growth and relieve pressure on our natural and urban environment.







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# The Netherlands, a moving country

Sustainable and smart mobility has emerged as a critical component of our future transportation systems. Innovations in electric vehicles, public transport solutions, and smart mobility technologies are paving the way for cleaner, more efficient travel options that reduce our carbon footprint while enhancing urban living.

The Netherlands stands at the forefront of this transformation, demonstrating how proactive government policies and effective public-private partnerships can drive both environmental sustainability goals and economic prosperity at the same time. By investing in sustainable and smart mobility solutions, we do not only create a futureproof mobility system but also unlock new markets and opportunities for innovation on the global stage. Our collaborative approach, backed by diplomatic efforts, ensures that Dutch expertise and technologies can contribute to sustainable mobility solutions worldwide.

This guide aims to share the Dutch experiences and best practices in sustainable and smart mobility, providing valuable insights for governments and businesses worldwide. It highlights the importance of integrated approaches and innovative technologies that can drive the shift towards futureproof transport systems and healthy cities.

The Dutch are eager to collaborate, share their expertise, but also to learn from other partners. We are very proud and happy to work together towards seizing these opportunities.



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# Towards truly sustainable and smart mobility together



Whether it's the fight against climate change, the need to facilitate economic development, a growing global population, or the challenge of keeping our cities safe, healthy, and liveable – some of the most fundamental issues the world faces are directly linked to a crucial part of our everyday lives: the way we move around and transport goods from A to B.



A well-connected, accessible transport system is crucial for a country's economic growth and development. And as the global population continues to rise, this will drive a massive surge in global demand for transport over the next few decades. Yet without fundamental changes to our mobility sector, the price society will pay for this growth will be too high: even now, transport accounts for more than a third of CO<sub>2</sub> emissions from end-use sectors, apart from its huge impact on the safety and liveability of urban environments and the health of their inhabitants.

Creating a sustainable and smart mobility system is certainly possible. It requires strategies to reduce the pressure on our mobility system (avoid), to promote the use of alternative, clean transport modalities (shift) and to ensure that eventually all modalities will be zero emission (improve).

#### Widely available innovations

The good news is that there is a plethora of technologies and innovations that can reduce the environmental and social impact of our various modes of transport, and many of these are either already widely available or have proven their feasibility and are market-ready. From electric vehicles to smart solutions that enhance road safety, optimise logistics, and minimise the likelihood of congested roads.

Yet, the availability of such technology itself is only one step. The real challenge is to implement these solutions, to scale them up, to share knowledge, and to integrate technologies. In short, to work together as we gradually build a truly safe, smart, and sustainable mobility system.

This brochure highlights some of the ways in which Dutch companies and researchers at the country's leading technology institutes and universities are contributing. The Netherlands has a strong track record as a developer and exporter of innovative technology. Despite its small size, the Netherlands consistently features in the global top 10 of most innovative countries.

## The Netherlands has a strong track record as a developer and exporter of innovative technology.

As a country with a deeply entrenched international outlook, it has cemented a strong position as the world's sixth-largest exporter.

It is perhaps not surprising that much of this innovative strength is focused on transport, infrastructure and logistics. As a small and densely populated country, the Netherlands has one of the world's densest road and public transport networks, and is one of the world's main logistics hubs, home to Europe's biggest sea port and an extensive inland waterway system. It has built up many decades' worth of experience and expertise in managing complex traffic flows, and in studying and mitigating their impact on society and the environment.

#### Open to collaboration

Perhaps even more importantly, the country stands out for its ability to take innovative ideas and bring them to life. The Dutch mentality is pragmatic and transparent, open to collaboration and eager to experiment. Over the years, the country has created a strong ecosystem of technology companies, research institutes, and public bodies who are used to taking on big challenges by pooling their ideas and resources. It's a welcoming environment: many international partners have already established a presence in one of the country's technology hotspots, or are regular visitors to its advanced research and testing facilities. And as this brochure illustrates, the Dutch are ready to intensify such collaboration. To help initiate, amplify, and accelerate the global shift towards sustainable and smart mobility.

## The Netherlands: the ideal breeding ground for intelligent mobility solutions



The Netherlands has one of the best-connected road networks in the world, with a total length of 139,000 km and an average road density of 5,000 metres per square kilometre.



The Dutch can rely on one of the most advanced EV charging networks in the world. More than 25% of European charging points are located in the Netherlands.



The country is famous for its well-developed cycling infrastructure, with approximately 35,000 km of dedicated bicycle paths, including 'cycling highways', and abundant, high-quality bike parking infrastructure.



The Netherlands' inland shipping sector is the largest in Europe, accounting for a third of the overall amount of transport by water in the EU.



# Zero-emission mobility

Phasing out fossil fuels from our mobility system is a crucial part of the decarbonisation challenge. After all, the mobility sector currently accounts for more than a third of CO<sub>2</sub> emissions from end-use sectors. The demand for mobility looks set to surge over the next few decades. There is a clear need to speed up the transition. Dutch mobility experts and technology companies are ready to take up the challenge.





Perhaps it would be better to talk about taking on a whole series of challenges. How can we make the switch to zero-emission vehicles attractive and affordable for people and businesses? What practical constraints need to be overcome? What infrastructure do we need to develop to support the transition? In all these areas Dutch companies and researchers are making a concerted effort to accelerate the transition to zero-emission modes of transport.

### Electric driving

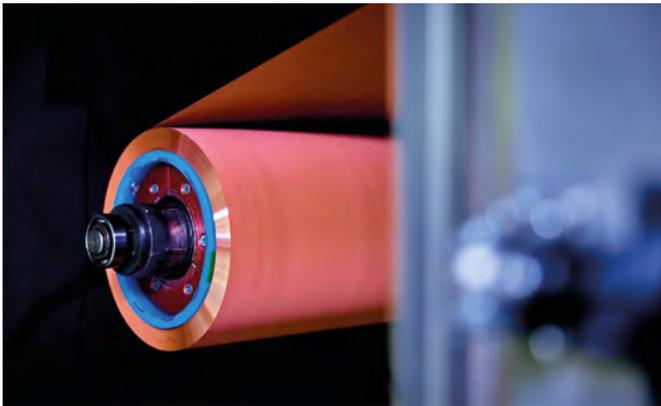
For passenger vehicles, it's become clear that electric driving is the most efficient and feasible way to go fossil-free. And the Dutch were among the earliest adopters. A recent industry study indicated it was the most mature EV country within the European Union. In 2023 over 30% of newly registered cars were fully electric, and another 36% were (plug-in) hybrid. With 73 charging stations per 100 km, the Netherlands now has one of the densest charging networks in the world (this will be explored further in the next chapter).

Yet much work remains to be done. For many people, the current purchase price of electric cars is still too high, while others may be held back by 'range anxiety'. While the overall environmental footprint of electric cars is already much smaller than that of

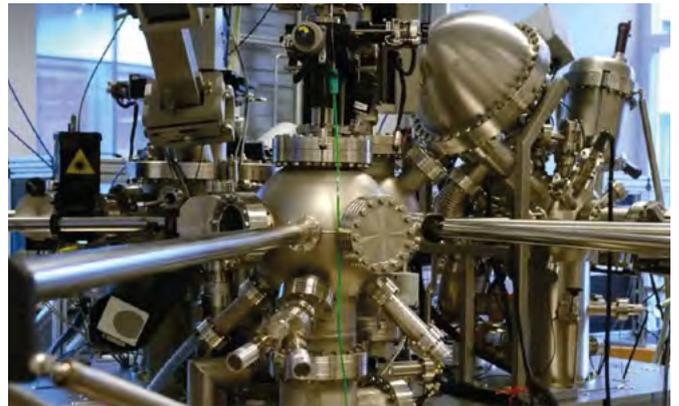
fossil-fuelled cars, it can be further reduced through recycling and by reducing the amount of critical raw materials used in the manufacturing process.

As a key supplier of components and technical support to the global car industry, the Dutch are working on addressing these concerns. Many are directly or indirectly related to the beating heart of the electric car: its battery. Several Dutch start-ups, established technology companies and research groups at the country's universities of technology are working on the development of next-generation batteries, that are safer, have higher energy densities and can be charged more quickly. Others are working on the solutions needed for large-scale recycling and reuse of battery materials.

As is often the case in the Netherlands, many of these companies and researchers collaborate in programmes and consortia, to accelerate the development and implementation of their innovations. For example, a Battery Competence Cluster has been set up to maximise the impact of the Dutch battery ecosystem. Not only in developing a new generation of batteries but also the required materials and production technology. And throughout the country, companies can refine their innovations in no fewer than 19 test facilities.



LeydenJar's 100% silicon anodes for lithium-ion batteries offer 70% higher energy density, enabling longer driving ranges and faster charging for electric vehicles. They also reduce the battery's environmental impact by 85%.



In the BatteryNL consortium, dozens of individual companies and the universities of Delft, Eindhoven and Twente have joined forces to accelerate the development of lighter, safer batteries with higher energy densities.



LionVolt has developed a groundbreaking 3D solid-state technology for next-generation batteries that are 100% safe, and offer twice the performance of modern Li-On batteries at half their weight.



Lightyear Layer is a global pioneer in vehicle integrated solar charging systems, working closely with leading international car manufacturers to create solutions that enable vehicles to charge their battery when not plugged in, or even while driving.



Leading research institute TNO operates a high-tech testing facility for innovations in the powertrains of trucks, including modifications of existing engine platforms to run on new fuels, such as hydrogen, methanol and ammonia.

### Heavy-duty vehicles

Many Dutch companies, meanwhile, are focusing on the roll-out of emission-free heavy-duty vehicles. Hundreds of fully electric trucks are added to the Dutch fleet each year. The goal is to have 16,000 electric trucks on the Dutch roads by 2030. The Netherlands is home to the European market leader in electric buses and coaches (VDL) as well as a leading truck manufacturer (DAF). In their wake, a number of specialist companies are supplying key components, such as complete, fully electric or hybrid power trains, battery systems and range extenders for heavy-duty vehicles. And the Dutch government, together with Californian NGO CALSTART, initiated the Global MoU Zero-Emission Medium and Heavy-Duty Vehicles. This memorandum, launched during COP26 in Glasgow, has been signed by over 30 countries, whose shared ambition is to increase global demand for zero-emission trucks to such an extent that by 2040 all new truck and bus sales will be 100% electric.

Batteries are not the only option when it comes to weaning heavy transport off fossil fuels. The Dutch are investing heavily in the development of industrial-scale electrolysis plants, to convert wind energy into clean hydrogen, and this has boosted innovation in other sectors where this clean fuel could be put to good use.

An example is to use hydrogen to fuel heavy-duty vehicles, such as trucks on long-distance routes and buses. Here the Dutch are seeking to emulate the success formula that allowed them to race ahead in the take-up of electric driving in the 2010s: by simultaneously investing in hydrogen-fuelled vehicles and refuelling infrastructure. For example, the Port of Rotterdam joined forces with over 60 partners in an ambitious programme aiming to create a fleet of 1,000 heavy hydrogen-powered trucks, as well as 25 hydrogen fuelling stations for heavy-duty trucks along major transport corridors. A recently announced subsidy programme by the Dutch government doubles down on this, by encouraging parallel investments in hydrogen trucks and fuelling stations.



VDL recently introduced the first of five hydrogen-powered trucks, using Toyota's fuel cell technology.



Dutch manufacturers such as Ebusco have led the way in expanding the range of electric buses well past the 500 km mark.



### Excelling in hydrogen

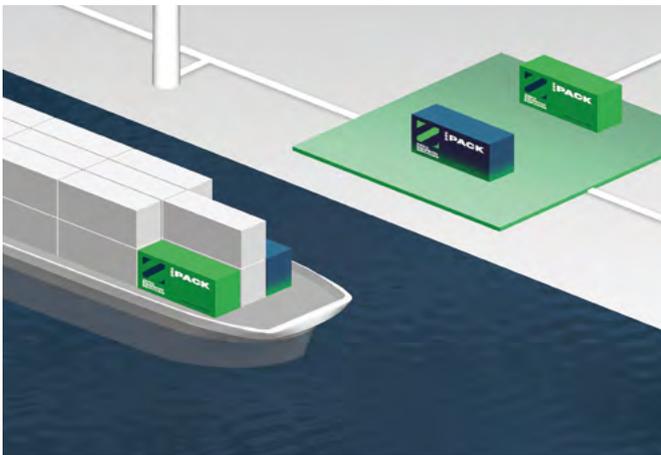
Fueling zero-emission transport is one of many opportunities afforded by advancements in hydrogen technology. The Dutch are among the frontrunners in developing innovative solutions across the entire hydrogen value chain – from production and storage to transport and end-use applications – including sustainable modes of transport. For more information on the research areas, proven technology and industry-leading companies who are building partnerships in areas such as green hydrogen production, fuel cell vehicles, or industrial applications, [download the brochure Excelling in Hydrogen – Dutch technology for a climate-neutral world.](#)

### Zero-emission shipping

The Netherlands has a large inland shipping sector. Much work is being done to explore ways of reducing this sector's dependence on fossil fuels.

For example, in 2023 the world's first hydrogen-powered zero-emissions inland container ship embarked on its maiden voyage, between the ports of Rotterdam and Antwerp. Anticipating the growth of more hydrogen-powered barges in the next few years, the province of Zuid-Holland initiated a pan-European project in which hydrogen fuelling stations will be built along the shipping corridor between Rotterdam and Genoa.

Meanwhile, other companies are demonstrating the feasibility of fully electric inland shipping. Not just by building battery-powered vessels, but by developing a smart business case to go with it: a pay-per-use model in which electric vessels can use exchangeable battery packs at charging stations along busy waterways. It illustrates how the Dutch are not only looking to come up with smart and feasible technology, but are focusing on the question how such innovations can make the transition from an attractive idea to successful implementation at scale.



Zero Emission Services (ZES) has launched its first electric battery-run vessel, transporting Heineken beer on inland waterways.



The PATH2ZERO research European consortium, led by the Delft University of Technology, is building a digital twin of the inland shipping system, to help evaluate the efficiency and impact of zero-emission strategies.



Future Proof Shipping has followed up the launch of the world's first hydrogen-powered container ship by successfully retrofitting another cargo vessel to run on hydrogen. The H2 Barge 2, which will operate emission-free on the Rhine between Rotterdam and Duisburg.



