Excelling in Hydrogen

Solutions for a sustainable world

Netherlands

2025

Hydrogen: the key to a clean, connected future

Hydrogen stands at the crossroads of the energy transition, bridging the gap between renewable electricity and sustainable fuels. As a flexible energy carrier, hydrogen enables the large-scale generation, storage, and global transport of renewable energy, opening new opportunities for decarbonisation, as well as for boosting energy security and generating economic growth. The Dutch hydrogen sector is rapidly developing and upscaling technologies, infrastructure, and global partnerships to seize these opportunities and unlock hydrogen's full potential.

At the Tweede Maasvlakte in the Port of Rotterdam, a conversion park is being constructed with large-scale electrolysers to convert wind energy into renewable hydrogen. Subsequently, the hydrogen will be distributed to industries throughout the Port area via a national hydrogen transmission network. Together, the projects will save millions of tons of CO_2 in one of Europe's largest port areas.

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Creating a global market for clean hydrogen

As a flexible energy carrier, hydrogen is an indispensable component of a robust and sustainable energy system. By scaling up the production and consumption of green and low-carbon hydrogen, we can accelerate decarbonisation, boost energy security, and last but not least: we can generate sustainable economic growth.

All of this only holds true if we succeed in building a global, integrated hydrogen market. International cooperation is indispensable both to scale up clean hydrogen production, to create sizeable, sustained demand and to develop the infrastructure and trading mechanisms needed to match supply and demand. And on behalf of the Dutch hydrogen sector we would like to invite partners around the world to work with us, to create new value chains - and ultimately a truly integrated, international hydrogen market.

As this brochure illustrates, the Dutch are keen to play a leading role in the development of a global hydrogen market, and with good reason.

First of all, The Netherlands has a lot to offer. We have the knowledge, technology and infrastructure to be a crucial hydrogen hub for North-West Europe. With our sea ports, distribution networks, storage facilities and trading mechanisms, we're a gateway to (potential) hydrogen markets not just in the Netherlands but in Germany, Belgium and many other other countries. We're already laying the groundwork for creating international hydrogen trading corridors, working with international partners to set up robust supply chains. And through close alignment with European policy frameworks and funding opportunities, we are well positioned to help transform ambitious ideas into feasible projects and innovation programmes.

Those international partnerships are crucial, not just because our own hydrogen production capacity is limited and we're keen to exchange knowledge with – and learn from – partners abroad. But also because joint investments in production, infrastructure and technology development will help us achieve economies of scale and lower costs. Working together in international (pilot) projects will accelerate the development of promising technologies into proven, market-ready solutions. We also need close international collaboration to find the right answers in areas such as standardization, regulatory issues and to create a truly integrated, European or even global hydrogen infrastructure.

The Dutch have a long history of international cooperation, and we remain convinced of the huge benefits such cooperation can deliver to all parties involved. We're also excited to see that despite the many challenges in scaling up a market for clean hydrogen, the Dutch hydrogen sector continues to invest in innovative ideas and is actively looking to establish international partnerships, ensuring that clean hydrogen can deliver on its promise of being a key enabler of the energy transition and of economic growth.

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FME POWERED BY DUTCH TECHNOLOGY

Hydrogen

A key enabler in the global energy transition

Hydrogen presents a triple opportunity. Producing large quantities of clean (green or low-carbon) opens up vital pathways to decarbonisation. It helps build a robust and flexible energy system, which can incorporate growing amounts of renewable energy. And it creates business opportunities around the world, boosting sustainable economic growth.

Scaling up green hydrogen production requires large amounts of renewable electricity. Wind power in particular is a vital enabler. The Netherlands aims to generate 35 TWh of wind energy by 2030, and to have installed 21 GW of offshore wind capacity by 2032.

As a flexible energy carrier, hydrogen is a vital enabler of decarbonisation. It can be used as an alternative to natural gas in industrial processes, as a feedstock for the production of chemicals, and as a carbon-neutral fuel in virtually all modes of heavy duty transport. Crucially, it can also help overcome some of the most persistent challenges in large-scale electrification. It enables large-scale storage of renewable energy, can help reduce the cost of transport of offshore wind energy and and solve issues around grid congestion or balancing.

Thus, hydrogen is a key enabler of a robust, flexible energy system, that is capable of incorporating large but fluctuating amounts of renewable energy. In the face of rapidly shifting and complex geopolitical challenges, hydrogen also offers new pathways to establishing energy security. And last but not least: it opens up attractive business opportunities around the world, including the prospect of building up new, international trade corridors that can generate economic growth along the value chain, from producing hydrogen in areas where renewable energy is abundant to distribution models and technology that enables (industrial) users to decarbonise energy-intensive processes.

These three opportunities - large-scale decarbonisation, energy security and economic growth - are at the heart of Dutch policies aimed at facilitating and accelerating the scaling up of green and low-carbon hydrogen production. After all, unlocking clean hydrogen's potential is not without its challenges. The cost price of electrolysis is relatively high, and it can be hard to secure funding for the large projects needed to achieve efficiencies of scale, roll out technological innovations and thus bring cost down. Creating demand can also be challenging, because of concerns over the availability and affordability of clean hydrogen.

Yet the Dutch are convinced that these challenges can and will be overcome. The country is investing heavily in both the production capacity and infrastructure needed for large-scale adoption of clean and low-carbon hydrogen. It is doing so partly by building on its own strengths, as well as by fostering international cooperation and cross-border initiatives aimed at the development and scaling-up of technological innovations. Building on its centuries-long tradition of global trading and cooperation, and its strategic position as a logistical gateway to Europe, the Netherlands is a driving force behind the development of international clean hydrogen corridors. It also offers attractive cooperation models and investment opportunities to international partners.

The Netherlands as a hydrogen hub

As a signatory of the Paris Climate Agreement, the Dutch government has enshrined in law its commitment to a decarbonised future, and has agreed ambitious targets (see the box) in a national Climate Agreement. For one of the most densely populated and industrialised countries in the world, meeting these targets will present considerable challenges. Billions of euros will be invested in renewable energy over the coming decades, especially in offshore wind energy and solar energy. Other key policies are aimed at large-scale electrification of the transport sector, residential heating through heat pumps, electrification of industrial processes, and the adoption of sustainable feedstocks and alternative fuels.

It should come as no surprise that hydrogen plays a crucial role in Dutch decarbonisation policies, both as a fuel, feedstock and as an energy carrier for solar and wind power. The country benefits from strong foundations for building a hydrogen market and ecosystem. It is already the second largest hydrogen producer in Europe, with an existing, dedicated hydrogen pipeline network reaching

Facts and figures on the Dutch hydrogen ecosystem




180 Petajoules

Dutch industry consumes an estimated 180 PJ of hydrogen annually and is the second largest hydrogen user in the European Union, after Germany.

3-4 GW / 2030

The Dutch ambition is to have installed 3-4 GW of electrolyser capacity by 2030 (± 10% of the total EU target for that year).

21 GW / 2032

Offshore wind is a crucial enabler of scaling up the production of carbon-neutral hydrogen. Planned projects in the Dutch zone of the North Sea add up to 21 GW of offshore wind capacity by 2032, with enough space for a scale-up to 40 GW in 2040 and 75 GW in 2050.

136,000 km

In addition to the current 1,000 km of dedicated hydrogen pipeline, the Netherlands has a dense natural gas grid comprising 136,000 km of high quality pipeline. Parts of this network are retrofitted to transport hydrogen and become part of a national hydrogen transmission network

GroenvermogenNL: Driving the Dutch hydrogen economy

GroenvermogenNL is a flagship investment programme, designed to accelerate the development of a climate-neutral hydrogen economy in the Netherlands. The programme's scope includes the entire hydrogen value chain: from production and infrastructure to diverse applications, with a focus on the uptake of green or low-carbon hydrogen in industrial sectors such as chemicals, steel, aviation fuel and fertilisers. The programme also includes a Human Capital Agenda, with regional roadmaps and learning communities that unite businesses, educational institutions, and government to align training with industry needs.

The Dutch government has allocated €838 million to the programme, and private sector contributions to specific initiatives are expected to push its total budget well past the 1 billion euros mark. By fostering collaboration between research institutes, industry leaders and policymakers, GroenvermogenNL positions the Netherlands as a global leader in hydrogen innovation, contributing to decarbonisation goals while strengthening its industrial competitiveness.

Among the initatives sponsored through GroenvermogenNL is the HyPro project, the largest Dutch clean hydrogen R&D programme to date. 58 partners will focus on improved electrolysis and plasma technology, and on developing a Dutch supply chain for materials, systems and components.

"Building on its strong foundations, the Netherlands is transforming itself into a global hydrogen hub."

into Belgium and France. The Netherlands also has one of the world's most sophisticated natural gas infrastructures, parts of which can be retrofitted for hydrogen transport. In addition, the country is a major European hub for cross-border trade in natural gas, both in gaseous and liquefied forms. Anticipating the roll-out of a nationwide hydrogen transmission network and the rapid development of the country's ports as hydrogen import hubs, the Netherlands is strategically located at the heart of the European hydrogen infrastructure proposed by 11 European grid operators.

In addition to its strategic location and infrastructural head start, the Netherlands is home to internationally renowned expertise in handling, monitoring and storing gas, and to research institutes developing cutting-edge technology. There is also a highly developed manufacturing industry, with hundreds of companies at every step of the value chain. This position is underlined by the launch of an Electrolyser Manufacturing Platform (EMP-NL) with more than 21 Dutch technology companies and knowledge partners assembled to accelerate innovations in the hydrogen economy.

Building a hydrogen economy

Building on these strong foundations, the Dutch are seeking both to develop a healthy home market for hydrogen and to become a global hydrogen hub. In addition to expanding and repurposing infrastructure, the country is planning to scale up clean hydrogen production and is working on the right conditions for large-scale adoption of hydrogen in the industrial and transport sectors. Recognising that large-scale production of clean hydrogen will take time, the Dutch are also building infrastructure for carbon capture and storage to enable the production of 'blue' or low-carbon hydrogen.
What all these initiatives have in common, besides a close aligment with national and European policies, is a characteristically Dutch emphasis on close collaboration, pragmatism and willingness to experiment. Dozens of projects are underway in which companies, regional and local governments, hydrogen associations and platforms, and Research and Technology Organisations (RTOs) are building a complete hydrogen ecosystem. They not only focus on technology but also on creating demand, developing new business models and on tackling a range of related issues, including regulatory challenges, corporate social responsibility, human capital requirements, certification, standardisation and safety concerns.

Cross-border cooperation

Another characteristic of the Dutch approach to hydrogen is that it is decidedly global in nature. As a small country in a strategic location at the confluence of major trading corridors the Dutch have always been strongly aware of

the need to look beyond the country's borders. Dutch companies, ports, research institutes and government agencies are well-connected to foreign markets and have built up strong collaborative networks all over the world.

This background explains why the Netherlands is currently at the forefront of establishing global hydrogen supply chains. As it is clear that a substantial part of the clean hydrogen needed in Europe will have to be produced elsewhere, the Dutch government has already signed nearly 20 Memoranda of Understanding (MoUs) with countries across all continents, and has developed advanced partnerships with countries including Spain, South Africa, and Namibia. These collaborations focus on developing hydrogen production facilities, conducting feasibility studies, and creating infrastructure for transport and distribution. Major Dutch players such as the Ports of Rotterdam and Amsterdam, offshore construction companies, TNO, Gasunie, Invest International and dozens of technology firms are contributing expertise.

Clean hydrogen, responsibly produced

The Netherlands is committed to working proactively on the UN's Sustainable Development Goals (SDGs). The country has also drawn up strict protocols for international socially responsible business practices. These explicitly address the goal of promoting sustainable economic growth and local employment opportunities. They also stipulate that any efforts to reduce carbon emissions through clean hydrogen projects must incorporate measures to mitigate potential negative effects of this transition on the wellbeing of people and communities around the world.
This includes rigorous standards to safeguard local ecosystems and communities in partner countries. For example, labour conditions throughout the supply chain must comply with the International Labor Organisation's core standards. Projects must protect biodiversity and natural carbon storage. A particular concern is to ensure that hydrogen production does not exacerbate scarcity of local freshwater, for example by integrating advanced water recycling technologies, using non-potable water sources and responsible processing of the brine resulting from desalination.

The north of the Netherlands was the first region to receive European funding as a 'Hydrogen Valley'. The initiative, backed by dozens of companies from six different countries, represents an overall investment of 9 billion euros over 10 years and encompasses over 50 projects covering the entire hydrogen value chain. Since then, other 'hydrogen valleys' have emerged throughout the country, in which dozens of companies, knowledge partners and authorities have joined forces.

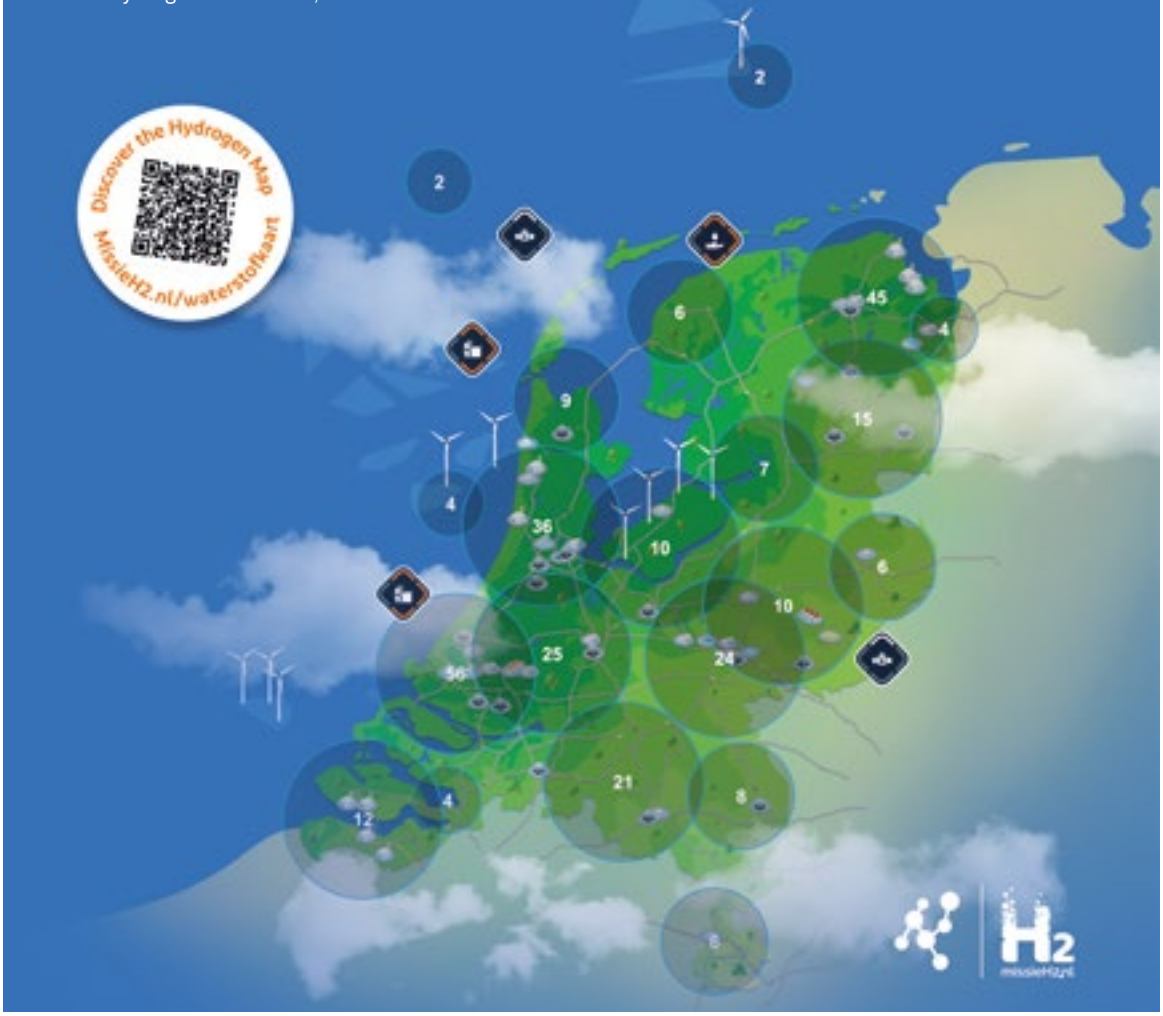
The European perspective

Building a hydrogen economy requires international collaboration—no country can achieve this alone. The Netherlands aligns its efforts with European partners and EU innovation programmes, fostering cooperation in research, policy, and technology deployment. Key examples include the Clean Hydrogen Partnership, which accelerates clean hydrogen production, distribution, and storage in support of the EU Green Deal, particularly for hard-to-abate sectors. Hydrogen initiatives in the Netherlands also stand to benefit from the implementation of the European Renewable Energy Directive III, which creates mandatory demand for renewable hydrogen, and the accompanying Decarbonisation Accelerator Act, which streamlines the permit process. The Clean Industrial Deal, meanwhile, provides direct funding through a €100 billion Industrial Decarbonisation Bank and a €3 billion yearly Hydrogen Bank, while creating lead markets for hydrogen-based products.

Large Dutch projects can also attain Important Project of Common European Interest (IPCEI) status, enabling greater public funding. Several Dutch projects have been granted IPCEI status in recent years, the latest example being an initiative to build a green hydrogen import terminal in the port of Rotterdam.

The Hydrogen Map

Mission H2 is an initiative by a consortium of Dutch organisations aiming to build a fully functioning hydrogen market by 2030. Their interactive Hydrogen Map contains the most comprehensive and up-to-date overview of existing hydrogen initiatives. It also offers a unique opportunity to 'travel through time', visualising the planning, development and progress of projects in the Netherlands. Scan the QR-code to discover all projects in the hydrogen value chain, their status and to dive into dashboard statistics.



Support for international collaboration

Building collaborations with Dutch hydrogen businesses could increase your company's financing possibilities. International B2B cooperation and cross-border consortia are stimulated and facilitated by the Netherlands Enterprise Agency, the ministries of Foreign Affairs and of Climate & Green Growth, InvestNL, FME, NWBA (Hydrogen & fuel cell association), NL Hydrogen and other supporting organisations in the Netherlands. Reach out to learn more (p.175).

Additionally, an overview of different Dutch and European hydrogen subsidies can be found on the websites of the Dutch National Hydrogen Programme (in Dutch): www.nationaalwaterstofprogramma.nl and the Netherlands Enterprise Agency: https://english.rvo.nl/topics/hydrogen.

Hydrogen production

Making clean hydrogen competitive

Hydrogen is only as clean as the energy used to produce it. For hydrogen to have a meaningful impact on the global energy transition, the production of clean hydrogen has to be scaled up substantially. And this, in turn, requires innovations that make its dominant production process – electrolysis – more robust and cost-competitive.

There is broad international consensus on the need for clean hydrogen, yet it has so far struggled to make a breakthrough. Its cost price can be an obstacle, and in the current market conditions it can be challenging to secure the commitment and funding needed to scale up production.

Electrolyser innovation

Many Dutch initiatives focus on the key challenge of making clean hydrogen more affordable through technological innovation. The country's hydrogen ecosystem consists of hundreds of technology providers, including manufacturers of electrolyser components (such as membranes) and supporting technology, as well as stack integrators and system integrators.

Many of these companies have extensive and valuable experience in other industrial markets, which can help to make the production process of electrolysers more robust and efficient. For example, by standardising and automating production processes, or by developing efficient water purification technologies. And in developing and scaling up innovations, these companies benefit from the presence of cutting-edge R&D and testing facilities.

"Many Dutch initiatives focus on the key challenge of making clean hydrogen more affordable through technological innovation."

1. TNO's Faraday laboratory is one of Europe's largest hydrogen research facilities. It is an open innovation lab, where researchers and industry partners are working on the development and rapid prototyping of innovations that improve electrolyser efficiency and boost production capacity.

2. The Hydrohub Test Centre enables extensive testing and optimisation of large-scale electrolysis installations. It is part of ISPT's Hydrohub programme, a large consortium of research and industry partners and has played a key role in creating a detailed design for a 1 GW electrolyser plant.

3. Avantium produces advanced test stations for third-generation electrolysers, enabling precise evaluation and optimisation of innovative hydrogen production technologies.

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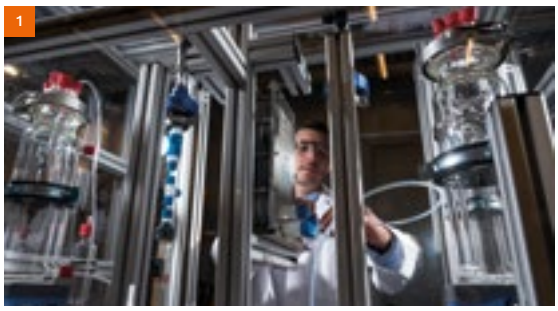

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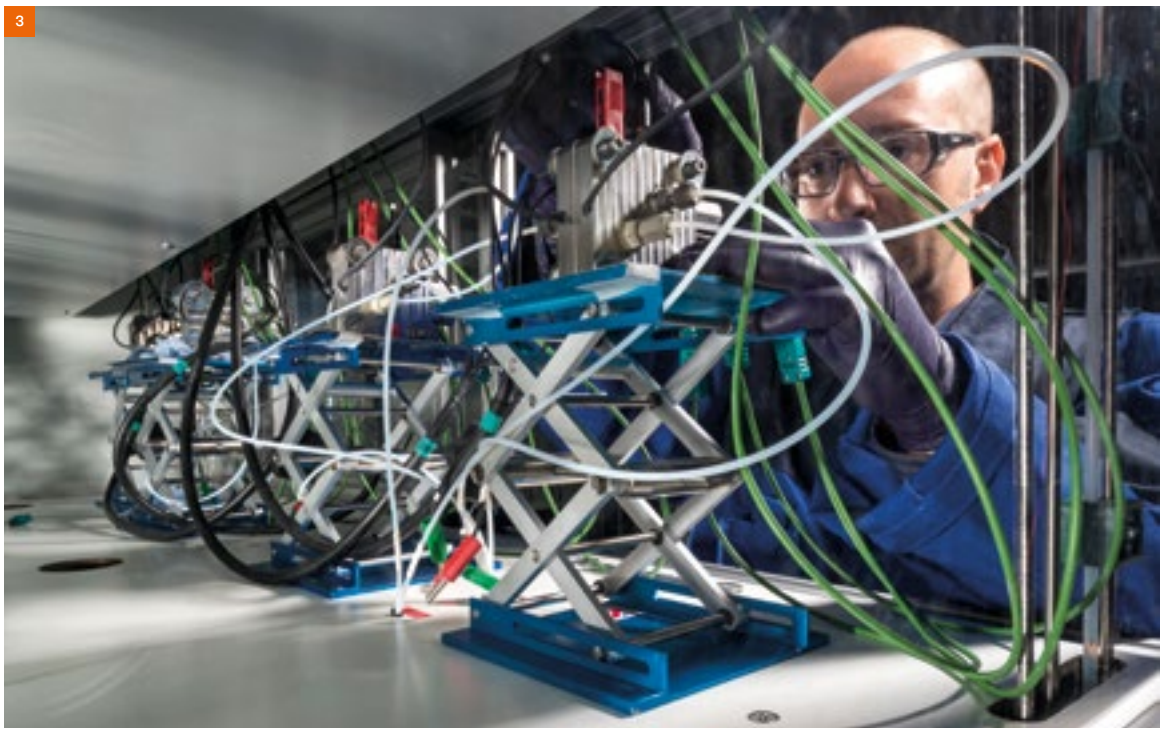

A particular concern is to manage and where possible reduce the use of rare metals and other critical raw materials. Not only to reduce the cost price of electrolysers, but also to reduce their environmental impact, to become less dependent on volatile markets and to manage geopolitical risks.

Another challenge is to ensure that electrolysers remain competitive throughout their lifecycle. For example, Dutch companies are working on optimised design, operational and maintenance strategies. Other innovations focus on the intermittent nature of solar and wind energy, which means that electrolysers need to be designed to handle fluctuating loads and many start-stop cycles.


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1. The Dutch National Materials Observatory plays a vital role in securing sustainable raw material supply chains for hydrogen technologies. It recently published a report outlining strategies for circular electrolyser production, ensuring resource efficiency and environmental impact reduction.

2. SparkNano's production technology, based on a concept first developed at TNO's Faraday Lab in collaboration with materials specialists from the Holst Centre, reduces the amount of iridium and platinum used in electrolysers by a factor of 40. The technology is based on spatial Atomic Layer Deposition (sALD) technology, originally developed for ultra-thin coatings in display technologies.

3. The Hydro Boreas Fieldlab focuses on developing advanced maintenance practices for hydrogen-producing installations, tailored to specific challenges such as the intermittent nature of renewables, autonomous operation and remote monitoring. It is a joint initiative by asset owners, OEMs, service providers, certification bodies and consultancies.

4. XINTC's scalable, low-cost electrolysers directly connect to fluctuating renewable energy sources without expensive electronics. Built from plastic and free of rare metals, these electrolysers can switch hundreds of thousands of times without performance loss. For more details, see page 28.


4

Scaling up production capacity

Current electrolysis installations typically have a capacity of a few megawatts, but to facilitate the huge growth of renewable energy (as well as to compete with much larger 'grey' hydrogen plants and fossil alternatives), this capacity will have to increase towards gigawatt-scale.

Scaling up electrolysis capacity is a focal point of Dutch hydrogen policies, with regulatory and financial instruments designed to stimulate this development. In parallel, the private sector is developing feasible business cases, for example through integrated projects covering the whole supply chain and by making the most of multiple value streams.

1. Shell's Holland Hydrogen I project will be Europe's largest renewable hydrogen plant, with a capacity of 200 MW. It will produce up to 60 tonnes of green hydrogen daily, powered by offshore wind energy. For more on this project, see p. 29.

2. VoltH2 is currently developing a 50MW electrolyser which will serve a range of industrial users, supply residual oxygen to an adjacent water purification plant and benefit from nearby storage caverns (see p. 28). The company also announced plans to build another 50MW electrolyser, which will supply green hydrogen both to the project partner – a large chemicals company – and to other customers through a tube trailer filling station on the partner's premises.

3. Hygro specialises in hydrogen production near (or even in) wind turbines. Along with partner Soluforce it has pioneered integrated 'Wind to Wheel' projects, in which hydrogen is transported directly to fuel stations at a cost price competitive with diesel. This idea has attracted international interest: the companies recently signed a cooperation agreement with Egypt's Suez Canal Economic Zone.

Low-carbon hydrogen: a transitional solution

While green hydrogen remains the ultimate goal for a fully sustainable energy system, low-carbon 'blue' hydrogen serves as a practical transitional fuel to accelerate demand and infrastructure development. Dutch policies acknowledge that blue hydrogen, produced from natural gas with carbon capture and storage (CCS), can help industries decarbonise while green hydrogen production scales up.

The Porthos project in Rotterdam is a multi-industry initiative designed to capture and store 2.5 million tonnes of CO_2 annually from various industrial processes, including hydrogen production, refineries, and chemical plants. While not exclusively focused on hydrogen, the Porthos project is supported by several producers of 'grey hydrogen' as well as a consortium planning to produce low-carbon hydrogen from industrial residual gases.

1. In the PosHYdon project, an electrolyser has been installed on an existing gas production platform off the Dutch coast. It is the world's first offshore electrolyser. Electricity generated by offshore wind turbines is used to power a 1MW electrolyser, which feeds into a natural gas pipeline taking a mixture of natural gas and hydrogen ashore.

Moving offshore

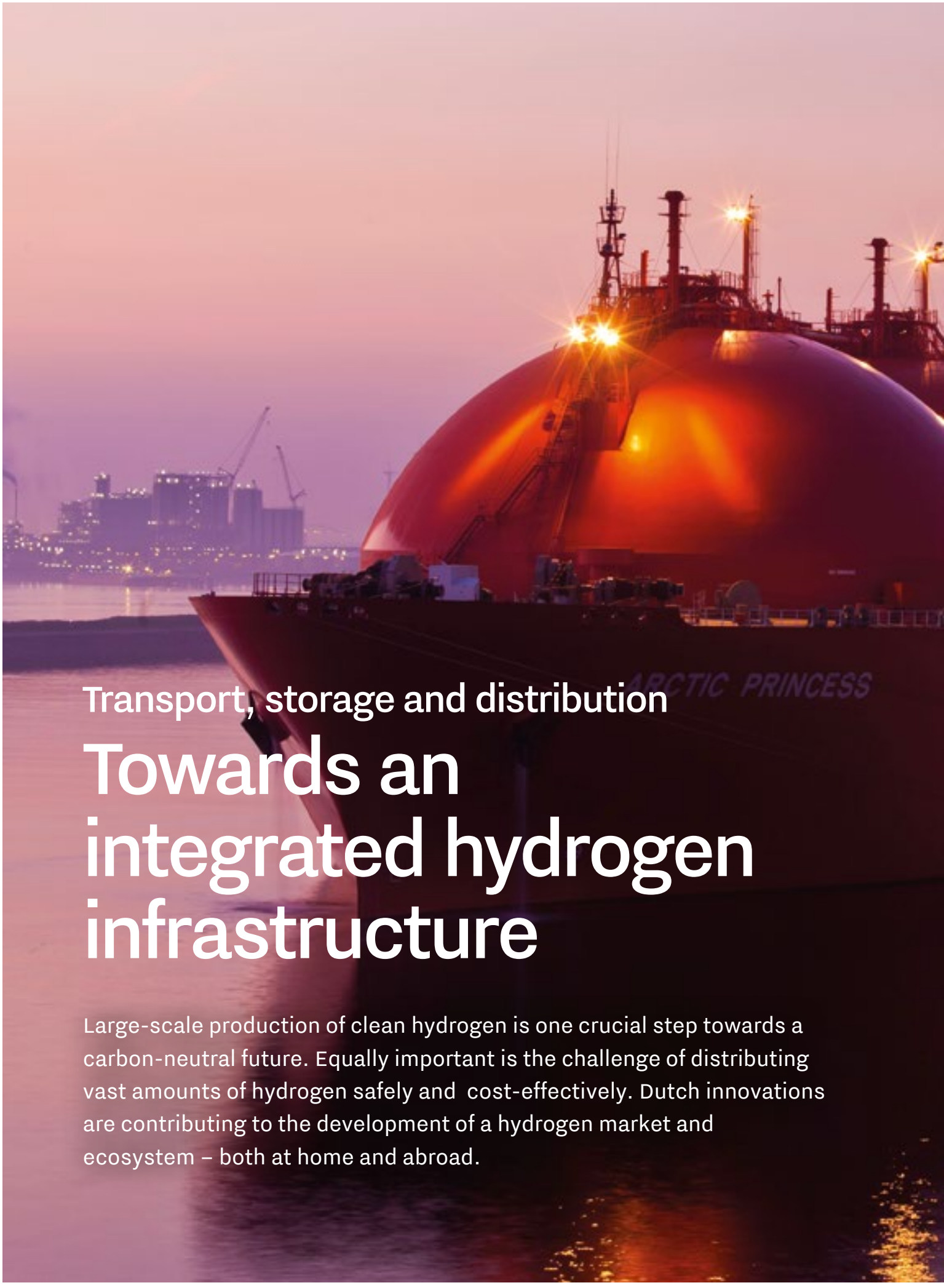
Finally, an increasing number of researchers and companies are focusing not so much on the question of how electrolysis can be implemented, but where. Since hydrogen is an ideal carrier for renewable electricity, it makes sense to try and produce it as close as possible to wind and solar installations, to help minimise the cost of transmission infrastructure, related energy losses and grid congestion. The most abundant supply of renewable electricity, in the Netherlands, can be found in offshore wind farms. The Dutch have already installed nearly 5 GW of offshore wind capacity and are aiming for 21 GW by 2032. Recently the Dutch unveiled the world's first operational offshore electrolysis installation (see p. 29), and plans have been announced for much larger facilities, and a dedicated network of pipelines as part of offshore 'energy hubs' and international hydrogen corridors.

The global perspective

Even with these ambitious plans, however, the Dutch expect that to meet future demand, up to half of all clean hydrogen used in the Netherlands will have to be imported from abroad. The Dutch are actively supporting the development of local hydrogen production in other countries, as part of the country's efforts to help set up international supply chains (see p. 22). This includes developing solutions for (technological) challenges in production: for example, to ensure that local hydrogen production does not put extra pressure on scarce supplies of freshwater. Another important prerequisite for developing global hydrogen supply chains is that these create local jobs and boost economic development in developing countries and emerging markets.

2. Offshore electrolysis plants are expected to be scaled up over the next few years. An offshore electrolysis plant with a capacity of several tens of MW has been planned for the early 2030s. Further upscaling is being planned, building on experience from the first demonstration projects.

3. Such large offshore electrolysis facilities require huge amounts of desalinated water using reverse osmosis: an energy-intensive process which involves the use of chemicals. Wageningen University and Research has developed the SeaHydrogen concept, combined with Schaeffler's electrolyzer stacks utilizing a separate cooling loop, in which the residual heat is used to power a different (and chemical-free) purification technology.



Transport, storage and distribution

Towards an integrated hydrogen infrastructure

Large-scale production of clean hydrogen is one crucial step towards a carbon-neutral future. Equally important is the challenge of distributing vast amounts of hydrogen safely and cost-effectively. Dutch innovations are contributing to the development of a hydrogen market and ecosystem – both at home and abroad.

The Dutch are busy building international clean hydrogen corridors. The ports of Rotterdam and Amsterdam are set to become hydrogen hubs, where imported hydrogen is fed into a national hydrogen transmission network, for transport to major industrial clusters in the Netherlands, Germany and beyond.

The most straightforward way of transporting hydrogen is through pipelines, and the Netherlands is busy expanding existing infrastructure into a nationwide hydrogen network with cross-border connections. The foundations for this national network are already in place. First of all, an existing network of dedicated hydrogen pipelines connects industrial sites in the south-western part of the country with Belgium and Northern France. Secondly, the Netherlands has an unusually dense network of natural gas pipelines. Thanks to the existence of parallel pipelines and a gradually decreasing demand for natural gas, parts of this network can be repurposed for dedicated hydrogen transport. The safety and practical implications of this have been extensively studied through a national research consortium, HyDelta.

A hydrogen transmission network

Building on these foundations, and constructing new pipelines where necessary, national gas grid operator Gasunie is taking the lead in the development of a national hydrogen transmission network, which will connect hydrogen port terminals with the five largest industrial clusters in the Netherlands and with hydrogen storage facilities. Through connections with Germany and Belgium, including a dedicated hydrogen pipeline to be built as part of a 'Delta Rhine Corridor', the network will be an integral part of Europe-wide hydrogen infrastructure – which Gasunie is also advancing through its German subsidiary's involvement in a German hydrogen network and efforts to create a Danish-German-Dutch pipeline corridor.

Large-scale storage

A crucial prerequisite for resilient and flexible hydrogen networks is to include sufficient large-scale storage capacity. Again the Netherlands is making the most of opportunities afforded by its gas infrastructure. Natural gas is already being stored in huge empty salt caverns in the north of the country. Based on extensive research and a series of pilot projects, four caverns have been

1. The Hydrogen Network Netherlands will connect hydrogen import hubs, five major industrial clusters across the Netherlands and hydrogen storage facilities, and will include cross-border connections with Germany and Belgium. The network will consist of repurposed natural gas pipelines, complemented by new pipelines where necessary. Construction started in 2023 in Rotterdam's port area. The first hydrogen transports are expected to take place over the next few years, ahead of the network's overall completion, scheduled for 2033.

2. HyStock's Zuidwending facility will feature four salt caverns dedicated to hydrogen storage, with a total capacity of 216 GWh. The first cavern is expected to be operational by 2031. Demand has already exceeded available capacity, highlighting the urgent need for expansion to meet growing industrial requirements. For more information, see p. 28.

3. In parallel with the national network, to which they may be connected in the future, several industrial clusters are developing regional hydrogen networks. In the south-western delta area, a repurposed 12 km pipeline already transports hydrogen between industrial facilities, saving 10,000 tonnes of CO_2 annually. The Amsterdam Port Zone is advancing an initiative to connect electrolysers and industrial users.

4. Meanwhile, Gasunie is investigating the possibilities for building an offshore pipeline network to support future hydrogen production from North Sea wind farms on dedicated electrolyser platforms (see p. 17). Plans include connecting offshore facilities to onshore hubs and extending pipelines internationally to countries including the UK, Belgium, France, Germany and the Nordic countries.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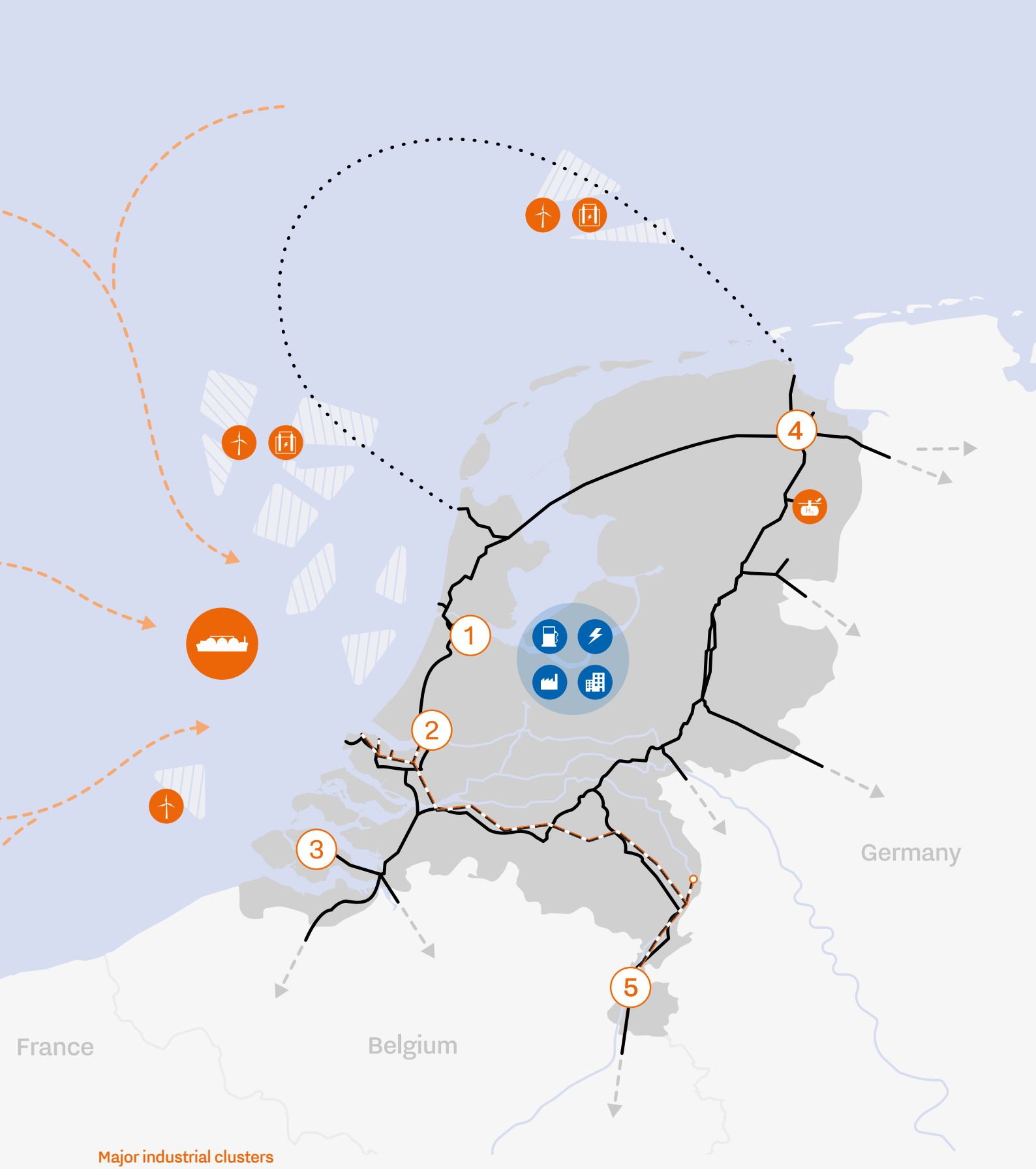

Major industrial clusters

1. Amsterdam
2. Rotterdam
3. Zeeland
4. Groningen
5. Chemelot

Upstream
Midstream
Downstream
Onshore hydrogen network

Electrolysis
(Re)conversion
Industry
Offshore hydrogen network

Offshore wind energy
Import
Power
Delta Rhine Corridor

Storage
Mobility

Underground storage
Built environment

designated for hydrogen storage, with the first expected to be operational by 2031. Meanwhile, researchers and industry specialists are already examining the technical and economic feasibility of another storage option: in empty gas fields, both on land and in the North Sea.

Hydrogen transport via pipelines requires a suite of supporting technologies to ensure safety, efficiency, and reliability. Dutch companies supply key components including advanced flow meters, leak detection systems, compressors and high-pressure testing equipment, as well as innovative, hydrogen-proof pipeline coatings and valves, and digital twin systems for pipeline optimisation.

Liquefied hydrogen and carriers

Building a hydrogen economy requires other and more flexible modes of transport besides pipelines and, in this respect as well, the Dutch are working on a range of innovations. This includes the development of new materials and storage methods, that enable hydrogen to be stored at very high pressure or (in liquid form) at extremely low temperatures, paving the way for safe and cost-effective transport by road, rail or ship. Recently an LH2 Knowledge Community was set up with the express purpose of sharing expertise and tackling challenges around the production, storage, transport, safety and costs of liquefied hydrogen.

Other Dutch companies focus on binding hydrogen with other materials, creating liquid energy carriers such as ammonia, methanol or liquid organic hydrogen carriers (LOHCs). These are much easier to transport at less extreme temperatures or pressure regimes, and in the case of LOHCs even at ambient temperatures.

Creating international hydrogen corridors

While such innovations open up new opportunities for distributing hydrogen in the last few steps of the value chain, they can also be applied to large-scale transport over (very) long distances. There is an urgent need for such solutions, since there is a huge potential for a global hydrogen market. The low cost of electricity in areas with abundant sunshine and/or favourable wind conditions boosts the business case for large-scale renewable hydrogen production. Over the next few decades, Northwest Europe is expected to become a net importer of clean hydrogen.

The Netherlands is at the forefront of establishing global hydrogen supply chains, building on its expertise in renewable energy, infrastructure, and logistics. The Dutch government has signed nearly 20 Memoranda of Understanding (MoUs) with countries across all continents, and has developed advanced partnerships with countries including Spain, South Africa, and Namibia. Such collaborations focus on developing hydrogen production facilities, conducting feasibility studies, and creating infrastructure for hydrogen production, storage, transport and distribution. Major Dutch players such as the Port of Rotterdam, offshore construction companies, TNO, Gasunie, and dozens of technology firms are contributing expertise.

Back in the Netherlands, meanwhile, much work is being done to prepare the infrastructure needed to import, store and distribute such hydrogen shipments. The Netherlands is excellently placed to become a major hydrogen hub for Western Europe. Some of the continent's busiest transport corridors converge on the Netherlands, thanks to excellent road, rail and inland shipping infrastructure, as well as pipeline connections with much of Europe. The Port of Rotterdam is the largest port for oil and (liquefied) natural gas in Europe, and is working with industrial partners to build up a similar position for hydrogen.

Supporting a global hydrogen marketplace

The growing market of clean hydrogen requires a properly functioning exchange platform, efficient pricing and detailed insights into (fluctuating) supply and demand.

The H2 Global Initiative aims to create a global hydrogen market by bridging the cost gap between renewable hydrogen production and market prices. It uses an innovative double-auction approach to conclude long-term contracts with suppliers and separate (short-term) sales contracts with buyers, and by covering any difference between sales and purchase prices from pooled government funding. The Netherlands joined as a signatory in 2023 and is a financial sponsor, contributing € 300 million to a Dutch-German tender for the import of hydrogen (either directly or through carriers, provided the final product is hydrogen) from all countries other than Germany and the Netherlands.

The Hy3+ initiative focuses on creating a resilient hydrogen infrastructure to guarantee continuous supply for industrial clusters in the Netherlands, Germany, and Belgium.

Instead of using general prognoses on the annual demand for hydrogen in certain countries or markets, this initiative will determine precisely how much production, transport, off-take and storage should be available on an hourly basis.

The HyXchange industry initiative complements these efforts by establishing a digital platform for hydrogen trading. It focuses on standardising contracts, certifying green credentials, and enabling price discovery.

1. Dutch sea ports are developing international trade corridors for green and low-carbon hydrogen. The Port of Rotterdam, Europe's largest sea port, is working on one of the continent's first North-South hydrogen corridors, in partnership with the Spanish port of Algeciras. Similar initiatives have been announced in cooperation with partners in Brazil, Namibia, Canada, the US, Morocco, the Gulf region and more. These partnerships focus on all carriers including ammonia, methanol, (liquid) hydrogen, LOHCs and sustainable aviation fuels (SAFs) produced from renewables. Since ammonia, methanol and (e)SAFs can already be imported, used and trans-shipped in significant volumes using existing infrastructure, the port of Rotterdam enjoys a unique position as a European hydrogen hub.

2. The Port of Amsterdam looks set to become a central hub for importing and distributing liquid hydrogen and LOHCs. Plans have been announced to develop hydrogen corridors connecting Amsterdam to the Spanish port of Bilbao, Oman, Saudi Arabia, Egypt and Norway. The latter initiative envisages a two-way corridor, with CO_2 captured during industrial processes to be transported back to Norway for permanent storage.

3. Meanwhile, a newly established Liquid Hydrogen Knowledge Community (LH2KC) serves as a platform for sharing expertise within the Dutch hydrogen sector and with international stakeholders. The platform also provides opportunities for joint innovation efforts.

Hydrogen applications

Creating demand

Kickstarting the hydrogen economy requires investments in supply and infrastructure, but naturally also a large and stable demand. Researchers and companies are working on a wide range of potential hydrogen applications, focusing on those with the highest impact on reducing carbon emissions.

Dutch manufacturers are actively developing hydrogen-powered trucks using both fuel cell and hydrogen combustion engine technologies. Holthausen Clean Technology (pictured here) and VDL (in partnership with Toyota) have introduced hydrogen fuel cell trucks, while DAF and TNO have built prototype trucks with hydrogen-suitable combustion engines.

Industrial applications

One of the key areas in which hydrogen is expected to have a large impact on reducing overall CO_2 emissions is in industrial processes which require high-temperature heat such as steel, glass and ceramic manufacturing. These typically require large installations which consume huge amounts of fossil fuel, mainly natural gas. The goal is to adapt industrial burner systems and ensure they can deal with hydrogen's radically different combustion characteristics.

Another industrial use case is for clean hydrogen to be used as a feedstock, for example in ammonia production for fertilizer. In combination with CO or CO_2, hydrogen also has a vast potential to replace petroleum and natural gas as a basis for the production of synthetic fuels and sustainable bulk chemicals, such as methanol, alkenes and aromatics. These industrial applications are not limited to the Netherlands: in fact, decarbonisation efforts in adjacent countries, notably Germany, are expected to play a key role in creating demand for clean hydrogen over the next few years.

Flexible power infrastructure

Hydrogen offers multiple opportunities to support large-scale electrification. For example, the Dutch are working on the technology to convert fossil-fueled power plants to run on (clean) hydrogen, including large-scale storage facilities (see p. 28), to ensure enough flexible back-up power when the supply of renewable energy is low.

However, one of the most pressing complications of the switch to renewables involves the opposite scenario: solar farms in particular often produce far more power than the grid can handle. One of the largest solar farms in the Netherlands, for example, has a peak capacity that exceeds grid capacity by 50%. Several Dutch projects focus on adding electrolyser capacity to solar or wind farms, to convert surplus power into hydrogen and prevent the need for curtailment. Other innovations include flexible electrolysers that can be used for grid balancing, frequency containment or – combined with fuel cells – as emergency power systems.

Mobility

Many Dutch innovations focus on modes of transport for which electrification may not be an efficient option. Several hydrogen-powered inland shipping barges have already been launched, and the goal is to introduce 150 hydrogen-powered barges over the next 10 years. As part of a pan-European project initiated by the province of South Holland, hydrogen fuelling stations will also be built along the shipping corridor between Rotterdam and Genoa, Italy via Germany.

Dutch solutions for road transport include hydrogen-fuelled buses and trucks (either using fuel cells or direct combustion technology), range extenders for electric vehicles and the technology needed for hydrogen refuelling stations. Of particular interest to many Dutch companies are hydrogen-powered heavy-duty vehicles including cranes and diggers. Not only to reduce carbon emissions, but also to break the deadlock in construction projects, caused by environmental concerns over nitrogen emissions.

Sustainable aviation

Can hydrogen contribute to decarbonisation of air travel? The Dutch are working on a range of options. Through the DutchH_2 Aviation Hub, companies, researchers, policy makers and entrepreneurs are working on the development and integration of hydrogen-powered

Battolyser Systems has developed the world's first integrated battery electrolyser system. It can instantly switch between hydrogen production and electricity discharge, making it an ideal solution for, among other use cases, alleviating grid congestion. The technology has undergone extensive field testing in RWE's Magnum power plant (as pictured here) and Battolyser has secured funding from European Investment Bank to scale up manufacturing capacity.

aircraft, the creation of hydrogen refueling infrastructure and on the required policy framework. With the financial help of a government-sponsored Growth Fund, a consortium of 17 companies and research groups has already designed a feasible architecture for retrofitting a passenger plane with hydrogen fuel cells, which is set to be tested in practice in 2026.

Yet even existing airplanes can substantially reduce their CO_2-emissions by adopting sustainable aviation fuels (SAFs) made from renewables. Many commercial passenger planes can already fly on a blend of SAFs and conventional kerosine, and 100% SAF-compatible airplanes are expected to be introduced by major manufacturers in the next few years. The Dutch are well positioned to play a key role in this development. In the northern part of the Netherlands, SkyNRG – a global pioneer in SAFs – is building Europe's first dedicated SAF plant, where green hydrogen will be used to produce SAFs from industrial byproducts and residue streams. In the Port of Rotterdam, which already supplies around a quarter of Europe's aviation fuel, the world's largest eSAF hub will be built, around a facility that will produce over 250,000 tonnes of e-SAF annually from a combination of locally produced green hydrogen and imported green methanol as feedstock.

