

waterproof

wateralliance 

**WATER
CAMPUS**
Leeuwarden

**MEASURES NEEDED TO
PRESERVE WATER QUALITY**

**'EVERY DAY I SAVE 20
MILLION LITRES OF WATER'**

**'MY WORMS NEVER
DISAPPOINT'**



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 in the Northern Netherlands, 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. **Editor in chief** Menno Bakker **Journal management** Brenda de Jong, Narvic Communicatie en media **Text Contributor** Henk Dilling, Casper Ferwerda, Menno Bakker and many others **Graphic Design** Jan Robert Mink **Photography** Franz Fazzi, Heleen Haijtema and many others **Printer** Van der Eems

IN THE SPOTLIGHT!

In a background article on its website CNN recently praised The Netherlands as one of the leading countries in the water technology sector. It's a fitting compliment to the efforts of water technologists, entrepreneurs, knowledge organisations and governments in 'the land behind the dikes'. However, this also represents a challenge to us, that we must be able to maintain this status and where possible, further strengthen our reputation in the future. After all, success is the truth of yesterday. On and around the WaterCampus in Leeuwarden we are working on that future. The innovative technology of tomorrow is created and marketed here. A growing concentration of cutting-edge technology and knowledge industry are working closely together with high-tech manufacturing. This inspiring eco-innovation system encourages an acceleration in the realisation of initiatives that increase economic vitality in the water technology industry. Also in this edition of WaterProof we reflect on some wonderful examples of innovative entrepreneurship and cooperation. We are happy to offer a helping hand when it comes to making the transition from idea to business. As the (business) network organisation of the WaterCampus we work with professional support in the areas of, among other activities; lobbying, matchmaking, marketing and PR. To do so, we constitute an attractive Holland Business Pavilion, in cooperation with our WaterCoalitieNL partners (NWP, VLM and Aqua Nederland), at international trade fairs such as the IFAT in Munich (in May), Singapore International Water Week (June) and the Weftec in New Orleans (September). At the Holland Business Pavilion we really put the spotlight on the Dutch water technology companies. However, this WaterProof publication is also a means to do that. A magazine in which we talk about amazing feats of entrepreneurship in water technology.

Happy reading!

Hein Molenkamp,
Managing Director Water Alliance





This year's edition of the world's largest environmental trade fair IFAT took place in Munich, Germany from 5-9 May. Just like two years ago, the trade fair drew some staggering 135,000 visitors from all over the world.

Water Alliance was present at this bi-annual trade fair as participant and co-facilitator of the Holland Business Pavilion.

The pavilion hosted 14 different Dutch water tech companies, including several members of the Water Alliance: Van Remmen, ISS Tanks B.V., Berghof and Econvert. The special lay out of the pavilion provided an optimum meeting place for potential new clients. Besides facilitating for its members, Water Alliance was able to further develop its network. Worthy of a special mention was the contact with the exhibitors at the Canadian pavilion which was very lively. Recent meetings between the Dutch and Canadian water sectors, both in Canada and Leeuwarden, clearly paid off. At IFAT many Canadian-Dutch business opportunities were further explored for potential cooperation.

Furthermore, relations with the Singapore water sector were strengthened, especially with members of the PUB



water authority. They visited IFAT as an introduction to the Singapore Water Week in June. For Water Alliance this was a unique opportunity to discuss options in order to increase exposure of Dutch companies that will participate at this high level Asian water tech conference and exhibition. During the IFAT trade fair many events took place at the Holland Business Pavilion. Highlight was the well-attended welcome reception.

MEASURES NEEDED TO PRESERVE WATER QUALITY

There is growing concern over surface water at all locations in the Netherlands where used for drinking water. This is due to climate change. Measures are needed to keep this water source to a suitable standard in the future for drink water preparation. The most promising solution is a combination of policies, changes in the water system and a more extensive purification treatment by water companies.

This according to a joint study by Deltares, KWR Water Cycle Research Institute and the National Institute for Public Health and Environment (RIVM).

The quality of water deteriorates as, in an on-going drought situation, the amount of water flowing through the rivers decreases. The impact of wastewater discharges on water quality is then much higher because the concentration of pollutants in discharge streams is less diluted. One possible policy measure that the parties advise is to define discharge permits according to the amount of water flowing through a river. Another measure could be to change the policy on allowable substances and to determine the amount of allowable substances based on their impact on climate change.

In order to combat the contamination of surface water from pharmaceutical drugs and other substances, especially at low tide, more extensive purification by wastewater treatment plants (WWTPs) would also be a good option. WWTPs discharge treated sewage into surface water, which is then used for drinking water. However, this purified water contains traces of pharmaceutical drugs because the water treatment at WWTPs is just not set up to tackle such substances.

Source: RIVM

MASTER CLASS FROM TOP EXPERTS

In cooperation with Empower People, Wetsus is this year organising a quarterly master class on a leading theme from within the water sector. The premiere was in March: "Technology and the limits of technological development."