Maeve is building a 94-seater hybrid-electric airplane with a range of 2,200 km and up to 40% lower carbon emissions than similarly sized planes. It is also working on a fully-electric aircraft for 52 passengers, with a range of 550 km.



Using cutting-edge technological innovations, high energy-density battery packs and new design principles, Elysian is developing a 92-passenger aircraft that can fly up to 1,000 kilometres.

### Fossil-free aviation

Aviation accounts for around 3% of global emissions. Some estimates predict an increase by 50-250% over the next few decades if left unchecked. Decarbonising aviation is a vital challenge, and a daunting one. Yet Dutch companies and experts at Delft University of Technology have taken up the gauntlet and are working on diverse solutions, from producing new and affordable sustainable fuels to the development of electric and hybrid-electric aircraft, or even hydrogen-powered aeroplanes.

The Dutch are among the frontrunners in the development of electric aeroplanes for commercial passenger flights, with several start-ups working on hybrid or even fully electric aircraft whose range is sufficient for many short-haul flights. To cover longer distances, another Dutch company is working on a hydrogen-fuelled plane. Meanwhile, the aviation sector can already reduce its carbon footprint by using alternative sustainable aviation fuels (SAFs). These are already available: a few years ago Dutch technologists were behind the world's first flight using certified, synthetic kerosene made from hydrogen and recycled carbon. The key challenge now is to produce and make such fuels available at competitive prices. The Dutch are well positioned to make a difference here. The country is home to the world's market leader in sustainable aviation fuel, and Dutch researchers are taking the lead in an ambitious European research programme aimed at developing a new, low-cost production process for synthetic kerosene.



FokkerNextGen is developing a 150-seater aircraft using liquid hydrogen combustion technology. The company recently concluded a partnership with, amongst others, Groningen airport, which includes the establishment of a Centre of Excellence in the Northern Netherlands for hydrogen-powered aircraft.

### Cycling, a driver for positive change

While electric driving already represents substantial carbon reductions, there is one alternative that's even cleaner: not to use the car at all. In addition to investments in high-quality public transport and mobility services and car-sharing initiatives, the Dutch have one other card up their sleeve: it's one of the most bicycle-friendly countries in the world. Cycling reduces traffic congestion and encourages a healthier and more active lifestyle, generally contributing to safer and more pleasant public spaces. The country has a unique, highly sophisticated cycling infrastructure, with dedicated cycling lanes and 'highways' or direct cycling routes, and with plentiful cycle parking facilities. And with the advent of electric bikes, cycling has become a feasible alternative to car journeys for longer distances as well. Over the past 20 years, the total distance travelled by bicycle in the Netherlands has grown by 12 percent. To find out more about Dutch solutions and innovations around bicycles, cycle-sharing or leasing schemes and cycling infrastructure, [download the Dutch Cycling Guide](#).



# Charging ahead

The EV revolution is well and truly underway. But as the number of electric vehicles grows, so does the demand for charging points. What infrastructure is needed to support large-scale electrification of cars, as well as heavy-duty vehicles? And how can we manage the massive impact of large-scale electrification on our power grids? As global leaders in charging technology, the Dutch have been working on the required solutions for years.



By international standards, Dutch drivers were quick to adopt electric driving. Currently, 1 in 7 passenger cars in the Netherlands is either fully electric or hybrid. With over half a million fully electric cars on the road, the share of battery-electric cars in the nationwide fleet is double the European average.

The rapid take-up of electric driving is no coincidence. In addition to a government policy to offer financial incentives to drivers, perhaps the most crucial success factor was that, at an early stage, the Dutch decided to avoid the ‘chicken-and-egg’ dilemma, by anticipating future demand and making substantial investments in charging infrastructure. And in doing so, they laid the foundation for what is now one of the world’s densest charging networks, with over 165,000 (semi-)public charging points, and hundreds of thousands of private ones. All in all, there are 817 charging points per 100,000 residents, by far the highest number in Europe.

From the start, this was a concerted effort. Businesses, grid operators, local authorities and government agencies worked closely together and aligned their efforts through a National Charging Infrastructure Agenda. Sophisticated modeling was used to predict where future demand would be concentrated, allowing grid operators to reinforce infrastructure in the right areas. And by developing a uniform grid interface, the Dutch substantially cut the time and cost of installing charging points.

#### Leading in charging technology

Meanwhile, Dutch companies used the burgeoning demand in their home market as a springboard to become global market leaders in charging technology. Not just for cars, but for all kinds of electric vehicles, from buses and coaches to trucks, heavy machinery and even ships and aircraft.



WeDriveSolar has worked with car manufacturers such as Hyundai and Renault to implement its Vehicle-to-Grid technology. It has installed thousands of bidirectional charging points, for example in large ‘solar charging plazas’.



At its cutting-edge testing facility in Arnhem, knowledge and innovation centre ElaadNL researches and tests smart and sustainable charging of electric vehicles, in close collaboration with manufacturers from all over the world.



Milence builds and operates high-performance public charging hubs for heavy-duty vehicles throughout Europe, aiming for 1,700 charging points by 2027. Soon, long-haul trucks can be fully charged in just 30-45 minutes with the implementation of megawatt charging systems.



In the Port of Rotterdam, more and more vessels can switch off their diesel-powered generators while berthed, and use wind power instead, thanks to a growing number of onshore megachargers. These have a capacity of up to 1,800MW each – the equivalent of the annual consumption of 1,500 households. Currently, 7 such shorepower systems are operational or under construction, while plans are being developed for at least 12 more.



Fastned is a European market leader in fast charging stations. The company currently operates and develops facilities in 9 European countries and aims to have installed 1,000 charging stations by 2030.

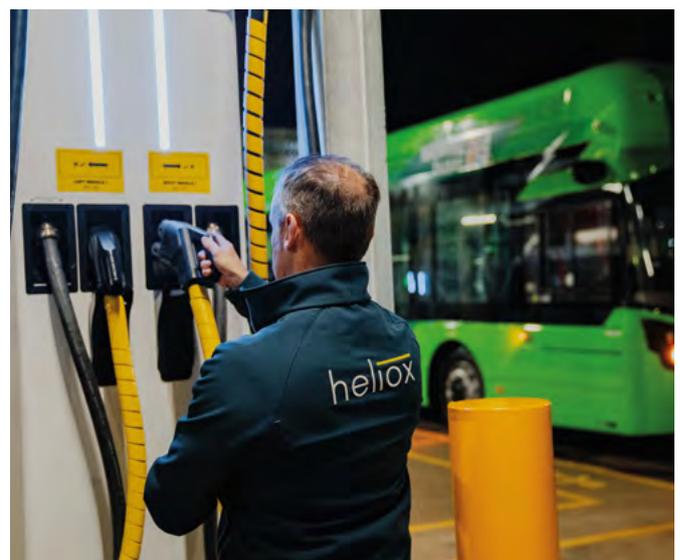
## Dozens of Dutch companies and research groups at knowledge institutes have specialised in important domains within charging technology.

Perhaps one of their most crucial achievements was to develop an Open Charge Point Protocol, which standardises communication between charging points and the back-office systems of various providers, ensuring that drivers can charge their car at any public charging point. This protocol has since been adopted across the world: currently, over 400 companies from 35 countries have signed up.

The country's position as a global leader in charging technology is also cemented by a wide range of high-tech testing facilities, which attract customers from around the world, including EV manufacturers. Dozens of Dutch companies and research groups at knowledge institutes have specialised in important domains within charging technology, from cybersecurity issues to energy management software. And the huge amounts of data generated by charging points are used by university research groups to study a wide-ranging set of questions, from the impact of EV on power quality to analysing the motives, perceptions and behaviour of EV drivers.

A striking feature of the Dutch approach is that right from the outset, the 'charging issue' was part of a broader vision of the future energy system. It was recognised early on that a fleet of electric vehicles places great demands on power grids – but that with the right technology, it could also be an important stabilising factor in an energy system built on renewables and much higher (but fluctuating) demand for electricity.

This has led to the development of smart charging technology. In close collaboration with knowledge institutes and grid operators, Dutch companies have developed a range of solutions for automatically adapting the charging speed of electric cars to peaks in demand. And taking the principle one step further, the Dutch are pioneers in bidirectional charging, which allows electric vehicles to both receive and supply electricity. This means that EV users can charge their vehicles when demand (and prices) are low, and either use the electricity themselves or discharge it back into the grid during peak hours. Such Vehicle-to-Grid technology will be a crucial element in our future energy system, relieving the strain on power grids.



Heliox, A Siemens Business, is a global market leader in fast charging systems for public transport, passenger vehicles, e-trucks, and other heavy-duty vehicles. Each day, over 80,000 charging stations in more than 60 countries across the globe are powered using the company's equipment with Siemens eMobility.

# Smart vehicles

From solving congestion problems to improved road safety or making cities more liveable... Many questions surrounding smart and sustainable mobility come together at the most fundamental building block of a traffic system: the vehicles in which we move around or transport goods. How can we make those vehicles cleaner, smarter, and safer?





While the Netherlands may not be home to any of the major international car brands, the country's technology sector is an important player in the automotive industry's supply chain. The Dutch automotive sector comprises over 500 companies, with combined annual export figures exceeding 40 billion euros. These companies include major manufacturers of coaches, buses, and trucks, as well as suppliers of crucial technology to the world's biggest car manufacturers: from chips and sensors to drivetrain technology, cooling systems, and smart software.

The Dutch automotive sector does more than supply technology: as an innovative partner and dynamic testing ground for new technology, the Dutch are playing a crucial part in developing, testing, and rolling out technological breakthroughs. In fact, in the most recent Automotive Disruption Radar, a biannual industry index, the Netherlands ranked second.

**Several Dutch companies play a key part in developing advanced driver assistance technology. They supply crucial components for higher levels of autonomous driving.**



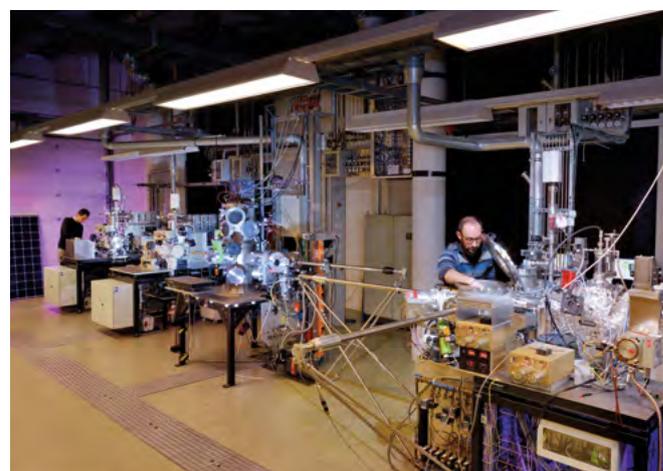
TomTom is one of only four map makers in the world to create its own digital datasets from the ground up. Its high-precision data is a crucial enabler for autonomous driving, allowing for centimetre-accurate positioning and enhancing the car's sensor perception by providing more context. It recently launched a new platform in which its own map layers can be enriched in real-time with data from other providers and data generated by the car itself.



Thanks to its advanced, highly digitalised road infrastructure and the willingness of many Dutch drivers to adopt new technology, the Netherlands is an ideal testing ground for innovative solutions. For example, Korean car manufacturers Hyundai and KIA recently signed an agreement with the Dutch government for the implementation of new in-car technology that uses real-time traffic data to enhance safety and reduce congestion.



NXP Semiconductors is one of the world's leading chip makers for the automotive industry. Its portfolio covers all kinds of applications, from advanced driver assistance to infotainment and in-car networking. And NXP is a global market leader in the highly sophisticated radar chips that are crucial for higher levels of autonomous driving.



The Technical Universities of Delft, Eindhoven and Twente play a key role in the Dutch automotive ecosystem, and have produced a series of successful spin-off companies in diverse aspects of (semi-)autonomous driving, as well as battery technology and solar-powered cars.



The TNO technology institute is a trusted partner for many international companies looking to develop and test their innovations. For example, its Streetwise methodology enables automated driving technology systems to be tested in virtual test scenarios that closely resemble real-world driving conditions.

This innovative power is partly due to the presence of unique knowledge and expertise in various crucial areas: from semiconductors and chips to high-tech materials, innovative battery technology, and the technology for (semi-)autonomous driving. This knowledge is not only found in companies, from start-ups to multinationals, but also in internationally renowned technical universities, colleges, and research institutions.

#### Joining forces

Crucially, this is an ecosystem in which the various players join forces, in consortia or research and development programmes. These collaborations often transcend national borders: the Dutch automotive sector has strong ties with automotive hotspots in Europe and the US and is a sought-after partner and testing ground for international parties.

Much of this activity is concentrated around the Automotive Campus near Eindhoven, which is home to dozens of Dutch and foreign companies, as well as extensive, high-tech research and testing facilities. These include a Living Lab: a 'real' residential area that can serve as a real-world testing ground for all kinds of innovative smart mobility solutions.

Within this ecosystem, parties work closely together around a few key ambitions: to make vehicles emission-free, to minimise road congestion, and to enhance passenger safety. A recurring theme is the development of increasingly smarter and even autonomous vehicles. Several Dutch companies play a key part in developing advanced driver assistance technology, and supply crucial components for higher levels of autonomous driving, such as radar chips and high-precision geographical datasets. Many international companies working on autonomous driving look for Dutch partners to test and validate their innovations, using hyper-realistic traffic scenarios generated from real-world data.

