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OVERVIEW

A tradition of innovation

THE PROVINCE OF NOORD-HOLLAND IS LEVERAGING ITS CLIMATE, LOCATION AND RESEARCH COMMUNITY TO BE A LEADER IN AREAS FROM SEED GENETICS TO RENEWABLE ENERGY. UNSURPRISINGLY, THIS HAS HAD INVESTORS SITTING UP AND TAKING NOTICE, AS NATASHA TURAK DISCOVERS

Faced with the ever-advancing sea, the Dutch have used water to their advantage throughout history, from maritime trading to the science of dams, canals and land reclamation.

The Netherlands' passion for defying boundaries still burns. This small country of 17 million people has one of the world's strongest agricultural sectors, encompassing everything from its famous tulip bulbs to seed genetics. At the other end of the industrial spectrum, it hosts some of the biggest internet exchanges and data centres. The north-western province of Noord-Holland is home to the vibrant capital Amsterdam, and in the north is Noord-Holland Noord, often called 'Amsterdam Next' because of its proximity to the city's logistics hub of Schiphol Airport, the Port of Amsterdam, and an array of land transportation and ICT infrastructure.

Noord-Holland is a focus for innovation, from sustainable energy projects to R&D in seed cultivation. The region attributes its strength to

generations of workers with an innovative spirit, a supportive business climate and the clustering of a variety of smart industries producing lucrative crossover opportunities.

In its pursuit of sustainable power, Noord-Holland works closely with the Energy Board, a partnership of industry, government, research and educational institutions aimed at accelerating renewable energy development and strengthening the economy. "Look, for instance, at green gas," says Noord-Holland vice-governor Jaap Bond, founder of the Energy Board. "We collaborate with the board, whose expertise enables us to produce green gas from agribusiness waste. A whole network of biomass gas installations then uses these leftovers, a beautiful example of a crossover between sustainable energy, the Energy Board and the GreenPort [home of the region's agricultural production]."

New power generation

A growing cluster of SMEs and multinationals comprise the Energy Innovation Park, Noord-Holland's incubator for sustainable energy development. An initiative of provincial and municipal governments and the private sector, the site provides a space in which entrepreneurs can turn their ideas into commercial products. "We are fully committed to the development of sustainable energy," says Mr Bond. "It's a choice that pays dividends: from sustainable energy to a sustainable economy. We are cutting carbon dioxide emissions, working on a more independent energy supply, creating scope for entrepreneurs and creating new jobs."

Plentiful wind and water, as well as the country's highest number of annual hours of sunlight, make Noord-Holland ideal for renewable energy investment. Hans van Breugel, CEO of tidal water turbine producer Tocardo, notes the region's environment as being especially beneficial to his company. "The majority of our economy is driven by SMEs, and we have local supply chains and research. The Energy Research Centre of the Netherlands, the National Research Institute and more have the knowledge to design products that are the most environmentally friendly and efficient," he says.

Niels Unger, managing director of Noord-Holland's Nuclear Research and Consultancy Group, adds: "We have a province that is proud of its high-end industries and supports us. There are not many other parts of the Netherlands where one could have these kinds of operations."

The Netherlands' tradition of innovation and entrepreneurialism goes back centuries, from the Dutch East India Trading Company in the 1600s to the establishment of the world's first stock exchange. Now the country is a global leader in the fields of energy, food production and technology, with Noord-Holland driving the search for local solutions to the world's most pressing issues. ■



Growth project: covering 370 hectares, Seed Valley is 40% greenhouses

Seed money

WORLD-CLASS EXPERTISE IN PLANT SCIENCE MAKES NOORD-HOLLAND'S SEED VALLEY AN AGRIBUSINESS POWERHOUSE WITH GENERATIONS OF EXPERIENCE TO CALL UPON.
NATASHA TURAK PAYS A VISIT

Noord-Holland has been called the most versatile agricultural area in Europe. The region's agribusiness dominance stems from generations of family-owned farms and horticulture businesses through which world-class knowledge has been passed down and is continuously refined.

GreenPort Noord-Holland Noord, known as the food garden of north-west Europe, produces a wide variety of vegetables, fruit, flowers and seeds that are exported throughout the Netherlands and beyond. Home to 6500 companies involved in the agricultural sector, it is a hub for agribusiness research. One of its most far-sighted assets is Seed Valley, a cluster of world-leading companies in plant

breeding, seed cultivation and processing, to which as much as 70% of the vegetable seeds used worldwide can be directly or indirectly traced.

