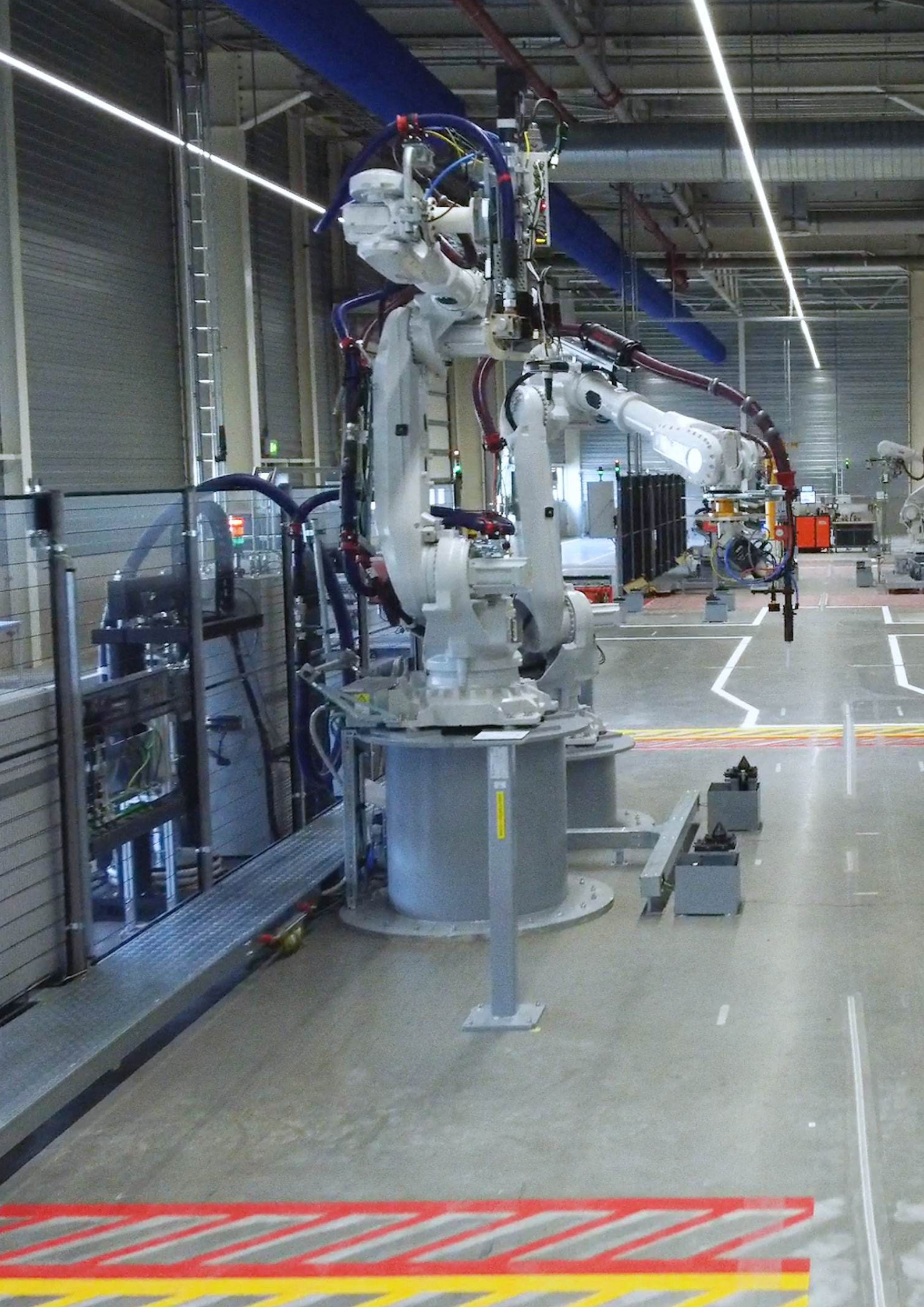
# ACCELERATION AGENDA DUTCH AUTOMOTIVE INDUSTRY

AUTOMOTIVE INDUSTRY NL



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# 1 Management summary

The overview before you looks into the significance of the automotive (manufacturing) industry for the Netherlands, both now and in the future. This overview is based on interviews, discussions, and workshops with more than 50 representatives [1], primarily from national and international businesses, knowledge institutions, and governments, and on desk research. The actions and collaborations between industry and government that are being called for are a direct result thereof. These actions and collaborations are endorsed by leading companies in the sector. The underlying process was completed in part thanks to cooperation with, and a subsidy granted by, the Ministry of Economic Affairs. The Dutch automotive industry represents one of the largest industrial and export activities in the Netherlands. The statement 'The Netherlands has hardly any automotive industry' is a major misconception, which could become a painful reality in the future. Especially now that Zero Emission (ZE) has become central and the Chinese and American governments are heavily supporting their industries. The automotive (manufacturing) industry is in many ways important for the Netherlands (employment, economy, innovation, and education).

**Automotive sector in figures**

In 2025, the automotive sector represents a large and important industrial activity in the Netherlands, supported by top-level knowledge institutions. (In Europe, it is even the largest industrial activity and largest R&D investor [2]). A total of 55,000 employees works in the Dutch automotive industry and they jointly generate a turnover of □35-40 billion [3], of which more than 85% is in export. In the Netherlands, approximately 100,000 heavy trucks over 16 tons (Heavy Duty or HD) are manufactured annually [4]. This corresponds to 30% of the trucks in this class sold in Europe [5]. Dutch suppliers deliver high-quality components and systems to the automotive industry (often also to the very large passenger cars market) and account for approximately half of the automotive turnover in the Netherlands [6]. Multiple companies hold a global top 3 position in that part of the market they are active in (for example NXP, VDT Bosch, and HERE). The transition from diesel to ZE propulsion and the increasing importance of software in and around the vehicle also create market opportunities for adjacent market segments (charging infrastructure, hydrogen infrastructure, and ICT). The large market share the Netherlands holds in HD, among others, is not a given and is coming under pressure rapidly. One of the most clearly visible factors proving this is the transition to zero-emission technology (currently almost everything is still diesel driven). Less visible, but still an irreversible development, is the increasing digitalisation and automation, also at vehicle level. Due to these transitions the cards are being reshuffled. However, the dominance of software and data (and of the associated tech companies from outside Europe) and the availability and reuse of raw materials will also play an increasing role. These are all developments that far exceed the scope of individual companies and even an entire sector but that are of great importance for these companies and/or their business location.


*Fig. 1. More than 100,000 heavy trucks are manufactured annually in the Netherlands*

## Transition to sustainable transport

Every day we read reports about the declining market share of European car manufacturers, which are under pressure from the continuous expansion of manufacturers from outside Europe. Additionally, the fact that the transition to zero-emission technology was initiated too late, also has its effects. The passenger car and truck industries are closely intertwined, particularly in the supply chains. If the Dutch truck industry and supply chain follow the same path as the passenger car industry, countless jobs will be at risk.

Prevention is better than cure, and anticipation better than waiting. For businesses, the conditions under which they and their competitors operate in the coming years will be more than ever before a determining factor. Governments and their policies form an important part of these conditions. For example, at least 30% of the fleet sold for the European truck industry must be ZE by 2030 (under penalty of fines that quickly escalate to a level that directly threatens a company's existence [7]). By 2040, this percentage is even increased to 90%. Hence, this involves unprecedented speed and scale. But especially dependencies that far exceed the automotive industry. Truck manufacturers are investing massively in ZE technology and the associated production facilities, so they can produce the required volumes.

## Importance of clear policy and rapid development infrastructure

However, the necessary infrastructure (electric charging infrastructure and hydrogen refuelling infrastructure) is becoming available (too) slowly. Causing the market to adopt the transition to ZE too slowly, creating uncertainty, which hampers investments in the logistics sector. The necessary 30% may soon be producible but will not be purchased.

With respect to infrastructure other sectors and especially governments play an important role. The transition to ZE and other transitions create new playing fields with new profound dependencies, often heavily impacted by other sectors and governments. Moreover, foreign governments often strategically use these transitions and dependencies to exercise control and to manoeuvre their own industry in a favourable position (with China and the US as clear examples). However, even within Europe, there are many examples of governments that prioritise supporting their own industry's position. For instance, Germany is granting government subsidies and guaranteeing grid connections to realise a (motorway) network of more than 130 public HD (1+ MW) charging stations by 2028. The Netherlands will start granting concessions for service areas along the motorway network in 2028 [8]. And does not have a clear plan or direct control at implementation level (available locations, permits, and grid connection). The emphasis is on urban ZE zones. However, the important logistics corridors are expected to have the greatest economic and CO2 impact. The lack of direction causes delays, and as a result, the Netherlands risks losing its market share and failing to meet our societal goals regarding sustainable mobility. Government policy will make all the difference here.