Residential heating

Gas-fired heating has been the standard for nearly every Dutch home for decades, yet this is about to change. Newly built homes are no longer connected to the gas grid and millions of existing homes are expected to switch to sustainable alternatives. Especially in older homes, hydrogen boilers may be a more feasible solution than electric heat pumps. Several pilot projects in the Netherlands have already demonstrated that the existing gas infrastructure could be adapted to distribute hydrogen. And the Netherlands has a strong ecosystem of condensing boiler manufacturers, who have already marketed models suitable for gas mixtures with up to 30% hydrogen or even 100% hydrogen.

1. Dutch industrial sectors requiring high-temperature heat are gearing up for a switch to clean hydrogen. Through the Brick Valley partnership, ceramic industries in the eastern part of the country are planning to use hydrogen, either through the nearby national hydrogen transmission network or by ammonia shipped along the Rhine.

2. In the Netherlands, hydrogen is seen as a promising clean fuel for heavy transport, including long-distance trucks and heavy machinery. However, large-scale adoption of hydrogen as a transport fuel also requires new technology for filling stations. Several companies, including HyET and Resato, have developed proven solutions for some of the related challenges, such as the need for affordable and reliable high-pressure compressors.

3. Several hydrogen-powered inland vessels have been launched in recent years. Built by Dutch shipyard Concordia Damen, the 135-metre long MS Antonie is 100% hydrogen-powered, transporting salt from Delfzijl to Rotterdam. Future Proof Shipping and the Holland Shipyard Group have built vessels which can transport up to 190 containers between Rotterdam and Duisburg, Germany.

4. In several pilot projects, grid operators are preparing to convert existing gas infrastructure for hydrogen transport to residential homes. The village of Stad aan 't Haringvliet is home to an active community of residents who are making a collective effort to phase out natural gas. Most residents want to switch to hydrogen central heating boilers. Dutch companies including Remeha and Nefit Bosch are leading suppliers of hydrogen boilers for both residential and commercial use, including models that can be retrofitted from natural gas to hydrogen and hybrid systems which combine a hydrogen boiler with a heat pump.

Dutch hydrogen flagship projects

Dutch flagship projects demonstrate our commitment to advancing hydrogen production technologies through diverse approaches. By partnering with international industries, governments, research institutions, and businesses, these innovations address global hydrogen development challenges while fostering worldwide collaboration on our shared climate objectives.

Hydrogen Network Netherlands

Status: Under construction
Project partners: Hynetwork

On 29 June 2022, former Dutch Minister for Climate and Energy Policy Rob Jetten announced the plans for the construction of a national hydrogen transmission network. Hynetwork, as a subsidiary of Gasunie, has been commissioned to construct and operate the hydrogen network in the Netherlands. The hydrogen network will link the major industrial clusters in the Netherlands and connect them to hydrogen storage facilities, import locations, and other countries. Construction of the network will start in the major industrial regions, such as in the North Sea Canal area and in the northern and the south-western regions of the Netherlands. Work on the hydrogen pipelines in Rotterdam started in 2023. The hydrogen transmission network will mainly consist of repurposed existing pipelines, more and more of which will become available over the coming years as the transmission of natural gas continues to decline. Where this is not possible new pipelines.

www.hynetwork.nl/en

Large-scale hydrogen storage in salt caverns

Status: Under construction, the first cavern is expected to be ready in 2031
Project partners: Hystock, Nobian

Given that supply and demand for hydrogen fluctuates, there is a need for large-scale facilities to store hydrogen underground. Gasunie subsidiary HyStock is developing hydrogen storage facilities at four salt caverns in Zuidwending, near Veendam in the Dutch province of Groningen.

The technical infrastructure for the first cavern, with capacity to store around 200 GWh of hydrogen, is expected to be up and running close to 2031. The other three caverns will be ready to store hydrogen soon after, in line with the growth of the market for renewable hydrogen. Parties who want to store hydrogen, either for the short term or the long term, will have access to these facilities through a connection to the Dutch hydrogen transmission network.

www.hystock.nl/en

XINTC opens the door to a new standard in hydrogen production

Status: operational since 2025
Project partners: XINTC, Energeion

XINTC has developed a new generation of multi-core electrolyser systems, specifically designed for direct coupling with renewable, fluctuating energy sources such as solar and wind. At the heart of this innovation is a maintenance-free plastic gas module, free from membranes, seals, and PFAS materials. These modules are capable of withstanding hundreds of thousands of switching cycles without noticeable performance degradation and are built using common materials, eliminating the reliance on critical metals.

What sets XINTC apart is not only its groundbreaking technology, but also its uncompromising focus on achieving the lowest possible cost per kilogram of hydrogen produced, regardless of purity level or application. The fully standardized, scalable system modules remove the need for complex EPC processes and allow seamless scaling from 500 kW to beyond 100 MW.

To showcase this technology in practice, XINTC has established a full-scale Experience Center in Kootwijkerbroek, The Netherlands, where the system modules are powered directly by an adjacent solar farm. Visitors can observe how the plug-and-play modules operate together in a real-world setup. The center offers insight into the system's functionality, scalability, and simplicity, and demonstrates how XINTC is addressing the need for affordable, flexible hydrogen solutions.

www.xintc.global

hynetwork

hystock
power to hydrogen

XiNTC
ELECTROLYSERS

PosHYdon: green hydrogen production from offshore wind in the North Sea

Status: operational in 2025
Project partners: NEL Hydrogen, InVesta, Hatenboer, Iv-Offshore & Energy, Emerson Automation Solutions, Nexstep, TNO, EBN, Eni Energy Netherlands, Gasunie, Noordgastransport, NOGAT, DEME Offshore, TAQA and Eneco

PosHYdon is the world's first offshore green hydrogen project with a production unit on an operational platform, to transport green hydrogen to shore. It is a demonstration project for offshore electrolysis, which produces green hydrogen from desalinated seawater using green power from offshore wind. The unit has a capacity of approximately 1 MW and can produce 400 kg of hydrogen per day, which is transported via an existing oil and gas pipeline from the platform to shore at the Maasvlakte area of Rotterdam. Here the hydrogen is used by the industry to decarbonize their processes.

The project intends to build experience in offshore electrolysis, the dynamic operation of the PEM electrolyser and the transport of hydrogen in a blend with natural gas to shore. During the project, experience is gained on safety and environmental aspects of offshore hydrogen production. Legal and policy barriers have been resolved with support from all stakeholders involved including the government. The offshore operation followed an extensive, successful onshore test program in 2024, to validate system performance and remote communication with the unit.

The unit will be in operation for six months to one year, after which a next step in scaling up offshore hydrogen production is planned, following the ambitious program of the Dutch government to realize commercial scale development of offshore hydrogen towards 2035.

poshydon.com/en/home-en/

H2 Hollandia: converting surplus solar energy into green hydrogen

Status: the final financing decision has been taken by project partners Avitec and Novar, and the final steps are underway to achieve financial close, with the first green hydrogen deliveries expected to take place in 2026.
Project partners: Novar, Avitec, Repowered

A solar farm that provides more power than the grid can handle. And companies that want to make their heavy equipment emission-free but cannot do so through electrification. With the H2 Hollandia project, developer Novar solves two challenges. An electrolyser next to the solar park Vloeivelden Hollandia will turn excess solar electricity into green hydrogen.

The green hydrogen will be used for sustainable mobility and industry in the region, in what can serve as a blueprint for how to manage and make the most of local sustainable energy production. For example, making hydrogen available regionally can pave the way for more sustainable heavy transport,

The 5 MW electrolyser will be connected to the 115 MWp solar park Vloeivelden Hollandia. The system will produce about 300,000 kg of green hydrogen from solar power each year. Since the electrolyser will be on the same grid connection as the solar farm, it can relieve pressure and prevent grid overloading. And thanks to the connection with the solar field, the excess power can be efficiently used to produce green hydrogen.

The project's financing structure requires a pioneering approach, since there are no comparable commercial projects at present and the technology used has a limited track record. Customisation and a long-term vision are therefore essential to secure financing for this innovative project.

www.novar.energy/projects/h2-hollandia-hydrogen-project/

Holland Hydrogen I

Status: under construction
Shell and over 150 partners, including Thyssenkrupp, Worley, Gasunie, Port of Rotterdam, Visser & Smit bouw, Evides, Howden, Conpacksys, Siemens, Kraayvanger, Volker Energy Solutions, FBM Hudson

Shell, together with contractors and vendors, is building the first big renewable hydrogen plant of Europe (200 MW). Once operational in the second half of this decade, it will produce up to 60 tons of hydrogen per day. This is the equivalent of what 2,300 hydrogen trucks will need and is powered by offshore wind produced at the North Sea.

The Holland Hydrogen 1 (HH1) factory rises behind the dunes of the Dutch coast, at the Tweede Maasvlakte near Rotterdam, on land reclaimed from the sea. This is a significant Shell investment with financial support from the Dutch government and the European Union through IPCEI, and an endeavour involving more than 150 contractors and vendors.

The project provides an answer to the need for cleaner energy in heavy-duty cargo and industries, sectors that have limited options for other renewable solutions. The design incorporates circular materials wherever possible. The space around the plant will be turned into green retreats for birds and other small animals – to showcase how factories can be, and should be, built.

The HH1 project kickstarts the hydrogen economy of the Netherlands and will speed up society on its path to net-zero emissions by 2050 or earlier, including Shell's own operations and that of its clients and partner companies.

www.shell.nl/energie-en-innovatie/waterstof/welkom-waterstof.html

Examples of Dutch partnerships worldwide

PWI: International Hydrogen Platform

The International Hydrogen Platform (Platform Waterstof Internationaal) connects Dutch hydrogen companies with international opportunities by providing market insights, research updates, policy news, and industry events. As a collaborative initiative between key government ministries (Foreign Affairs, Economic Affairs), agencies (RVO), and industry organizations (FME, Top Sector Energy, NWBA, New Energy Coalition, NMT-IRO, NLHydrogen), the platform supports Dutch companies in transforming innovative ideas into practical solutions while leveraging the country's strategic position, ports and infrastructure. PWI aims to stimulate international hydrogen trade and strengthen the Dutch position in the emerging global hydrogen economy. Stay informed through the PWI newsletter or LinkedIn.

Register for the PWI newsletter

Follow us on LinkedIn

Partners for International Business (PIB)

Creating solutions for a hydrogen-powered economy together

The Dutch government has developed multi-year action plans with clusters of Dutch businesses and knowledge institutes. These include strategic activities in the hydrogen sector that provide the Dutch hydrogen industry with the best possible platform abroad for international cooperation. These collaborations present an opportunity for Dutch and international companies in the hydrogen chain to exchange knowledge, share innovative ideas and build partnerships. This includes sharing know-how on hydrogen developments from supply chains (production, transportation and storage) to usage and applications (mobility, built environment, and energy and industrial sectors).

Australia

The capabilities of this cluster of Dutch hydrogen experts in the PIB H2 Australia span the entire hydrogen chain. Together, the partners can help Australia realise its ambitions to produce and export clean hydrogen to the global market. This partnership is coordinated by New Energy Coalition.

Chile

Chile is to be a competitive exporter of green energy and the focus of this PIB programme is to build connections between Dutch hydrogen companies with the Chilean hydrogen market, with a strong emphasis on companies that are active in port logistics, port infrastructure and storage. This partnership is focused on the two main potential 'hydrogen hubs'; the Southern Magallanes and Northern Antofagasta region. Rotterdam Partners is the coordinator of this PIB.

Gulf Region

The Gulf region is well positioned to become a net exporter of clean hydrogen and its derivatives at globally competitive costs. Their ability to scale up clean hydrogen production makes these Gulf states the ideal breeding ground for developing clean hydrogen value chain-related technology from pilot to commercial scale. The PIB will help to enable business opportunities related to the development of the hydrogen value chain, including creating required corridors to transport hydrogen or derivatives from the Middle East to Europe. The cluster of more than 40 companies is coordinated by Holland Hydrogen Hub.

Japan

Both the Netherlands and Japan have a strong industry in the field of hydrogen and a high development potential. Through innovative cooperation, both countries can strengthen each other in the developments surrounding both the supply of hydrogen and large-scale and broad applications of hydrogen - in particular applications in industry, mobility and the built environment. New Energy Coalition is coordinating this cluster.

And more to come...

The Dutch are busy investigating possible new PIBs in promising hydrogen markets.

For more information about Partners for International Business and the clusters mentioned here, see our initiatives on TradewithNL.nl or contact us at pib@rvo.nl.

Scan the QR code
for more information

Five benefits of doing business with the Netherlands

1. Quality and reliability

We 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

We have been doing business abroad for centuries and understand what it takes to work successfully across borders and cultures. We are also 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, we rank fourth in the world and we are home to world-class research institutes in clean energy technology, global players in semiconductor technology and excellent machine manufacturers.

4. Joint innovation

We strive to create flexible, fast-moving networks of specialist companies and research institutes and are proud of the 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

We have organised our clean energy expertise into national consortia. These networks offer fast and easy access to the right technology providers, researchers or combination of specialists. We all pursue a common goal: solving global challenges together.

Dutch hydrogen expertise

Looking for specific expertise or technological solutions? In this section, Dutch businesses and other organisations in the Dutch hydrogen sector introduce themselves and their portfolios. Consult the table on p. 36/37/38/39 to identify possible partners in your future hydrogen endeavours.

All companies listed in this section can also be found on the online, interactive 'Mission H2' map, along with examples of current hydrogen projects and innovations. See page 11 for more information or scan the QR code.

Creating international partnerships is essential to stimulate the global hydrogen economy

Nations worldwide are in transition towards a renewable-powered energy system to fight the threat of global warming. The latest IPCC report stresses the urgency to increase the speed and scale of renewable deployment to reach the goals of the Paris Agreement.

Hydrogen can, and - in my opinion - will play a key role in achieving the transition towards a climate-neutral and circular economy. Hydrogen has a multitude of potential applications across energy-intensive sectors. It can be used as feedstock and it can replace fossil fuels in high-temperature processes in our industry.
Due to its high-energy density, it is suitable for long-distance transportation purposes, and it can partially play a role as sustainable backup energy source for longer term, seasonal storages.

However, truly incorporating hydrogen into the global energy system remains challenging. The large-scale (sustainable) hydrogen production, development of a new European and international infrastructure, and a global hydrogen market are still in the early stages of development. This market is expected to become similar in form and magnitude to the current oil and gas markets. Especially because the climate challenges are global and hydrogen is only one of few alternatives available.

To achieve a truly integrated hydrogen system, it requires a cooperating international community. The Netherlands' enormous experience with natural gas, as the "gas roundabout" of North-West Europe, makes it an ideal and willing candidate for a substantial and constructive role within a hydrogen-based economy. Our ports and the fact that we are well-connected to other Northwest European countries provide a geographically strategic position that we can use to become the center of a European and perhaps a global hydrogen market. Furthermore, Dutch knowledge institutions and regional ecosystems, such as the green hydrogen valley, are extremely effective in translating ideas into practice within and outside the Netherlands. As this brochure illustrates, the Netherlands is also home to a wide variety of ambitious companies, ready to kick-start the European and global hydrogen market. In that perspective, I'm proud of the Dutch ambition to lead the development of hydrogen markets.

Activity in the Netherlands related to technological innovation and business developments is increasing. Creating international partnerships is essential to stimulate the development of a global hydrogen economy. It is our joint responsibility to turn initiatives into concrete projects and operational systems and thereby demonstrating hydrogen's full potential in a sustainable energy system.

We understand that realising hydrogen's full potential will take time in which considerable challenges must continuously be overcome. Our aim is to support you in achieving your projects, ambitions and goals.

Peter Molengraaf
Chair Energy Innovation NL

tki nieuw gas
topsector energie

	ELECTRICITY	H_2 PRODUCTION	ENGINEERING / INSTALLATION	INFRASTRUCTURE	FLOW SOLUTIONS	STORAGE	MOBILITY	MARITIME	INDUSTRY	BUILT ENVIRONMENT	INFRASTRUCTURE AND STORAGE	RESEARCH / ADVISORY	ASSOCIATION	PAGENUMBER
&Flux												●		40
20K Hydrogen B.V.				●	●		●	●	●		●			40
ABB B.V.	●	●	●	●	●	●	●	●	●	●	●			41
ABC-Techniek B.V.			●		●		●	●	●		●			41
ACE Terminal				●							●			42
Adsensys H2 Solutions		●	●						●		●			42
AECOM Netherlands B.V.	●	●	●	●		●	●	●	●	●	●	●		43
AEG Power Solutions B.V.	●	●	●						●	●				43
Air Liquide B.V.		●	●	●	●	●	●	●	●	●	●	●	●	44
Air Products Nederland B.V.		●	●	●		●	●	●	●	●	●			44
Alkalium B.V.		●	●			●								45
Alles over Waterstof BV							●			●		●	●	45
AMF Bakery Systems B.V.									●					46
Ansaldo Thomassen B.V.									●					46
Antonius				●		●		●	●		●			47
AquaBattery B.V.		●				●		●	●	●	●	●		47
Arcadis			●	●			●		●	●	●	●		48
Atlas Copco			●				●	●	●					48
AVK Nederland B.V.			●		●				●	●	●			49
AVOXT B.V.		●	●				●	●	●	●				49
AWL Techniek B.V.			●						●			●		50
BA2C Europe/Latin America														50
Ballast Nedam	●	●	●	●	●	●	●	●	●	●	●	●	●	51
Battolyser B.V.	●	●	●			●	●		●	●	●			51
Berenschot Groep B.V.												●		52
Bilfinger Engineering	●	●	●	●		●			●		●			52
Bosal Nederland B.V.	●	●					●	●	●	●	●			53
Bosch Rexroth B.V.				●	●	●	●	●	●	●	●			53
Bosch Thin Metal Technologies			●			●	●		●		●	●		54
Bout Hydrogen Consultancy			●	●		●	●	●	●					54
Bredenoord B.V.	●					●	●				●			55
Brigh2		●					●		●			●		55
Bronkhorst Nederland B.V.					●				●			●		56
Brunel														56
Burckhardt Compression Nederland B.V.			●	●		●			●	●	●	●		57
Bureau Veritas		●	●	●		●	●		●	●	●	●		57
Bürkert Fluid Control Systems		●			●		●	●	●	●	●			58
Capgemini			●									●		58
Cenex NL							●					●		59
Circonica Circular Energy B.V.	●	●	●			●	●	●	●	●				59
Clear												●		60
CoheSys												●		60
Connectr Energy Innovation	●	●	●	●	●	●	●	●	●	●	●	●	●	61
Conpacksys			●	●	●	●			●		●			61
Corre Energy Storage B.V.						●								62
Cryoworld B.V.				●	●	●	●	●	●		●	●		62
Danfoss B.V.	●	●		●	●	●		●	●	●	●			63
De Boer Sustainable Project Solutions		●	●	●		●			●		●			63
Deelrijk		●	●	●		●	●	●	●			●		64
Deerns Nederland B.V.		●	●	●	●	●			●	●	●	●		64
Deltalinqs													●	65
Demaco Holland B.V.		●	●	●	●		●	●	●		●	●		65
Demcon Production B.V.		●	●				●		●			●		66
Desu Systems		●				●	●	●	●		●	●		66
Development Agency Noord Holland Noord (ONHN)	●	●	●	●	●	●	●	●		●	●	●	●	67
Development Agency OostNL	●	●	●	●	●		●		●	●		●		67
DLS B.V.			●				●	●	●					68
Doeko B.V.		●	●	●		●		●	●	●	●			68
Douna Machinery		●	●		●	●			●	●		●		69
Drenthe College		●	●	●	●		●	●	●		●	●		69
Duiker Combustion Engineers B.V.			●			●			●	●		●		70
Dumaco Woerden B.V.			●											70
Dutch Boosting Group							●		●	●	●	●		71
Dutch Marine Energy Center	●	●						●	●			●		71
Duurzaam Energie Perspectief		●	●	●		●	●		●	●	●	●		72
DWG			●	●		●		●	●					72
E&E advies												●		73
Eekels Technology B.V.	●					●		●	●		●	●		73

	ELECTRICITY	H_2 PRODUCTION	ENGINEERING / INSTALLATION	INFRASTRUCTURE	FLOW SOLUTIONS	STORAGE	MOBILITY	MARITIME	INDUSTRY	BUILT ENVIRONMENT	INFRASTRUCTURE AND STORAGE	RESEARCH / ADVISORY	ASSOCIATION	PAGENUMBER
Ekinetix B.V.		●	●	●		●	●	●	●	●		●		74
Ekwadraat advies B.V.												●		74
ElecHydro B.V.		●												75
Elestor B.V.		●				●			●	●				75
E-Lions H2 B.V.		●	●				●							76
Eltacon Engineering B.V.	●	●							●		●			76
Emerson		●	●		●		●	●	●		●	●		77
Emmett Green	●	●	●	●		●	●	●	●	●		●		77
Enablemi												●		78
Endress Hauser					●									78
Enercy B.V.			●	●								●		79
Energy Storage NL													●	79
ENGIE	●	●			●		●	●	●	●		●		80
EnginX	●	●	●	●	●	●	●	●	●	●	●			80
ENI		●		●		●					●			81
EnTranCe		●	●	●	●		●	●	●	●	●	●		81
EoxTractors B.V.							●		●	●				82
Erez Energy		●					●		●					82
Eriks B.V.					●			●	●			●		83
E-Trucks Europe B.V.							●							83
Ernst & Young												●		84
Feenstra Verwarming B.V.			●							●				84
Festo			●		●				●					85
Fijnmechanische Industrie Noord-Nederland Finn B.V.		●					●	●				●		85
Firan				●										86
Fluidwell B.V.		●	●	●	●	●	●	●	●	●			●	86
Fluor		●	●	●	●	●			●		●	●		87
FME												●	●	87
Fountain Fuel				●			●							88
Fujifilm		●										●		88
Future Proof Shipping							●	●	●	●		●		89
Gasunie				●		●					●			89
gAvilar B.V.			●	●					●	●		●		90
Georg Fischer N.V.		●		●	●			●	●		●			90
Green Energy Park Global B.V.		●		●		●			●		●			91
Greenwise Campus Innovatiecentrum		●	●	●	●		●		●	●		●		91
Groene Hart Werkt													●	92
Groningen airport Eelde N.V.	●	●		●			●					●		92
Groningen Seaports N.V.	●	●	●	●	●	●	●	●	●		●	●		93
H2 Academy												●		93
H2ARVESTER	●		●				●	●	●			●		94
H2 Circulair Fuel B.V.		●				●	●	●	●	●	●			94
H2Do		●	●											95
H2Dock BV		●												95
H2 Hub Twente	●	●		●			●		●	●	●	●		96
H2O Systems		●		●						●	●	●		96
H2Storage B.V.			●	●		●	●	●	●	●	●			97
H2XP		●					●	●	●					97
HAN University of Applied Sciences												●		98
Heattec heat Technology B.V.		●	●						●	●				98
Hermanos Energy	●	●				●	●		●		●			99
Hexwise									●			●		99
Hinicio												●		100
HINT Global B.V.														100
Hobre Instruments B.V.	●	●							●					101
Howden Thomassen Compressors B.V.		●		●	●	●	●	●	●		●			101
HSM Offshore Energy BV		●	●	●					●		●			102
HyCC B.V.		●							●					102
HyDevCo BV		●	●				●	●	●	●				103
HydraSun		●	●	●	●		●		●		●			103
Hydrogen Architects		●	●	●		●	●	●	●		●	●		104
Hydrogen Powered Solutions		●	●			●			●	●	●	●		104
Hydrogreenn		●	●	●	●	●	●	●	●	●	●	●	●	105
Hydro Motion Team TU Delft			●		●	●	●	●						105
Hydronex B.V.	●	●		●			●	●	●			●		106
HyEnergy Consultancy BV		●	●	●		●	●	●	●			●		106
Hyer Power	●		●		●				●	●	●			107
Hyet Hydrogen B.V				●	●	●	●	●	●	●	●	●		107

	ELECTRICITY	H_2 PRODUCTION	ENGINEERING / INSTALLATION	INFRASTRUCTURE	FLOW SOLUTIONS	STORAGE	MOBILITY	MARITIME	INDUSTRY	BUILT ENVIRONMENT	INFRASTRUCTURE AND STORAGE	RESEARCH / ADVISORY	ASSOCIATION	PAGENUMBER
Hygear		●	●	●		●	●	●	●	●		●		108
HyMatters Operations B.V.	●	●	●	●	●	●	●	●	●	●	●	●		108
HyNetwork				●										109
HyNorth												●		109
HyPlanet		●		●		●	●	●	●					110
Hysolar		●		●			●	●				●		110
Hystream B.V.	●	●	●	●		●	●	●	●	●	●	●		111
HyStock						●								111
ISPT									●			●		112
Invest International	●	●	●	●	●	●	●	●	●		●			112
IV-groep BV	●	●	●			●								113
Ionbond		●					●	●	●					113
JP Energy Systems		●	●			●	●		●	●				114
Kapp Nederland B.V.		●	●		●		●	●	●	●				114
Kelvion B.V.		●	●			●	●		●		●			115
Kenter B.V.				●										115
Kiwa Nederland N.V.	●	●	●	●	●	●	●	●	●	●	●	●		116
KLINGER The Netherlands		●	●		●				●		●			116
Koedood Dieselservice B.V.	●		●			●	●	●	●			●	●	117
Koninklijke Van Twist B.V.	●								●					117
Krock H2 Boats								●						118
LFF Glamal Europe B.V.					●									118
Lhyfe		●	●				●	●	●					119
MAGNETO special anodes B.V.		●			●		●	●	●	●	●	●		119
Magnus Energy B.V.				●					●		●	●		120
Marsh Netherlands						●			●		●	●		120
Maximator			●	●	●	●	●	●	●		●			121
Mechatest sampling Solutions									●					121
Metalot Future Energy Lab B.V.												●		122
Mokveld Valves B.V.					●				●		●			122
Mott Macdonald BV		●	●	●	●	●	●	●	●		●	●		123
MTSA Technopower B.V.		●				●	●	●	●	●	●			123
Micro Turbine Technology B.V.	●		●						●	●		●	●	124
MV Energietechniek	●	●	●	●	●	●	●		●	●	●	●		124
Nedstack BV	●							●	●	●		●		125
Netherlands Enterprise Agency (RVO)												●		125
Nettenergy B.V.	●	●	●									●		126
New Cosmos-BIE B.V.	●	●	●	●		●	●	●	●	●	●	●		126
New Energy Business School							●	●	●	●	●	●	●	127
New Energy Coalition		●		●		●	●	●	●	●	●	●	●	127
Nexus Energy			●	●				●	●	●	●			128
Noordgastransport B.V. NGT		●		●	●	●			●		●			128
Nederlandse Innovatie Maatschappij B.V. (NIM)	●	●	●	●	●	●		●	●		●	●	●	129
NL Hydrogen													●	129
Nogat B.V	●	●		●		●					●			130
North Sea Port Netherlands N.V.				●				●						130
Nuvera Fuel cells Europe	●						●	●	●					131
NWBA													●	131
NXT Mobility				●			●							132
Nijhuis Saur Industries B.V.		●							●					132
OCI Global		●		●			●	●	●					133
On2Quest		●	●				●	●	●	●		●		133
Peutz bv		●	●	●	●	●	●	●	●	●	●	●		134
Plug Power		●	●	●		●	●	●	●	●	●			134
Pondera Consult BV	●	●	●			●	●		●	●	●	●	●	135
Port of Amsterdam	●	●		●			●	●	●		●			135
Port of Rotterdam	●	●		●			●	●	●		●			136
Power2X		●		●		●		●	●		●	●		136
Pro Control Process Automation B.V.					●		●	●	●					137
Prodrive Technologies B.V.	●	●		●					●		●			137
Promotec					●	●			●		●			138
Proton Ventures B.V.			●			●		●	●			●		138
Pure Water Group	●	●							●					139
PwC												●		139
RAI Automotive Industry NL							●	●	●			●	●	140
RAP Clean Vehicle Technology							●		●		●	●		140
REDstack B.V.	●	●			●				●					141
Remeha B.V.			●							●		●		141

	ELECTRICITY	H_2 PRODUCTION	ENGINEERING / INSTALLATION	INFRASTRUCTURE	FLOW SOLUTIONS	STORAGE	MOBILITY	MARITIME	INDUSTRY	BUILT ENVIRONMENT	INFRASTRUCTURE AND STORAGE	RESEARCH / ADVISORY	ASSOCIATION	PAGENUMBER
Resato Hydrogen Technology			●	●			●							142
ResH2		●												142
RN Solutions									●					143
Royal HaskoningDHV												●		143
RWE	●	●				●	●	●	●					144
SALD BV			●				●	●	●	●		●		144
Samotics BV									●					145
Saxion Hogeschool Enschede							●		●	●	●	●		145
Schaeffler Nederland B.V.		●					●	●	●	●	●			146
Schwank BV		●	●	●	●				●	●	●	●	●	146
SHV Energy				●		●	●		●	●	●			147
SIA Partners	●	●		●	●							●		147
Siemens Nederland N.V.	●	●	●	●		●	●	●	●		●			148
Solstice management BV												●		148
Soluforce				●	●						●			149
Sorama		●	●	●	●	●	●	●	●	●	●	●		149
Sparknano			●						●			●		150
R. Stahl Electromach				●			●	●	●		●	●		150
Stirling Cryogenics				●		●	●	●	●		●			151
Strohm BV					●	●		●			●			151
Summit Engineering		●	●	●		●	●	●	●	●	●	●		152
SUWOTEC B.V.		●					●	●	●	●	●	●		152
Swagelok Nederland					●		●	●	●	●	●	●		153
Tebulo Engineering bv	●	●	●	●	●	●		●	●		●			153
Teesing B.V.			●		●				●					154
T.EN Technip Energies		●	●						●			●		154
Teijin Aramid		●			●	●	●				●			155
TKI Gas												●		155
TNO												●		156
TNO Holst Center												●		156
To70 B.V.												●		157
Torrgas Projects B.V.		●	●						●			●		157
Toyota Material Handling Nederland B.V.							●							158
Tradinco Instrumenten-Apparaten B.V.					●		●	●	●	●	●	●		158
TSG Group			●						●			●		159
TSG Netherlands		●				●	●	●	●		●			159
TU Delft	●	●		●	●	●	●	●	●	●	●	●		160
TU Eindhoven	●	●				●			●		●	●		160
TU Twente (HyUT)	●	●		●		●	●	●	●	●	●	●	●	161
Twynstragudde	●	●	●	●			●	●	●	●	●	●	●	161
Van Leeuwen Buizen Groep				●	●						●			162
Van Wees UD and Crossply Technology BV						●	●	●	●					162
Varo Energies Netherlands B.V.		●							●					163
VDL Energy Systems B.V.	●				●	●	●		●	●	●			163
VDL Hydrogen Systems			●						●		●			164
Veco B.V.		●					●		●					164
Vecom Group B.V.		●		●	●	●	●	●	●		●			165
Vega		●		●	●	●		●	●	●	●			165
Veolia		●	●				●		●					166
VoltH2		●					●	●	●					166
Vonk			●											167
Royal Vopak				●	●	●	●	●	●		●			167
Voyex B.V.						●	●	●	●	●	●			168
VSParticle		●												168
VTTI				●		●					●			169
Water Alliance													●	169
WE | doubleyouenergy b.v.		●	●			●	●	●	●	●	●			170
Wigersma & Sikkema B.V.					●						●			170
Witteveen+Bos	●	●	●	●			●		●	●		●		171
Wolfard &Wessels			●	●				●	●					171
World Class Maintenance		●	●		●				●		●	●	●	172
WSP Nederland B.V.	●		●	●	●	●		●	●	●	●			172
XINTC B.V.		●	●				●	●	●					173
Zepp Solutions						●	●	●	●		●	●		173
Zeton B.V.		●							●			●		174
Novar Nederland BV	●	●				●	●		●		●			174

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Building new value chains, starting with 'proof of concept' and strong stakeholder engagement – that is what drives us. We understand the complexity of transitions and know how to bring market, government, innovations, business cases, technology and policy together. In each of our focus fields — energy transition, feedstock transition, circularity and climate adaptation – we have developed and initiated programmes with a multitude of partners from business, government and society. Examples include the boosting of sustainable heat projects in eg the Amsterdam metropolitan area, CO_2 as a feedstock for future proof industry, market for re-use of solar panels and developing international hydrogen value chains. &flux initiated several international hydrogen value propositions, like an industrial hydrogen import chain between North Africa and the Netherlands.

In Estonia we established the hydrogen strategy for Port of Tallinn. Through cooperation with business and government partners we kick-started the build of a new economic proposition with Port of Tallinn as the central node in the hydrogen ecosystem. We extended this into a hydrogen action perspective for the Estonian aviation cluster. Recently, we started to explore a joint collaboration platform and hydrogen strategy for Klaipeda (port, municipality and FEZ) region in Lithuania. The ultimate goal of these projects is to enable companies and governments to establish hydrogen projects along the full value chain. In the Netherlands, &flux initiated and is leading the H2Makers platform (www.h2makers.nl), connecting entrepreneurs, corporates, education institutions, experts, governments and suppliers for the hydrogen manufacturing industry.

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20K Hydrogen : the supplier for high-end LH_2 cryogenic products. The company was founded in 2021 as spinoff of Cryoworld, to deliver its innovations as series produced, repeatable, high quality, certified and tested products to the market. In order to make the energy transition possible we are convinced that delivery of products for liquid Hydrogen is an important piece of the puzzle due to its high energy density and quick response to load changes. We want use our decades of cryogenic engineering and building experience to make the energy transition a success.
We deliver various essential products and components in the liquid hydrogen supply chain. Examples are;

Liquid hydrogen storage solutions, volumes up to 10.000 L in vertical or horizontal design (scalable, larger upon request), low boil-off design based on scientific helium experience:

- Small-scale LH_2 movable storage dewar
- Sturdy LH_2 storage tank for mobile and static applications
- LH_2 lightweight aluminium tank for mobile applications such as aviation.

Lab scale liquefier HYQUE L50, liquefaction capacity 10 kg/day, storage capacity 500 L (scalable, larger upon request).

Liquid hydrogen distribution systems:
- Lab scale LH_2 testing systems
- LH_2 Filling station
- LH_2 flexible transfer line
- LH_2 Johnston coupling

From our first-line experience, we know that properly build liquid hydrogen equipment is a substantial part of the solution to the climate challenges the world is facing.

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ABB is a global technology leader in electrification and automation. We see our purpose as being to enable a more sustainable and resource-efficient future. By connecting our engineering and digitalisation expertise, we help industries run at high performance, while becoming more efficient, productive and sustainable so they outperform. We call this: 'Engineered to Outrun.' We have around 110,000 employees worldwide and a history that stretches back more than 140 years.

The global push toward net-zero emissions has positioned hydrogen as a crucial energy carrier and ingredient in the transition to sustainable, less carbon intensive applications.

ABB provides integrated automation, electrification, and digital technologies that help industries outperform. Our digital solutions for sustainability ensure accurate control and optimisation throughout the production process, while comprehensive instrumentation and analyser solutions support operations from electrolysis to final verification of hydrogen purity. The company is also supporting hydrogen transport applications through marine fuel cell technology, as well as advanced traction converters and battery systems.

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Over a period of three decades ABC-Techniek became a well- known and established system integrator for customers around the world.

Work together to find the best solution and a no-nonsense mentality are important factors that contribute to the growth of our company. Besides this our technical know-how, high internal standards of quality and the passionate drive for our areas of expertise are indispensable. Therefore, we can call ourselves an innovative player in the field of engineering, fabrication of control systems and electrical and instrumentation (E&I) installations.

ABC-Techniek is an ISO-9001 certified organisation with a proven knowledge along with experience in the design as well as delivery of control- and distribution panels for a power supply up to 690VAC and 3200A. Furthermore an extensive experience in wiring of electrical and instrumentation installations and finally an expertise in explosion protection.
Our professional knowledge offers you an integral approach from the designing process to realisation, pre-operational and start-up, maintenance and services.

ABC-Techniek provides products and services for the hydrogen and renewable energy industry, petrochemical and process industry (ATEX/IECEx). Our staff is certified to execute inspections in particular on electrical installation in hazardous locations. The professional competence is warranted by the IECEx 05 Certification of Personnel Competence (CoPC).

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ace Terminal

To address the growing demand for hydrogen, strategic partners Gasunie and Vopak have joined forces and knowledge to develop a hydrogen import terminal at the Port of Rotterdam.
This open access terminal will enable the reception and storage of ammonia as a hydrogen carrier for customers in north-western Europe.
In addition, the terminal will facilitate the conversion of the ammonia into hydrogen, the transshipment of the ammonia, and the transport of both hydrogen and ammonia to end users.

ACE Terminal will be built at the Port of Rotterdam, whose strategic location offers direct access from the North Sea and a connection to Rotterdam's industrial area and to Gasunie's pipeline infrastructure leading to north-western Europe.

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Adsensys

Adsensys makes an impact by sharing knowledge about the possibilities and benefits of green hydrogen and offers turnkey solutions for hyrdogen production in various sectors such as mobility, industry and agriculture and horticulture with a modular and scalable hydrogen configuration that produces and stores 99.9% clean hydrogen.

Taking the next step in the energy transition - that's what you do when you generate hydrogen with Adsensys' scalable solutions. Our hydrogen products consist of a core, which is then mass-produced. The result? A scalable and flexible solution. Due to scalability, the applications are almost endless. So together, we always find a solution that fits your needs seamlessly.

With a scalable, modular and innovative system, we make green hydrogen accessible to everyone. From 2.4 kilowatts to several megawatts, which can be connected to an infinite number of megawatts. In doing so, we reduce the impact of fossil fuels on the climate and contribute significantly to accelerating energy transition. Together, we make the world a little more beautiful. And that with 99.999% clean green hydrogen.

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AECOM provides decarbonisation professional and project delivery services to support clients to transition from carbon powered infrastructure to more sustainable alternatives. We help customers to decarbonise portfolios, transition to sustainable alternatives and deliver innovative energy solutions in the production, handling, and usage of hydrogen for a full range of mobility, heating and storage outcomes. We provide single-source multi-disciplinary engineering, environmental, project and construction management services across the whole hydrogen value chain. Our combination of global experience and integrated technical capabilities delivers strategic solutions that improve and modernise infrastructure; enhance sustainability and resiliency; and benefit communities.

References:

- EPCM services for Shell's Hydrogen fuel stations (heavy and light duty infrastructure) across Benelux
- Design and delivery of filling points for Qbuzz's fleet of hydrogen-powered buses in Groningen, The Netherlands
- Feasibility and pre-FEED design support for world's first 100% hydrogen-fired gas turbine power station and conversion of an existing CCGT to 50% hydrogen blend in the UK
- Upgrade of Italy's historic Apennine diesel railways to hydrogen train transportation and supporting generation, including supply infrastructure
- Confidential site selection, engineering and feasibility services for blue and green hydrogen production facilities, UK
- Confidential green ammonia import facility environmental permitting and programme support

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AEG POWER SOLUTIONS

Since decades, AEG Power Solutions has ensured continuous availability of power and the safe operation of critical applications in all environments thanks to a wide portfolio of power supply systems and services. Our distinctive expertise spans AC & DC technologies and we have developed world-class engineering capabilities that span conventional and renewable energy platforms.

We leveraged our unique power electronics, grid integration and conversion expertise to develop power solutions supporting the energy transition, from wind power generation to energy storage and hydrogen production. AEG PS is a proven specialist for storage converters in On/Off Grid energy storage applications thanks to our bi-directional system, Convert SC Flex.

For hydrogen production, our high current rectifiers Thyrobox DC3 are a solution of choice to supply power for the electrolysis process.
We provide the complete power block (transformer + rectifier) solution with the integrated grid compliance requirement and low losses.
The power blocks ranges from 500 kW – 10 MW blocks which can be connected together to supply the electrolyser cells for large scale projects above 100 MW. AEG PS is working with electrolyser OEM's, EPC's and integrators to support them with our power solutions. We have been an active player in this field for over 8 years and have developed a field expertise to best support our customers.

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Air Liquide

Air Liquide, your strategic business partner to accelerate a hydrogen society in Europe.

Reducing CO_2 emissions has become a major challenge, in particular for industry and heavy-duty mobility key players. To meet this challenge, Air Liquide has a comprehensive portfolio of technology and service solutions to support the decarbonisation efforts of its customers around the world, from the supply of low-carbon industrial gas to active CO_2 capture.

To decarbonise the planet, hydrogen plays a key role. The Air Liquide Group's unique expertise in this field dates back more than 50 years. Its technologies are widely used throughout the low-carbon hydrogen supply chain, from production to storage and distribution.

This technological expertise has already enabled Air Liquide to forge numerous strategic partnerships to accelerate the activation of hydrogen markets, together with worldwide leading players in key industrial basins.

The momentum is there, and almost everything is actually in place to scale up a hydrogen economy, especially in Europe: early markets coming on stream, initiated efforts to align for deployment, existing supporting policies, a systemic need, a strong technological potential as well as signs of societal acceptance.

Joining forces is essential to accelerate the role of hydrogen in the energy transition!

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AIR PRODUCTS

Air Products has been a leading global producer of industrial gases for more than 80 years. With a strong focus on energy, environment and emerging markets, Air Products supplies essential industrial gases and related equipment to dozens of industries including refining, chemicals, metals, electronics and food and beverage.

Air Products is the world's largest hydrogen producer. We believe that hydrogen, the most abundant of all elements, will be the solution – the future of energy. Through our partnerships we are already working towards a hydrogen-based world where hydrogen and fuel cell technology will play a central role in decarbonising heavy duty vehicles and industry. Air Products is active throughout the complete hydrogen value chain including production, distribution, storage and dispensing and has been at the forefront of hydrogen refueling for decades. Air Products has experience with more than 250 hydrogen refueling station projects in 20 countries. Air Products' technologies are used in more than 1.5 million refueling operations annually.

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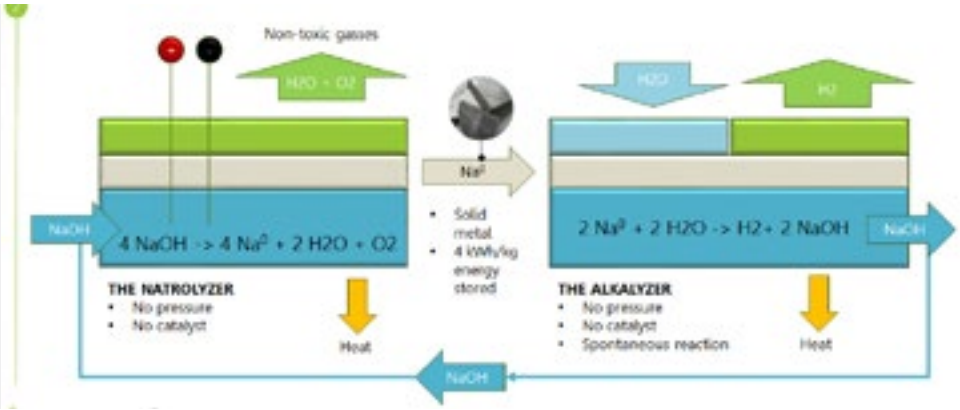

ALKALIUM energy storage for life

Alkalium supplies an alternative for energy storage. Our energy storage is using Sodium metal . Our solution is based on the Alkalium process. The Alkalium process is based on two devices: The Natrolyser to convert electrical energy in sodium metal from sodium hydroxide and the Alkalyser to convert sodium to hydrogen and sodium hydroxide by applying water. The sodium hydroxide is then returned to the Natrolyser. With Sodium metal we can span energy storage from hours, months into years. We can also have the Natrolyser operating in one country and have the Alkalyser in another country due to the high energy density of the Sodium metal which makes transport feasible using existing infrastructure and transport facilities.

Alkalium offers both the Natrolyser and the Alkalyser and is open to technology agreements to allow local manufacturing of these devices.

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ALLES OVER WATERSTOF

Our mission is to enhance the social acceptance of hydrogen by sharing our expertise and experience in an accessible and interactive manner. We achieve this through practical courses, workshops, and hands-on demonstrations. Rather than just discussing hydrogen, we showcase its production, storage, and applications in real-world scenarios.

To support this, we have developed various hydrogen-powered applications, including a scooter, cargo bike, drone, and even a hydrogen-powered cooking stove. We can even organise a hydrogen BBQ!

Additionally, we collaborate with schools on hydrogen experience projects. For example, we have already built a hydrogen-powered kart and are currently working on a hydrogen soapbox. We have also produced an educational film on hydrogen in the Benelux, which is freely available for classroom use at nederlandwaterstofland.info

Furthermore, we provide practical, hands-on advice to companies looking to integrate hydrogen solutions without requiring extensive reports. For instance, we successfully helped a company develop a hydrogen generator – covering design, field tests, and safety assessments – all within six months. We are results-driven! By actively engaging communities and organisations, we contribute to the broader acceptance of hydrogen as a crucial component in the energy transition. Ideal for any group seeking to expand its knowledge and awareness of hydrogen. Experience hydrogen with us!

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Bakeries and food production companies worldwide partner with AMF Bakery Systems, including AMF Tromp and AMF Den Boer, for top-quality equipment and complete system solutions, from mixing to marketplace. Using innovative, precision engineering and the expertise of our master bakers, AMF designs integrated production solutions for a variety of baked goods, including soft bread and buns, artisan bread and rolls, pizza and flatbreads, cakes and pies, pastries, and croissants.
We offer both single machines and complete production lines, meeting market standards and providing custom solutions. Our oven-building company, Den Boer, produces tunnel ovens and band ovens, for many food applications like bread, cake, muffins, pizza, pie, pastry, crackers, rusk, cookies, and more.

AMF Den Boer has introduced the world's first hydrogen-fuelled tunnel oven, which bakes with zero emissions, significantly reducing the bakery's environmental footprint. Our hydrogen burners can be retrofitted onto existing ovens, and we also offer hybrid models that combine natural gas and hydrogen, providing a sustainable step for bakeries until hydrogen prices become more affordable.
AMF Europe is part of a global company with facilities in the United States, Latin America, the United Kingdom, the Netherlands, China, and Singapore, working with over 600 teammates worldwide. The AMF Europe team blends global networking with local charm, fostering a culture of passionate people dedicated to improving food quality and enhancing the lives of their teammates, families, customers, and communities.

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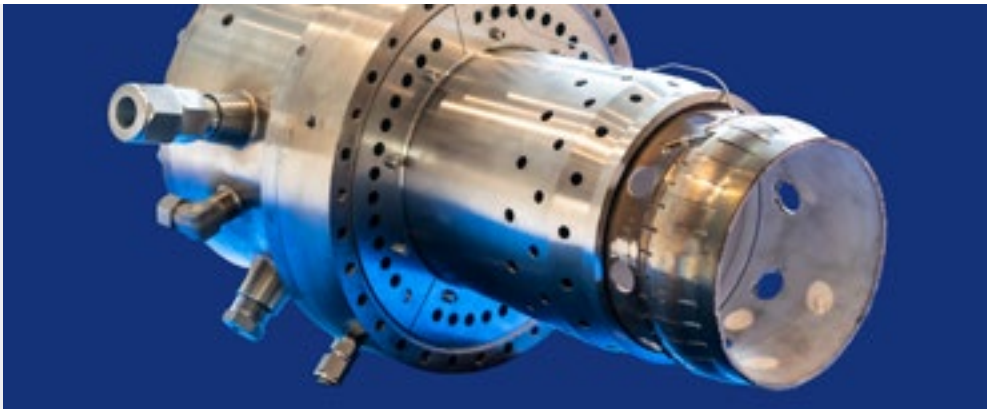

Ansaldo Thomassen (ATH) is a leading supplier of technologically advanced aftermarket gas turbine components, performance upgrades, in-house component repair and outage services for existing GE heavy-duty gas turbines. We offer flexible and comprehensive Service Agreements (FSA's), ranging from parts supply and reconditioning to full scope agreements including remote monitoring and diagnostics and inventory management.

Our vision is to supply cost effective advanced retrofit solutions for a Clean Energy World. ATH is leading a consortium targeting the demonstration of gas turbine retrofit technology for hydrogen. Together with our partners we are currently working on our High Hydrogen Retrofit Project.

Major objective of this project is to develop a cost-effective ultra-low emission (sub 9ppm NOx and CO) combustion system retrofit for existing installed gas turbines in the output range of 1 MW to 300 MW. At the centre of this innovative high-technology project is the patented and novel aerodynamic trapped vortex FlameSheet™ combustion technology platform. Fuel flexibility and stable operation from 100% natural gas to 100% hydrogen and any mixture thereof, is a key requirement.

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The energy transition is taken place right know and we are living it together. Green hydrogen will play a key role in regulating our energy needs based on supply and demand. Therefor the storage of renewable energy and the infrastructure is an important part of the whole process.

Antonius can be your industry partner for storage and transport design of energy. We are an experienced fabricator that can design your production process and build your newly developed product. Your idea will be transferred into a design ready for production. As your partner we will take care of the complete project management, fabrication and assembly of your product. Over 80 years of craftsmanship in shaping metals brought us to the level we are at right now.

With our extensive knowledge of materials and production methods, with the best qualified welders in the industry and our special machines we can produce high quality products against all applicable standards. Our craftsman-ship is the reason why customers and engineering firms do contact Antonius at an early stage.

We have an ideal situated production location (40,000 m^2) with a direct waterside connection, to transport big parts by ship worldwide.

Meet our strength and challenge us to experience our craftsmanship. Let's work together and make this green deal! ANTONIUS.

