

Against the backdrop of having developed and applied innovative solutions to water-related challenges for hundreds of years, the Netherlands is increasingly looking to expand Dutch companies' overseas business opportunities and let key markets, such as the United States, also benefit from these innovations.

Dutch innovation sparks global opportunities in water technology

As essential as water is to life, people all over the world struggle with its related challenges. Some people have too much water and need to develop ways to keep it out. Others have too little and need to create innovative approaches to stretch what they have. And everyone needs to clean it.

While solutions to water challenges have to be applied locally, the search for solutions and innovative approaches is increasingly global. The Netherlands, with its rich history of water innovation, understands this complex relationship with water and has developed an international reputation for water management and technology.

As an experienced watertech partner, the Dutch are exploring opportunities to expand in the United States (US) to create business opportunities and international collaborations.

"As one of the water hubs worldwide, we have a lot of contact with, for example, water hubs in the US and in Canada. We exchange information about the challenges we deal with in the Netherlands and challenges in the US, and how we can add value to each other," says Jantienne van der Meij, US liaison with the Water Alliance, an organization representing the Dutch water technology sector.

Economic impact

The Dutch contribution to the global water industry is built on the strength of the water sector within the Netherlands, where it is one of the most important economic sectors. It represents almost US\$10 billion in annual turnover and contributes substantially to the Dutch economy. Half of the water sector labor force is highly educated, and it creates an added value of more than \$150,000 per person – 25 percent above the average in other Dutch industries.

Nearly 1,000 Dutch companies are active in the area of water technology, which has experienced a 13 percent industry growth since 2012. Furthermore, nearly half of the companies in the water sector expect to grow their turnover by more than 20 percent by 2023.

Innovation drives international partnerships

Opportunities to work with other countries are greatest when the countries face similar challenges. The same goes for the Dutch watertech sector, which sees the potential to have

a positive impact in the US on issues such as the circular economy, wastewater, and water quality. The US, of course, has its own expertise, but the active support of innovation in the Netherlands means it can offer valuable complementary approaches that include a focus on integrating innovative solutions to achieve an overall improvement in cost or process efficiency.

The Netherlands boasts numerous leading universities and research institutes in the water sector. Their significance for innovation is reflected in the country's ranking as the world's fourth most competitive country in the Global Competitiveness Index and its top-five position for scientific research institutions, according to the World Economic Forum.

The Dutch focus on innovation results in much more than research organizations and companies working in isolation. Activities include the collaborative research programs of organizations such as KWR and Wetsus in addition to the approach of building worldwide connections including WaterCampus, the European water hub in the city of Leeuwarden. Particularly important are the close links with end users, with an important role for STOWA, the Foundation for Applied Water Research, as the knowledge center of the country's regional water authorities. All of these collaborative research programs have an emphasis on real-world testing, piloting, and application of new technologies.

Furthermore, the Dutch Ministry of Economic Affairs and Climate Policy backs a policy that promotes business opportunities while focusing at the same time on societal challenges such as climate change, food production, energy transition, and the circular economy. This approach allows cross-sectoral development of integrated solutions to address these societal challenges, which are just as significant to the US as they are to the Netherlands.

Counselor for Innovation, Technology & Science at the Innovation Attaché Network of the Embassy of the Kingdom of the Netherlands in the US and Canada, Sigrid Johannisse sees how the Dutch initiative on water innovation and focus on integrated approaches will position the sector for contributing internationally.

"Involving all key actors is crucial to develop a game-changing approach. Technology alone is not enough," Johannisse says. "The Dutch watertech sector, by involving all its public and

The Netherlands Pavilion at the upcoming WEFTEC 2018 provides an opportunity to explore the possibilities of international partnerships.

Testing the results of new water treatment technology at Watterskip Fryslân, the Netherlands. Photo by Daniel Hartog

private partners, and looking at challenges and opportunities together, masters this game."

The US understands the need for innovation, as evidenced by the growing number of innovation hubs and incubators dedicated to water technology.

"There is an increasing awareness in the US water sector for the need to apply innovations," says Jantienne van der Meij of the Water Alliance, which is based at the WaterCampus Leeuwarden water hub. She notes, for example, the growing number of water innovation hubs such as those in Milwaukee, Akron, and Houston as well as the innovation program of the US Environmental Protection Agency and work by the Water Environment Federation to support hubs in sharing their experiences.