The next master classes are:

June 12th Summer School

'Resource Recovery and value'

September 18th Autumn School

'Public-private integration'

December 18th Winter School

'Financing of projects in developing countries'

For 2015, the subjects 'water scarcity', 'water & IT' and 'start-ups in a world economy' are on the agenda. Registration for the master class is through www.empower-people.nl. More information can be found at www.wetsus.nl

APPLYING FOR GRANTS? WATER ALLIANCE CAN HELP!

Companies looking for funding to enable their innovation on water technology are invited to contact Water Alliance. Recently, the Province of Fryslân has made regional grants available for innovative projects. One fund is aiming at experimental development (Fryslân Fernijt IV), the other will be available for demonstration and implementation of innovative water

technologies. Water Alliance supports in building strong cooperations, screening the grant proposals and giving access to the appropriate regional grants. Furthermore, Water Alliance has access to organisations involved in granting Dutch and European business fundings. For further information, please contact Bart Volkers: b.volkers@wateralliance.nl.

To do list

18 June 2014: WaterCampus Business Café
21-26 September 2014: IWA, Lisbon
27 September - 1 October 2014: WEFTEC New Orleans
6-7 October 2014: Wetsus Congress, Leeuwarden
2-5 December 2014: Pollutec, Lyon
24-27 March 2015: Wasser Berlin, Berlin



Innovation Attachés from Thailand, France, Brazil, Scotland and Canada visited the Weterskip demosite on May 15 to learn more about waste water treatment in the Netherlands.

WATERCAMPUS BUSINESS CAFE - TOPIC: U.S. AND CANADA

A new edition of the WaterCampus Business Café is going to be held at the WaterCampus on Wednesday, June 18th. This edition is dedicated to doing business on the North American continent. The Water Alliance ensures for a high quality program that includes speakers who will present successful business cases. Moreover, an introduction will be given on the water technology trade opportunities from across the U.S. and Canada. As usual an informal networking reception will follow, which for this time we will add a sparkling element of surprise. More information is available on the website of the Water Alliance. www.wateralliance.nl



WORLD WATER DAY: WHY DOES ENERGY OUTPERFORM WATER?

The national celebration of World Water Day 2014 in the Netherlands took place on 20th of March in Leeuwarden. This year's theme was water & energy. What can be done to promote sustainable practices in the realm of water and energy? The national event in Leeuwarden was organised by WaterCampus Leeuwarden (Water Alliance, Wetsus, CEW, Vitens Evides International, Aqua for All and the Netherlands Water Partnership.

The United Nations, initiator of World Water Day, chose the theme water & energy to raise awareness for the strong link between both sectors. One of the main concerns is that the demand for electricity will increase by 70 per cent by 2035. The organisers of the Dutch event focused on the issue of affordability of water and energy in public services. In particular the participants debated the question 'Why does energy outperform water?'.

3,4 BILLION EURO

Key note speaker was Dutch representative of the European Investment Bank (EIB), Mr. Ben Knapen. He introduced the audience to the world of banking. EIB is a bank that does not want to make profit on its loans. Annually it lends 3,4 billion euro to water-related projects. According to Mr. Knapen the Water Framework Directive is an important guideline with which to judge loan applications. The EIB only grants water projects that are based on the principles that the polluter pays and full cost recovery (beneficiary pays all costs for the water use).

HUB FOR R&D

The WaterCampus Leeuwarden is an important hub for R&D within the Dutch water treatment technology. Elmar Fuchs of Wetsus showed how water and energy could work together and form a 'bridge'. He created the phenomena by filling two beakers with triple deionized water and exposing it to a high d.c. voltage. The water formed a stable, cylindrical bridge between the two beakers. Fuchs explained that the water in the bridge

is stiff. It is in a unique state, in between liquid and solid. Research proved that water reacts differently. Fuchs foresees that his research impacts medicines and biology as there is a large similarity with human cell membranes.

In workshops the attendees of World Water Day discussed why the energy sector outperforms the water sector in developing countries. Energy supply is booming business, whereas the water sector is struggling to provide access to safe and affordable water for more people. A record number of 33,000 Dutch children of primary schools participated in the campaign 'Walking for Water'. The children walked 6 km with 6 litres of water in a backpack, like many of their peers in developing countries who have to walk this distance to fetch their daily water. A total of 1,321,738 euro has been raised. The money will be spent on water projects in Africa and Asia.

MORE ABOUT WORLD WATER DAY

A full report of World Water Day 2014 in Leeuwarden can be read online. Jac van Tuijn published an article in English on the website of World Water Day.

www.wereld-water-dag.nl



Mr. Ben Knapen



WHAT IS THE WATER ALLIANCE INNOVATION STIMULATION AWARD?

The Water Alliance Innovation Stimulation (WIS) Award is a prestigious award that helps your business to get (international) attention for your innovative product. If you are nominated, you will compete against the other nominees in the autumn of 2014 during several rounds of the award. Moreover, your innovation will be included in media communications of the Water Alliance during this period. The winner of the award will be announced during the grand finale on the WaterLink symposium in January 2015. Win the WIS Award and you will receive a marketing and communications support package to the value of 10,000 euro to promote your innovative product internationally.

