



# wateralliance proof

**A TOUR OF  
EUROPE**

**HIGH  
POTENTIALS**

**HOLLAND  
INNOVATION**

**WATER  
BRIDGE**



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A TOUR OF EUROPE  
Eip 2016



HOLLAND INNOVATION  
& inspiration hotspots



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chemistry turned upside down



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Berghof Membrane Technology



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COLOFON

WaterProof is the magazine of the Water Alliance, a partnership between government, research institutions and industry in the field of innovative and sustainable water technology. From its base, the WaterCampus in Leeuwarden, the Water Alliance builds on the 'water technology innovation chain'; a process whereby new ideas from universities, laboratories and test sites are converted into worldwide marketable products. WaterProof provides regional, national and global information on developments, results and background in the field of water technology.



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# OPEN FIELD

*'meeting, sharing  
and collaborating  
is exactly what we  
enjoy doing'*

Anyone wanting to learn the origin of the word 'campus' is up for a difficult task, because the words exact etymology is still not entirely known. Of course, hearing the term brings to mind university grounds, with many different kinds of services and facilities for students and professors. At the WaterCampus, we know all about that, though in our situation we also have to add the prominent role of the business community and laboratories for scientific research.

For our purposes, the Latin definition of the word seems more illustrative. 'Campus' in Latin means something like an 'open field' or 'plain'. That idea of a campus as an open field appeals to me. Because a place to meet, share and collaborate is what comes to mind whenever I imagine education, research and especially doing business in today's context. And meeting, sharing and collaborating is exactly what we enjoy doing at the WaterCampus Leeuwarden. Whether it's in Leeuwarden, in the North Netherlands, elsewhere in the country or at an industry event in Canada or Singapore, we are constantly on the lookout for partnerships. And we're not alone in this. It was with good reason that the WaterCampus was host to numerous delegations over the past months. We welcomed trade delegations, and provided venues and support for a variety of events. These included 'Water Match' (9 February), the European Innovation Partnership (EIP) Conference (10 February), 'Cities & Water' (11 February) and not least, the Water Tech Fest (25 May) – part of a national campaign to promote the Netherlands as a launching pad for start-ups. We were there. We were part of the organization. We learned, and we shared our own knowledge. That same attitude is at the heart of our involvement in the Holland Business Pavilion, now a fixture at water industry events throughout the world. We organize the Pavilion in close collaboration with the Netherlands Water Partnership. The pavilion's theme, The Holland Innovation and Inspiration Hotspot, offers an excellent backdrop for presenting compelling innovations in water technology.

This issue of WaterProof reports on all these activities, spotlighting the valuable collaboration born in the open field provided by conferences, industry events and campuses. I wish you much reading enjoyment and a wonderful summer vacation.

Sincerely,  
Hein Molenkamp  
Managing Director

*Hein Molenkamp*





# ICT and water

It is well known that global development in ICT is a driving force in the water technology sector, and developments are moving quickly. For that reason, the organisers of the Water Info Day in Den Bosch (March 2016) chose to highlight ICT.

Over 550 visitors were inspired and informed about the latest developments in information technology in the water sector. ICT is essential for good water management. Rijkswaterstaat's National Water and Flooding Information System (In dutch: 'Het Landelijk Informatiesysteem Water en Overstromingen'(LIWO)) contains a range of basic information and knowledge, in the form of map layers, which is useful and necessary for anyone familiarizing themselves with flooding. Smart data and information management is also bringing about large changes in the wastewater chain. Koos de Voogt from the municipality of Rotterdam shared his experiences from a Rotterdam perspective. In the afternoon, four experts from Royal HaskoningDHV held round table sessions on smart water management in the waste water chain. The Water Info Day is the annual, independent convention and trade show on information management in the water sector, during which governments, companies, and knowledge organizations inform each other about experiences, new developments, and ambitions.



To review the presentations and program or to sign up for the Water Info Day 2017, visit [www.waterinfodag.nl](http://www.waterinfodag.nl)

## THE BIRTH OF THE ECOWATCH

*High-tech camera continuously monitors cyanobacteria*

**The EcoWatch was put into operation in Lake Paterswolde, just south of the city of Groningen, the Netherlands, on Thursday 7 April. The EcoWatch is an innovative field monitor which allows remote measuring of surface water quality, including cyanobacteria concentrations, over the internet. The product is an innovation of Water Alliance member BlueLeg Monitor.**

Hans Wouters of BlueLeg Monitor was happy to explain what makes the EcoWatch unique. 'Unlike a satellite, the device can measure water quality all day and is not obstructed by cloud cover. The collected data is sent to the water authority over the internet. This data provides water authorities and other surface water managers with real-time information on water quality and allows us to predict how the water quality will develop throughout the next few days. The water authority can conduct cost-effective water management while becoming more knowledgeable about the development of cyanobacteria at the same time. The extra knowledge helps them assess risks better, take measures sooner, and inform the public better.'

According to Wouters, there is a lot of national and international interest in the product. 'Desalination plant managers and companies and organizations involved in drinking water intake, cooling water intake, and fish farming have expressed their interest. If the pilot in Lake Paterswolde goes well, we expect to sell large numbers of our unique product world-wide.'



Hans Wouters

BlueLeg Monitor is not the only party involved in the development of this innovation. The product was developed in close cooperation between BlueLeg Monitor from Sneek, Water Insight from Wageningen, and INCAS3, the institute for high-end sensor technology from Assen in a partnership with the Noorderzijlvest Water Authority and the Paterswolde Lake Authority.

Financial support was provided by the province of Friesland, the Ministry of Economic Affairs, the Northern Netherlands Provinces Alliance, and the Noorderzijlvest Water Authority.



The official opening at Lake Paterswolde.



## AQUA ROBUR WINS EUROPEAN WATERCAMPUS BUSINESS CHALLENGE

*Swedish startup develops alternative power source for water pipe sensors*



The Aqua Robur Team: Liisa Karttunen, Niklas Johansson and Pablo Bardossy

**The European WaterCampus Business Challenge (EWCBC), an event which has gained a well-established status in the European water technology sector, was held from 7 to 11 March this year. Fourteen startups from all over Europe competed for the highly coveted final victory in the seventh edition. Besides the victory itself, the challenge offers a valuable networking platform. Swedish company Aqua Robur won the first prize.**

WaterCampus Leeuwarden has established a leading reputation in many corners of the world, as demonstrated during the EWCBC. The fourteen young companies competing for the prize came from many different countries: Spain, Hungary, Poland, Belgium, Ireland, Sweden, and even India. All the contestants have one thing in common: they believe in their inventions. The only thing missing is the necessary funding and contacts to turn their invention into a success.