The industry is not asking to reverse what has been set in motion by changing regulations for example, but rather for specific **industrial policy** in the field of automotive also in the Netherlands. Such policy is urgently needed to prevent an **uneven playing field** in relation to our surrounding (and other) countries. This initially concerns the HD segment but will also have an impact on the transition in the logistics sector. Countries that have good (charging) infrastructure and energy prices will be the first to make major investments in a ZE fleet. This threatens to cause a shift in investments that could ultimately also trigger a shift in (main) business locations. Policy is needed to prevent **tens of thousands of jobs from silently disappearing**, jeopardising one of the important pillars under the high-quality industry in the Netherlands. A specific policy that ensures that the Dutch government stands up for its own industry both in the Netherlands and abroad. At national level, additional measures are needed to accelerate **the construction of HD charging infrastructure and the availability of hydrogen** (both infrastructure and (green) hydrogen itself) along the important logistics corridors. In the area of **charging and hydrogen infrastructure**, the industry is initiating several **stimulus projects** and is requesting the government to also give maximum priority to these projects. The projects are part of an **Acceleration Agenda** (more information can be found further in this agenda) in which the sector proposes several stimulus programmes in the fields of electrification, hydrogen, battery technology, digitalisation and automation, and the availability and reuse of raw materials. The nature of these programmes is often cross-sectoral by necessity given they largely depend on other sectors. It is important to translate these programmes into tangible stimulus projects to enforce further (cross-sectoral) prioritisation and simple governance. The stimulus programmes focus on collective marketing, which, following investments in innovation, must ensure the sufficiently swift adoption of (government-enforced) transitions in the market. The sector is already investing heavily in most topics included in the agenda (e.g., by means of 5 mostly cross-sectoral innovation programmes) and asks the government to help shape and jointly implement this Acceleration Agenda where necessary as an important part of the intended

industrial policy. The stimulus programmes have a national dimension and therefore significantly contribute to the national societal transition goals. In addition, they are essential for creating a home base and favourable **business climate** for the industry. Initially, the stimulus programmes are not based on the assumption that new resources must be deployed, but rather on redirecting the use of existing resources.

### Joint action aimed at 'EU Action Plan for The Automotive Industry'

Given the crucial role of exports, the international aspect of industrial policy is of great importance. Recently, the European Commission launched the 'Action Plan for the Automotive Industry' [9]. The plan addresses topics, which are important to Dutch automotive manufacturing companies, such as technology neutrality, data accessibility, digitalisation and automation, battery technology and demand stimulation, and strengthening of infrastructure for ZE vehicles. The concrete nature of the plan still leaves much room for interpretation, especially on topics concerning HD (including infrastructure and demand stimulation). Particularly now, it is important for Dutch companies that **industry and government join their forces** in Brussels based on the Acceleration Agenda and the 'Action Plan for the Automotive Industry', to strengthen the international dimension of Dutch initiatives in respect of short-term market development. But also, in relation to the long-term innovation agenda where this is required. This is also included in the Draghi report [10]. Important parts of that innovation agenda are about mobility and logistics. If Dutch businesses want to maintain and even expand their position in the mobility industry and if the Netherlands wants to remain Europe's most important logistics hub, the Netherlands must be at the forefront of sustainable and digital (robotisation) transitions in the HD market and of associated technological innovations. This not only concerns vehicles but also the infrastructure and the interaction between both. Moreover, part of the measures from the 'Action Plan for the Automotive Industry,' especially regarding the realisation of (charging and hydrogen) infrastructure and demand stimulation, will first need to be addressed at national level anyway. All the more reason to use a dynamic approach when taking up the proposals from the Acceleration Agenda. In addition to the previously mentioned topics, the industry also wants to initiate **stimulus projects for battery technology** and production **and vehicle automation** ('Green and Smart Transport Delta'), in line with the 'Action Plan for the Automotive Industry.'

### More attention for automotive (manufacturing) industry

For these industrial policy proposals in the automotive field to work quickly and effectively, it is necessary that policies affecting the automotive manufacturing industry are addressed in a more coordinated and specific manner by **one central point of contact** within the government. And that the government's knowledge of the sector increases. (This is also a lesson learned from the process involved in creating this Acceleration Agenda). The **co-ownership of the government** is an important prerequisite for success, especially since the automotive sector (but also the logistics sector, for example) largely depends on progress in other sectors. The sector itself wants to place more emphasis on cross-sectoral developments in the future and needs an active government approach towards increasingly important cross-sectoral themes.

From a practical point of view, the sector proposes to initiate a **structured dialogue** in the near future between several directors of companies from the sector and the Ministries of Economic Affairs and Infrastructure & Water Management to set in motion the above-mentioned proposals and guide those proposals at a strategic level. The structured dialogue will be initiated by launching and guiding the two **stimulus projects** (charging and hydrogen refuelling infrastructure along the first logistics corridor, starting in 2026). In the same dialogue, the implementation and governance of the Acceleration Agenda will be further developed and guided.



Fig. 2: Vehicle manufacturers are investing heavily to support growth in the ZE market (photos of DAF assembly line for electric vehicles and a prototype hydrogen truck). However, the necessary growth of charging and hydrogen refuelling infrastructure continues to lag far behind, which is worrying.

# 2 Market and ecosystem

## Automotive sector in the Netherlands

In the Netherlands, a total of 55,000 employees are working in the automotive manufacturing industry, who together create a turnover of □35-40 billion, of which more than 85% is intended for export. Suppliers deliver significant components and systems to the automotive industry and the charging and refuelling infrastructure industry worldwide. DAF Trucks and Scania together produce approximately 30% of the annual European volume of heavy trucks. DAF Trucks as part of the PACCAR group, which is the second-largest truck manufacturer worldwide. And Scania from Zwolle, where the most modern factory with the largest production capacity of the company is located. The bus segment in the Netherlands also consists of two important players: VDL Bus & Coach and Ebusco. Additionally, there are various manufacturers of special vehicles. For example, Terberg is globally active in port vehicles, and VDL Steelweld develops Automated Guided Vehicles (AGVs) for ports.


Fig. 3: We are also successful in niche markets, e.g. with the special vehicles from Terberg Benschop.

These companies are supported by approximately 300 supply companies specifically focussed (sometimes partially) on automotive. Very large supply companies include NXP and Bosch Transmission Technology, which even hold a worldwide leading position in their market and generate a turnover of billions. Additionally, companies such as HERE, VDL, Tata Steel, Akzo Nobel, TomTom, Inalfa, and Apollo Vredenstein are part of the globally exporting companies that generate an automotive turnover of billions or hundreds of millions.


Fig. 4: One of Europe's largest chip factories is NXP's factory in Nijmegen. More than 40% of NXP's turnover is in automotive.

Jointly with hundreds of others, these companies are at the strong automotive heart of the Netherlands. Moreover, many of these companies are not only active in the automotive industry but also in other industries. In the Netherlands, they also constitute an important basis for the strong High-Tech Systems and Materials (HTSM) cluster.

The HTSM ecosystem also provides the basis for strong innovation of the automotive manufacturing sector. This has led to a large number of new companies particularly focused on ZE and digital technology emerging in recent years, but also to the transition that existing automotive companies are undergoing. In addition to the existing clusters focused on, for example, the diesel engine or the truck cabin, new supply chains have emerged, significantly broadening the sector. Within the sector, three new chains are clearly emerging in which dozens of existing companies, but also startups or entrants from other sectors (for example, from the energy and maritime sector), knowledge institutions, and certifying parties are active. These clusters have actively responded to government stimulation specifically focused on innovation in mobility (RDM) or in a broader sense (Growth Fund). Although these clusters and the individual companies naturally also work closely together internationally, it is significant and beneficial that all links in the chain are covered by multiple Dutch players. Also noteworthy is the fact that many (potential) new entrants are active or could become active within these chains and thus could benefit from existing automotive knowledge, networks, and market positions. Below are some examples per cluster.

## Electric vehicles and Infrastructure

Within the electric vehicle and infrastructure cluster, a significant battery chain has emerged, which, meanwhile, can be viewed as a separate chain. This new value chain is remarkably well developed across a broad spectrum in the Netherlands, from supply of charging infrastructure to production of electric buses and trucks. Many companies are also active in the conversion market, where mainly special vehicles are converted from diesel-driven to electric-driven. Internationally, the Netherlands has been highly regarded for years when it comes to innovation of electric vehicles [11]. Furthermore, it is significant how many companies and knowledge institutions are affiliated with the Battery Competence Cluster - NL (BCC-NL), which has been active for over a year. It demonstrates the high level of knowledge regarding battery technology and relevant production technology available in the Netherlands (This knowledge has not been randomly acquired by those companies and knowledge institutions given the strong chemical, materials, and semiconductor industry). Additionally, there is a need for batteries and battery technology among relatively large Netherlands-based buyers (see integrators in fig. 5), as well as in other surrounding countries.