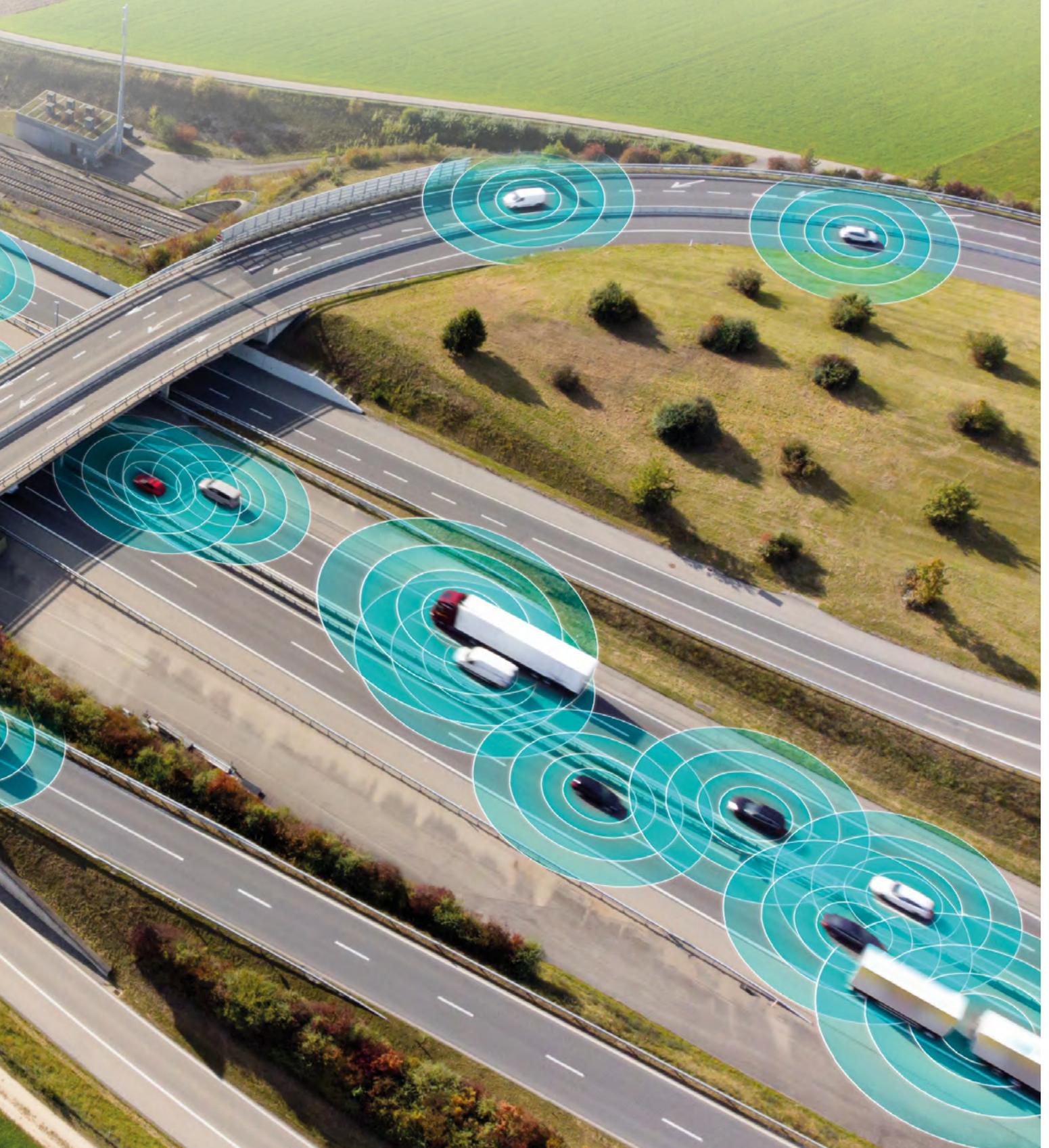


Vtron was recently named a European 'key innovator', in recognition of its advanced, market-ready technology for remote-controlled vehicles using 5G network communication.

# Smart, connected mobility



Creating a smart and sustainable mobility system requires more than emission-free, smart vehicles. The crucial challenge is to optimise the interaction between road users, and to understand and manage complex traffic flows, reducing congestion and emissions and creating more liveable urban spaces.



The Netherlands has long been a global leader in traffic management, with a strong tradition of close collaboration between government agencies, road authorities, and private companies to manage complex mobility flows. As a result, the country has developed highly advanced infrastructure, traffic control systems and traffic management centres, and high-quality traffic information services. Throughout the country, this technology has been put to good use to optimise traffic flow, reduce emissions and enhance road safety. For example, a combination of road sensors and dynamic traffic lights enable policy makers and traffic managers to prioritise certain groups of road users, such as emergency services, public transport or (groups of) cyclists. On some roads, traffic lights switch to green when lorries approach, avoiding unnecessary emissions.

### Optimise mobility

With the rise of connected vehicles and new sources of real-time data, huge opportunities have emerged to build on these foundations and further optimise mobility. Instead of relying solely on physical infrastructure, the focus has shifted towards leveraging the rich, diverse array of real-time data generated by vehicles and road users themselves.

The Dutch are well positioned to seize this opportunity, having laid the foundation for data sharing some years ago. Collaboration is essential for effective data-driven traffic management, and municipal, provincial and national road authorities in the Netherlands have been pooling their traffic data for some years in a National Road Traffic Data Portal. More recently, they have also started using Floating Car Data, which is procured from carefully selected external service providers and data sources.

### Data-driven approach

This data-driven approach has opened up a whole new range of possibilities to address key challenges such as congestion, CO<sub>2</sub> emissions, air quality, and road safety. For example, data from various sensors in cars provide road authorities with valuable information not only on current speeds and congestion problems, but also on the condition of roads and hazardous situations. And this approach is not just about collecting data. The Netherlands has fostered an open, yet secure environment where innovative service providers can roll out smart mobility concepts. For example, the Dutch recently introduced the concept of Digital School Zones, in which road users receive in-vehicle warnings when they approach schools during opening and closing times.



SmartwayZ.NL is a Dutch public-private partnership that develops intelligent mobility solutions using real-time traffic data. One recent example is a tool that recognises groups of cyclists and prioritises them at traffic lights, with hardly any impact on the waiting times for other road users.



Goudappel is a leading international consultancy in the field of Sustainable Urban Development Plans. The company helps cities across Europe and North America by combining expertise in diverse but closely related fields such as economy, transport, spatial planning and environmental issues.



TNO's Urban Strategy technology has been used to create digital twins of entire cities, from Amsterdam to Delhi and Singapore. The technology is capable of processing and evaluating highly complex scenarios up to 1,000 times faster than with existing state-of-the-art technology.



In the Merwedekanaalzone, a new urban development in Utrecht, data-driven solutions are being implemented to create the world's largest car-free residential area. To ensure accessibility for approximately 10,000 residents, the area will feature innovative mobility hubs with limited parking spaces, high-quality public transport connections and shared e-bikes, cargo bikes and e-cars.

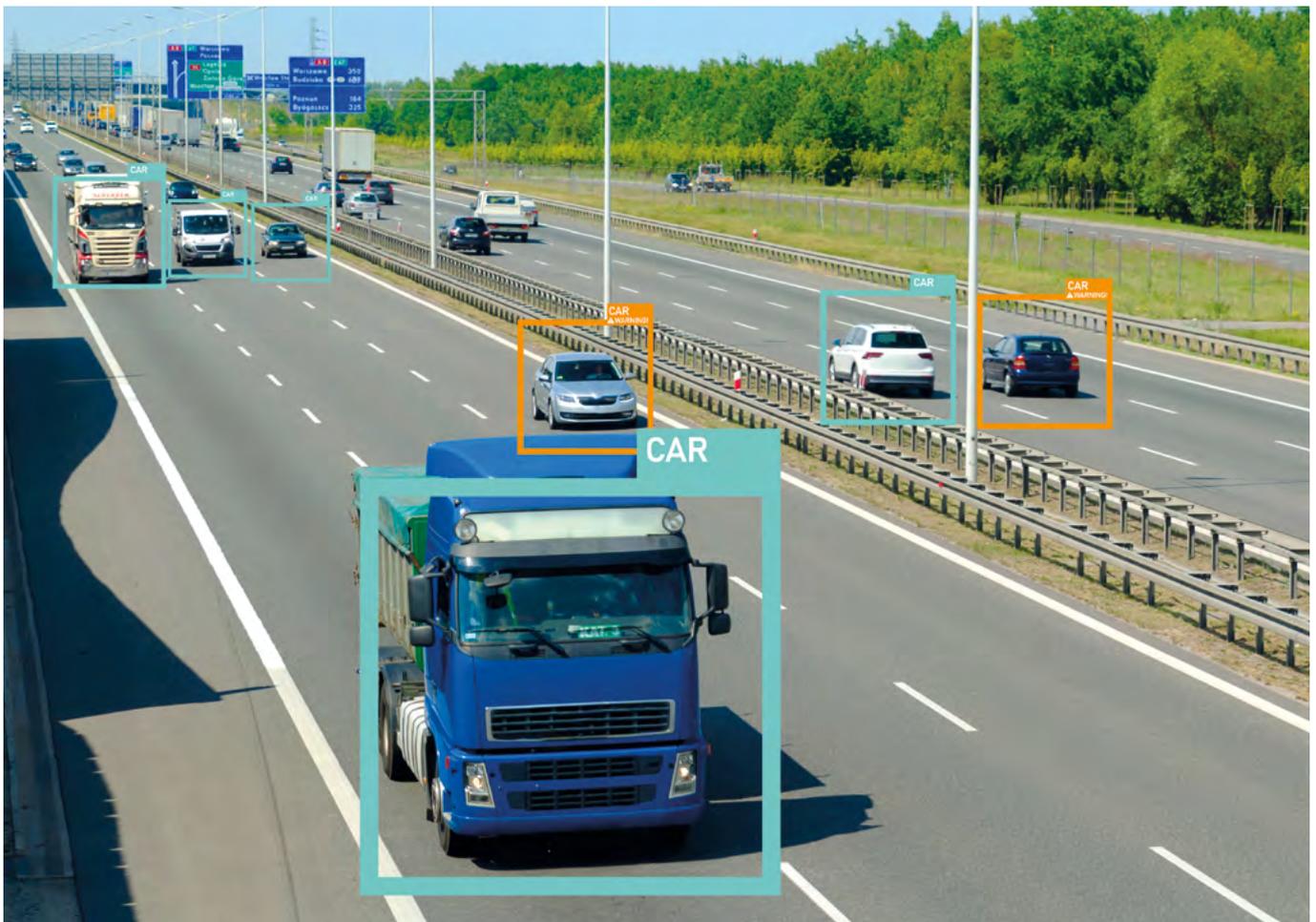
## The Netherlands has developed highly advanced traffic control systems and traffic management centres, and high-quality traffic information services.

Other possible applications are to divert traffic to alternative routes to ensure air quality norms are not compromised, or to enable drivers to adjust their speed to avoid having to stop at upcoming traffic lights. Accurate data is the lifeblood of Mobility as a Service concepts, which can lower the threshold for drivers to switch to other modes of transport. And last but not least, real-time data is crucial to developing new concepts for Smart Logistics (see the next chapter). The value of data, of course, is not limited to the real-time management of traffic flows. In the Netherlands, there has always

been a close connection between traffic management and spatial planning. As the inhabitants of a small, densely populated area – sometimes described as a big city rather than a small country – the Dutch are keenly aware of the need for a holistic approach to spatial planning to make the most of every square metre available. And in drawing up plans for urban developments, the Dutch are increasingly using data to understand, predict and manage the future use of roads and transport systems.

### Digital twins

For example research institute TNO has developed sophisticated technology that allows them to build interactive, digital twins of cities. These powerful models can be used to simulate and evaluate complex scenarios at unprecedented speed. This gives planners a unique insight into the impact of new developments on future traffic demand. What's more, it allows them to adjust and finetune plans, taking into account all kinds of parameters such as traffic flow and air quality to energy consumption – laying the groundwork for smarter and more sustainable urban development.



As the number of (real-time) data sources increases, so does the need for a coherent, well-ordered system for collecting and sharing data, according to well-defined standards. The Dutch are developing a Digital Framework for Mobility Data to facilitate safe, efficient and sustainable traffic, optimal use of infrastructure and multimodal transport choices.

# Smart logistics

Freight transport, especially via roads and international shipping, is responsible for a substantial portion of global CO<sub>2</sub> emissions from the transportation sector. The sector itself is responsible for over 20% of total worldwide emissions. As one of the world's major logistical hubs, the Netherlands is pioneering new ways to make logistics more efficient and reduce its carbon footprint.





## Dutch companies, road authorities and technology institutes have joined forces, along with international partners, to develop innovative solutions.

The Dutch are acutely aware of the need to find smarter, cleaner and more efficient ways of moving goods from A to B. The country is one of Europe's main logistical hubs. It is home to the continent's largest port (Rotterdam), third largest cargo airport (Schiphol), and some of the continent's busiest road and rail corridors.

While the Dutch are keen to maintain and strengthen their logistical capabilities, which are a major contributor to the country's economic success, it is clear innovation will be needed to drastically reduce the environmental impact of logistical operations. And by the very nature of this sector, in which numerous stakeholders are inextricably linked in complex supply chains, this requires a great deal of collaboration.

### Innovating logistics

Dutch companies, road authorities and technology institutes have therefore joined forces, along with European partners, to develop innovative solutions such as:

- **Smart urban logistics and last-mile delivery.** Dutch companies are developing micro-hubs, cargo bikes, and collaborative platforms to optimise city distribution and reduce congestion and emissions.
- **Streamlined road transport.** As described in the previous chapter, the Dutch are making the most of the real-time data generated by vehicles and road users, for example to generate in-vehicle guidance for optimised routing and reduced congestion and emissions.



For over 10 years, the Dutch have been researching and developing the concept of truck platooning: convoys of self-driving trucks, in which only the first truck has a driver and the others can safely follow at a distance of only 0.3 seconds, thanks to vehicle mounted sensors and wireless communication. The technology will pave the way for fuel savings, lower CO<sub>2</sub> emissions, improved road safety and improved traffic flow.

- **Connected Automated Transport.** This includes the development of autonomous and/or remote-controlled vehicles, for example to handle container transport on logistical sites. Looking further ahead, the Dutch are conducting pilots with (semi-)autonomous driving trucks, which can also operate in platoons.
- **Electric trucks.** Thanks to the rapid development of battery technology, electrification has become a feasible option for large-scale decarbonisation of heavy-duty vehicles. Dutch companies and researchers are contributing both to the development of battery systems, emission-free trucks and buses and to the fast, high-power charging infrastructure which will have to be built along international transport corridors.
- **A modal shift:** the Dutch are working towards a multimodal freight transport system, by integrating and enhancing the efficiency of rail, road, and waterway transport. For example, a government-sponsored programme is underway aimed at shifting at least 1,500 containers (3,000 TEU) a day from the country's roads to either inland shipping barges or freight trains.