Conditions for participation:

- The product is innovative within the water technology industry
- Commercially available
- Not older than 2 years (<2 years commercially available)
- Maximum one entry per company
- You assume all supporting promotional activities

For more information please visit:

www.wateralliance.nl/wis

"Water is the looking glass of Earth, the tool with which to read the passing of time."

Paul Claudel
French poet 1868-1955





THE 'GUINEA PIG' POTATO

IWC and ATB boost innovative disinfection

How exactly do innovations happen? Often when people come together with innovative ideas, there's the famous 'click' and they inspire each other to share knowledge. Take for example the cooperation between the companies Innovative Water Concepts (IWC) in the Frisian 'Grou' and ATB Netherlands in Wapserveen. The parties were brought together by Alex Berhиту, Coördinator Business Development at Water Alliance, and immediately shared the 'feel good factor' about each other. Cooperation seemed appealing. What followed became an investigation into how you can best combine innovative cleaning technologies for, amongst other things, food products and associated equipment to be more efficient and sustainable. The potato was chosen to play the part of guinea pig. The concept is sound: fewer infections and less rinse water. Good for economy and ecology.

A short introduction of the key stakeholders: the company ATB Netherlands, run by businesswoman Gentia Lokkers, is one of the few specialists in the field of disinfection of air and water through ionization. This ionization technique has been increasingly developed over the last decades. ATB can trace its roots of involvement in this technology some way back to the Nineteen Thirties, explains Lokkers. "The grandfather of my German partner had been studying the ionization technology at the time, in order to try to improve air quality on submarines. Technically, it did not work at that time. Years later, after the fall of the Berlin Wall, this technique was taken out of the deep-freeze and developed further together with the University of Bremen. This technique is nowadays not only used by us for the purification of air, but also of water. This is a global marvel. The big advantage is that by purification with ions, no chemicals are needed. It is also safe for humans and the environment and there are no harmful residues. This technique is currently most often used in the beer industry."

60 PER CENT LESS WATER

Then there is the Frisian company Innovative Water Concepts (IWC) owned by Tjerk Nijdam and Ton Winters. This company has developed a cleaning technique that allows all kinds of food, from vegetables to chicken, as well as the associated industrial equipment to be cleaned under high pressure using a mixture of air and water. The technique (Undine) is based on an innovative device that contains special nozzles inside it. "In many industries, you cannot stop flushing," explains Nijdam. "The great advantage of our technique is that you use 60 per cent less water. All our customers put together already save every day twenty million litres of water. Can you imagine what this could mean on an international scale?"

DRAMATIC IMPROVEMENTS

Alex Berhиту recognized the potential power of such an alliance and consequently organised a matchmaking meeting between ATB and IWC. They clicked! The concept was that combining both technologies could potentially lead to dramatic improvements, which could not only prove cost effective for the industry, but could also mean good news for the environment. As guinea pig, the potato was chosen, as this product is susceptible to contamination, for example by contact with rotten tubers during harvest.

Along with the research department of Life Science Research&Development (LSRD, a collaboration between the universities of applied science of Van Hall Larenstein and NHL), a consortium was launched, which also included the participation of several other companies. Sytze Wiegersma of LRSRD recalls: "After some delay it turned out that our study was suitable for funding under the Fryslân Fernijt program. So, in cooperation with Applied Plant Research (part of Wageningen University, ed.) we investigated whether a combination of techniques for cleaning potatoes would lead to better results. We came to the

conclusion that this was clearly the case." Percentages are hard to call, says Wiegersma. "It will always be microbiology and is by nature complex. However, the fact that you see substantial improvements in disinfectant performance is a very good starting point for further research." Lokkers from ATB added: "That's exactly what we want. We see business opportunities. It would be nice for example, when the next follow up research project gives us a basis to provide actual devices for various industries."

SIGNIFICANT ENVIRONMENTAL BENEFITS

Where do these partners see themselves in five years' time? "Hard to say", says Nijdam from IWC. "I hope that together we will have refined one or two methods that will be truly adopted and will enable industry to be that much more efficient and cleaner again." Lokkers dares to take that one step further. "I have a green heart. The significant environmental benefits we hope to achieve over the next five years represent an important motivation for both our companies. Furthermore on a business level, I am also ambitious. I would like very much to be market leader by that time in my specific segment."

Berhиту overheard this interview with an amiable smile. "Of course what happens here so far is all pioneering work, you cannot really predict everything. But it's nice to see how, based on the very first round of technology research, things really get into motion. The only thing that was needed was a cup of coffee at a motorway cafe in Heerenveen."