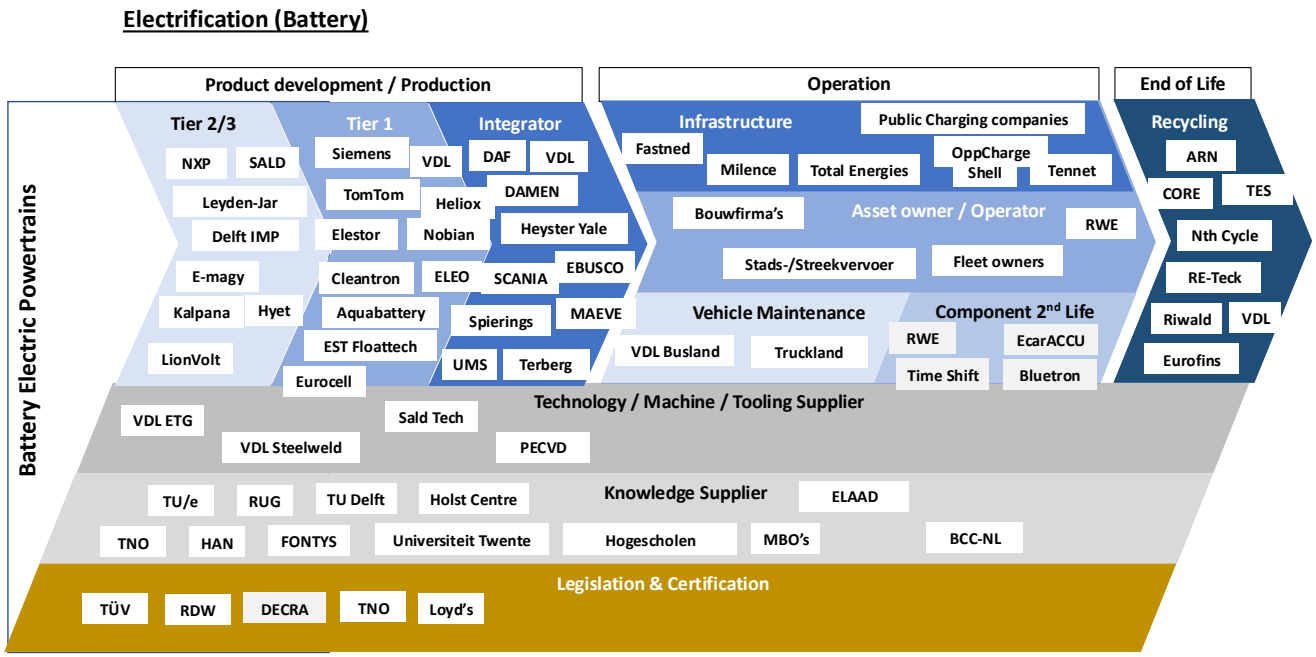


Fig. 5: Value chain electric vehicles and infrastructure

Not only established companies like VDL, which has started production of battery packs in Born, are active in this value chain, but also relatively many startups. Leyden Jar and ELEO will be discussed in the next chapter to illustrate how startups can impact growth in this part of the market. The strong development of this cluster, when it comes to charging infrastructure and conversion market, is in part thanks to Dutch policy in respect of electric passenger cars, the issues regarding nitrogen in construction, and the national market that has emerged as a result of this [12]. Continuing this value chain with more emphasis on HD offers many opportunities. The essential role of the government in this respect is explained in the following chapters.

### Hydrogen vehicles and infrastructure

The value chain around hydrogen vehicles has already been existing in the Netherlands for several decades (especially for city busses) and has developed in recent years as a result of regulations for ZE and HD. For a long time, hydrogen was regarded the only serious ZE solution for HD. Battery development in terms of energy density and price makes battery electric vehicles relevant for a significant portion of HD applications as well. New stimuluses are also provided by the growing need to buffer solar and wind energy in the form of hydrogen and the opportunities that are presented by applying hydrogen in combustion engines. The possibility to quickly and/or temporarily obtain larger power outputs locally without generating emissions also increases interest in hydrogen technology (reinforced by the grid connection problems in the Netherlands).

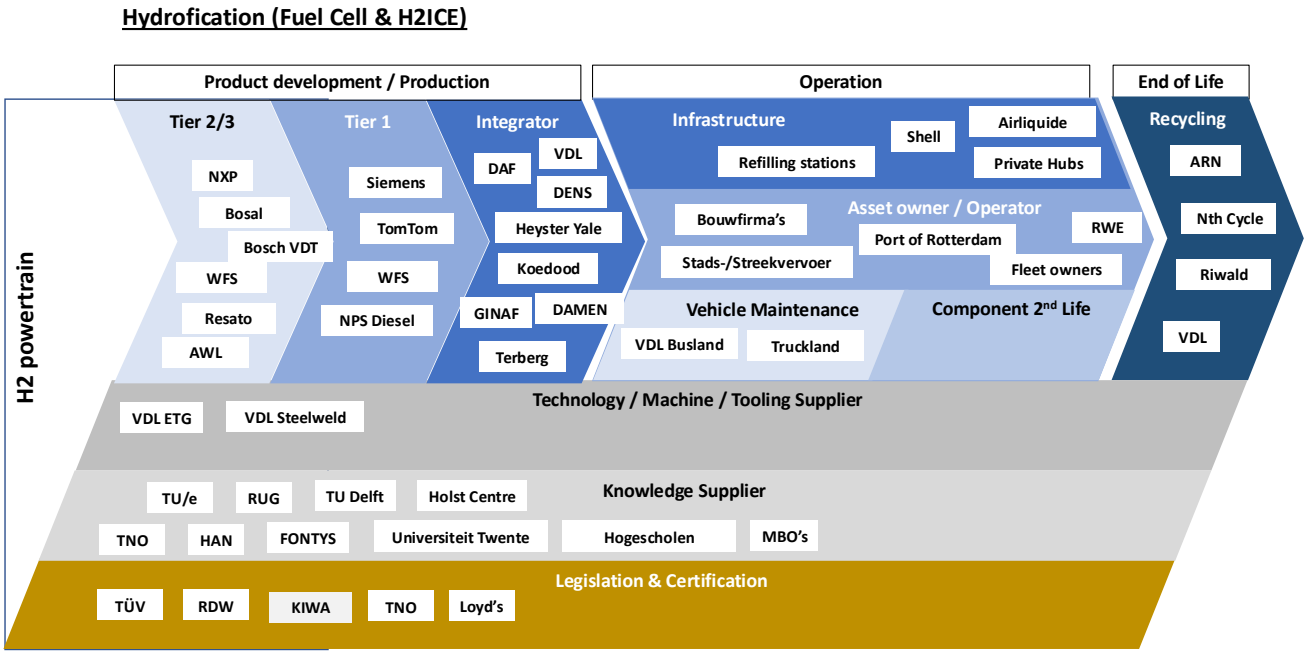


Fig. 6: Value chain hydrogen vehicles and infrastructure

HD OEMs in Europe are not only working on hydrogen based on combustion engines, but also on fuel cells. The latter is still regarded as too costly for now. Dutch parties are active throughout the chain, and a lot of knowledge is available (for example from the chemical industry and the natural gas distribution chain). The examples of Bosch VDT and/or Bosal, two suppliers from the traditional vehicle fuel chain, provide a nice insight into how these companies are using their knowledge for new applications.

Bosal is a solid player in e.g. the exhaust systems market and has a lot of knowledge regarding the processing of thin sheet metal for applications that experience high thermal loads. As a result of the ZE transition combined with the available expertise and production facilities, the company focuses on the development of heat exchangers and other components for fuel cells. Bosch-VDT has globally unique knowledge (supported by hundreds of patents) about the application and production of steel belts for Continuously Variable Transmissions (CVTs) and leads the market with this product. The company uses its knowledge to develop new methods for production of the so-called stack (the costly heart of the fuel cell).

### Digitalisation vehicles and infrastructure

Dutch companies have also been playing a prominent role in vehicle robotisation for many decades [12]. The Port of Rotterdam was the first worldwide to introduce [13] AGVs. Rijkswaterstaat and the provinces and municipalities hold a leading position when it comes to the introduction of intelligent traffic lights that enable communication between vehicles and infrastructure (for traffic management). Companies such as TomTom and Here are serving the automotive industry from the Netherlands with advanced navigation software that is increasingly enabling or will increasingly enable all kinds of robotised functions in vehicles. Another important player is NXP, which is the world market leader in the field of network and communication chips that play an important role in the systems developed for robotised vehicles.

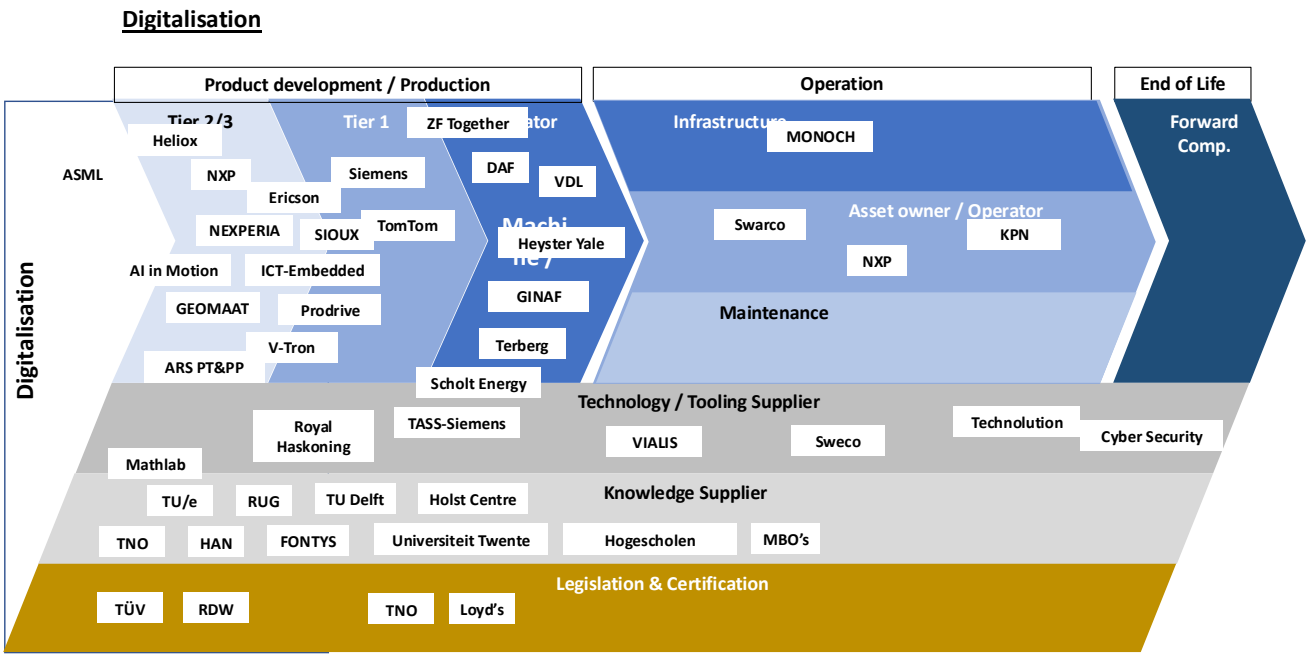


Fig. 7 Value chain digitalisation, autonomous vehicles and infrastructure

Fig. 8 Under leadership of TNO, a consortium of all European truck manufacturers in the ENSEMBLE project, has developed a standard that enables truck platooning in Europe.