As a country, the Netherlands is the second largest exporter of agriculture in the world after the US, a particularly impressive feat considering the US is 237 times the size of the Netherlands. More than 80% of what the country produces is exported.

One of the many things that makes the businesses at Seed Valley and GreenPort stand out, says Noord-Holland vice-governor Jaap Bond, is commitment to R&D investment. "On average, 16% of company turnover goes into research, and more than 20% for some companies," says Mr Bond. By contrast, overall R&D investment in the Netherlands is 1.84% of GDP.

Enza Zaden, a 77-year-old family business specialising in vegetable breeding and processing, provides a standout example. "About 30% of our budget goes into R&D each year – that's €70m," says general manager Jaap Mazereeuw, who represents the

third generation in the firm. This research goes toward disease prevention, crop yield, appearance, taste, shelf life, resistance and more.

Innovation centre

Covering 370 hectares, Seed Valley is 40% greenhouses and 40% test fields. "When you look at the combination of the metropolitan area of Amsterdam and the open spaces here in the north of the province, that combination is unique. We don't have that anywhere else in the Netherlands," says Theo Meskers, alderman of Hollands Kroon municipality. Mr Mazereeuw adds: "The microclimate here has attracted many companies. Because of all the plant breeding that started here, many companies were able to start and diversify at Seed Valley."

A tradition of knowledge and innovation is pivotal in developing the crops that will feed millions. A major challenge is keeping up with the pace of change. "To produce good seeds is already a challenge, but to produce good seeds with constant quality every year – in different sea- ▶

sons, varieties and species – is very difficult when we produce internationally,” says Mr Mazereeuw. Enza Zaden develops these seeds for millions of growers and distributors across the globe, in an array of different climates.

Seed Valley was established as a brand by a cluster of companies in 2008 to strengthen the sector and attract talent to the industry, but many of the businesses there go back hundreds of years. Bejo Zaden started as a family vegetable breeding business in the late 19th century and now has nearly 1200 employees spread across 30 subsidiaries involved in agricultural production. The area grew as an agribusiness hub, eventually becoming a global exporter.

“That process started after the Second World War,” says Mr Meskers. “We had to think about how to feed all the people who were living here in the Netherlands but also in western Europe. How could we create a new future for all the agricultural companies after the war?”

Going global

For Enza Zaden – *zaden* being the Dutch words for seeds – the answer to this question is not about being multinational, but multilocal. The company now has 42 subsidiaries and three joint ventures across 24 countries in research, marketing and sales. Two-thirds of its 2000 employees work outside the Netherlands. “If you want to be successful with a new vegetable variety, it has to be adapted to local environments,” says Mr Mazereeuw.

“That’s why our research is all over the world and the subsidiary management is almost all local. We believe that local people know the customer and the conditions best, and it’s also more sustainable that local people manage the site.”

Many of Seed Valley’s smaller family-run companies have coalesced through mergers and acquisitions into larger companies, including international ones such as Swiss-based multinational Syngenta. “The Netherlands has a unique infrastructure in terms of knowledge, technology and high-quality services,” says Peter van der Toorn, Syngenta’s global head of breeding for vegetables. “We are talking ‘top tier’ in each of these areas.” UK agribusiness giant Monsanto also operates in Seed Valley.

The cluster of ‘smart industry’ sectors and suppliers and a business-friendly government are among the factors that brought Israeli-Dutch company Hazera to Seed Valley. A subsidiary of French agricultural cooperative Limagrain Group, Hazera’s Netherlands R&D station specialises in crucifers (cabbage, cauliflower and radishes). And it is expanding: building a new €9m, 10-hectare facility for offices, labs, seed testing and production is planned for completion in the next two years.

“At Hazera we’re combining the agricultural strengths of both Israel and the Netherlands, and this sector expertise is particularly present here. That is why we and Limagrain decided to invest here,” says Hazera marketing communications projects manager Lando van Doorn.

“What we want to do is contribute to the global supply of vegetables, in the end for the wellbeing of consumers.” Hazera’s products are present in more than 100 markets worldwide.