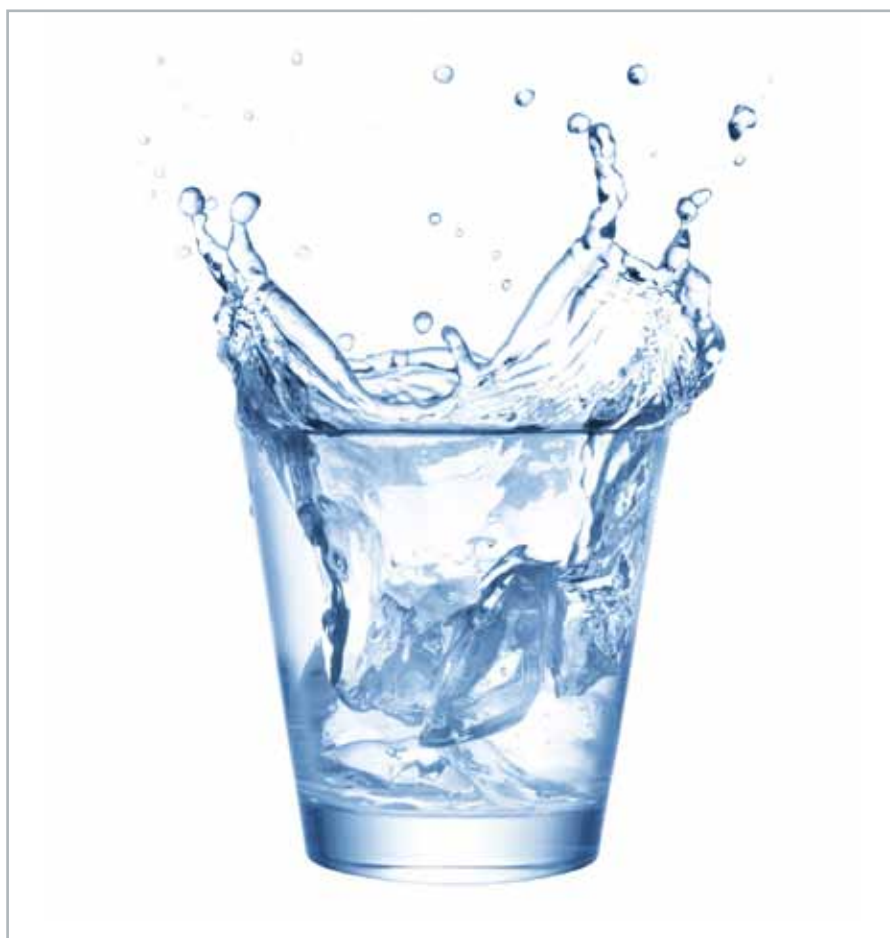
ionization FOR DUMMIES®

ATB disinfects water and air through ionization. What exactly is that? After a thunderstorm the air feels somehow purer, fresher. Measurements reveal how this becomes fact: the electric discharge during the thunderstorm has created ionization in a natural process. It comes down to an oxygen atom being split, released by the electrical charge of the storm. Oxygen atoms change, due to that splitting effect, into positively and negatively charged oxygen ions. Which through a fairly complex process of cold combustion, leads to the cleaning up of contaminants. The ionizers made by ATB work by the same principal, only to a greater effect and by using little energy.



About Life Sciences R&D

Life Sciences R&D is a research department within a cooperative work group called Life Sciences & Technology. The department has been working on applied research for ten years in all segments of life sciences. Life Sciences R&D makes use of a combination of education and project engineers for the design and implementation of projects, in collaboration with entrepreneurs.



This article was previously published in The NOMMER. That is the magazine of the NOM, Investment and Development Agency for the Northern Netherlands.



'Every day I save 20 million litres of water'

"I made the great discovery in 1997. I found out that you could mix water with pressurized air for cleaning contaminated surfaces. The result is a spray of water needles that work at a high speed to remove dirt without damaging the surface. Within a day I had designed a mixing chamber that not only cleaned better, but also made gigantic water savings.

The invention was a eureka moment. My former company processed fifteen tons of leeks per hour. To clean all those leeks I used 30,000 litres of water. I discharged this into ditches where cattle drank from. The local authorities feared that my leeks would taint the milk and I had to stop discharging.

The mixing chamber was the solution to my water problem. However, I wanted to do more with this idea. Other major water consumers could surely also benefit. In

2004 I met my current business partner, Tjerk Nijdam. He knew how to market my mixing chamber that we called the Undine. GPS - Nunspeet (Combined Poultry Slaughterhouses) was the first major customer of Innovative Water Concepts (IWC) in early 2005. Since that day just for one slaughter line we save them 100,000 litres of water per day.

You can use the Undine in many applications. We focus mainly on the food industry where hygiene is always important, such as dairies, vegetable processors and slaughterhouses. We do this in The Netherlands, but also in countries like Germany, Ireland, France, Denmark and even Saudi Arabia. IWC also works with machine manufacturers, so they are more in control within their designs with respect to cleaning. These include some absolute world class companies. This makes me very proud.

I stopped the leek business years ago. Now I get a lot of energy from the entrepreneurship perspective. The fact that my Undine system was awarded by ID-NL invention of the year was very nice, but the fact that daily my clients save 20 million litres of water, gives an even greater kick!"