Much intelligence can still be added, not only to vehicles but also in infrastructure. Especially in the Netherlands, there is a lot of expertise and business activity in this area. The Netherlands is a densely populated country, which is far ahead in terms of logistics. This in combination with further automation of transport makes it a strong business case for digitalisation in the Netherlands.

### SMEs and Startups

Innovative SMEs are active in all the aforementioned chains, and new and successful startups are constantly emerging. A sign that the automotive chain in the Netherlands is an important driver of innovation. One of the reasons for this is undoubtedly the fact that, unlike in 'traditional' automotive countries, the chains are less dominated by one large end manufacturer and/or system supplier in a particular region and are therefore more open. On the other hand, the influx of relatively many students in automotive study programmes and the appeal for student teams to work on automotive topics are also positive factors.

## Significance automotive sector in Europe

The automotive industry is the largest industrial activity in Europe in terms of employment (2.435 million FTEs) [14]. The

industry is the largest direct investor in technology (33% of private R&D in the EU) and a major buyer of technology and resulting innovation and products. With the latter, the automotive industry constitutes a very important pillar for the basic industry, but also for the semiconductor and software industry, for example. The automotive industry provides an important European 'domestic market' for many companies from different sectors. The HD sector is still dominant in Europe (almost 100% of HD sales is manufactured in Europe) and 60% of the HD trucks in the US are produced by companies owned by European truck manufacturers. This dominant position is based on a leading position in technology that, just as with passenger cars, is coming under pressure. The automotive sector in Europe approximately invests twice as much in R&D compared to Japan, China, or the US. It is of great importance that in addition to innovation and technology, industrial policy is used to maintain or (re) improve the market position. The sector is of substantial significance, both directly and indirectly, to Europe.

## Wide range of industry in the Netherlands

In addition to the automotive manufacturing industry, the automotive sector in the Netherlands consists of a substantial sector focused on bodywork, trailers, and vehicle conversion with an annual turnover of □2 billion and direct employment for 7,000 people [15]. Collaboration with the automotive manufacturing industry is important, especially in terms of technology (Y-electro trailer). The automotive sector's Import, sales, and maintenance activities also provide employment to a large number of people.

### Mobility manufacturing Industry

In addition to the automotive industry, also the maritime and aviation industries in the Netherlands have a long history when it comes to large-scale industrial manufacturing. In 2024, the mobility sector was a large and important industry within the Netherlands and Europe, supported by top-level knowledge institutions. Our maritime industry is worldwide supplier of ships, 30% of the trucks >16 ton in Europe are built in the Netherlands, and without Dutch technology, no aircraft would be able to take off from Schiphol. This success is made possible in part by a large number of specialised suppliers and maintenance companies that play a crucial role by providing (digital) systems, components, materials, and services. Our logistics sector is enabling the chains in this international ecosystem to continuously develop.

In total, there are 245,000 employees working within the maritime, aviation, and automotive manufacturing industries in the Netherlands, who jointly generate a turnover of □82.5 billion, the vast majority of which is from export. In the logistics sector, 1,270,000 employees work together to create an added value of more than □123 billion. Impressive figures. However, the sectors are under great pressure [16].

Already in 2021, the mobility sectors jointly took up the challenge to initiate innovations to enable the transition to fossil-free and internationally competitive transport solutions. Although they have been investing heavily, more investments are needed. Like in the surrounding economies, cooperation between industry, users (logistics), and the government is necessary. Technologies that are important for different sectors often have a common basis before they are further developed into specific end applications per sector. Hence, alignment in prioritisation and cross-sectoral cooperation has a lot of potential. The dependency on a partly common infrastructure (think, for example, of ports) also shows many similarities. In recent years, the boards of industry organisations in the mobility manufacturing industry have increasingly collaborated at project level but also in bringing their joint significance and importance to the attention of the government (for example, a joint letter on earning capacity to the Parliamentary Committee and a joint congress).

## Logistics

The Netherlands is a Delta in which trade and logistics are strongly connected. Logistics is an important sector in the Netherlands (8% of GDP). Technology has traditionally played an important role in the competitive position of the logistics sector, initially mainly in the maritime sector, but later also in aviation, automotive, and digital technology. The ports, airports, and logistics sector play an important role in the Dutch economy, but so does the manufacturing industry that provides the technology. The technology used in the different modalities has been more or less developed separately. However, the use of the different modalities has increasingly been connected thanks to digitalisation (first virtually). Automation and robotisation will increasingly provide a physical connection in the future ('physical internet'). This particularly applies to transshipment locations: ports, airports, and distribution centres. Especially at these locations, in addition to a very high-quality digital infrastructure, there is also a great need for ZE energy infrastructure. Additionally, the role of government services (customs, security) is often of great importance at these locations. Such services also increasingly use advanced technology and data. In short, the ever-increasing system complexity in logistics and the associated physical technology (in the various modalities and infrastructure) maximally manifests itself in the transshipment areas that determine a large part of the Dutch economy. In the future, the spatial design, liveability, and economy of our Delta will depend even more on how we deal with this complexity. An integrated approach is necessary, and we do have the (technological) building blocks at our disposal. The automotive modalities (and specifically freight transport) serve the main transport corridors as well as the smaller roads and play a major role now and in the future when robotisation takes flight as an omnipresent (physical)

connecting link. Especially transshipment activities have a major impact on logistics costs and thereby on the earning capacity of companies in the Netherlands (in the logistics sector and beyond). A seamlessly functioning hub, both digitally and physically, is therefore essential and crucial to maintain control on some essential points. This is also important for managing logistics, a role often carried out from the Netherlands (to prevent becoming an out-of-control Amazon office). This provides an opportunity we must seize now, before it turns into a threat.

## Other Important sectors

### ICT

As described earlier, digitalisation has become indispensable in logistics and mobility (and many other sectors). ICT connects virtually every logistic link across modalities and in traffic management, ICT is becoming increasingly important too. In both sectors, it constitutes the prelude to robotisation. The Netherlands is at the global forefront when it comes to digital and physical infrastructure. That is no coincidence since that infrastructure is crucial for our country's large commercial and logistics sector. In the coming decades, dependency on ICT will only increase because of integration of robotisation into the road network. This means that the digital design of the road network will become important, requiring active investment (also from the government).

Digitalisation of vehicles has also taken an enormous flight. There is hardly any product on earth with as many processors as a car (more than 100 in a mid-sized car). Let alone a mass product that has to perform at high speed at a very robust safety level. The impact of software is immense and even threatens to exceed the impact of mechanics (software-defined vehicle). The Netherlands is a global leader in the field of physical and digital infrastructure with strong supporting sectors, including the vehicle industry. Rotterdam was the first port in the world using robotised transport (port AGVs) on a large scale (based on Dutch technology!). The fact that we are approaching the decades where robotisation will increasingly be integrated into the road network, will provide an opportunity that cannot be missed.

The Netherlands has strong ICT and traffic management sectors, many companies that implement embedded software into vehicles, and logistics and planning software. This combination offers great opportunities. This is especially important given the impending dependence on major US players in this area.

### Energy

The Netherlands has a strong energy sector, consisting of petrochemical industry, based among other things on the position of the Port of Rotterdam, the large gas reserves and the electricity network (including wind and solar energy). In the past decade, the Netherlands has been one of the first to introduce electric vehicles in Europe. The electrical infrastructure needed is being established at a rapid pace. Companies such as Fastned, Shell, Heliox, and the collaborating network companies (Elaad) are playing a prominent role in this development, as does Milence, which already has gained a strong position. But also all levels of government are very active and important in this respect. The petrochemical industry and the companies active in the gas sector also have a great deal of knowledge in the field of hydrogen. This strong background is a good basis for an effective transition of the energy infrastructure in the Netherlands and for strong export to all regions where the same is about to happen.

### Materials and circularity

The Netherlands has a strong materials, material processors, and production technology chain (see also the HTSM roadmap on Materials). Many companies in these chains are also relevant for the automotive industry in the Netherlands and worldwide. Think, for example, of large companies such as TATA-Steel, DSM, Sabic, and AkzoNobel. With many companies that process materials and produce components for the automotive industry in their wake. In addition, the Netherlands also has a strong cluster of companies that produce and process composite materials for the automotive industry and aviation. The transition within the HD sector means that another existing strong material cluster, which focuses on thin-layer technology (emerging from the semiconductor industry), will become more important, initially, particularly for battery production. The materials cluster is present in every new automotive value chain and is essential for the future of the automotive manufacturing industry. Especially considering future regulations regarding the availability and reuse of (critical) materials.

# 3 Transition and Growth

## Transition and technology

The automotive sector has a long history based on large-scale application of technology in products and in production technology. In many areas, the industry has been the driver of technology development and large-scale application thereof (=innovation). There are numerous examples, from combustion engines to aftertreatment and from airbags to Emergency Braking. And not to forget the application of lightweight materials or robot technology in production. The role of the automotive industry in this respect is far from over. Currently, the industry is a very important driver of the continued development of battery and fuel cell technology, but also AI and underlying semiconductor developments.

### Product technology

Technology from the Netherlands is very important worldwide. DAF, NXP, Bosch VDT, AKZO, and Siemens-TASS are among the absolute world leaders with market positions in the global top 3 based on, among other things, their unique positions in the technology market. These companies are globally renowned and their dominant link with automotive and Dutch technology is not immediately evident. In the wake of these companies, there is still a long list of hundreds of companies that are partly or fully focused on the automotive industry, each with its own unique product positioning (from bolts, oil seals and transmissions to navigation systems).


Fig. 9: A long list of Dutch companies is active in the global automotive supply chain.