Dutch innovations in the US

In addition to new opportunities for innovative business developments, Dutch companies that are active in the US, such as Paques, Nijhuis, and Royal HaskoningDHV, have the potential to further contribute solutions based on expected needs. These projected needs could include aging infrastructure, new treatment standards, and thousands of water resource recovery facilities that will need upgrading over the coming decade.

Opportunities include offering solutions where there are space constraints or providing options

with lower energy requirements to offset energy costs. It is with such opportunities in mind that 12 companies will be present in the Netherlands Pavilion at the forthcoming WEFTEC 2018, the 91st Annual Technical Exhibition & Conference, to be held on September 29 – October 3.

The circular economy is a prime example of where the Dutch hope to be able to offer complementary solutions. Practical application of this concept is still developing, but it is clear the management of municipal and industrial sewage has a part to play. Progress in the US with uptake of lower energy use options and the recovery of resources such as phosphate signal an interest in this field. Such developments are coupled with the prospect of the need for water resource recovery facility upgrades.

One of the Dutch companies, for example, that will be present in the Netherlands Pavilion at WEFTEC is DMT Environmental Technology. This company offers biogas upgrading systems using membrane technologies to produce pure methane for gas network injection or vehicle fuel, and it also offers technologies for resource recovery. Treating biosolids with thermal hydrolysis increases the biogas production and the digester capacity. Additionally, DMT's product portfolio includes desulfurization technologies to remove sulphur from biogas. According to the company, its membrane technology has produced 250 mil-



Ultraviolet light used to break down contaminants in water.

lion cubic meters of biomethane to date.

The continuing rise in urban populations places an even greater importance on the need to use water in cities with increasing efficiency and still achieve high standards of supply. In this context, NEDAP, another of the companies that will be in the Netherlands Pavilion, offers a range of intelligent, high-efficiency drivers to power UV disinfection lamps. The company supplied the drivers for the new New York City UV water purification plant. The company also offers Naiade, a solar-powered UV water purifier for use in rural areas.

Technologies are also needed to meet environmental water quality requirements in anticipation

Resources

1. Netherlands Water Partnership: www.nwp.nl/en/about-us
2. Water Alliance: www.wateralliance.nl/en/
3. Netherlands in the USA: www.nlintheusa.com/water/

of both rising urban populations and the desire to sustain and grow economic activities, which ultimately depend on the availability of water. As a further example, Netherlands Pavilion participant Titan Salt applies its expertise on the salt industry to the industrial wastewater purification market, using its vaporization and crystallization techniques to provide a customized zero liquid discharge system. Titan Salt creates value from the waste stream and provides a purified condensate that is suitable for reuse or which can be released to the environment.

An emphasis on integrated approaches

The Dutch approach emphasizes bringing such solutions together in an integrated way, which is increasingly recognized as essential in solving water challenges. In practice, applications range from an integrated use of technology in a single installation up to an integrated basin-wide approach.

Mark Niesten, US Project Manager for the Netherlands Water Partnership, another organization that promotes Dutch expertise, says, "The Dutch have a very strong tendency to look for multiple added values in water solutions." This approach is especially evident when a number of driving factors come together, such as urban development, the circular economy, and ecological needs, he adds.

The shift toward an integrated approach is not something that a single technology company can deliver. For this reason, there is a broader strategy of involving Dutch government and public sector representatives that share experiences of integrated solutions to support a wider shift in thinking and expectation.

US-Dutch partnership building

The Dutch anticipation of a need for partnerships and a focus on integrated approaches has prompted the Netherlands to take a long-term view around building its presence in the US. For this reason, there are a number of organizations focused on helping companies and others to make the connections needed in the US to begin the process. These include the Netherlands Water Partnership, the Water Alliance, and the Innovation Attaché Network at the Embassy of the Kingdom of the Netherlands.

The Netherlands Pavilion at the forthcoming WEFTEC in New Orleans in October provides an opportunity to explore the possibilities of international partnerships. The message from the Dutch is for visitors to come along and find out more about the appeal of the integrated solutions offered by Dutch water technology innovations.

Author's Note

Keith Hayward, a journalist who specializes in the water environmental field, prepared this article with contributions from the Netherlands Water Partnership, the Water Alliance, the Innovation Attaché Network at the Embassy of the Kingdom of the Netherlands, and the Netherlands Consulate General in Miami.