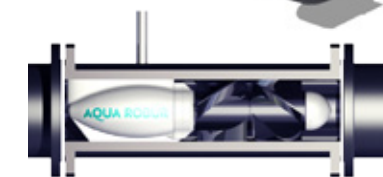
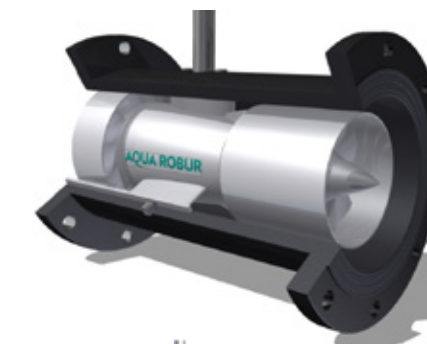
### From idea to commercialization

Suppose you have a fantastic idea for water technology, such as reusing wastewater in chicken abattoirs; how do you turn your idea into a success? In a nutshell, that is the crash course the contestants receive during the five-day EWCBC. During the challenge, there are various workshops on presentation, fundraising, and networking. During the final, the contestants must convince the jury that

their idea is the best. Winning the challenge can make all the difference, as the winner will receive support from WaterCampus Leeuwarden to further commercialize their innovation.

### Aqua Robur

The winner of the EWCBC 2016 is Swedish company Aqua Robur, owned by Niklas Johansson. He developed the Aqua Power Shark system, a revolutionary system for powering sensors in water pipes. A small, in-line water turbine generates precisely the right amount of electricity to power leak detection and water quality sensors. The wireless system paves the way for measurement equipment in remote areas of water supply systems where there is no electricity available.



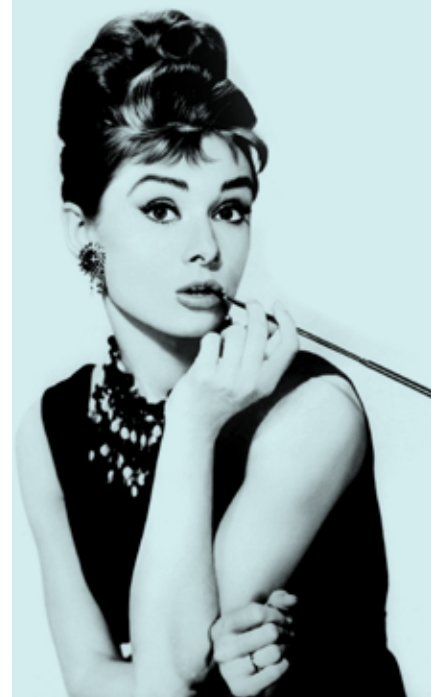
**AQUA ROBUR**

## Quote!

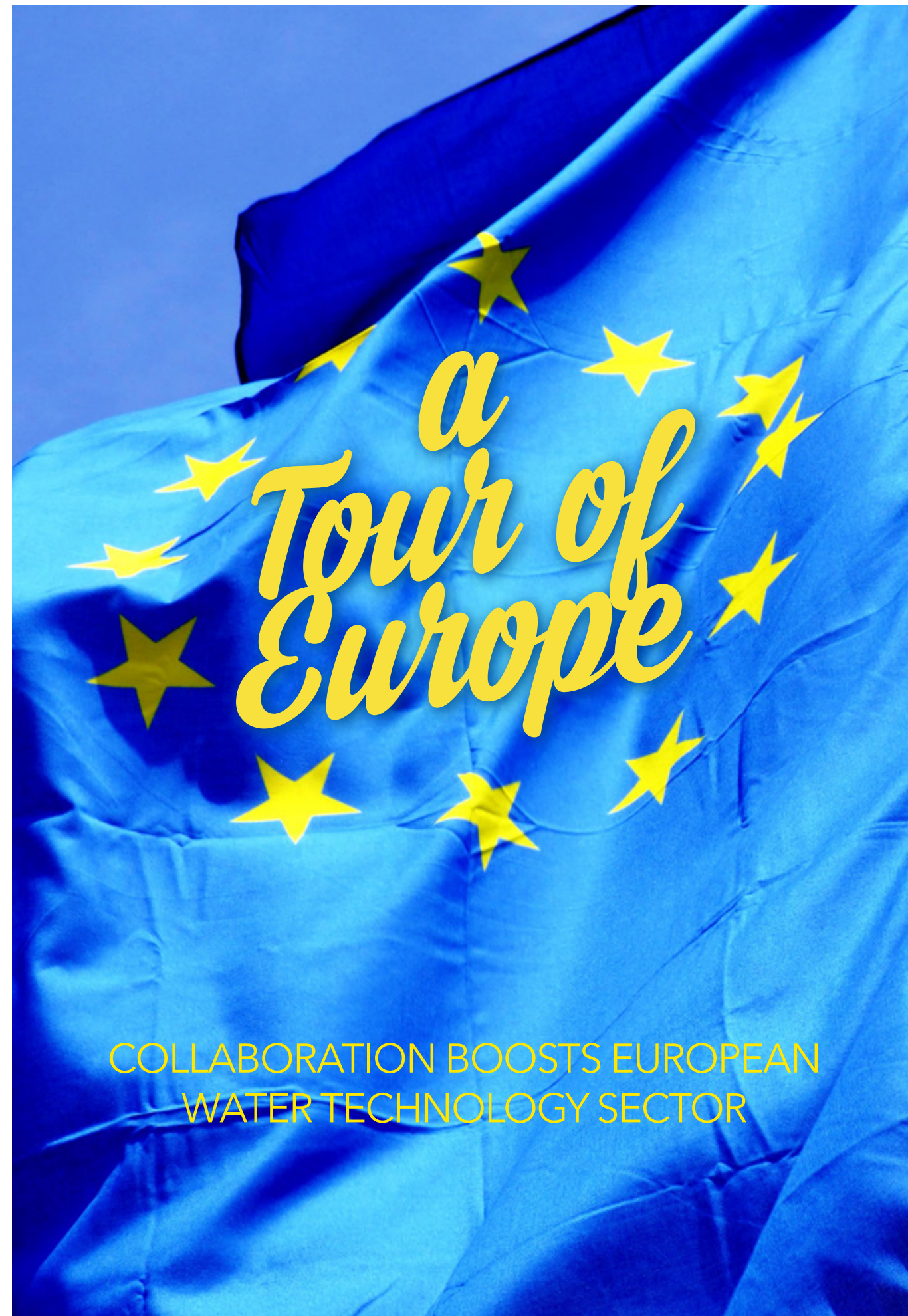
*'People in Ethiopia, the Sudan, etc., don't know Audrey Hepburn, but they recognize the name UNICEF. When they see UNICEF, their faces light up, because they know that something is happening. In the Sudan, for example, they call a water pump 'UNICEF.'*