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AquaBattery is a deep-tech company based in the Netherlands working to revolutionise green energy storage. Our mission is to cut energy bills and catalyse the development and uptake of renewable energy technologies across the EU and beyond. We recognise that renewable energy is only part of the solution, and only through pairing it with cheap and scalable energy storage solutions can truly make an impact. AquaBattery was founded in Leiden in 2014 to commercialise the world's cleanest energy storage solution: a battery that can store renewable energy in water and salt (such as seawater). Our team is composed of leading experts in water membrane technologies and the energy storage industry, combined with the leadership of visionary founder Dr. Jiajun Cen. Together, the team combines 50+ years of engineering experience with 25+ years in business and management. We are supported by a network of exceptional partners, such as Climate-KIC, TU Delft, The Green Village Delft, and technical experts at Imperial College London, REDStack, and Wetsus. Our technology has been successfully demonstrated through several prominent installations in the Netherlands and in Italy and has reached TRL 6. Our saltwater battery is a flow battery where power and storage capacity are decoupled. The user can decide on how large the respective components of power or storage capacity need to be in other to suit the application. The cost for scaling up the storage capacity is low, one just need a larger tank, some salt and water. At locations where space is not the limiting factor, we can realise virtually unlimited storage capacities. This makes our battery very well suited for long-duration storage (10+ hrs).

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Arcadis: Energy transition & climate challenges in a rapidly changing world
Arcadis has an independent position in the market. Second, our company truly acts as a global player, active in 70 countries. Colleagues from different parts of the world are already working together to deliver the best solution for our clients, for example in Pecem, Brazil. With sustainability at the heart of everything we do, our focus is on maximising our impact aimed at improving quality of life.

Hydrogen & hydrogen carriers
Our main services:
- (pre)Feasibility studies & FID
- General Engineering
- Environmental & Social Impact Assessment (ESIA, CSR)
- Safety and hazard studies
- Licensing & Permitting

Hy3+
Arcadis and TNO are now working on the Hy3+ programme. We are building a dynamic gas model and with a PESTEL analysis, we will evaluate the security of supply, demand & storage for the largest industrial clusters in the world (BeNeLux & DE). In fact it is a stress test of the planned hydrogen network with all large hydrogen value chain players involved: mainly industries for production, import and offtake, but of course also grid operators, governments & ports (see picture). For more information please visit and reach out if you would like to join:
https://hy3.eu/2023/12/22/hy3-has-kicked-off/

Atlas Copco Compressors Nederland
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Atlas Copco Netherlands is part of the Atlas Copco Group. Since 1873, Atlas Copco Group has been providing innovative technology, products, services and solutions. Atlas Copco Group is committed to developing technology that transforms the future and creates value for our customers, employees, shareholders and society.

Atlas Copco H_2Y compressors support hydrogen refuelling and trailer filling stations. Whether you are adding to your fuelling infrastructure or just getting started, these ultra-reliable boosters have the technology you need to maintain constant discharge pressure in varying conditions. Efficient and cost-effective to run, they deliver peak performance in 24/7 service, helping you lead the way to a more reliable transport and mobility sector.

H_2Y compressors feature a modular design that makes them easy to integrate into any hydrogen storage or hydrogen refuelling station. The standard compressor is supplied in a 20-foot container, combining easy transportation and outdoor installation with maximum flexibility when it comes to space utilisation. The standard package includes the compressor, chiller, pre-cooler, intercooler, and aftercooler. These are supplied, along with all the other components you need, as one smart Plug & Play solution.

H_2Y compressors are designed to meet the specific challenges of hydrogen compression and storage. Along with maximum reliability, we prioritised safe handling and zero contamination, delivering the quality you need.

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AVK Nederland is part of the AVK Group, market leader in the field of appendages in the segments: water, gas, wastewater, fire protection and industry. Our range consists of a wide variety of valves, fire hydrants, couplings, street covers and accessories that all meet the highest standards in terms of safety, durability and quality.
Every day, AVK solutions help deliver clean water and sustainable energy to millions of people in households and industries all over the world.
We assist in transporting, treating and reutilising wastewater, and in assuring safe, secure surroundings ready to battle unfortunate events of fire. We work towards a better, more sustainable future, where natural resources are used and managed wisely. We want to make our performance on social responsibility concrete and objectively demonstrable by means of the CSR Performance Ladder certificate, level 4.
AVK would like to contribute to a successful and safe energy transition. Hydrogen can become an important link in the energy supply of the future. It is a sustainable option as a raw material and energy carrier. Moreover, the infrastructure needed to transport and store it is already largely available in the Netherlands. With AVK gas valves you are ready for the future with our KIWA certification for hydrogen. AVK also contributes to projects testing hydrogen distribution. In the Netherlands gate valves are supplied to a project with TU Delft 'The Green Village' where 100% hydrogen is being tested.

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Avoxt is a pioneering company that specialises in the development of high-efficiency hydrogen electrolysis technology. Their innovative electrolysis systems use alkaline electrolysis technology to convert water into hydrogen and oxygen with exceptional efficiency. Through its membrane less design, the technology is highly efficient, making it a more cost-effective and sustainable solution for producing hydrogen while reducing maintenance cost. Avoxt's electrolysis systems are modular, compact, and easy to integrate into existing energy systems. They can be used in a variety of applications, including energy storage, transportation, and industrial processes. Avoxt's systems are also highly flexible, allowing them to adjust to varying electricity inputs, making them an ideal solution for balancing the grid and managing intermittent renewable energy sources. Moreover, Avoxt is committed to sustainability and reducing carbon emissions. By providing a clean and efficient way to produce hydrogen, Avoxt is helping to reduce dependence on fossil fuels and promote a more sustainable future for generations to come.
With their commitment to innovation and sustainability, Avoxt is well positioned to play a leading role in the transition towards a carbon-free future.

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AWL
Ensuring global productivity

At AWL, we specialise in building scalable, modular, and flexible production lines tailored to your fuel cell and electrolyser production needs. Our comprehensive range of services ensures seamless integration into your production processes, offering complete production lines, embeddable process modules, process automation, and pre-investment testing.

AWL boasts over 30 years of expertise as a leading machine builder and system integrator in the automotive, metal processing, and logistics sectors worldwide. Our commitment to delivering excellence lies in our ability to design and construct intelligent, modular machines that add significant value to your operations.

We excel in laser applications, quality control, traceability, and turn-key automated manufacturing solutions. Our innovative approach and unwavering dedication to quality enable us to meet the industry's evolving demands while ensuring efficiency and reliability in every project we undertake.

For the H_2 market we offer low volume production machines that can be scaled to high volume lines with the focus on cost reduction solutions for a variety of processes such as welding, gluing, sealing, cleaning and integration of other processes like coating and leak testing. Quality gating and part traceability are major aspects of these lines.

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BA2C
zero emission molecules project development

BA2C Europe / Latin America (BA2C) is a green hydrogen and renewables chemicals/fuels/electricity project developer. It is our aim to be (one of) the first project developers introducing new, but most efficient, technologies to produce green ammonia (NH_3), methanol (CH_3OH), synthetic fuels from renewable electricity, municipal and organic waste feedstock. In this way we decarbonise existing brownfield industrial production sites (to make use of the existing assets) or set-up greenfield plants in areas where renewable electricity, municipal and agricultural waste is cheap. BA2C cooperates in its projects together with leading technology developers from all over the World.
With our knowledge with energy transition and industrial transformation BA2C also advices companies and ports to define best strategies to become energy efficient and reduce CO_2 emissions while keeping a good and interesting business case.
BA2C also invests in other green molecule development projects. Examples are the well-known Liquid Wind initiative (to produce renewable methanol from biogenic CO_2 and green hydrogen) and HyAPC, a venture of BA2C. This last Netherlands technology is an oxy-fuel combustion technology using green hydrogen and green oxygen (both from an electrolyser).
In future we are convinced HyAPC will play an important role to balance the (renewable) electricity system. Another activity of BA2C is guiding and supporting scientists to develop new generation technologies.

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Ballast Nedam

Ballast Nedam is a Dutch construction and development company. For 150 years we have been exploring new ways of creating a better living environment. We focus on transitions that represent the societal and environmental challenges we face and the solutions we want to offer:

- Energy transition to create a sustainable energy system.
- Urban development & construction to improve well-being for living and working.
- Infrastructure to enhance mobility and logistics.
- Water resilience to improve water supply and water protection.
- Industrial renewals to enable industrial transitions.

The world is transitioning towards a new sustainable energy system based on clean and renewable sources. Reducing the use of fossil fuels leads to lower CO_2 emissions and helps protect our planet from climate change.

Ballast Nedam plays an active role in this shift, by constructing the components of our future energy system. Our projects and know-how range from renewable generation. We work offshore and nearshore on wind and solar parks. Ballast Nedam and our subsidiary Ekinetix are committed to developing and realising new energy systems. We support companies and governments that focus on energy transition and sustainable mobility. We map out the possibilities and realise the actual solutions. We work both domestically and abroad. We continue to explore international opportunities. Our projects abroad are concentrated in Europe, Asia, the Caribbean and Africa.

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Battolyser Systems

Battolyser Systems develops and manufactures the world's first electrolyser with an operating range of more than 100%: the Battolyser®.

That is because a Battolyser® is a battery and electrolyser in one unified system. The patented technology can store and supply electricity as a battery, but during loading and when it is fully charged, it automatically starts splitting water from the electrolyte into hydrogen and oxygen as an electrolyser.

Thanks to its ultimate flexibility which allows to follow any renewables load curve and an outstanding overall efficiency above 80%, we can deliver the lowest Levelised Cost of Hydrogen, while balancing the grid for societal demand.

Battolyser® only uses the abundantly available materials Nickel and Iron and is hence a suitable solution of large scale hydrogen projects.

Battolyser Systems is a Delft University of Technology spin off and has Koolen Industries as the main shareholder. It plans to build a production facility of 1GW nameplate capacity in partnership with Port of Rotterdam.

Commercial demonstration units of 1-5MW are to be delivered in 2024, followed by large scale commercial series production in 2025 onwards for global roll-out.

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Berenschot

We work with Dutch and European organisations in the energy sector, users, industries and governments to conduct system studies, roadmaps, strategic- and policy advice.
Our services related to hydrogen are embedded in a systemic view:
Scenario studies: we provide insight into the consequences of choices with regard to our energy system, both economically and energetically. Recently, we developed four national scenarios for a low carbon future in 2050 (II3050). In all scenarios hydrogen (green & blue) plays a pivotal role in system balancing, storage and decarbonisation of sectors.
Flexibility and system integration: we provide support in quantifying the potential and feasibility of flexibility measures like power-2-gas and hydrogen storage. Currently, we are developing a blueprint for a Hydrogen Exchange in the Netherlands. We analyse the technical, energetic and economic consequences of flexibility measures in the short and long run. We often work together with the energy industry.
Techno-economic analysis: we help to translate ambitions into plans for technology options like heat pumps, heat networks or carriers like hydrogen in order to arrive at the best future-proof solution with low costs and high durability.
Implementation of the strategy: we have extensive experience with organisations that operate in a mix of a regulated playing field of government and business. We help you with your strategy, design of the organisation and the optimisation of business processes.

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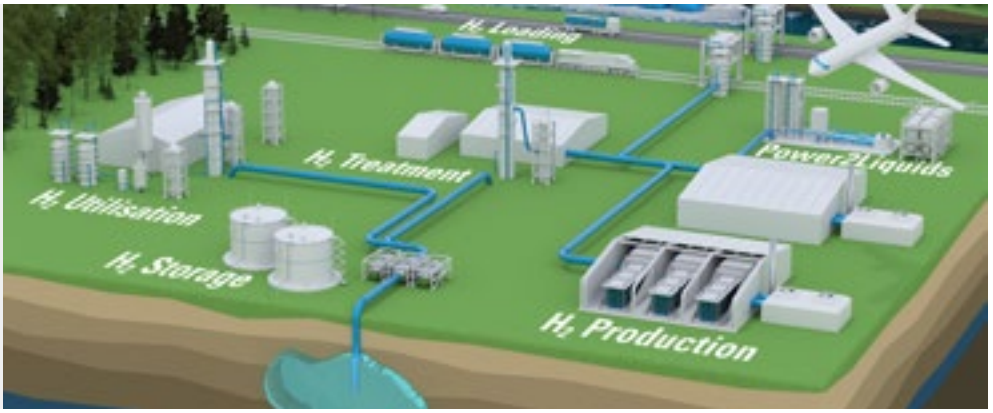

BILFINGER

As part of the Bilfinger Group, Bilfinger Engineering can call on a strong global network with a broad spectrum of expertise. This gives us the opportunity to proactively anticipate our customers' needs with the best integrated services. Our comprehensive hydrogen solutions offer industrial companies consulting and implementation services ranging from production to storage, transport and application.

Our services for the hydrogen market include:

- Consultancy and engineering: Bilfinger supports and advises plant operators, energy suppliers and users of hydrogen from the very first step. The range of services extends from feasibility studies to conceptual and basic engineering.
- Plant construction and EPC services: Bilfinger offers a full range of plant construction services including project management, detailed planning and control, procurement and the execution of construction and installation work.
- Maintenance and service: Bilfinger is a reliable and experienced partner when it comes to operating, maintaining and optimising plants and can provide all maintenance and service activities.
- Technologies: Bilfinger employees have unique process expertise and are familiar with a wide range of technologies and processes for the production, transport, storage and utilisation of hydrogen. They can also evaluate the effectiveness and efficiency of components and processes.

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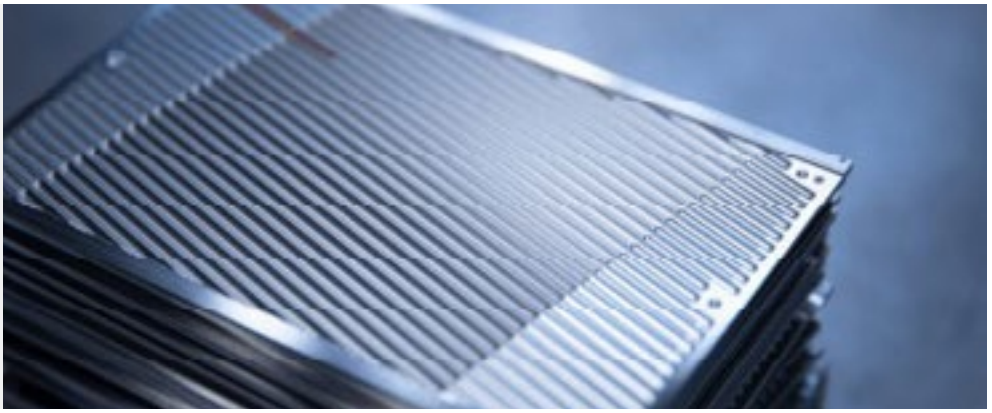

BOSAL is a family-owned company founded in 1923 in the Netherlands.

With more than twenty-five years' experience in the energy sector, BOSAL is determined to take a leading position in the emerging hydrogen market. We provide proven solutions for numerous hydrogen related technologies which have an important role in the near future, such as Solid Oxide Fuel Cell Technology (SOFC) and Solid Oxide Electrolysers (SOEC).

BOSAL's main competitive differentiator is our offering of our ultra-thin foil high temperature heat exchangers integrated in a hot balance of plant, which combine highest effectiveness with low back pressure in very compact designs.

To increase the level of integration, BOSAL's heat exchangers can be supplemented with a number of value-adding features as: integrated catalytic oxidative and reductive coatings, protective coatings, integrated mixers, insulation and piping.

To offer its customers tailor-made solutions, BOSAL formed successful engineering and research partnerships with several leading industry players.

We have more than 1,700 employees supporting our mission in 16 manufacturing plants and distribution centers and 6 R&D sites worldwide.

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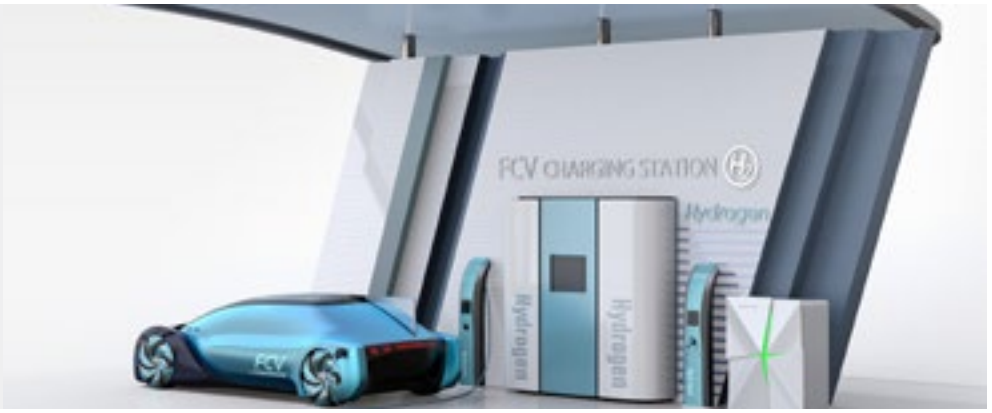

Green hydraulics: basis for efficient H_2 supply. The political framework is in place. Now it is important to find the right technologies for the rapid introduction of green hydrogen. Hydraulics is one of them, as it can compress hydrogen highly efficiently and safely. Last but not least, filling stations are thus particularly reliable and energy efficient.

Proven industrial hydraulics solutions are a major help in building the H_2 infrastructure. With Bosch Rexroth as a partner, the players benefit from needs-based support. This ranges from robust and safe components to engineering support and complete solutions.

When setting up H_2 filling stations, manufacturers and operators can choose from several approaches: For H_2 compression up to 900 bar and a delivery rate of approx. 100 kg/h, either highly dynamic cryogenic pumps or highly efficient compressors with linear or rotary drives can be considered. If smaller delivery rates are required, servo-hydraulic compact axes generate advantages because they require little space, especially for retrofitting in urban areas, and can be put into operation quickly thanks to the Plug & Produce preconfiguration.

Safety shut-off blocks and valves from Bosch Rexroth also prove their worth when transporting H_2 in pipelines. In addition, the hydraulics expert's close-knit service network creates the best conditions for optimum on-site maintenance.

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BOSCH

Our many years of experience and competencies in the production of high-precision automotive stamping parts are now being used for the development and production of systems and thin metal components for electromobility, fuel cells and hydrogen technology. Bosch Tilburg is the R&D pre-development center within the BOSCH GROUP for the development of electrolyser stacks. Customers can contact Bosch for PEM stacks of 1.25 MW.

The location also supports the production development of bipolar plates for electrolysers and fuel cells. Bipolar plates are a crucial component for the construction of electrolyser and fuel cell stacks.

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BOUT HYDROGEN consultancy

After working 37 years for a leading global industrial gases manufacturer, of which the last three decades as project specialist Liquid Hydrogen (ADR: UN 1966), I am now an independent self-employed LH_2 specialist. In my previous role I was involved in every LH_2 project that was awarded in Europe, from early start to turnkey delivery. This included equipment selection, supervise installation and carry out cooldown, first fill and final commissioning, as well as modification and extension of existing installations.

This also included non-visible work, like location check, procurement selection, customer training, procedure development, and contribution as SME in HAZID's, HAZOP's and QRA's. These projects were carried out at customer sites throughout Europe, who are main players in (semi) conductor industry, (petrol) chemicals and aerospace that require hydrogen for its Ultra High Purity (chips manufacturing) or in large quantities (chemical and aerospace; rocket engine testing).

In the past two decades, I was also involved in HRS (Hydrogen Refuelling Stations), both 350 Bar and 700 Bar gaseous hydrogen (ADR: UN 1049) in standards development, engineering, demonstration and installation.

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Bredenoord is the specialist in temporary and mobile power solutions. Throughout the world, we ensure that businesses, institutions and governmental organisations can work as they wish to. In a clean, efficient and responsible way. Together with our clients, we work on appropriate solutions for sustainable energy security.
For many years, our R&D department has been working towards providing temporary and mobile power with the lowest emissions possible.
We offer effective solutions such as a patented particulate filter, to bigger challenges such as mobile solar panels. Bredenoord was the first to provide a mobile hydrogen fuel cell generator, and the ESaver was the first mobile hybrid battery solution for smaller energy needs. We often work on the development of new technologies and solutions, together with our clients, governmental organisations and innovation partners. Hydrogen is already successfully in use as fuel for gensets. In 2009 Bredenoord launched the Purity with fuel cell technology. Hydrogen gensets have the benefit of working very quietly, in addition to all of the aforementioned benefits of hydrogen as a fuel. In 2021 Bredenoord released the next generation Purity, called 'Hydrogen Power'. This new hydrogen power solution includes a battery pack in combination with fuel cell technology, making this genset just as stable and flexible in use as a regular diesel genset. And with the moving technology hydrogen fuels are increasingly widely applicable. For example, applications such as formic acid can aid in solving the challenges surrounding transportation and storage.

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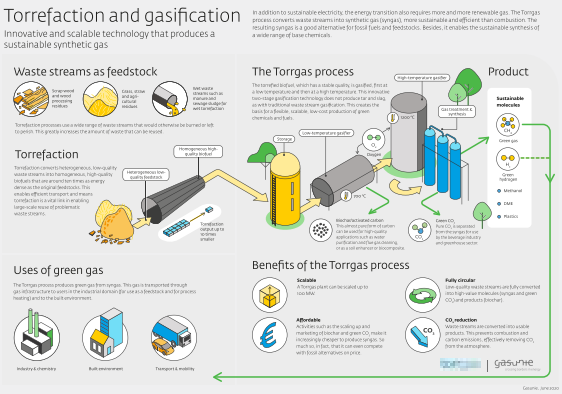

BrigH2 : The Renewable Alternative. BrigH2 plans to start a 50 MW gasification unit to produce 6300 mtpa renewable hydrogen, pure bioCO_2 and Biochar. The Demonstration plant will be situated on Brightlands Chemelot Campus and will serve the industrial users on the Chemelot site, but also intends to produce Fuel Cell grade Hydrogen for the mobility sector.
The project is in the feasibility phase at the moment. The location of the plant on the Chemelot campus fits exactly with the circularity target of the campus and the site. The feedstock will be torrefied biomass, where torrefaction does create a significant extension of the area where the biomass is gathered. Torrefaction also creates an uniform feedstock for the delicate process, reducing the investment costs per ton of renewable hydrogen to the max, but has proven itself in the quality of the syngas produced and the potential for uninterrupted continues production. Next to the hydrogen production, BrigH2 also provides a long term sustainable route for CCU processes due to the biogenic origin of the CO_2 produced, as well as negative CO_2 emissions by connecting to the CCS infrastructure under development on the Chemelot site. Alternatively the CO_2 prevents an additional fossil CO_2 emission once applied in greenhouses.
The Biochar is of exceptional quality and suitable for a large number of applications now dependent on petrochemical coke of low sulfur.
The technology is developed in Groningen on a 1 MW scale and is further scaled towards a 2 x 12.5 MW unit to produce Methane from syngas in Delfzijl.

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Bronkhorst®

Bronkhorst is a leader in low flow fluidics handling technology. The small robust flowmeters Bronkhorst develops are very well suited for testing fuel cells and electrolysers, both for research and production applications.
Our instruments are ideally suited for delicate control of the pressure or flow of single gases, liquids or fluidic mixes to support development and quality assurance. We also support improvements to LOHC (liquid organic hydrogen carrier) and hybrid hydrogen carrier technology. The IN-FLOW range of instruments can be applied to measure high quantities of hydrogen at production sites. Because we offer low flow liquid flow control technology as well, our instruments are used in odorant delivery to hydrogen or natural gas that is injected in gas grids.

Bronkhorst offers an extensive product range of thermal, Coriolis and ultrasonic flow meters and flow controllers for low flow rates of gases and liquids. Its flow instruments are used for a variety of applications in laboratory, machinery, industrial and hazardous areas. By sharing their knowledge and closely cooperating with OEM customers and research organisations in the field, Bronkhorst develops customer specific low flow solutions for gas, liquid of vapor flow control.

Bronkhorst is a truly world-wide organisation with an extensive network of offices, distributors and service stations across Europe, the Americas, Africa, the Middle East, Asia Pacific and Japan.

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Brunel

Founded in 1975, we are a global specialist delivering customised project and workforce solutions to drive sustainable industry transformations through technology and talent.

With 120+ offices and a powerful network of more than 12,000 specialists around the world in 45 countries, we deliver Project and Consulting Solutions, Workforce Solutions and Global Mobility Solutions that transform global projects in Hydrogen, Renewables, Conventional Energy, Mining, Life Sciences and many other sectors.

You are committed to delivering projects that meet the highest quality standards with full legal compliance. But how do you do that safely, on time and on budget, every time? Brunel provides the custom support, international network and local knowledge that your projects need to thrive.

Do you sometimes struggle to improve productivity and achieve organisational goals while also optimising your workforce management? Brunel leverages advanced recruitment techniques and strategic workforce planning to streamline talent acquisition and enhance your overall performance.

Have you ever tried to master the complexities of international workforce mobility while solving the logistical nightmare of getting your teams to ten different places? Brunel seamlessly transfers individuals, teams and even whole businesses wherever they are needed – from the next state or region to the farthest corners of the planet.

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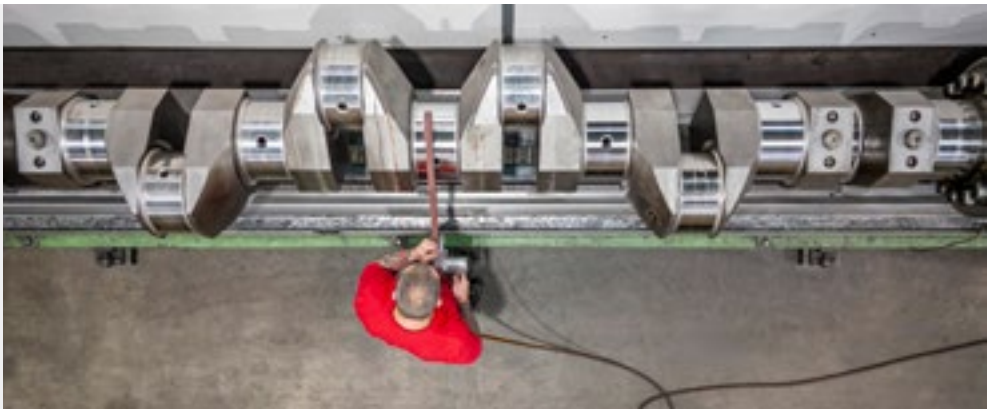

Burckhardt Compression

Compressors for a Lifetime™

The Burckhardt Compression Group creates leading compression solutions for a sustainable energy future and the long-term success of its customers. It's the only global manufacturer that covers a full range of reciprocating compressor technologies and services. Its customised and modularised systems are used in the Petrochemical, Gas Transport & Storage, Hydrogen and Industrial Gas sectors as well as for applications in Refinery and Gas Gathering & Processing. Since 1844, its passionate, customer-oriented and solution-driven workforce has set the benchmark in the gas compression industry.

Burckhardt Compression's Service Centre in Rotterdam offers services for repairing and overhauling crankshafts of compressors and diesel engines up to 12 meters and 30 tons. With its special equipment and highly qualified technicians, the Service Centre is your trusted choice for crankshaft repairs. Being part of an extensive global network of service centres, Burckhardt Compression is your ideal partner for service solutions for reciprocating compressors of any type, model or make.

In addition, the team offers professional service solutions for steam & gas turbine rotors, motor blocks, pumps, gear boxes, rotors of centrifugal and axial compressors, and other rotating equipment. Burckhardt Compression is specially qualified to provide tailored service solutions regardless of the original manufacturer to meet your needs.

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BUREAU VERITAS

Bureau Veritas is a world leader in laboratory testing, inspection and certification services. Created in 1828, the Group has more than 83,000 employees located in more than 1,600 offices and laboratories around the globe.

Bureau Veritas helps its clients improve their performance by offering services and innovative solutions in order to ensure that their assets, products, infrastructure and processes meet standards and regulations in terms of quality, health and safety, environmental protection and social responsibility.

With a rich history of bringing trust, transparency, and quality assurance to clients, and as a Hydrogen Council member since 2020, Bureau Veritas has the expertise to support hydrogen industry players today and tomorrow. Leveraging our well-established position within the oil and gas, power and utilities, and shipping industries, Bureau Veritas is a strategic partner to hydrogen energy players worldwide. We bring our global, broad and cross-sector technical expertise in the field of hydrogen to the industry.

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Bürkert Fluid Control Systems is one of the world's leading manufacturers of measuring, control and regulating systems for liquids and gases. Bürkert products are used in a wide range of industries and applications, ranging from labs to medical, bio-engineering and aerospace technology. With a portfolio of more than 30,000 products, Bürkert is the only supplier to offer all fluid control system components, from solenoid valves to process and analytical valves, from pneumatic actuators to sensors. With its headquarters in Ingelfingen in Germany, the company has a wide-ranging sales network in 36 countries and more than 3,000 employees. Bürkert develops customised solutions and innovative products at its five Systemhaus locations in Germany, China, and the USA.
The product portfolio is topped off by extensive services, from consulting and conception, through implementation, to maintenance and training.
A rule of thumb applies in the language of engineers: the quality of a system is proportional to the quality of its components. In fact, the peripherals are coming more to the fore among experts – with control and regulating system modules as well as intelligent process related coupling of these components. This is where Bürkert has been active for over 60 years. As one of the few providers who can cover the entire process chain involving measuring, controlling and regulation. It is no wonder, that the Bürkert product range includes precisely those components which are optimal for use in hydrogen technology: certified modules with low power consumption, a wide temperature range, chemically resistant properties and a good price-performance ratio.

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Capgemini is a global business and technology transformation partner, helping organisations to accelerate their dual transition to a digital and sustainable world, while creating tangible impact for enterprises and society.
It is a responsible and diverse group of 340,000 team members in more than 50 countries. With its strong over 55-year heritage, Capgemini is trusted by its clients to unlock the value of technology to address the entire breadth of their business needs. It delivers end-to-end services and solutions leveraging strengths from strategy and design to engineering, all fuelled by its market leading capabilities in AI, cloud and data, combined with its deep industry expertise and partner ecosystem.
Capgemini is active in the hydrogen industry, helping clients to tackle main challenges across the value chain and position themselves in the low-carbon hydrogen market. Capgemini provides support for:

- Market positioning by determining hydrogen strategy through due diligences, public funding strategies, market analyses and partnerships.
- Systems and equipment reliability and efficiency by leveraging system simulations, testing, safety protocols and design to X.
- The scale up of the production of equipment to optimise costs by building data backbone to implement smart manufacturing and factory digital twins.
- The track of the carbon content of H_2 by using life cycle assessments to evaluate the carbon intensity and create certificates to guarantee the content of the molecule.

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Cenex NL is an independent not for profit research and consultancy organisation on zero emission mobility and related infrastructure, and the circular economy with regards to mobility. Cenex NL is not driven by shareholders or returns-on-investment and was founded in 2018 for the purpose of accelerating transition to clean transport by providing technical expertise and disseminating lessons learned across Europe. Cenex NL is a strategic partner of the UK's first Centre of Excellence for Low Carbon and Fuel Cell Technologies (Cenex UK – est. 2005). The Cenex organisations are established players in the European hydrogen community through:

- Active on-going participation in European R&D work:
  - H_2ME (2016-2022): EU's largest FCEVs and refuelling infrastructure demo;
  - ZEFER (2017-2022): Commercial and operational viability of high-usage vehicles;
  - HyTrec2 (2014-2020): Hydrogen vans, trucks and refuse collection vehicles in North Sea Region.
- Market studies that analyse the European hydrogen market, enabling conditions and policy landscapes for technology take-up.

We offer expertise to automotive industry, early adopters of FCEVs and policy makers looking to implement strategies to accelerate the use of clean hydrogen in mobility. Examples include:

- Performance analysis of vehicle and refuelling infrastructure at real-world operations;
- Customer value proposition and business case of hydrogen in land transportation;
- Life Cycle Analysis of FCEVs and refuelling infrastructure.

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In a world that strives for CO_2 neutrality, Circonica is developing a component that can help the Netherlands lead the way in the energy transition. At the heart of this initiative is the Hollow Electrode Loose Stacking Solid-Oxide Fuel Cell (HELP-SOFC), a groundbreaking fuel cell technology from Circonica. This technology promises to revolutionise cost, energy efficiency, and reliability, while reducing CO_2 emissions by 70-100%.

The existing proof-of-concept of the HELP-SOFC is unique in its kind due to its versatility in fuel use, from fossil fuels to biofuels and hydrogen, allowing it to perform optimally and achieve impact during all phases of the energy transition. In addition, the system can act as a fuel cell and/or electrolyser for hydrogen production, making it particularly suitable for many applications.

Together with its partners within projects such as TSE (completed), GTD-H (ongoing) and the NGF-4 application for rSOC-NL with, among others, VDL, Bosal, TNO, RUG and 12 others, Circonica strives to achieve a cost breakthrough for mass production of SOFC/SOE with the HELP concept. First in stationary applications (built environment), such as powering cable networks and micro-CHP systems. Then in markets for hydrogen mobility and electrolysis. To this end, Circonica search to link up with partners with knowledge, infrastructure, maritime and petrochemical activities, but especially ambitions in the field of hydrogen and its applications.

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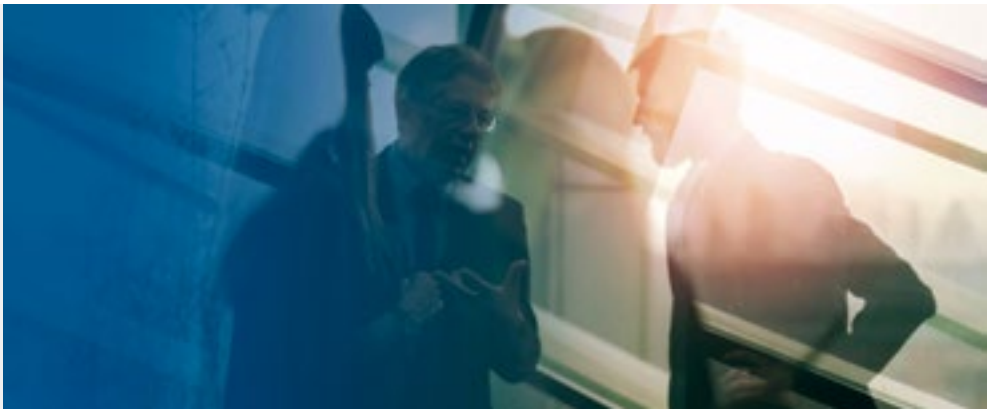

CLEAR is a financial advisory boutique with an international team, assisting deep tech, climate tech and clean tech scale ups in raising growth capital as well as providing financing solutions for renewable projects. Headquartered in Amsterdam though compiled of a group of 20+ internationally based entrepreneurial partners, each with their unique background and network across sectors such as technology, advisory, manufacturing and investment, CLEAR understands the complexities, rewards and hurdles involved in growing a business and securing funding. The CLEAR team provides expert financial advisory services and finds the right investor for technology companies on a global scale.

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CoheSys is a consulting company on metallurgical and/or production related issues. With more than 30 years of working experience we have done many projects in high (and low) tech environments. Our projects include setup for laboratory scale production up till mass production. We are busy in semiconductor production and the nuclear industry, but find ourselves equally at home in a foundry.

We excel in fast and reliable literature search and advice and train your people in metal and hydrogen related questions. We understand production in all stages, from drawing board till mass fabrication. If you don't know how to start or how to scale your production process up to the next level: call us.

Connectr - Energy innovation
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CONNECTR
energy innovation

Connectr, where new energy innovations emerge and grow. The Province of Gelderland has a strong energy cluster centred in Arnhem, where Connectr is located. Arnhem is known as the Hydrogen Tech capital of The Netherlands due to the concentration of SME companies in the value chain of high tech hydrogen solutions. By ensuring the vitality and growth of that cluster, Connectr contributes to the energy transition, the regional economy, and the human capital agenda.
The strength lies on the implementation level: new ideas are immediately tested and put into practice from Connectr, and they can grow from there.
Connectr is a triple-helix foundation funded by public and private parties as well as knowledge institutions. Partners are the city of Arnhem, The Province of Gelderland, HAN University of Applied Sciences including SEECE and ACE, Development companies as OostNL and KiEMT, IPKW, Generation E and many energy related companies resident in Connectr or the region or actively connected with projects.
Connectr consists of an Innovation Programme, an Innovation Lab and Shared Facilities. In the midst of these components, the Core Organisation provides connection, reinforcement, and acceleration.
Focus strengthens the contribution to the global energy transition. That's why Connectr focuses on three key technologies that are already developing strongly in the region and that will add value on an international level.

1. Power systems engineering
2. Electrochemical energy storage
3. Sustainable drive systems

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ConPackSys

ConPackSys is an engineering firm located in Dordrecht, the Netherlands close to the Rotterdam and Antwerp harbours. We specialise in the engineering, packaging, construction and commissioning of compressor systems for the industry. This entails the technical design, fabrication and testing of the compressor itself but also its auxiliary systems; drivers, process equipment (coolers, separators), piping, control and instrumentation, noise enclosures and lube oil systems These are all required for safe and sound operation of the compressor. ConPackSys has experience with applications for hydrogen and carbon dioxide(including Carbon Capture and Storage).

Compression is going to be important throughout the hydrogen value chain. Compression is required for storage of hydrogen, for transportation from A to B and also at the end-user. Hydrogen can be converted to green chemicals, to generate electricity or is used in mobility. ConPackSys is able to provide solutions for each of these applications with compressor duties ranging from 10 kW up to 10 MW.
We specialise in tailor made and turn key systems for our clients.

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Corre Energy Storage is a Dutch, Groningen headquartered business, that develops large scale renewable energy storage. The technique we use is called Compressed Air Energy Storage (CAES). We aim to develop several projects across Northern Europe, enabling the integration of renewables at large-scale and catalysing the energy transition and the Green Hydrogen Economy. Corre Energy wants to develop its first CAES project in Zuidwending, the Netherlands through its subsidiary Corre Energy Storage. CAES provides an energy balancing solution for both TSO's and renewable energy portfolio operators, without which countries like the Netherlands will be unable to reach the targets of 70% renewable energy by 2030. Why this project? In order to guarantee a sustainable future – also for future generations – CO_2 emissions in the Netherlands (in Europe and throughout the world) will have to be reduced drastically. In accordance with the Paris Climate Agreement, as society we produce more solar and wind energy every year. However, this growth also has its limitations. For example, the wind and the sun cannot be influenced, which means that sometimes too much and sometimes too little green electrical energy is produced. On days when more energy is produced than the market needs, installations sometimes have to be switched off, causing the loss of valuable energy and investments. On days when too little green energy is produced, natural gas has to be used and CO_2 is released. In short: it is very difficult for society to accurately absorb fluctuations in the electricity network without wasting energy or emitting CO_2. The project in Zuidwending offers the solution for these problems.

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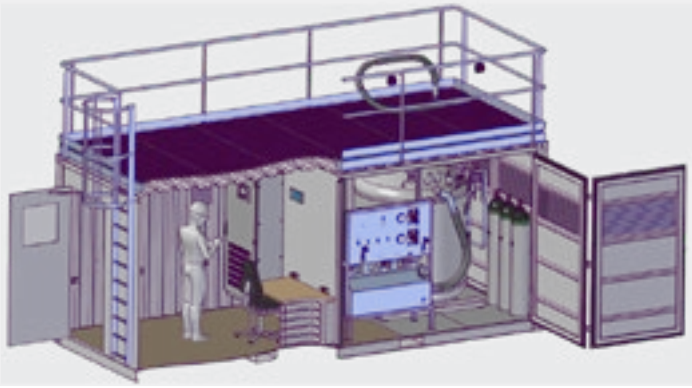

Cryoworld B.V. is a development company specialised in high-tech cryogenics in general. In recent years we have used our decades of experience for applications in Liquid Hydrogen. Through our in-depth cryogenic knowledge and experience in building advanced cryogenic installations for (scientific) applications (LHe, LAr, LH_2, LiN, LOx) we have experienced that we can offer excellent and efficient designs and build solutions for LH_2 applications. Our experience goes back many years. We have built for example the LH_2 infrastructure for the Tokio Olympic games, and delivered in 2015 our first equipment, and rocket test benches for liquid hydrogen and oxygen.
We are particularly proud that major international operating gas suppliers, with their own in depth knowledge of liquid hydrogen, use us to build and/or design parts of their important LH_2 products and systems. Some relevant projects in LH_2 in recent years:

We have designed and manufactured the world's first refueling units for LH_2 for mobility applications, and our designs for tanks have the best gravimetric indexes in the world.

- We designed and delivered the first testing infrastructure for LH_2 to TNO and NLR.
- We designed and delivered several distribution systems (with flexibles and rigid piping).

We can deliver the following products as a standard or bespoke item:

- Flexible metallic LH_2 transfer-hoses with couplings, low heat load, self-closing
- Transfer units
- Storage dewars with low boil of rates, depending on demand and size
- Lab scale liquefiers
- Pump systems
- LH_2 bayonet couplings, DN10 to DN40.

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Danfoss
ENGINEERING TOMORROW

With more than 90 years in energy efficiency, Danfoss offers a uniquely extensive range of cutting-edge solutions for green hydrogen, all the way from the grid connection to the electrolysis plant to hydrogen transportation and storage. Our portfolio encompasses:

- AC to DC power converters: Our grid-friendly power supply solutions with impressive energy efficiency offers low harmonics and a high power factor, ensuring a competitive, scalable and stable power supply for electrolysis plants.
- High-Pressure Pumps and Energy Recovery Devices: Crafted to infuse ultra-pure water into the electrolysis cell, these pumps are engineered to achieve the elevated pressures vital for prolific hydrogen production.
- Water Treatment Solutions: Committed to the perpetual provision of ultra-pure water for hydrogen generation, Danfoss delivers state-of-the-art solutions to transform seawater into deionised (DI) water via reverse osmosis.
- Heat Exchangers: Designed to facilitate the effective and consistent transfer of heat within the electrolyser environment.
- Sensing Solutions: Precision-engineered sensors adept at measuring and relaying critical pressure and temperature data, essential for electrolyser monitoring.
- Fluid Conveyance Solutions: With wide operating pressure ranges and optimal levels of abrasion resistance, our fluid conveyance components optimise solutions for cooling and conveying hydrogen.

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De Boer
Sustainable Project Solutions

De Boer SPS is founded in 2008 and is an independent company specialised in development of new sustainable energy techniques and business. Examples are projects related to (bio) LNG, production of bio gas, bio methanol, energy from waste concepts etc.

De Boer SPS has developed logistical solutions for the storage and transport of gasses including hydrogen for several customers. New techniques like LOHC and liquid hydrogen where considered and further developed for upscaling and use. Furthermore, De Boer SPS has developed several concepts for (bio) LNG distribution and storage and can be also used for hydrogen distribution concepts.

Secondly, De Boer SPS is involved in new techniques for capture and re-use of CO_2. During the capture of CO_2 also H_2 is produced and with additional (green) hydrogen, this is the basis for several base chemicals and fuels like methanol, ethanol and urea.

Every project and initiative is unique and the approach of De Boer SPS is unique for every project. Please contact us for further acquaintance is our mutual approach will work for your company.

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deelrijk hydrogen & experts

Deelrijk is an independent project advisory firm focused on hydrogen. We initiate, guide, and realise hydrogen projects. We also temporary outplace experts that realise other energy transition projects. Deelrijk stands for sharing knowledge and enriching each other by collaboratively working on solutions, within and outside our organisation.

Together with our partners, we develop and realise green hydrogen production sites, hydrogen storage and transport systems, and are involved in the development of hydrogen refueling stations (HRS). We believe that converting sustainable energy into transportable high-quality gas is an important way to contribute to the energy transition.

The experts we temporary outplace contribute to the realisation of a broader range of sustainable energy projects. We do this in the area of hydrogen, but also in wind energy, district heating networks, solar energy, and infrastructure. We primarily outplace experts on roles in the project development phase.

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Deerns

As an independent engineering firm, Deerns specialises in advice, design and implementation supervision in the field of installation technology, building physics, energy supply and sustainability. Our expertise contributes to sustainable, intelligent and future-proof buildings that do what they are intended to do.

Our experts know the challenges our clients face. In the markets in which we operate, especially clean technology, data centers, healthcare, airports and real estate, we know what is going on and what is needed to arrive at a successful solution. We are able to provide suitable advice and design quickly, can provide construction supervision of installations and provide aftercare. So that eventually buildings are created that work for people.

Active in the following themes:
- Advice (Technology/Policy/Subsidies/Permits)
- ProjectManagement
- Technique: Production (Electrolysis/etc.)
- Technology: Distribution (Pipework/ Appendages/Gas station/etc.)
- Technique: Storage (Bottle/Tank/Trailer/etc.)
- Technique: Use (Fuel Cell/Industry/Mobility/ etc.)
- Technique: O&M (Maintenance/Management/ Measurement)

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Within the Deltalinqs Climate Programme (DCP) we work together on the climate transition of the Rotterdam Port Industrial Complex. In the DCP, Deltalinqs works with its members and partners on three themes: future energy mix, sustainable fuels & energy carriers and circular harbor & industry.

The role of the DCP is to connect the right parties to each other, to provide those parties with information and inspiration, and to help our members start innovative projects.

This includes projects across the full hydrogen value chain, including import as well as blue and green hydrogen, infrastructure, and industrial applications in hard-to-abate industries, as well as transport.

In the 'Versnellingshuis' we work together with public partners to mitigate barriers which are inevitable when starting new and innovative projects. Through our involvement in the Data Safe House, we help our infrastructure partners prepare the grid of the future.

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Our team of cryogenic experts delivers complete turn-key solutions worldwide for a wide variety of cryogenic hydrogen projects. We take full ownership from the initial concept to the commissioning of the application. With infinite knowledge and experience, our team supports the implementation of liquid hydrogen (LH_2) in various sectors and is ready to significantly accelerate the sustainable energy transition.

We advise, design, develop, manufacture, test, and install customer-specific hydrogen solutions. Infrastructures with loading bays, or loading arms and vacuum insulated transfer lines with the proper couplings; our team delivers high quality projects.

Demaco has been part of OPW CES since 2024. OPW Clean Energy Solutions, formed in 2021, integrates ACME Cryogenics and RegO® Products, later adding CPC-Cryolab, Demaco and SPS-SGS in 2024. It provides advanced clean-energy fluid-handling systems, including cryogenic storage, distribution, and flow-control solutions.

Together, they drive innovation in hydrogen, LNG, and alternative fuels, shaping sustainable energy markets. OPW's mission is to define the future of clean energy with cutting-edge technologies and a commitment to a greener world.

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DEMCON

Demcon energy systems develops advanced technical solutions and provide innovative products in the field of sustainable energy.
It draws on the extensive multi-disciplinary engineering know-how and production expertise that Demcon has built since 1993 for a very wide range of applications and technologies.
The fast-growing Demcon group of companies currently employs 750 people in its branches in Best, Delft, Enschede, Groningen, Maastricht, Münster (Germany), Tokyo and Singapore.

One of the focus areas of Demcon energy systems is the development of technologies and equipment for the production of green hydrogen by means of water electrolysis. Together with partners, Demcon develops and supplies electrolyser modules for the decentralised production of hydrogen for transportation and industrial applications, and other systems related to energy production and storage.

In addition to supplying complete systems, Demcon offers engineering and OEM production services to support our customers with the development and manufacture of their own solutions. Areas of expertise include mechatronics system engineering, multiphysics modelling, electronics and software development and industrial automation. Our customers can thus benefit from the unique combination of the very broad engineering excellence within the Demcon group and the deep understanding of the technical challenges in the sustainable energy sector that is the specialty of Demcon energy systems.

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DESU
Special Hazard Fire Detection & Suppression

Desu Systems strives to make hydrogen production, storage and the fuelling process as safe as possible. Being the European Master distributor for Spectrex flame detectors, we supply to OEM's, contractors and fire safety companies.

We have several flame detectors in our portfolio that can detect an (invisible to the human eye) hydrogen flame within (milli)seconds.
Our products are known for their long life and fault-free operation.

Our Hydrogen flame detectors are already in use in many hydrogen filling stations, hydrogen powered vehicles, equipment and in storage facilities all over the world.

With our skilled staff and local stock we strive to provide fast and friendly service. Is your hydrogen project safe? Just give us a call.

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nhn

The Development Agency Noord-Holland Noord (NHN) plays a significant role in the development of the hydrogen economy in the region North Holland North, located above Amsterdam. NHN is actively involved in promoting the development of energy solutions, with a focus on hydrogen. Together with a network of stakeholders, including companies, universities, and research institutions, NHN supports the development and implementation of hydrogen technology and infrastructure. NHN also assists companies interested in investing in hydrogen technology in the region. Furthermore, NHN promotes the region as an attractive location for companies involved in the hydrogen value chain. The existing infrastructure of on- and offshore gas and oil pipelines, our experience and knowledge with the generation, processing, storage and transport of energy and the large-scale plans for more sustainable energy, puts the NHN region on the map as hydrogen region of the Netherlands. Together with local and foreign companies, research institutes such as the Faraday Laboratory of TNO in Petten, and operation and maintenance facilities at the Port of Den Helder, we work on the energy for our future, which is expected to include Hydrogen production at the North Sea in combination with the onshore hydrogen production initiative H_2-Gateway. NHN aims to accelerate the growth of the hydrogen economy in our region and beyond for a sustainable energy future.

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East Netherlands Development Agency

oost nl

In East Netherlands, we have a complete hydrogen value chain with R&D, testing and certification, pilot facilities and fuel stations focusing on hydrogen solutions. This gives you the advantage of not only finding pioneering crossovers from hydrogen technology to building and industrial applications but also top-class research programmes. Join our strong network of global businesses, research institutes and universities, SMEs, engineering companies, field labs and business communities that are all working together in the hydrogen value chain.

East Netherlands has a thriving business climate where companies can grow their businesses. With a focus on start-ups and scale-ups as well as advanced applied science, it enables companies to benefit from the critical mass to lower the time to market, reduce CAPEX and operational costs and share facilities, programmes and an extensive international network as well as get access to funding. The region's manufacturing industry has a proven track record in producing high-quality components and systems, making it a key player in the global hydrogen market.