“This is a historic cradle for the worldwide seed industry,” says Kees Hertogh, global trial network coordinator for breeding at Hazera. “The pre-existing infrastructure and expertise are key reasons for being here – it’s a combination of favourable circumstances and regulations and the dynamism of entrepreneurship.”

Developing talent

One challenge that remains is finding the right talent to staff the facilities. “There are more than 40 companies here, and we need a lot of talented people abroad and from the region,” says Mr Mazereeuw. “At Enza Zaden, we have more than 100 vacancies per year.” Fostering talent is aided by what is called the ‘triple helix’, a decades-old alliance between the Dutch government, research institutes and the business community.

In addition to education, the government facilitates fundamental and applied research. Within a 30-minute drive are institutes of applied science and Amsterdam University, at which Seed Valley recently established a plant genetics chair. The Seed Valley foundation, in collaboration with training institutes, offers courses across the discipline.

“The government facilitates new projects; we have very good relations with the province and local governments to invest in this business,” says Rik van Wijk, Hazera’s breeding director for crucifers. “We’re close to the world thanks to Schiphol Airport, Amsterdam and Rotterdam harbours, but [we] also have great IT connectivity. In this region the government sees this expertise and entrepreneurship and does a lot to stimulate it. This is where the public and private work together quite well.”

Growers from Canada to India are able to improve the yield and quality of their food production thanks to the Noord-Holland’s history of expertise in the area, proving that no region is too small to take on global challenges. “This is our motto,” says Mr Meskers. “Global issues, local solutions.” ■



THE NETHERLANDS HAS A UNIQUE
INFRASTRUCTURE IN TERMS OF
KNOWLEDGE, TECHNOLOGY AND
HIGH-QUALITY SERVICES



From the ground up

NOORD-HOLLAND'S VICE-GOVERNOR TELLS NATASHA TURAK A STORY OF SUCCESS BUILT ON HARD WORK

Speaking to **fDi** from his office in Paviljoen Welgelegen, an 18th-century country estate and museum, Noord-Holland vice-governor Jaap Bond describes just what makes this northern province of the Netherlands so special.

"Out of our 12 provinces, Noord-Holland is one of the most important economically," he says. "We have a strategic location in western Europe – a huge amount of space right next to a major international hub." Just 30 minutes from the provincial capital of Haarlem is Amsterdam Schiphol Airport, Amsterdam's ports, and the logistics infrastructure that comes with it.

This space is what enables Noord-Holland's industries to thrive, in sectors from energy and agribusiness to state-of-the-art data centres. "It's a region where agriculture is the founding father of everything which happens afterwards. Sixty-one percent of our ground potential is agriculture," says Mr Bond. Noord-Holland is home to the GreenPort and Seed Valley, from where vegetable and flower seeds are exported to more than 100 countries after being bred and cultivated by a range of local and foreign companies. This expertise can be traced back through generations of Dutch family-run businesses, many of which have since joined larger multina-



Noord-Holland vice-governor Jaap Bond



tional companies through mergers and acquisitions.

"What really makes the seed companies unique is the investment in innovation: between 20% and 25% of their total turnover is reinvested in R&D. That's millions of euros every year," says Mr Bond. This was not widely known, says the vice-governor, "because for them it was normal to have the highest standard; they are not used to talking about how good they are".

A strong work ethic has been key to the region's success, according to Mr Bond. "We tell the story that local clothing shops used to sell shirts with the sleeves already rolled up, always ready for work," he says. "People here are hard working, sober and are willing to do everything for their employer. That's been the moral for hundreds of years."

Staying strong

Mr Bond believes that these factors are what has kept the region stable despite Europe's financial turmoil. "In times of crisis, people have been able to work hard for less money because of that loyalty and because they are family companies," he says. "They have a bit of 'fat on the bones' maintaining a certain level of security, which makes this part of Noord-Holland less vulnera-

ble economically compared with other regions of the Netherlands and the rest of Europe."

"Other internationally operating companies are now seeing that there is a best-kept secret in the northern part of our province with the necessary infrastructure and know-how and a willing government to facilitate investment," he continues. "We have a large talent pool coming from the universities of applied science in and around Amsterdam. And you are well connected to one of the most exciting hubs in Europe – we call [our] region Amsterdam Next because it is so close to Amsterdam. We have top-quality land, air and water infrastructure, the last of which we have been investing in for more than 200 years. And our digital infrastructure makes the location even more attractive – Noord-Holland is home to AMS-IX, one of the biggest internet exchanges in the world. Our government now plans to invest more heavily in digital infrastructure than ever before."