Many strategies for optimising logistics depend on one crucial prerequisite: the availability of highly specific data. For example, real-time traffic data can be used to predict arrival times of trucks at terminals or inland shipping vessels at locks, bridges or ports, to minimise congestion. Other traffic data can be used to continually optimise routing. And further efficiency gains can be made when data is available on the current location, itinerary and remaining cargo capacity of trucks or barges – allowing planners to make the most optimal choices and minimising the amount of unused cargo space.

**Standardised data exchange**

Making the most of such data requires that it can be shared safely across supply chains. After all, logistical operations typically involve many different stakeholders. That's why the Dutch are developing a Basic Digital Infrastructure framework. The goal of this programme, overseen by the Dutch Ministry for Infrastructure and Water Management, is to create a set of protocols for safe, seamless and standardised data exchange between all stakeholders in the multimodal transport chain.



In the Smart Shipping programme, Dutch companies and researchers are working on the autonomous operation of inland barges and sea-going vessels, using on-board technologies and sensor data to enable more efficient sailing, boosting the sector's competitiveness against other modes of transport.



Stadslogistiek (City logistics) is a partnership between PostNL and local companies who create shared logistics hubs for business-to-business deliveries. These hubs are located on the outskirts of Dutch cities and enable efficient, 100% emission-free last-mile delivery.



Through the Joint Corridors Off-Road programme, dozens of companies have joined forces to create 'joint corridors', allowing them to combine shipments to reach the critical volumes needed for a modal shift from trucks to trains or inland shipping.



# Five benefits of doing business with the Dutch

## 1. Quality and reliability

The Dutch combine first-class technical expertise and innovative strength with a commitment to delivering high-quality, reliable products and solutions. Working with Dutch technology means you can be certain of compliance with the highest (European and international) standards.

## 2. An international outlook

The Dutch have been doing business abroad for centuries. They understand what it takes to work successfully across borders and cultures, and are regularly ranked as having the world's most proficient non-native English skills.

## 3. High-tech excellence

The Netherlands has a long history in high-tech innovation. In terms of the number of patents per capita, it ranks fourth in the world. It is home to world-class research institutes, global players in semiconductor technology and excellent machine manufacturers.

## 4. Joint innovation

The Dutch excel in creating flexible, fast-moving networks of specialist companies and research institutes. The Netherlands is home to dozens of 'field labs' in which such networks translate fundamental research into innovative solutions and test them in real-life pilot environments.

## 5. Easy access to specialist expertise

The Netherlands has organised its sustainable and smart mobility expertise into national centres of expertise and industry associations. These networks offer fast and easy access to the right technology providers, researchers or combination of specialists. They pursue a common goal: solving global challenges together.

# Dutch sustainable and smart mobility expertise

Looking for specific expertise or technological solutions? In this section Dutch technology providers with international track records introduce themselves and their portfolios. Consult the table on the next page to identify possible partners in your next step towards sustainable and smart mobility successes.

Do you have any questions? Or would you like to present your company profile worldwide in the next edition of the Dutch sustainable and smart mobility guide? Please send your email to [ICEP-dumo@rvo.nl](mailto:ICEP-dumo@rvo.nl).

	AUTOMOTIVE	LEV	TRANSPORT / HEAVY MA- CHINERY	ZERO-EMISSION INLAND SHIPPING	AVIATION	PUBLIC TRANSPORT	CHARGING INFRASTRUCTURE	BATTERIES	DATA, DIGITALISATION AND IT/ AUTONOMOUS VEHICLES	SERVICES (E.G. MAAS / SHARED MOBILITY / LEASE)	PROJECT DEVELOPMENT / RESEARCH / CONSULTANCY	ASSOCIATION / PUBLIC SECTOR	PAGENUMBER
ACE Mobility	•												36
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Axa Novi B.V.	•							•			•		37
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automotive  
center of  
expertise

ACE Mobility is the connector, initiator and intermediary in the cooperation with the Automotive programs of the Fontys and HAN Universities of Applied Sciences and companies from the automotive and mobility sector. To contribute to a sustainable future of this sector, ACE Mobility focuses on education, Human Capital and innovation which form the starting point of this strategic network. Within the Education focus, the emphasis is on the connection between education and business and talent development. Together with our solid partner network we organise various successful activities to promote this. The transition to digitalisation, autonomous driving and electrification requires employees with the right skills and education. That is why we also focus on Human Capital and lifelong development. In Innovation & Research, we focus on intensive collaboration with

the research departments of the universities of applied sciences. With the dynamics of ACE Mobility as an initiator we have a strong role in knowledge dissemination.

Sustainable and Smart Mobility projects: so-called 'wicked problems', such as climate change, require a major energy transition with a related mobility transition. Industry, government and education therefore see the urgency of innovations in the field of energy and mobility technology, but also see the need for behavioural change by travellers and carriers. Specifically for ACE Mobility, this can be translated into:

- New energy systems in the mobility domain, including CO<sub>2</sub>-free/low-carbon drivetrains
- Connected & automated driving
- New mobility concepts and services
- New business models

### Arcadis

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Harnessing digital advances, we create sustainable, data-led and connected transport solutions across the full asset lifecycle. Working with clients, we're responding to ground transportation's biggest challenges, helping to create:

- Safe and reliable transportation
- Greener mobility
- Connected mobility

We're harnessing the power of connected mobility, helping clients ready their assets for the future, plan for future modes of travel and using data and AI to improve the transport network for owners and users in real time. As society increasingly demands digitally connected, inclusive, autonomous and sustainable transport solutions, mobility is changing. We're partnering with clients across the globe to modernise the way people move.

Increasingly we're experiencing demand for our expertise in new mobility, including autonomous vehicles, advanced air mobility (AAM), mobility hubs, alternative fuels such as hydrogen, electric vehicles (EVs) and EV charging infrastructure (EVCI), micro-mobility, shared mobility, mobility on demand and people-oriented development.

Arcadis is a world leader in delivering sustainable design, engineering and consultancy solutions for natural and built assets and was founded in the Netherlands 135 years ago. They are more than 36.000 people, in over 70 countries, dedicated to improving the quality of life within their three business areas: Mobility, Places, and Resilience. Climate change, urbanisation and digitisation trends are requiring today's mobility projects and systems to address an evolving set of demands from the world's growing population.

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Arkimedes will produce solid-state batteries in the Netherlands and obtain all raw materials from Europe, thereby creating independence from other continents. Through its own production facility, the Netherlands can acquire a strong position on the sustainability ladder and at the same time provide additional employment.

Our team of entrepreneurs and researchers is driven by the desire for a better world for future generations. Together we have over 100 years of combined experience as entrepreneurs and scientists, with a large network in the EV world and diverse skills in the areas of financial services, Marketing & PR, fundraising, circular economy and building multidisciplinary teams.

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Axa Novi is a boutique automotive consultancy agency with a strong focus on business strategy, business development, and market research. It is our mission to support ambitious automotive parts manufacturers, distributors, or other relevant market players in their quest for growth and enhancement of customer satisfaction. While you understand, manage, and lead your business and your own company, we provide a fresh pair of eyes to help you secure long-term success. We help you realise your business growth ambitions with incisive analyses, by formulating a clear and sustainable vision or strategy and putting that advice into practice. We realise lasting, concrete improvements in your business performance together. Axa Novi analyses, defines, and implements. We call this 'Active Strategy'!

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Innovation program for a strong Dutch battery ecosystem. To leverage and accelerate the opportunities provided by battery technology and the energy transition, the industry, knowledge institutes and trade associations are jointly committed to developing a strong battery ecosystem.

The Battery Competence Cluster – NL is the innovation program for companies, knowledge institutions and organisations that want to work together to acquire knowledge and develop skills in the field of battery technology. The Dutch battery, transport and shipping industry join their forces in the Battery Competence Cluster – NL.

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Brainport Eindhoven is a world-class top technology region. High tech and design are combined with an advanced high-end manufacturing industry and entrepreneurship. Close collaboration and sharing knowledge are part of our DNA and characterise the open innovation culture which makes Brainport smart and strong. By quickly anticipating to rapid world-wide changes and continuously connecting to new people, we create new opportunities. For everyone. This attracts talent and enterprises from all over the world. Entrepreneurs, knowledge institutions and governments form a unique business climate in which we compete by collaboration, expand by adaptation, multiply by sharing, achieve by trying and predict the future by inventing it. In that way, partners in Brainport Eindhoven work together in finding solutions for societal challenges for health,

mobility, energy, food and safety. As the high tech growth accelerator of the Dutch economy and part of the technological backbone of Europe, Brainport Eindhoven is a global frontrunner in innovation.

As for our role regarding the Dutch automotive industry we work close with RAI Automotive Industries NL on trade, innovate and invest relations in a global setting. Mainly focussing on the future of Smart and Green Urban mobility by helping companies to develop (new) research and business to address our mobility challenges towards 0-emission, 0-casualties and 0-congestion.

To name a few large scale projects we are involved in: Charging Energy Hubs, Digitalisation of Future Mobility (DITM), Battery Competence Cluster, Hydrogen for heavy duty mobility.

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# BUKO DIGITAL.

**BUKO.** INFRASUPPORT

## BUKO. INFRASUPPORT

BUKO is a dynamic group of service companies specialising in construction, civil engineering, and the events sector. Our ambition? To be a thriving service organisation that stands out for its quality, decisiveness, service, and teamwork. Every day, you'll find us hard at work across the Netherlands, United Kingdom and Germany – whether it's along the roads, on construction sites, at solar parks, or during events. With our extensive expertise, BUKO Infrsupport combines years of experience with the most modern traffic management solutions. Together, we work to keep road workers and road users safe, day and night, all over the Netherlands. As digitalisation advances, we offer a new generation of traffic measures. We provide advanced solutions and services in traffic management and mobility, demonstrating how data, behaviour, and digitalisation work together to create a better experience for road users and

residents. We are BUKO Digital, the digital innovators in the realm of temporary traffic situations. Our approach centres on data, behaviour, and digital tools. By leveraging scientific insights and cutting-edge techniques, we create smart connections between technology and data. Today, roadworks and events are managed with numerous physical measures designed to keep workers safe, direct traffic, and minimise disruptions. To enhance these traditional methods, we add digital tools from BUKO Digital. These online measures help us facilitate and support road users both before and during their journey, encouraging the desired behaviour around temporary traffic situations. We provide personalised travel advice to those affected by temporary traffic situations, engaging road users and local residents directly in the project.

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CarbonX helps the automotive industry and battery manufacturers by providing a local alternative to graphite for their supply chains. We produce a high-quality, drop-in replacement for graphite at full commercial scale, using our patented technology. This allows us to set up production facilities near gigafactories.

Our active battery material is produced at a rate of 100 tons per day, at a competitive cost, with a lower reduced carbon footprint when compared to graphite. Currently, 95% of battery graphite comes from China, creating a heavy reliance on a single source. This, along with high energy

demands and potential shortages in graphite production, weakens global supply chains.

CarbonX offers more than just a graphite alternative. Its unique structure improves charging speed and stability compared to conventional synthetic graphite. Our battery application department in Delft is fully equipped to provide clients with pouch cell data and support. We produce in EU, US and China.

We are excited to supply you with CarbonX samples and more!

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We are a small company in the Netherlands. Our product is an electric 3-wheel transport scooter with registered brand called Cargobee. It is perfect to use for all kind of deliveries, services and small businesses in the city.

In Europe this vehicle is street legal as a moped in the category L2e , in some countries even possible in combination with a trailer. It's equipped with a 48V75Ah Lithium battery (LiFePO4) with a charger onboard to be able to charge with 220V everywhere.

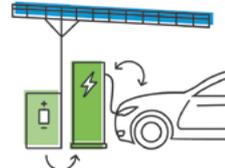
This Light Electric Vehicle doesn't need much space in traffic and can reach places where cars are not allowed to drive or park. The trend in European cities is making the infrastructure of city centres more suitable for pedestrians, cyclists and Light Electric Vehicles with a max. speed of 30 km/h.

To scale up and be more competitive we are looking for a partner/investor with production facilities and distribution network.

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Transport & Mobility • Energy Infrastructure • Circular Mobility



**cenex**  
**nederland**

At Cenex Nederland it is our mission to help those who make the world a better place to live and travel in. We are a not-for-profit consultancy and research organisation providing independent expertise across three key areas:

- Transport and Mobility (how vehicles are used and perform)
- Energy infrastructure (how fleets interact with energy systems)
- Circular Mobility (minimising resource use and extending technology lifespans)

Transitioning to sustainable and zero-emission transport means organisations face questions around fleet and infrastructure demands, costs, regulation, and the need for transformative change. Our consultancy offers strategic guidance, tools, technical expertise, and

project support, helping to navigate this journey. In research and demonstration projects we evaluate technical, socio-economic and environmental performances in real-world environments to help accelerate the transition. Examples of our diverse work include transition plans for municipality, postal services and emergency services fleets, vehicle performance evaluations, lifecycle assessments, circular and eco-design strategies, charging infrastructure needs analysis, charging innovation studies, strategies for shared and LEV mobility, battery swapping models, and more. Amsterdam may be our hometown, but our reach is international as we work with organisations in the Netherlands, across Europe, and beyond. Partner with us and let's drive the road to zero-emission mobility together.

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Cognizant Technology Solutions Corporation is a leading American multinational company specialising in information technology services and consulting. Headquartered in Teaneck, New Jersey, Cognizant is part of the NASDAQ-100. Cognizant is also committed to social responsibility, focusing on diversity and inclusion, environmental sustainability, and community impact.

Cognizant offers transformative mobility solutions through their Mobility+ program. This includes connected, autonomous, shared, and electric (CASE) mobility solutions that provide rich and immersive experiences.

Cognizant provides engineering services for autonomous, connected, and electric vehicles. They support automotive original equipment manufacturers (OEMs) with expertise in electrical

and electronic systems, connected vehicle applications, and emerging capabilities for autonomous and electric vehicles. After acquiring ESG Mobility in 2021, Cognizant rebranded it as Cognizant Mobility. This division focuses on research and development for intelligent, connected mobility, particularly in Europe. They work on the design, integration, and operation of complex electronic and IT systems for connected, autonomous, and electric vehicles.