East Netherlands Development Agency (Oost NL) is an agency that focuses its activities and projects on strengthening and stimulating the economy in East Netherlands. Oost NL supports you as an entrepreneur (interested) in our region. Oost NL assists you at every stage with free and confidential services. We are committed to help you to grow your business.

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DLS has over 55 years of experience in powertrain solutions for heavy duty vehicles and machinery. We are a customer and service oriented technical organisation that provides powertrain products and parts, and specialised service and maintenance. In addition to our traditional powertrain solutions, we extended our product range with solutions for green & smart mobility.

Our green mobility solutions for better conditions for people, climate and environment help to make drive systems and stationary equipment more sustainable. They are suitable for both new (OEM) drive systems and drive systems of existing vehicles and machines (retrofit). One example of our green mobility solutions is fuel cell technology.

At DLS we supply and integrate multiple A-brand fuel cell solutions for your hydrogen electric powertrain and stationary equipment, like the Toyota fuel cell module. These fuel cells are specially designed for heavy duty applications, such as large construction equipment, and hydrogen generator sets. The fuel cell modules range from 60 to 80 kW, offer a wide output voltage range, and are available for OEMs or as retrofit.

Based on your wishes and requirements, we advise the best solution for you. We can deliver the complete system, including related equipment, extensive installation and operation manuals, and, if needed, technical support. Optionally, we can deliver an integrated system solution, including engineering, assembly, and commissioning.

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For more than half a century, Doeko is specialised in High tech tooling. Through those years, Doeko gained a lot of experience in cutting tools, plastic injection tools, precision mechanics and mechatronics. Experience that can not be matched with machines or systems. We design and manufacture high-tech components, modules and systems based on precision engineering and machining. We look at your complete production process with a helicopter view and then design the optimal assemblies down to the smallest detail. Doeko is able to produce your components to the highest precision. In our own modern workshop, we work with 53 highly skilled and experienced people. Besides the people, we work with 25 robots that can run 24/7. The engineering of tooling for your product, can be (partially) done by our inhouse engineers. Doeko believes in hydrogen and wants to help you in producing the right tools and machinery for your product. Whether you have a functioning production line, prototype or design. Together with us, we can bring your product to the next level! As a specialist in high precision tooling we believe that we can help you.
When you want to discuss how we can help you with producing your product, please visit our website or contact us.
We deliver the smartest solution for your production process!

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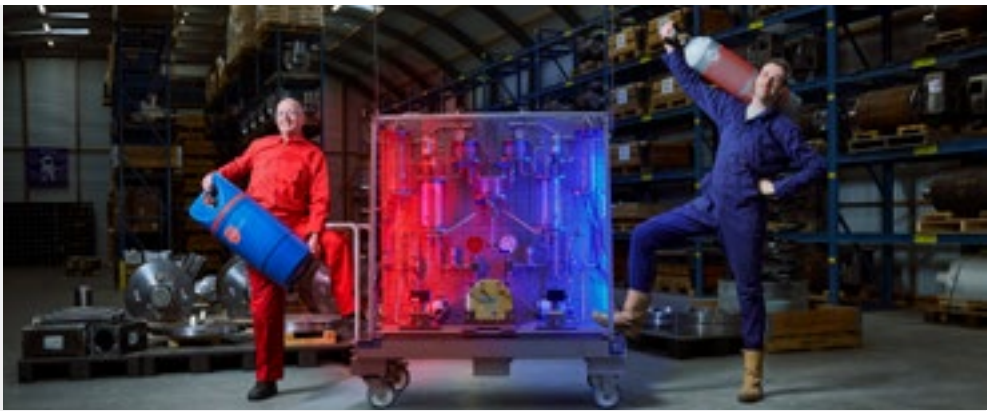

Douna Machinery is a factory active in mechanical machine building for 100 years. Ultimate experience in prototype construction of various machines where the gas industry is the biggest part. With our own engineering department, we can assist from idea to assembly and production of complete machines. Nowadays Douna is connecting green technologies, for example for future energy supply or energy storage.
In addition, precision large machining, certified welding, assembly and measuring in a conditioned measuring room are key words that belong to Douna's craftsmanship. The industrial hydrogen ecosystem in the Northern Netherlands is receiving a significant boost with the delivery of the WAviatER project in September 2023.

Douna played a significant role in this project as developing partner. With consortium partners an 1 MW Hydrogen production technology is built for the Aviation sector and Energy applications as demonstration facility on airport Eelde. On the roof of Douna Machinery factory 1400 solar panels generate 550.000 KWh of electricity per year. That is enough to provide about 200 households with power for a year. In addition, it will also save 124 tons of CO_2.

In 2024 Douna produced their own prototype of an alkaline electrolyser. Developed for use in education and as a test platform for hydrogen innovations. Membrane-based electrolysers (PEM & AEM) under development, see www.dounahydrogen.com.

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Drenthe College: the training centre for tomorrow's hydrogen economy! At Drenthe College, we train the professionals who are making the energy transition possible. With a strong focus on hydrogen technology, we prepare students and professionals for the jobs of the future. Whether you work in technology, construction, energy, or mobility: the demand for hydrogen knowledge is growing fast, and we make sure you stay ahead.

Our programmes and courses include:
- Practice-oriented vocational education (MBO) with hydrogen modules
- Upskilling and reskilling for technicians, installers, and engineers
- Masterclasses for professionals and companies

We offer hydrogen elective modules, approved by the Ministry:
- Hydrogen Technology (K1235) and Hydrogen Industry & Networks (K1237) in Emmen
- Hydrogen Technology (K1235) and Hydrogen in Mobility (K1236) in Assen

Additionally, we provide Lifelong Learning (LLO) programmes and masterclasses on: Value chains, Safety and Business cases. Drenthe College is involved in national and international programmes such as H2COVE and GreenSkills4H2. Our education is closely connected to the Pracoraat, where research and practice come together. Shape the hydrogen world of tomorrow!

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Duiker Combustion Engineers

Duiker specialises in developing, designing, supplying, installing and servicing advanced combustion solutions, tailored to customer needs for liquid and gaseous fuels for the oil refining, chemical and process industry worldwide.
At Duiker we believe in jointly realising inventive solutions that make a meaningful contribution to people and the environment and hereby Duiker's motto is `Thousands of process solutions, you can rely on our experience'.

The following products & technologies in relation to hydrogen are relevant:

1. Stoichiometry Controlled Oxidation (SCO) for conversion of fossil fired power stations into renewable ammonia (as hydrogen carrier) fuelled power stations for zero CO_2 emission electricity.
2. Multi-Fuel Combustion Technology: engineered flexible solutions for revamping existing process heater/furnaces from fossil fuels into low carbon or renewable fuels.
3. Stoichiometry Controlled Oxidation (SCO) for conversion of renewable ammonia (as hydrogen carrier) into high temperature heat for the process industries. This SCO technology is scalable, proven and commercially available.
4. Ammonia cracking technology, developed by Duiker based upon their proprietary SCO technology for converting renewable ammonia into affordable & pure hydrogen. This ammonia cracking technology has been developed for large, world scale ammonia cracking at low costs and for high conversion yields.

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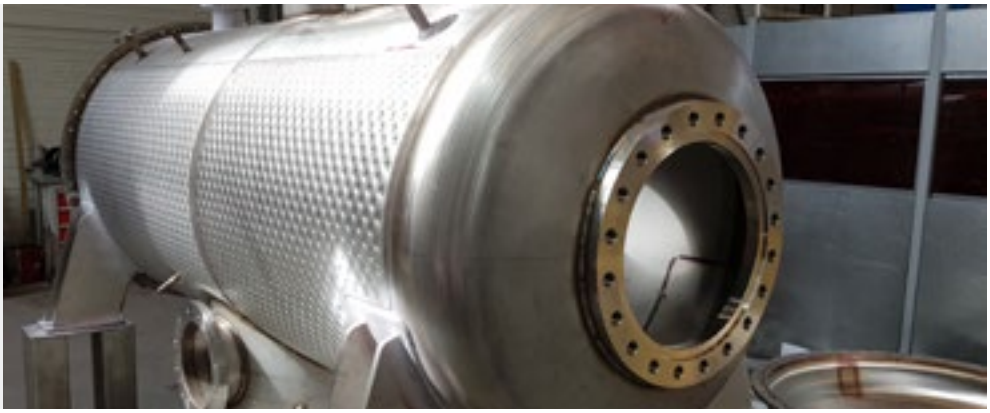

dumaco Woerden

Dumaco (Dutch Manufacturing Companies) is a brand of 9 metal working companies. With over 750 employees we are the one stop shop for all your needs when it comes to:

- Engineering
- Laser- / water cutting
- Tube laser cutting
- Bending / rolling
- Certified (robot)welding
- Machining
- Grinding / polishing
- Pickling & passivating

At Dumaco Woerden we are specialised in the engineering and production of components and welded assemblies in exclusively stainless steel, this to prevent contamination with carbon steel.

In our state-of-the-art production location in Woerden we work with a team of 70 highly qualified and certified employees. Materials we process are SS 304, SS 316, but also more specialised materials like (Super)Duplex and nickel alloys.

For the hydrogen market we are focused on the engineering and production of PED certified pressure vessels / piping and complete stainless steel skids for electrolyser systems. We are fully certified to design and weld the components of a system as per applicable design code. Since we can do the engineering, calculations and certification in house we are very flexible in design, advise and delivery time. We are always looking for a partnership and cooperation with our customers and suppliers to make the difference.

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dutch boosting group | vernieuw verbeter versnel

At Dutch Boosting Group, we are system thinkers for the living environment. Always with the bigger picture in mind. Continuously looking for new ideas. Our working method is based on a systematic approach. By explicitly balance needs and interests we believe to create sustainable solutions. We are driven by improvement and curious about new ideas and future-proof solutions. We innovate, we improve, we accelerate: that's how we boost!

We have been successfully applying our expertise for many years in complex Infrastructure projects, Spatial Development and Energy Transition. Sectors in which we see a crucial role for the application of hydrogen. In order to create the highest impact, we boost the application of hydrogen on various levels. Some examples:

- Quick Scans for organisations to determine the most suitable set of solutions, including hydrogen to attain its sustainable energy goals.
- Network analyses for governmental organisations to steer their policy making, by providing overview of stakeholders needs to adopt hydrogen applications, spatial distribution of local potential hydrogen availability and demand.
- Programme/Process management of regional hydrogen programmes and processes in order to accelerate the development and to stimulate local initiatives in order to boost innovation.

The challenges we face are complex. To find solutions, we are always open for joint ventures and collaborations in order to boost the implementation of hydrogen.

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DMEC
DUTCH MARINE ENERGY CENTRE

DMEC is an international accelerator and service centre for marine energy solutions. We believe that marine energy will be a crucial driver to realise our global energy transition and foster sustainable growth. By advancing innovation, mobilising capital and shaping policies, we create multipurpose energy solutions for a wide variety of markets, including green hydrogen production.

Electricity produced using marine energy applications can be used for offshore or nearshore green hydrogen production. Possible ways of doing this vary from using wave energy converters for producing hydrogen at decommissioned platforms, to future use of salinity gradient technology and tidal turbines to produce hydrogen at existing infrastructures like the Afsluitdijk or the Eastern Scheldt barrier. We foresee a promising future for green hydrogen and marine energy is ready to be a part of this.

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duurzaam energie perspectief

Together with Alliander, Sustainable Energy Perspective (DEP) has realised the first electrolyser for green hydrogen in the Netherlands. Located in Oosterwolde, this groundbreaking project marks a significant milestone in sustainable hydrogen production, demonstrating DEP's commitment to pioneering innovative energy solutions.

Sustainable Energy Perspective (DEP) is the technical consultancy firm for the energy systems of the future. As part of Alliander, DEP possesses specialised knowledge in designing, permitting processes, technical implementation, construction supervision, automation, and optimisation of hydrogen (H_2) projects. Our team supports clients from initial design to final realisation, integrating hydrogen solutions seamlessly into existing infrastructures. When hydrogen projects get complicated, they become interesting to us!

Recent projects to which we have made a significant contribution:

- A pilot project in Lochem where around ten homes are heated with hydrogen instead of natural gas.
- Developing a public hydrogen distribution network for the Amsterdam port region.
- Dimensioning an energy hub with an electrolyser for optimal efficiency.
- Designing the permit application for a 5 MW hydrogen production facility, followed by construction partner selection.

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DWG
Industrial Solutions

DWG is system integrator for complete process, safety and automation solutions. The services we offer provide support throughout the life cycle of process improvement or process installations.

That support is based on extensive knowledge and experience in our areas of expertise. We are expert in the following areas: Consultancy, Project Management, Process Engineering, Electrical Engineering, Instrumentation, Industrial Automation, Information Technology (IT), Data Technology, Cyber Security, Safety, Service and Maintenance.

DWG offers added value in the hydrogen sector in the areas of:

- Automation of the various processes in the hydrogen cycle, such as electrolysers, hydrogen gas boosters and various utilities in a hydrogen network. Together with the customer we set up the process, designing the electrical installation and software, commissioning the electrical systems and ultimately we provide the annual support for the systems.
- The automation of the tank terminals needed for the storage of hydrogen. DWG has developed a Terminal Management System for this purpose and is a specialist in the automation of these tank terminals by means of PLCs in combination with Route Control software.
- The conversion of factories that currently heat processes with gas, but will switch to hydrogen in the near future.

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Consultants of E&E advies focus on connecting the energy transition to economic development. E&E advies supports governmental organisations, the industry and public-private partnerships to develop ambitions, strategies and policy.
We perform exploratory research, we advise on policy and strategy, we monitor and evaluate policy or business cases and provide programme and project management.

Our result-oriented approach is based on our wide experience with clients in industry, governmental organisations and research institutes and strong analyses based on both quantitative and qualitative data.

Recently, we worked on several hydrogen projects:
- We developed energy roadmaps for Dutch Provinces and municipalities;
- We performed exploratory research on hydrogen production, infrastructure and use in Fryslân and Drenthe. Based on in-depth research and interviews, we identified regional opportunities and actively involved stakeholders from industry, governmental organisations and universities in our research;
- We have performed analysis that provide insight in the economic value of the energy transition and presented the results in factsheets;
- We monitor climate ambitions of several Dutch municipalities and provinces.

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For over 110 years, Eekels has been operating in the Marine & Offshore and Industry & Infrastructure markets. Its employees, totalling almost 600, carry out projects and maintenance & service operations in technical automation, electrical engineering and mechanical engineering.

Eekels has specific expertise in electrical drive systems, shore power connection systems, ship systems (including alarm and monitoring systems) and process automation. Eekels takes care of the entire process from engineering, panel building, implementation and start-up to maintenance and service.

We design, build and commission fuel cell systems including electrical conversion in a range from 100 kW to 500 kW and integrate them for vessels.

For the infrastructure we provide energy storage systems and provide electrical power with hydrogen as an energy carrier. These setups provide energy for construction sites and in harbour areas as mobile shore facility.

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Ekinetix: leading advisory and engineering firm in the energy transition, with extensive expertise in hydrogen technologies. We cover the entire value chain, from concept development and feasibility studies to the complete realisation of technical installations (EPCM).
Ekinetix engineers have been involved in nearly all novel product-market developments for hydrogen in the energy transition in the Benelux. This is possible by our extensive expertise in high-tech gases solutions.
We provide turnkey project management and system integration for technical installations, covering design, construction and commissioning. Innovative projects in (large scale) electrolysis, high pressure gases, liquid hydrogen, (multimodal) refuelling stations and distribution hubs, bunkering for maritime and aviation sectors.

Our benchmark advisory work includes building blocks of current hydrogen policy and developments: A One-Gigawatt Electrolyser Design; Green Hydrogen Economy Northern Netherlands; Hydrogen: Opportunities for the Dutch Industry.
Our clients trust us in all aspects of the hydrogen value chain: industrial gases and energy companies, fuel retail, shipping, grid operators, public bodies and knowledge institutes.
We are the connecting factor in the hydrogen value chain. We deliver innovations in sustainable energy, using our >25 y experience and broad network. If you have an innovative idea in energy transition, Ekinetix can help you realise it.
Ekinetix. Realising Energy Transition.

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Ekwadraat guides and advises companies and entrepreneurs in the realisation of projects in the field of energy saving, sustainable energy and energy saving.

For hydrogen projects, Ekwadraat provides (among other things):

- feasibility studies;
- subsidy applications;
- permits;
- certification;
- justifications for subsidy obligations and legislation and regulations;
- and PPA's.

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ElecHydro contributes to the global energy transition. We do this with a new generation of innovative electrolysers based on the Anion Exchange Membrane technology (AEM). Our goal is to develop highly efficient, fully adjustable and sustainable electrolysis systems with which green hydrogen can be produced at the lowest possible Total Cost of Ownership. This competitive proposition is achieved through the application of innovative technologies that lead to high performance electrodes and a better connection to sustainable energy sources with a higher efficiency. With the upscaling of the production of the electrolyser stacks to series and mass production, further price reductions are realised.

ElecHydro develops and supplies electrolysis systems based on AEM technology with the following Unique Selling Points:

- Controllability of the system from 0% to 100%. This makes the system ideally suited to combine with intermittent sources such as solar and wind energy.
- Start-up speed of the system within one minute. Ideally suited for the combination with intermittent sources such as solar and wind energy.
- Comparable or higher efficiency than comparable technologies. This at both stack and system level (> 80% system efficiency)
- Low cost and fully recyclable (cradle to cradle). We do this by making little or no use of precious metals such as iridium and platinum, a simpler stack design, and a less complex Balance of Plant.

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Elestor has introduced an innovative electricity storage technology for large scale stationary applications, based on flow battery, reducing the electricity storage costs are to an absolute minimum. Low-cost active materials are used, combined with a patented system design and easy to manufacture, compact cells. This triple cost reduction strategy enables viable business cases, essential to stimulate the adoption of electricity storage and thus to accelerate the energy transition.
The technology has the potential to replace fossil power plants at GWh scale and has all the properties to become the equivalent in large-scale, long duration electricity storage of what Lithium ion is today for mobility.

The Elestor technology is 100% modular and any desired MW/MWh combination can be designed, enabling very cost-effective bridging of long periods during which hardly renewable electricity is generated.
A unique feature is that the Elestor technology can be integrated in H_2 infrastructures and electrolysers, resulting in largely reduced production costs for green hydrogen.
Elestor was granted the 'Offshore Wind Innovators Award 2022', juried by Vattenfall, Green Giraffe and the Technical University of Delft.
Fuelled by a recent Series A investment of 30M€, in a round led by Equinor with also Vopak joining the investors team, as well as by agreements with clients strategically adopting its innovative storage technology, Elestor has embarked on an ultra-rapid growth path.

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The Solution For Zero-Emission Commercial Vehicles. With our circular solution for medium-sized commercial vehicles, your company can take a big step towards meeting environmental targets as well as becoming a leader in your industry when it comes to zero-emission vehicles in your commercial fleet.

Besides 0-emissions, our concept offers a unique aspect. Circularity. We give diesel-powered commercial vehicles a second and clean life by converting them to Fuel Cell Electrical Vehicles.

And the good thing is; your will have a range up to 650 km, a towing capacity of 3.500 kg and a load capacity up to 2.500 kg!

Conversion company of zero emission vehicles with the possibility to circular construction. With all the advantages that a traditional diesel powered commercial vehicle has, but with the big difference that our vehicles are 100% zero emission and sustainable.

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Eltacon Engineering supplies gas treatment systems for the Power Industry and Oil & Gas market. Located in The Netherlands, Eltacon is an independent engineering contractor since the year 1987. Over the years we have obtained an excellent reputation in the design and fabrication of tailor made equipment.

For applications on the energy transition and related markets we have supplied several hydrogen treatment and mixing stations. In order to reduce carbon emissions hydrogen can be mixed to the current fuel gas stream to a suitable fuel gas mixture. By means of flowmeter, pressure reduction, measurement of Wobbe index etc. the downstream mixture will be regulated automatically. Eltacon will supply the complete treatment system based upon skid mounted units.

Reference projects have been delivered to (among others) Russia, Poland and Belgium and include natural gas mixing with hydrogen, nitrogen, BOG's and COG's.

For end-users, EPC contractors, turbines manufacturers and other clients Eltacon delivers high quality products with flexible services. The company itself is very flexible and is able to meet the variety of requests from the market.

The same as our clients, we are constantly striving for new solutions that minimise environmental impact. Conversely, they want to maximise productivity while generating a reliable supply of energy. Eltacon Engineering can meet those market needs, and others, thanks to our extensive experience and recognised know-how.

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Emerson: Powering the Hydrogen Future, Safely and Efficiently. Emerson (NYSE: EMR), a global industrial technology leader, is committed to driving innovation that makes the world healthier, safer, smarter, and more sustainable, a vision perfectly aligned with the hydrogen industry. With over 130 years of experience, Emerson delivers advanced automation solutions that are crucial for the safe and efficient development of the hydrogen value chain.

Our portfolio of intelligent devices, control systems, and industrial software enables us to optimise every stage, from upstream production to downstream applications. We understand the unique challenges of the hydrogen sector, including the need for precise control, rigorous safety standards, and scalable solutions.

Our strategic priorities for the hydrogen industry centre on optimising and digitising the value chain, leveraging data for safer and more efficient operations, and collaborating closely with our customers to develop tailored solutions. We are dedicated to helping companies navigate the complexities of hydrogen production, transport, and utilisation.

Through our world-class talent, comprehensive technology stack, and proven expertise, Emerson solves customer challenges, drives value creation, and propels the hydrogen industry towards a sustainable future.

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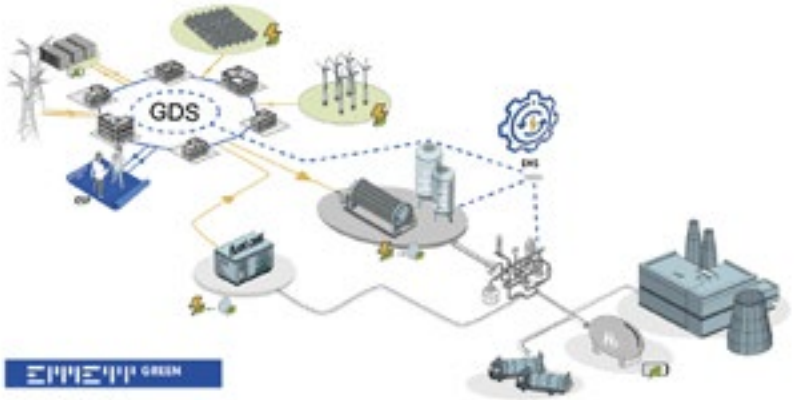

Emmett Green is an innovative company driving the energy transition. We do this by combining deep knowledge of electrical engineering, heat, hydrogen, batteries, financing, IoT and algorithms, projects management and asset management within one company. Emmett Green has been involved with several hydrogen projects and the company has an extensive knowledge base in the subject. An example of such a project is the design, financing, realisation of an electrolyser for sustainable business operations or transport.

Emmett Green is realising several Energy Hub projects within the Netherlands and has developed a state of the art Energy Management System (EMS). An Energy Hub allows for local production, conversion, storage and consumption of different types of energy carriers. The EMS will monitor, control and optimise the energy flows within the Energy Hub. The EMS can be seen as the brain of the Hub. Emmett Green's EMS allows for the connection of several assets, under which hydrogen systems, such as fuel cells and electrolysers. Emmett Green is also conducting research on the implementation of fuel cells into electric micro-grid configurations.

The combination of in-depth technical knowledge, financing and project management allows us to create a suitable tailor-made solution for your energy case. For more information, please visit our website or contact us via mail or phone.

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ENABLEMI

Enablemi helps companies develop innovative ideas and projects by securing subsidies and grants, accelerating their success. Our core expertise lies in developing and managing impactful innovation projects that contribute to the Sustainable Development Goals.
While technology drives innovation, real progress depends on strong networks and collaboration. We connect companies, knowledge institutions, governments, and end-users (quadruple helix) to accelerate new energy technologies.
Our team of subsidy specialists – with expertise in technology, finance, marketing, and project management – guides the full innovation journey, from concept to implementation, driving the energy transition and sustainable innovations.
Recent hydrogen-related activities:

- Developed research projects on system integration and asset planning with Eindhoven University of Technology.
- Secured funding for startups and companies specialising in hydrogen technology.
- Built the GENIUS consortium, drafted its budget, and wrote project documents to tackle grid congestion with a smart energy platform.
- Secured subsidies and conducted a state aid assessment for Hydrogen Valley Campus Europe (HVCE), an energy-focused campus in Northern Netherlands, a project of Wubbo Ockels School of Energy and Climate, EnTranCe Hanze University and many more partners.
- Supported TU/e Student Team SOLID, innovators of Iron-based Hydrogen Storage (IRHYS), now EGYPES Climatech Challenge 2025 finalists.

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Endress+Hauser

Endress+Hauser is the global supplier of measuring instruments for production, generation, distribution, storage and use of hydrogen. The product portfolio consists of process and lab instrumentation including flow, level, pressure, temperature, gas and liquid analysis devices. Instrumentation health can be monitored with special Heartbeat Technology and made available via the Netilion eco system.

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ENERCY is an international engineering consultancy specialised in the development of Green Hydrogen ecosystems, also known as Hydrogen Valleys. We provide the following technical and strategic consulting services:

- Project development
- Technical project design
- Identification & Application for EU Funding
- Project management
- Stakeholder engagement & public awareness
- Capacity building

In cooperation with our international partners, Enercy has led the technical design, and supported the development and delivery of several Hydrogen Valleys across Europe such as the BIG HIT project in the Orkney Islands, UK, the HEAVENN project in the Northern Netherlands and the GREEN HYSLAND Flagship Project in Mallorca, Spain as well as EU Hydrogen IPCEIs. For these multi-million, integrated cross-sector projects we provide technical support, and bring together international stakeholders from the private sector, government and civil society, to develop economies of scale and bring down costs to support the implementation of green hydrogen as a key pillar of the energy transition.
In order to create a full-fledged hydrogen economy, we also contribute our more than 20 years of experience in the hydrogen sector to support immersive training and educational programmes. ENERCY is also an active member of the European Clean Hydrogen Alliance and the EU Clean Energy Island initiative.

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Energy Storage NL represents the Dutch energy storage sector and promotes the development of technological solutions for storing energy in various forms. This contributes to building a sustainable and reliable system capable of meeting energy demands consistently.

There are numerous methods for energy storage, including in electrons (such as batteries), heat (like a thermal buffer), or molecules (such as hydrogen or ammonia storage). ESNL utilises various working groups to obtain up-to-date knowledge about bottlenecks and technical possibilities from its members, which it then utilises in its network and advocacy activities. The Molecule Storage working group, among others, leverages its diverse membership to gather and consolidate a variety of insights to efficiently address obstacles in the energy market, thereby accelerating the Dutch energy transition.

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ENGIE is an international leading company in the business of technical services and renewable energy generation. The 6.000 employees of ENGIE in the Netherlands support consumers, institutions and commercial companies to make the change to a more sustainable way of working and living.
At ENGIE, we believe that Hydrogen will accelerate the transition to green energy in regions around the world for the benefit of all. Green Hydrogen, produced through the process of electrolysis will provide:

- Decarbonised solutions in mobility on both water and land
- Grid stabilisation services to solve congestion problems
- Storage capacity of intermittent energies

Renewable hydrogen, or hydrogen as a by-product, is a versatile energy vector that can be used to decarbonise many applications.
At ENGIE, we offer solutions that are present across the entire value chain: strategy, design, engineering, construction of energy efficient assets, digital platforms, operations, and financing. We are committed to delivering the expected results. Our proximity to our customers allows us to enhance local resources, through production and decentralised Hydrogen storage for local uses.

Are you a company or local authority looking for partners capable of providing you support and advisory to develop carbon free solutions?
ENGIE can work with you in your zero carbon transition goals, design integrated turn-key energy solutions that meet your specific needs.

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Engineers and technicians, are you ready for a game-changing innovation that will transform the way you work?

EnginX offers innovative software designed to streamline the creation of hydrogen systems. By incorporating complex knowledge from various sources, we empower engineers to work more efficiently and accurately. Our flagship solution, Orion, consolidates four essential workflows—drawing, configuring, simulating, and exporting—into a single, user-friendly ecosystem.
This approach enables machine builders to design hydrogen-based systems faster and with greater ease, safeguarding valuable expertise while reducing reliance on scarce specialised personnel.

In addition, our smart catalogue, Atlas, provides seamless access to both commercial off-the-shelf and custom components, ensuring flexibility and speed in the design process. Iterations that were once time-consuming are now simplified, allowing for quicker adjustments and refinements.

Located at Radboud University Science Park, we collaborate closely with academic institutions and industry partners to deliver high-quality outcomes and drive innovation in the hydrogen technology sector. We are open to working with industry leaders and partners on varying projects.
Get your free trial today!

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Eni Energy Netherlands is the largest gas producer on the Dutch part of the North Sea. We are ex-perts in producing and transporting molecules; whether those are gas or hydrogen molecules. We are moving towards a climate-neutral energy system that is reliable and affordable. The key lies in the integration of the offshore energy systems on the North Sea. It has an extensive gas infrastruc-ture and offers opportunities for large-scale wind energy, green hydrogen production and CCS.

We are participating in PosHYdon, the world's first offshore green hydrogen production pilot on an ac-tive platform. The pilot aims to integrate three energy systems in the North Sea: offshore wind, off-shore gas and hydrogen by producing green hydrogen from seawater on our Q13a-A platform. The aim of the pilot is to gain experience of integrating working energy systems at sea, the production of hydrogen in an offshore environment and the transportation via existing infrastructure to shore.

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EnTranCe|Centre of Expertise Energy contributes as a learning, practice-oriented knowledge community to a clean, renewable and affordable energy supply. Scientists, students, businesses and authorities all come together at our center of expertise to share knowledge. With our premise people in power, we develop the innovations that are much needed for the energy transition and strengthen the regional knowledge economy.

The multidisciplinary energy research carried out by EnTranCe is mainly on the level of villages, districts, neighborhoods or companies. This is where large-scale energy suppliers and infrastructure meet small-scale, local energy initiatives. And this is where the main breakthroughs will be needed to ensure a successful transition.

Project examples:

- Groene Waterstof Booster: helps entrepreneurs to realise hydrogen innovations and ideas. With a financially attractive scheme (voucher programme), we give companies access to a strong and broad network in the Netherlands and unique test opportunities on the grounds of EnTranCe.
- Waterstof Innovatie Netwerk Groningen: a hydrogen facility which companies and organisations can use to accelerate the development of hydrogen techniques. With WING, SMEs can host hydrogen training sessions for staff, conduct physical tests and demonstrate technology.
- Hydrohub MegaWatt Test Centre: a state-of-the-art research facility on the grounds of EnTranCe to optimise and scale up the production of green hydrogen via electrolysis.

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EOX Tractors produces emission free tractors through unique technology and groundbreaking designs for agricultural and infrastructural construction purposes. As an innovative agile start-up, working with commercial partners and academic institutions, we stay ahead of the market in delivering zero-emissions vehicles. In 20 years' time, all tractors will be electric. Many farmers have already laid a good foundation for this transition by investing in solar power, wind energy or even an electrolyser. Today we are therefore designing and building the machines to work fully electric or on hydrogen as front runners in the industry.

The EOX platform is designed as a smart modular chassis with proven electric powertrain technology for optimal efficiency. Our unique electric drivetrain powers four independently controlled wheels. The availability of this technology makes our platform ready for a wide variety of autonomic applications. Based in Arnhem at Industry Park Kleefse Waard, EOX Tractors operates in the Dutch center of hydrogen technology development. Together with affiliated partners connected through our investor's network we are able to stay ahead with zero-emission and autonomic productions and developments.

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Erez Energy produces green hydrogen locally as a service for the industry and heavy mobility that need green hydrogen in their future energy mix.

Our goal is to be the catalyst in the hydrogen transition for the industry. With our locally produced green hydrogen we enable the industry to start with the hydrogen transition by mixing green hydrogen with natural gas or gray hydrogen.

Our modular and standardised green hydrogen systems are located near the industrial offtaker. With our approach green hydrogen becomes available on a short term and on locations where hydrogen pipeline infrastructure isn't expected soon. Our approach is a first step in the hydrogen transition and therefore mitigates the financial risks that the uncertainties of this transition might cause.

As project developer Erez Energy takes care of the complete scope of the hydrogen production, from investment to operation. As a consultant, Erez Energy helps companies with insights and feasibility studies.

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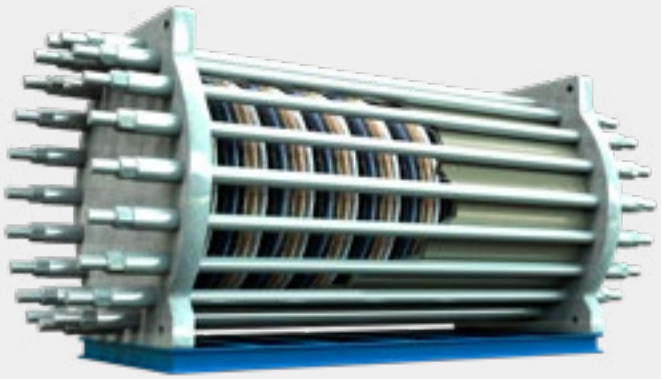

ERIKS is a specialised industrial service provider that offers a wide range of technical products, co-engineering and customisation solutions, as well as related services for all possible hydrogen applications. We help customers in a variety of industrial segments to improve their products' performance and reduce their total cost of ownership. Our skilled colleagues worldwide serve customers in their original equipment manufacturing (OEM) and maintenance, repair and overhaul operations (MRO).

Our technical know-how is the basis of our specialism. We have built up deep expertise in the areas of sealing & polymer, gaskets, valves & instrumentation, industrial & hydraulic hoses, industrial plastics, power transmission & bearings and tools, maintenance & safety products.

We supply A-brands as well as our own ERIKS products. Besides we have our own departments for engineering, assembly, condition monitoring, smart asset management, inspection and field service engineers.

At ERIKS, we stand for doing good business. We value long-lasting relationships with all our stakeholders and contribute to a better and more sustainable society. ERIKS sees hydrogen as an important sustainable energy carrier for the near future. We are working on building this hydrogen fuelled world by combining hydrogen knowledge and products available in all our expertise areas. Our team of hydrogen specialist in the Netherlands is at your service for a customised solution.

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E-Trucks Europe develops, produces, sells, rents and services hydrogen trucks. This concerns heavier trucks with an energy-consuming structure such as garbage trucks, but also vehicles with a crane, hook-arm system, tipper or cooling installation on board. We have been doing this as a family business since 2010 from our workshops in Westerhoven (the Netherlands) and Lommel (Belgium).

In 2013, we launched our proof of concept of a hydrogen refuse truck, which we used to collect waste paper in the city of Eindhoven for a year. Then we took the time to use the experiences of the test period to improve the truck and the hydrogen-electric system, in which we use a fuel cell. We have now delivered zero-emission refuse trucks who operate in various cities such as Groningen, Noordenveld, Arnhem, Helmond, Antwerp (BE), Herten (DE) and Dijon (FR).

There is great interest from almost all countries in Europe for our hydrogen refuse trucks. The European Commission is stimulating this development based on its vision for the future of hydrogen and its Clean Vehicles Directive to green mobility.

As E-Trucks Europe we actively collaborate with more than 70 chain partners. In practical terms, this means a.o. that we develop projects together around new hydrogen refuelling stations. If you are also interested or if you have any questions, please do not hesitate to contact us.

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Building a better working world

At EY, we are committed to a better working world. We do this by working together on a future-proof and sustainable energy sector. We are keen to live up to our commitment to sustainability and eager to support organisations in their distinct sustainability efforts.

On your sustainability journey, EY teams can help you reach your goals by designing tax frameworks and risk management methodologies to accelerate transition, decarbonise your supply chain, and genuinely green business operations. To support this, we help you stay aware of policy developments and their impact and assist with securing incentives and funding and complying with new tax and non-financial reporting obligations.

EY teams insight creates a bird's eye view of your sustainability strategy, supporting and flexing across your enterprise. This insight allows us to bring in key players at vital stages, sharing our technical and market experience related to the tax, legal, governance and workforce challenges you face during your sustainability journey.

With the use of these financial, grants & incentives, tax and legal expertises, EY shares its sector knowledge about hydrogen applications. Initiating consortia of (inter)national companies and applying for Dutch and European grants and incentives is an important pillar for the (knowledge) development of new hydrogen and fuel cell solutions. In this way, EY contributes to the transition to a sustainable future and the creation of long-term value.

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Feenstra

Feenstra started in 1947 and is since its establishment a major player in the Dutch market for installation and services of energy supply systems in dwellings. Both for private residential and housing corporations. These energy supply systems consist of solutions for heat, cold and electricity generation and storage. With more than 800 field service engineers, Feenstra is also active in the field of renewable energy solutions and the energy transition. We are front-runners with our partners in the field of hydrogen-projects, for existing and new buildings. For Feenstra's 800,000 customers we are always looking for new solutions whereby sustainable and comfortable living play a central role.

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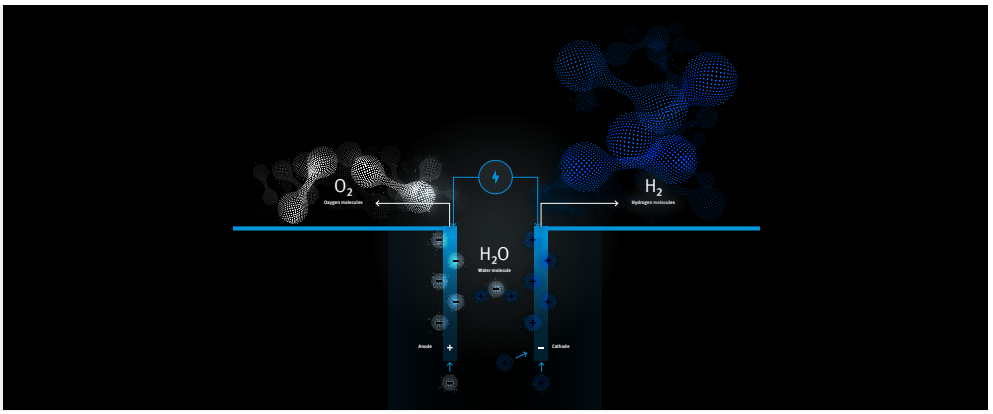

Festo is a global leader in automation technology, providing innovative solutions to enhance productivity and efficiency in various industries. With a strong commitment to sustainability, Festo is at the forefront of the transition to renewable energy, particularly in the production of green hydrogen.

Festo plays a crucial role in the green hydrogen market by offering advanced automation solutions for efficient and safe electrolysis processes. Their extensive portfolio includes SIL-certified components designed for use in potentially explosive environments, ensuring both performance and safety. Key products such as solenoid valves, proportional pressure regulators, and valve terminals optimise energy consumption and reduce maintenance costs.

From production to distribution, Festo's solutions guarantee reliable operation and flexibility. Their ready-to-install process valve units and preassembled control cabinets simplify commissioning and installation, providing a productivity advantage. With expert advice and tailored solutions, Festo supports companies in successfully transitioning to a sustainable future.

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TCE Van der Klok Beheer and TCE FINN are Netherlands based companies. They started in 2011 to streamline research, engineering, design and manufacturing components to finalise and bring to market innovative, green technologies designed to operate in the current world infrastructures.

This is a brief history summery of the TCE companies including the development of its technologies and products. In addition, an overview of the principles involved, a description of the products, testing protocols and results, and the current and future outlook for the company. This will be followed by sales projections, market development strategies and opportunities, growth needs and recognised challenges.

TCE has many years experience in engineering and production Hydogen electrolysers. The TCE Hydrogen System is a patented electrolytic retrofit technology for diesel engines. The product gases (oxygen and hydrogen) are an enhancement additive to the diesel fuel, not a fuel replacement. Using water, the product gas is produced in pods via an electrolytic process near the engine. The amount of gas produced is directed by the integrated computer system and determined by the power load of the engine. The harder the engine works, the more product gas is produced. It is then safely injected into the airstream just prior to combustion. TCE is specialist in machining high precision volume Electrolyser part and Electrolyser assembling.

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Firan, as a subsidiary of Alliander, develops and manages energy networks for innovative energy sources. It does this based on the social interest of keeping energy reliable, affordable and accessible for everyone. Firan makes hydrogen accessible for regional industry. That is why we are working with partners to realise local, innovative energy solutions that accelerate the energy transition. This means that we work with municipalities, hydrogen producers, off-takers and other partners on solutions for buildings, areas and municipalities.

We are ready to solve local energy issues. Our working method is characterised by ingenuity, thoughtfulness, agility, decisiveness and responsibility. With our versatile expertise and years of experience, we tackle all technical, legal, organisational and financial aspects of the infrastructure for new energy. In this way, we find the smart infrastructure solutions that will advance the Dutch energy transition. We work on regional hydrogen networks and make hydrogen applicable in local energy networks such as energy hubs.

Together we will achieve more. Together we make sustainable energy accessible to everyone.

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Fluidwell Hydrogen Systems is committed to becoming a leading producer of innovative, modular electrolyser systems for decentralised green hydrogen production. Our goal is to empower customers to produce hydrogen with maximum energy efficiency and reliability, achieved through intelligent process control and seamless integration of Balance-of-Plant components in our electrolyser systems.
With over three decades of experience in the global energy sector, Fluidwell has a proven track record in developing safe and efficient ATEX, IECEx and CSA certified products for hazardous areas. Our unparalleled knowledge of measurement and control technology, instrumentation, and hydrogen makes us the go-to partner for pioneering hydrogen projects.

Fluidwell plays a pivotal role in the development of PEM and AEM electrolyser technology. In addition to our involvement in long-term research projects, we focus on integrating innovative components and systems. By combining and testing various sub-innovations in a complete electrolyser system, we can demonstrate the practical value of these technologies and accelerate the energy transition.
In addition, Fluidwell has developed a Weights and Measures certified stationary and mobile truck-dispenser system that is used throughout Europe on tube trailers to supply hydrogen filling stations (HRS), large-scale consumers and storage locations. In the supply chain for safe hydrogen production, we are internationally active in several areas and we are looking for new partnerships.

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FLUOR®

Fluor is a global, publicly traded engineering, procurement, construction (EPC) and maintenance company. We work with clients in diverse industries around the world to design, construct and maintain their capital projects. Fluor has more than 46 years of experience in the hydrogen industry with 50 plants producing a total of more than 2,300 million cubic feet per day of hydrogen, including the world's largest hydrogen production plant at the time. Moreover, Fluor has its own independent electrolysis expertise, and knows the licensors of the basic elements and the developers of the hydrogen electrolysers applying these technologies. With this knowledge, we can assist clients to select the right application for their objectives. Fluor in The Netherlands offerings: We successfully executed projects in Europe for more than 75 years using a multi-office execution approach. With Fluor's offices in Hoofddorp, Bergen op Zoom, Geleen and Rotterdam, plus Stork, A Fluor Company, we can support clients with additional technical and project support. Our comprehensive solutions span the entire project life cycle and deliver capital efficiency. Industries served includes Advanced Technologies & Life Sciences, Oil & Gas, Refining, Chemicals & Petrochemicals, Gas Processing & Underground Gas Storage.

- Conceptual Studies, Full Front End Engineering and Design
- EPC and Project Management Consultant (PMC) capabilities
- Zero Base Execution
- Value Improvement Programmes
- Organisational Effectiveness
- Integrated Partnership Programmes

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FME POWERED BY DUTCH TECHNOLOGY

FME is the Dutch employers' organisation in the technology industry. The 2,200 affiliated companies include technology start-ups, trading companies, small and medium-sized industrial enterprises as well as large industrial conglomerates. Our members are active in the fields of manufacturing, trade automation and maintenance in the metal, electronics, electrical engineering and plastics sectors.

Around 400 members are active in the renewable energy sector and 130 members in the hydrogen sector. Together with our members we coordinate and participate in multiple hydrogen projects in the Netherlands and in an international setting.

FME members employ a total of 220,000 people, have a combined turnover of € 91 billion and their exports total € 49 billion.

We connect and mobilise companies, knowledge institutes, end users and investors in order to find solutions to the global challenge for a greener future. Please connect with us if you are looking for a specific company, product or service. Let's work together!

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Fountain Fuel is building a well-established network of 30 zero-emission energy stations in Europe by 2028, where green hydrogen refueling and e-charging are combined. This way, we provide the best of both worlds.

We offer a reliable, outspoken and flawless experience at our stations. Our diverse and knowledgeable team continuously improves our station design and operations, providing best-in-class reliability and quality for our customers. We use proven technologies and collaborate with robust partners such as Linde Engineering. Our operational station in Amersfoort acts as the blueprint for our future installations, with a benchmarked uptime of over 98.23% since opening.

As a result, we have already created a strong brand with a positive connotation. The presence of Fountain Fuel means added value for project developers and governmental organisations. We create sincere partnerships and regional value chains, ensuring long-term relationships with off-takers, suppliers, governmental organisations and knowledge institutes, to maximise shared value and business results. In May 2023 we opened our first Fountain Fuel in Amersfoort, which will be followed by Nijmegen and Rotterdam in 2024. In The Netherlands, we have 7 stations in the pipeline and 6 more in Sweden. Several leads are currently under investigation in Germany, France, Spain and Portugal. This means we are on track for reaching our 30-station goal, accelerating the transformation to sustainable mobility.

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Fujifilm is the world's largest imaging company. Many of Fujifilm's new products find their roots in the company's original product: photographic film. However, our activities nowadays extend over a much wider area then only photographic film. Using the experience and know-how from our imaging history, we have diversified into many new markets. Today more than 70% of the products sold by Fujifilm have been developed over the last decade. These include medical and life science applications. But also highly functional materials have been developed for semiconductor, photovoltaic, automotive, water treatment and gas separation applications.Based on our long standing knowledge in coating thin functional layers onto substrates, Fujifilm is developing membranes for various industries. The first achievements of Fujifilm membrane technology are in the field of water purification and natural gas treatment. In those business areas, membranes are increasingly competing on price and performance with conventional purification techniques. The development of Fujifilm's ion exchange membranes and gas separation membrane technology takes place at the R&D labs of Fujifilm in Tilburg, The Netherlands and in Tokyo, Japan. With the growing need for green energy and carbon neutral future, hydrogen electrolyser technologies become an important cornerstone to meet the national, European and global CO_2 reduction targets. Membrane technology will play an important role in this for with several electrolyser types like Alkaline, PEM or AEM. Besides the technology, economy of scale will be required to meet cost down targets for green hydrogen as indicated by the international institutes and governmental roadmaps.

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Future Proof Shipping (FPS) offers zero-emissions marine transportation services to enable players across the value chain make the transition to zero-emissions. We are connecting and enabling the entire maritime and green energy value chain, starting with logistics service providers and cargo owners who are ready to take the lead.

As a zero-emissions vessel owner, we are building our own fleet of zero-emissions inland and short-sea vessels, which we offer for charter. With our zero-emissions advisory, we are enabling others to make the transition to zero-emissions through technical, financial, and commercial support as well as project development and management.

Over the next five years, we aim to build and operate a fleet of 10 zero-emissions inland and short-sea vessels based on long-term time charter contracts to operators, logistics service providers and cargo owners/shippers. We do this by retrofitting existing diesel-propelled ships in partnership with other investors or their current owners who are looking to adopt a zero-emission business model.

One of our current projects is to retrofit the Maas, an inland container vessel to sail 100% on zero-emissions hydrogen fuel.

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Gasunie is a leading European energy infrastructure company. The Dutch state is our sole shareholder. Our core activities are gas transport and gas storage. We serve the public interest and facilitate the energy transition by providing integrated infrastructure services.

In the Netherlands and the northern part of Germany, Gasunie operates infrastructure for the large-scale transport, storage and conversion of gas. At the moment, this is mainly natural gas, but the energy transition is increasingly shifting towards CO_2, green gas, heat and hydrogen. Our infrastructure, services and geographical position mean that we are at the heart of the north-western European energy market.

By developing new value chains, in close cooperation with Germany and North Sea countries, Gasunie contributes to maintain the strong Dutch position as a significant energy hub and gateway for energy flows to north-western Europe. This is vital for an affordable and reliable energy supply of northwest Europe.

On the way to becoming a zero-emission society, natural gas is increasingly being replaced by hydrogen, especially in manufacturing and industry. Gasunie is developing a largescale transport and storage infrastructure for hydrogen in the Netherlands and northern

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gAvilar specialises in gas pressure regulation. We produce regulators and systems (stations) including safety devices for network companies and industry in the world. Mainly still for natural gas but more and more for other gases, because of the energy transition, like biogas (green gas) or hydrogen. Our products are suitable for hydrogen, confirmed by Kiwa for some specific ones, and are therefore used in several pilot projects in The Netherlands.

Projects H_2 in Lochem and Wagenborg
gAvilar is a leading partner in development projects for hydrogen use in homes. gAvilar built the hydrogen measuring and control installation in Lochem and Wagenborg.

Furthermore, we have used standard natural gas regulators and components, and the electronic components naturally comply with the correct Atex classification. We have also devised a well-functioning solution for odorising hydrogen with a shelf life of 5 Nm3/h. We can even odorise at the right level from 1 Nm3/h.

H_2 mixing with natural gas and accurate measurements for billing purposes?
gAvilar B.V. developed a compact and robust energy measurement system for gas mixtures, including hydrogen. A cost-effective solution with the accuracy of a gas chromatograph, but without the need for regular calibration and maintenance-free. The system consists of the latest Volume Converter gFlow1500 in combination with the Mems gasQS™ flonic sensor, which creates a certified energy measurement.

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As the leading flow solutions provider for the safe and sustainable transport of fluids, GF Piping Systems creates connections for life. GF supplies high-quality plastic piping systems and related products for industrial applications, water/gas utility and building technology. GF connects resources, technology, and people, enabling positive change for a better future. Creating intelligent products and solutions for every flow application makes our world more connected and ensures the safe preservation and transportation of global (fluid) resources.