Audrey Hepburn

Source: [www.brainyquote.com](http://www.brainyquote.com)







*There are many complaints about 'Europe', often referring to the EU. 'Too slow', 'too indecisive', 'too expensive' are issues frequently cited by sceptics. The irritation is sometimes understandable but, at the same time, ignores the positive developments currently taking place everywhere in Europe. In the water technology sector, for example, economic and innovation collaboration is quickly increasing, largely due to the funds provided by Europe to that end. The fact that collaboration is more intensive than ever was brought home during the European Innovation Partnership (EIP) on Water which was held in Leeuwarden last February. The conference was not the only thing to unite knowledge and commerce; matchmaking was enthusiastically carried out at contiguous events as well. Leeuwarden in three days: a tour of Europe.*

## WANTED: INTERNATIONAL PARTNER

Over forty organizations from eleven countries participated in Water Match, a side event of the EIP Water Conference in Leeuwarden on Tuesday 9 February. In search of international cooperation, businesses, knowledge institutes and government agencies met at the WaterCampus for short, one-on-one interviews. The event was an initiative by Water Alliance as a partner of the Enterprise Europe Network (EEN) and the day was a great success.



Most of the forty Water Match participants came from abroad. Aside from the Netherlands, the WaterCampus Leeuwarden was host to organizations from Spain, the UK, Germany, Greece, Argentina, Belgium, Hungary, Portugal, Italy, and Romania. Water Alliance members Amfitech, Berghof, Brightspark, BlueLeg Monitor, DMT, and I-real also participated.

The participants were enthusiastic about Water Match afterwards, as demonstrated by the pile of completed evaluation forms sent in to organizer Matthijs Plijnaar (Water Alliance) a few weeks after the event. 'The evaluation covered various aspects, such as the location and duration of the matchmaking. We scored good to excellent on almost all points.'

Plijnaar is also very satisfied. 'Match-making is highly effective. The fact that the Water Match participants select each other for a meeting beforehand increases the likelihood of cooperation. The participants were highly inquisitive and very interested in each other. Unfortunately, due to the EIP's busy schedule and related activities, not all the meetings were able to take place, but many of those parties still made appointments to meet each other outside of Water Match. One company is located near Schiphol and a British company stopped for a quick visit on their way to the airport after the EIP conference.'



## 'INNOVATION DEPENDS ON POLITICS'

*Experts speak during EIP*



Dutch minister Melanie Schultz van Haegen (left) talking to Mariana Mazzucato (right)

The EIP on Water, held on 10 February 2016 in Leeuwarden, was attended by 700 experts from over sixty countries. Richard Elelman, Head of Public Administration Projects at Fundacio CTM [technological institute, Ed.] in Barcelona, accurately explained the importance of water technology, emphasizing the important role played by politics. 'The importance of water is still greatly underestimated. Wrongly so, as it is the most vital part of our lives, both ecologically and economically. People need to realize that and politics can play a part in that, particularly at the municipal level where they are close to the people. Innovation depends on politics. There will be no change as long as they do not feel the urgency.'

Mariana Mazzucato, Professor in the Economics of Innovation at the Science Policy Research Unit (SPRU) of the University of Sussex, has a clear opinion on project funding: 'Money is often said to be a problem for innovation. It's not. There is money. The problem is the way we have organized financing. The

government can do something about it, but so can businesses. Many companies profiting from government funding forget where they got their first funding once they become successful. They do not have an automatic urge to funnel their profits back into projects which serve a common interest.'

Investing in water technology is not easy, according to Reinhard Hübner, Investment Manager at Skion GmbH. 'The water technology market is a difficult market to invest in. It's very fragmented and there are large differences between countries. In addition, there have only been a few real innovations in the industry. Membrane technology is one of them. Most of the hundreds of products entering the market are inventions; good inventions, but not revolutionary developments which radically change the way we have worked so far. We see opportunities for innovation in sanitation and water treatment, especially regarding the reduction of energy costs and other costs.'

## Quotes about Water Match

*'Halfway through the afternoon I had already had five interviews, four of which were scheduled for follow-up. The organizations were from various countries, including Argentina and Spain. We discussed procurement, sales and potential partnerships.'*

**Rahmat Peijpers**

business developer at Wageningen UR, the Netherlands

*'My company is involved in removing phosphate from wastewater for use in agriculture. I am particularly enthusiastic about an interview with the Dutch company Brightwork which has devised something similar. They could implement some of our cheaper technology in their design.'*

**Chris Drayson**

director of Red Media, Great Britain

*'Water Match has met my expectations. It yielded multiple interesting contacts. We are discussing cooperation with one of the companies, and we will be scheduling a follow-up meeting with another company which may become a customer in the future.'*

**Claudia Silvius**

sales engineer at Berghof, Germany/the Netherlands

*'We had less time for match-making than at Aquatech in Amsterdam last year, unfortunately. Nevertheless, I had good meetings with parties from countries including the Czech Republic, Germany, Greece and the UK. Even if there is not always room for a deal or for cooperation, matchmaking always yields fresh ideas. Events like this enable you to help each other in different ways.'*

**Xavier Florensa**

product sales manager at ADASA Sistemas, Spain

## EUROPE SHARES KNOWLEDGE AT CITIES & WATER

### *Cities discuss each other's water problems*

European cities face various water problems, such as shortage, pollution and flooding. To discuss these problems, over 150 European water experts gathered at the Cities & Water event in Leeuwarden on Thursday 11 February. The conference was one of the side-events of the EIP Water Conference. At the end of the day, the conclusions were recorded in a draft agreement at WTC Expo.