Cognizant has committed to achieving net zero emissions by 2030. This includes transitioning energy-intensive data centres to public cloud use, designing IoT-enabled smart buildings, and using IoT and cloud solutions in transportation and supply chain applications to improve fuel efficiency and reduce emissions.

**DLS - Drive Line Systems**

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At DLS we have over 55 years of experience in drive line solutions for heavy duty mobility and machinery and stationary equipment. We are a reliable partner for the design and delivery of high performance powertrain products.

As a recent addition, our green mobility and energy solutions help to make drive systems and stationary equipment more sustainable. Our green mobility solutions include emission technology, fuel cells and ePTOs. All are suitable for both new (OEM) and existing (retrofit) drive systems of vehicles and machines.

Our smart mobility solutions use user friendly interfaces and modern control and data communication systems to make vehicle information available in real time. This way you always have up-to-date data of your vehicle(s) at hand,

you can easily generate management information, and based on this make decisions that improve your business operations.

DLS is involved in many sustainable and smart mobility projects, where we are installing electric PTOs on full electric trucks to drive auxiliary functions like a crane, a compactor, hookloaders, etc.

We are also a partner in multiple Dutch grant projects. For the Green Transport Delta – Hydrogen project we are involved in the development of a modular Solid Oxide Fuel Cell (SOFC) system for mobile heavy duty vehicle applications. For the yDrive project we are responsible for the engineering of a Rechargeable Energy Storage System (RESS), which includes the energy storage, as well as all electronics and cooling.

## DOCKR

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DOCKR helps entrepreneurs in the transition to cleaner transportation. We do this by offering the best electric cargo bikes in a flexible leasing concept. For a fixed monthly fee, you ride the best bike that is insured and regularly maintained. If something breaks down, report it in the portal and a mechanic will come within 48 hours. If the mechanic can't fix the problem on the spot, you get replacement transport. It may come as a surprise, but an electric cargo bike saves you a lot of time in the city. Especially in the inner-city, a delivery person works about 60% more efficiently with a cargo bike as opposed to a van. Why? On the bike, you're not hindered by congestion and traffic jams, you simply take the shortest route through the city jungle and you always arrive at your customer's doorstep on time. Oh yeah... and finding a parking spot will never be an issue again.

The number of low-emission zones in the Netherlands will increase dramatically as of 2025. Smart to prepare for this now. Electric cargo bikes are 90% cleaner than diesel vans in terms of CO<sub>2</sub> emissions. As an entrepreneur, you are contributing to cleaner air in the city when you switch to electric cargo bikes.

Buying or leasing a van is always a costly endeavour. Besides you're always attached to it for a longer period. Depreciation, fuel, parking dents, it all adds up. Renting a vehicle for a shorter period is also relatively expensive. If you use an electric cargo bike to deliver your order, you can be sure that you will be saving money as well as time. Especially if the distances you cover and the cargo you transport are both small to medium.

## DOET Association (Vereniging DOET)

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DOET (Dutch Organisation for Electric Transport) has been the industry association in the field of electric transport in the Netherlands since 2009. The DOET Association mainly focuses on representing the interests of market parties active in the field of Charging Infrastructure and Charging Services, one of the fastest growing sectors in the Netherlands.

The Netherlands is at the forefront of the most important change that this sector will face in the coming years. DOET strives for 100% electric mobility in which innovations strengthen green growth. The approximately 80 members of DOET are entrepreneurs and parties that focus a central part of their business operations on charging infrastructure and charging services.

DOET develops activities for them in the field of networking, lobbying, knowledge sharing and subsidies and international (collaboration) opportunities in the field of electric mobility. DOET is heard and is the national and international party that is consulted on electric transport.

**Vision:** The Netherlands as a leading country in Europe in the field of charging services and charging infrastructure for electric mobility.

**Mission:** Nationally and internationally encouraging the rollout of smart charging infrastructure and charging services through collaboration between entrepreneurs (industry), central and decentralised governments, and DSOs.

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Eco-Movement is the leading charging station data platform.

Driven to deliver the best location and pricing data. Our independent platform, tools and services simplify the sharing of reliable charging station data, making it universally accessible. As the leading charging station data platform,

Eco-Movement provides all relevant market players with a reliable and comprehensive source of information. Our data is used by Navigation specialists, Car manufacturers and Map developers to provide a great EV driving experience. Research companies, Consultancies and Governments use our data to fuel their projections, insights, and policies.

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Answering tomorrow's challenges today

Ecorys: Your Partner in driving Smart and Sustainable Impact. Ecorys is a global research, consulting, program management, and communications firm operating in over 150 countries. We focus on the economic and societal impact of systemic changes and transitions. Our clients include government authorities, semi-public sectors, and international organisations.

We offer innovative solutions that balance mobility needs, sustainability goals, liveability, use of space and economic growth. We specialise in:

- Policy and strategy development
- Qualitative and quantitative research
- Impact assessment, appraisal, and cost-benefit analysis
- Monitoring, evaluation, and learning

Showcasing examples of our work. Our experts...

- conduct market research on shared mobility and charging infrastructure and support government authorities in developing policies for promoting and regulating new mobility solutions.
- support the European Commission in developing and implementing tools that help inland ports on the TEN-T network transition to sustainable hubs and improve their environmental performance (Green Inland Ports).
- have assessed the (potential) sustainability impacts of various mobility pilots and programmes and advises on scaling policies and measures.
- draft fuel strategies for various mobility interest groups to achieve zero-emission mobility.
- developed 'Intermodal Links', an online tool to optimise intermodal transport for logistic operators, reducing costs and environmental impact.

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We are a design and engineering studio with a strong belief in our style engineering philosophy, in which design and technical development go hand in hand.

Thanks to this integrated strategy, we develop innovative products together with our clients that not only look good, but also function well. Mobility is our specialty; we develop vehicles in the broadest sense of the word. From passenger cars to commercial vehicles such as heavy trucks, light last mile delivery solutions to cargo bikes. We are active in both the design of the vehicles themselves, as well as the design of production facilities and the management of all processes involved.

We are a multi-disciplinary and multi-cultural team with a versatile background, which makes

us extremely flexible in our services. That is why we not only use our expertise to develop intelligent mobility solutions, but we are also happy to take on challenges in other sectors. As a result, we remain a fixed value for automotive OEMs, and we broaden our horizons in collaborations with small and medium businesses and start-ups. Current ecological and economic challenges require future-proof solutions, where we can no longer design for today without understanding the world of tomorrow. Sustainable solutions are our standard, the ecological footprint of our designs is just as important to us as traditional design criteria such as weight, ease of use or cost price. We can offer this extensive service portfolio because we connect our local presence in the Netherlands with the international competencies within the global EDAG Group.

### Eindhoven University of Technology

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**EINDHOVEN  
UNIVERSITY OF  
TECHNOLOGY**

Eindhoven University of Technology (TU/e) is one of the global frontrunners in academic collaboration with industry. This is unsurprising as the university was founded in 1956 at the request of the region's high-tech industry. The university has been the beating heart of the innovation ecosystem of the Brainport Eindhoven region for many decades.

At TU/e we believe that a future of fully sustainable mobility is possible and within reach. In fact, our students and over 200 researchers who conduct research on mobility related issues, are committed to accelerate the transition to a sustainable future mobile system, often in close collaboration with industry and government partners.

Some examples of our mobility research projects are:

#### National

- EAISI Mobility Lab – Accident free mobility
- iCave – Integrated Cooperative Automated Vehicles
- Xcacity – Working on better cities with less cars
- NEON Research – Accelerating the future of energy and mobility
- RAISE – Robust AI for SafeE (radar) signal processing

#### Some EU projects

- AITHENA – Trustworthy, explainable, and accountable CCAM technologies
- MODI – Accelerates the introduction of highly automated solutions to improve European logistic chains
- EdgeAI – Key initiative for the European digital transition towards intelligent processing solutions at the edge

**EKK Eagle Simrax**

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Eagle Simrax offers a comprehensive range of products and services designed for the automotive industry, specialising in dynamic seals for various applications. Our portfolio includes high-quality seals for electric traction motors, water pumps, and climate compressors. All supported by advanced technology in stamping, PTFE manufacturing, and assembly. With over five decades of expertise, Eagle Simrax not only is a manufacturer, but also acts as a strategic partner, offering full-scale solutions from concept to completion, including custom prototypes and finishing services to meet precise specifications. Our commitment to innovation and manufacturing excellence is evident in our use of Industry 4.0 technology and 6 Sigma methods, ensuring efficiency and effectiveness in all processes. Eagle Simrax stands out as an active international oriented company in the automotive

electro mobility sector due to its innovative approach to product development and commitment to providing comprehensive solutions. The company has made significant contributions to the transition to e-mobility by developing a range of products that enhance the efficiency and reliability of electrified systems within the automotive industry. Our portfolio also includes textured mechanical seals designed to seal high-speed e-drive thermal management systems with minimal friction losses. Additionally, Eagle Simrax is at the forefront of developing a novel power transmission system that facilitates efficient current conduction to the rotor of external excited synchronous machines. We aim to be a total solutions provider, working closely with clients from concept to completion to meet precise specifications and requirements.

**ElaadNL**

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Knowledge and innovation centre ElaadNL researches and tests smart and sustainable charging of electric vehicles. ElaadNL is an initiative of the joint Dutch Grid Operators. Due to their mutual involvement in ElaadNL, the network operators are preparing for a future with electric driving and sustainable charging.

Together with manufacturers from all over the world, we test the latest techniques for charging electric cars, trucks and buses in our Test Lab in Arnhem.

We are investigating the expected growth of various forms of electric transport, the associated charging infrastructure and how to integrate this smartly into the power grid.

ElaadNL's claim to fame is the development of OCPP (Open Charge Point Protocol). It is an open standard communication protocol used in electric vehicle (EV) charging infrastructure. OCPP enables the interoperability between EV charging stations (also known as charge points) and central management systems, known as charging station management systems (CSMS) or back-office systems. OCPP is the de facto global standard for smart charging.

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**Eli** Electric Vehicles

We import the Eli Zero. The Eli Zero is an electric 45km especially designed for the city. Due to it's small size it needs less parking space than a normal car but offers the same comfort. The vehicle is equipped with air-conditioning/heating, power steering, power brakes, rear view camera, parking sensors, etc. etc.

The vehicle is sold mainly to businesses so personnel can commute easily in the city.

**Emobility Consulting**

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E-Mobility Consulting is a consultancy company focused on all aspects of EV charging infrastructure. Michel Bayings started already in 2008 before the first Electric Vehicles drove in The Netherlands, with contribution to the definition and roll out of the first charging networks. In 2010 this became the first nation wide covering charging network in the world! Michel gave advice to many governments and

organisations in the world on how to improve the charge infra systems and how to enable (cross country) interoperability. With CGI (former Logica) and ElaadNL Michel won several awards like ICT Innovation awards and the Computer world awards. Michel is Director of the EVRoaming Foundation and manager of eViolin the European EV charge infra branch organisation.

### EMOSS Mobile Systems

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EMOSS Mobile Systems is a Dutch manufacturing company that specialises in the electrification of on-road and off-road vehicles, ranging from light to heavy-duty vehicles. With over 20 years of experience, EMOSS is a market leader in electrifying vehicles. EMOSS provides a total solution for customers, handling component selection, integration, testing, and functional safety and cybersecurity releases.

EMOSS also offers full vehicle conversions, including on-road homologation, for virtually any truck or vehicle (new or second-hand).

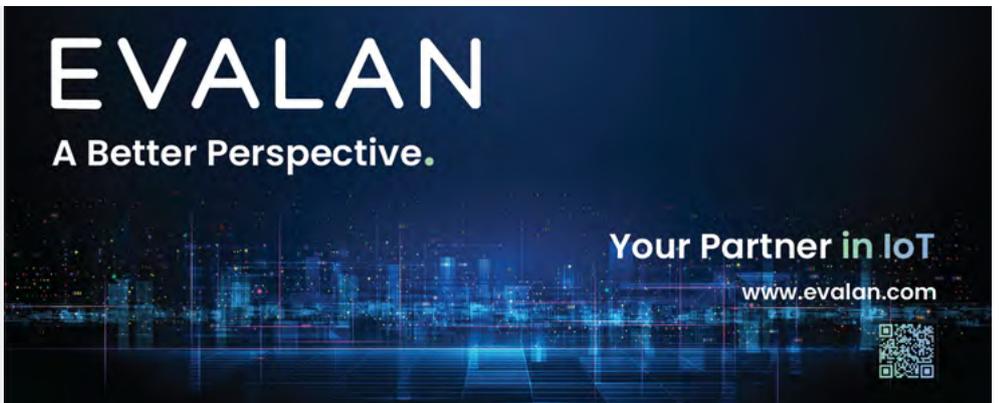
EMOSS gives vehicles a second life and helps its customers achieving their circular economy goals while saving on the investment in a new truck, all within a short and interesting lead time. Our goal is to support our customers with zero-emission solutions and contribute to a cleaner world with a team of bright minds that understand customer needs.

Since 2020, EMOSS has been a 100% subsidiary of Precision Camshaft India (PCL). Precision Camshaft is one of the largest suppliers (>20% market share) to OEMs in the car industry.

### Evalan

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## EVALAN

Evalan is a fast-growing application partner in the field of the Internet of Things. Evalan delivers and operates end-to-end IoT solutions and middle-ware systems for the IoT chain. Evalan operates and maintains these IoT systems on behalf of its customers. These include large international companies, start-ups, scale-ups and the Dutch Army.

One of Evalan's products is WattMaestro, a smart Energy Management System that optimises energy use in a company, a building or a home.

WattMaestro can link all energy assets, brand-independent, such as solar inverters, charging stations, smart energy meters, heat pumps and batteries. This can be done with one gateway.

WattMaestro combines the information from these assets into one online Energy Management platform.

With this information WattMaestro can offer functions such as:

- Monitoring and Performance Tracking
- Energy Use Optimisation
- Dynamic Load Balancing
- Peak Shaving and Load Shifting
- Curtailment based on negative Energy Pricing
- Battery Optimisation
- Imbalance Trading

WattMaestro helps users save money on their Energy bill (or earn more on their Energy production) and at the same time support the reduction in Grid Congestion.

Evalan has been recognised as one of the most innovative Dutch small to medium-sized enterprises several times, most recently in 2023.