Name:

Ton Winters

Age: 51

Company:

Innovative Water Concepts (IWC)

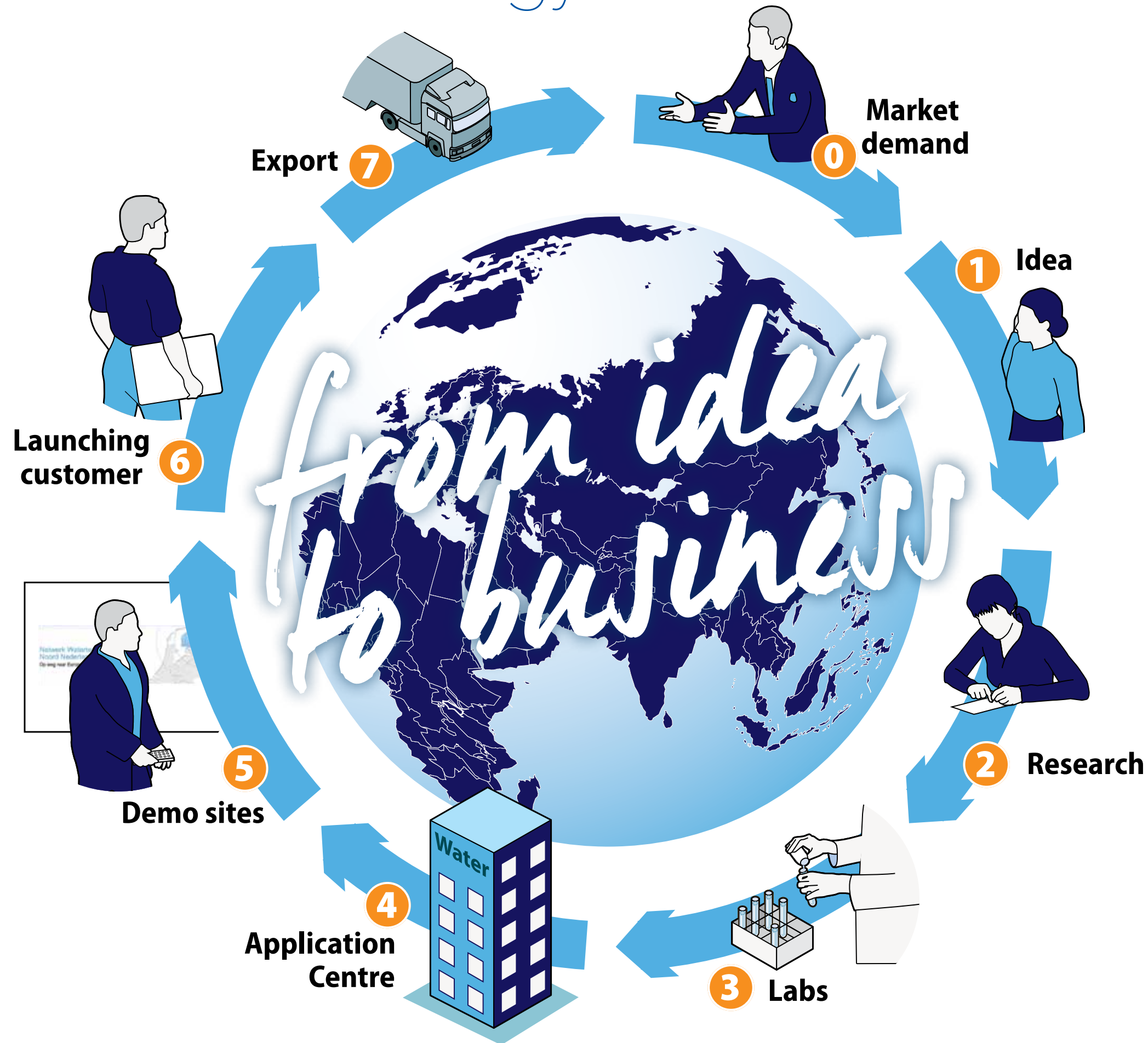
Function: Technical manager

Location: Grou/Emmeloord

www.iwc-international.com



Water Technology Innovation Chain



'A great mix of mature and green propositions'

With sixteen participants and eight different nationalities represented, the WaterCampus Business Challenge held its fifth edition in March. One of the participants was Pathema, an innovative family business from Mark and Paul Boeren from Goirle in the province of North Brabant.

The WaterCampus Business Challenge is a support program for entrepreneurs who want to launch a water related product or a water related service on to the market. During the course of several days, they are trained by experts. In several sessions, participants can discuss issues such as financing, positioning, strategy and marketing. At the end of the week the entrepreneurs presented their revised business plan to a panel of investors and experts in water technology. Organiser Paul Lelieveld of Wetsus is excited about the 2014 edition. "It was an exceptional week," he says. "A great mix of mature and green propositions. All driven entrepreneurs. Very nice to see how inspired they all are, but also how they know how to look to each other for inspiration. Moreover, we have never welcomed so many different nationalities before, with such participants as: Irish, American, Romanian, Australian, Afghan, Spanish, Belgian and Dutch."

Illustrative of the high level this year: there are two winners. Arne Verliefde and Arnout D'Haese from A & A Water won with their business plan for their

innovative, simple and cost-friendly clean water pump, which is powered by solar energy. Jan Buisman of CO2Dry won with his plan for efficient CO2 powered technology. Which uses less energy while it produces a better quality than conventional drying technologies.