The European Commission, Wetsus, and the Municipality of Leeuwarden were in charge of organizing the event. The participants came from all over Europe. The speakers included European Commissioner Karmenu Vella (Environment, Maritime Affairs and Fisheries), Cees Buisman (scientific director at Wetsus), Ferd Crone, Mayor of Leeuwarden and Carel de Villeneuve from the Ministry of Infrastructure and the Environment. Representatives from large cities, water authorities, knowledge institutes, networks, and businesses throughout Europe were also present.

### Leadership

During discussion sessions and presentations, the national and international experts deliberated on the water issues faced by their cities and regions, such as pollution, shortage,

flooding and aging infrastructure. To solve these problems, it is important that all parties involved, including citizens, are aware of the problems and embrace them, according to Pavel Misiga (head of the unit for Water at DG Environment of the European Commission) during Cities & Water. 'There are various water problems in Europe, but I see many solutions as well. Why can't we unite the problems and solutions? Money is not always the problem; there is enough money. It is mainly due to a lack of leadership. Leeuwarden is setting the right example though.' Mayor Crone received a loud applause following that speech. He noted that the water experts at the WaterCampus deserve a lot of credit. 'We have gained a lot of knowledge in the past years; it is now time to put that into practice.'

### Agreement

At the end of Cities & Water, those present prepared a draft agreement. The document is an important building block for the preparation of the Urban Water Agenda 2030. During the conference in Leeuwarden, agreements were made on, among others, raising awareness among citizens, involving youth in innovations, reducing water consumption, increasing reuse of water, establishment of better infrastructure, and improved cooperation between cities and regions.

'The agreement will be used to set targets, undertake action, and make the most of opportunities', said European Commissioner Vella. 'Cities want prosperity and quality of life. To achieve that, a good water system is essential and, therefore, so is this day. Without the efforts of those present, Europe will never achieve its main water-related goals.' The European Commissioner also spoke well of Leeuwarden. 'The city fills a leading role in water technology, international cooperation, and citizen involvement. When those things are dealt with correctly, it becomes easier to solve problems. Thanks to events like Cities & Water, experts are able to share experiences. Every city has its own problems, but another European city probably faces the same challenges. Governments, water innovators and policy makers all have the same items on their agendas. We need to work together and inspire each other, using Cities & Water as a stepping stone towards better and more efficient water management.' Henk Ovink, Special Envoy for International Water Affairs at the Ministry of Infrastructure and the Environment, was the chairman of the day. He is happy with the agreement. 'Although water is a threat to the world, it provides opportunities at the same time. We need dare seize these opportunities. Storytelling is an important part of that. Water innovators need to continue telling their stories, even when things are not going well. That helps raise awareness among citizens and helps solve the problems faster.'



# EUROPEAN WATER AND ENERGY CLUSTERS JOIN FORCES



ECCP participants at the kick-off event for the new platform, Brussels, 8 March 2016. From the left: Pieter de Jong, EU Liaison, WaterCampus; Michael Green, COSME project coordinator, Research Fellow, Anglia Ruskin University (UK); Bianca Dragomir, director AVAENSE (ES)

Brussels hosted the kick-off event for the European Cluster Collaboration Platform (ECCP-4i) in early March. The platform was set up by the European Strategic Cluster Partnerships (ESCP), an organization uniting the cluster organizations in Europe. These organizations will feed information to the platform, which among its main tasks will maintain a central website and database, to generate a shared knowledge base. An admirable initiative. But, there is already a profusion of alliances, platforms and clusters. So it is sometimes difficult for the intended beneficiaries – European SMEs – to see the forest for the trees. WaterProof approached Pieter de Jong, EU Liaison Officer for the WaterCampus Leeuwarden, to get his take on this new platform's utility and value. Those, as it turns out, are indisputable.

'The goal of the new platform is to unlock a wealth of knowledge and information, while promoting collaboration across Europe and developing a multi-year agenda', says De Jong. 'The many cluster organizations, of which Water Alliance is a good example, have members. Most of them are SMEs. And international growth is one of their main objectives. But it is sometimes difficult to know where to start. Right now there are 23 Cluster Partnerships in Europe, created

at the initiative of COSME, Europe's programme for small and medium-sized enterprises. Each focuses on a different industry. A business or collaborative association serving a particular industry, like for example, water technology, can benefit from having an easy way to find out who's who at the European scale. Finding the right partners, knowing the issues at stake in different places and providing insights on opportunities: those are things businesses have to get straight.

Providing access, via a platform, to knowledge and information from all these organizations and their constituencies, will give European SMEs an edge. It will help guide them to closer collaboration and position them better to take advantage of business opportunities in Europe and, more widely, to launch successful activities outside Europe too.'

*'increase the competitiveness of water technology companies in Europe'*

One of the Cluster Partnerships is 'Energy in Water'. The Water Alliance is a participant in this cluster, representing the Netherlands, alongside cluster partners from France, Spain, Denmark and the United Kingdom. De Jong continues, 'A goal that the Energy in Water cluster has set for itself is increasing the competitiveness of water technology companies in Europe and helping companies achieve their internationalization plans.' An important focus here is the North and South American market. So it was encouraging to note that representatives of South American and Mexican cluster organizations were among those present at the ECCP launch event in Brussels. There is a special network - the European and Latin American Technology-Based Business Network (ELAN) - dedicated to promoting collaboration between knowledge institutes, government and the commercial sector in Europe and South America and the Caribbean.

Participants in the European Energy in Water cluster:

Water Innovation Network (UK), AVEASEN and ZINNAE (Spain), CD2E and EA (France), CLEAN (Denmark) and Water Alliance (Netherlands).

[www.clustercollaboration.eu](http://www.clustercollaboration.eu)





# Dutch water technology in the spotlight

*Holland Innovation & Inspiration Hotspot*

**The Dutch understand water like no other. They understand the possibilities it offers for transport, energy, and tourism, as well as the risks regarding flooding, safety, and pollution. Yet, the knowledge of the Dutch runs deeper. Every day, the secrets of water are researched and revealed in many places in the Netherlands, right down to microscopic level. This regularly results in remarkable innovations with worldwide applications. In order to increase the international publicity of Dutch knowledge and innovations in water technology, Water Alliance has established the 'Holland Innovation & Inspiration Hotspot', a special concept which highlights Dutch water technology's best practices and innovations at large, international trade shows.**

The reputation of Dutch water technology is beginning to resemble the way 'Dutch design' and Dutch DJ's cause a furore. Internationally, 'Bring in the Dutch' is becoming an increasingly common phrase when problems and challenges in water technology are concerned. However, the full extent of what the Dutch water technology sector has to offer is not yet known everywhere; reason enough for the Water Alliance to set up the Holland Innovation & Inspiration Hotspots.