## EVBox

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# EVBOX

To build a sustainable future, EVBox empowers businesses and drivers to embrace electric mobility. EVBox's charging solutions lay the foundations for a world where electric mobility is the new normal by giving EV drivers the ability to charge with confidence, allowing businesses to easily enter the market and scale their offering as demand grows, and evolving with the rapid pace of innovation. Founded in 2010, EVBox is now a market leader in electric vehicle charging infrastructure (EVSE) who has delivered over 550,000 charging ports to partners and customers globally. The solutions EVBox is offering include charging stations for residential, commercial, and fast-charging network usage, as well as charging management software.

EVBox's charging solutions range from residential, over commercial and public commercial use. We offer AC and DC charging stations (from 22kW to 400kW). EVBox Care provides partners, charging station owners, and operators with the perfect combination of services, support, and knowledge for the optimal operation and maintenance of EVBox charging stations. A comprehensive portfolio of support and field services include commissioning services, preventative maintenance, support and corrective maintenance services, technical trainings and certification, warranty extensions and care plans.

## EVRoaming Foundation

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# EVRoaming Foundation

## Realising cross-border charging



The objective of the EVRoaming Foundation is to facilitate roaming services for charging electric vehicles and provide transparent information to consumers about charging locations and prices, by use of the open and independent Open Charge Point Interface (OCPI) protocol. The ultimate goal is to allow any EV driver to charge at any charging station: simplify, standardise and harmonise.

The EVRoaming Foundation manages and maintains the OCPI protocol and ensure its availability as a free and reliable standard worldwide. We want to ensure that OCPI is a sustainable and strong protocol that remains accessible in the long-term. We also want to assure the best possible implementations, based on testing and certification services developed within the foundation. The foundation is not

limited to OCPI and can also support other related activities and services. One example of this is our whitepaper on harmonising tariff structures across market actors, to assure a simpler and more transparent pricing for EV drivers. OCPI as the de facto market standard, is driven by market actors. There is a large OCPI community that contributes to new OCPI developments and versions, but also helps with installations, questions from other OCPI users, OCPI-based roaming agreements and addresses the need for EV roaming support in the future. Every market actor is welcome to become part of the EVRoaming community as a contributor, thereby joining the discussions and receiving valuable support for developing strong and open roaming propositions and other EV charging information services, based on OCPI.

## EVTools

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EVTools is a collaborative software platform that provides value for CPOs and site-hosts along the charging life-cycle. The EVTools platform has three modules. 1) Maps: Finding & planning the optimal locations for chargers. 2) Workflow: Streamline and automate the request, placing and commissioning of EV Charging Stations. 3) Asset Management: Use data analytics to upgrade, replace and manage charging stations along the EV charger life-cycle. Through Data APIs integration is easy to use valuable data and external software for efficient charging network management.

EVtools allows joint stakeholders to install EV stations with a 40% cost reduction, in the best locations to reduce CO<sub>2</sub> emission and increase location revenues.

## FIER Sustainable Mobility

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FIER Sustainable Mobility (since 1995) is a specialised consulting and business development company, active in the market of mobility & logistics, focusing on sustainability and innovation. FIER initiates, develops and manages projects which have a strong impact in making mobility more sustainable and contribute to the fight against climate change. For customers and stakeholders in our network, FIER is seen as an ambitious team of experts who do their work based on (scientific) knowledge and experience. "Accelerating sustainable mobility & logistics, FIER gets the job done". FIER consists of a team of 10 dedicated professionals with a large international network. FIER supports (inter)national and local public authorities in defining and implementing their policies in e-Mobility and charging infrastructure.

The knowledge of FIER on economics, logistic and vehicle technology, is used as well for companies in their strategic change towards e-Mobility, including their vehicle portfolio strategy, their charging equipment and/or their services.

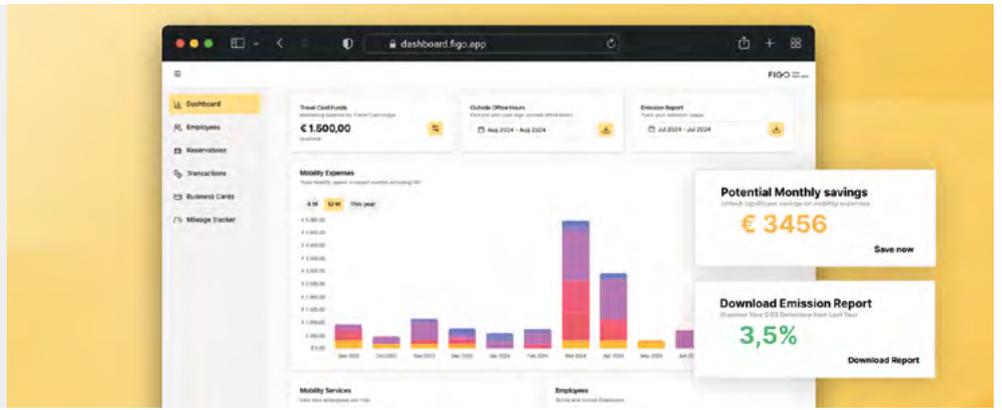
FIER is a renowned partner and developer of EU consortia and projects, due to the drive to create visible results, for example through developing and piloting new mobility concepts and business models.

FIER is (lead) partner in several consortia such as the EAFO-portal, SOLUTIONSPLUS, SCALE, PIONEERS, GEMINI, STREngTh\_M, Bouwplaats van Morgen, ZEBRH, Implementation Hubs and Charging Energy Hubs.

## Figo BV

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# FIGO

Figo Mobility introduces a specialised, cost-efficient solution designed to revolutionise commuting for the B2B traveller. Our automated platform integrates seamlessly with HR systems like Workday to automate eligibility checks for commuting benefits, ensuring only those within the 10km rule receive appropriate travel options such as the NS business card, Figo TravelCard or shared mobility.

Our comprehensive mobility access provides employees with seamless connectivity to public transportation and shared mobility services. The bespoke Figo TravelCard supports domestic and international employee travel, reflecting the company's global operational needs. A key feature of our solution is its cost-effectiveness, priced at just €1.99 per user per month. This

competitive rate coupled with robust automation minimises administrative costs and optimises subscription management.

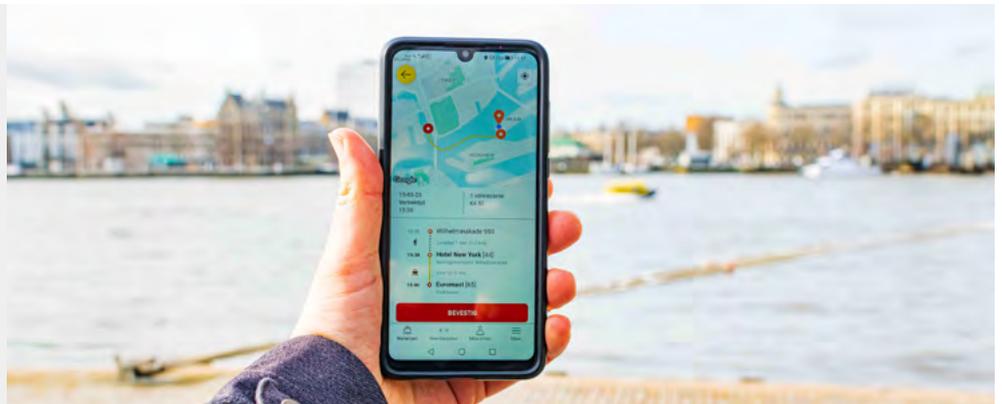
The platform ensures a flexible, reliable travel management experience, facilitating both business and personal travel expense tracking. It includes a user-friendly employee portal available through mobile apps and a custom company dashboard, enhancing user experience by offering real-time access to travel data and subscription management.

Furthermore, our 24/7 customer support and comprehensive ESG reporting capabilities align with the company's sustainability goals by tracking and reporting CO<sub>2</sub> emissions effectively. We started 5,5 years ago and now take care of all mobility needs for companies such as Booking.com, YoungCapital and Adyen.

## Flying Fish Maritime Innovations

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Our company, Flying Fish, is dedicated to speeding up sustainable maritime mobility. We provide cutting-edge solutions such as water mobility systems for managing water taxis, ferries, and other water-based transport operations. These systems include on-board fleet tracking, automatic planning systems, and user-friendly apps for passengers to serve thousands of customers per day. You may compare it to the Uber of sustainable water mobility.

We also offer maritime sustainability hardware. We implemented commercially proven electric propulsion systems that run on batteries or hydrogen fuel cells, enabling emission-free

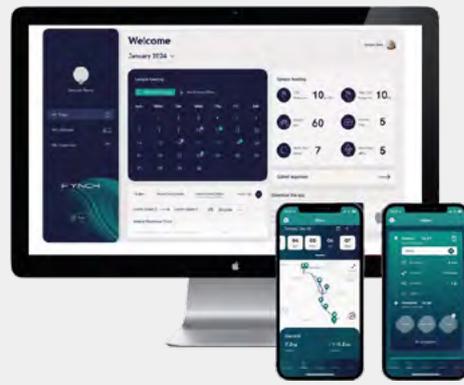
operations for a wide variety of vessels. Additionally, our hydrofoil technology significantly reduces drag, offering energy savings of up to 80% for commercial fast vessels by lifting boats out of the water.

Currently, we're working on impactful projects like setting up zero-emission water mobility systems in other European cities. Here, we offer our water taxi operations systems, hydrogen-electric propulsion systems for commercial shipping and hydrofoil systems, which ensure faster travel with reduced energy consumption. At Flying Fish, we are driving innovation towards a greener, more sustainable future for maritime transport.

**Fynch Mobility**

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Fynch offers a software solution for employers who wish to gain insight into their mobility CO<sub>2</sub> footprint and facilitate employees with a sustainable and flexible mobility policy. With Fynch you can easily set up mobility expense rules and offer your employees a lot of convenience when registering and reimbursing business trips, commutes and work from home days.

This saves time, money, and CO<sub>2</sub>. And you immediately comply with CO<sub>2</sub> reporting laws such as the CSRD reporting legislation.

**GBO Innovation makers**

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We are a leading design studio in the Brainport region, specialising in sustainable product development. As a full-service partner, we support entrepreneurs from sketch to final product using our proven design process, ensuring high-quality outcomes and successful market introductions.

We specialise in the Mobility & Infra sector, where we address rapid urbanisation and technological innovations. We design and develop innovative, eco-friendly transport solutions that contribute to the energy transition and enhance safety. This includes autonomous vehicles, shared mobility, and sustainable infrastructure.

Our vision is a future where mobility and infrastructure contribute to a more efficient, healthier, and greener environment. With our expertise in weight reduction, material innovations, and energy efficiency, we play a crucial role in the development of safe, sustainable transport solutions and infrastructures for a circular future.



### GreenBee

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NTCS GreenBee B.V. (GreenBee) is a leading electric mobility consultancy with a proven track record in promoting sustainable transportation initiatives worldwide. We believe that electric mobility is an essential part of the global energy transition, and our goal is to support governments and businesses in their shift towards zero-emission transportation. Our vision is for electric transport to become the global standard, while our mission is to build sustainable and scalable electric mobility ecosystems in developing and emerging markets.

GreenBee's team of experts brings extensive international experience, with a solid base in the Netherlands, a global leader in electric mobility, EV charging, and integration of these technologies into the broader energy transition.

We specialise in public-private cooperation, interoperability, standardisation, charging services, business models, and government leadership. GreenBee has successfully established EV charging ecosystems in Europe, Africa, Latin America and the Caribbean.

Our expertise empowers stakeholders to make informed decisions and address challenges related to EV charging infrastructure. Through strategic guidance and technical know-how, we ensure that the deployment of charging infrastructure is seamless, user-friendly, and aligned with international standards, enhancing the overall efficiency and accessibility of the EV network.

### ICT Group

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Staying connected in a sustainable world. As a technology service provider, we develop innovative ideas into sustainable solutions that make the world smarter every day. In our focus markets Automotive and Public Mobility we create smart IT solutions that improve the quality of (city) life, promoting economic growth and innovation. Sustainability has taken a prominent place in our daily activities. ICT Group is aware of its environmental responsibility and the functions we fulfil as an employer, supplier, client, and business partner. Sustainable business operation is an integral part of our endeavour to create a smarter world. We create industry-specific software that makes complex systems smarter, including energy management systems, mobility solutions, and in-vehicle software. Like in the examples below. GRE from diesel to electric within five months

thanks to Motar: Converting diesel-powered asphalt machines into electric, emission-free replacements. Thanks to ICT Group's no-code Motar platform, the software for the vehicles' controllers is being developed graphically. This is one of the reasons that allowed GRE to convert new types of machines within five months. Battery Management System essential for Automotive electrification: One of the systems that is crucial for the safe and correct functioning of an electric or hybrid vehicle is the Battery Management System (BMS). It ensures safe battery pack operation by monitoring cell voltages, temperatures, and state of charge. Data standard makes trains more punctual and energy-efficient: A Driver Advisory System that helps trains save energy and run more precisely according to their time schedule.

### Last Mile Solutions

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## Last Mile Solutions

Last Mile Solutions is Europe's leading EV charging and energy transaction management platform. Founded in 1997, Last Mile Solutions has a long history of innovation in sustainable mobility, from pioneering the development of charging stations to providing cutting-edge SaaS solutions for energy transactions.

Our platform is designed to simplify the complexities of energy transactions, providing an independent, scalable, and hardware-agnostic solution for businesses worldwide. By offering a seamless end-to-end experience, we enable organisations in sectors such as automotive,

energy utilities, and fuel retail to integrate sustainable energy practices into their operations.

Last Mile Solutions connects over 209,000 charge points, managing a network of more than 600,000 roaming charge points across 22 countries. Our services include comprehensive billing, payment processing, and tailored solutions for fleet management, business payments, and energy utilities. With a core focus on independence, adaptability, expertise, and personalised service, Last Mile Solutions aims to lead the global energy transition, transforming energy into value for a sustainable future.

### Loginex

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With Loginex, companies in the logistics chain can generate CO<sub>2</sub> emission reports for both their own business and for their clients and customers. Visma and UC Group are responding to European legislation that, from 2024 onwards, requires companies to produce CO<sub>2</sub> emission reports.