### Production technology

The competitive position of companies, including those mentioned above, is often based on a distinctive product specification, combined with a unique production technology. The pursuit of the combination of both (uniqueness in both product specification and production technology) characterises the most successful companies in the supply chain [17]. However, there are also many companies in the Netherlands, both within and outside the automotive industry, that focus specifically on production technology and associated mechanical engineering. VDL Steelweld is an important provider of production lines for vehicle bodies (Body in White). AWL-techniek is a leading player in advanced machinery for advanced joining techniques and is innovative in terms of, for example, production technology for hydrogen tanks. In the Netherlands, relatively many innovative machine manufacturers are active in the field of thin-layer technology (semiconductor applications); this technology is very important in battery production (especially future production).

Fig. 10: VDL Steelweld is an important player in setting up automotive production lines.

### Startups

The Netherlands has many technology startups, which are directly or indirectly relevant to the automotive sector now or will be so in the future. Not only the strong (and broad) high-tech ecosystem is playing an important role, but certainly also the specific automotive-oriented companies within that ecosystem. Two examples of promising startups emerging from the Dutch knowledge infrastructure are Leyden-Jar (spin-off TNO) and ELEO (continuation of student team (TU/e)).

Leyden-Jar develops an anode (core component of a battery), and the associated production technology based on silicon, increasing the energy density of a battery with 70%.


Fig. 11: Significance of Leyden Jar technology for Tesla Model 3 battery.

ELEO, which began as an automotive startup, is involved in assembling and manufacturing battery packs for various applications. The company is experiencing explosive growth and is now active on the international market.

Fig.12 The ELEO facility, which has been built only a few years ago, is already maximally extended to accommodate the explosive growth.

**Knowledge and education**

The Dutch knowledge infrastructure in the field of automotive and automotive-relevant technologies is highly developed and world-leading. TNO, TU Eindhoven, and two universities of applied sciences have specific automotive departments. These educational programmes are an important magnet for technical talent, which is also highly sought after outside the sector. Additionally, many student teams choose automotive subjects, and these teams regularly evolve into startups. TU Delft is also expanding its activities in the automotive field, and other universities and universities of applied sciences are actively pursuing topics within the automotive domain. A prominent driver of innovation and business activity is the Automotive Campus in Helmond, where public and private knowledge infrastructure is strongly represented.

**Major innovation programmes**

In recent years, several large automotive-oriented programmes have been launched with respect to digitalisation and the ZE transition. More than 150 companies and institutions are collaborating in 5 major innovation projects. The content of these projects is largely directly focused on HD-ZE applications.

| Project | # Deel-nemers | Programma |
|---|---|---|
| Green Transport Delta-Elektrificatie | 26 | RDM |
| Green Transport Delta-Waterstof | 19 | RDM |
| Digitale infrastructuur (DITM) | 20 | |
| Waterstoftechnolgie voor HD | 28 | In voorbereiding |
| Digitale infrastructuur | | In voorbereiding |
| Integrale HD energie voorziening | 29 | RDM |
| Batterijtechnologie (BCC) | 60 | Groeifonds |

Table 1 Overview of major Dutch innovation projects from the automotive industry. Of the 7 projects mentioned here, 5 are ongoing and 2 are on hold due to the suspension of growth fund applications [18,19,20,21,22] RDM = R&D Mobility Sectors

In total, they represent an investment of more than □1 billion, with the majority of the investments coming from companies. These 5 projects cover most of the Dutch industries' HD-ZE priorities:

- Hydrogen (combustion, fuel cell, vehicle and refuelling infrastructure)
- Battery (composition, circularity, new generation)
- Energy infrastructure (electric, hydrogen, storage, micro-grid)
- Digital infrastructure (connected car, digitalisation, energy infrastructure, local vehicle automation)

The projects show a clear shift towards new technologies for which involvement of the broader HTSM network and the ICT and energy sectors is highly relevant. This is also reflected in the fact that companies and knowledge institutions are involved.

**Cross-sectoral**

These and other automotive projects have a strong cross-sectoral character due to the profound nature of the transition and the speed at which it is being rolled out. The major technological steps that must be taken and the speed at which they are taken represent the new normal in the global competitive field in which companies have to operate. It is therefore of great importance that the existence of a broad technological ecosystem is cherished and that cross-sectoral projects are encouraged. The automotive sector thus aspires to create technological and programmatic connections with a number of key HTSM areas and other sectors to put this into practice. Extra attention will be given to these topics in the next version (2025) of the Automotive Roadmap.

**Mobility**

The automotive industry is an important driver in the development and scaling of technology. However, the technological challenges the sector is faced with have strong similarities with those of other mobility sectors, namely ZE and digitalisation. Also, the technology needed in

relation to safety (often with very high requirements) and to meet the requirements for digital and energy infrastructure, which literally come together at ports and airports, is often the same basic technology used in other sectors. The aviation and automotive industry also have a substantial interest in applying lightweight (high strength) materials. Technological collaboration at product level between these two sectors was less obvious in the past (although they certainly collaborated) but this collaboration could use a boost, especially there where the modalities come together. Direct results can be expected in locally achieved solutions and the new propositions emerging from those solutions. Indirectly this will strengthen the ecosystem.

## Growth

It is to be expected that HD-ZE vehicles, or better say the HD-ZE market, will be one of the strongest growing markets in Europe and other economic centres in the world in the coming decade (both in volume and in value). From 2030 onwards, almost all HD sales for Europe will gradually shift to ZE (90% by 2040). In 2030, this will amount to more than 100,000 ZE trucks annually in Europe and approximately 300,000 in 2040 (based on a heavily sanctioned EU obligation for manufacturers, not buyers). This strong growth is caused by the fact that almost the entire HD fleet in Europe must be replaced by ZE vehicles in a short time span, the costs per vehicle are much higher (currently 2 to 3 times as high), and the complete energy infrastructure (electric and hydrogen) must be set up in that same short period. The effect of HD vehicle robotisation taking place in that same period will also have an impact. Table 2 includes several key figures showing the large significance of the entire automotive chain for the Netherlands, which can be compared to the European average.

The Netherlands, jointly with Germany and Sweden, is the most important manufacturing country. The expected or targeted revenue growth is approximately a factor of 40 (!) in a period of 7 years.

| | Nederland | Europa |
|---|---|---|
| #HD Trucks geproduceerd[1] | >100.000 | 305.000 |
| Omzet Automotive productie in NL (Euro)[2] | 35-40 Miljard | |
| #Arbeidsplaatsen Automotive productie[2] | 55.000 | 2.400.000 |
| Aandeel Automotive in industriële werkgelegenheid[2] | 7% | 8% |
| Aandeel Automotive industriële productie[2] | 8% | 8% |
| Aandeel Automotive industriële export volume[2] | 12% | |
| **Groei EU** | **2023** | **2031** |
| HD-ZE Trucks (US Dollar) | 400 miljoen | 16 Miljard |
| HD laadinfra (US Dollar) | 230 miljoen | 8 Miljard |

Table 2 Key figures HD-ZE market on annual basis and significance of NL in the automotive Industry [23,24,25,26,27] 1 = 2023 2 = 2022

## Growth factors

The expected growth is strongly driven by the ZE requirements imposed by the EU and other economic blocs. In addition, ongoing digitalisation and robotisation are also playing a major role. This involves growth in the number of vehicles, higher technology costs, and increasing functionality. However, there are even more factors at play:

- Continued growth in freight transport (due to economic growth) [28]
- Development of sustainable trucks
- Digitalisation and robotisation (shortage of labour, including drivers)
- Installation of charging and hydrogen infrastructure
- Installation of intelligent motorway infrastructure
- Broadening the service package offered by the automotive sector (for example in the field of energy and energy technology)

Given the strong starting position the sector currently has and its growth over a period of at least 15 years, it is well worth fighting for this position.

## Growth in the Netherlands

The Dutch industry is preparing itself and using its strong principles to respond to the opportunities offered by this growth. Opportunities for the currently strong technological and strategic market position of the Netherlands and for companies active in related sectors.

The automotive sector itself has, as mentioned earlier, major players that are at the top of their game globally. Their strong market position and that of final-product manufacturers DAF and Scania provide important market access. An access that can also significantly reduce the threshold for new technologies and associated companies. Moreover, they are already largely represented in the Netherlands.

The automotive product portfolio includes batteries and fuel cells, hydrogen infrastructure on vehicles, sensors and control systems, software, cooling and electrification of systems and/or subsystems, components, and the associated production technology.

**Example: Battery Competence Cluster – NL (BCC-NL)**
The demand for battery technology and batteries is growing rapidly in the automotive industry. Given the strategic autonomy the Netherlands is striving for in this area, automotive has become a key topic. More than 60 Dutch organisations have joined forces in BCC-NL to translate the technological expertise existing across various relevant sectors and knowledge institutions into practical applications and business activities. In the short term, the focus of these efforts is primarily on assembly of battery packs and battery management systems. Several companies have developed technologies or production methods that represent significant improvements regarding the current state of the art. In the longer term, that focus will expand to next-generation battery technologies (such as solid-state batteries) and the reuse of (scarce) raw materials. Participating companies such as VDL and ELEO are already manufacturing battery packs at an increasingly large scale. The European automotive battery market is expected to grow from □10 billion today to □40 billion by 2030. Currently, the majority of this market is still dominated by companies outside Europe (particularly from China).

Beyond the sectoral boundaries, HD energy infrastructure in particular is an important growth market for Dutch companies.