We offer holistic solutions for the hydrogen economy: from hydrogen production to storage and transport/distribution to utilisation.
With many years of experience in the field of gas supply and industrial water treatment we have a comprehensive portfolio of high-quality and reliable solutions for hydrogen technology.
For our product lines ELGEF PLUS and MULTI/JOINT 3000® PLUS system we have already received the KIWA certificate AR214 *Suitability of hydrogen gases* and thus offer a complete range for hydrogen distribution.

In the field of hydrogen production, GF Piping Systems can create added value thanks to its broad product portfolio and many years of experience in water treatment, cooling applications and customer-specific product design and prefabrication, which are all efficiency-increasing, weight-saving and corrosion-resistant.

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Green Energy Park

Green Energy Park Global is a vertically integrated, renewable energy franchise, that shares know-how, technologies, experience, and best practices with its global members. We primarily focus on hydrogen technology applications and champion hydrogen and its derivatives as the premier renewable energy carrier. Our franchise endeavours to develop, finance, construct, and manage renewable energy facilities under a common brand, uniting upstream, midstream, and downstream operations around shared values and a common mission. At the heart of our operations are two monumental projects:

Green Energy Park Piauí in Brazil is a 10GW green hydrogen and ammonia production plant in the special economic zone of Parnaíba. Strategically positioned adjacent to the newly developed port infrastructure of Luís Correia, the plant boasts seamless export logistics. Green hydrogen produced here will be transported to Krk, while the remaining quantity will be distributed to various ports across the globe to serve industrial offtakers.

Green Energy Park Krk in Croatia is a unique midstream facility set to import and distribute 10 mln tons of renewable ammonia annually. With its deepwater seaport and terminal infrastructure, it unlocks the value chain for renewable ammonia distribution throughout South-Central Europe. The facility boasts direct access to a deepwater seaport, on-site ammonia storage, and modern infrastructure, offering efficient and cost-effective distribution channels.

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greenwise campus

The Innovation Centre is the beating heart of Greenwise Campus, Emmen – a vibrant hub where industry, education, and research collaborate to create smart, green solutions for today and tomorrow. It is a place where ideas are shared, partnerships are formed, and innovation becomes accessible to all, fostering connections that drive sustainable progress.
The Innovation Centre is home to the Centre of Expertise (Practoraat) Hydrogen in Industry and Networks, part of DCTerra. Established in 2021, this centre addresses the challenges of the energy transition with a regional focus on hydrogen applications in industry. We play a crucial role in applied research and education on hydrogen production, infrastructure, and industrial applications. A core focus lies on safety, inspection regimes, and maintenance strategies – essential for a reliable and secure hydrogen future.
Our mission is to optimise hydrogen deployment and train the next generation of professionals.

- Developing education and training programmes on hydrogen production, combustion, and refuelling stations.
- Advancing safe operation and maintenance strategies through failure analysis and safety research.
- Becoming the national knowledge centre for hydrogen safety, inspection, and maintenance within Hydrogen Valley Campus Europe.
- Establishing a regional hydrogen innovation centre for businesses by 2026.
- Integrating hydrogen knowledge into vocational and higher education curricula.

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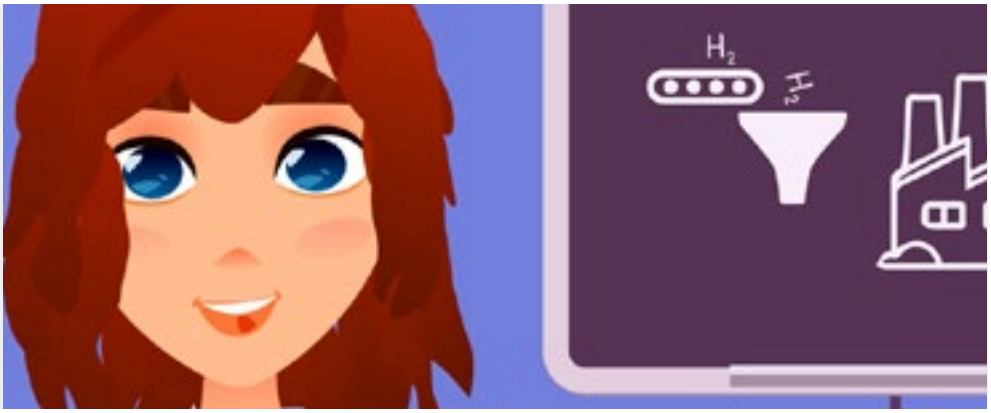

Groene hart werkt!

Platform Groene Hart Werkt! (PGHW) is the regional platform for circular economic initiatives in 'The Green Heart' of the Netherlands.
In co-operation with ten townships in the middle of the country PGHW inspires, connects and facilitates entrepreneurs, start-ups, council representatives and students in all circular economy aspects. A major part is dedicated to the hydrogen business.

Building a sustainable economic future means co-operation in many ways. By facilitating and sharing knowledge between partners in our network we contribute to a proper circular economy for our region and country.
The hydrogen business is on top of our list.

Not only we contributed to some concrete projects but we also work together with an innovation centre and university students on a hydrogen project in the automotive industry: the 'Hydrogen Education Bus'. An animation movie about the meaning and application of hydrogen was made in co-operation with a consultancy and engineering firm and issued by us. This year together with Provincie Zuid-Holland we started a 'regional hydrogen programme'. Purpose of this programme is to stimulate the hydrogen economy and the use of zero emission energy carriers in our region.

Contact us to see if we can help you with your circular and hydrogen business and ideas!

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GRONINGEN AIRPORT EELDE

Groningen Airport Eelde is a regional airport in the Netherlands and serves as an important testing and demonstration ground for the sustainable aviation industry. As a testing ground, it offers a unique environment for the development and validation of innovative aviation solutions. The airport actively seeks partnerships and initiatives that can contribute to the advancement of sustainable aviation practices. It focuses on various application areas, including unmanned aviation, green energy production and storage, zero-emission ground operation (such as our hydrogen ground power unit), refueling infrastructure for electric and hydrogen-powered aircrafts and sustainable aviation fuels. It has a special focus on hydrogen application in aviation; as Hydrogen Valley Airport, it aims to develop hydrogen ecosystem including green hydrogen production, distribution, and usage. The starting point is the existing 22 MW solar farm, the largest airside solar park at an operational commercial airport, and its location in the heart of Europe's first official Hydrogen Valley.

By collaborating with various stakeholders, Groningen Airport Eelde aims to foster knowledge exchange, share best practices, and accelerate the development of sustainable aviation technologies. The airport serves as a vital link in the value chain, facilitating the testing and implementation of emerging technologies and solutions that can shape the future of aviation.

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GRONINGEN SEAPORTS

Groningen Seaports: Hydrogen hub of Europe. Groningen Seaports is the port authority for the port of Delfzijl, Eemshaven and the adjoining industrial sites. We provide the complete package of port services to industrial and commercial clients. In addition to this, the Eemshaven plays a central role in the development of the energy-related industry.

In this capacity, Groningen Seaports supports and strengthens the production of green hydrogen. There are multiple hydrogen projects in development within the Delfzijl and Eemshaven area. These are projects relating to the construction of electrolysers and hydrogen plants, the creation of specific port facilities, the development of a plastic pipe system ('backbone'), but also the use of hydrogen in public transport and the development of hydrogen filling stations. Groningen Seaports is therefore fully committed to innovation and offers space and facilities for test centres, start-ups, scale-ups, pilot and demo plants.

Europe's biggest green hydrogen project starts in Groningen. A consortium of Gasunie, Groningen Seaports, Shell Nederland, RWE and Equinor is working on the realisation of the NorthH_2 project: the production of green hydrogen using electricity generated by a gigantic offshore wind farm. The amount of green hydrogen produced, initially at Eemshaven and later possibly also offshore, is expected to be around 800,000 tonnes a year by 2040.

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H₂ Academy
POWERED BY RESATO

The H₂ Academy is the hydrogen centre of expertise. We connect the business community with leading knowledge and educational institutions to facilitate applied innovation, develop knowledge and expertise, and offer tailored education. Together, we can create educational programmes, innovation challenges, and training facilities to ensure that:

- Companies have everything they need to turn their employees into hydrogen experts.
- Hydrogen gets well-known and attractive to students, job seekers, and other professionals.
- Hydrogen knowledge gets transferred to (sub) suppliers, service partners, customers, and other stakeholders that are active in the hydrogen industry.

We believe that the future of hydrogen lies in mobility. Under European legislation (AFIR), hydrogen refuelling stations must be available in all urban hubs and every 200 kilometres along the TEN-T core road network by 2030. This will ensure that hydrogen cars can refuel seamlessly across the EU. To make this a reality, we need more skilled professionals in the hydrogen industry. Driven by a passion for development, innovation and growth, our mission is clear: we unite, develop, and share hydrogen knowledge to promote the intake of qualified professionals into the hydrogen sector and support the growth of the hydrogen job market.

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H2arvester is a circular energy system for a local and/or regional economy: local-for-local & scale-by-scale. Regional employment is leading and is in line with the concept of the 'short-chain': local producers add value to the environment and short chains help to realise the ambitions for a circular system. This is a unique opportunity to contribute to the energy transition to sustainable energy and a sustainable economy at a local and regional level, in addition to the large-scale production of energy.

H2arvester is a partnership for research, product development and realisation of movable and autonomous systems for the generation of solar energy and the production, storage and applications of electricity and hydrogen.

H2arvester was founded by L'orèl Consultancy from Groningen and npk design from Leiden. L'orèl Consultancy, npk design and LTO Noord are the inventors of the H2arvester system and have all the qualifications for energy research, technical development, facilitating pilots and outsourcing the production. H2arvester won the RVO competition 'Solar power in agricultural areas' at the end of 2017.

Selected Dutch (and preferably local) agricultural mechanisation companies are engaged for the production, installation and maintenance of the mobile solar systems. For the realisation of the electrical systems, hydrogen production and storage systems, we collaborate with system suppliers and market leaders in these industries.

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H2 Circular Fuel is a Dutch company. It has specialised in building applications to extract H_2 from H_2Fuel ($NaBH_4$), reducing it to $NaBO_2$ and to regenerate this Spent Fuel back to $NaBH_4$.

H_2Fuel is a patented technology for the production, storage and release of hydrogen. For its production, no electrolysis is required. The hydrogen is stored under normal atmospheric conditions in a powder. Release takes place without additional energy, using ultrapure water. Not only is one hundred per cent of the hydrogen stored in the powder released but, as a bonus, the same amount of hydrogen is released from the water, as well.

In dry powder form, the hydrogen can be stored for an unlimited period, is in energy terms the maximum attainable result, has no safety risks and, throughout the production process from production through consumption, features no harmful emissions at all. Once the hydrogen has been issued, the residual substances can be returned to the powder state with hydrogen stored in them: this makes H_2Fuel the world's first circular fuel. H_2Fuel can be deployed in all sectors of society and the economy and, as a result, forms by far the preferable alternative to both fossil fuels and other sustainable alternatives.

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HYDROGEN OF DUTCH ORIGIN
MAKING IT HAPPEN

The mission is clear: from grey to green. For that, we need green electricity and green molecules. Offshore wind on the North Sea has taken off. Onshore conversion to green hydrogen will face limitations in a few years. Landing the electricity to shore with wind parks being built further and further away on the North Sea poses high costs and challenges. Offshore conversion to green hydrogen offers the solution. The green energy goals for offshore wind set by the Dutch authorities are ambitious: 72 GW by 2050. Achieving these goals requires concrete action – now. That's why Hydrogen of Dutch Origin (H2DO) was founded.

100% Focus and Commitment. We are a 100% dedicated Dutch company focused on offshore green hydrogen development. Our mission is clear: to demonstrate, accelerate, and grow offshore green hydrogen production in the North Sea. Our team has extensive offshore energy experience, innovative minds, and a belief in cooperation and knowledge sharing. We deliver on time and within budget – we get the job done. And that is why our tagline is 'Making it happen'. By making it happen, we help build and strengthen the Dutch reputation as a frontrunner in offshore green hydrogen production.

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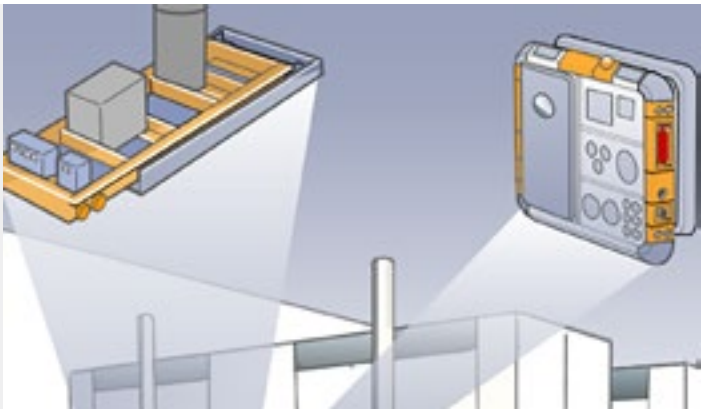

H2Dock

H2Dock's purpose is to contribute to the energy transition by helping to lower the production cost of green hydrogen. We will enable cost effective hydrogen production by assisting our clients (electrolyser/stack OEMs & EPCs) with efficient hydrogen production enclosures, based on a standardised and modular building system. Onshore or offshore. From 5MW up to more than 1GW. Hydrogen production facilities can now be configured-to-order instead of engineered-to-order.

The H2Dock hydrogen production building system consists of three distinct parts:

- a containerised module for Stacks and Balance of Stack equipment;
- a modular plant building system for Balance of Plant equipment and
- a docking module with interfacing connections for electrical, data/control, gas and fluids piping, facilitating the required interconnections between building blocks.

Our clients will build their equipment (Stacks, Balance of Stack and Balance of Plant) on removable skids which are placed in the containerised module or within the modular plant.

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H2Hub Twente, officially named 'Coöperatie Waardemakers in Waterstof UA', is located in Almelo. The H2Hub is a knowledge and education centre and regional hub, where businesses, government and knowledge institutes come together to reshape the region towards a circular Green Hydrogen future. Starting 2024, H2Hub Twente launched a new four-year programme, after successfully wrapping up 'Businessplan 2020-2023' where the foundations were laid. Roadmap 2024-2028, will focus on seven key themes relevant for the Eastern Netherlands:

- Development of Knowledge and Human Capital.
- Infrastructure and Storage.
- Mobility.
- Production of green hydrogen.
- Process, food and manufacturing industry.
- Area development.
- HORIZON IS2H4C (Industrial Symbiosis to Hubs for Circularity).

The H2Hub Twente owns a small scale electrolyser system that is available for experimenting and testing. Hydrogen produced on site for testing is 100% green, electricity is generated by 1MW solar and 70kW wind, which is stored in an energy storage system to ensure green hydrogen production throughout the night as well.
Partners: RES Twente, Waterschap Vechtstromen, Provincie Overijssel, University of Twente, Saxion Hogeschool, HAN, ROC van Twente, KIWA, OostNL, Boessenkool, Bolk Transport, Bolletje, Bronkhorst, Brusche, Cogas, Crematoria Twente, Jotem, Nijwa Zero, Powerspex, Roelofs, Schröder Energie Technologie, VDL Energy Systems, Witzand, Oostkracht10, Brandweer Twente, Zuivelhoeve.

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H_2O Systems Holland (H_2O) designs and produces systems that generate 'Warmth from Water'. Hydrogen extracted from water is widely seen as the most valuable alternative fuel. H_2O introduces the 'next generation' hydrogen powered home heating systems. The system converts water into hydrogen by low power electrolysis and burn the hydrogen to produce heat.

H_2O systems are designed for consumer use in single home units and in the future also available for multiple units and apartment buildings.
The system is developed as an alternative for the currently used fossil fuel powered systems. The system is fully emission (CO_2) free.

The system's unique points are being a 'closed system' that 'on location' and 'on demand' generates hydrogen. Burning hydrogen makes sure the system generates energy and subsequently supplies heat for house warming and tap water.

The critical elements 'closed' and 'on location' imply no transport, no infrastructure nor any storage of gas is required. Dangerous and expensive transport and storage are completely eliminated. The key element 'on demand' implies that the H_2O systems generates hydrogen 'on location' and 'on call' when the consumer turns on the system needing heat or heated tap water.
This high potential research company holds the Intellectual Property (IP). Currently worldwide is no comparable system available. The Company's potential is based on international expansion as well as financial performance, shareholder and stakeholder value.

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H2Storage is a 100% Dutch company with experienced executives (from the energy, composites, aviation and automotive sectors) as the driving force behind this successful start-up. By combining our years of experience gained from the aforementioned sectors we developed a viable solution for long term energy storage. We have fulfilled an essential step towards a hydrogen economy by introducing the use of high pressure lightweight composite storage tanks from recyclable material to store hydrogen. Now we have an alternative solution to store more hydrogen under high pressure in the whole supply chain, from production all the way till the end user. This can be realised by type 4 composite cylinders with NWP of 700 bar. Portfolio of H2Storage consists of single lightweight composite cylinders, double, triple or quadruple bundles and standard 10-45ft container containing tenfold(s) of these cylinders including the essential appendages for hydrogen storage. The solution to store locally, transport and use locally (e.g. an off-grid (emergency) generator) large quantities of hydrogen. These products are developed according to the International (ISO/ADR/ADN/TPED) and European standards (R134) for the automotive, shipping, stationary and transportation industry. Currently we are fully involved in, among other things, the SHIP2DRIVE consortium, the realisation of a sustainable inland vessel and the realisation of a sustainable excavator. Naturally, our role is to realise the most efficient storage and transport of hydrogen systems.

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H2XP (a joint venture between Klimaatfonds Nederland and EnergieXP) is a project developer specialising in green hydrogen production installations in the Netherlands. Our focus is on strategically positioned local projects that maximise synergies with existing infrastructure and local initiatives. By fostering long-term relationships and leveraging our experience in renewable energy development, H2XP enjoys broad-based support from municipalities, provinces, and local stakeholders.

Our ambition? By 2030, we aim to produce at least 10% of the Netherlands' green hydrogen supply.

A key project in our portfolio is a 70 MW hydrogen production facility in Brabant, situated in the rural area of the municipality of Woensdrecht. This flagship project, part of a regional energy hub, is being developed on a site previously used for intensive farming. Strategically located between the industrial clusters of Antwerp, Moerdijk, Vlissingen, Terneuzen, and Ghent, the facility also benefits from its position along the Leidingstraat ('Piping Street'), which provides access to essential infrastructure for water supply and hydrogen export. For electrical infrastructure, we will utilise the connections of our neighbouring solar parks, while additional opportunities include a shared grid with other renewable energy assets and users in the vicinity, as well as potential oxygen supply to a nearby water treatment facility.

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HAN_UNIVERSITY OF APPLIED SCIENCES

HAN University of Applied Sciences is committed to education and practice-based research that drives innovation in the energy transition. Our focus is on developing smart, green, and socially responsible solutions to tackle climate challenges and accelerate the adoption of hydrogen technologies.

Within the Balanced Energy Systems (BES) and Automotive Research centres, we focus on hydrogen as a key component of future energy and mobility systems, and industrial integration. Key Research Focus Areas:

- Hydrogen's role in integrated energy systems
- Storage, and conversion of hydrogen for system flexibility
- Hydrogen applications in mobility and transportation

We are actively involved in all active projects related to GroenvermogenNL, the €838 million national hydrogen transition programme funded by the National Growth Fund, supporting the acceleration of hydrogen adoption and innovation. Our H2Lab located in Connectr, Arnhem, serves as a shared R&D hub where research, education, and industry collaborate on developing, testing, and validating hydrogen technologies. We are engaged in leading hydrogen research projects, including HyTROS, Enowatts, and H2Modus, working on practical hydrogen applications.
Together with Saxion University of Applied Sciences, we form a strong applied hydrogen research network in the Eastern Netherlands, collaborating with regional, national, and international partners to advance hydrogen innovation across multiple domains.

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HEATTEC® HEAT TECHNOLOGY

Heattec is a Dutch supplier of combustion equipment, such as gas burners, biogas burners, (bio) oil burners and matching steam and hot water boilers. We are importer and service partner of the Swedish burner manufacturer Bentone for the Benelux and German market.

We supply new installations, but also execute service and maintenance on burner equipment. We also have developed a hydrogen on demand electrolyser and have made Bentone gas burners suitable for burning hydrogen.

With our burner solutions and local generation of green hydrogen with our alkaline electrolyser, we are able to make existing industrial processes more sustainable by replacing gas burners with hydrogen burners, thus reducing gas consumption and carbon footprint. We currently have hydrogen solutions starting from 100 kW installed power up to 1200 kW.

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Hermanos Energy

We provide a plug-and-play solution for consumers, farmers, and small industries. Our solution always includes an electrolyser and a battery, with optional components like a fuel cell, fuelling station, or hydrogen heater, depending on your needs. All our solutions are designed for companies that want to produce and use hydrogen on-site.

- Our Power-to-Power solution produces hydrogen when there is an abundance of green energy – such as from your solar panels – and converts it back into electricity when needed. This is ideal for businesses facing grid congestion issues.
- Our Power-to-Drive solution is perfect for hydrogen-powered vehicles that operate on-site, such as tractors or forklifts. Even if your vehicles can refuel elsewhere, our solution is more cost-effective.
- Our Power-to-Heat solution is for customers with excess solar energy who still require gas for heating.

We use a smart energy management system that integrates with your local energy system and forecasts your energy demand. By actively monitoring European energy markets, we capitalise on moments when electricity prices drop to extremely low levels – or even go negative on the day-ahead market. This allows us to produce hydrogen at minimal operating costs.

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Hexwise

Hydrogen is essential for a CO_2-free future, but transporting it efficiently remains a significant challenge. Gas transportation networks are critical infrastructure for delivering hydrogen across vast distances. However, existing natural gas compressor stations already consume considerable energy – typically using 1-5% of transported energy just for compression. With hydrogen, this challenge intensifies, as energy consumption could rise up to threefold.

Hexwise addresses this crucial barrier to profitable and scalable hydrogen infrastructure through innovative, technology-driven solutions. Our groundbreaking digital twin software specifically optimises air-cooled heat exchangers in compressor stations across the entire hydrogen transport network. Our digital twin technology offers unparalleled insights into heat exchanger performance, empowering operators with actionable intelligence to optimise their hydrogen transport infrastructure. With our technology, network operators will be able to reduce the energy consumption of the entire network by up to 33%.

At Hexwise, we believe in the power of innovation and cutting-edge technology to redefine industrial efficiency, paving the way toward a resilient, profitable, and sustainable hydrogen economy. Are you ready to enhance your hydrogen network using our cutting-edge digital technologies? Reach out to our team to learn more about how our technology can optimise energy efficiency across hydrogen and natural gas transport networks.

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Hinicio is a strategy consulting firm specialised in sustainable energy, with areas of expertise including hydrogen, renewable energies, energy storage and transport. Since 2007 Hinicio has developed a leading European competence centre on hydrogen and fuel cells. Our team collectively combines many decades of experience in the sector, including working in senior positions with leading industry players.

With offices in the EU, China and Latin America and an extensive partner network in Australia, Canada, USA, Korea, Japan, Hinicio supports customers globally on topics ranging from strategic assessments, innovation and marketing strategies, business plan appraisal, innovative business models development, market and techno-economic feasibility studies, due diligence, etc.

Hinicio has been working for players involved at every step of the value chain, from upstream (industrial gas companies, utilities, O&G companies, TSOs/DSOs), to chemical companies, equipment manufacturers (electrolysers and fuel cells), car makers and suppliers, fleet owners, public and private investors as well as industry associations and public institutions at all levels.

Over the years, Hinicio has developed world-class expertise on the development of infrastructure, a unique proprietary industry database on hydrogen and transport technologies, in-house modelling tools as well as knowledge on the (upcoming) regulatory framework.

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Hint Global helps companies with independent consulting & software tools to manage their facilities more efficiently.
Our mission is to help you avoid wasting time and money & give you the correct quality information in your hand.

Active in the following activities:
- Engineering & Consultancy
- Custom Software Solutions
- Standard Software Products

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hobré
ANALYZER SOLUTIONS

At Hobré we are committed to serve our customers in achieving their goals for sustainable development. Our product portfolio has already solutions for a range of analytical challenges related to emission reduction, hydrogen, biogas, metal recycling, biofuels from waste etc.

Green hydrogen produced from solar and wind energy is increasingly mixed into natural gas grids, typical levels being up to a few percent at this moment. Projects are running that demonstrate the feasibility of bringing the hydrogen content in local gas grids up to 15% by volume. For feedforward control of gas turbines and furnaces the hydrogen content can be up to 100% and may fluctuate rapidly. The presence of hydrogen in natural gas introduces several challenges for which Hobré offers the right solution, for example:

- Our new PRISM Raman analyser which offers an online, zero emissions measurement of natural gas compositions, including 0-100% H_2, within seconds.
- The WIM Compas on-line calorimeter can handle any mix of hydrogen (up to 100% hydrogen) and natural gas. As a result, the fast WIM Compas is a tremendous tool for feed forward control of gas turbines and furnaces that are fired on natural gas/hydrogen mixtures.
- Participation in the Green Transport Delta Hydrogen Project to develop an online analyser to measure hydrogen purity for e.g. fuel cell applications

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Howden

Howden is one of the world's leading manufacturers of air and gas handling solutions. We address the challenges of the energy transition with highly innovative solutions to contribute to the deployment of renewable and low-carbon hydrogen. Hydrogen compression is a key aspect in hydrogen applications to move hydrogen efficiently across the value chain from production to consumption. With over 100 years of experience in the compression of hydrogen, we have developed highly innovative solutions for our customers, optimising the availability, reliability and installation footprint, while reducing the total cost of ownership of operations. 'Advanced compression solutions across the hydrogen value chain' says it all. Whether gasification or electrolysis are involved, we combine innovative technology and worldwide engineering expertise across the hydrogen value chain, from the world's largest centralised operations to smaller scale decentralised applications. Howden compression technology, based on reciprocating pistons and diaphragm compressors, enable large volumes of hydrogen and associated pressures to get the energy values needed. Howden designs and manufactures compression solutions as individually engineered packages to meet the specific demands of unique applications and requirements. Nevertheless, production and life cycle follow our established standards to meet with speed of delivery and life cycle of the compression solutions' requirements. Howden's highly innovative compression solutions can be found at the heart of leading clean hydrogen projects around the world, playing a key role in supporting the global energy transition.

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HSM Offshore Energy are an integrated solution provider in EPCIC (Engineering, Procurement, Construction, Installation and Commissioning) of multi-disciplinary offshore projects.
By leveraging engineering know-how and technological excellence, driven by our commitment to a sustainable energy future, we are the contractor of choice for the offshore energy sector. With our 60 years of offshore experience, we delivered successfully well over 150 projects such as integrated platforms, modules and jackets for the offshore upstream energy sector.

Focusing on High-Voltage Substations, Green Hydrogen Platforms, Gas Production and Processing Modules, Carbon Capturing Storage infrastructures and steel jacket foundations.

Focusing on High-Voltage Substations, Green Hydrogen Platforms, Gas Production and Processing Modules, Carbon Capturing and Storage infrastructures and steel jacket foundations. We have developed a range of Offshore Green H_2 production platforms from 50 to 500 MW.

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HyCC (the Hydrogen Chemistry Company), is a leading industrial partner for safe and reliable green hydrogen supplies to enable the transition to zero-carbon industry.
From making sustainable steel to circular jet fuels HyCC believes that green hydrogen is the key to providing a growing population with essential products, with zero emissions to realise more sustainable economic development.
Building on over 100 years of experience in electrolysis and their leadership in safety, HyCC realises pioneering water electrolysis projects to supply industries with zero-carbon hydrogen from renewable power and water.
The company's 1 gigawatt portfolio includes projects such as:

- Djewels, a 20-megawatt electrolyser project based on advanced pressurised alkaline technology to help decarbonise industries at the Chemical Park in Delfzijl;
- H_2eron, a planned 50-megawatt electrolyser in Delfzijl to enable the production of sustainable aviation fuel and other sustainable applications at the Chemical Park Delzijl;
- H_2-Fifty, a 250-megawatt facility being developed together with bp to reduce emissions from the Rotterdam refining and chemical cluster;
- H_2era, the Netherlands's first 500-megawatt green hydrogen plant, located in the port of Amsterdam;
- GreenRoot, an industrial-scale electrolysis project under development with German gas company VNG to enable the decarbonisation of central German industries.

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HYDEVCO

HyDevCo can be technology supplier, project-partner or developer for decentral hydrogen production for local use. Projects with an extraordinary environmental impact by avoiding NET 12 kg of CO_2 emission for each kg of hydrogen produced. We achieve this by using the Hynoca® technology which is capable of converting RED II biomass into 5.0 quality hydrogen and biochar. We ideally place our installations on small plots, next to a petrol station, a factory or housing block where we can provide the hydrogen directly from the plant at a pressure of 8-30 bar. This way we avoid transportation costs and efficiency losses.

The hydrogen can flow directly into the process at a capacity of 30 kg of hydrogen per hour, 720 kg a day. At the production of 30 kg of hydrogen per hour, with a guaranteed availability of 8.000 hours, the yearly need for biomass is 6.400-8.000 ton. The biomass needs to be RED II certified to obtain certified hydrogen and certified biochar. Some interesting biomass examples are, (demolition) wood, short rotation coppice, digestate from a biogas plant, (straw)manure, cereal dust, miscanthus etc. So we convert into hydrogen and biochar. The biochar meets the EBC standards meaning that it qualifies to sell related carbon certificates! At the same time the biochar, at average 1.3 ton / hectare, can be used as a soil amendment to hold water in the superficial layer, to house micro-organisms, reduce the need for fertilisers and binding nitrogen. Let's get in touch!

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hydrasun

Hydrasun, a leading specialist provider of integrated fluid and gas transfer solutions to the Energy Sector since 1976, has a strong track record with the successful provision of high quality, high reliability product and service offering to global markets. Hydrasun made its first moves into the emerging hydrogen market in 2016 and since then has completed a number of significant green hydrogen projects in Europe in partnership with a number of leading OEMs.

Hydrasun has developed a wide range of integrated product and service solutions for the hydrogen marketplace. This encompasses the supply of instrumentation (fittings, valves & tubing) & fluid connector products for various applications, as well as engineering support and system build.

This offering is complemented by the provision of personnel to undertake site installation & maintenance services and an overall project management capability.

Our Hydrogen Skills Academy provides training and skills development in a real world environment. We deliver a competence assessed pathway through the Energy transition by retraining and reskilling the existing workforce as well as developing a new workforce with new skills to meet growing market demands.

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HYDROGEN ARCHITECTS

Hydrogen Architects is a specialised advisory developing Hydrogen Valleys as the vector to power energy transition and benefit (regional) economic development. Hydrogen Architects provides services enveloping project development, liaising and matchmaking to create Hydrogen business opportunities for stakeholders from the private and/or the public sector. Hydrogen Architects brings to the table experience spanning more then 20 years in the energy, hydrogen and transition business with access to a refined network of stakeholders and partners. This body of expertise is the DNA of Hydrogen Architects' business: supporting initiation, (co)creation and (co)developing Hydrogen Valleys or Hydrogen Hubs, as it is directly and indirectly involved to many Hydrogen Valleys in Europe and therebeyond.

Hydrogen Architects offers professional services operating from the heart of the first European Hydrogen Valley over the spectrum of innovation through investments contributing to:

- Developing Hydrogen Valleys
- Developing regional Hydrogen strategies
- Developing Hydrogen ecosystems: industry, road, maritime and aviation
- Assessing Hydrogen Technologies and Hydrogen systems
- Supporting Hydrogen export/import facilities
- Connecting stakeholders and Hydrogen markets
- Connecting Hydrogen Valleys

Hydrogen Architects is your partner in the Hydrogen Arena. Connect to the future, connect to Hydrogen Valleys: connect to Hydrogen Architects!

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H2PS Hydrogen® Powered Solutions

We at Hydrogen Powered Solutions (HPS) are convinced of the possibilities of hydrogen to accelerate the achievement of the environmental targets for 2030. We offer solutions and products with hydrogen technology for financially sound conversion and sustainability of heating and combustion/incineration installations or plants. After several years of intensive R&D work, adjustment and assessment, the time has come that HPS can actively contribute to the current environmental problems. The developed hydrogen technology coupled with a combustion appliance such as a gas wall-mounted boiler or add-on burner offers a wide range of options for drastically reducing natural gas consumption and significantly minimising the CO_2 emissions simultaneously. The Hydrogen Power Unit (HPU) developed for this purpose, in combination with a combustion appliance, is capable of minimising natural gas consumption by up to 50%.

The new technology offers a wide range of optional and on-demand operational capabilities for the HPU system to meet all requirements . The system is robust, compact, safe and requires no end-user intervention. It is fully automated and can be monitored in real time by H_2PS. With remarkable and significant performance and efficiency, you can ensure that natural gas consumption is minimised by up to 50%. At present, the HPU is extensively available and finds its way into housing associations, office complexes. The HPU is committed to further developing and improving its technology to be compatible with all residential or industrial facilities with the best possible expectations.

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HYDROGREENN (Hydrogen Green Regional Energy Economy Network Northern Netherlands), founded in 2017, is the driving force behind the green hydrogen transition in Northern Netherlands. This dynamic network connects over 300 organisations and 440 professionals, including SME's, industry leaders, government bodies, and knowledge institutions. Together, they accelerate the energy transition, stimulate innovation, and strengthen the region's position as Europe's leading hydrogen hub.

HYDROGREENN organises networking events, facilitates knowledge sharing, and supports businesses with access to funding, expertise, and infrastructure. It plays an important role in bringing together stakeholders within and beyond HYDROGREENN and conducts pre-competitive research. A great example is the Hydrogen District Hoogeveen, where innovative applications are tested in practice.

Initiated by Willem Hazenberg, Professor of Practice at DCTerra, and managed by ENTRANCE (Centre of Expertise Energy) at Hanze University of Applied Sciences Groningen, HYDROGREENN is powered by three core partners: Hanze University, Greenwise Campus, and Bilfinger. Supported by public-private funding, including EU programmes, HYDROGREENN's success formula – collaboration and innovation – offers a scalable model for Europe's hydrogen economy. In 2025, HYDROGREENN was recognised by Interreg Europe as a Good Practice example for regional hydrogen collaboration.

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The TU Delft Hydro Motion Team is one of the Dream Teams at Delft University of Technology. Our team consists of 25 ambitious students from eleven different fields of study. Our team is fully committed every year to show the applications of our advanced technologies at spectacular races. For over 15 years, we have been designing, building and racing cutting-edge boats driven by sustainable tech. Each year the team builds a new boat made in conjunction with the knowledge of industry experts and the experience of alumni.

With our project we want to work together with the maritime sector to accelerate the transition to green energy. There is still a lot to be gained in this sector and by thinking together with the maritime world and innovating in the field of sustainability, we contribute to a better and greener future. Because only together we can make a change.

This year, we optimise every part of our boat for the use of hydrogen. We will design our boat to excel in endurance, speed and manoeuvrability. To put our boat to the test, we will participate in the Offshore Competition of the Monaco Energy Boat Challenge to become world champions.

Our team shows what a multidisciplinary team of driven students can achieve with the right mindset and by combining their strengths. Being the engineers of the future, we take the next step towards a sustainable world.

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Hydronex is a subsidiary of the Roelofs Groep, primarily focused on initiating, developing, constructing, and operating energy hubs, where green hydrogen plays a key role.
We strongly believe in the increasing role of local entrepreneurs and collaborations in transitioning to a sustainable economy, ensuring the resilience of our future energy supply.

In addition to developing renewable energy projects, Hydronex collaborates with strategic partners to establish decentralised energy hubs. Our hubs create intelligent connections between the production, distribution, storage, and consumption of renewable energy, with green hydrogen often optimising affordability, continuity, and security of supply, fostering a favourable business climate at both local and regional levels.

At Hydronex, we take the lead in project initiation, conduct techno-economic feasibility studies, and manage permitting, financing, stakeholder engagement, and construction to build sustainable energy systems with our partners. Currently, we are working with coalition partners to develop the first two green hydrogen production facilities in the Dutch cities of Steenwijk and Vriezenveen, integrating local renewable energy sources directly into the electrolysis process. These locations are designed to be scalable, with a potential combined production capacity of 45MW. Both installations are scheduled to be operational by the end of 2027, supplying green hydrogen for local industries and the transport sector.

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HyEnergy® is an experienced consultancy specialising in hydrogen and energy communities. Helping to deliver new, clean technical solutions for a sustainable future. Our goal is to ensure that the systems and technologies gain commercial acceptance by delivering low cost, clean, onsite energy solutions which compete with fossil technologies. Beginning in the industrial gas sector, we have grown to work with many sector stakeholders – including industry, local/regional public sector organisations and national governments. Our capabilities extend across the whole hydrogen value chain, including:

- Renewable hydrogen supply, storage and distribution technologies
- Integration of electrolysis and renewable technologies
- Fuel cell and hydrogen application technologies
- Hydrogen-based integrated energy systems
- Clean energy vectors & cross-sector integration (hydrogen, renewables, biogas)
- Renewables & energy storage integration
- Microgrids & renewable-based remote/off grid power systems
- A sound understanding of barriers to market development and technology deployment in the sector
- Hydrogen Valleys
- Strategic steering of technology/product & business development
- Development of local and regional hydrogen business models
- Project management
- Collaborative project development and steering, technology evaluation
- Techno-economic analysis
- Technical & strategic due diligence

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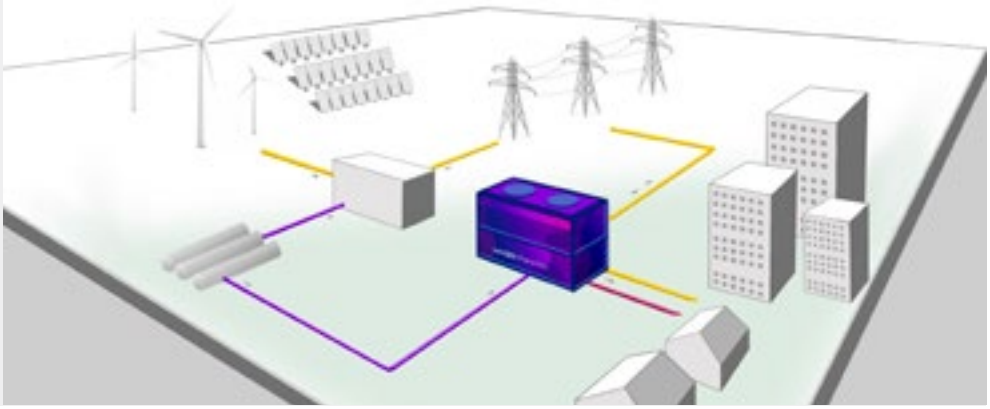

HyER Power, a Delft-based startup, is at the forefront of hydrogen innovation, developing cutting-edge solutions to efficiently generate both electricity and heat using hydrogen. As the energy transition accelerates, our mission is to provide scalable, zero-emission alternatives to traditional energy systems, enabling industries and buildings to become more sustainable.

At the core of our portfolio is the HyER Power Plant, a revolutionary fuel cell-heat pump system that integrates advanced energy management software (EMS) for optimal performance. This all-in-one solution allows buildings to generate their own renewable electricity and heat, significantly reducing reliance on fossil fuels while maximising efficiency. To accelerate the adoption of hydrogen energy, we also offer our advanced energy management system that optimises fuel cell utilisation, hydrogen production, and thermal flows while maximising overall efficiency. Additionally, our simulation software provides a powerful tool for modelling and optimising hydrogen-based energy systems before implementation.

Hydrogen is a promising solution for decarbonising heating, but high costs have limited large-scale adoption. The HyER Power Plant changes this by being twice as efficient as conventional hydrogen boilers, delivering both heat and electricity while enabling cost savings and energy optimisation. By making hydrogen more efficient, we transform it into a viable and scalable energy solution for the built environment.

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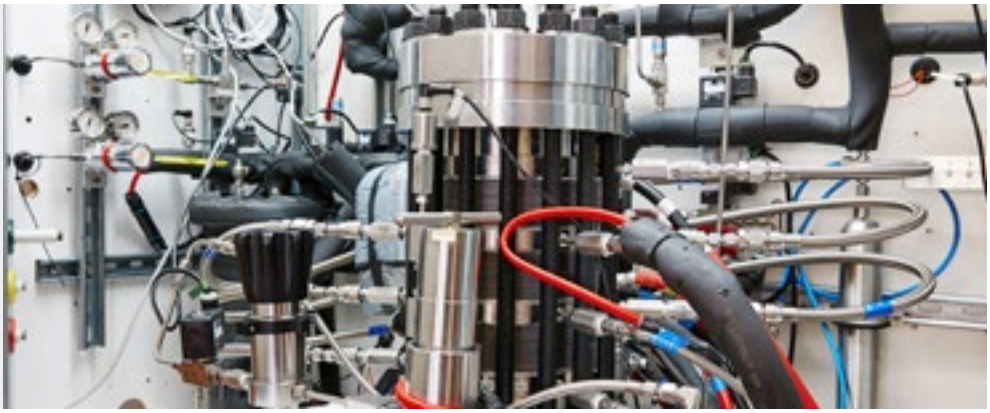

HyET Hydrogen is an international company based in Arnhem, the Netherlands. HyET Hydrogen is a leading SME in the field of electrochemical hydrogen compression, extraction and separation, also referred to as Hydrogen Processing Technologies. HyET Hydrogen was founded in 2008. HyET has introduced the first commercially viable Electrochemical Hydrogen Compressor (EHC) in 2017. HyET enters partnerships with key stakeholders all over the world to develop products with a focus on application within the Hydrogen value chain. HyET's headquarters are located in Arnhem, the Netherlands and is run by an experienced interdisciplinary team.
HyET Hydrogen had expanded its focus to the USA with a subsidiary, HyET Hydrogen LLC based in Colorado. HyET's Electrochemical Hydrogen Compression (EHC) is completely silent, safe, cost effective, energy efficient and has no moving parts. The fact that the electrochemical compressor has no moving parts is also advantageous because it avoids wearing of parts which reduces the overall maintenance costs. The absence of moving parts contributes significantly to the reduction of maintenance costs and the prevention of damage, when compared to mechanical compressors.
HyET's Electrochemical Hydrogen Processing technologies can significantly lower CAPEX and OPEX in the H_2 supply chain for many existing industrial H_2 markets as well as for the upcoming FCEV markets. Besides compression of Hydrogen, HyET Hydrogen also developed a technology which can extract and purify Hydrogen from mixed gas streams.

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HyGear, a true hydrogen pioneer since 2002, began with the conviction that on-site hydrogen production delivers unparalleled advantages in reliability, safety, durability, flexibility, and cost-effectiveness compared to central distribution. Today, HyGear has emerged as the global market leader in on-site hydrogen production, purification, and recycling, recently enhancing its portfolio with innovative carbon capture systems. Our systems utilise natural gas or biomethane for steam methane reforming (SMR) or water for electrolysis, integrating hydrogen production from biogas and carbon capture solutions to produce the most sustainable hydrogen.

As an expert partner in major international research projects, HyGear boasts exceptional laboratories, testing, and production facilities in Arnhem. We develop, manufacture, and service on-site plants, boasting approximately 100 active HyGear installations worldwide. Our long-term clients include leading industrial organisations in the global markets for glass, metallurgy, food hydrogenation, chlor-alkali, semi-conductor, and transport.

With sales offices in The Netherlands and North America, and a production location in Poland, HyGear provides global support to its customers, supported by locally based service teams around the world. We are proudly a part of the HoSt Group, a large and rapidly growing family company established in 1991 offering high-tech renewable energy systems.

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HyMatters is a leader in hydrogen solutions and energy infrastructure. We combine extensive theoretical knowledge with practical expertise to design and develop tailored hydrogen solutions that meet our customers' specific needs. This positions HyMatters as the architect of optimal energy systems.

We offer comprehensive advisory and engineering services throughout the entire development of energy projects:

- Conceptual design
- Feasibility studies
- Detail engineering and business case
- Permitting
- Procurement
- Project management realisation

HyMatters is involved in a wide range of projects, from small-scale initiatives to large-scale projects, including electrolyser systems feeding into national grids, local hydrogen hubs, local energy hubs, energy strategies, refuelling stations, and grid congestion solutions. Our diverse clientele includes energy project developers, real estate developers, manufacturing companies, building contractors, hospitals, energy companies, public bodies, and knowledge institutions. Additionally, HyMatters provides education through hydrogen and energy market courses. Over 500 professionals have already completed our courses, which offer foundational knowledge and serve as a starting point for developing each participant's own energy vision. HyMatters is dedicated to helping you develop and implement your optimal energy system.

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On 29 June 2022, former Dutch Minister for Climate and Energy Policy Rob Jetten announced the plans for the construction of a national hydrogen transmission network. Hynetwork, as a subsidiary of Gasunie, has been commissioned to construct and operate the hydrogen network in the Netherlands.

The hydrogen network will link the major industrial clusters in the Netherlands and connect them to hydrogen storage facilities, import locations, and other countries. We will start by constructing the network in the major industrial regions, such as in the North Sea Canal area and in the northern and the south-western regions of the Netherlands. We started on the hydrogen pipelines in Rotterdam in 2023.

In the development of the hydrogen transmission network we are mainly using existing pipelines, more and more of which will become available over the coming years as the transmission of natural gas continues to decline. Where this is not possible we will install new pipelines.

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HY NORTH
Connect to Invest

As an independent foundation, HyNorth is committed to the development of the hydrogen investments in the Northern Netherlands. With a growing community of stakeholders, HyNorth ensures a connection between supply and demand and facilitates acceleration through a variety of means. With knowledge, research and a growing network, HyNorth is helping to build the leading position of the Northern provinces in the energy transition.

HyNorth investigates local and regional ecosystems (Hyhubs), maps out all hydrogen investment plans and informs and advises the value chain of the hydrogen economy. In addition, HyNorth makes valuable connections with local and regional government to contribute to decision making regarding the hydrogen economy with independent and up-to-date knowledge and information.

Since June 2022, the Good Morning HyNorth series of monthly breakfast meetings has welcomed more than 1,500 participants. With HySync meetings, HyNorth ensures the harmonisation of knowledge and insight for stakeholders and with HyEnd meetings it maintains a close network with directors of companies and governments. Moreover, more and more companies are joining as HyNorth partners.

HyNorth ensures that the unique position and ambition of the three Northern Dutch provinces to be leaders in the energy transition can be translated into actions and results. The mission is: Connect to Invest!

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HyEnergy and Green Planet launched the HyPlanet joint venture as part of their activities within the HEAVENN hydrogen valley project.

HyPlanet will is developing a hydrogen trailer-filling hub in the Delfzijl chemical cluster. The hub is due to come onstream at the start of 2026.

The hydrogen, which will obtained from the by-product of a local chlor-alkali plant, will be trailered to downstream mobility and industrial applications including the world's first inland waterway vessel to run on hydrogen-power.

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Hysolar, founded in 2019, focuses on green hydrogen for mobility. In our vision, green hydrogen is a key element in a circular economy. Relying on practical experience in combination with scientific know-how we develop green hydrogen ecosystems, where continuous innovation is crucial. Hysolar activities are threefold:

1. The supply of green hydrogen as of 2021 in Nieuwegein (NL) by opening our public 350 and 700 bar Hysolar / Greenpoint hydrogen refuelling station.
2. Using local solar power and green electricity from the grid, Hysolar realises a 2-2,5 MW electrolyser to supply 250 tons of green hydrogen starting Q2 2023. To make the electrolyser an integrated part of the energy system, it will be utilised for the dispatchable capacity of the national grid operator. Moreover, the residual heat will be used locally to reduce the consumption of natural gas.
3. Innovation and consultancy activities to support businesses, local governments and other parties in their transition towards green hydrogen.

Over the years we have helped municipalities and businesses with our innovation and consultancy activities. We've developed solutions in which grid congestion is solved by producing green hydrogen and we work closely together with an inland shipping company to decarbonise their activities. Last but not least our innovative 'dual fuel' solution has led to the launch of the first tractor on hydrogen. We are busy applying this innovation to other heavy machinery such as excavators.

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Hystream is a Dutch company, founded in 2020 with the mission to let hydrogen flow by realising hydrogen infrastructure. Hystream is active in the following areas:
1. Project development & management
2. Advice, Design & Permit
3. Construction & Maintenance
4. Product development

Hystream has successfully designed and built two hydrogen filling stations and commissioned the largest electrolyser in The Netherlands (2,5 MWe). Hystream actively develops new hydrogen projects as well as hydrogen products.Hystream guides various customers with their hydrogen projects, ranging from production, filling stations to mobile power solutions. We are familiar with the most recent legislation, standards and requirements in the field of hydrogen and have extensive experience in the Netherlands with the type of information and questions authorities can ask. We use this experience proactively to ensure that the permit processing time is as short as possible.

Based on its experience, Hystream has decided to develop two new products with the aim of broadening and accelerating the use of hydrogen:
- Compact and standardised storage of hydrogen with more effective kilos of hydrogen on board per m2 and per m3 compared to classic hydrogen bundles. This product will enter the market Q2 2025.
- A highly standardised solution for industrial estates, agricultural sector and other industries with a surplus of green energy and no means to effectively convert these costs to hydrogen. This product will enter the market 2026.

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Given that supply and demand for hydrogen fluctuates there is a need for large-scale facilities to store hydrogen underground. In view of this need, Gasunie subsidiary HyStock is developing hydrogen storage facilities at four salt caverns in Zuidwending, near Veendam in the Dutch province of Groningen.

The technical infrastructure for the first cavern, with capacity to store around 200GWh of hydrogen, is expected to be up and running close to 2031. The other three caverns will be ready to store hydrogen soon after, in line with the growth of the market for renewable hydrogen. Parties who want to store hydrogen, either for the short term or the long term, will have access to these facilities through a connection to the Dutch hydrogen transmission network.