In addition to measuring and allocating, Loginex can also highlight opportunities for reductions. Depending on the cause, various measures can be taken to reduce emissions. In almost all cases, CO<sub>2</sub> reduction also leads to cost savings for both companies and customers.

Loginex Carbon Intelligence provides insight into CO<sub>2</sub> emissions across the entire supply chain based on the EN16258 standard and ready for ISO14083. The amount of emissions can be accurately assigned to all individual participants in the chain. Loginex analyses emissions per shipment, per customer, per mode of transport, and per vehicle. Reports are prepared according to European standards.

## MobilityLabel

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# MOBILITY LABEL

In an era where sustainability and employee well-being are becoming increasingly important, the MobilityAnalyst tool emerges as a vital resource for employers. This tool is designed to analyse commuting patterns and provide actionable insights to promote sustainable and active commuting. By leveraging data analytics, MobilityAnalyst helps organisations understand how their employees commute and identify opportunities for promoting greener and healthier commuting options.

Many employers are working on their organisation's commuting policy. Some from the ambition of sustainability, some from new reporting requirements, the need for flexible employment or because of a constant lack of parking spaces.

Whatever the reason, commute policy change starts with facts: What exactly is your organisation's cycling potential? How many people can travel to work by public transport? And what if you combine cycling and public transport? How much CO<sub>2</sub> can you save with smarter commuting policies? How many parking spaces can you save? And what is the impact on employee vitality?

With the MobilityAnalyst tool, you can easily discover the improvement potential yourself. Once we have processed your data, performed necessary calculations and prepared your own dashboard, you can simply play with all kinds of policies and immediately see their impact of that on your organisation in clear maps, graphs and overviews. Self-explanatory and no-nonsense.

## Mobycon

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# MOBYCON

Mobycon is a Dutch-Canadian consultancy specialising in developing and implementing innovative and sustainable mobility solutions nationally and internationally. As a multi-disciplinary team of traffic engineers, urban planners, economists, marketeers, and human geographers, Mobycon delivers diverse, integrated mobility products and consulting services. Our work supports the development of healthy, connected, liveable communities working to reduce car dependence. With almost 40 years history operating in the Netherlands and across Europe, Mobycon began actively applying Dutch knowledge to support mobility innovation in North America in 2012. Three years later, Mobycon launched our office in Ottawa, Canada in the spring of 2015. In 2023, we expanded our footprint by opening our newest office in Portland

(OR), USA. Our team is growing, and we now operate from offices in the Netherlands, Canada, USA, and Germany. We are dedicated to sharing our expertise to create better living places for all. Mobycon aims to reduce the world's dependence on cars by integrating other mobility solutions. It's all about improving connectivity through enhanced transit options such as walking, cycling, and public transit, ensuring they work together seamlessly and reducing the reliance on cars. Our services encompass a wide range of offerings, from training and capacity building to study tours and masterclasses. We also provide planning, design, coaching, and even assistance with community engagement, marketing, and storytelling. This diverse portfolio reflects our commitment to supporting various aspects of sustainable mobility.

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MO-EV strives for enabling the earth with more electric vehicles (mo-ev), through its comprehensive service model in which it delivers a light electric vehicle (LEV) tailored to your last mile delivery need. The offering includes a range of 2 and 3 wheels LEV, with cargo loads ranging up to 3,000 litres and includes financing, insurance, preventive maintenance, damage repair, fleet management tools and customised client specific branding. Our vehicles are manufactured by leading LEV producers and co-designed by us with our 15+ years of experience and data. Our 24/7 service network spans the Netherlands and Belgium.

**Monotch**

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Founded in 2015, Monotch has rapidly become a global leader in the smart mobility sector. Our Traffic Live Exchange Platform (TLEX®) is the backbone of digital infrastructure, enabling seamless integration across the mobility ecosystem. We provide the essential foundation for connected mobility worldwide by facilitating real-time data exchange and ensuring interoperability.

Monotch's innovative solutions are designed to be more than just theoretical – they are practical, proven, and ready for immediate implementation. We focus on creating secure, efficient, and sustainable systems that deliver tangible

benefits. Our platform is built with a relentless commitment to cost-efficiency and safety, reshaping the mobility landscape by driving significant advancements in both areas.

We extend our impact beyond technology, ensuring that our solutions deliver real-world results for all stakeholders – road users, authorities, partners, car OEMs, and smart cities. Monotch is committed to sparking a chain reaction of improvements that enhance mobility efficiency, increase safety, and contribute to a more sustainable future. Safe, reliable, and impactful – Monotch is at the forefront of the global smart mobility revolution.

### Nedal Aluminium BV

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Based in Utrecht, the Netherlands, Nedal Aluminium develops, produces and sells aluminium solutions to clients all over the world. With over 85 years of industry expertise, Nedal is committed to quality, reliability, and sustainability.

Nedal's lighting column division specialises in manufacturing smart, multi-functional and sustainable lighting columns. Our goal is clear: to empower cities in their transition to smart, eco-friendly urban environments.

A key innovation in this mission is our CityChargeR – a unique combination of a charging station and a lighting column. It is designed to meet the growing demand for charging points for electric cars in space-limited urban areas. By

integrating two essential urban functions into one, the CityChargeR not only maximises space efficiency but also contributes to cleaner, more organised streets. This innovative solution ensures easy access to charging stations while supporting the shift towards a greener, more sustainable future.

Additionally, Nedal is contributing to a futuristic infrastructure with products like solar-powered lighting columns and Smart City lighting columns equipped with 4G/5G and WiFi enclosures. The solar-powered column charges itself using cylindrical solar panels, making it an ideal solution for areas where conventional infrastructure is hard to install. This not only reduces carbon footprints but also provides a practical, off-grid lighting solution.

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Netherlands Enterprise Agency

The Netherlands Enterprise Agency stimulates entrepreneurs in sustainable, agricultural, innovative and international business. It aims to improve opportunities for entrepreneurs, strengthen their position and help them realise their international ambitions with funding, networking, know-how and compliance with laws and regulations. As a government agency, it operates under the auspices of the Ministry of Economic Affairs, and its activities are commissioned by the various Dutch ministries and the European Union. The Netherlands Enterprise Agency runs a number of programmes and supports business initiatives with various grant schemes.

Energy and Climate is one of the agency's key topics. The Dutch government is investing billions of euros in energy efficiency, sustainable energy and CO<sub>2</sub> reduction. In line with this, the Netherlands Enterprise Agency supports Dutch and international entrepreneurs and researchers in developing sustainable projects related to energy, climate and the environment. Innovation and public-private partnerships are key to the Dutch approach: the government, private sector, and academia co-operate on topics such as sustainable energy technologies, green materials, built environment, sustainable mobility, chain efficiency, sustainable electricity, new gas, and greenhouses as a source of energy.

### NPS Driven

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NPS Driven is a premier provider of power train components, power generation, and engine solutions for industrial and marine markets. Our team of skilled engineers and designers specialises in providing cost-effective solutions for the most challenging applications, focusing on cost-of-ownership and performance, complying with the strictest emission legislation. We are dedicated to providing trustworthy, premium products for marine and industrial applications. We offer a complete range of services, including design, engineering, manufacturing, installation, and maintenance. Our extensive selection of products includes those from well-known brands such as John Deere, DAF Paccar, Nanni, and HYUNDAI, in addition to our OEM brands like Zenoro, Ioda, and Xeamos. Within the next ten to twenty years, sustainably produced hydrogen will be widely accessible,

providing a new future for the internal combustion engine. NPS Driven is fully committed to the energy ecosystem of the 21st century, in which hydrogen will be the primary fuel. This means sustainable use of combustion engines that best match the familiar mechanical engineering concepts and the applications of diesel engines for current customers. The transition to hydrogen-based combustion engines is an exciting and quickly accessible alternative that requires minimal additional training and adaptations. Our first hydrogen combustion engines are running in the TNO laboratory as a replacement for the diesel generator engine. NPS Driven started the first field tests in 2024. An extensive field test with selected partners will take place in 2025. NPS Driven expects to launch the hydrogen engine in 2026 as the first option to use hydrogen as an alternative to diesel.

### NXP Semiconductors

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NXP Semiconductors N.V. (NASDAQ: NXPI) is the trusted partner for innovative solutions in the automotive, industrial & IoT, mobile, and communications infrastructure markets. NXP's 'Brighter Together' approach combines leading-edge technology with pioneering people to develop system solutions that make the connected world better, safer, and more secure. Built on 70 years of combined experience and expertise, the company has approximately 34,500 employees in more than 30 countries and posted revenue of \$13.28 billion in 2023. Find out more at [www.nxp.com](http://www.nxp.com). State of the art radar technology will make traffic safer. Modern cars are equipped with an increasing number of sensors, such as radar, to improve safety. In order to use sensors on a large scale they need to be affordable, compact and

reliable. NXP's radar technology meets these requirements and plays a critical role in active safety functions, such as adaptive cruise control, blind spot monitoring and autonomous emergency braking, and are also essential to self-driving cars which use a radar cocoon setup with multiple sensors around the car to allow for a 360-degree view. About 1.3 million people die in road accidents every year. NXP believes that radar will play a key role in reducing that figure significantly, making traffic across the world much safer than today. The use of more radars per car can also increase the safety of road users in and around the car. Commercial trucks will continue to expand their use of radar sensors to eliminate the notorious 'blind spot', which is now often the cause of accidents with pedestrians and cyclists.

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## Impact starts with insight



Panteia B.V. is a Dutch consultancy firm which supports policy and decision makers, to help them formulate, monitor and evaluate strategies for an effective strategy in different fields, including the economic and transport sector, labour market, health and education. To do so, we apply unique knowledge bases and innovative methods, supported by independent market and policy research. Together with our clients we aim to contribute to sustainable, social and economic progress. Our areas of interest are: (1) Transport and mobility; (2) Society and Economy; (3) Data & Analytics. Our ISO 20252 and 27001 Quality Certificates testify to the precision with which we execute our tasks. For over sixty years Panteia, has specialised in research, consultancy and training services in transport, infrastructure, logistics and mobility. Our activities cover a broad field, encompassing all the economic and social aspects of both freight

and passenger transport, for all modes. In the field of transport, Panteia has wide-ranging experience for both the national and international markets. Recently we have worked for various in the European Union, Balkans and Caucasus, as well as in Ukraine, Russia and Belarus. Africa (Algeria, Botswana, Cameroon, Central African Republic, Chad, Egypt, Ethiopia, Uganda, Rwanda, Zambia), Central Asian Countries and Indonesia, Latin America (Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, México, Panamá and Suriname). Having worked in over 50 countries, Panteia has an extensive track record in international consultancy. Our clients include the World Bank, African Development Bank, European Bank of Reconstruction and Development EBRD, European Investment Bank, Asian Development Bank, European Commission, Dutch and other national governments.

## Peblar

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At Peblar, we are dedicated to advancing sustainable mobility by producing reliable, easy-to-use EV chargers. As a fast-growing brand launched by Prodrive Technologies, we leverage our fully vertically integrated production facility in Eindhoven to maintain strict control over quality and supply chain, adapting quickly to market changes and innovations. With all steps, from design to production, under one roof, we ensure our products exceed industry standards. Our chargers are engineered with longevity in mind, reducing waste and promoting efficient resource use. Our integrated PCB technology enhances reliability and efficiency while minimising environmental impact. Built to last, our chargers are ideal for home and semi-public use, supporting a greener planet and optimising the EV charging process.

Key features of Peblar EV chargers:

- Aesthetic design: Seamlessly blends into any environment
- Rocksolid: Built to withstand time and the elements
- Safe & secure: Prioritises safety for a reliable and secure charging experience
- Quick installation: Easy and fast installation, getting you connected sooner
- Easy to use: Intuitive and accessible for all

We prioritise responsible, sustainable growth, ensuring quality always takes precedence over quantity. Our dream is simple: to see a Peblar charger at every street across Europe, bringing a smile to every user and contributing to a sustainable future.

### RAI Automotive Industry NL

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RAI Automotive Industry NL is the cluster organisation of the Dutch automotive industry, and related knowledge and education centres with about 200 members.

RAI Automotive Industry NL supports the innovative Dutch automotive sector by representing the sector, nationally and internationally. An important basis is formed by its national ecosystem that is part of the innovative Top Sector High Tech Systems & Materials (HTSM), in which industry, education, science, and governments parties actively work together.

The Netherlands is one of the most innovative countries globally, according to Global Innovation Index (PwC), Automotive Disruption Radar (Roland Berger) and Autonomous Vehicles Readiness Index (KPMG). RAI Automotive Industry NL promotes the maintenance of the international market position of its members and promotes the business climate in The Netherlands. In particular in relation to the innovation ecosystem.

Our purpose is to:

- Connect internal and external stakeholders
- Represent the Dutch Automotive Industry
- Facilitate new initiatives and joint interests
- Inspire and energise
- Share best practices and intelligence
- Stimulate cooperation and innovation

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Resato Hydrogen Technology, a leader in Dutch industry, is at the forefront of sustainable hydrogen infrastructure development. With over 30 years of expertise in high-pressure technology, Resato provides tank solutions for cars, trucks, and buses operating at 350 or 700 bar, demonstrating a steadfast commitment to excellence.

With more than 50 public and private hydrogen refuelling stations across Europe, Resato Hydrogen Technology is a dependable partner in promoting sustainable business practices. Their dedication to sustainability, safety, and efficiency drives the transition towards zero-emission mobility, ensuring a greener future.

### Royal HaskoningDHV

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Royal HaskoningDHV has been an independent consulting engineering company since 1881. With 6,000 professionals worldwide we innovate by collaborating with customers and partners to have a positive impact on people and planet. We understand that mobility is undergoing a seismic shift. Exponential population growth and increased consumption of goods, alongside increased appetite for low emission zones and new modes of transport are placing new demands on mobility networks around the world. The result? A fierce battle for every square metre of public space, bringing challenges for planners and policy makers. At Royal HaskoningDHV, we combine cutting-edge technology, tailored strategy, and expert implementation to enable you to navigate the transition to sustainable transport. Together we can shape the mobility system of tomorrow.