And that's not all. "Housing and living costs here are much lower than in Amsterdam," says the vice-governor. "You get more space for your money and there are excellent schools. It is a beautiful place not just to work, but to live." ■

LL
LIVING COSTS
HERE ARE MUCH
LOWER THAN IN
AMSTERDAM





Under glass: Agriport A7 combines intensive cultivation with logistics

Agribusiness and technology unite

DIVERSE TENANTS AND AN INNOVATIVE APPROACH TO ENERGY EFFICIENCY ARE MAKING NOORD-HOLLAND BUSINESS SITE AGRIPORT A7 A NEW KIND OF BUSINESS HUB.
NATASHA TURAK REPORTS

Space, connectivity and a spirit of innovation have conspired to create Agriport A7, considered by some to be the most modern agricultural business park in the world. Occupying 950 hectares in the north of Noord-Holland province (Noord-Holland Noord), the site is home to about 50 businesses, most of them in the greenhouse industry but some in logistics, storage, packing, and what might seem like an outlier: big data. The secret behind the growing success of Agriport is the synergy between the industries clustered within it.

“We started out in 2005 as a project for greenhouses and the agribusiness market, and expanded into a logistics park,” says Jack Kranenburg, Agriport’s commercial director. Logistical synergy came when the greenhouse companies built more than 300 hectares of

greenhouses within the first seven years of Agriport’s start; they expect to double in size once the following seven years are up.

The greenhouse companies have invested more than €600m since Agriport’s start. “Coming from a business that didn’t exist in 2006, this has really been a vibrant place to work, and together with those entrepreneurs we’ve achieved quite a lot in terms of agribusiness. We’re now sold out for 80% of our greenhouse space,” says Mr Kranenburg.

“What makes this area different from others is that we’re very focused on large-scale enterprises,” he adds. The average size of a greenhouse in the Netherlands is between 2.5 and 3 hectares, whereas in Agriport it is about 60 hectares – more than 100 soccer fields.

“Because this area is reclaimed land, we have all the space available for large-scale development. Outside is another 19,000 hectares of open space, all close to Amsterdam,” says Mr Kranenburg. He further notes that Noord-Holland Noord receives 10% more sunlight per year than the rest of the Netherlands. To put that into quantitative terms, 1% more sunlight means 1% more kilos of

tomatoes. “Just by choosing this location, you have a competitive advantage of 10% per year – at no extra energy or building cost,” says Mr Kranenburg.

An energy ecosystem

In addition to recycling rainwater and avoiding chemicals, Agriport’s greenhouses produce their own heat and carbon dioxide, which is essential for growth. Using combined heat and power technology, the cogeneration plants producing heat and carbon dioxide also produce electricity, which is sold to the Dutch electrical grid. The carbon dioxide and heat, instead of being waste products, are then used to grow the crops. In this way, the life-cycles within Agriport are more sustainable, reliable and cost-effective than traditionally powered systems.

“We try to reuse everything,” says Mr Kranenburg. “This cycle saves the companies about €100,000 per hectare per year, simply by using the waste product from one process as a feedstock for the next.”

When it comes to infrastructure, Mr Kranenburg says: “The only way to start a sustainable greenhouse business is to invest in infrastruc-



WHEN YOU THINK YOU'RE WORKING ON YOUR COMPUTER, YOU'RE ACTUALLY GROWING PEPPERS AT AGRIPORT



ture, so we asked the Dutch minister of economic affairs for a licence to establish our own power company. We then made a connection to the national grid at the highest voltage level." This joint energy company, ECW, also has two geothermal heat pumps, which meet around 20% of Agriport's heating needs. The greenhouses now produce power for about 200,000 households. Add to this the current and planned wind power projects in the area and it becomes clear why Agriport is such an efficient energy hub.

Data growth

Vast and affordable land offers a unique opportunity for this collaboration between greenhouse horticulture and sustainable and cheap electricity. Data centres produce massive amounts of waste heat, and instead of sending it into the sea the minds at Agriport have found a better use for it: growing vegetables. Synergy between data centre energy run-off and agricultural production was likely the driving force behind the establishment of Europe's largest data centre in Noord-Holland Noord.