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Institute for Sustainable Process Technology

The Institute for Sustainable Process Technology (ISPT) is dedicated to making complex industrial processes more sustainable. As an independent, non-profit organisation based in the Netherlands, we connect stakeholders across sectors and disciplines in a trust-based environment, to accelerate innovation and provide a driver for the sustainability transition.

One of these programmes is the Hydrohub Innovation Programme, aimed at green hydrogen production through large-scale, low-cost, electrolysis-based technologies, involving over 90 partners. The programme focuses on:

1. Technology: Advancing water electrolysis, exploring novel systems, and scaling manufacturing techniques
2. Scale-up: Developing strategies for cost-effective, large-scale electrolysis, integrating renewable power sources
3. Value Chain: Analysing global production and optimising supply chains for efficient hydrogen distribution.
4. Deployment Enablers: Enhancing project reliability through safety, standardisation, and risk assessment.

Key projects include the Hydrohub Megawatt Test Center for technology testing, Gigawatt Scale Electrolyser for system design, and HyScaling to reduce hydrogen production costs by 2030.

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Invest International

Invest International is a financing institution owned by the Dutch Ministry of Finance (51%) and Dutch development bank FMO (49%). We offer tailor-made financing and project development expertise to bring projects in emerging markets to fruition and create impact on the SDG's, while serving Dutch interests.
We have a catalytic financing capacity, offering investment capital for public and private projects, as well as grants enabling public infrastructure projects. While deploying our funds, we make efforts to engage the expertise of Dutch businesses, demonstrate strong environmental & social commitment and strive for local impact and inclusive growth.
Invest International was assigned by the Dutch Government to develop and finance Green Hydrogen projects in emerging markets, to contribute to local sustainable development and support the energy transition in Northwestern Europe.
Carrying out this assignment, Invest International launched, together with Climate Fund Managers, Climate Investor Three (CI3) as a blended finance investment platform targeting energy transition and green hydrogen projects. CI3 is currently structured as a family of funds including a global structure and country-specific funds in Namibia and South Africa.
Additionally, Invest International helps kickstarting green hydrogen corridors from emerging markets to Northwest Europe, to meet the demand required for the decarbonisation of industries. We do so by deploying a diverse range of financial instruments, and developing – together with partners – risk mitigation and offtake stimulation strategies.

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Iv is active in the field of hydrogen across the entire breadth of the organisation.

Within Iv-Offshore & Energy, most of our work today is in offshore renewables, our roots are in the Oil & Gas Industry. This experience provided a solid foundation for developing offshore wind substations, both HVAC and HVDC and, more recently, hydrogen. As a result, much additional knowledge and skills have been developed to meet the challenges of these new projects: we adapted to the new offshore wind market, new operator requirements, new stakeholders, innovative technologies and broader engineering scope.

Iv-Industry is in the Hydrogen for the industrial sector., among others to provide hydrogen for efficient transport which is vital to getting green hydrogen on land and into the (small-scale) industrial sector.

Escher has developed a technology for the decentralised production of green hydrogen from ammonia. Ammonia is an excellent carrier of hydrogen that can be produced anywhere worldwide simply by extracting nitrogen from the air. Escher's technology separates the ammonia back into hydrogen and nitrogen, facilitating further separation into almost pure hydrogen and nitrogen. Producing hydrogen locally in this way costs only a fraction of the energy compared to conventional local hydrogen production with electrolysis.

We constantly seek the optimum balance between effectiveness, sustainability, and cost while never compromising on safety measures in our designs.

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Ionbond provides thin-film coating services and operates worldwide. Its coatings are used to improve durability, quality, functionality, efficiency and aesthetics of tools and components. Our portfolio includes PVD, PACVD, CVD, CVA and CVI technologies, including a broad range of DLC coatings.

Over 50 years of experience in coating technology. Our global and regional experts are here to support you with state-of-the-art knowledge so that we can deliver world-class products to you wherever you are.

Innovative standard and customised PVD, CVD, and PACVD coating solutions. We are always eager to take on your challenging, highly specialised coating applications to serve you with the solution you looking for.

Extensive worldwide network in Europe, North America and Asia. Benefit from our extensive network with over 30 coating centres in 15 countries.

Specifically for the Hydrogen economy we provide PVD thin film coatings for mainly PEM stack components, such as a.o. bipolar plates, porous transport layers and expanded meshes that protect the substrates from corrosion and improve electrical conductivity. Our coatings have proven to ensure stable and reliable performance at high demand levels over time.

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JP ENERGIESYSTEMEN

JP Energy Systems is specialised in combined hydrogen and battery solutions and is agent of the French company Powidian. We help customers with the generation, storage and reuse of sustainably generated energy. In this way we help to make your location more sustainable and make it partially or completely energy independent. Our intelligent systems make very efficient and effective use of renewable energy sources.

JP Energy Systems is a reliable partner with many years of experience in the energy sector. We know our technologies very well and work closely together with our customers, partners and suppliers. We work with proven technologies and reliable and experienced partners who value quality. We deliver turn-key projects and provide the complete package needed to realise the project, including project management, commissioning, service, training and aftercare.

The energy transition needs acceleration and requires new types of technical solutions and new ways of working together. We believe in having the guts to execute projects quickly and well. This not only makes the energy transition visible and tangible, but follow-up projects can be realised better and faster thanks to learnings from the experiences gained.

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KAPP
HEAT TRANSFER ENGINEERS

We are Kapp, Heat Transfer Engineers. We not only know every heat exchanger inside and out, but also the industry in all its diversity. In the field of hear transfer, this allows us to go further than anyone else. We design, plan, produce and construct. And we don't leave until everything works. At Kapp, we see it as our mission to accelerate the energy transition by fundamentally improving our clients' processes and projects.

When it comes to heat transfer, we really do have a head start. Like you, we are convinced that green hydrogen will make a major contribution to the energy transition. Developments in the field of hydrogen are rapid, with the number of installations and electrolisers increasing rapidly worldwide. But processes are not yet fully crystallised. Understandably so! People all over the world are looking for the optimum configuration to produce hydrogen as sustainably and efficiently as possible. We have a suitable heat exchanger for every step in hydrogen production. This gives us a real edge, which benefits our customers. That said, knowledge and experience of other experts in the hydrogen sector are essential for us. Our approach in this market is therefore: "Here to teach, here to learn". A philosophy that stems from the realisation that time is short and that we can accelerate developments, especially together with other experts from the sector.

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KTS (Kelvion Thermal Solutions) is a manufacturer of a wide range of heat exchangers and cooling solutions with manufacturing workshops on all continents around the globe. With their heat transfer solutions, they offer their products along the hydrogen value chain.

Examples:
- Cooling towers and industrial air fin coolers for large scale hydrogen production plants (100 MW and bigger)
- Heat dissipation for hydrogen liquefaction
- Diffusion bonded heat exchangers (also known as PCHE) for cooling high pressure hydrogen in refuelling stations
- Heat exchangers for evaporating liquid hydrogen
- Integrated solutions for heat recovery in steam methane reforming
- Recuperators in fuel cell systems

In co-creation with clients and suppliers, KTS is constantly setting new standards in the industry and creating value. As KTS has a strong track record in tailor-engineered solutions, we are always looking for new heat transfer challenges. Do you have a heat transfer challenge you would like to speak about? Contact us.

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Kenter is a Dutch energy solutions provider, currently serving over 30,000 customers in the Netherlands. Specialised in metering services, energy infrastructure and electric vehicle charging solutions, we help organisations to optimise their energy use and adopt innovative solutions to aid the process.

As a leading energy solutions provider, we're also specialised in hydrogen metering. This can be applied in various ways and with different purposes. For example, when you want to know the exact amount of produced hydrogen.

Kenter is at the heart of today's fast-moving energy world and is ready for a challenging future. As an independent part of Alliander, we are an experienced and knowledge-intensive partner. From the local bakery to large multinationals and from sport clubs to municipalities. They can all count on the expertise of more than 300 specialists working at Kenter.

We provide a complete package of energy services and metering solutions based on an up-to-date understanding of the market and innovative technologies. Would you like to learn more? Contact us by calling +31 (0)88 191 15 55 or send an e-mail to info@kenter.nu.

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Kiwa is a world-leader in Testing, Inspection and Certification (TIC) , Training, Technical Advisory and Consultancy. With a background of more than 90 years in water, energy, and gaseous fuels Kiwa is a knowledge institute, and international quality authority.

Our services in the field of renewable energy production, power2X and hydrogen (low & high pressure) cover the complete value chain: Generation, Transportation, Distribution, Storage and Application of Hydrogen and Sustainable Fuels.

Key Services:
- Wide range of Solar and Hydrogen Testing Facilities 17025 accredited;
- Inspections of Solar, Wind, Sustainable Fuels and Hydrogen installations, including pre-compliance and consultancy inspections;
- Testing, assessment and certification of components and systems like electrolysers, fuel cells, appliances, pressurised tanks and components, pipes, valves and fittings;
- Consultancy supporting R&D programmes, tecno-economic feasibility studies, support in innovation and transition, technical due diligence, business and investments planning, pilots design and development, risk analyses, material research, failure analyses, etc;
- Training and qualification of personnel working in the renewable energy production and hydrogen fields.

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KLINGER is the world's leading manufacturer and provider of industrial gaskets and valves. Formed in 1886 as a family enterprise, the pioneers in gasket technology today are a globally active Group of manufacturing, sales and service companies that offer unique know-how and competent on-site consultancy services.
Our know-how, which in the meantime spans more than 130 years, enables us to be fully committed to supplying not just products, but tailored state of the art sealing, fluid control and fluid monitoring solutions, using the latest design and pilot technology.
KLINGER products contribute to the safety of transport, storage and processing of hydrogen. KLINGER gaskets and valves will keep the connections of constructional elements leak tight and impermeable, even for the extremely small molecules of hydrogen.
Leak tightness is essential when handling hydrogen. After all, it can ignite within seconds when coming into contact with oxygen and a spark. All KLINGER gaskets have been tested by TÜV with regards to hydrogen and are recognised as particularly high-quality seals.
From the revolutionary development of the compressed fiber gasket to the advanced sealing material technology and high tech valve solutions of today, development, innovation and problem-solving abilities have always been the pillars of our philosophy.
Our products are 'trusted. worldwide.' as a result of their high reliability, long life cycle and extremely low total cost of ownership.

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The Koedood Marine Group observes an increasing demand for electrification and sustainable inland shipping. Our group is comprised of several specialised companies centred around the development and implementation of future proof marine power trains. Koedood is the largest dealer of Mitsubishi engines in The Netherlands. With an innovative heart Koedood leads the development in the inland marine sector by example. Our group has knowledge stretching far wider than the inland marine sector alone and we are active in all markets involving maritime activities. Koedood now exists for over 40 years and has always been a driving force in the Dutch maritime industry.

Our mission is to maintain a leading role in sustainable technology for the maritime sector. With more than an decade of experience with hybrid systems and almost half a century of experience in the Dutch marine sector, our hydrogen technology can be seamlessly integrated in modern hybrid vessels. Our vision is to develop systems that can sail completely zero-emission on longer routes.

We seek strategic partners and contribute to several hydrogen projects and consortia. In the role of system integrator we take part in the Rh2ine consortium and actively develop hydrogen enabled drive train systems to further green the European waterways.

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Royal Van Twist is a family owned business with a history of more than 180 years. 80 years ago the distributorship for Perkins Engines was acquired. Based on the strong core engine Royal Van Twist started the development for gas fuelled engines 40 years ago. This resulted in the approval as Perkins official gas partner in 2014. The current gas engine range goes from 10 to 1200 kilowatt electrical. During the 40 years of history we developed a great amount of knowledge with a large variety of gasses as Natural gas, Biogas and LPG. The last 10 years we have focused on gasses with a low methane number, mainly for thermal waste recycling processes. During these processes waste as tires, plastics, MDF and even medical waste is heated to high temperatures resulting in products like nafta (raw gasoline), carbon black, active coal and ash. As by-product a waste gas is produced. This is used as fuel for the gas generator providing electricity to the grid). As low methane gasses could cause serious engine damage we have developed our own engine control systems. The systems are tested in our state of art in-house test facility. As hydrogen could be considered as a gas with a low methane number we asked ourselves if it would be possible to use hydrogen as a fuel for our engines. After a positive conclusion from the feasibility study during the first half of 2019 we started the technical design at the end of 2019. The design includes a custom-built hydrogen injection block which is connected to the inlet manifold of the engine. The hydrogen engine was first started in October 2020. The first pre-production engines will be available for trail applications in the first quarter of 2021. Full production will start by the end of 2021.

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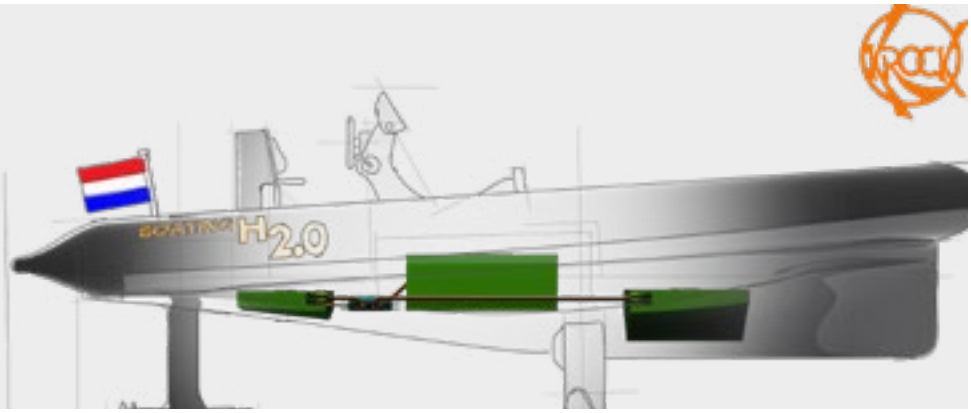

In the realm of maritime innovation, Krock H2 Boats is making waves with their groundbreaking approach to sustainable marine transportation. At the heart of their latest endeavor lies the preparation for series production of the 6-meter hydrogen-powered boat. This ambitious project marks a significant step forward in the company's mission to revolutionise the maritime industry and usher in a new era of environmentally-friendly watercraft.

Krock H2 Boats is paving the way for a greener future on the open seas. The 6-meter hydrogen-powered RHIB represents the pinnacle of efficiency and sustainability, leveraging cutting-edge hydrogen fuel cell technology to deliver zero-emission operation without compromising on performance. Designed to meet the demands of both recreational and commercial users, this innovative vessel promises to set new standards for eco-conscious marine transportation.

In addition to their groundbreaking vessel production, Krock H2 Boats offers comprehensive maritime hydrogen consultancy services. Leveraging their expertise in hydrogen fuel systems and maritime regulations, their consultancy arm provides guidance to organisations seeking to embrace hydrogen technology in their marine operations. From feasibility studies to implementation strategies, Krock H2 Boats' consultancy services empower clients to navigate the transition towards a sustainable future.

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The LFF Group was formed in London in 1983 and has grown steadily to become a global leader in the supply of Pipes, Fittings, Flanges and Valves. We are involved in many of the world's largest projects and MRO contracts across many industry sectors through our 15 facilities around the world. We support these activities with an extensive inventory of Carbon, Stainless, Duplex and Super Duplex Steels. Integrity, professionalism, technical competence, and commitment are core values of the group. These foundations have allowed us to build an organisation offering an unrivalled combination of service, quality, safety, and value.

Located in the Netherlands, LFF Glamal Europe supplies piping products for critical infrastructure projects across the European Union. Leveraging our extensive experience in project and supply chain management, we focus on the EPC project market, catering to a diverse range of industries including energy, water, and pharmaceuticals.

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Lhyfe, a pioneering company in green and renewable hydrogen. Founded in 2017 by Matthieu Guesné, Lhyfe is a European group dedicated to the energy transition, producer and supplier of green and renewable hydrogen. In 2021, Lhyfe inaugurated the world's first industrial green hydrogen production site directly connected to a wind farm and using sea water.

In 2022, Lhyfe inaugurated the world's first pilot platform for green hydrogen production at sea. Lhyfe is deploying numerous onshore and offshore sites throughout Europe and has now established itself as a key player. Its production sites aim to provide access to green and renewable hydrogen in industrial quantities allowing entire sections of industry and mobility the opportunity to decarbonise and enter a clean energy model.

A hydrogen pioneer and pure player, Lhyfe is present in 11 European countries and today employs more than 200 people who are fully committed to building a new energy model. With our unparalleled expertise, we bring together a team of skilled professionals who excel in designing and implementing cutting-edge solutions.
Our engineers leverage their vast knowledge and experience (piping, electricity, automation, civil, mechanical, process) to create robust infrastructure that maximises renewable hydrogen production while prioritising safety.

From conceptualisation to execution, we ensure that every aspect of the production site is meticulously designed to meet the highest standards of safety and efficiency.

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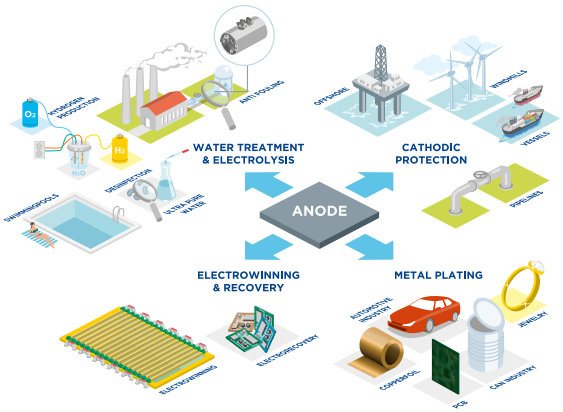

MAGNETO special anodes strives to be the best designer, producer and supplier of titanium anodes for electrochemical applications. Inventor and proud supplier of high-quality titanium anodes and electrochemical cells for a variety of applications, MAGNETO has been catering to the electrochemical industry for more than six decades. We aim to ensure our customers are satisfied with their anodes.

The right anode is key for electrochemical applications. Selecting the correct one can lead to substantial cost savings. MAGNETO understands that your application – whether it's metal plating, water treatment, electro winning, cathodic protection, or hydrogen production – has its unique features. That's why we pride ourselves on our ability to manufacture custom electrodes that meet your requirements, regardless of the specifications. In fact, we're well known in the industry for providing the optimal anode for every individual application.

A green economy will increasingly make use of hydrogen produced by water electrolysis. It is expected that water electrolysis will play a pivotal role in the future energy landscape. MAGNETO produces several components for PEM electrolyser systems in a cost-efficient and flexible manner.

We're committed to designing, manufacturing and supplying titanium anodes for hydrogen production systems that fit your needs, withstands the test of time and reduce your operational costs.

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MAGNUS energy

Magnus Energy works on a bright future. Helping to build strong energy systems that fully incorporate renewables. Balancing sustainability, security, and affordability. Navigating the complexities of the ever-evolving energy transition. We employ the best and brightest consultants with in-depth knowledge of energy markets and systems. Covering every aspect of the energy transition.

Our experts are deeply involved in the nascent hydrogen industry in Europe. Take our work for a consortium of energy companies, for example. Our experts analysed the compatibility of a cross-border hydrogen infrastructure project with the requirements of the EU's Hydrogen and Decarbonised Gas Market Package. We identified gaps and potential red flags for the project's financing and implementation. More than that, our experts offered guidance and solutions in securing the green light for the final investment decision. "Magnus Energy's assessment gave us the confidence that we understand the risks from regulatory changes and that all relevant aspects are addressed and under control."

Moreover, the learnings of this project served as input for finalising the EU package. The project now serves as benchmark for future cross-border hydrogen projects. More about implementing the EU Hydrogen and Decarbonised Gas Market Package? Our experts conducted a study about its key challenges. Download the report here: https://magnusenergy.com/insights/key-challenges-to-implement-the-2021-eu-hydrogen-and-decarbonised-gas-package/

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MarshMcLennan

Marsh is a global leader in insurance broking and risk management. In more than 130 countries, our experts in every facet of risk and across industries help clients to anticipate, quantify, and more fully understand the range of risks they face. In today's increasingly uncertain global business environment, Marsh helps clients to thrive and survive.

We work with clients of all sizes to define, design, and deliver innovative solutions to better quantify and manage risk. To every client interaction we bring an unmatched combination of deep intellectual capital, industry-specific expertise, global experience, and collaboration. We offer risk management, risk consulting, insurance broking, alternative risk financing, and insurance programme management services to businesses, government entities, organisations, and individuals around the world.

Marsh JLT Specialty provides flexible project risk management and insurance placement services for the full value chain of hydrogen investments, in combination with other renewable energy sources and Carbon sequestration if required. Our service framework will enable control over risk and insurance issues and is supported by hydrogen and other renewable energy risk engineering capabilities to provide a seamless project to operational risk transfer product that will enhance bankability of your projects. The product will provide comprehensive risk protection around your planned balance sheet.

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MAXIMATOR® HYDROGEN BeNeLux

At Maximator Hydrogen Benelux, our vision is to make hydrogen usable on a large scale in the energy sector and to help it achieve a breakthrough as a new energy source for widespread use. With over 22 years of experience in the high-pressure sector, we are committed to leading the way in hydrogen technology, leveraging our unique expertise to develop suitable solutions with and for our customers.
Our ambition is clear: to be the No. 1 in hydrogen compression technology. We pride ourselves on being fast, efficient, and innovative. With a long-standing tradition of excellence, we view challenges as opportunities to expand our expertise and portfolio. Products and Services: We specialise in building hydrogen refuelling stations, which are crucial for the development of hydrogen infrastructure. Our hydrogen refuelling systems (HRS) include all necessary modules such as the MAX Compression System for compressing hydrogen, MAX Storage for storing it, and dispensers for releasing hydrogen during the refuelling process. These systems are designed to be compact, efficient, and scalable, allowing for easy expansion and adaptation as demand grows. Projects: Maximator Hydrogen Benelux has been involved in numerous projects across Europe, including the development of hydrogen refuelling stations in Germany, Switzerland, and the Benelux countries. Our projects range from small pilot initiatives to large-scale infrastructure developments, all aimed at supporting the hydrogen economy and reducing carbon emissions. Notable projects include the establishment of hydrogen hubs and the integration of hydrogen solutions in heavy-duty transport sectors.

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MECHATEST SAMPLING SOLUTIONS

Mechatest, is a leading certified manufacturer and worldwide supplier of analyser and sampling solutions specific for the Hydrogen market but in general for the petrochemical, chemical, oil & gas, pharmaceuticals, and power industry.

We offer advice, engineering 3D design and manufacturing capability for the supply of Hydrogen measurement solutions, our solutions are suitable for outdoor use in an industrial environment and ATEX Zone 1 or 2.

Hydrogen (wet gas) analyser or detection systems should be considered for product quality control and/or protection of the environment. The major challenge in measuring hydrogen samples in wet gas in an electrolyser system is to protect the hydrogen sensor and ensure a long service life and high-quality measurement.

The output of the electrolyser is Hydrogen and Oxygen as a gas composition and might be saturated with water vapour. To take in a wet gas a Hydrogen sample is not easy, most sensors for this typical measurement in this acceptable price range are mostly not suitable for wet gasses.

Mechatest designed for the new electrolyser unit a Hydrogen gas measurement solution that allows for analysis of the wet gas Hydrogen stream in Oxygen composition and the Oxygen in Hydrogen composition. For more information go to: www.mechatest.com/hydrogen-measurement/

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Metalot Future Energy Lab aims to accelerate the energy transition by boosting the development and market introduction of promising technologies in the sustainable energy domain. Particular focus is placed on Metal Power: the circular use of iron powder for large-scale import of renewable energy and for which H_2 is the key to convert rust into iron powder that can be combusted later and elsewhere.

Within the Hydrogen domain Metalot Future Energy Lab currently builds the hydrogen community in Southern Netherlands that focusses on the acceleration of experimental Hydrogen technology from TRL 4 and up, for production, storage and application. For this purpose, the Metalot H_2 Fieldlab has recently come available for responsible testing of small-scale hydrogen prototypes.

Together we achieve acceleration by:
- Building new value chains together with knowledge institutes, governments and companies;
- Developing joint visions and roadmaps on technology application and adoption in the market.
- Building consortia to work on concrete R&D projects to realise innovative technology and equipment.
- Joint commercialisation of potential Intellectual Property.

For more information check out www.metalot.nl or contact us via info@metalot.nl to get in contact with the Hydrogen Community.

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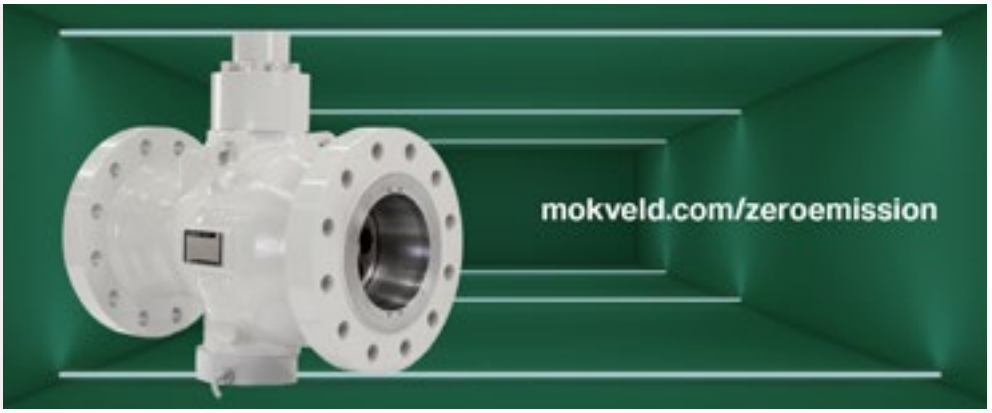

A future with hydrogen fits in the vision of Mokveld Valves in The Netherlands, being that the world's energy, water and material demand can be met in a sustainable way, with a responsible and environmentally safe use of our planet's resources.

Mokveld contributes to this by developing and manufacturing state-of-the-art equipment and services, based on innovative technology and best available techniques. The full scope of Mokveld valves is H_2 ready.

Moreover, the latest innovation of Mokveld is highly suitable for hydrogen: a true zero emission valve! Integration of the actuator inside the valve removes the need for a dynamic stem seals thus eliminating the main potential leak path of common valve designs with external actuators.

On top of the zero external leakage throughout the lifetime of the valve, this valve offers very low electric power requirements, extreme accuracy and our well-known axial design with the inherent streamlined flow path, high capacity and low weight. All benefits have a positive effect on the opex and on GHG emission reduction scopes allowing energy companies to achieve their net-zero goals. The valve is now fully qualified and commercially available.

Mokveld is ready to help energy companies to reduce their environmental footprint and to achieve their net-zero goals.

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MOTT MACDONALD

Mott MacDonald is an employee-owned engineering, development and management consultancy, with more than 20,000 people in over 50 countries. We plan, design, deliver and maintain the energy, transport, water, buildings and wider infrastructure that is integral to people's daily lives. Our core strength is using our expertise to overcome complex challenges, for the benefit of our clients and the communities they serve.
To help reach carbon neutrality, countries and companies around the world are increasingly turning to hydrogen as a versatile and clean energy carrier. We have the expertise to support clients across the entire project lifecycle in the energy sector and have been involved in more than 70 projects supporting clients to make the transition to hydrogen.

Reference hydrogen projects:
- Speyside Hydrogen: Owner's engineering services for Storegga's >200MW electrolytic hydrogen plant, providing feasibility studies, pre-FEED design, and ongoing support for regional decarbonisation in northeast Scotland.
- HyOne: https://www.mottmac.com/en-gb/news/mott-macdonald-wins-gasunie-contract-to-assess-feasibility-of-an-offshore-hydrogen-network-in-the-north-sea/
- NorthH_2: https://www.mottmac.com/en-gb/projects/north2-europe/
- The North Sea Wind Power Hub: https://www.mottmac.com/en-gb/projects/north-sea-wind-power-hub/

Engineering. Management. Development.

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MTSA TECHNOPOWER

MTSA Technopower develops decentralised energy management systems that convert green electricity into hydrogen and vice versa to make green energy available 24/7 and to prevent peak loads from solar and wind farms on the electricity grid.

Sun and wind energy is sustainable, CO_2 free and can be generated almost anywhere. On location, however, most of the day's yield is usually produced in just a few hours, while during the rest of the day hardly or no green power is available. Often the 80/20 rule applies.

Another obstacle to the large-scale application of solar and wind energy is the current grid capacity. This is often not sufficient to handle peak production from (planned) wind and solar parks.

MTSA Technopower offers a solution. MTSA Technopower develops product lines for:

- Power to Gas (P2G): Electrolyser systems for the production of green hydrogen in the capacity range of 1-10 MW.
- Gas to Power (G2P): Fuel cell systems for the production of electricity from hydrogen in the capacity range of 0.5-5 MW.
- Power to Power (P2P): Integrated energy management systems that combine hydrogen and electricity production.

Please visit our website: www.mtsa.nl or www.mtsa.nl/lines-of-business/waterstof-technologie

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Historic city centres and energy transition: Where heat pumps fail, and solar PV cannot be used, the Energy Transition for build environment has serious challenges to overcome. This is especially the case in Europe's historic city centres, which are essential for our European culture, identity and economy. Regulations prescribe that historic buildings must be preserved. Modern energy technologies (wall insulation, solar panels, double glazing or floor heating) are not desirable, not allowed or have severe restrictions. Heat pumps cannot be used because low-temperature floor heating will affect building structures. EnerTwin solution: The EnerTwin is the perfect solution to improve the energy efficiency and CO_2 emission reduction of a building. EnerTwin is a small-scale heat and power plant combined in one sustainable device. Its core is a micro turbine that drives a generator. Micro turbines have great advantages in terms of reliability and lifetime, and bring low maintenance, high-efficiency and significant CO_2 emission reduction. EnerTwin is also suitable for clean fuels such as green gas, biomethane and gas mixtures with up to 23% hydrogen, but it can also run on natural gas. By using renewable fuels, 100% green electricity is produced. Moreover, this leads to additional CO_2 emission reductions. Plug and play installation (no renovation required) makes EnerTwin the perfect solution for rapid energy transition of historic buildings. Hydrogen: The EnerTwin is currently CE certified for fuels with up to 23% Hydrogen (mix). It will be adapted to 100% Hydrogen in 2 steps (50%, 100%), while backwards integration is still possible in case a hydrogen infrastructure is not available yet. A 50% Hydrogen solution is expected to be commercially available by the end of 2022.

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- Concept supplier, answers for your hydrogen related questions
- Hydrogen solutions:
  - Production and conversion
  - Storage
  - Industry
  - Mobility
  - Built Environment
- Living labs – Learning by doing
- Project supervision and support
- Support and answering your inspection questions:
  - PED
  - Machinery Directive
  - ATEX
  - Low Voltage Directive
- Training and workshops

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Nedstack Fuel Cell Technology is a leader in high-power, heavy-duty LT-PEM fuel cell stacks, systems, and solutions. With 25 years of experience, Nedstack excels in industrial and maritime applications. Our technology powers sea-going and inland shipping, co-generating heat and power plants, and (datacentre) backup systems. Our fuel cells run on waste-stream, reformate, and pure hydrogen sources, showcasing versatility.

Developed in-house by multi-disciplinary engineering teams, our systems are built with application and system integration experts.

The core technology is developed and manufactured at our R&D and production facility in Arnhem, the Netherlands. Committed to sustainability, our fuel cells produce zero emissions, contributing to a cleaner future.

Nedstack's global presence spans various industries, including utilities, transportation, and industrial applications. As we continue to innovate and expand our product portfolio, Nedstack is poised to lead the transition to sustainable energy solutions worldwide.

Our next generation fuel cell systems introduce a 1000kW fuel cell power system module with a operational lifetime up to 40.000 hours before stack refurbishment and is engineered for series-production.

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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 Climate Policy, 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_2 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.

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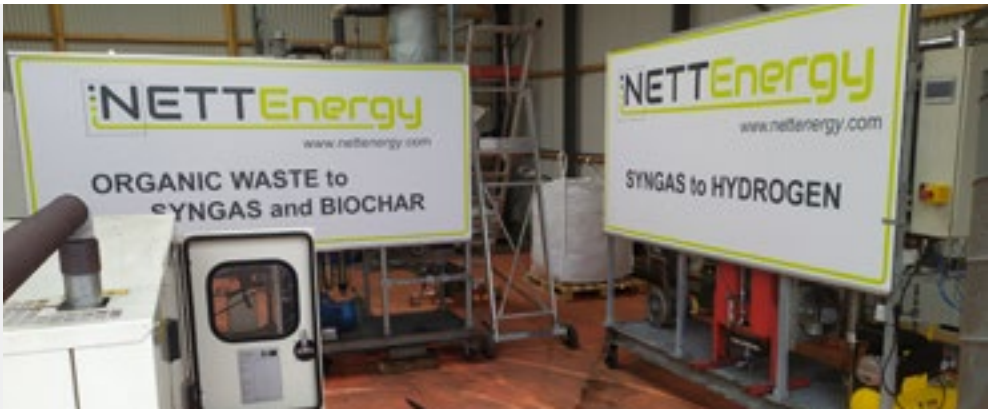

Nettenergy is a pyrolysis technology company with technology ranging from fast pyrolysis, gasification and super critical water gasification. We focus on organic waste as feedstock and small mobile installations with 10 MTPD feedstock. With our PyroGasification technology we produce syngas and biochar. This syngas can be used for electricity production or used in our unique SYN2H technology and converted into hydrogen. The SYN2H reactor is atmospheric and uses a non-catalytic process for converting the syngas. The production capacity is 500 kg/day of H_2. The combination of producing renewable hydrogen and store CO_2 in the soil using the biochar differentiates this route from the green hydrogen produced using solar/wind. Welcome to the world of orange hydrogen production!

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For more than 65 years, New Cosmos is a leading manufacturer of cutting-edge portable and fixed gas detection equipment, driving the global transition towards New Energy. Our innovative solutions play a pivotal role in ensuring safety and efficiency during this transformative Energy Transition. Among our flagship products is the HL-310 residential hydrogen detector, designed to safeguard homes embracing hydrogen as a clean energy source. Additionally, our CSD-02 and CSD-04 hydrogen gas sensors are designed for automotive safety by providing precise hydrogen detection for fuel cell vehicles. New Cosmos also has a wide range ATEX certified gas detectors for applications such as fuel cell car hydrogen gas leak inspection, hydrogen refuelling stations and hydrogen production and storage. With a relentless commitment to innovation and sustainability, New Cosmos is shaping the future of gas detection technology, paving the way for a safer and more sustainable world.

Our strengths:
With in-house sensor development, 65 years of experience, reliability, unique selectivity, long lifetime, and a wide range of gas sensors and detectors, we excel in gas detection.

Solutions for the following markets:
Besides New Energy Markets, we also serve markets in Oil & Gas Exploration, Chemical & Petrochemical Industry, Automotive Industry, Laboratories and the Micro Electronics Industries.

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New Energy Business School

New Energy Business School stands as the global leader in energy education, blending theoretical foundations with practical application. We offer programmes that span the entire energy value chain and address all facets of the ongoing energy transition. Our courses are made by leading academics and industry professionals, ensuring they remain at the forefront of global energy developments.

In the journey toward a zero-emission future, hydrogen is recognised for its pivotal role in the energy transition and decarbonisation efforts. Serving as an efficient medium for storing and transporting renewable energy, hydrogen is key to addressing diverse energy requirements and propelling us toward a climate-neutral economy by 2050. As the sector's momentum builds, so does the demand for skilled professionals in the hydrogen industry.

Our curriculum includes a wide range of offerings, from introductory and executive courses to cutting-edge virtual reality tours, providing a deep dive into the hydrogen value chain—production, storage, transport, and use. These programmes are designed to equip participants with strategic insights, practical skills, and an extensive professional network, positioning them as l eaders in the energy transition.
The core mission of the New Energy Business School is the dissemination of hydrogen knowledge to foster connections among energy professionals through our network.

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New Energy Coalition

Drivers of Change

New Energy Coalition is a continuously growing network and knowledge organisation that aims for a sustainable future by accelerating the energy transition on a national and international level.
A triple-helix organisation funded by public and private parties, it connects energy knowledge, policy and markets. New Energy Coalition resulted from the merger of established energy associations, creating a comprehensive coalition of research and educational institutes, leading energy companies and government parties.
The coalition focuses mainly on the development and valorisation of growth potential of the energy sector in the Dutch provinces of Groningen, Friesland, Drenthe and Noord-Holland, the region being a perfect breeding and testing ground for energy innovation. The accumulated knowledge and results are available for the benefit of all.

New Energy Coalition is the catalyst of the Northern Netherlands' Hydrogen Valley (as well as recently Noord-Holland Hydrogen Valley), a six-year European programme in which more than thirty public and private parties contribute to the realisation of a hydrogen network and value chain. From large-scale production of hydrogen up to expansion of the number of hydrogen vehicles and fuelling stations, and from underground hydrogen storage to heating of residential areas. All these initiatives are being developed within the Hydrogen Valley (www.newenergycoalition.org/en/hydrogen-valley/), which has put the region on the international map as the exemplary region for hydrogen.

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NEXUS
ENERGY

We started Nexus Energy because we felt a strong sense of responsibility to change our beloved maritime and transport market for the better. We have to eliminate the use of fossil fuels. It's that simple. This has been the core of our developments. In addition, we felt that the energy transition shouldn't feel imposed change... it should feel like improvement.

And improvement only comes when things are Easier, Better and more Fun. This is the basis of all our decision making in the development of our company.

We start with our mission by providing a hydrogen powerpack for the maritime, infra & construction and aviation markets. We have a focus on high consuming equipment, such as workboats, cranes, piling rigs and airport GPU's.

What makes us unique is the compactness of our system: our powerpack has the highest energy density around. Together with a tailor made and in-house designed control system, we provide your electricity extremely efficient. Not only does our powerpack allow you to work 100% zero emission, but due to the high energy efficiency it also results in substantial fuel cost savings.

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NGT

NGT B.V. owns and operates a nearly 500 kilometer network of pipelines in the North Sea. For over 50 years we have been successfully transporting natural gas to shore.

By transforming the existing infrastructure into an integrated offshore hydrogen backbone, we aim to accelerate the green hydrogen economy.

With natural gas production declining and a new sustainable energy generation growing we aim to reuse our existing pipelines to transport offshore produced green hydrogen to land. Research results show that our extensive gas pipeline infrastructure – running from the North Sea UK border to Uithuizen, Groningen – is suitable to transport hydrogen. Furthermore, combined with the equally suited NOGAT pipelines- running from Denmark to Den Helder- we can start transporting H_2 as early as 2030 and ensure a redundant offshore pipeline system by 2045. Integrating existing infrastructure is the smart way forward. We join relevant consortia and projects to share knowledge and expertise. Among others, we are member of the European Clean Hydrogen Alliance and consortium partner in PosHYdon. NGT brings energy ashore.

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NIM (Nederlandse Innovatie Maatschappij B.V.) is a pioneering company specialising in sustainable solutions for the maritime sector. With an emphasis on clean energy and innovative technologies, NIM aims to lead the shift towards greener maritime operations. The company is driven by a mission to make shipping and marine operations more environmentally friendly, efficient, and cost-effective. With a knowledge-based focus on innovative approaches such as hydrogen fuel cells, methanol, heat recovery, and carbon capture technologies, NIM is at the forefront of a sustainable future.

NIM is structures through cooperation, prominent businesses have joined NIM as a member to engineer the complete value-chain of hydrogen.

We include companies specialising in production, shipyards, electrotechnical companies and insurance companies. Our motto: 'A successful project with innovative technology must incorporate the complete landscape.'

With our collaborative approach in the complete value-chain of hydrogen we offer the possibility to cover your project back-to-back. We source hydrogen from within our network, create or include your project in the logistic chain, arrange for a future proof technical energy installation and take care of certification, insurance and permits. Assistance in financing your project can also be done via the NIM. All in all, this well-rounded package significantly increases your project's success.

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NLHydrogen is the industry association that connects, strengthens, and represents the hydrogen sector in the Netherlands. Together with our members we lead the way in the realisation of a CO_2-free society. With knowledge sharing, a powerful network, and sustainable solutions, we ensure that our members are and remain frontrunners. Our goals are:

1. Improving the investment climate for the hydrogen value chain by
   - Stimulating the use/purchase of hydrogen.
   - Stimulating the supply of renewable and low-carbon hydrogen from various sources.
   - Facilitating the construction of hydrogen infrastructure, emphasising a systems perspective and cross-border connections.
2. Utilising hydrogen in a socially responsible manner by
   - Ensuring the safety of hydrogen production, use, and transport through collaboration with the Hydrogen Safety Community.
   - Implementing specific measures with partners and members to adhere to the ICSR covenant.
3. Being an important spokesperson for policy development in the Netherlands by
   - Offering fact-based information and innovative solutions to support hydrogen policy making in the Netherlands
   - Assisting both members and the government in implementing EU hydrogen regulations within the country.
   - Connecting our members with other hydrogen players at international level, through our strong relationship with other European and international hydrogen associations.

Our motto: Hydrogen connects today with tomorrow.

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NOGAT BV is the owner and operator of a 250 kilometre offshore pipeline system connecting Danish, German and Dutch natural gas fields with the onshore Dutch network with a daily capacity of 36 million Nm^3. With declining natural gas production, NOGAT is working on a new business model to accommodate large scale offshore green hydrogen production. The NOGAT system has the capacity to transport approximately 10 -12 GW of wind power in the form of green hydrogen. A pilot project bringing together offshore wind, hydrogen production and transportation is being prepared at one of the connected platforms and is expected to be on stream in 2026. NOGAT is member of the European Clean Hydrogen Alliance and consortium partner in PosHYdon, H_2opZee, North Sea Energy Programme 4 and PHD@Sea.

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North Sea Port is taking a lead in the energy and climate transition and playing the hydrogen card. As one of the Europe's ten largest ports and one of the top industrial regions of Western Europe, North Sea Port is in an excellent position to secure a leading role in the production, storage, transit and distribution of green hydrogen as a sustainable energy source and circular raw material. The cross-border port area is already the largest hydrogen cluster within the Benelux countries, producing and consuming 580,000 tonnes of the gas every year. The unique combination of the steel and chemicals industries and the presence of large solar and on/offshore wind farms enable interactions between major players committed to greening and sustainability who are using hydrogen as a lever to that end. Several projects to build electrolysers and installations to convert hydrogen into synthetic fuels and raw materials are at the construction stage and will be operational in the near future. In many cases, these are 'first of their size' projects. North Sea Port and its partners are also further developing the necessary basic pipeline infrastructure to link together supply and demand. They are working towards a marketplace for hydrogen as an indispensable link in a value chain extending beyond the port area. In addition, the port is releasing more than 400 hectares for investments that will reinforce this circular dynamic and pave the way for sustainable economic growth and jobs. The strategy and aims of North Sea Port are in line with the objective shared by Europe, the Netherlands, Belgium and Flanders of a climate-neutral and zero-emission future.

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Nuvera Fuel Cells Europe (NFCE) is a division of Nuvera Fuel Cells, LLC, a global provider of efficient and reliable zero-emission power systems for on- and off-road vehicles, port equipment, stationary power and maritime applications. Nuvera® Fuel Cell Engines power numerous motive and stationary applications worldwide. Our customers leverage Nuvera's three decades of technology development and field experience proven in real-world operation.

NFCE, based in Italy and the Netherlands, provides engineering and application services related to fuel cell system design and development. Nuvera operates a testing, qualification, and service facility for assuring the durability and reliability of Nuvera fuel cell products and components. And lastly a customer focused office is deployed to support our customers in the Business Development, Application Development, and Aftersales phases.

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The Dutch Hydrogen Association (NWBA), founded in 2002, has a noble goal in mind: the promotion of hydrogen and fuel cell technology in the Netherlands to make our society more sustainable. As the beating heart of the Dutch ecosystem for the hydrogen market, we bring together crucial stakeholders, including companies, governments, universities and international partners.
With more than 75 active members, the NWBA acts as the gateway to the national hydrogen cluster. We regularly organise knowledge sessions and networking events where interesting parties come together. Our members can access projects, share expertise and seek advice within our WhatsApp communities. Thanks to the strength of our members and our extensive network, we strive to make the Dutch hydrogen market more competitive and accessible. Furthermore, we represent the Netherlands towards important international stakeholders.

To stimulate the use of hydrogen and fuel cell technology in the Netherlands, the NWBA has organised itself into three pillars:

- Government & International
- Human Capital Agenda
- Innovation, Knowledge Exchange & Stimulation of End Use

Based on these pillars, the NWBA develops its initiatives to stimulate the hydrogen and fuel cell market in the Netherlands. We regularly form new working groups within these pillars and we also have young NWBA, the first Dutch hydrogen organisation for students and Young Professionals.

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Due to environmental and climate challenges, the demand for more sustainable mobility is growing. There are good alternatives to petrol and diesel available, but the availability of these alternatives is not yet optimal. NXT Mobility is a total concept to make mobility more sustainable. We offer climate-neutral mobility cards and charging solutions for electric vehicles. With NXT Energy Hubs, our filling stations of the future, we already offer less environmentally and climate-damaging fuels and energy solutions. We increase the availability of more sustainable fuels and make the energy transition locally possible. In addition to traditional fuels, we offer more sustainable variants at our NXT Energy Hubs such as LNG, HVO, electricity and hydrogen. The first hydrogen filling point will be realised mid 2022 at our NXT Energy Hub in Alkmaar. The second will be opened at the end of 2023 at our NXT station in Westzaan.

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Nijhuis Saur Industries today is one of the global water quality service providers delivering solid and adaptive solutions for sustainable and resilient water use, energy- and resource recovery.
More than 18 companies have been successfully integrated into one global operating company supporting municipal and industrial clients in over 140 countries with engineering and consultancy services, EPC / DBFOM project execution, mobile water solutions, O&M site services and Water As A Service. With an extensive portfolio of innovative technologies and game-changing solutions, Nijhuis Saur Industries deliver local, scalable, and circular water-on-demand solutions to more than 7,000 references around the world and contributes to a more sustainable and resilient future.

Our purpose is to be an advocate for water, ensuring everyone gives water the value it deserves. With our unique Customer for Life approach, we protect water resources, contribute to the water-, energy-, waste- and food transition, and help to restore and close the water loop.
We call it #MissionWater.

For the hydrogen industry we design and manufacture complete systems to produce ultrapure water from surface water, seawater, effluent from municipal waste treatment plants and other sources. These systems are modular and easily scalable which we deliver and support worldwide.

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OCI Global is a leading global producer and distributor of nitrogen, methanol, and hydrogen products and solutions providing fertilizers, fuels, and feedstock to agricultural, transportation, and industrial customers around the world. OCI's global production capacity spans four continents and comprises 16.7 million metric tons per year. OCI has more than 4,000 employees and is headquartered in the Netherlands.

Key hydrogen projects in development include:

- A world-scale blue ammonia plant in Texas, with low carbon hydrogen and nitrogen supplied by Linde, which is on track to start production in 2025. It will be the first greenfield blue ammonia facility of this scale to come onstream in the United States.
- Our green ammonia project, Egypt Green Hydrogen, Africa's first integrated green hydrogen plant, started commissioning its first unit of 15 MW in November 2022.
- Landmark collaboration with Masdar and ENGIE to study the co-development if a green hydrogen facility in the UAE.
- Expansion of ammonia throughput capacity in the Port of Rotterdam, and a partnership with NorthH_2 that will see the development of the first large-scale green ammonia and methanol value chains in the Netherlands.
- Evaluating a gasification opportunity at our methanol facility in the Netherlands. This would be the first plant in the Netherlands to transform biomass derived feedstocks into bio-methanol to cater to growing demand in the marine and vehicle fuels markets and the chemicals market.

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ON2Quest is a global supplier of advanced gas generation, purification, and recycling technologies, serving industries that require reliable, cost-effective, and environmentally friendly solutions. Our expertise lies in the engineering, supply, and maintenance of hydrogen, nitrogen, and oxygen generation and purification systems. With a strong focus on innovation and sustainability, we provide cutting-edge technologies that help industries optimise efficiency and reduce environmental impact. Every project and gas stream is unique, which is why we offer a diverse portfolio of purification technologies. Our engineering team collaborates with customers to determine the most efficient and cost-effective solution, leveraging standardised components to minimise capital expenditures while ensuring high performance.

Our purification solutions include:

- Hydrogen purification via PSA (Pressure Swing Adsorption) – Offering rotating manifolds for enhanced reliability and VPSA (Vacuum PSA) for higher yields at lower pressures.
- Oxygen removal through catalytic conversion for high-purity hydrogen streams.
- TSA (Temperature Swing Adsorption) for effective moisture removal, ensuring gas quality and system longevity.
- Gas recycling systems to minimise waste and emissions, supporting a circular economy.

ON2Quest is committed helping industries achieve higher efficiency and lower emissions in their processes. Need a gas purification or recycling solution? Contact our specialists today!

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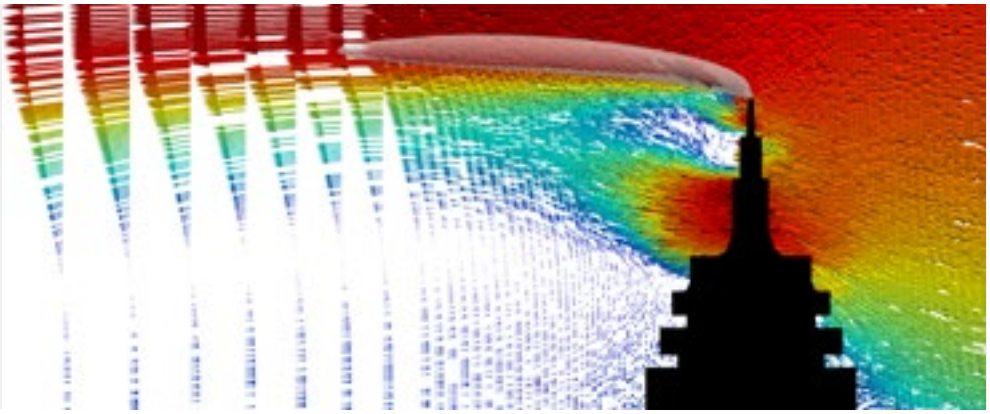

Peutz is a group of independent consultancies specialised in a wide range of fields related to the design and building of any type of architectural or industrial development. Specialties range from acoustics, building physics, physics of urban design, noise control, and environmental technology to fire safety, sustainability and flow technology. The Peutz Group is based in the Netherlands, Belgium, Germany and France and has over 300 employees.