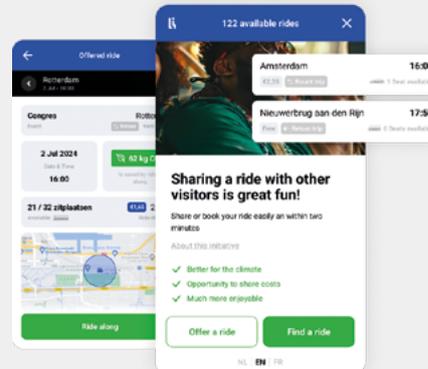
Current projects include:

- Guiding 40 major Dutch cities towards realising Zero Emission Zones in their inner cities by 2025, from impact study to enforcement.
- Redesigning major rail stations like Leiden as well as co-developing broad public mobility systems to keep cities liveable and rural areas reachable.
- Supporting road authorities to identify high accident risk locations and proposing targeted safety measures, providing road users with correct and timely information.
- Co-creating empathetic, inclusive, and accessible mobility solutions by working closely with various stakeholders to learn from diverse mobility experiences.

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# slinger

Slinger: revolutionising event transportation with sustainable ride sharing. Slinger is a cutting-edge platform that makes sustainable mobility easy and accessible by promoting ride sharing for event attendees. Designed for event organisers, Slinger allows visitors to effortlessly share rides, reducing traffic congestion, parking challenges, and harmful emissions.

The platform's seamless integration through a simple widget on event websites means setting it up is quick and effortless. Trusted by major industry players such as NOC\*NSF, Mojo Concerts, Easyfairs, KNVB, and the Johan Cruyff Arena, Slinger is already transforming transportation. Slinger's impact is growing

across borders, being active in six different markets.

By connecting event-goers traveling to the same destination, Slinger not only cuts down on travel costs but also fosters a sense of community and environmental responsibility. Event organisers also benefit from an insightful dashboard providing valuable data on travel patterns and CO<sub>2</sub> savings.

Join the movement towards greener, more sustainable events with Slinger. Together, we can reduce carbon footprints, promote social connection, and make shared rides the future of event transportation.

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At Sorama it is our mission to make the world sound right. Whether it is silence or noise, our goal is to make it sound right for you. We contribute to a better sounding world by driving innovation to make sound insightful. The visualisation of sound empowers people with actionable data to reduce unwanted noise.

Based in Eindhoven, the Netherlands, we work with a team of about 85 people. By developing innovative acoustic devices, we enable people to positively influence environmental noise and at the same time reduce health risks, caused by noise pollution. This is how we aim to improve the quality of life for people all over the world.

For more information go to [www.sorama.eu](http://www.sorama.eu)

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The Netherlands Organisation for Applied Scientific Research (TNO) is the largest independent Research and Technology Organisation in The Netherlands, established by law in 1932. As a trusted independent science and innovation organisation we collaborate closely with the private sector, governments and universities to drive technological breakthroughs. Leveraging our independent role, we assist industries in developing low-emission technologies and support governments in crafting effective policies to promote the uptake of sustainable transportation solutions. TNO supports industry partners by refining powertrain technologies, tailored for specific heavy-duty applications. From hydrogen trucks for emission-free logistics to battery powered construction

equipment, we assist partners with R&D to devise feasible, sustainable solutions. Our development of an H<sub>2</sub> Internal Combustion Engine, for instance, is a promising option to drastically and quickly reduce CO<sub>2</sub> emissions of heavy-duty equipment, using trusted technology.

TNO supports industry on how to interpret and meet future emission regulations and supports governments developing effective zero emission strategies. TNO's Innovation Centre for Sustainable Powertrains (ICSP) measures, assesses, and validates actual energy consumption and emissions of engines and powertrains. For real-world validation of vehicles, TNO offers unique testing facilities such as the Altitude-Climate Chamber, capable of mimicking any driving condition on earth for any type of powertrain.

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## TRANZER

Tranzer offers a one-stop-shop technological solution for European public transport planning, booking and payment, integrating in any mobile app or end-user platform ('EUP') via an application programming interface ('API'). The technology can also be integrated through an international Web Portal which is an external link that is easily connected to any app or website. By integrating Tranzer's API, EUPs get access to unique, in-house developed, state-of-the-art technology, that facilitates ticket matching with multimodal, cross-border journey planning, while Tranzer takes care of immediate clearing and settlement. The Company offers 8 modality types

including train, tram and bus, while connected to major public transport mobility operators in 11 countries throughout Europe such as NS, Deutsche Bahn, SNCF and OBB. Tranzer covers approx. 75% of all railway kilometres throughout Europe. In addition to the API/Web Portal, Tranzer offers a B2B mobility pass allowing travellers to seamlessly travel with a mobile ticket in their digital smartphone wallet by tap in-tap out. EUPs that use Tranzers technology are e.g. 9292, FreeNow, AirFrance, Multitankcard. The Company was founded in 2017 by Paul Rooijmans and Sanneke Mulderink and has various shareholders in the mobility space.

### TRENS Solar Trains B.V.

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TRENS Solar Trains B.V. in the Netherlands develops and produces electric road trains, specifically aimed at sustainable urban mobility of goods (city logistics) and passenger transport (visitors and tourists).

The vehicle consists of a powerful tractor followed by wagons and meets the mobility need for the last mile between a central HUB for goods or people and their destination in an urban area.

The characteristics of this smart vehicle are:

- It offers ZERO EMISSION mobility: the vehicle is 100% electric. Lithium batteries ensure reliable and safe transport.
- Solar cells provide extra energy. These cells are integrated in the roofs of the vehicle components.

- No truck driving license is required for the TRENS road train.
- Large loading capacity and manoeuvrable: the road train combines the volume of a truck with the manoeuvrability of a commercial van.
- The slim design enables efficient loading/unloading without blocking the road.
- Comfortable passenger transport.
- The low axle load makes canal quays and bridges in vulnerable parts of inner cities easily accessible.

And that without emissions. After all: It's all electric!

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Based on the philosophy that everyone has the right for safe passenger transport, we develop innovative mobility solutions. We design and manufacture all products to transform a brand-independent vehicle into multifunctional wheelchair accessible minibus. Safety and user-friendliness are key points for every new solution, which all comply with European guidelines for M1 passenger transport.

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Udenco is a leading manufacturer and developer of cutting-edge EV charging systems, specialising in private-label and white-label solutions for the DC market.

We offer complete innovative portfolio of all-inclusive AC/DC and DC/DC white label EV chargers, such as 40kW up to 800kW DC/DC chargers, battery systems with DC/DC connectivity, and direct solar integration with DC/DC bus connections, enabling the seamless operation of local grid and DC/DC networks.

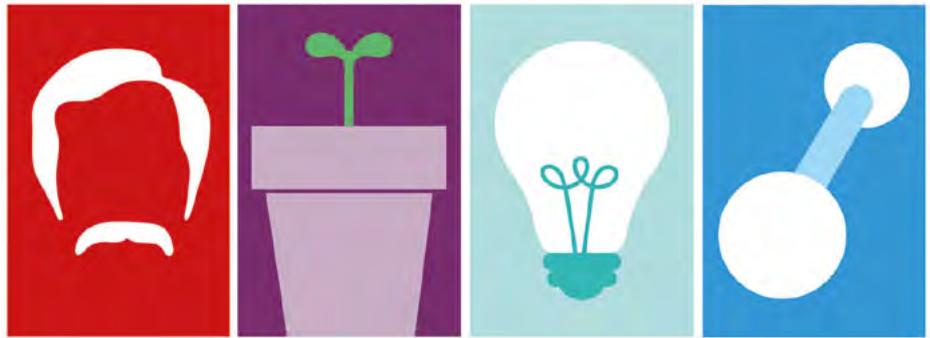
With Udenco, your company saves valuable time, energy, and resources in terms of production and time-to-DC charger market. With our customisable private-label and white-label solutions, we allow our clients to establish their own distinct brand identity while benefiting from our state-of-the-art technology.

Udenco is your trusted partner in electrification. Let's shape the future of mobility, one charge at a time.

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university of  
 groningen

wubbo ockels school for  
 energy & climate

The Wubbo Ockels School for Energy and Climate at the University of Groningen is a key player in advancing sustainable and smart mobility. It brings together researchers, entrepreneurs, students, and policymakers to drive innovation in clean, efficient, and intelligent transportation systems. By blending academic research with industry expertise, the school supports the transition to carbon-neutral mobility solutions that impact both local and global transportation networks. The school's focus on learning communities encourages collaboration on real-world mobility challenges, from electric vehicles (EVs) to hydrogen fuel cell technologies. These communities develop, test, and refine smart mobility systems that integrate with urban infrastructure, enhancing sustainability and reducing emissions. With state-of-the-art facilities and partnerships

across sectors, the school leads projects like: **Electric and Autonomous Vehicles:** Developing advanced EV technologies and autonomous systems, integrating them into smart grids and cities.

**Hydrogen Mobility:** Advancing hydrogen-powered vehicles and infrastructure, focusing on public transit and heavy-duty transport.

**Smart Infrastructure:** Creating intelligent transportation systems to optimise traffic and improve safety.

**Sustainable Urban Mobility:** Designing integrated urban planning and mobility solutions for liveable cities.

**Battery Research:** Developing next-generation batteries with longer lifespans and sustainable materials, essential for future energy storage solutions in various applications.

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At VDL Groep, we believe that true success stems from the pride and dedication of the people who develop and build our products. Our curiosity drives us to continually strive for excellence, inspiring us to create high-tech innovations that enhance well-being and prosperity for all. We are committed to excelling not just for today, but for future generations as well.

VDL Groep develops and produces a wide range of industrial products, from precision components to advanced finished products. Our activities are categorised into the 'five worlds of VDL': Hightech, Mobility, Energy, Infratech, and Foodtech. Each of these worlds has its own unique characteristics and challenges, but they are all united by a common denominator: a unique combination of thinking and doing. This is what sets us apart.

Some of our projects and products:

- 1. Public Transport Experience:** The New Generation Citea buses set the standard for zero-emission public transport with over 200 million electric kilometres in more than 10 countries. VDL Bus & Coach delivers around 1,200 buses annually and has won several awards, including the RedDot Award and IF Design Award.
- 2. Transport and Heavy Machinery:** VDL Special Vehicles is building fuel cell trucks to support decarbonising logistics and the European hydrogen ecosystem. VDL ETS is electrifying construction equipment to create an emission-free world.
- 3. Automated Vehicles:** VDL Groep specialises in zero-emission vehicles and automated transport solutions, with over 200 port AGVs in operation.

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V-tron focuses on the deployment of telemetric technology in the mobility sector since 2007. Our three pillars support organisations in and around the Automotive sector with products, services, and projects. Communication of digital data always plays the main role in this. Our product line supports fleets in safe, sustainable, efficient, and effective use. We offer governments and road authorities services to improve digital infrastructure in their areas of operation. Our projects continuously pave new roads for innovative vehicle automation.

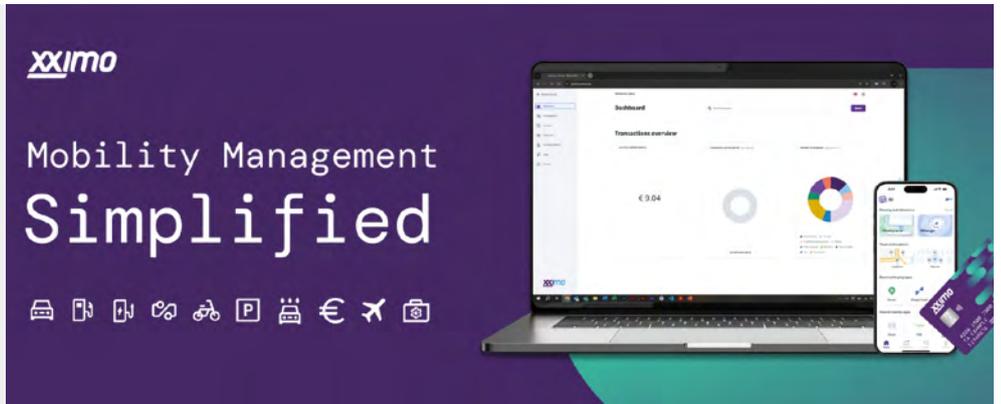
Previous projects, such as Concorda (smart highways), ISA-FIT (digital data infrastructure), ReVeAL (urban access) and 5G Blueprint (cross border connectivity) proved V-tron's ability to deploy connectivity for localisation, vehicle integration, vehicle automation, and remote control of driving tasks in the vehicle. In ongoing projects, such as FlexShield (data-security), Smartzone Buffer (smart-city), yDrive (electric trailer), CEYAS (automated yard movement), and DITM (tele-operation), we will further develop these facilities.

We believe that autonomous driving will become a reality in the long term, but until then, automated mobility will play the leading role. As OES, we focus on transition technology to accelerate the future through the aftermarket.

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leads the way  
in mobility.

XXImo is a leading mobility payments platform that empowers companies to enhance and expand the mobility solutions they offer their corporate clients. We provide a comprehensive suite of tools designed to meet the needs of modern business travel and commutes, offering flexible payment options, multi-modal travel support, and simplified expense management, while capturing all travel data and consolidating all mobility spend on one VAT invoice. Founded in 2011, XXImo operates at the intersection of innovation and sustainability. Our platform integrates seamlessly with existing systems, enabling multinational companies to navigate the complexities of local and European regulations while providing their customers' employees with easy access to a wide range of mobility services – from public transport and shared mobility to EV charging and international travel.

XXImo is committed to supporting sustainable practices. Our virtual mobility cards, which can be added to digital wallets, eliminate the need for physical plastic cards, along with the associated printing and delivery processes. This aligns with global efforts to reduce environmental impact. Additionally, we enable some of the largest employers in the Netherlands to track and report their employees' carbon emissions, ensuring compliance with the latest environmental legislation in Europe.

With a focus on technological excellence and sustainability, XXImo is a preferred partner for businesses aiming to deliver sustainable, efficient, and user-friendly mobility solutions tailored to the evolving needs of corporations and their employees across Europe.

This is a publication by:

**Netherlands Enterprise Agency (RVO)**

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Would you like to present your company profile worldwide in the next edition of the Dutch sustainable and smart mobility guide? Please send your request to ICEP-dumo@rvo.nl.

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b=bottom, m=middle, t=top, l=left, r=right

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Netherlands Enterprise Agency

**NL**

**Netherlands**