"Back in 2010, after a visit from the data centre project team, we

asked our municipality to change the zoning plan to accommodate a large company requiring a large piece of land," recalls Bjorn Borgers, manager of acquisitions at Noord-Holland Noord's development agency. "We could not tell them who the company was, but they produced the plan and the process four years later was very quick." Thus, in 2014, US giant Microsoft began building its data centre at Agriport.

The site's proximity to Amsterdam, its glass fibre connections with AMS-IX, the world's second largest internet exchange, its ICT and logistical infrastructure, and the cheap energy supply from the greenhouses undoubtedly played a part in the company's decision. And the greenhouse-generated electricity is transferred by ECW to both the national grid and directly to the data centre, whose waste heat then goes right back into growing the vegetables. As Mr Kranenburg says: "When you think you're working on your computer, you're actually growing peppers at Agriport."

Government collaboration

The municipal and national governments have played a vital role in

making this project possible. "Agriport, Noord-Holland Noord and the Netherlands Foreign Investment Agency have been working successfully together for four years," says Mr Kranenburg. "Noord-Holland Noord has been particularly important as a link to the municipality and the province, allowing procedures to be completed in less than eight weeks." This rapid process was not only an important factor in attracting Microsoft, but is also crucial in keeping up with the rapid pace of change in the technology industry.

The data centre at Agriport is now the single largest example of FDI in Noord-Holland in terms of capital. Its establishment has increased the business park's attractiveness to other data companies, and Mr Kranenburg hopes to see more centres built on the land in the coming years. "With the wind power and new sub-station coming in, I think we'll be able to attract two hyperscale data centres to this area in the next few years," he says. Already, satellite enterprises are setting up shop around the data centre, paving the way for a vibrant IT and data cluster. ■

A European powerhouse

FOR A SMALL REGION, NOORD-HOLLAND HAS A WIDE RANGE OF TEMPTING INVESTMENT OPPORTUNITIES IN POWER GENERATION, FROM WIND TURBINES TO NUCLEAR REACTORS, AS NATASHA TURAK DISCOVERS

Necessity is the mother of invention, and for hundreds of years the Netherlands' need to stay above water has fuelled its drive for innovation. Today, the country is actively pursuing a sustainable energy policy, and Noord-Holland is at the heart of the science behind it.

Experts estimate that 10% to 15% of the Netherlands' energy needs can be met by hydroelectric power by 2030. Noord-Holland tidal energy specialist Tocardo is reckoned to be among the top three underwater turbine designers and producers globally, and plans to export 80% of its output by next year. "Our turbines, because of their small scale, are suitable for rivers in countries such as Myanmar, Nepal and India, which desperately need a stable energy supply. And demand is increasing," says Tocardo sales manager Albert-Jan van der Wal.

Meanwhile, about 300 wind turbines in Noord-Holland generate a total output of 343 megawatts, with a goal of 685.5 megawatts of wind energy by 2020. These onshore projects have spurred offshore wind power development, creating jobs and attracting businesses to the area. Noord-Holland is also home to several geothermal wells, but the uncertainty involved in tapping them means they are deemed high risk for investors. Wind power also faces problems in terms of energy storage and predictability, an issue the companies hope to address through continued innovation.

Energy Innovation Park

In the province of Alkmaar lies Noord-Holland's Energy Innovation Park, a growing cluster of SMEs and multinationals that has become an incubator for sustainable energy development. At its heart is Abu Dhabi-based energy company TAQA, which runs Europe's largest open-access seasonal gas store. TAQA built its underground storage facility in the area's depleted Bergermeer gas reservoir, a unique part of Noord-Holland's geological environment. Offering 4.1 billion cubic metres of seasonal storage capacity for the north-west European gas market, TAQA is a crucial component in

the Noord-Holland gas hub.

"People entrust billions of euros-worth of gas to us, so this region is crucial in that we have the geography for these facilities but also people with decades of experience in the industry," says TAQA business development manager Bas Froom.

Petten Research Park in Noord-Holland is home to the Energy Research Centre of the Netherlands (ECN), one of Europe's largest energy R&D institutes and the Nuclear Research and Consultancy Group (NRG), the largest manufacturer of radioactive isotopes for medical use in Europe. NRG runs the nuclear reactors and produces one-third of the world's isotopes, providing treatment for 24,000 cancer patients each day.