Peutz operates laboratories for acoustics, building physics, wind technology and fire safety. These laboratories are used for specific project-related research as well as fundamental research studies. Moreover the laboratories are accredited for various standardised measurements. Customised solutions are created by linking laboratory research, field measurements, numerical simulations and expert knowledge.

In hydrogen Peutz is active in the full chain of production, storage and distribution as well as usage of hydrogen. Our core expertise is present in the fields of noise and vibration, risk assessment, permitting, fire safety and flow technology. Examples:

- Risk assessment production, distribution, pipeline, multi-fuel station, hydrogen trailer parking, warehouse
- Permitting of hydrogen plants, noise and vibration, external safety
- Fire safety assessment
- Flow technology CFD simulations of (cryogenic) hydrogen, emergency emission, ventilation simulations, maritime, industry, transportation

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Plug is building the global hydrogen economy with a fully integrated ecosystem that spans hydrogen production, storage, delivery, and power generation. As the world's first vertically integrated pure-play hydrogen company, Plug delivers turnkey solutions – including electrolysers, liquid hydrogen, fuel cell systems, storage tanks, and fuelling infrastructure – to enable clean energy at scale. With over 40 years of experience and a global track record, Plug has deployed more than 72,000 fuel cell systems and 275 hydrogen fuelling stations worldwide. The company is also the largest buyer and consumer of liquid hydrogen globally.

In the Netherlands, Plug operates a Centre of Excellence dedicated to electrolyser technology. This expert team is responsible for system design, project execution, and post-delivery services for European customers. The Dutch operation also supports additional product lines, including material handling and stationary power solutions – ensuring localised expertise and customer service across Plug's entire portfolio. With a growing presence across Europe and deep commitment to energy transition, Plug is helping the Netherlands – and the world – achieve energy independence and decarbonisation through practical, scalable hydrogen solutions.

For more information, visit www.plugpower.com

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PONDERA

At Pondera, we understand the complex environmental challenges that governments and companies face. As consultants and developers of sustainable energy we use our knowledge and expertise to aid in diverse energy-transition projects that contribute to a greener future.

We have in depth knowledge and expertise in every step of the project development process, from conceptualisation to hand-over across a multitude of renewable energy implementations, including hydrogen. Our services cover permitting, contracting, feasibility studies, market studies, owner's engineering, project management, modelling, due diligence, technical auditing and risk assessment related to the production, storage and transport of (RFNBO-grade) hydrogen.

We have applied this knowledge and expertise to advance the development of hydrogen infrastructure in the Netherlands and internationally. Our active projects include, for example, the permitting, contracting and owner's engineering of the development of a 10 MW offshore hydrogen production platform, contracting of 50 MW onshore hydrogen production, modelling of hydrogen chains, and the permitting of large-scale offshore hydrogen transmission infrastructure.

We are always pursuing innovative projects that further the energy transition and would gladly get into contact about your project.

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Port of Amsterdam

The Port of Amsterdam is currently one of the leading energy hubs in Europe with availability of large scale flexible tank storage terminals, supported by extensive blending infrastructure for oil products, and its role as a supplier of kerosene to Schiphol Airport through a direct pipeline. The Port of Amsterdam is however strongly committed to play an active role in the transition towards sustainable energy production and use in both local, regional, national and international supply chains. The Port of Amsterdam therefore aims to become the largest hub for the storage, blending and transit of renewable and synthetic fuels in Europe. In addition, it enhances the investment climate for existing and new companies to establish production facilities for these types of fuels.

The port is working closely with different partners to establish new value chains based on for example hydrogen, synthetic kerosene, and methanol. Therefore the proposal presented by the Port of Amsterdam reflects the strategy of the port in the development of creating the 'building blocks' for the Future Fuels Hub containing the following clusters of projects:

- Regional Integrated Backbone (RIB): development of a newly constructed regional hydrogen pipeline connecting production sites (e.g. project Hermes / 100 MW electrolysis with Nouryon and Tata Steel) as well as the national hydrogen backbone, with partner Gasunie.
- Development of a hydrogen distribution network in the port area.
- Development of a (green) CO_2 distribution network in the port.

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Rotterdam is the largest energy hub in Europe and is a frontrunner in the energy transition. Hydrogen is a key element in this transition. Together with its partners, the Port of Rotterdam is working on a series of projects to develop the production, use, infrastructure, import and transit of hydrogen for both blue and green hydrogen. Regarding green hydrogen, several companies are making plans to ensure that an electrolysis capacity of 500 MW will be operational by 2026. This capacity could according to announced plans be scaled up to 2 GW by 2030, among other things by realising 2 GW of additional wind at sea, connected to Rotterdam. For the exchange of hydrogen between companies, there will be a hydrogen pipeline through the port area in 2025, where the construction of the national hydrogen backbone starts. This is a boost for the development of a physical hydrogen market, and so is the realisation of a hydrogen exchange. Together with a large number of partners, the Port of Rotterdam is examining the import and transit of hydrogen from overseas, to replace the current European fossil energy imports (like oil, coal). This is done with parties from many countries, ranging from Iceland to Australia and from the Middle East to South America. To be able to accommodate these imports, the focus is on realising terminal facilities in Rotterdam and a robust infrastructure to the hinterland, especially hydrogen pipelines to Chemelot and North Rhine-Westphalia. Simultaneously, the application of hydrogen is encouraged, as fuel for industry and the transport sector, and as raw material for chemical products. Current projects include one that is aimed at having 1,000 hydrogen-powered trucks on the road.

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Power2X is a project developer and management consultancy for energy transition projects across Europe and North America. The company works with several business partners on new projects in the energy transition. The focus is on sizeable projects in Green and Blue Hydrogen as well as related conversion, storage and end use assets, all with a focus on decarbonisation of industry. This also includes projects related to green ammonia, methanol and other derivatives, such as clean fuels. Power2X has a growing team of circa 50 professionals and is headquartered in Amsterdam, the Netherlands. It has a development pipeline of 5 large scale projects, in various stages of development.

Supported projects often imply large-scale greenfield projects, major industrial site redevelopments, and decarbonisation of large energy intense assets. In case of a project owner involvement, we look after projects with a CapEx ticket of €250+ million. The current project development pipeline includes:

- Blue and green hydrogen
- Renewable ammonia production (e.g., the Power2XMadoqua project)
- Bio- & e-methanol
- Other derivatives like SAF and rDME

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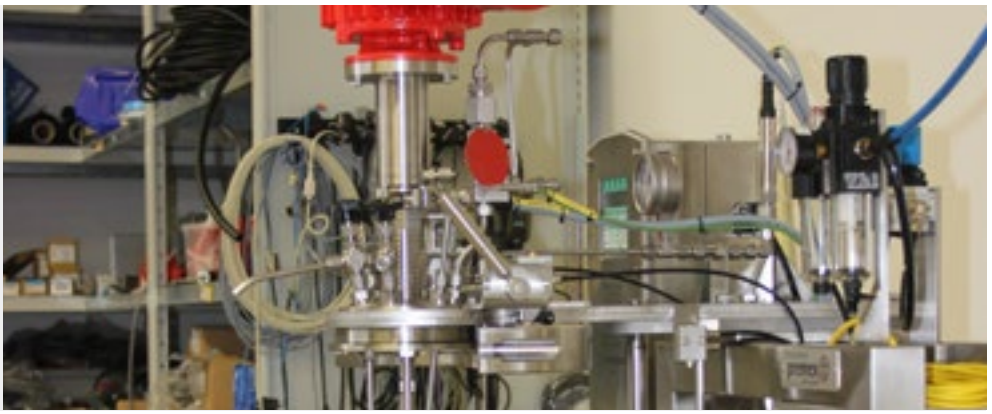

Pro Control is an engineering company with a very clear focus on the delivery of process control (PLC controls) and data acquisition systems for process installations (lab, bench and pilot scale) and skids. We have been doing this for over 20 years and work for well-known organisations active in the world of Chemicals, Oil & Gas, Seed Breeding, Aerospace and Defence. We distinguish ourselves through our knowledge and expertise of measurement & control technology applied in these demanding and often complex environments. We have knowledge of Siemens, Eurotherm, Honeywell, DeltaV, Rockwell, Beckhoff, Hitachi, Wonderware, iFix, Reliance and National Instruments LabVIEW (we are NI Alliance Partner). Supplemented with our expertise in the field of measurement and control technology, integration of analytical instrumentation (GC, MS, FTIR, etc.), recipe control, data processing and the fact that we can deliver E&I projects turn-key, makes us a serious discussion partner in the field of automation and control engineering.

To give you some examples:

- For several skid builders active in Petro Chemical environments we are supplying the automation for the process skids they developed. Units have spread all over the world;
- We are an automation partner for a seed breeder in Enkhuizen and we supply turn-key machine controls and carry out extensions/adjustments/ renovations to the automation of existing installations;
- For the space authority we supply the automation (software, cabinet, cabling) of a vacuum set-up in which materials are tested in extreme conditions.

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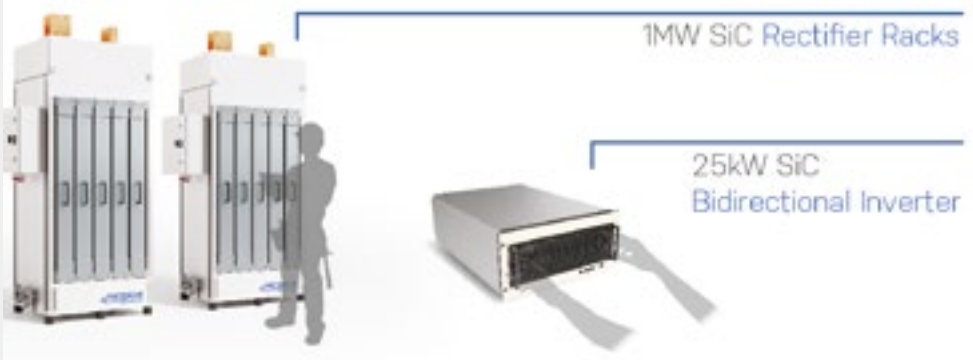

Building on 30+ years of experience in high-reliability and high-precision electronics, Prodrive develops two SiC-based power conversion solutions for both efficient and scalable hydrogen production (electrolysis) and hydrogen consumption (fuel cells).

For hydrogen production, a 1MW rack, consisting of several 200kW modules is designed for a rectifier to be scalable to GW-scale while being significantly more efficient, compact, and reliable compared to contemporary thyristor and IGBT technology.
The use of SiC-based power electronics also allows for a flexible output voltage (0 – 1500V), and an almost negligible disturbance on the grid provides unlimited and future-proof scalability.

The 25kW inverter provides the same scalability for fuel cell and battery connections while also providing both single- and three-phase grid formation. Both solutions are bi-directional and can be used as both a rectifier and an inverter for hydrogen applications. They can also be customised to fit every practical hydrogen scenario.

Prodrive is a developer and manufacturer of high-tech electrical, mechanical, and computing components for applications in demanding industries, including semiconductor, energy, and industrial. Prodrive Technologies' business model is based on a combination of its own R&D and in-house high-tech production facilities, with a total workforce of approximately 2,500 FTE, of which 600 in R&D. Reported turnover over in 2024 exceeded €500 million.

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PromoTec is a Dutch based company, located in Hilversum, supplying and servicing sealless pumps for Hydrogen carriers and many other applications. Already since the early 1980s, PromoTec has focused on sealless industrial pumps.
Like Greenpumps magnetically driven pumps and Wanner Hydra-Cell sealless diaphragm pumps. Sealless means there is no mechanical seal in the pump. Due to the absence of a seal, the pumps offer complete containment of the medium. This makes the pumps completely leak- and emission-free. A packing can leak and that is unacceptable in the field in which these pumps are used.

Sealless pumps require less maintenance, since there are no mechanical seals to replace. Less maintenance means less downtime. Leaks are disastrous for the environment and also no longer acceptable due to increasingly strict regulations.

The sealless centrifugal and displacement pumps are more expensive, but they also last much longer and rarely or never cause problems. As a result, the Life Cycle Costs are actually lower than with traditional seal pumps.

PromoTec offers technical support and pumps to many innovative companies in the new energy sector, for Hydrogen carriers like formic acid, ultra-pure water, electrolytes, hydrocarbons, hydrozine and sulfuric acid. Handling a variety of high pressures, relatively high temperatures, low capacities, gas inclusions, Atex: all leak- and emission free.

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Proton Ventures is an engineering company specialised in ammonia related technology and products. Proton Ventures is experienced in building and running pressurised and refrigerated ammonia terminals. Therefore our portfolio ranges from liquid chemical storage facilities, De-NO_x and N_2O removal systems up to modular production facilities of green ammonia. Hence, Proton Ventures is an experienced partner when it comes to hydrogen carrier and storage concepts needed for the energy transition. Next to this, Proton Ventures also enables the agricultural industry to switch towards green fertilisers.
Whether you need a new facility built from the ground up, or an existing one upgraded, we are happy to be of service. Our team consists of talented developers, design engineers and project managers whom develop, design and execute projects, meeting your requirements and exceeding your expectations.
Our modular ammonia plants are based on our NFuel concept. The feedstock for this ammonia production is power produced from renewable sources (solar, wind turbines, hydro). This new concept allows production of green ammonia in a de-centralised fashion, which can be further used as:

- Nitrogen carrier (fertiliser)
- Hydrogen carrier/storage
- (Combustion) Fuel

As a basic starting point for our designs, Proton Ventures works with three different production capacities. Within this range of the capacities Proton Ventures deals with the supply and demand of the energy market.

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Pure Water Group is globally renowned as a leading manufacturer of advanced and sustainable water purification equipment for the production of Ultrapure water and have been serving the Power Generation, Micro-electronics and Pharmaceutical Industries for more than 25 years.

We partner with innovative technology suppliers to develop and expand our product range and one of our core technologies is CEDI - Continuous Electrodeionisation. CEDI forms part of the water preparation process for Hydrogen Electrolysers and offer significant technical and environmental advantages over other processes.

As specialists in this technology, Pure Water Group has unparalleled experience in the design, manufacture and support for high-capacity systems that will be required for the scale up of Hydrogen projects.

Pure Water Group: Engineering Purity

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PwC is one of the global leading energy transition tax and advisory firms. We understand the challenges resulting from the fundamental changes to the energy system. For the energy transition hydrogen is an essential energy carrier. Without hydrogen it will be hard to meet the ambitious climate targets. We support both leading companies in the hydrogen industry, as well as Dutch government on the challenges of this quickly developing and innovative industry.

We help solve these important problems, with our broad industry knowledge, deep technical financial expertise and thorough understanding of the technical challenges. We help companies turn their (infrastructure) projects with high capex and uncertainties into a success or assist governments in kickstarting a hydrogen market and infrastructure by tapping into all opportunities to optimise their investments. We assist companies and governments with understanding the challenges related to hydrogen projects and ensure these projects are optimally prepared for access to (equity) funding, green (project) financing, subsidies and other European and local (tax) incentives. With our vast global network, we are also well positioned to help companies expand cross border.

We can support from the early stages (market analyses and -entry studies, feasibility studies, business case set-up), towards the realisation (funding, financing, subsidies) until exploitation (management,reporting and compliance).

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Cluster organisation RAI Automotive Industry NL facilitates a network of companies, active in the Dutch Automotive Industry, that maintain and strengthen their international innovative lead through mutual cooperation and collaboration with government and knowledge institutions. Making a social contribution plays an important role and therefore all activities are aimed at realising the following ambitions:

- Zero emission
- Zero congestion
- Zero accidents

Together with over 30 entities across the Netherlands we facilitate for the development of three hydrogen technologies: hydrogen combustion engines, hydrogen fuel cells, and a next-generation hydrogen refueling infrastructure technology.

These main developments in this project are related to cross-sectoral mobility applications for the automotive, marine, and non-road mobile machinery sectors, and the resulting technical requirements of the products from the end-user's perspective. The project also takes into account legislation and regulations and other market-specific factors. With this, the consortium partners aim to accelerate and improve the transition to sustainable mobility and to strengthen their (international) competitive position on the market for sustainable mobility applications and power units.

RAI Automotive Industry NL is a part of the RAI Vereniging and together represent the interests of the Dutch automotive industry on a national and an international level.

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Over 35 years experience in development, homologation, training and commercialisation of components and systems for gaseous fuel propulsion

• LPG	Liquefied Petroleum Gas
• CNG	Compressed Natural Gas
• LNG	Liquefied Natural Gas
• Bio-Methane	Upgraded Biogas
• H_2	Hydrogen

on :

- engines
- on-road vehicles Light Duty and Heavy Duty
- off-road vehicles & non-road applications
- vehicle repair workshops

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REDstack is an impact scale-up company, developing and implementing technology and membrane-stacks, for per example:

Reversed Electro Dialysis for sustainable and continuous power generation out of 2 waterflows with different salinities. The Pilot-Plant at the Afsluitdijk is running successful, and now ready for upscaling into a 0.5 MW Demonstration-Plant. The stacks generate DC, full continuous and very suitable for feeding directly into Hydrogen Electrolysers.

Electro Dialysis for water desalination. The new developed ED-technology and ED-stacks from REDstack have a significant lower energy consumption than traditional stacks.
Industrial Electro Dialysis applications, per example for Nutrient recovery.

The stacks and system-design and supply is done in close cooperation with companies within the group: W&F Technologies and Pure Water Systems.

As REDstack has significant experience in designing and assembling various membrane-stacks, REDstack is a good partner in developing and realising alkaline Hydrogen Electrolysers.

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Remeha develops innovative and energy-efficient products for climate control or heat and hot water, both for homes and utilities. With more than 700 employees, Remeha has grown into a leading manufacturer in the Netherlands and Europe. Remeha heats more than 2 million homes in the Netherlands and is also the market leader in non-residential construction. By making sustainable indoor climate solutions feasible and affordable, the company wants to make an important contribution to a CO_2-neutral society.
Remeha is one of the main brands within BDR Thermea Group. BDR Thermea Group in Apeldoorn achieved a turnover of € 2.2 billion in 2022 with more than 6,800 employees and sales activities in more than 100 countries. Remeha started developing the first hydrogen boiler for homes in 2017. Since 2019, Remeha has gained extensive experience in heating homes and apartments with hydrogen. For example, in 2019

Remeha was involved in heating an apartment complex in Rozenburg with hydrogen. At the time, this was the first hydrogen application in the world in a residential building. This was followed by successful hydrogen projects in existing and new homes. Hydrogen projects for utility buildings have already started. Remeha uses proven natural gas boiler platforms to control hydrogen boilers for both residential and non-residential buildings, which also meet the highest standards in combination with heat pumps or propane. The well-known Quinta platform is available for the utility market, which is scalable to larger capacities. Remeha has developed three 100% hydrogen boilers with different capacities for pilot projects. Remeha believes in several paths to sustainability: gases, electricity and heating networks. We see the solution in the combined use of energy carriers, appropriate to the environment and existing infrastructure.

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Resato Hydrogen Technology is driving the future of zero-emission mobility with innovative hydrogen refuelling stations for trucks, buses and cars. In addition to our refuelling technology, we offer advanced tube trailer filling solutions for transporting compressed hydrogen. With over 30 years of expertise in high-pressure technology, we are committed to delivering our customers a flawless fuelling experience.

As pioneers in hydrogen technology, we proudly design and manufacture nearly every component of our stations in-house, leveraging Resato's own innovations. We are engineers at heart, with the drive of a fast-growing global player. Ensuring seamless, back-to-back refuelling, our scalable and cost-efficient solutions are perfectly tailored to meet the growing demands of the hydrogen economy.

Our goal is clear: to lead the future of clean and sustainable mobility. Specifically, Resato's technology can help to reduce emissions by supporting heavy duty transport, such as buses and trucks. Hydrogen vehicles are particularly well-suited for heavy-duty transport and long-distance travel, thanks to their great range.

With advanced H_2 technology and a dependable fuelling network, we can solve the chicken-and-egg dilemma – giving drivers the confidence to choose hydrogen-powered vehicles while ensuring the necessary refuelling infrastructure is in place.

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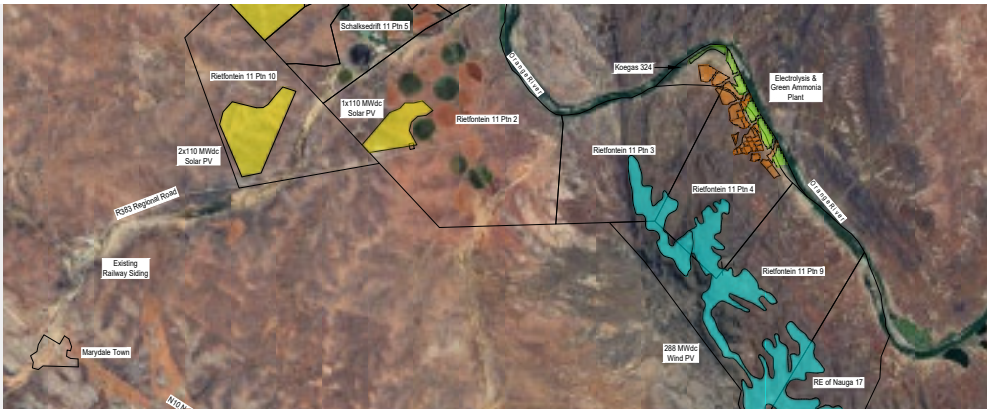

RESH2 is an international green hydrogen development company with offices in the Netherlands, South Africa, and Australia. Our core business is the development of large-scale green hydrogen projects, with our flagship initiative, the Koegas Green Hydrogen Project in South Africa, demonstrating our commitment to driving the global energy transition. In support of our development work, we have created a powerful, proprietary quantitative evaluation engine, built on decades of collective intellectual property (IP). This engine enables us and our partners to rapidly assess opportunities across markets, technologies, and jurisdictions, delivering unmatched insight, speed, and accuracy in project viability and investment strategy. As forward-looking innovators, we are also actively exploring white hydrogen as a promising alternative energy source. By applying our expertise and technological capabilities to this emerging frontier, we aim to remain at the cutting edge of the hydrogen economy. RESH2 focuses on high-impact, collaborative renewable energy ventures, particularly between the Netherlands and other strategically aligned countries, that meet the rigorous risk-reward profiles of our company and its network of partners and investors.
The Koegas Green Hydrogen Project, located in the Northern Cape of South Africa, presents a compelling and future-proof value proposition. It is founded on the strategic utilisation of cost-effective renewable energy and secured water resources to produce green hydrogen at an industrial scale. As a cornerstone initiative of RESH2, Koegas is designed to deliver long-term impact through a phased and scalable rollout.

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RN Solutions B.V. is a developer and manufacturer of highly efficient patented membrane distillation (MD) modules. The modules have been extensively tested on seawater, river water and on industrial applications. Using waste heat of the electrolyser or other heat sources, MD produces pure water with a conductivity of less than 5 **|** S/cm in one single step. The membrane is highly hydrophobic (water repelling) and allows only water vapor to pass, retaining all salts at the feed side.

The process operates at a low pressure (1 bar), therefore the additional electrical power requirement is low. Furthermore, plastic piping can be applied (polyethylene, polypropylene or PVC). As the membranes are homogeneous, reverse flow can be applied in case of fouling of the feed channel. This can simply be automated, requiring no operator intervention. The process needs a limited pretreatment.

The most commonly applied desalination technology, reverse osmosis (RO), operates at 60 bar, therefore requires more electrical power and the use of chloride tolerant stainless steel materials. The membranes are layered composite materials, reverse flow will irreversibly damage the membranes. To reach a similar low conductivity, reverse osmosis needs a double pass for seawater desalination, and an intensive pretreatment. Antiscalants are required, and cleaning of the membranes requires operator intervention.

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Royal HaskoningDHV has been an independent engineering services, consultancy and project management agency since 1881. Our nearly 6,000 professionals worldwide innovate by collaborating with customers and partners to have a positive impact on people, the environment and the economy.

We advise companies and (semi) governments on all parts of the hydrogen chain, from the first idea to the conceptual design phase. We provide technical-economic feasibility studies in which we involve stakeholders and society. We also provide specific services related to safety, permits, legal and policy advice.

We are active in all parts of the hydrogen chain, including the demand-side options. For us, one of the major challenges is to bring the high level ideas to realisation as many parts of the chain are still in development, both in the technologically as well as organisational and regulatory.

Next to that we understand that hydrogen has a key role in energy transition and complements electricity to have a sustainable energy system. As such, H_2 may be the best option, but in other cases a different solution such as electrification or CCS may be the most optimal option.

RHDHV has carried out over 50 hydrogen projects in various roles. These are projects for the production and import of hydrogen, such as our 1 GW parametric design; transport and storage like a QRA for a H_2 pipeline or in the use phase the development of the business case for H_2 buses.

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RWE

RWE is shaping the way to a clean energy world of tomorrow. RWE is already one of the leading companies in the field of renewable energy. RWE is investing billions of euros in expanding its generation portfolio, in particular in offshore and onshore wind, solar energy, batteries and green hydrogen projects. It is perfectly complemented by its global energy trading. Around 20,000 employees work for the company in almost 30 countries worldwide.

With its investment and growth strategy Growing Green, RWE is contributing to the energy transition and decarbonisation of the energy system. Hydrogen is a cornerstone of industrial decarbonisation and offers enormous potential for the energy transition. As a leading producer of electricity from renewable energies, RWE can supply the clean electricity and has the necessary technical expertise needed to produce green hydrogen. The project portfolio comprises various integrated projects along the entire value chain in The Netherlands, Germany, the UK and other focus markets.

RWE is decarbonising its business in line with the 1.5-degree reduction pathway and will phase out coal by 2030. The company will be net-zero by 2040.

RWE: Our energy for a sustainable life.

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SALD
SPATIAL ALD
INNOVATORS

With 'Spatial Atomic Layer Deposition', SALD has developed a globally unique, patented process for applying functional nanolayers as thin as a single atom on an industrial scale. These conformal nano coatings are deposited via a self-limiting gas-phase process with web speeds up to 90 meters/min. We can apply it under ambient conditions on nearly any substrate, like metal, glass, wafers, plastics, textiles or membranes. Spatial ALD process will revolutionise entire industries, including the electrolysis technology industry, the production of battery cells for cars and smartphones, the textile industry, printed electronics (organic computer chips), the new solar energy industry and the packaging industry for consumer goods and convenience food.

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Samotics

Samotics seeks to address the factors that contribute towards an efficient operation of AC-driven rotating assets, and with it reduce electricity consumption and GHG and carbon emissions. AC motors are an integral asset across various industries. These motors however, have critical problems, such as failing unexpectedly, being used inefficiently, and being selected inadequately (right sizing). Energy waste occurs as a result of all three of these factors. Samotics strives to solve these three issues by providing a combined energy and condition monitoring service, called SAM4.
SAM4 is a plug-and-play solution and service for critical AC motors and rotating equipment. SAM4 utilises electrical signature analysis (ESA) and powerful AI-driven algorithms, which use voltage and current data of AC motors and rotating equipment. This data is obtained by plug-and-play, easy to install (and scale), SAM4 hardware, which is installed in the easy to reach and safe environment of the motor control cabinet of the assets, instead of on the assets themselves.
To date Samotics has 120+ clients to which energy and condition monitoring services are provided and is monitoring thousands of assets in the field. Moreover, Samotics has multiple global partnerships, amongst others with Schneider Electric. Would you like to get know more about our solution, SAM4, do not hesitate to reach out.

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SAXION UNIVERSITY OF APPLIED SCIENCES

Saxion is an open and accessible university of applied sciences which provides solutions to social issues through education and applied research. The current energy transition is unmistakably a big challenge for society in which Saxion is taking up its role. Both in educating young professionals to support the required work force for the transition, but also by means of application research that brings together researchers, industry and students around energy related topics. The important role of hydrogen in the transition is acknowledged and has a role in the various academies and research groups. This includes technical aspects of the hydrogen applications, but also sociological, economical and legislative aspects that play a role. Within the group of Sustainable Energy Systems, one of the research lines focusses on industrial use of hydrogen, including high temperature heating applications and the generation of green molecules. We are involved in several hydrogen related projects (e.g. RELEASE, GROHW, HYGENESYS and Hydrogen Connect 2020-2030) and are closely working together with the H_2Hub Twente fieldlab (Almelo, the Netherlands). Together with the HAN University of Applied Sciences we are a strong applied hydrogen knowledge and research group in the Eastern Netherlands with a strong regional, national and international network.

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SCHAEFFLER

The Schaeffler Group has been driving forward groundbreaking inventions and developments in the field of motion technology for over 75 years. With innovative technologies, products, and services for electric mobility, CO_2-efficient drives, chassis solutions, Industry 4.0, digitalisation, and renewable energies, the company is a reliable partner for making motion more efficient, intelligent, and sustainable – over the entire life cycle. Schaeffler describes its comprehensive range of products and services in the mobility ecosystem by means of eight product families: from bearing solutions and all types of linear guidance systems through to repair and monitoring services.

Schaeffler supports the energy transition and decarbonisation of various industrial sectors by developing and manufacturing the core component of an electrolysis system based on Proton Exchange Membrane (PEM) technology.
Our product range includes R&D stacks and industrial stacks with a power input from 50kW to 1MW.

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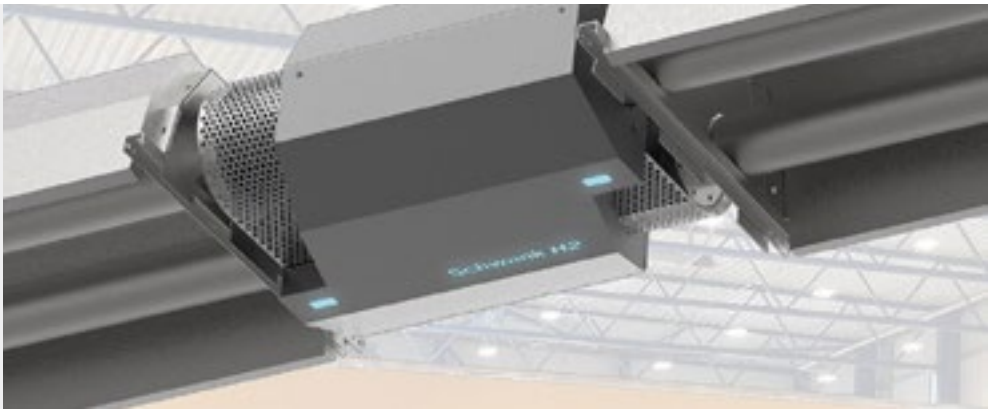

Schwank is a world market leader in the manufacture and supply of technologically advanced heating and cooling systems, sophisticated HVAC products and comprehensive customer support services. We are at the leading edge in our field of engineering and are committed at all times to exhibiting the hallmarks of “Made in Germany” quality.

With the geniumSchwank, Schwank has created the world’s first 100% hydrogen industrial heating system. With this new, unique heating system, an important development step and innovative breakthrough for the use and sustainability of H_2 has been achieved. And even better:

geniumSchwank is so revolutionary because not only hydrogen, but also natural and liquid gas can be used.

With this multi-gas approach, the system adapts to the demands of today: Flexibility in terms of the environment – flexibility in terms of economic efficiency. Companies that want to continue using the advantages of natural gas today, but are planning to go down the path of hydrogen as an energy carrier tomorrow, need future-proof solutions like the geniumSchwank. Because it can be adapted to hydrogen in just a few steps.

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SHV ENERGY

SHV Energy is a Netherlands based, family owned multinational distributing LPG, LNG and sustainable fuels servicing the energy needs of over 30 million customers worldwide.

We are proud to provide energy for hundreds of applications, ranging from cooking to heating to powering low-polluting vehicles. Through our local brands including Calor, Primagaz, Ipragaz, Liquigaz, Supergasbras, Xiwei, Supergas and Pinnacle Propane, we serve our customers through our market-leading LPG companies on four continents: Europe, Asia, North and South America. It is our mission to help clients find unique energy combinations, going beyond our responsibility of simply supplying energy.

Everyday we provide people and businesses beyond the gas grid with the opportunity to switch from high-polluting, carbon-intensive fuels to cleaner forms of energy. In 2018, we pioneered the launch of renewable propane (also known as bioLPG) to offer our customers a drop in replacement with up to 80% carbon reduction. Our activities within our Sustainable Fuels team are to explore, encourage and develop solutions for decentral off-grid domestic heating and cooking, industrial process heat and transportation applications. We already operate Hydrogen infrastructure in China and we see long term potential for global growth. Our focus is on collaborative action to tackle the challenges of green hydrogen for off-grid production and usage.

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siapartners

Sia Partners is a next-generation consulting firm focused on delivering superior value and tangible results to its clients as they navigate the digital revolution. Sia Partners was founded in Paris in 1999. Today, Sia Partners is still headquartered in Paris but developed into an organisation with over 1800 consultants, active in 31 offices around the world.

With its global expertise in the energy sector and its recognised know-how in business transformations, Sia Partners is able to seize the opportunities offered by hydrogen to its clients from a business and technology perspective. The added value of Sia Partners:

1. Our teams work on projects all along the energy value chain – from strategic to operational steps – and are therefore familiar with a large spectrum of actors/possible partners;
2. Sia Partners' expertise on the energy sector, especially on the stakes of energy transition and;
3. Sia Partners' knowledge on the hydrogen market and the actors of the ecosystem, which is deeply fragmented.

So far, Sia Partners has helped major gas infrastructure companies, energy producers, energy suppliers and research and knowledge institutions on a wide variety of hydrogen projects. Examples of Sia Partners' project focus areas are contextualisation and challenges of the hydrogen sector, definition of hydrogen development strategies, support for project management and development of analytical tools.

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Energy transition is the greatest challenge our generation faces. How do we reduce emissions while also increase energy supply? It is an uphill battle. And there is no silver bullet. But finding solutions has always been in our DNA.
For more than 150 years our engineers have been spearheading the electrification of the world. Today we are a team of 96.000 sharing the same passion, vision and values. Our diversity makes us strong and helps us to find answers together with our partners. Located in 90 countries, Siemens Energy operates across the whole energy landscape. From conventional to renewable power, from grid technology to storage to electrifying complex industrial processes.

Our mission is to support companies and countries with what they need to reduce greenhouse gas emissions and make energy reliable, affordable, and more sustainable. Let's energise society.
Our portfolio includes conventional and renewable energy technology, such as grid technology with switchgear, transformers, rectifiers, grid stability solution, substations, battery solutions and grid consultancy. Working towards a hydrogen economy, our gas-turbine portfolio for industrial and power generation applications is 'hydrogen ready'. With our electrolyser portfolio and compression technology for a wide range and application of gases, we can support customers for (larger scale) hydrogen and power-to-x projects. With our portfolio for (industrial scale) heat pumps, fuel cells and digital and automation solutions, we can provide both single and hybrid solutions across our portfolio.

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Solstice Management BV was founded in 2016, and has experienced rapid growth and expansion ever since. Solstice Management BV is providing financial advisory services and is a specialist Business Development consultancy, strong in advisory and non-executive board roles. We offer procurement advice as well as specialised services for the search of suppliers and clients, for small and medium sized companies, especially in the green hydrogen eco-system, plastic pipe and fittings industry, water treatment and recycling, sanitation as well as in renewable energy systems. Our area of interest is focused on Southern Africa, operating from Windhoek / Namibia.

Subsidiary Taatisolar Namibia (Pty) Ltd. is importing and distributing Solar Home Systems and DC appliances for the off-grid market in Namibia.
With networks in the Netherlands as well as in Namibia, Solstice Management B.V. is well placed to support Dutch companies in finding relevant counterparts as well as identifying market needs.
A report on the propositions Namibia offers in green hydrogen has already been prepared for RVO.
Further research is conducted on the local Namibian needs for skills development and capacity building in the green hydrogen eco-system.

Solstice Management is planning to play an active role around the Africa Green Hydrogen Summit during 3-5 September in Windhoek.

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SoluForce

SoluForce offers a safe, sustainable, cost-efficient and, above all, quickly deployable infrastructure for local hydrogen distribution.

Originating as a corrosion-free solution for fluid and gas transport, SoluForce Reinforced Thermoplastic Pipes (RTP) have become synonymous with reliable (energy) infrastructure. They are used for many applications, such as hydrogen, hydrocarbons, water, offshore and mining. With over 4.500 km of installed pipeline worldwide, SoluForce continues to revolutionise the way energy is transported.

SoluForce flexible pipelines play a pivotal role in various hydrogen projects. From decentralised hydrogen production to industrial applications, SoluForce solutions are versatile and impactful. Being non-metallic, they are fully corrosion-free and do not suffer from hydrogen embrittlement. The key advantages of the SoluForce system is their significantly lower CO_2 emissions and Total Cost of Ownership compared to traditional pipelines. Plus, the coil-based supply system streamlines logistics and installation, providing substantial time and cost savings.

Based on proven technologies, it can be the perfect accelerator to achieve local (green) hydrogen distribution in a fast, flexible and cost-efficient manner. This certified and ready to use pipeline solution has a major impact on the feasibility of (green) hydrogen projects and a sustainable energy mix.

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Sorama

Sorama, leader in acoustic imaging technology, is a deep-tech company from the Brainport region in Eindhoven in the Netherlands. Aimed at detecting and visualising sound for various (industrial) applications. Our team of approximately 100 employees is committed to developing innovative solutions for gas and air leaks, partial discharge, and mechanical inspections with anomaly detection in hazardous zones.

Sorama's acoustic cameras are designed to efficiently detect and visualise gas leaks, including hydrogen. This is critical for safety, but also plays a vital role in minimising financial losses caused by unwanted emissions.

Sorama already demonstrated technological innovations in robotics, handheld and fixed installations within the international hydrogen sector.

Applications for the hydrogen sector include:
- Hydrogen leak detection
- Partial discharge detection
- Mechanical inspections (anomaly detection)

Our acoustic cameras can be integrated into third party systems and various robotics platforms. When you want to discuss how we can support you with localisation of leaks, partial discharge or mechanical inspections, please visit our website or contact us.

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SparkNano is a high-tech product company that designs and commercialises Spatial Atomic Layer Deposition tools (S-ALD) redefining nanofabrication on an industrial scale. SparkNano's Spatial ALD technology enables its customers to deposit thin, functional layers, thereby increasing performance and reducing costs for manufacturing fuel cells, batteries and solar cells.
SparkNano's patented technology plays a critical role in addressing the global challenge of creating a sustainable way of generating, storing, and converting energy. It provides solutions by significantly reducing the waste of scarce materials used in electrolysers and enhancing the performance, lifetime, and stability of next-generation fuel cells, batteries, and solar cells.
SparkNano's product range includes versatile and flexible R&D tools for process development and pilot production (Labline series) and fab tools for mass production on planar, porous, and flexible substrates, either via sheet-to-sheet (Vellum) or roll-to-roll (Omega) series respectively.
Each product is based on atmospheric pressure Spatial ALD, either thermal- or plasma-enhanced. This technology enables the deposition of thin films with atomic-scale precision and uniformity at high speeds and large areas, ensuring a low cost of ownership. Furthermore, SparkNano offers customers a total solution, including production ramp-up support, recipe development, and application and process support resulting in a seamless Lab to Fab transition.
Founded in 2018, the company has built extensive application knowledge and a network consisting of major technology research centers, market-leading technology companies, and technology partners. These include TNO, Holst Center, Solliance, Eindhoven University of Technology (TU/e), VDL, and Air Liquide.

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R. Stahl Electromach is an international leading design company with an extensive engineering and manufacturing expertise in explosion proof control systems. Our components and systems can be applied in areas where gas and dust explosions may occur. Therefore, we are the obvious partner of choice for oil, gas, petrochemical and offshore applications such as in refineries and oil and gas.

All safety solutions by R. Stahl Electromach are customer-based and include the development of application software, manufacturing, assembly, testing and on-site commissioning. R Stahl Electromach offers these solutions as full-service packages, from consultation and conceptual design to operation. We also take care of all international certification and providing after-sales support.

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STIRLING CRYOGENICS since 1954

Stirling Cryogenics is involved in many different markets requiring either liquid gases as product or cooling power for applications working at cryogenic temperature. Based on the two-stage Stirling Cryogenerators we offer a range of hydrogen liquefaction systems producing 5 kg/day of LH_2 up to 2.000 kg/day. These systems need H_2 gas and electric power as input, producing para LH_2 into a transfer vessel.

Incoming hydrogen gas is cooled to 80K in the first stage, so no LN2 requirement. Gas is then liquefied at 20K in the second stage during which catalysts will perform the ortho-para conversion. The liquid flows into a transfer vessel by gravity, from which the LH_2 is transferred to the storage tank.

Our systems are built according ATEX or other relevant coding and will include all necessary internal piping, instrumentation, catalytic ortho-para conversion, containerising, transfer vessel and system control. Alternatively, Stirling Cryogenerators can be supplied as modules to a system integrator building the total system with the Cryogenerators as the core.

A Stirling Cryogenerator will start producing LH_2 within 20 min of warm start-up, hence a system can react swiftly when GH_2 flow increases again. Besides the production of LH_2, the Stirling Cryogenerator can also be used as a re-liquefier for boil-off gas of a storage tank, preventing GH_2 blow-off.

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Strohm

As the leading composite pipe technology company, Strohm boasts the world's largest track record for Thermoplastic Composite Pipe (TCP) since pioneering its use in the Oil & Gas industry in 2007. TCP not only reduces total installed and life cycle costs for subsea flowlines, jumpers, and risers but also slashes pipeline infrastructure CO_2 footprints by over 50%. Committed to sustainability, our TCP solutions propel clients toward net-zero carbon emissions targets and bolster the renewables sector.

Recognising the synergy between clean hydrogen and offshore wind early on, we developed a compelling pipe solution to support this alignment. Pipelines, capable of transferring up to nine times more energy than cables, serve as hydrogen storage units, enhancing offshore wind farm uptime. Our TCPs, known for flexibility, lack of corrosion, fatigue, or embrittlement, emerge as the superior pipeline solution for offshore wind farms generating hydrogen.

Strohm's unique value proposition, widely accepted and field-proven in the offshore oil and gas sector, is recognised in the offshore wind to hydrogen realm as an enabler for large-scale developments, replacing cables with TCP. Anticipating further opportunities in this space, we expect expansions of our production capacity. We eagerly anticipate shaping the future of the energy landscape with our TCP solutions. Reach out to discover how we can support your operations!

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summit engineering
Your partner in CO_2 reduction

"Leaving a world to thrive in for future generations." We want to use our personal energy for that.

Summit Engineering was founded by Arjan Hartemink and Robbert van der Pluijm after a trip to Mount Kilimanjaro. The journey to the top and back, has inspired them in many ways. The glacier at the summit is becoming smaller every year due to global warming. Being confronted with this so closely, was the final push: we have to do something.

Summit Engineering now supports companies and governments with their Energy Savings Programmes and Sustainable Energy Projects. We also share our knowledge with the future generation by teaching classes at universities. Together we work on reducing CO_2 emissions and on taking steps towards a CO_2 neutral world. Hydrogen can play in important role in achieving this goal.

At Summit Engineering we have experience in the various aspects of the hydrogen supply chain. From production, to transport storage and utilisation in different areas. We provide concrete advice and excellent project support you can count on. Whether you are at the concept phase of your project or already working towards project implementation.

We use our knowledge, experience, as well as our extensive sector network, to provide a tailor-made programme for achieving optimal results.

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SUWOTEC
SUSTAINABLE WORLD TECHNOLOGY

To secure a sustainable future for generations to come, We develop sustainable circular technologies that are inspired by the way nature works.

First understand nature.

Nature has its own unique ways and systems to create, utilise and recycle. These are proven processes, fine-tuned over thousands of years. More often than not, the way we humans have built today's energy and transport infrastructure, however, follows completely contrary ideas. Then, develop game-changers.

Identifying nature's fundamentally efficient and resilient processes, we develop game-changer technologies that are circular by design and feasible over time. Our work must have a positive effect on people and planet, right where it matters most.

One of the game changers is the development of non-corrosive electrodes and membranes. Ongoing development for electrolysers, fuel cells, batteries, water cleaning and carbon capture. Electrodes with longer life time and not participating in the process. We expect suitable for multiple energy carriers next to hydrogen.

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Swagelok Nederland

Swagelok actively supports companies developing alternative fuel technology for the any industry, designing fluid system components and assemblies for use in hydrogen applications.
We not only understand the fluid system performance needs of the industry, but also the complex approval processes and compliance requirements that govern them. We provide solutions that range from easy-to-install tube fittings to custom-designed fluid system assemblies that deliver longlasting performance in hydrogen applications. We also provide fluid system evaluation and advisory services to help customers improve the performance of their existing systems, and we provide product design support for fuel systems in vehicles and filling station infrastructure. Swagelok products and services are also integral to success in transportation industry sectors including shipbuilding, aerospace, and tire manufacturing. Our widely certified fluid system products are the standard choice for use in many military and commercial maritime applications.
At Swagelok, we recognise that safety is often the number one priority of our customers, especially those working with and transporting highly volatile fluids as part of their daily business. We can help you build safety into your fluid system-related practices from installation through routine maintenance. We provide:

- A comprehensive programme of safety training and competency skills development
- Leak-tight fluid system designs based on best practices for operator safety
- Evaluation and advisory services that help you address risk factors throughout your fluid systems
- High-quality Swagelok components.

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TEBULO ENGINEERING B.V.

The world is facing several global challenges. The need for new, sustainable energy sources and responsible use of our planet is more urgent than ever. The linear economy, where we extract resources, make products, use them and then throw them away, is no longer sustainable.
By making the transition to a circular economy, we can protect our planet and create a better future for generations to come.

At Tebulo Engineering, we believe that technology is the key to addressing these challenges. Approximately 80% of the projects Tebulo delivers annually are engineering for industry, where sustainability, innovation, development, improvement and creativity are central.
Our projects often include front-end engineering trajectories, but also related activities such as studies, risk assessments, basic and detailed engineering are important.

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TEESING

Your Co-maker for Hydrogen solutions.
For more than 15 years, Teesing is active in the hydrogen industry by designing and delivering high-tech components and subsystems for fuelling, purification, and customised applications.
With expertise in chemical-resistant materials and system engineering, Teesing develops reliable and efficient hydrogen subsystems that meet the highest standards of safety and performance.

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T.EN TECHNIP ENERGIES

Technip Energies is a global technology and engineering powerhouse. With leadership positions in LNG, hydrogen, ethylene, sustainable chemistry, and CO_2 management, we are contributing to the development of critical markets such as energy, energy derivatives, decarbonisation, and circularity. Our complementary business segments, Technology, Products and Services (TPS) and Project Delivery, turn innovation into scalable and industrial reality. Through collaboration and excellence in execution, our 17,000+ employees across 34 countries are fully committed to bridging prosperity with sustainability for a world designed to last.

The office in Zoetermeer is Technip Energies' centre of excellence in hydrogen technologies offering decarbonised and affordable licensed solutions for hydrogen production based on steam methane reforming (SMR), autothermal reforming (ATR) and partial oxidation (POX) processes coupled with tailored carbon capture and purification technologies.

Competences comprise: Licensing, R&D, product development (e.g. industrial burners able for 100% hydrogen firing) as well as the full spectrum of EPC expertise based on which we offer worldwide proprietary grey, blue and green hydrogen technologies as well as revamps (conversion of grey-to-blue, plant modernisation (e.g. energy efficiency), capacity increase, etc.). Our services include (digital) client support in day-to-day plant operation including furnace/reformer surveys and supply of spares.

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Teijin Limited, founded in 1918, is a global enterprise specialising in high-performance fibres, healthcare, films, resin and plastic processing, and polyester fibres. Committed to innovation and sustainability, Teijin delivers advanced solutions across industries.

In hydrogen, Teijin drives sustainability with its aramid fibres like Twaron®, used in reinforced thermoplastic pipes (RTPs) for safe hydrogen transport – offering three times lower environmental impact than steel.

Teijin's Tenax™ carbon fibre is key in hydrogen storage, reinforcing tanks for vehicles, bulk transport, and hydrogen-powered trains and boats. Teijin also offers Miraim®, a microporous membrane made with Ultra-High Molecular Weight polyethylene (UHMWPE), suitable for hydrogen applications.

Additionally, Teijin developed the industry's thinnest gas diffusion layer (GDL) for fuel cells, improving conductivity and durability. It is also advancing ion exchange membranes for proton exchange membrane (PEM) fuel cells.

Through advanced materials and innovative technologies, Teijin plays a crucial role in the shift to a sustainable energy future.

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Energy Innovation NL (in Dutch: Topsector Energy), is the driving force behind innovations that are necessary for the transition to an affordable, reliable and sustainable energy system.
The Dutch Knowledge and Innovation Agenda, as a part of the National Climate Agreement, determines the priorities of the TSE. The specific innovation agenda of TKI New Gas focuses on the following topics:

- Hydrogen: full hydrogen chain as well as the system role that hydrogen can play
- Green gases from biomass through different processes, such as digestion, gasification and supercritical water gasification
- Capture, Utilisation and Storage of CO_2
- Geo energy, with focus on subsurface innovations regarding energy storage and geothermal energy.

Hydrogen is a cross-cutting theme for our Topsector because it deals with all sectors of our national climate agreement as well as addressing the system role which could be beneficial for all stakeholders in the energy transition.

Our main activities include 3 types of activities:

- roadmapping, such as defining innovation agendas together with Dutch stakeholders
- facilitating innovators, for example finding partners, matchmaking and access to funding opportunities
- communication and dissemination on activities, innovation projects, research programmes and relevant developments.

We help innovators to contribute to the energy transition.

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TNO innovation for life

Hydrogen Safety and Secure Hydrogen Infrastructure are part of our broad portfolio of activities that focus on Safe & Reliable Chemistry.