ZOOM OUT

"I found it a versatile and professionally structured week," said Mark Boeren from Pathema. "It provided the tools to help you reach your personal goals. I have been able to 'zoom out' for a whole week and it helped me to realise business concepts and ideas that will yield great returns in the long term." The company, which he founded along with his father Paul focuses on technology for sustainable water treatment and product development. "Usually it comes down to customisation, which is based on the specific needs and technical requirements of the customer and their installation," explained Boeren. "Our products can be implemented anywhere within cooling water, process water, wastewater, surface water and boiler water systems."

CHEMICAL-FREE

The North Brabant based company, earlier this year won the second prize of the Water Alliance Innovation Stimulation Award with the IVG-C Cool Water technology, a complete solution for controlling cooling water completely chemical free. Boeren explains: "The

product combines all the techniques to operate a cooling tower or evaporative condenser in the water area without chemicals as well as using low water consumption and reduced energy consumption." When asked about the biggest opportunities for Pathema, he states: "We want to supply our industrial target market with a hybrid model. The intention is to sell and rent industrial water treatment and to implement servicing for the customers so they get a complete hassle free service. This allows the industry to use cooling and process water chemical free, as well as saving on water and energy. These are products with which the client is able to invest in sustainability." On the question of why he has become an entrepreneur he does not hesitate in explaining. "I come from a family of entrepreneurs, where free thinking and exploitation of opportunities are seen as paramount. Passion for our products and the opportunity for a more sustainable society are for me the key reasons as an entrepreneur to get this moving and bring our technology to the market. We want to help to reduce water scarcity and bring solutions that are in harmony with the environment and make solid financial returns."

GREAT OPPORTUNITY

According to Hein Molenkamp, director of the Water Alliance, the WaterCampus Business Challenge offers new and established entrepreneurs 'a great opportunity' to sharpen their business model. "As an entrepreneur, you will be challenged to work on your business plan and to think critically about your market and your target audience. But also to capture the imagination of investors. These are extremely valuable business points, which are just as important as a cast-iron product or an incredibly grandiose service. The Challenge forces you to not only look at the technology, but also all other factors that are needed to bring your idea successfully to the market." Hein Molenkamp acted as a coach during in a part of the WaterCampus Business Challenge.

Name: **Mark Boeren**
Age: **30**
Marital Status: **Living together**
Education: **Knowledge Engineering (University Maastricht)**
Entrepreneur for: **5 years**
www.pathema.nl



Name: **Paul Boeren**
Age: **57**
Marital Status: **Married**
Education: **Stanislaus, Tilburg**
Entrepreneur for: **35 years**
www.pathema.nl



'ALLOWS THE INDUSTRY TO USE COOLING AND PROCESS WATER CHEMICAL FREE, AS WELL AS SAVING ON WATER AND ENERGY'