## Extraordinary stories

'Particularly during international trade shows, we want to highlight the fact that these are extraordinary innovations', explains Juliette Douglas, marketing manager at the Water Alliance. 'It is not difficult to distribute a flyer about everything that the Netherlands has to offer. We want to take it further than that; we want to tell the extraordinary tales, as well as the advantages that these innovations can offer the world. Combipro, for example, is the result of a collaboration between Holland Water from Driebergen and HG Ulfima (a member of the Hotraco Groep) from Hegelsom in Limburg. Combipro is a new system for Legionella and biofilm control. The thus far available copper and silver ionisation systems for the control of Legionella bacteria were only allowed to be used in priority locations such as hospitals, healthcare facilities, swimming pools and hotels, and only in the event of an ongoing Legionella problem. The new

system also allows preventive Legionella control measures.' Without hesitating, the marketing manager mentions another example: AWT Watertreatment. 'They are specialists in membrane bioreactors. The company is currently using its expertise to build the world's largest water treatment plant in Tilburg, the Netherlands for companies such as IFF, Coca Cola, Agristo and Fujii. It uses the waste generated by one to help purify the other's wastewater; clever, right? These are compelling examples, with which the rest of the world must become acquainted.'

## Chain of innovation

According to Douglas, the idea behind the selected strategy is to convey the fact that it is no coincidence that many innovations come from the Netherlands. 'It involves many different factors; there is a lot of knowledge, with numerous universities and an institute like Wetsus, but the whole innovation ecosystem is well organized. At the WaterCampus in Leeuwarden, where the Water Alliance itself is based, knowledge institutes, government, Water Alliance, and numerous companies form a chain of innovation which can help from the initial idea all the way to the international product launch. The unique structure we have established in recent years accelerates the process of getting innovation on the market, and that is starting to pay off.'

*'we want to highlight the fact that these are extraordinary innovations'*



Juliette Douglas



# A new way to shower

*Upfall Shower reduces water and energy consumption by 90%*

**Approximately three quarters of all drinking water produced in the Netherlands is used by households. Around forty percent of that is heated only to disappear down the shower drain. René Betgem decided it was time for a change. About fifteen years ago, he began thinking about a way to shower that wastes less water and energy. The result is now on the market: the Upfall Shower.**

## Upfall Shower

Upfall Shower is one of Water Alliance's newest members. Owner / director René Betgem sees substantial benefits to the membership. 'For me, the collaboration with other members is particularly indispensable. It makes networking easy, and that is essential for a new product.' Upfall Shower won second prize at the WIS Award (Water Alliance Innovation Stimulation Award) in January. 'That was excellent publicity. It provided us with a great list of new contacts in the sustainability sector.'

## 90% savings

Pump the used, still warm shower water up, purify it and pump it back to the shower head. That is how the Upfall Shower works, in a nutshell. Hence the name. 'For the average household the water, and more importantly, the energy used for showering can cost hundreds of euros per year. The Upfall Shower can save up to 90% in water, gas and/or electricity, wastewater, and CO2 emissions.'

## UV filtration technology

Keep it simple. That is a lesson that René Betgem learned in the sanitary industry. As a result, the Upfall Shower uses relatively simple technology. The used shower water is first filtered through a microfilter to remove hair and larger dirt particles. UV disinfection is then used to kill or inactivate microorganisms. While the shower head outputs 40 litres per minute, the system adds just one to two litres of clean, heated water every minute.

## World first

On 5 April 2016, the Upfall Shower was installed in a hotel for the first time. Hajé Hotel Joure installed a single shower to gain experience with it. 'It is an important step for us, as well as for Hajé. Hotels are faced with often hefty wastewater discharge fees, and the Upfall Shower can provide appealing savings. It also fits in the sustainability trend. For example, a hotel could offer a zero-energy 'sustainable room'. They can really distinguish themselves with a product market combination like that.'

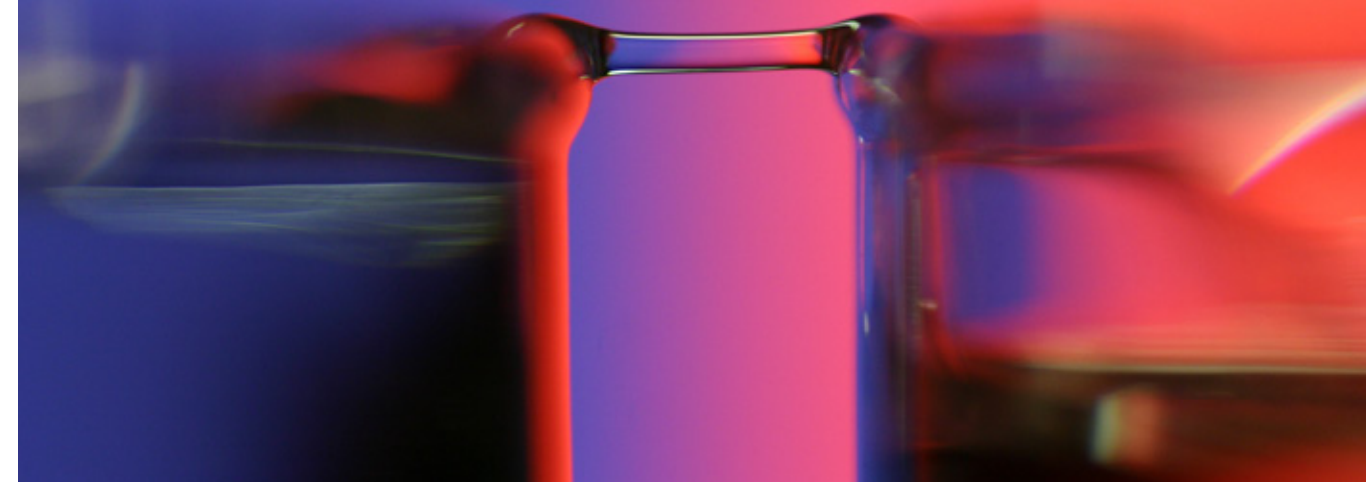
[www.upfallshower.com](http://www.upfallshower.com)

Hot Spot!