We have unique capabilities for assessing the behaviour of dangerous chemicals and examine processes that operate at harsh conditions. We apply our hazardous chemistry expertise, explosion safety knowhow and highly specialised infrastructure, to assess and prevent risks related to processing, handling and storage of hazardous materials. Our unique expertise supports your pursuit towards inherent safe applications.

We have a proven track record in (customised) testing the behaviour of processes and materials linked to hydrogen. Our hydrogen expertise include:

- both liquid and gaseous hydrogen testing capabilities
- from 0 to 2000 bar pressure
- from cryogenic to high temperatures
- from lab-scale to pilot-scale.
- permeability, tensile testing, material compatibility
- explosion safety, stability, sensitivity
- consultancy

Our team of multi-disciplinary specialists and facilities allow a broad range of possibilities and enable the exploration of innovative developments without compromising on safety.

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Holst Centre
powered by imec & TNO

TNO @ Holst Centre is developing high-tech (production) solutions for next-generation electrolysis stacks by leveraging its extensive background in thin-film technology and integration technologies.

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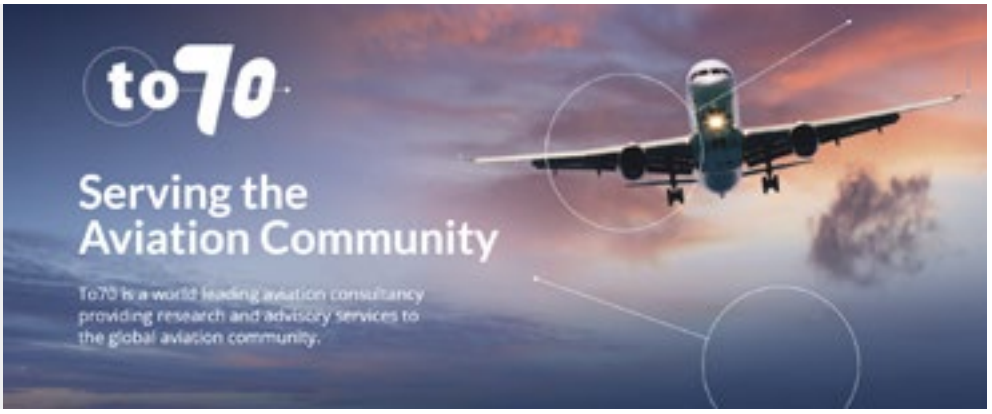

to70

To70 is a leading aviation consultancy firm based in the Netherlands with more than 12 offices worldwide. To70 provides environmental, operations, safety and efficiency services to a wide range of stakeholders within the aviation sector. These include airports, public institutions and government bodies as well as air traffic management and private businesses. At To70 we are strongly committed to a sustainable aviation sector, and aspire to work together with our partners and clients to ensure aviation becomes carbon free and future proof.

An increasing area of attention within sustainable aviation is the development of hydrogen fuelled aircraft. Although still in the early stages of development, increased public awareness of aviation emissions as well as national and European hydrogen developments are pushing innovation. Besides changes in aircraft, the transition to hydrogen will require the wider aviation ecosystem including airports, regulatory bodies and air traffic management bodies to adapt.
At To70, we are able to provide research services and strategy guidance for hydrogen infrastructure, operations, safety and risk management.
Our years of experience, international presence and sustainable vision allow us to support all stakeholders within aviation that aim to develop future hydrogen powered aviation.

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torrgas

Torrgas is a leading technology company in the production of renewable syngas and bio-char. Syngas is the building block of the chemical industry. Torrgas offers viable and profitable opportunity as an alternative for the world's addiction to fossil fuels. After the torrefaction of the waste streams, the Torrgas process converts low value waste into bio-based commodity products with a high added value. Syngas is used for the synthesis of almost any bio-hydrocarbon that are currently produced from fossil fuels; among others in this case Hydrogen.

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TOYOTA
MATERIAL HANDLING

Toyota Material Handling supports businesses of all sizes in overcoming today's logistics challenges with a full range of forklift trucks, warehouse equipment, and automated warehouse solutions. We add value through flexible service offerings, including service contracts, short-term rental, used forklift trucks, and fleet management solutions. We offer a variety of energy solutions for forklifts trucks, including lead-acid, lithium-ion, and hydrogen. Toyota Material Handling operates in 30+ countries across Europe, with its headquarters in Sweden, a European office in Belgium, and production sites in Ancenis (France), Bologna (Italy), and Mjölby (Sweden). Through the acquisitions of Vanderlande, Bastian Solutions, and Viastore, we have strengthened our position as a leading partner in material handling and automation. We are committed to delivering end-to-end solutions for logistics projects of all sizes. By continuously investing in cutting-edge technology, scalable material handling systems, and advanced automation solutions, we help our customers maximise their efficiency and sustainability. Customer focus and continuous improvement are at the heart of our approach. By maintaining close contact with our customers, we provide tailored solutions in technology, energy management, service, and financing. Our operations follow the principles of the Toyota Production System (TPS) and Toyota Service Concept (TSC), ensuring continuous improvement, reliability, and efficiency.

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Tradinco Instruments®

Tradinco instruments, is a supplier for sensors, calibration, equipment, services and software. We have an excellent track record since 1963 and have strong links with the process industry and equipment manufacturers. With our knowledge and hands-on experience, we provide expert advice and if necessary we can design and supply custom instrumentation to match requirements in your application. Customisations can range from small modifications on existing equipment and sensors to completely new developed instruments and software. Our calibration test benches and AutoCal+ calibration software are used around the world. With our ISO17025 accredited calibration lab, we offer facilities and knowledge to do research or qualification tests.

Specifically for hydrogen applications, we offer dedicated sensors and can calculate expected service life of pressure transmitters based on the process conditions and advice on the best option for your application. Our sensors are already used for many years in hydrogen installations for the automotive and semiconductor industry. Next to this we offer customised test, measurement and calibration solutions. For more information, please visit our website or contact us via email or phone.

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TSG Group is a 100% Dutch SME company headquartered in Brainport region Eindhoven with a second office at Brightlands Chemelot Campus in Geleen. As a system integrator, TSG Group develops and realises new products, modules and machines for the industry. We serve different markets like HTSM, LSH, Mobility, Food and Digitalisation.

In our technical projects for B2B customers we combine expertise, skills and experience of hardware and system engineering with software development to create new industrial solutions, to automate processes and to accelerate science based innovation towards the industry with smart development. TSG applies digitalisation to improve new and also existing technical installations and equipment. By integration of sensors and software data can be obtained for valuable insights and to create models for preventive and predictive maintenance.

Some hydrogen related projects TSG is involved i n exist of (plasma) reactor development for hydrogen generation from industrial released greenhouse gas to make the industry more sustainable. Another example is in the field of online software where we have realised the online platform WaterstofNet – Catalyst for sustainable hydrogen projects for our customer. In electrolyser development we support in materialisation, design and engineering, and industrial automation.

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TSG Solutions is a global solutions provider. TSG Solutions has a large sales and service network across Europe and Africa. Thousands of TSG engineers and technicians across 30 countries serve our customers promptly and efficiently: Wherever the client is located TSG is around the corner. TSG provides a wide array of solutions combining equipment sales, services and projects to the energy distribution networks both retail and non-retail (industry) aimed at fuelling mobility systems through its six business segments. The business Segment TSG Gas is focusing on solutions for alternative fuels based on gasses CNG, LNG, LPG and Hydrogen. Regarding the hydrogen market, TSG Gas is a system integrator of storage, mobility, marine and industry applications. We can provide several products from electrolysers, hydrogen fuel stations for mobility and marine sector until hydrogen storage systems in an EPC project approach. Storage systems with type 4 CPV up to 500 bar(G) with H_2 capacity of 560 kg complete installed on 20 FT trailer or ISO container. TSG Gas has a high-level service degree and can provide 24/7 services to their customer due to the automated field services system. Currently we are working on several projects mainly focused on hydrogen mobility systems and storage systems. If you have any questions or requests do not hesitate to contact TSG Gas.

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The TU Delft is the largest Dutch technical university and is highly ranked for engineering and technology worldwide. It contributes to solving global challenges by educating new generations of socially responsible engineers and expanding the frontiers of the engineering sciences. The research and field labs aims at delivering technology-driven, innovative solutions to societal problems through collaborations with leading national and international partners.

The TU Delft is active over the whole hydrogen (value) chain, from production to transportation, storage and distribution, to consumption in for example shipping, aviation, green steel and for seasonal balancing. However, also the whole energy system is considered and how hydrogen (carriers) can be used for large scale transport and storage.

The TU Delft Hydrogen Platform, part of Delft Energy, is the gateway for hydrogen research and innovation at the TU Delft. At TU Delft, roughly 250 researchers are, to some extent, involved in hydrogen research. Through collaboration with the other energy institutes like the e-Refinery, PowerWeb and Wind, multi-disciplinary research questions on for example offshore hydrogen and energy hubs can be tackled.)

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At TU/e, a myriad of researchers is working on hydrogen. Research challenges vary from how to generate hydrogen through intermittently driven electrolysers, to how hydrogen storage is used to manage demand and consumption of electricity under a wide variety of operating conditions. Around 140 researchers are, together with industry, executing projects on for instance the modelling of alkaline electrolysers, cost-effective production of electrodes, the purification of mixtures with Palladium coated membranes, the performance modelling of larger sized solid oxide cells and so on. An internal TU/e Hydrogen Community was established to bundle efforts, share experience on this topic, enhance TU/e's contribution through internal and external collaboration and showcase our research and education on hydrogen. One of the activities of the Hydrogen Community is the organisation of a Eurotech hydrogen summer school for international PhD students, to follow up on a previous two editions organised by DTU in Denmark and the Ecole Polytechnique in France.

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University of Twente is a pioneer in connecting technology, science, and engineering with social sciences to make a differences in the world around us. Societal challenges are bigger than ever: the low-carbon energy and chemical transition, the necessity for worldwide resilience, digitalisation of the society, improving and personalising health care, shaping our vast changing world with innovative materials and smart production systems.

Part of that solution within the UT is our hydrogen community, HyUT. With more than 200 people involved in research and education on hydrogen, and over 60 academics part of the HyUT community, we strive to facilitate a cross-disciplinary and cross-topic coordination across the five University of Twente faculties on the topics of hydrogen-related research and education such as production, utilisation, storage and transport, systems, and policy and society.

Through collaboration with other institutions and industry, locally in OostNL, and across Europe and beyond, HyUT is working on several projects that aim to advance the frontiers of hydrogen-based solutions, and strengthen UT's position as a global leader in sustainable energy research and education.

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TwynstraGudde is an independent consultancy firm, serving public and private sectors.
Our experience in the hydrogen sector covers the entire value chain, from production and global imports to the off-take by end users.

Our approach is scalable and applies to local projects (such as local eco-systems covering 400 houses), regional cases (such as transition roadmaps for industrial clusters), up to international context (such as development of cross-border hydrogen backbones, global import streams and securing strategic security of supply). Our mission is 'make the transition happen', by addressing and ranking the right value opportunities, business drivers, interests, and risks. Moreover, we are experts in bridging differences of interests or opinion between partners and stakeholders, and ways to overcome hurdles (e.g. regulatory or financial).

Using our Cordence Worldwide network and working closely with our international partners, we offer global perspectives and track record to our customers. We believe managing transitions is not merely a technological challenge and that societal, economic and governance aspects are equally important. We execute projects in local, regional, national and international context: from local domestic communities to development of global supply streams.

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VAN LEEUWEN

Van Leeuwen is an experienced supplier for hydrogen projects. We supply our pipe and tube material to producers of hydrogen production plants, compressor stations, ammonia import & storage terminals, and electrolysers. Our proposition to the hydrogen market includes:

- in-house knowledge and expertise on hydrogen applications
- experienced project management teams
- strategic locations near important hydrogen project locations and hubs
- large stock positions ensuring instant availability of pipe and tube material
- global procurement network
- our proven concept of dedicated project storage areas

For hydrogen projects, our main product offer consists of:

- welded and seamless steel pipes
- elbows, bends, fittings and flanges
- gaskets & fixing materials

Van Leeuwen is a globally operating trading company and specialist in steel pipes and pipe and tube applications. The company is headquartered in Zwijndrecht and globally active with over 70 offices and warehouse locations in 33 countries in Europe, the Middle East, Asia Pacific and North America. The family-owned company was founded in 1924 by Pieter van Leeuwen. With a history of a century as a specialised business partner, we live up to our promise of delivering 'More than tubes'. Our employees have specialist knowledge of sourcing, processing, stock planning, project management and logistics. Our passion is to create the best value, working closely together with customers in various segments in the industry and energy markets.

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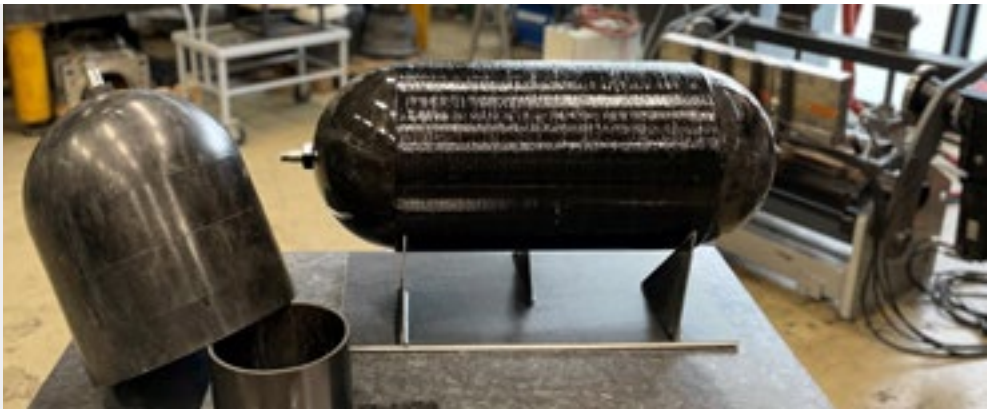

van Wees
UD and Crossply Technology

With more than 80 years of history in machine building, Van Wees has evolved to being bench-mark in production lines for thermoplastic composites and protective materials. Within its Research and Development Centre we have invented a new method for making high pressure tanks, based on thermoplastic composites. This development is at TRL 5/6 level.

This Type 5 tank, with a liner made from the same base material as the reinforcing layers is made much more efficient in comparison to Type 4 tanks. Type 4 tanks, with thermoset carbon fiber reinforcements and plastic liners cannot be recycled without major loss of fiber properties.

The tanks made according to the Van Wees process tanks will be re-used in the same or similar applications and keeping the material properties at the highest possible level. This leads to lower cost price of the tanks and an environmental better solution for tanks in automotive and other applications where weight is an item.

Van Wees is looking for partnerships to bring this development to production level at its prospects/customers.

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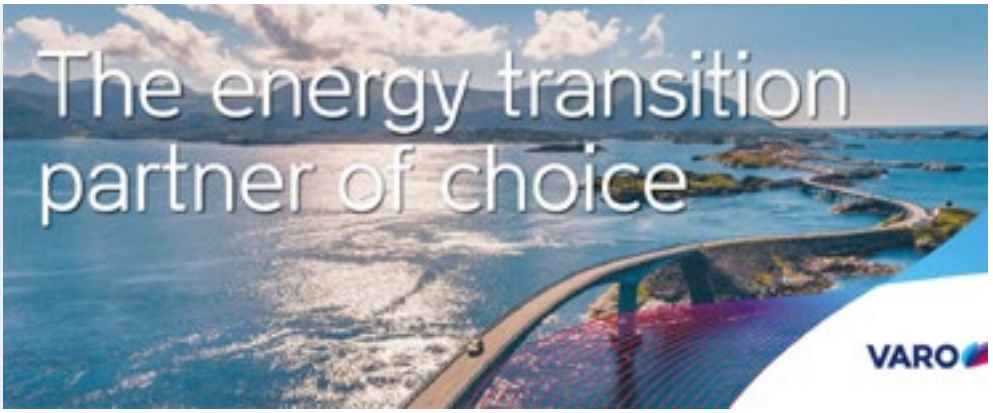

VARO Energy ("VARO") is the partner of choice for customers in the energy transition by providing the sustainable and reliable energy solutions that they need to decarbonise. Engine 1 includes manufacturing, storage, distribution, marketing, and trading of conventional energies. Engine 2 activities are focused on sustainable energies and include biofuels, biogas, green hydrogen, e-mobility, and nature-based carbon removals. VARO plans to invest around $3.5 billion over the 2022-26 period, with two-third committed to sustainable energies. The company has a net zero target for scope 1, 2 and 3 by 2040. VARO is a Swiss-based private company.

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VDL Energy Systems

VDL Groep develops and produces a wide variety of industrial products, from parts to advanced finished products. Our activities can be summarised in the 'five worlds of VDL': Hightech, Mobility, Energy, Infratech and Foodtech. Each of these 'worlds' has its own characteristics and challenges, with one common denominator: a unique combination of thinking and doing. This sets us apart.

As a family business founded in 1953, we cherish the values of workmanship, deliberateness and cooperation. Our employees are our organisation's greatest asset – they enable us to make the difference. By working together closely and combining craftmanship with innovation, we inspire to make change happen. We are aware that the decisions we make today will affect the world of tomorrow. Together with our personnel and partners, we can make a difference today for a better world tomorrow.

VDL Groep has over 14,000 employees in 20 countries. The group encompasses more than 100 closely cooperating operating companies, each with its own specialism. The combined annual turnover stood at 4.281 billion euro in 2024. We stand for strength through cooperation.

VDL Energy Systems is part of the VDL Groep, and is focussed on the design and manufacturing of reliable systems for storage and conversion of energy. The VDL 'e-PU10' is a smart lithium-ion based mobile energy storage system that can be combined with our DC fuel cell charger.

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VDL HYDROGEN SYSTEMS

At VDL Groep, we believe that the strength of achieving real success lies in the pride of the personnel who develops and produces our products. Our curiosity motivates and inspires us to always strive for the best. We ensure that we continue to spark the imagination and develop high-tech innovations that improve everyone's wellbeing and prosperity. With a drive to excel, for now and for future generations. VDL Groep develops and produces a wide variety of industrial products, from parts to advanced finished products. Our activities can be summarised in the 'five worlds of VDL': Hightech, Mobility, Energy, Infratech and Foodtech. Each of these 'worlds' has its own characteristics and challenges, with one common denominator: a unique combination of thinking and doing. This sets us apart. As a family business founded in 1953, we cherish the values of workmanship, deliberateness and cooperation. Our employees are our organisation's greatest asset – they enable us to make the difference. By working together closely and combining craftmanship with innovation, we inspire to make change happen. We are aware that the decisions we make today will affect the world of tomorrow. Together with our personnel and partners, we can make a difference today for a better world tomorrow. VDL Groep has over 14,000 employees in 20 countries. The group encompasses more than 100 closely cooperating operating companies, each with its own specialism. The combined annual turnover stood at 4.281 billion euro in 2024.
We stand for strength through cooperation.
VDL Hydrogen Systems is part of the VDL Groep, and is focussed on the design and manufacturing of cost efficient electrolysers.

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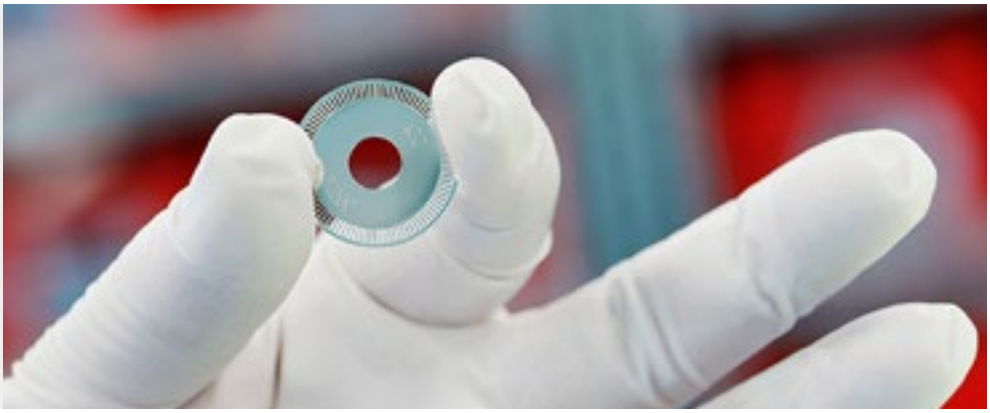

veco

Veco is a world-leading manufacturer of micro-precision metal parts. It serves the world's most innovative, hi-tech companies from industries that demand high quality and precision. To meet customers' specifications and demands, Veco has developed high standards of performance in Electroforming. This technology allows a powerful combination of precision and economical production; for high volumes and prototypes, standard and custom-made products.

Veco's Ni-E³ electrode solutions with surface enlargement up to 20,000 times. With the worldwide ongoing energy transition from fossil into green energy, electrodes are gaining more and more interest. Veco's electrodes solution with its unique properties can be used for Electrolysis, Fuel-cells, and Desalination.

The main difference and advantage of Veco's electrodes is the enlarged surface area that can be achieved. Up to 14 times enlargement has been achieved when this Ni-E³ process is used. In addition, several coatings can be applied that can further result in a surface enlargement of up to 20.000 times resulting in yields that are unprecedented in today's world. The process is sustainable due to zero waste, making it a very cost-effective and future-proof technology in producing Electrodes.

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Vecom is specialist in chemical technical cleaning on-site (worldwide) with over 65 years' experience. We can also carry out metal surface treatments in our metal laundries, located in The Netherlands, Belgium and the United Kingdom.

Vecom focuses on customer and process-specific solutions for complex contaminations and strives to be the best quality service provider in metal surface treatment. Knowledge and experience is combined with flexibility and operational perfection. When it comes to metal surface treatment, Vecom has the knowledge, expertise and equipment to deal with chemicals, metal and waste streams in a responsible way. Safety for people, the environment and your assets are key.

What can Vecom do for the H_2 network? When changing from natural gas to H_2 gas, the existing piping may need to be cleaned depending on fouling. Vecom has the knowhow and experience to chemically clean and/or decontaminate piping systems with a proven method of removal of hydro carbon and sulphur contaminations. Optionally also rust and other inorganic contaminations can be removed. If ultraclean specifications apply, oxygen cleaning and DNV approved methods will be used.

Furthermore, prefab parts for H_2 handling equipment can be pickled and passivated in our metal laundries. If required, the oxygen cleaning method can be applied as well. Please contact our specialists for suitable solutions.
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VEGA produces instruments for level- and pressure measurements. VEGA employs over 2,200 people worldwide, 1,000 of whom work at its headquarters at Schiltach in the Black Forest. This is where, for more than 60 years now, solutions to demanding measuring tasks are being conceived and turned into reality. We have been supplying instruments to almost any industry imaginable, and now, also for the hydrogen industry. Production processes are becoming increasingly complex.
The measurement technology that is used to control and monitor processes should therefore be all the more comprehensible. VEGA has set itself the goal of developing innovative measurement technology that is easy to install and operate that provides maximum security and reliability.

VEGA is active in more than 80 countries with its globe-spanning network of subsidiaries. The company and its products have all the necessary certificates and approvals for world-wide application. This applies to the technical safety as well as to the quality of all products and services.

VEGA offers a wide range of instruments that are compatible with Hydrogen applications. Each with their own specific attributes to remain extremely accurate in harsh conditions. Moreover, due to our experience with our instruments that are already being applied within electrolyser, stacks and storage applications we are equipped and dedicated to help you make your project or product a success.

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As Veolia's global water technology experts, we deliver performance and sustainability without compromise. We provide customers with peace of mind knowing businesses are safeguarded, efficient and resilient. Together we protect, preserve and reuse resources, tackling today's environmental challenges while creating the water treatment and process solutions of tomorrow. Green hydrogen and blue hydrogen industries are key to achieving net zero carbon emissions, and unlocking new and sustainable fuels and chemicals. Veolia focuses on designing and packaging solutions and services around the electrolysers to improve hydrogen electrolysis efficiency. We help customers develop projects to produce green hydrogen sustainably by providing solutions that address crucial process requirements for production, including:

- Water Purification – standard engineered and customised solutions for seawater desalination, reclaimed wastewater or surface waters covering plant capacities with ranges from 100 kWh to over 500 MW H_2
- Hydrogen Gas Purification – standard engineered containerised solutions for 50 MW, 100 MW and 250 MW H_2 plant capacity
- Chemical Solutions and Monitoring for cooling water treatment and membrane cleaning
- Services – optional operation and maintenance of our technologies

Veolia works with industries (refineries, petrochemicals, fertiliser, steel, power), project developers, EPC contractors and electrolyser suppliers on projects for hydrogen, e-SAF, e-methanol or e-ammonia production.

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VoltH2 is committed to developing and operating green hydrogen plants in Europe. The company focuses exclusively on the large-scale production of green hydrogen. This hydrogen is intended for use by local industry and the transport sector. The first two production facilities are currently being developed in Vlissingen and Terneuzen (the Netherlands). These plants are already licensed and are expected to be operational in 2026. Scalability has been taken into account in the design of both installations: in the initial phase, each installation will produce nearly 2 million kg (1,890 tonnes) of green hydrogen per year. In time, production will be expanded to grow along with the market for green hydrogen.

Since the spring of 2022, VoltH2 has been developing a third green hydrogen plant in Delfzijl (within Groningen Seaports). At the start-up, which is planned for the end of 2026, VoltH2 anticipates a production capacity of approximately 50 MW (3,800 tonnes). This plant has also been licensed. At the beginning of 2023, VoltH2 announced the development of a German hydrogen plant in Wilhelmshaven, Germany's primary energy hub. Later that year, steps were taken for a second and third German site in the industrial-rich Ruhr region, specifically in Essen-Frillendorf and Gelsenkirchen.

With the six current locations in the Netherlands and Germany, VoltH2 has a portfolio with a potential production capacity of over 500 MW.

VoltH2 is a collaboration between Volt Energy (the company of founder André Jurres), Virya Energy and DIF Capital Partners.

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VONK is a leading manufacturer of power supply solutions for large-scale electrolysis. Using proven sustainable technology, it delivers affordable customised solutions for green hydrogen projects.

Large-scale green hydrogen production facilities are connected to the high-voltage electrical grid, whereas the electrolysers require a low-voltage DC input. This necessitates power conversion equipment to convert the electricity. For any facility to be granted a connection to the electrical grid, it must comply with grid requirements. On the electrolyser side, the converter must adjust the voltage and current to match the specific requirements of the electrolysers.

Therefore, the optimal choice of power conversion topology emerges from a careful alignment of grid compliance requirements and electrolyser characteristics. Therefore, VONK's NEYA-branded power supplies are available in multiple standard topologies. These are taken and integrated into project- or customer-specific requirements. VONK's deep knowledge of the application, experiences in several demanding industries and adaptable organisation have enabled it to establish VONK as the leading manufacturer of power supplies for large scale electrolysis in Europe.

VONK's NEYA-branded rectifier solutions are preferred with multiple leading OEM's and EPC's because of the following key reasons:

- Smallest footprint
- Cost effective
- PF & Harmonics compliant

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Royal Vopak is the world's leading independent tank storage company. We store vital products with care. With over 400 years of history and a focus on sustainability, we ensure safe, clean and efficient storage and handling of bulk liquid products and gases for our customers. By doing so, we enable the delivery of products that are vital to our economy and daily lives, ranging from chemicals, oils, gases and LNG to biofuels and vegoils. We are determined to develop key infrastructure solutions for the world's changing energy and feedstock systems, while also investing in digitalisation and innovation. Vopak is listed on the Euronext Amsterdam and head-quartered in Rotterdam, the Netherlands.

Vopak is exploring how to set up new renewable hydrogen supply chains between production and demand centres in Europe and beyond. Next to pipelines, other infrastructure will be needed to enable safe, substantial, flexible and cost-effective international transportation, storage and distribution of hydrogen. Vopak aims to provide solutions by creating open access terminal infrastructure at both export and import locations. Together with partners in various countries, Vopak aims to develop storage and transportation, using three technologies: Liquid Organic Hydrogen Carriers, Green Ammonia, and Liquefied Hydrogen.

Vopak is also a partner in the H-vision project that aims to substantially reduce emissions of the Rotterdam industry through low-carbon hydrogen. Please visit www.vopak.com.

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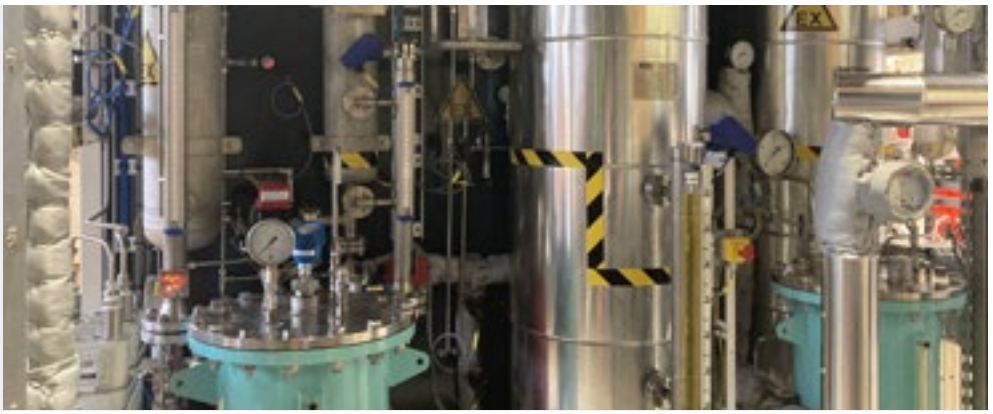

VOYEX
Hydrogen Powered

Voyex develops Liquid Organic Hydrogen Carrier (LOHC) technology. With this technology, we bond hydrogen to a most safe and easy to use liquid that is similar to diesel in terms of handling and storage. Inside heavy-duty mobility, maritime or industrial applications, the hydrogen is released from the liquid and made available to power engines. The LOHC is developed to be circular and can be used hundreds of times to bond and release hydrogen. Voyex LOHC is characterised by a 'safer-than-diesel' hazard level, due to a higher flashpoint and less toxicity profile, and efficient conversions through smart heat integration with hydrogen combustion engines. The combination of a high hydrogen storage content (62 kg H_2/ton) and usage at atmospheric pressures and room temperatures overcomes major storage and distribution challenges associated with the cost and efficiency of conventional hydrogen storage and distribution methods. With this new LOHC technology, we aim to provide a substitute for diesel fuel in applications used in industry, building and construction, marine and trucks. Next to using the LOHC as a fuel replacement to diesel, it is also perfectly suitable for medium-to-long transport of hydrogen and storage large quantities of hydrogen (import). Voyex's three core activities are synthesis of the LOHC substance from sustainable raw materials, developing technology to bond the hydrogen (hydrogenation) and releasing the hydrogen (de-hydrogenation). We develop our technology in-house in the Netherlands in our labs and offices in Delft. Our aim is to deliver a pilot-scale value chain in 2026, including several de-hydrogenation operational systems in the field, and achieve commercial roll out of all technology components in 2027+.

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vsparticle

VSParticle (VSP) is a pioneering Dutch company focused on accelerating the discovery and development of high-performance thin-film nanoporous catalyst layers, a crucial component in electrolyser stacks that would unlock the potential of green hydrogen. In order to achieve global energy transition and climate goals, green hydrogen plays a vital role, as intermittent renewable electricity can be stored in chemical bonds and utilised across various industries.
To meet these goals, it is essential to reduce electrolyser costs while enhancing both the efficiency and longevity of the catalyst layers which is a core component of the system.
VSP has developed a cutting-edge nanoparticle generation technology VSP-P1 Nanoprinter that breaks down the bulk material into nanoparticles while simultaneously deposits them in a single step dry coating process, only using electricity and inert gas. VSP is leading the way with a roadmap to scale its advanced technology to the gigawatt (GW) scale, offering a sustainable, cost-effective, efficient, and automated solution for large-scale green hydrogen production. With this brand manufacturing process for state of the art thin-film nanoporous layers, VSP enables all key stakeholders in the material development process:

1. Top researchers that are pushing the boundaries of electrolyser performance and durability by developing new materials. The VSP-P1 provides the best material synthesis platform to build self-driving labs that are optimised to screen new materials 100x faster than manual R&D.
2. Industrial stack manufacturers looking for next generation Porous Transport Electrodes (PTE) for PEM WE with 90% less Iridium than today.

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VTTI, a global leader in energy storage and infrastructure, is developing a European network of ammonia import terminals and ammonia crackers, called Project Amplifhy Europe. With Project Amplifhy Europe, VTTI will enable the development of the European hydrogen economy, contribute to the targets in the Renewable Energy Directive and support the EU strategies RePowerEU and Fitfor55.
VTTI's offering of ammonia import and cracking facilities underscores its commitment to supporting sustainable energy solutions at two of Europe's most critical energy hubs in Rotterdam and Antwerp:

- Amplifhy Rotterdam: Industrial-scale ammonia import terminal and cracking facility at VTTI's terminal in Rotterdam (ETT).
- Amplifhy Antwerp: Similar facility at VTTI Antwerp (ATPC), offering combined ammonia storage and cracking capacity.

Timeline

- 2024: Feasibility
- 2025-2026: Permits & Engineering
- 2026: Final Investment Decision
- 2029: Operations Start

For over 18 years, VTTI has been a global leader in independent energy storage and now develops critical energy infrastructure needed to move towards a carbon neutral future. Fuelled by its purpose, 'Energy to Move Tomorrow,' the company safely provides and expands access to essential energy, including biofuels, chemicals, gasses, and other energy derived products and accelerates the transition to sustainable sources for customers and partners.

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Water Alliance is a unique partnership of public and private companies, government agencies and knowledge institutes involved in the Dutch water technology. We focus on innovative and sustainable water technology that can be used worldwide and support small and medium sized enterprises in the water technology industry in terms of (international) matchmaking, networking and business development.
Water Alliance is based at WaterCampus Leeuwarden, the Netherlands. WaterCampus Leeuwarden is the physical core of the Dutch water technology sector and has the ambition to play a sector uniting role for the rest of Europe as well. The WaterCampus is an innovation eco-system, which brings together a complete chain of innovation for water technology, from first ideas to research & development, specialised laboratories, a water application centre and various demo sites to launching customers and ultimately tangible business. We help companies to find the best way through the innovation chain to cover their needs and speed up their developments. WaterCampus stimulates cooperation between (inter)national businesses, knowledge institutes and governments within the water technology sector, in order to create synergy for world class innovation, education and entrepreneurship. This strengthens the global position of the European water technology sector. Additionally, WaterCampus offers a unique research infrastructure, and is a meeting point for scientists and companies from all over Europe. The international cooperation organised and stimulated by WaterCampus Leeuwarden leads to knowledge, talent and entrepreneurship that contribute to solutions for global water problems.

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WE – doubleyouenergy® started in the hydrogen world in 2018 and is H2planet Netherlands and Horizon Fuel cell Netherlands, WE – doubleyouenergy® sells Hydrogen electrolysers, storage systems high pressure up to 1000kg / 450bar and metals hydride systems, fuel-cells and hydrogen, methanol and bio-gas electricity generator sets from 20 Watt to 2 MW. For the Netherlands, WE - doubleyouenergy ® is the exclusive re-seller of h2planet products, distributor of Horizon fuel-cells and is agent of UMOE advanced composites, with this participating towards a more sustainable and cleaner world!

WE - doubleyouenergy ®, not only sells but also designs and builds hydrogen systems together with the client and come to the best suitable solutions for your hydrogen requirement, WE - doubleyouenergy ® is a start-up, small but can think big and has a portfolio with some of the biggest suppliers like Horizon, UMOE and H2planet, they have everything you need!

WE - doubleyouenergy ®, has done many projects, i.e. starting with hydrogen cargo bikes for Maximator Hydrogen compressor company as an example what can be done with hydrogen and the municipality of Groningen as a prototype trial. Further the off grid Tiny Solar Hydrogen House Hoogeveen for the municipality of Hoogeveen. And the Solar Hydrogen generator sets for Royal Oosterhof Holman and Volta Energy, also we supplied i.e. the 40kW fuel cell for the Technical University of Delft which was installed in a open sea race boat which became world champion during the Monaco open sea race boat challenge.

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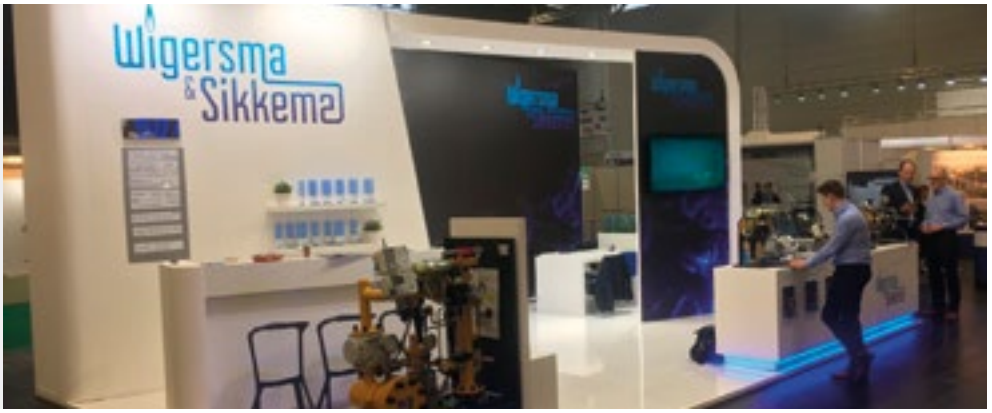

Wigersma & Sikkema, founded in 1921, develops, produces and delivers measurement and control equipment for gas distribution. Products include Electronic Volume Conversion Devices (UNIGAS 300), remote reading systems such as dataloggers and modems (UNICOM 300), gas pressure regulators (RS350S) and inspection systems for gas pressure regulating stations (PLEXOR). With these high-tech products, we are the market leader in the Netherlands and are increasingly gaining a foothold internationally. With years of knowledge and experience and our own R&D and production, we can optimally respond to changes in the market, such as hydrogen and green gas. Wigersma & Sikkema is known for quality products, fast delivery and excellent technical service.

KIWA was commissioned by Netbeheer Nederland to investigate whether existing gas pressure regulation stations for natural gas are suitable for the use with 100% hydrogen. The gas pressure regulation station which was tested had an W&S RS350S DN50 regulator built in. The station was equipped with BMA and BDA system couplings to connect the PLEXOR inspection system. A UNIGAS 300 electronic volume converter was used to measure and record pressure, temperature and flow. For several tests, the PLEXOR inspection system was used. The conclusion is that the station can be operated with 100% hydrogen without modification.
Please find the link to the report of KIWA (April 2021) here: https://wigersma-sikkema.com/wp-content/uploads/2021/04/Kiwa-Gas-pressure-regulating-station-for-hydrogen-1.pdf

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Witteveen+Bos, a renowned Dutch engineering and consultancy firm, has extensive experience in the field of (green) hydrogen – from large-scale industrial hydrogen production facilities to smaller decentralised applications in the built environment.
Our public and private clients (i.e. energy companies and grid operators) both in the Netherlands and abroad benefit from our long history in clean water and our knowledge and experience in high voltage and electrical engineering. After all, both electricity and (process) water are needed to generate green hydrogen. With our background in civil engineering, we are able to lay the groundwork for large projects in complex environments on- and offshore – from feasibility studies and conceptual, basic and detailed engineering to HSE and permitting (see 'Our services' below). We view hydrogen production as an integrated system and actively consider opportunities to integrate oxygen byproducts and reuse residual heat in our designs (e.g. at wastewater treatment plants). In addition to our technical expertise, Witteveen+Bos has extensive experience in advising the private and public sector (e.g. the Dutch government) on policies and strategies in the energy transition, including the role of (green) hydrogen. Our services:

- Advice on strategy, policy, and spatial planning
- Feasibility and scenario studies
- Environmental impact assessments
- Conceptual designs
- Basic and detailed engineering
- CAPEX, OPEX, and business case analyses
- System integration and smart energy hub solutions with hydrogen
- HSE/permit advice and application, including supporting (safety) studies
- Planning

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Founded in 1936, Wolfard & Wessels is an experienced innovator in maritime piping systems. From the traditional engine room systems till the new alternative fuel systems. The company's specialists cover every aspect. Engineering and manufacturing in-house.

Wolfard & Wessels is active in a variety of segments such as shipbuilding, refits, industrial process installations, etc. for piping systems in CuNiFer, stainless steel, super duplex, single and double walled.

Are you looking for the best way to outsource parts or even the complete project? We will be with you every step of the way, from measuring, designing (3D), fabricating to installation and commissioning. The end result is a high quality piping solution, tailor-made to your standards.

Wolfard & Wessels has been using its double-walled piping system for many years to install fuel systems on board seagoing ships and luxury yachts. Double-walled piping systems for engine fuel, helicopter fuel-, gas fireplaces and barbecues, ventilation-, heating systems, etc. For nearly every liquid or gas on board ships, offshore or for industrial applications.

Safety features regarding fire, explosion and air poisoning but also the integration of sensors for monitoring vacuum, pressure or ventilation is part of our knowledge and experience.

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Hydrogen is playing an increasingly important role in the energy transition, with concrete projects strengthening the national hydrogen infrastructure. The climate agreement aims for 4 GW electrolyser capacity, with plans to increase this to 8 GW. These installations are crucial for industrial applications, chemical processes, heating, transport, grid balancing, energy storage, and large-scale electricity production. Reliability, similar to gas and electricity networks, is vital, requiring solid maintenance and inspection strategies.

The focus in hydrogen industry is on scaling up, bringing down costs, similar to the development of wind energy. This acceleration has led to a heterogeneous asset base in wind energy, causing maintenance standards to vary. While the WCM Zephyros Fieldlab helps close this knowledge gap, managing hydrogen installations needs to be integrated into the technological development from the start. The 'Hydro-Boreas' project aims to develop knowledge and expertise for managing hydrogen infrastructure.

There are several challenges, such as new technologies (e.g., electrolysers and compressors), legacy equipment (e.g., gas turbines and pipelines), and uncertainties regarding lifespan and safety. Hydrogen is extremely light, flammable, and has specific safety requirements, such as gas detection to prevent leaks. The project focuses on collaboration to optimise design, maintenance, and knowledge sharing. The 'Hydro-Boreas' project seeks to challenge the sector to accelerate innovations by developing knowledge, learning and improving together.

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WSP is a consulting and engineering firm operating worldwide. In the Netherlands, we have 400 employees working at 10 local offices, offering technical expertise and strategic advice to clients in the sectors Buildings, Infrastructure, Energy, Water and Environment.

Having spent decades working within the gas industry, coupled with our Carbon Capture Utilisation and Storage (CCUS) experience and experience with re-purposing natural gas pipelines to hydrogen pipelines, or engineering new ones, we believe we are strongly positioned to deploy market-leading, clean hydrogen projects for our clients. We have harnessed a multi-disciplinary, global approach when tackling the hydrogen challenge. We understand the complete hydrogen value chain and offer sector-wide expertise and consultancy; with the ability to harness knowledge from a broad range of disciplines and services, as well as internationally. This enables us to advise throughout the design lives of our client projects for hydrogen production, storage, transmission, distribution, and utilisation across multiple sectors.

Hydrogen aligns with our 'Future Ready' innovation programme, which supports our ambition to advise on solutions that are both ready for today and the years to come, giving our clients confidence that we will tailor our approach on a project by project basis to embed sustainability and resilience into our planning and designs.

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XINTC is redefining hydrogen production with its scalable, multi-core electrolyser system, designed for industrial applications and mobility solutions anywhere in the world. Unlike conventional systems, XINTC is the only company offering direct integration of its electrolysers with photovoltaic (PV) systems. This eliminates the need for power electronics such as inverters and batteries, reducing complexity, minimising costs, and maximising efficiency.
A key innovation lies in our all-plastic gas module (stack), which eliminates the use of critical metals, membranes, and seals. This breakthrough enables cost-effective mass production while ensuring that our gas modules are virtually maintenance-free. Our plastic gas modules are designed to seamlessly adapt to fluctuating renewable energy sources, switching on and off as needed for over 100,000+ cycles without performance degradation. This ensures 100% utilisation of available PV energy, eliminating the losses associated with curtailment and power thresholds in conventional systems.
At our Experience Center in Kootwijkerbroek, Netherlands, visitors can explore XINTC's four standardised system modules, which offer flexible configuration options for capacity, hydrogen purity, and output pressure. Additionally, our system eliminates hydrogen losses during the upgrading process to 99.999% purity, a common issue in nearly all conventional systems.
Targeting the global mid-range market, XINTC's systems range from 500 kW to over 100 MW. With unmatched efficiency, low operational costs, ease of use, and the highest safety standards, XINTC sets a new benchmark in hydrogen production.

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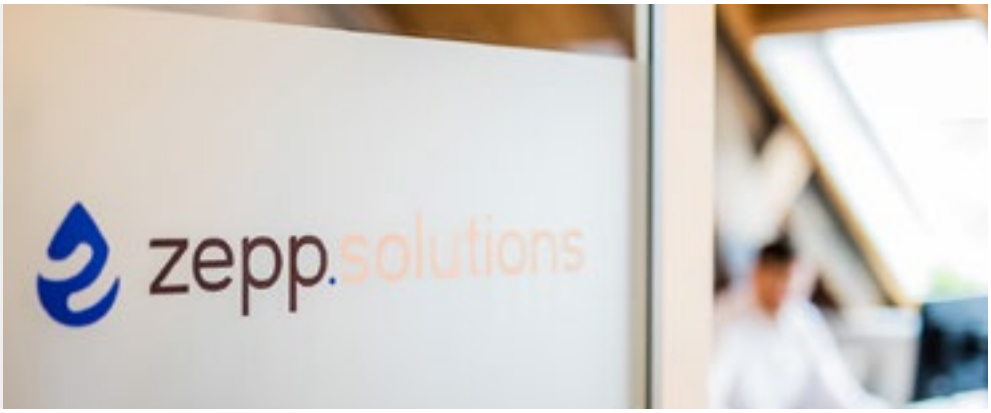

Zepp.solutions is one of the leading hydrogen fuel cell system suppliers in Europe, designing and producing drop-in fuel cell systems for various heavy-duty applications. Zepp.solutions enables its clients' transition towards zero-emission operations by offering fully integrated hydrogen fuel cell systems with minimum integration complexity. Their systems offer robust operations at high efficiency with industry-leading power density. Zepp.solutions also supports concepts and projects with consulting and engineering services, including the development of hydrogen storage systems and integration support for its hydrogen fuel cell systems.

Zepp's systems provide zero-emission power for a wide range of sectors, including transport, maritime, construction, and off-grid applications. The modular design of zepp's fuel cell systems allows for easy integration into diverse applications, from individual vehicles to multi-unit deployments in large-scale projects. Their technology powers projects such as the Rotterdam Watertaxi, the inland shipping barge 'Ab Initio,' the 'Europa' hydrogen-electric trucks, and many more. With a growing portfolio of successful deployments, zepp.solutions is helping its partners reduce emissions and adopt sustainable energy solutions without compromising on performance or practicality.

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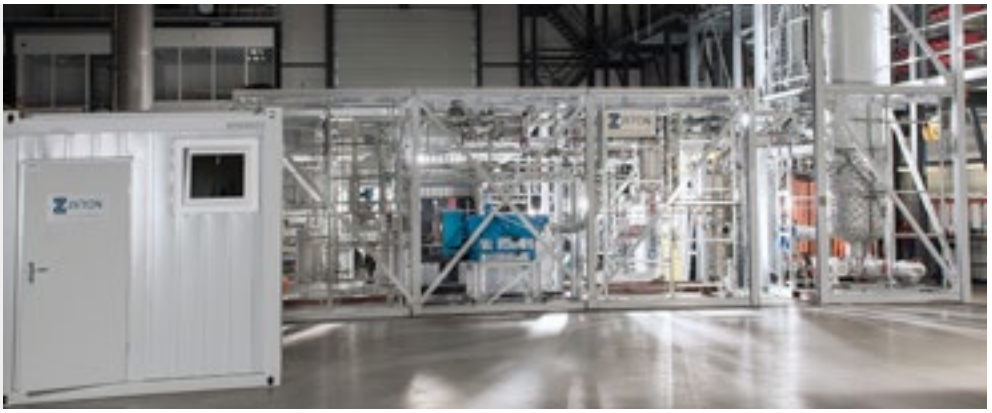

Are you looking for a partner, which provides t he expertise in designing and building process systems to prove your scaled-up technology? As the world's leading Designer and Builder of innovative lab scale systems, pilot plants, demonstration plants and small modular production plants, Zeton helps its customers bring their processes from lab to market, faster, with less risk and lower cost.
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In many of these industries projects are realised which use hydrogen either as raw material, intermediate or product.
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With state-of-the-art, integrated design-build facilities in Enschede, The Netherlands, and Burlington, Ontario, Canada, Zeton has successfully completed over 800 projects in 35 countries across six continents. For more information, please visit our website www.zeton.com

ZETON, one partner from early phase concept to real built process plants.

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We are Novar. We develop green energy systems for the corporate market, including generation, storage, distribution and management, from A to Zero. Our ambition is to generate 4 Gigawatts of sustainable energy by 2030 to accelerate the energy transition. For reaching our goal we realise major turn-key solar energy and energy storage projects, smart grids and more. Every asset we deliver contributes to a green energy system. We work for companies, government institutions and cooperatives, as well as wholesale clients, landowners and clients with green ambitions.

Whatever challenge they're facing – whether it's network congestion, funding or regulations – we'll find a solution. We'll work with all the parties required and use our extensive experience, new technologies and strong determination to make projects a success. This way we are taking the next steps to make the world more sustainable. Ready to take on any challenge, even if no one has ventured there before. This is for example how we built the world's largest solar carport and the first large-scale solar thermal park in the Netherlands. By acting today, we're making a lasting impact. For our clients and for the planet.

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Excelling in Hydrogen

Dutch Offshore Wind Innovation Guide

Solar and storage synergies for a sustainable future

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Advancing biobased energy

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