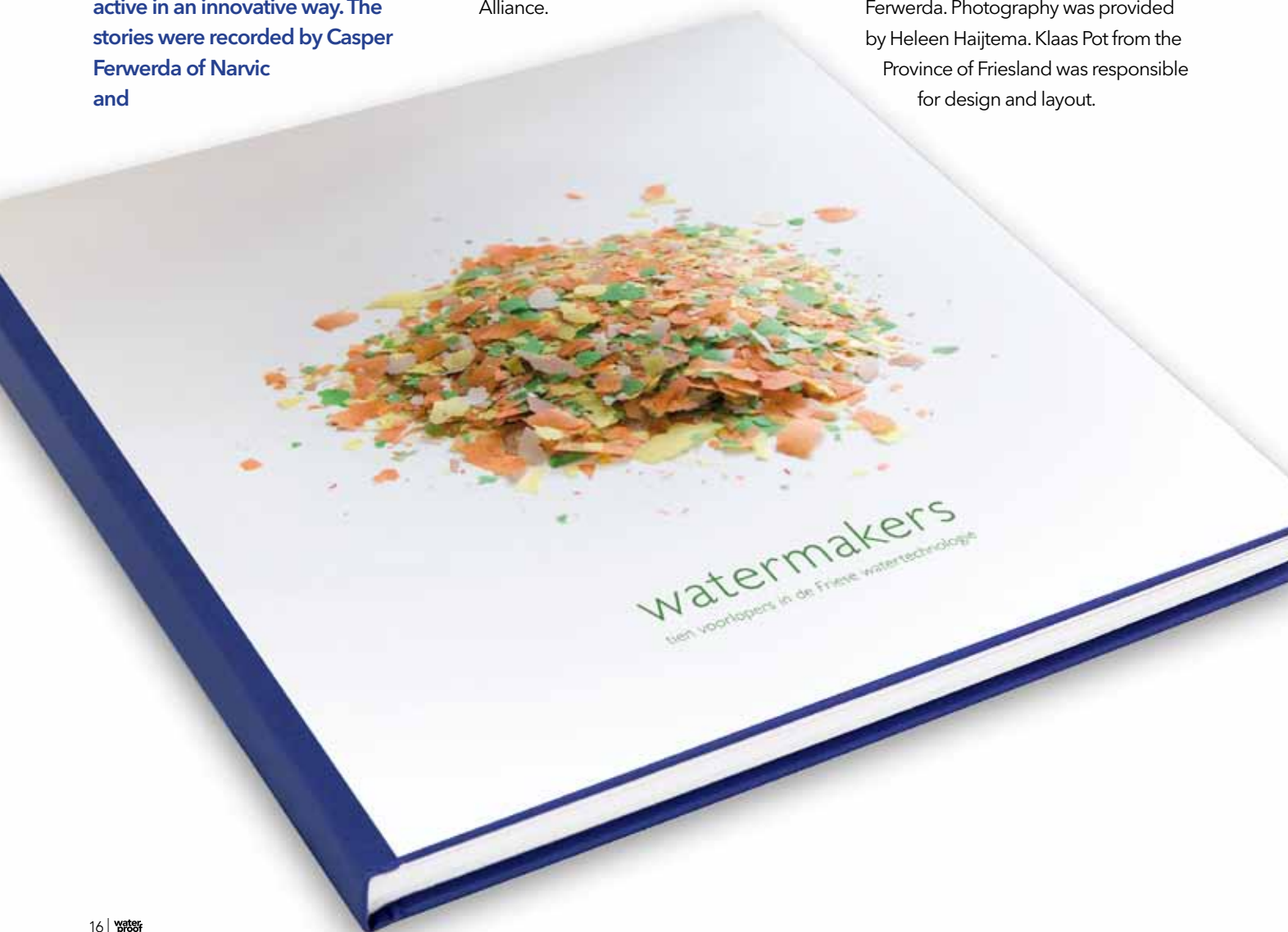
water makers

Deputy Hans Konst of the province of Friesland has recently, in collaboration with the Water Alliance, been making an entertaining and concise booklet, containing short monologues from Frisian 'water makers'. Passionate people who have a heart and head for water and on top of that are active in an innovative way. The stories were recorded by Casper Ferwerda of Narvic and

supported by eye-catching photo portraits taken by Heleen Haijtema. This issue of WaterProof includes a selection of stories for your reading pleasure.

The booklet 'Water Makers' is a publication of the Province of Friesland, in collaboration with Water Alliance.

The concept of 'Meet the Water Makers' was coined by Bastiaan Blaauw, Sjoerd Bootsma and Klaas Sietse Spoelstra. Project coordination was placed in the safe hands of Immie Jonkman (SPRNG!), who also provided the final editing in partnership with Casper Ferwerda and Menno Bakker (Water Alliance). Texts and interviews were done by Casper Ferwerda. Photography was provided by Heleen Haijtema. Klaas Pot from the Province of Friesland was responsible for design and layout.



Name: Eddy van Opijnen
Age: 27 Company: Brightwork
Position: Process engineer
Location: Sneek
www.brightwork.nl

"I'm an outdoor type. In the town where I was born and raised, Sijbrandaburen, as a child, I was often to be found either on or near water! Fishing was, and still is, one of my biggest hobbies. I found technology interesting from an early age too. Later I went on to study environmental science at Van Hall Larenstein; the best of both worlds."

My last internship was at a consulting firm in the field of water technology and product development called Brightwork. I just never left. Our clients include water authorities, drink water companies and industrial organisations from various sectors. Our BioTrap project is a highlight for me. Cooperating with a number of project partners and a launching customer, Brightwork developed a reactor filled with (filter) sand on which bacteria can grow.

When you allow polluted water to flow through the sand, suspended solids remain trapped between the sand grains. The grains of sand, positioned higher in the reactor, the BioTrap, are used as an adhesion material for the biomass. In this way, organic compounds, nitrogen, phosphate and suspended matter are removed at the same time from the wastewater. After a test period at the demo site in Leeuwarden where I managed the pilot, the BioTrap is now in operation at the customer. It is working very well.

Wastewater is increasingly seen as a product containing valuable raw materials. That is very important. Domestic wastewater consists, for example, of a lot of toilet paper or cellulose. This is almost 30 per cent of the total suspended solids. With our innovative fine mesh technology we

can filter cellulose from the wastewater, subsequently you can upgrade this to, for example, paper and bio plastics.

Working on cleaner, cheaper and innovative solutions for the treatment of wastewater gives me a good feeling every day! We simply cannot manage without water; water is life. Innovation is therefore crucial. Here in Friesland we are very strong in this area. Sometimes I think: How far can we still go? Fortunately, I am surprised every time."

"YOU CAN UPGRADE THIS TO PAPER AND PLASTIC"





Name: Hellen Elissen
Age: 38 Company: TailTec
Position: Director
Location: Leeuwarden
www.tailtec.nl

'MY WORMS NEVER DISAPPOINT'

"Many industries suffer from organic waste production. My worms know how to deal with it. I build reactors with small freshwater worms, so called blackworms. They eat a lot of low-grade, but clean waste streams. The worms get steadily fatter and eventually are being processed into bait for farmed fish. This is important because the demand for fish continues to rise and the fish stocks in the sea are rapidly declining.

We need to take a closer look to nature for sustainable alternatives. The way things are heading now is not looking good. I've always been very environmentally aware. As a child I constantly had my head buried in an animal encyclopaedia. It quickly became my goal to make the world a better place

In my PhD research I came across blackworms. It was already known that they were good fish bait. They were already used for aquarium fish. I came across Wetsus whilst doing my research on worms and continued it within Wetsus. A doctoral student in Leeuwarden carried on my worm research, I provide mentoring. I have been involved there since 2012 with my company TailTec.