Hot Spot!

# Water Bridge

*Chemistry turned upside down!*



**Researchers at Wetsus and the Technical University of Graz, in Austria, discovered that a so-called water bridge can be used to produce electrically charged water. Their discovery holds great promise for the medical world and the industry, among others.**

## Shortage and surplus of protons

The discovery relied on the use of a water bridge, a floating stream of water flowing in both directions between two beakers under high voltage. If the water bridge is suddenly switched off, the charge carriers remain in the beakers: anodic water in one beaker, cathodic water in the other. The anodic water has a proton surplus, while the cathodic water has a proton shortage. During the study, the charged water held the charge for over a week. This was measured using impedance spectroscopy, which measures the electrical resistance of a liquid at various frequencies.

## Strange properties

The research was conducted by a team of scientists: Brabant Water, Waterlaboratorium Noord (WLN) and the Grander Wasserbelebung from Austria. They have applied for a worldwide patent on the discovery. 'The water in the bridge has a number of strange properties', says team member Gerrit Veenendaal. 'Some of them are closer to those of ice, others

to those of water.' He is excited about the recent results of the study the team has been working on since 2007. 'Our findings will turn the chemistry world upside down.'

## Fewer chemical processes

The discovery is significant for a large number of applications. Besides storing an electrical charge, it can be used to produce acids and alkalis without opposing ions. More concretely, Veenendaal is thinking of 'eco-friendly' cleaning products, for membranes for example, reduced waste from chemical processes, and new possibilities for medical applications such as the production of medicine. 'Before any of that can take place, additional and larger-scale research is required to see if it is possible to significantly increase the charge density, thereby also better identifying market opportunities, according to Veenendaal. 'In order to make this possible, we hope that our discovery will excite commercial parties and incite them to support us for the coming time.'

*'Our findings will turn the chemistry world upside down!'*



Gerrit Veenendaal



**Berghof Membrane Technology GmbH (Berghof Membranes) - part of the family-owned Berghof Group - with its sales office in Leeuwarden has put itself on the global map by developing innovative filtration concepts using high-end tubular membrane products. Berghof Membranes is a specialist for filtration and separation of industrial process streams and wastewater. This year will mark Berghof Group's 50th anniversary, an occasion which will be greatly celebrated together with staff, customers and partners.**

# *fifty years of innovation*

A number of special events will take place this year as part of those celebrations. There was an Innovation Day at the IFAT 2016. 'We invited keynote speakers and there was a panel discussion with stimulating propositions', says Eric Wildeboer, CEO of Berghof Membranes. 'The speakers came from many different places, but shared the same drive: clean water for future generations. We discussed the challenges involved in industrial wastewater treatment, in which innovation plays a crucial role. There will be another event on October 6th in Germany, for which each business unit will invite its most important contacts. 'We will show them new partnerships and new technology. The theme of the day will be Trust, Cooperation, and Balance', says Wildeboer.

## **Innovation**

'Wildeboer and Berghof Membranes moved into an office in the Johannes de Doper Business Center at the Leeuwarden WaterCampus in 2008. The situation has changed significantly since then. 'Due to substantial company growth, including an increase in staff, we moved last year into a modern renovated office with 160 m2 at the WaterCampus (first floor Pastorie). The key to Berghof Membranes' great developments is innovation. Creating innovative technology is in the company's DNA. One example is Biopulse, the self-regulating filtration system. 'The technology is an extremely dynamic one', explains Rick Te Lintelo, Director Sales and Marketing at Berghof Membranes. 'The system adapts to the changing conditions of wastewater and aims for the lowest possible energy consumption.'

## **Cooperation**

There are other elements of success, besides developing innovative products. According to Te Lintelo, establishing and maintaining a good network is equally important. 'We attend a lot of international conferences. We are always looking for long-term partnerships with research institutes, universities, consultants, OEM partners and end-users. For example, we plan to have testing conducted by enthusiastic and inquisitive young professionals at the Water Application Center (WAC). As far as end-users are concerned, gaining trust is essential. 'You have to keep your promises', says Te Lintelo. 'Extensive contact with partners is necessary, which is why I often find myself on Skype with clients on the other side of the globe at night.' 'Our service goes much further than delivering a good product', says Wildeboer. 'Berghof Membranes works proactively to fully relieve the customer, even after the purchase.'

## **Invention**

Although the anniversary will be abundantly celebrated, Berghof Membranes has not moved innovation to the back burner. Quite the opposite in fact; Te Lintelo indicates that they have an invention on the way that will turn the world of membrane technology upside down. He won't reveal exactly what the revolutionary invention is just yet. 'We will announce it later this year', he says with a wink. 'For now all I can say is that we have been working on it for a long time and that it will be a game changer.'

*A celebration of history and a glimpse into the future...*

**The Berghof Group was founded in 1966 by professor Georg Zundel.** Berghof Membrane Technology GmbH (Berghof Membranes) is a part of the family-owned Berghof Group and is a leading manufacturer of tubular membrane products all made in Germany. It has years of experience in industrial process streams and wastewater. Last year, Berghof Membranes opened a new office in Singapore for the Asia-Pacific market. Berghof Membranes boasts an impressive list of 1000 references. For more information, visit [www.berghofmembranes.com](http://www.berghofmembranes.com).

*'innovative technology is in the company's DNA'*

Rick te Lintelo (seated) and Eric Wildeboer







His Royal Highness Prince Constantijn:

*‘A framework is needed to connect businesses to the difficult water problems facing the world’*

*‘An incredible environment to do great deals’, that’s how His Royal Highness Prince Constantijn of the Netherlands described the WaterCampus Leeuwarden during his visit on 25 May to open the Water Tech Fest Event. ‘A framework is needed to connect businesses to the difficult water problems facing the world’, he said.*

Prince Constantijn was recently appointed special Dutch envoy for start-ups. It was in this new role that he addressed representatives of the water technology industry at the WaterCampus Leeuwarden.

‘Start-ups have innovative power but lack the ability to bring new technologies to scale. Large companies lack innovative power but can bring technologies to scale. Governments have funding, but lack implementation power’, he said. ‘A framework could provide a potent tool for connecting businesses to pressing water issues.’