**Energy infrastructure**
The Netherlands has a strong position in supply of charging and hydrogen infrastructure, driven by the country's robust (petro)chemical industry and the rapid development of electric passenger cars. Development of ZE infrastructure in and from the Netherlands by companies such as Fastned, Milence, Heliox, and Shell is significant. Established in 2022 in the Netherlands as a joint venture between Volvo, Traton (Scania and MAN), and Mercedes, Milence focuses on rolling out HD charging infrastructure across Europe. The choice for establishing the business in the Netherlands was based on the country's strong technological position in e-mobility and its innovative logistics sector. Fastned is considered a pioneer in fast charging infrastructure across Europe. Heliox is one of Europe's key suppliers of charging technology, and Shell is active in ZE infrastructure throughout the continent. The Dutch supply chain supporting these companies can grow rapidly in their wake and build a more than proportionate large market share. Major international opportunities will arise for these companies as well. In addition, the strength of the Dutch logistics and ICT sectors plays a critical role.

Fig. 13 The Dutch company Milence aims at realising 1,700 high-power charging points across Europe by 2027 (a partnership between with Volvo, Traton (= MAN + Scania), and Mercedes).

## International landscape
The opportunities available to Dutch companies also apply to international competitors, especially in a globally oriented industry like the automotive industry. Important differences may occur primarily in terms of how agile companies are and the conditions they operate under. Especially in the latter case, the influence of government policy is significant and cause for important differences.

**Example: approach Germany and Sweden**
In Europe, Germany and Sweden are key players in HD truck manufacturing. Traditionally, there is a strong relationship between the government and German industry, which is manifested in multiple ways. A striking example are the German federal government's proactive and large-scale efforts to establish HD charging infrastructure. Currently, a tender has been issued to ensure the realisation of 130 HD fast-charging stations along Germany's motorway network by 2028 (with guaranteed energy connections). In Sweden, there is close collaboration between government and industry with respect to developing HD charging and hydrogen infrastructure. The first Megawatt Charging Stations have already been realised (with public funding).

Fig.14 Germany plans to build 130 fast-charging stations for electric trucks by 2030 (first stations operational by 2028). [28] Any Dutch plans for a similar network are not yet known.

This way, both countries assure the logistics sector that investing in ZE infrastructure can result in sustainable and profitable operations, helping kickstart the market (and provide security for investors). Logistics companies and manufacturers, in turn, gain valuable experience, which strengthens their export position. In the Netherlands, investments in necessary infrastructure for the decarbonisation of HD transport along critical corridors are already lower than expected, particularly in public infrastructure.

From an international perspective, Dutch companies are well-positioned to benefit from this growth, especially considering their product portfolios. Furthermore, the Dutch technological ecosystem is less compartmentalised compared to major industrial nations, which can be an advantage when working across sectors. In this regard, growth opportunities are certainly comparable. However, the Dutch government's generally cautious approach in driving the industry is increasingly becoming a disadvantage. The current era calls for a different approach.

If most growth is generated outside the Netherlands, this will harm the Dutch industry and lead to a competitive lag, which could have been prevented.

## Market dynamics

Global transitions and the rise of China in the passenger car market are reshaping the industry. This has far-reaching consequences for suppliers and manufacturers (in the Netherlands especially with respect to HD and bus production).

The market share in HD will not vanish overnight in 2025, and genuine growth opportunities still exist. The industry is at a tipping point. At the same time, we frequently hear about the declining market share of European passenger car manufacturers due to the aggressive expansion of non-European brands. The passenger car and truck industries are closely intertwined, especially at supply chain level. If the Dutch truck industry follows the same path as the passenger car industry, many jobs will be at risk.

As with passenger cars, batteries will play a central role in HD, as will China. In addition to electric buses, the first electric trucks from China are already entering the European and Dutch markets. It is only a matter of time before American companies like Tesla enter the European truck market as well. Meanwhile, both China and the US are making significant progress in automation of vehicles, especially freight transport. Given the acute shortage of drivers especially in Europe, (partial) automation could become a major competitive advantage in the long term.

Lastly, major tech firms (especially Amazon) are becoming active players in the logistics sector, where data and data access are increasingly crucial. Using data technology to integrate services and physical system levels is strategically advantageous from a business operations and competitive position perspective. This directly impacts the strategic position of European companies.

Fig. 15 While Dutch company VDL is growing in the electric bus market in Europe, Chinese manufacturers are rapidly gaining ground. VDL assembles its battery packs in-house.

Not only the impact of other regions is noticeable, also the increasing dependence on sectors outside the automotive industry. Sectors that do not necessarily have to meet the same obligations and have the same priorities as the automotive sector.

Decarbonisation of HD transport requires an integrated, cross-sectoral approach. The vehicle manufacturers, the only ones obligated to produce ZE vehicles, are not the main concern, the rest of the value chain is. The logistics sector will not invest in more expensive ZE vehicles if doing so is not economically appealing. This issue is exacerbated by the lack of large-scale investments in energy infrastructure.

In turn, the latter is hindered by inadequate grid connections and complex permitting procedures, resulting in major regional disparities. In the Netherlands, this threatens to trigger a downward spiral that must urgently be broken to enable the transition to sustainable HD transport.

Many of the previously mentioned factors contribute to unprecedented dynamics, including:

- Transitions (ZE and digitalisation), whether voluntary or mandated
- Rapid technological development and the associated emergence of new players and market structures
- Market expansion
- Entanglement of HD and passenger car supply chains
- Dependencies on other sectors (e.g., logistics or energy)

- Competition from regions supported by aggressive industrial policies
- Regional differences in government policy

These dynamics create both opportunities and threats for everyone in the industry, and an increasing vulnerability to competition that greatly benefits from strong governmental support.

## Government impact

As previously mentioned, the role of the government is significant.

Other sectors, and especially the government, play a crucial role in the success and economic nature of these transitions. A few examples:

- The government (in this case the EU) determines the pace required for the transition. In addition, it plays an extensive role (nationally, regionally, and locally) in realising large-scale energy infrastructure and the required grid connections. A substantial part of the charging infrastructure, crucial for scaling up the market rapidly, must be realised in public spaces. Grid connection in the Netherlands is far from guaranteed, and regulations often still need to be adapted, causing major delays. Permits for both public and private infrastructure must be issued by the government, usually through a lengthy and complex process.

- In the Netherlands, current policy focusses on ZE zones, but policies vary significantly per municipality. However, for the rapid expansion needed to meet 2030 targets, focusing on major logistics corridors is far more effective. These are the routes where the mileage is made that logistics companies need to recoup their high investments in electric trucks (and reduce CO2 emissions). At present, it is impossible to predict when energy infrastructure along these main corridors will be realised, leading to major investment uncertainty throughout the value chain.

- When directly compared to our neighbouring European countries, Dutch investment in necessary infrastructure for sustainable mobility, particularly in electric high-voltage applications, lags far behind. For instance, Germany launched a call for tender this year aiming to establish high-capacity charging infrastructure at 130 (!) motorway locations by 2030. Fostering significant industrial activity, security of investment, and a competitive edge.

- The Netherlands rightly aspires to play a major role in hydrogen within Western Europe (e.g., Port of Rotterdam). Companies like DAF, supported by Westport, AWL, etc., will be capable of delivering hydrogen-powered combustion engine vehicles at a large scale by 2028. (This technology is not available in China and only scarcely available in the US). However, the lack of hydrogen infrastructure and reliable hydrogen supply remain decisive factors.

- The Port of Rotterdam was the first in the world to use autonomous transport at a large scale (over 30 years ago, using Dutch technology). Yet when it comes to (experimental) semi-automation on public roads, other countries have since surpassed us. A joint effort between sectors and the government could reverse this trend. The Netherlands is still globally viewed as an ideal country to implement innovations, thanks to its excellent physical and digital infrastructure, strong logistics and tech sectors, and high willingness to adopt new technologies.

- As a delta country, the Netherlands naturally holds a strong trade and logistics position, supported by extensive physical and digital infrastructure. Dutch companies often have a coordinating role in key supply chains, increasingly based on digital information. Thanks to battery-electric transport in particular this role will be supplemented with a crucial (data)-management role (availability of charging capacity). A cross-sectoral approach (logistics, vehicles, energy, and ICT) could mark a major strategic leap forward. Such an approach is unlikely to succeed without active involvement from the Dutch government, and it will significantly impact the (future) spatial design of the country.

- National policy is critical for the international positioning of companies.
Integrating ZE vehicles into operations is complex and disruptive, not only in the initial phase but especially when scaling up. Logistics companies, many of which are located abroad, must choose where to begin fleet electrification. National policy has a great impact on this decision and, consequently, on the competitive edge Dutch companies can gain in the national or international chain.

- The high and direct dependency on energy infrastructure and soon also on traffic management and (automation) infrastructure, will have major implications for regional business climates. Moreover, it underscores the substantial influence of governments at all levels (including regional). This makes the government more of a stakeholder than ever before, and alignment is crucial for the success of businesses.


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# 4 Strategic perspective

## Economy

### Strategic market position

The Netherlands already holds a strategic position in terms of HD manufacturing as a significant share of HD trucks is manufactured in the Netherlands, equivalent to around 30% of the European market. This volume means that not only the automotive industry, but also the basic and supply industries, can benefit from a strong potential market close to home, bringing various advantages, such as employment opportunities. European HD manufacturers still hold a dominant position globally, but this position is increasingly under pressure from China and, in the longer term, the United States.

### The Netherlands in a unique position

Paccar (the parent company of DAF) is the only non-European global manufacturer of significance (ranking second worldwide). Scania, along with MAN, is part of the Traton Group and thus part of the Volkswagen Group. As such, the Dutch HD industry has strong roots in Europe with DAF and Scania, while also maintaining a solid link to the US. However, the fact that the headquarters of both companies are located outside the Netherlands calls for increased vigilance and additional efforts to maintain the relationship with both companies and safeguard their local presence.

### Distinctive characteristics

The European market differs from those in the US and China in several ways, due in part to spatial constraints, geography, and the wide variety in infrastructure (especially urban). Product specifications in Europe are at a state-of-the-art level and will continue to be defined in Europe (for the time being). This leadership position could be maintained in the future, provided Europe continues to lead in upcoming transitions.