As an entrepreneur, I have a lot to thank Wetsus for. You learn how to market an idea. For this TailTec got help from Wetsus partner Westt, experts when it comes to business development. Consequently, I also know a lot about marketing and sales. This year we start to carry out the first pilot trials at some potential

customers. Then I'm going to use my protein-rich and cost saving worms on a large scale.

People often laugh when I say that I breed worms. There is still a long way to go before everyone understands it. The law also needs to change. Rules about the cultivation of certain proteins make this not yet possible. I must have perseverance.

Personally, I think my worms are amazing. I even have a box at home. To protect themselves from enemies blackworms tend to clump together. I regularly throw some food to my 'ping pong balls' to see if they like it. They never disappoint me."



'THEY EAT A LOT OF LOW-GRADE WASTE STREAMS'



Name: Hans-Henk Wolters
Age: 40 Company: Metalmembranes
Position: Daily Management
Location: Leeuwarden
www.metalmembranes.com



Name: Sybrand Metz
Age: 39 Company: Metalmembranes
Position: Technical director
Location: Leeuwarden
www.metalmembranes.com



'WE'RE LOOKING FOR PROBLEMS FOR OUR SOLUTION'

Sybrand: "I have known Hans-Henk since 1992. We both studied chemical engineering in Leeuwarden. Together we are developing metal membranes with very small pore sizes. They are now just a half micron in size, for this we use electrochemical treatment. Our membranes are much more robust and energy efficient than the usual variants. Moreover, on average ten times as much fluid can pass through."

Hans-Henk: "After we had patented our invention we started up Metalmembranes in 2009. In the beginning it was a Friday afternoon activity alongside our other jobs. I am also director of ECM Technologies in Leeuwarden and Sybrand is a researcher at Wetsus. Thanks to grants we were able to develop our business and technology further. Our discovery is just the tip of the iceberg. However, we are already thinking commercially. Just as with our membranes the approach is non-conventional. We already have a solution and now just need to look for problems – normally it's the other way around. A customer with a problem should be able to find us fast. In this respect, internet marketing is especially important. Therefore, we have invested heavily in our website, which will also include 3D animations."

Sybrand concluded: "In collaboration with its customers, Metalmembranes wants to develop prototypes and final products in the coming years. Via our other jobs Hans-Henk and I do already have contacts. We now continue to scour the niche markets. I think the medical field and sectors where analysis techniques and fine filtration are required. For an innovation such as our metal membranes, it is good to couple together the different disciplines. This happens

at Wetsus (based at WaterCampus). Problems can be tackled from a variety of different angles. Knowledge is actually applied. The number of innovative water technology companies continues to grow in Leeuwarden. This will certainly pay dividends. Personally, I think the processes to desalinate water are really cool."

Hans-Henk: "Leeuwarden and the Province of Friesland are firmly on the water map. When I speak with my contacts in the field, I always mention that we operate from Leeuwarden. This makes me feel proud."

'THANKS TO GRANTS WE WERE ABLE TO DEVELOP OUR BUSINESS'





Name: Maurice Tax
Age: 45 Company: Bright Spark
Job Title: Creative Thinker
Location: Joure
www.brightspark.nl



'WE STILL KNOW NOTHING ABOUT WATER'

"Water is very special. Whereas all materials shrink when it is cold, water expands. Set two glasses with deionized water next to each other - this type of water cannot normally conduct electricity - put 5.000 volts through it and it vibrates, even creating a bridge between the two glasses of water. This surely shouldn't, but it does happen. Crazy!

My passion for water arose quite by chance. After years as a technical officer at Leeuwarden Air Base, I started my own business in 2002 as an inventor and launched the company Bright Spark. Already from a young age I found that creative thinking and quick analysis was fun. I can solve a problem straight away. I have never let my clients down and they are really very diverse. Having said that, Bright Spark started off only with water related projects.

I want to help people. Therefore, I found it unbelievable that the West has all but failed to supply drinking water in a simple way, safely for developing countries. I invented the 2B Sure, which is in fact, nothing more than a PVC pipe with some electrodes. Connect the 2B Sure to a battery and put it in a container of polluted water; within ten seconds, the water is clean. When Southeast Asia was hit by a tsunami in 2004, the UN was my first big client.

When inventing, you must act quickly. There should be a maximum of six months between the concept and the prototype. Otherwise you cannot make it commercially available and will be overtaken by competitors. I find the water world too conservative; like that you just cannot transform the World!

Young people are open to new developments. This is something educational institutes should pick up upon. I'm actually setting up a think tank in Sneek this year for children up to eighteen years old. For all the problems there truly is a technical solution. That is what we reflect upon. Water plays a major role again. You can get so much more out of it. We currently know nothing about water."

'WITHIN 10 SECONDS, THE WATER IS CLEAN'



The 2B Sure device

**WATER
CAMPUS**
Leeuwarden



wateralliance



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