The Water Tech Fest brought together international start-ups, investors and business leaders from the water technology sector. The event was part of the week-long Startup Fest Europe, which also featured matchmaking sessions on various themes and sectors.

Startup Fest Europe is part of the official programme of the Dutch presidency of the European Union.

[www.startupfesteurope.com](http://www.startupfesteurope.com)

## ‘Start-ups have innovative power’



Prince Constantijn and the mayor of Leeuwarden, Ferd Crone (l)





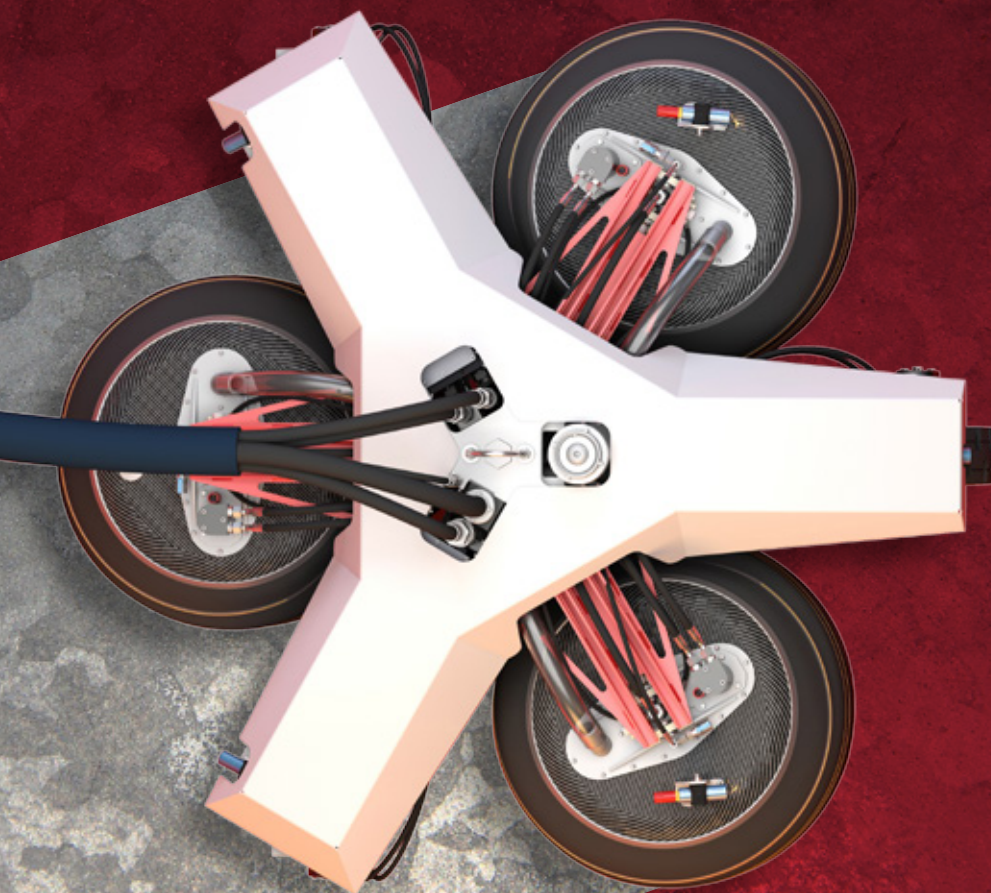
# THE WATER TECHNOLOGY INNOVATION CHAIN

The WaterCampus  
brings together a  
complete chain of  
innovation for water  
technology, from first  
idea, research, specialized  
laboratories, various  
demo-sites, launching  
customers to commercial  
international applications  
by commercial  
companies. Indeed from  
knowledge to business.  
It is driven by the idea  
that technological  
development and  
innovation is needed to  
develop new markets and  
create new business  
opportunities.





# Combining economics & ecology



*The clean and efficient innovation from Fleet Cleaner*

**The attention wasn't anything new. After all, in 2014 they won first place in the Dutch New Venture competition for innovative entrepreneurship (supported by the Ministry of Economic Affairs and McKinsey & Company management consulting). But for Cornelis de Vet and Alex Noordstrand, of Fleet Cleaner, the Water Alliance Innovation Stimulation Award (WIS), which they won early this year, was also a major coup. Both the added recognition and the publicity support that came with the prize were very welcome by the young pioneers. Especially now that they're geared up to 'enter the market' in 2016, following years of intensive preparations. A conversation about an innovation that might just spark off a revolution in ship cleaning. And, on everything that comes with it regarding the setting up and running of a commercial enterprise.**

*Tell us a little something about your backgrounds. How did this adventure begin?*

'Alex and I were both studying maritime engineering at the Delft University of Technology', says De Vet. 'There we learned something that most boaters probably already know: that ships' engines have to be oversized because of all the fouling that accumulates on the hull, like algae and slime. Then we came up with a robot that cleans ships' hulls in the harbour while the vessel is being loaded and unloaded. In the shipping industry that's revolutionary, because up to now environmental regulations required that vessels be cleaned outside the harbour area, usually by divers. So ship cleaning takes a lot of time, which you can save with the Fleet Cleaner. 'To illustrate,' says Noordstrand, 'a diver can clean up to about 400 square metres per hour but our robot covers three times more surface area in the same amount of time. Another thing: the brushing machines used by divers can damage the antifouling coating on vessels. Our robot cleans using high-pressure waterjets.' 'Saving time isn't the only benefit',

De Vet adds. 'There's also reduced fuel consumption. We've done extensive research and can state without a doubt that a clean ship uses up to 5% less fuel. For a medium sized ship, that means a savings that quickly amounts to up to €300,000 on an annual basis.'

*So, you have an idea. Various studies confirm that you've come up with something valuable.*

*What then?*

'It took us two years to build the robot', says De Vet. 'That was no simple task; it has something like 6,000 component pieces. Meanwhile, of course, you start exploring the market. What permits are needed, what partners could offer a helping hand.' 'Our Water Alliance membership was instrumental in all that', says Noordstrand. 'Via that network, we attended a wide variety of trade shows and got to know new partners.'