## Innovation

### Innovation driver

The highly technological automotive sector in the Netherlands is the driving force behind several major innovation programmes. These programmes align with key European and global transitions and benefit from the broad involvement of Dutch tech companies. Consequently, these projects strengthen the Dutch technological ecosystem. Among the top eight companies in the Netherlands investing most heavily in R&D in 2024, three are fully or substantially active in the automotive sector [30].

### Attractive to engineering students

Automotive topics are highly appealing to engineering students (which are lacking in the Netherlands). In addition to the automotive industry, many of these students eventually work in the broader Dutch tech industry, where they are in high demand. Also notable is the high number of student teams working on automotive-related subjects during their studies.

### Upscaling potential

The scale of the automotive sector in the Netherlands is crucial for breaking through innovation deadlocks. The sector not only acts as a driver of innovation but also provides an initial gateway to large international markets. Given the increasing diversification of the automotive sector, it is well positioned to take on a cross-sectoral role in advancing key technologies.

### No sustainable logistics hub without automotive industry

The Dutch logistics sector is also of strategic importance. It owes its position not only to the favourable geographic location of the Netherlands but also to the proactive adoption of new technologies. The automotive sector currently plays a major role in making logistics more sustainable and will soon contribute significantly to its automation. The Netherlands can use this strong starting position to gain major strategic advantages in terms of spatial planning and liveability, while strengthening the (export) position of both the logistics and automotive sector.

## Growth

Due to a combination of factors as outlined above, the HD segment of the automotive industry is expected to grow significantly over the coming decades. This will help in maintaining and creating jobs, economic development, and the expansion of the knowledge ecosystem. However, such growth is not guaranteed. While there will be opportunities for new entrants, the pace of growth will vary significantly by region, particularly depending on the availability of the right (ZE and digital) infrastructure.

## Resilience

The sector is not only important in terms of economic resilience but also, potentially, in terms of national physical resilience (defence). Both DAF and Scania have a history of supplying military vehicles (including armoured tracked vehicles (YPR). Given Europe's growing need for a stronger defence industry, the strategic importance of development,

sourcing, and production capabilities of these companies is considerable.

## Importance automotive sector

Contrary to popular belief, the automotive industry in the Netherlands is highly relevant to both the Dutch and European economies. In short, it matters because:

- It generates significant employment
- It supports the Dutch manufacturing industry and provides the scale needed to sustain market volume, which is also critical for other industries (e.g., amount of materials used, and, in the future, batteries). It offers a domestic high-tech market, which is significant in scale.
- It drives adoption of new technologies and maintains an evolving knowledge ecosystem valuable across sectors now and in the future.
- It inspires students pursuing technical education (as seen in student team involvement).
- It enables access to affordable, robust, and safe technology.
- It forms the physical backbone of a highly complex, near-comprehensive, global logistics system that is becoming increasingly automated and autonomous.
- It holds the capability to develop and manufacture the vehicles needed for Europe's defence readiness.

The combined value of the automotive sector for the Netherlands and its industry is substantial and deserves more recognition to prevent this vital sector from slipping away unwittingly.

# 5 Conclusions and recommendations

## Conclusions

The automotive industry in the Netherlands is one of the most important industrial activities in the country (revenue between □35 and 40 billion and more than 55,000 jobs) and especially in the HD segment, it holds a strong international position and will also do so in the future.

For the Dutch automotive industry, it is essential to maintain the current European market share in HD, which is more than 30%, even after 2030. Maintaining and where possible growing this market share, including in adjacent sectors, is important not only from a direct economic and employment perspective but also from a broader strategic viewpoint. In a growing market, strengthening this position is certainly possible, but not self-evident. The sector is making considerable (partly collective) efforts toward this goal, but the economic and social interest and responsibility of the government in this respect are also significant. As in other countries, the government plays a crucial role.

The automotive sector in the Netherlands is particularly innovative and, being integrated into the Dutch high-tech ecosystem, is relatively close to the new technologies that are important for the industry's future.

The market will be turbulent in the coming years (decades) due to the ongoing ZE and impending digital transitions. These transitions offer opportunities for growth but also pose many external threats. The supply chain in the Netherlands is under pressure, as elsewhere in the EU, but is also resilient and innovative. Growth opportunities are also emerging for other important sectors that can benefit from the strong starting position in, particularly, HD.

The threats mostly come from outside Europe. Particularly from China and the US in the field of electric and autonomous vehicles, but also from the US regarding (logistics) cloud and traffic management services. However, slow action on the part of European governments (including the Dutch government) can also play a major negative role. The sector is a major important user of the Dutch basic industry, and it is important to keep the knowledge of that industry up to date for both the automotive industry and other industries in the Netherlands. The sector is also essential for addressing the major challenges the logistics sector is faced with and the associated social spatial planning issues. The Netherlands increasingly functions as a complex logistics system and will need to expand this system to remain the European hub it currently is (Green and Smart Transport Delta). The mobility manufacturing industry (alongside the automotive, aviation, and maritime industry) jointly with the energy, ICT, and logistics sectors are at the forefront of this expansion. But so is the Dutch government.

Within the automotive sector, many companies, also in collaboration with companies from outside the sector, already took up the challenge in 2021 to initiate innovations for the transition to fossil-free and internationally competitive transport solutions. In addition to a joint investment of approximately □1 billion, individual companies are investing many times this amount in innovation to render their product portfolios suitable for the transitions required by the market and/or mandated by governments. The fact that many parties from outside the sector are involved in these projects is essential (cross-sectoral).

The (coordinated or uncoordinated) actions of the government (or lack thereof) affect the innovative spearheads and the future of the Dutch automotive industry at its core. Cooperation between government and industry is essential for both to achieve national and international (social and economic) goals. Only in this way, the Dutch manufacturing industry can maintain its leading position in the future. During the process leading to the creation of this Acceleration Agenda, it has become apparent that the lack of recent discussions in the Netherlands about the content of industrial policy is a major limitation. This applies to discussions between sectors, but certainly between industry and government and between ministries.

The Draghi report identifies massive investment in mobility innovation as one of the key focus areas for Europe. The European Commission is currently discussing with the European automotive industry how to deal with the threats that are now primarily affecting the passenger car industry. In the 'Action Plan for the Automotive Industry,' the first result of these discussions, little attention is given to HD. Especially in the field of HD, the Netherlands should want to be at the forefront when it comes to future (European) investments.

**Industrial policy is essential**

To maintain an international position, an active and consistent governmental (industrial) policy is both crucial and necessary. The days when a strong automotive sector

was taken for granted (if that awareness ever existed) are over.

## Key elements of industrial policy

While the aforementioned investments in innovation are essential, they alone do not determine success. Additional leverage is needed, often not in the form of (new) funding but rather in policy and coordination to initiate or prevent the stalling of desired market developments. The conditions under which the market is developing with respect to innovations (often as a part of or directly resulting from government policy) are in critical areas less favourable in the Netherlands compared to competing countries. This negatively impacts the domestic industry. At the same time, these conditions can also present opportunities in the Netherlands, which can flourish when aligned with the right policies.

**Earning power must be a priority—In words and actions**

As emphasised, innovation is vital for the sector's survival as are national and international market development. These elements should be prioritised by businesses and by the government, especially in an era where global powers such as China and the US massively support their domestic industries. However, European countries like Germany and Sweden (the main European competitors in the HD segment) also act expressly in the interest of and in coordination with their industries. Although the Dutch approach may differ, it is no less necessary to offer Dutch innovations a realistic outlook both domestically and internationally. The lack of an established industrial policy practice is addressed in the following proposals by starting a number of stimulus projects. Real projects (still) small in scope, quickly implementable often using existing resources, yet impactful and directional.

**International and domestic**

Although over 85% of the Dutch automotive industry's revenue is from exports, it is important that the Netherlands not only focuses on innovation, but also on market development. This allows suppliers and buyers to gain early experience with new innovations close to home, creating a head start for international activity. This is especially true for disruptive innovations such as those required for the ZE and future automation transitions. Cross-sectoral collaboration with strong government commitment is crucial.

Furthermore, internationally operating companies can facilitate access to new markets for their partners.

**Recommendations**

From no (specific) policy to a coherent policy for the automotive sector

1. Currently, there is no specific policy targeting the automotive manufacturing sector. Given the direct and indirect economic significance of the automotive manufacturing industry in the Netherlands and the role the industry can play in addressing societal challenges, it is crucial for the government to concentrate expertise, improve coordination and take a leadership role.

**Acceleration Agenda and stimulus projects**

From no (specific) policy to a coherent policy for the automotive sector

2. The sector has a clear vision of how both the Netherlands' earning potential and societal goals can be enhanced. It calls on the government to jointly turn this vision into practice through an Acceleration Agenda. This involves the following stimulus programmes and associated projects:

- Accelerating the availability of HD electric infrastructure on main logistics corridors
  This means putting more emphasis on fast-charging stations along those corridors and the establishment of ZE zones to ensure security of investment for logistics companies and support market uptake (similar to efforts in Germany).

- Battery technology and infrastructure. Numerous Dutch companies have launched, with support from the government, a joint project to meet the growing need for battery technology in, especially, the mobility sector (Battery Competence Cluster (BCC)). Given the strategic importance of this topic across Europe and the particularly strong relevance to the HD segment in the Netherlands, it is important for industry and government to work together to not only secure a technological position but also to develop a competitive business position for the long term.