"We're far enough from the busy parts of the country but close enough to attract highly skilled employees, and the North Sea provides an exit for our cooling waters," says NRG managing director Niels Unger. "Our customers require timely delivery by road and air. We have excellent logistics and transport infrastructure all nearby."

Safety first

Safety regulations pose problems for private investment into nuclear research, however. New rules are needed to open it up to the private sector and SMEs, and funding needs are huge. "We want to run our current installations for another 10 to 12 years, but to do that safely and reliably, we need to invest," says Mr Unger. The Dutch government and the province of Noord-Holland have provided an €80m loan to begin funding for NRG's new Pallas high-flux reactor, taking on the risk where private investors were more hesitant. Pallas will need €650m to €850m in investment over the next 40 years.

Noord-Holland's commitment to sustainable energy is a driving force for the Netherlands, with a knock-on effect on Europe and beyond. Its geographical advantage, access to talent, logistical infrastructure, knowledge hubs and unique cluster of smart industries prove that big change can indeed come from a small source. ■



Turbo-charged: Noord-Holland-based Tocardo has plans to export 80% of its product by 2016



Seed Valley, just north of Amsterdam, is where 'green software' is developed, the genetic programming that determines a plant's level of resistance to diseases and how vegetables taste. It is home to dozens of specialized companies supplying vegetable and flower growers all over the world with high-quality seeds, cuttings, and young plants. Technology suppliers of this industry have also developed into global players. Together, they form a successful business ecosystem with a high-tech character.

With a rapidly growing global population, innovation in Seed Valley is primarily focused on increasing food production per hectare while reducing consumption of water, artificial fertilizer, and crop protection products. The supply of high-quality seeds to growers - wherever they may be in the world - is the most important factor for increasing the quantity and health value of food produced.

seedvalley.com

GLOBAL CHALLENGES LOCAL SOLUTIONS



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R&D



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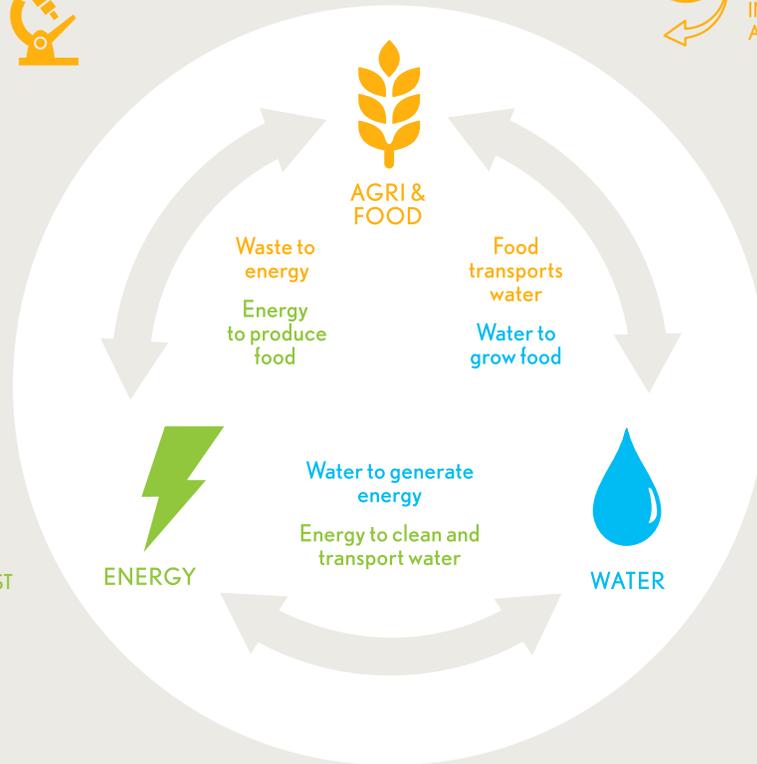
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INVEST IN NOORD- HOLLAND NOORD



The region Noord-Holland Noord is located 30 minutes north of Amsterdam and Amsterdam Airport Schiphol. Here you'll find everything that the Dutch are famous for. For centuries we provide solutions to many challenges: rising sea-levels, population growth, increasing scarcity of natural resources.

Entrepreneurs, knowledge institutions and government agencies are working together closely to apply their unique knowhow to provide innovative solutions to global challenges. As a result, in the last decade the region attracted more than 10 billion euros of investments.

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