*One of those partners is Oosterhof Holman. What exactly does that collaboration entail?*

'We're talking about an innovation we hope to roll out worldwide', says Noordstrand. 'That means you have to be confident, and test and retest everything, full scale too, so on large vessels using a demonstration model robot. Oosterhof Holman Environmental Technology is an excellent partner for us in this. They have lots of clients in the maritime industry, and can rent our robot and offer it to shipping companies. We also share a similar vision when it comes to growth. One area they place major emphasis on is developments around the Wadden Sea region, where the authorities are thirsty for innovations that combine ecology and economics. That is also why an organization like the Wadden Sea Foundation supports us. The pilot project and development of a support system to go with the robot cost some €400,000. The Wadden Sea Foundation funded €270,000 of that.'

*What is the link to ecology? Your innovation saves fuel, but does it offer advantages for harbours too?*

'Absolutely', says De Vet. 'The robot is attached to the hull while the ship is being loaded and unloaded. The machine then scrubs the hull clean and vacuums up the waste. Afterwards, we filter out the gunk so that clean water flows back into the harbour.'

'The residual material can then be processed on shore', adds Noordstrand. 'Right now we're investigating whether the residual material can be processed in biogas installations.'

*Fleet Cleaner has been a huge adventure for you both, not only personally but also as entrepreneurs. Have there been frustrations along the way?*

'No comparable installations exist anywhere in the world', says Noordstrand. 'To finally get this innovation right technically has therefore been a huge challenge. Meanwhile, financing has to be arranged, contacts made with market parties, good suppliers found, et cetera. So a great deal of stamina is called for, and perseverance.'

*'ship cleaning takes a lot of time, which you can save with the Fleet Cleaner'*

*You conducted a major pilot project in Eemshaven this past April. How did it go?*

'Obviously, we already knew the robot worked', Noordstrand says. 'But together with Groningen Seaports (manager of the harbours at Delfzijl and Eemshaven, ed.) and Royal Wagenborg (a shipping company), we've now confirmed that the Fleet Cleaner delivers on all the benefits we claim when it comes to sustainability. To do that we deliberately chose a harbour on the Wadden Sea, which since it is a world heritage site operates under extremely tight environmental regulation. The test results were good. For both underwater and above water ship cleaning, all of the fouling removed was successfully captured.'

*What are your aims for the future? Where will Fleet Cleaner be five years from now?*

'Serious interest has been expressed by parties in the Netherlands, Germany, Sweden, Singapore and the United States', says De Vet. 'If this takes off, five years down the road we'll be an active player in many international ports. By then, Fleet Cleaner should have dozens of robot installations operating worldwide. We hope and anticipate that the Dutch maritime industry and the Dutch water technology sector will at that point have another terrific showpiece.'

[www.fleetcleaner.com](http://www.fleetcleaner.com)



Alex Noordstrand (l) and Cornelis de Vet



**UNICEF estimates that 1,450 children under the age of five died every day as a result of diarrhoea in 2014. More than half of those deaths (58%) were a direct result of diarrhoea caused by dirty drinking water, poor sanitary facilities and bad hygiene. UNICEF is working hard to improve those statistics. And others have joined them in the fight, like the Clean Water for Mozambique project. Since 2010, it has achieved success after success in improving sanitation facilities in eight cities in this African country. Project leader Jos Schouwenars, recently back from Mozambique, explains.**



**'We need more businesses involved in sanitation!'**

Jos Schouwenars on Clean Water for Mozambique

The project focuses on sanitation and hygiene in schools, homes and public places. It also pays considerable attention to good hygiene awareness campaigns. The project ends later this year. 'In the seven years we've been active, more than 120 schools have gained access to good toilet facilities', says Schouwenars. 'That equates to 140,000 children who now have a decent toilet to use, and can wash their hands afterwards. That's a tremendous progress. Especially when you consider that seven years ago children did their business in a corner of the schoolyard.' His most recent trip brought him back to a region where the project began in 2010. 'We have made unannounced visits to schools there. Even though we've been gone for two years now, the toilet facilities were still available and being well maintained. Lessons in hygiene and sanitation were also still being given. That awareness-raising is incredibly important. The schools and city government have done good work in that respect. From our perspective it was an excellent investment.'

The city government and school board have worked together to ensure sustainable funding for the project, so the children continue to benefit from safe toilets at school, and it looks like things will stay that way for the foreseeable future. 'Progress aside, some major changes are still needed', says Schouwenars. 'There is room for improvement in the public awareness campaigns, and the basic rules of hygiene could be anchored more strongly in local culture. In the first place, that's a question of priorities. What choices do you make when resources are limited? A new television? Or a safe, hygienic latrine? Local governments in Mozambique have a role to play in informing those kinds of decisions. City governments in Mozambique are the project's main partner. 'We work closely with the cities to build capacities in the area of sanitation. But we also need more involvement of businesses that earn their living by maintaining and managing public toilets.'

When asked what he is most proud of in retrospect, Schouwenars smiles, 'Definitely the amazing kids at the schools. Those hundreds of eyes lighting up in delight at what you're doing. That sticks with you! And another important thing was seeing democratic processes get under way in the cities. For example, city administrators and councillors are now explicitly mandated to provide updates on progress in the area of sanitation.'



Clean Water for Mozambique is a partnership with Wetterskip Fryslân, Vitens water company, the Province of Friesland, numerous Frisian municipalities and many partners in Mozambique. The Water Alliance presented the project a €2,500 cheque to mark its 'Water Link' event in early 2016.

# Bringing 'high potentials' to the WaterCampus

**In March of this year, eight international 'high potentials' came to the Netherlands on a ten-day visit. The Hague, Delft, and Amsterdam were some of the stops on their journey, and of course the WaterCampus Leeuwarden. Here in Leeuwarden, Hein Molenkamp introduced them to the Water Alliance and the WaterCampus. Bob van Bijnen talked about the Water Application Centre (WAC), and Roel Meulepas (scientific project manager) provided a tour of the laboratories and the new Wetsus building.**

The Dutch Visitors Programme (DVP) is a 10-day introductory scheme organized by the Ministry of Foreign Affairs. Its aim is to foster good relationships with future opinion leaders in countries viewed as strategically important to the Netherlands. Six DVPs are held per year, each focused on a particular theme. In March, water was the chosen theme. Participants in this round hailed from Bangladesh, Brazil, Egypt, Malaysia, Qatar, Vietnam, South Africa and South Korea. DVP participants are nominated by the Dutch embassies abroad.









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