- Accelerating the availability of hydrogen infrastructure for HD on logistics corridors and ensuring that (green) hydrogen is available and affordable. While hydrogen vehicle technology may become available on a smaller scale than battery-electric solutions in the short term, hydrogen can play a key role in the ZE transition. Hydrogen combustion using a diesel engine is seen as a viable interim solution in the transition towards fuel cells. Proactively supporting the development of technologies (fuel cells, electrolysers, and e-fuels).

- Accelerated deployment of (partial) automation and robotisation in logistics locally and on transport corridors suitable for automation to strengthen the Netherlands' position as a European logistics hub and boost businesses within and beyond automotive manufacturing. A cross-sectoral approach is required, with a key role

for the government. This includes supporting data and software infrastructures to enable and secure automated logistics (Physical Internet) and related vehicle technologies (Software-Defined Vehicle), including safety and security, as well as creating a regulatory environment conducive to innovation and experimentation.

- Material availability and circularity. Ensuring sufficient supply of strategic materials (e.g., for batteries) and promoting circular use of materials will become increasingly important for all industries, especially for the high-consuming automotive sector. A coordinated and active policy in collaboration between industry and government in this respect will strengthen the Netherlands' position as manufacturing base.

**Stimulus projects**

**3.** The sector recognises that not everything can or needs to happen at once. The ambition is to launch several stimulus projects that can deliver tangible impacts and help shape broader policy and priorities in the short term. These projects can often be implemented with existing resources and/or guide future resource allocation (e.g., for energy and digital infrastructure). Translating ideas into real stimulus projects is key to enforcing prioritisation and ensuring simple governance, especially given the cross-sectoral nature of many of the stimulus programmes. Two important projects, which are already partly underway (HD charging and hydrogen infrastructure), are described further down in this agenda. The sector plans to apply this approach to the remaining stimulus programmes as well.

**Shared ownership with government**

**4.** For the government to translate the efforts outlined in this Acceleration Agenda into real action, shared ownership and strong leadership with respect to the stimulus programmes and projects are essential.

**5.** The sector highlights the lack of a central national contact point. It is essential that this organisation knows everything there is to know about the sector, plays a central role in discussions, and has the ability to help shape current and future stimulus projects.

**Automotive Roadmap and cross-sectoral collaboration**

**6.** The sector plans to revise its Automotive Roadmap in 2026, aligning it more closely with the aforementioned stimulus programmes and their underlying objectives. Greater emphasis will also be placed on establishing connections with key areas within HTSM and other sectors (cross-sectoral). The first steps for the mobility manufacturing industry and the logistics sector have already been taken. RAI Automotive Industry NL aims to further shape this development through joint stimulus projects, country-focused market strategies (Strategic Multi-Year Market Development - SMM), missions, and thematic meetings. Given the cross-sectoral nature of this effort, long-term support from the government is crucial.

## Moving forward

We propose that the government and industry jointly discuss the strategic challenges and opportunities outlined in this agenda in the short term and translate them into a joint Acceleration Agenda up to 2030. The sector proposes to establish a structured dialogue between several company directors from the industry and the Ministries of Economic Affairs and Infrastructure & Water Management. The starting point of this collaboration would be the launch and oversight of the two stimulus projects proposed earlier (charging and hydrogen refuelling infrastructure along the first logistics corridor). Within the same dialogue, the implementation and governance of the Acceleration Agenda will be further developed and coordinated. This Acceleration Agenda (jointly supported by both industry and government) aims to remove bottlenecks, stimulate accelerating initiatives, enhance predictability in market development and the business climate (earning potential), and strengthen the dialogue between industry and government. In parallel, discussions are ongoing between the Ministry of Infrastructure and Water Management and the industry to start the most urgent stimulus project related to charging infrastructure in 2026. The secretariat's office who is responsible for planning this structured dialogue will be managed by the soon-to-be-established central national contact point and RAI Automotive Industry NL, on behalf of the sector.

## Stimulus projects

Two pilot projects are described here as an example. These pilot projects are not so much focused on the technology itself, but rather on accelerating its application (e.g. breaking deadlocks related to energy supply and regulatory pressure). The aim of these pilots is to speed up the realisation of HD-ZE energy infrastructure. To realise these projects, strategic alignment between the government and these sectors, both nationally (Ministries of Economic Affairs and Infrastructure & Water Management) and internationally (Germany–Netherlands) is urgently needed. (With HD-ZE corridors between both countries as a tangible result.)

## Stimulus project for charging infrastructure

The transition to sustainable, affordable, and feasible mobility is being hampered. In particular, the realisation of charging infrastructure is being impeded by a cautious stance and investment uncertainty created by the Dutch government. The logistics sector is awaiting certainty of (energy) infrastructure supply, despite the vehicle

industry offering electric trucks (mandated by the EU). Meanwhile, infrastructure parties are in turn awaiting permitting procedures and security of energy supplies. As a result, despite the availability of sufficient resources and willingness in the market, too little is being invested to break this impasse. A forecast by NAL / Elaad indicates that by 2030, in an average scenario, the Netherlands will need 253 public charging points at motorway service areas specifically for HD vehicles (500–1500 kW), and about 1,000 elsewhere, to serve more than 10,000 trucks in total [13]. So far, realisation has been very limited and falls far short of this demand (with at most a few publicly accessible stations offering too-low charging capacity). Nonetheless, the number of electric trucks sold in the Netherlands in 2023 was significant (1,148 trucks). Within Europe, this is an exceptionally high number, which is likely connected to subsidy schemes, the introduction of (25) ZE zones in the Netherlands in 2025, and the nitrogen emissions issue in the construction sector. This spike in Dutch sales is likely temporary and says little about the true state of the transition in the logistics sector.

Prioritising charging infrastructure for HD transport along main logistics corridors in the Netherlands will, by definition, positively impact the economic performance of logistics companies. Moreover, fleet greening benefits the Dutch vehicle industry (and leading Dutch companies active in the charging infrastructure market).

This pilot project (Netherlands–Germany) involves the planning, realisation, and operation of the first ZE-HD (battery-electric) corridor between the Netherlands and Germany within 12 months, starting in the first half of 2026. This includes permitting procedures, energy infrastructure (and grid connection), and volume operations. It entails 4 to 6 charging stations of 1+ MW, (distributed in both directions across the Dutch and German sections of the route), enabling the deployment of 250+ trucks along the corridor from 2027, operated by at least 10 participating (logistics) companies.

## Stimulus project for hydrogen Infrastructure

Prioritising hydrogen infrastructure along the main logistics corridors will also have a major impact on how ZE logistics is realised both in the short and long term. Using hydrogen in existing (technically adapted) diesel engines can become widely feasible well before 2030, without the heavy investment burden that battery-electric vehicles require (both at vehicle and network level). This reduces the dependence on grid reinforcement and lays the foundation for a robust future that includes both electric and hydrogen solutions. Additionally, the hydrogen network can, over time, help address the challenge of grid congestion, which would in turn benefit the Dutch industrial business climate as well as the logistics sector.

This pilot project (Netherlands–Germany) involves the planning, realisation, and operation (by 2028) of the first ZE-HD (hydrogen-electric) corridor between the Netherlands, Germany and Scandinavia. This includes permitting procedures, energy infrastructure, and volume operations.

This means the realisation of ten hydrogen refuelling locations, distributed in both directions across the route, and the deployment of 250+ trucks from 2028, operated by at least ten participating (logistics) companies.


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## References


[1] In the process leading to this Acceleration Agenda, dialogues were held with more than 50 representatives from the automotive industry, knowledge institutions, and government bodies. Half of these dialogues were held in the form of targeted interviews, supplemented with several national and international workshops. It goes too far to list all dialogues separately. With a focus on the Dutch automotive manufacturing industry, the parties involved include Bosal, NXP, DAF, VDL, Heliox, Milence, Westport Fuel Systems, Scania, Fastned, Ewals Cargo Care, TNO.

[2] ACEA-Pocket-Guide-2024-2025-1.pdf, ACEA, 2025, https://www.acea.auto/files/ACEA-Pocket-Guide-2024-2025-1.pdf

[3] Based on annual reports or publications from 2022 (or more recent reports) of the top 15 automotive companies in the Netherlands. Where a company is only partly active in automotive, only the relevant portion of revenue was included or estimated in some limited cases. This concerns only companies that are directly active in the automotive chain. These 15 companies each generate more than □100 million in automotive revenue annually, and together more than □35 billion per year. More than 300 companies are directly active in the automotive chain but are not included here as their revenue is below □100 million per year. This also applies to companies that, for example, produce rolling stock or supply indirectly to the chain.

[4] Facts and Figures – DAF Trucks N.V., Scania Production Zwolle increases production capacity to 240 trucks per day | Scania Netherlands New commercial vehicle registrations 2022–2024. In the Netherlands, DAF and Scania only manufacture trucks in the 16-ton class. Based on their production capacity in the Netherlands and their European market share (each over 15%) and the corresponding quantities, the production level in the Netherlands is estimated at around 100,000 vehicles per year. 2020, DAF, https://www.daf.com/nl-nl/over-daf/feiten-en-cijfers#:~:text=Marktleider%20in%20zowel%206%20Europese,Trucks%20in%202022%20. 2022, https://www.scania.com/nl/nl/home/about-scania/newsroom/news/2022/scaniaproduction-zwolle-verhoogt-productiecapaciteit-naar-240-trucks-per-dag.html

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[7] $CO_2$ emission standards for Heavy-Duty Vehicles. The exact calculation of fines for manufacturers is complex but can quickly reach up to hundreds of millions of euros if, for instance, the $CO_2$ reduction target (30% by 2030) is missed by 1%. DAF CEO Harald Seidel also identified this as a major threat to the existence of European manufacturers (conference “From Fossil to Sustainable Transport”, Holland High Tech, 28-11-2024). 2023, EU, https://ec.europa.eu/commission/presscorner/detail/en/qanda_23_763

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