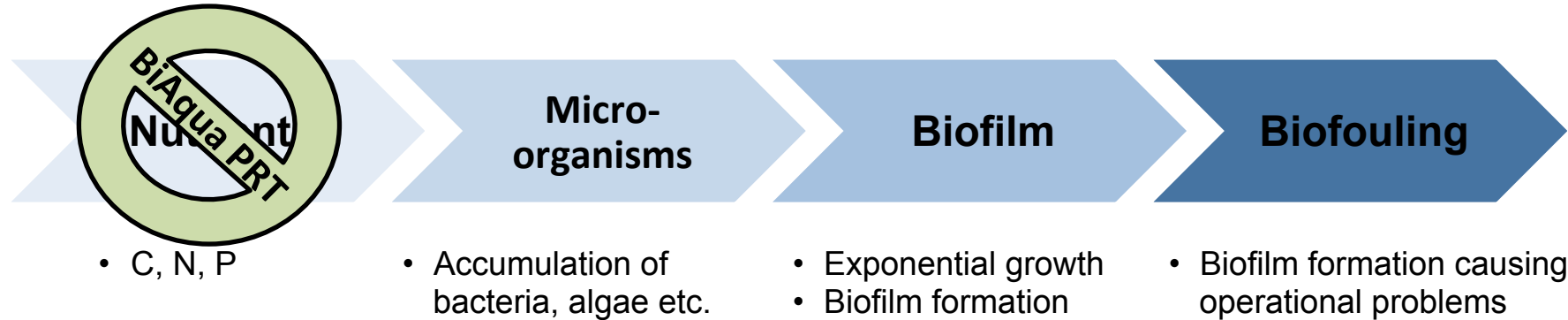




BiAqua PRT™
effective biofouling control
by nutrient limitation

Wilbert van de Ven, Technology Manager

Biofilms are a large problem in the water treatment industry



Problems associated with Biofouling

- Loss of efficiency
- Increased energy consumption (UV, Ozone, pumping)
- Low membrane lifetime (in desalination)
- Extensive pretreatment requirements
- High chemical consumption (biocides, chlorine, etc.)
- Downtime of downstream systems
- Corrosion

Potential markets

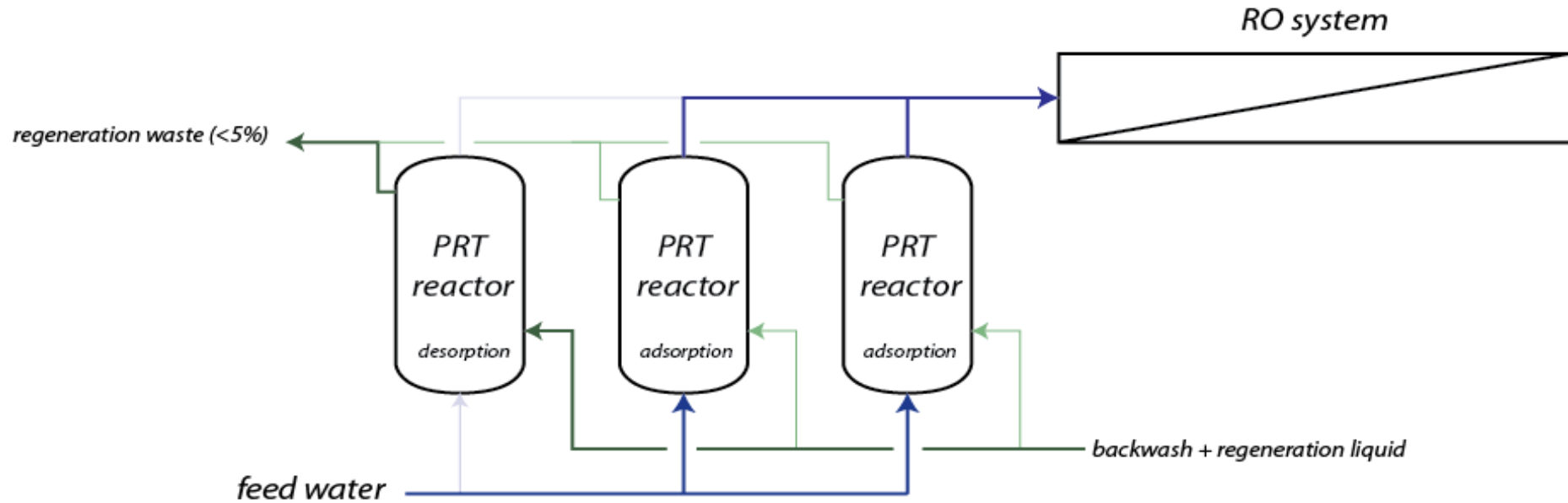
- Cooling towers & heat exchangers
- Pipes
- RO systems market (> 10%/year growth, biofouling represents a 5-15€/m³ problem)



Source: www.global-membrane.com

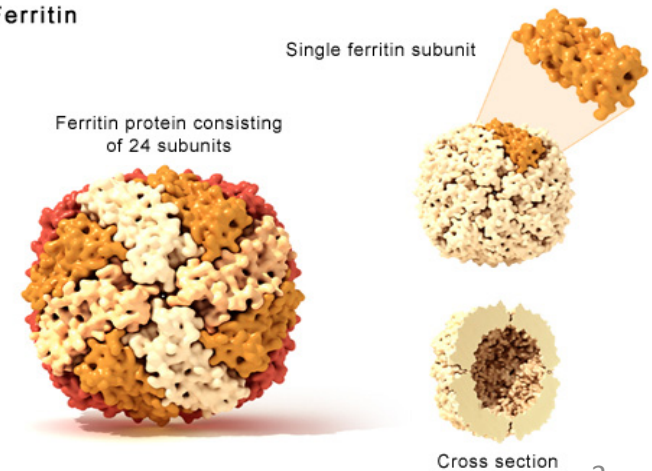


BiAqua PRT™ is an environmentally friendly and straightforward adsorption/desorption technology



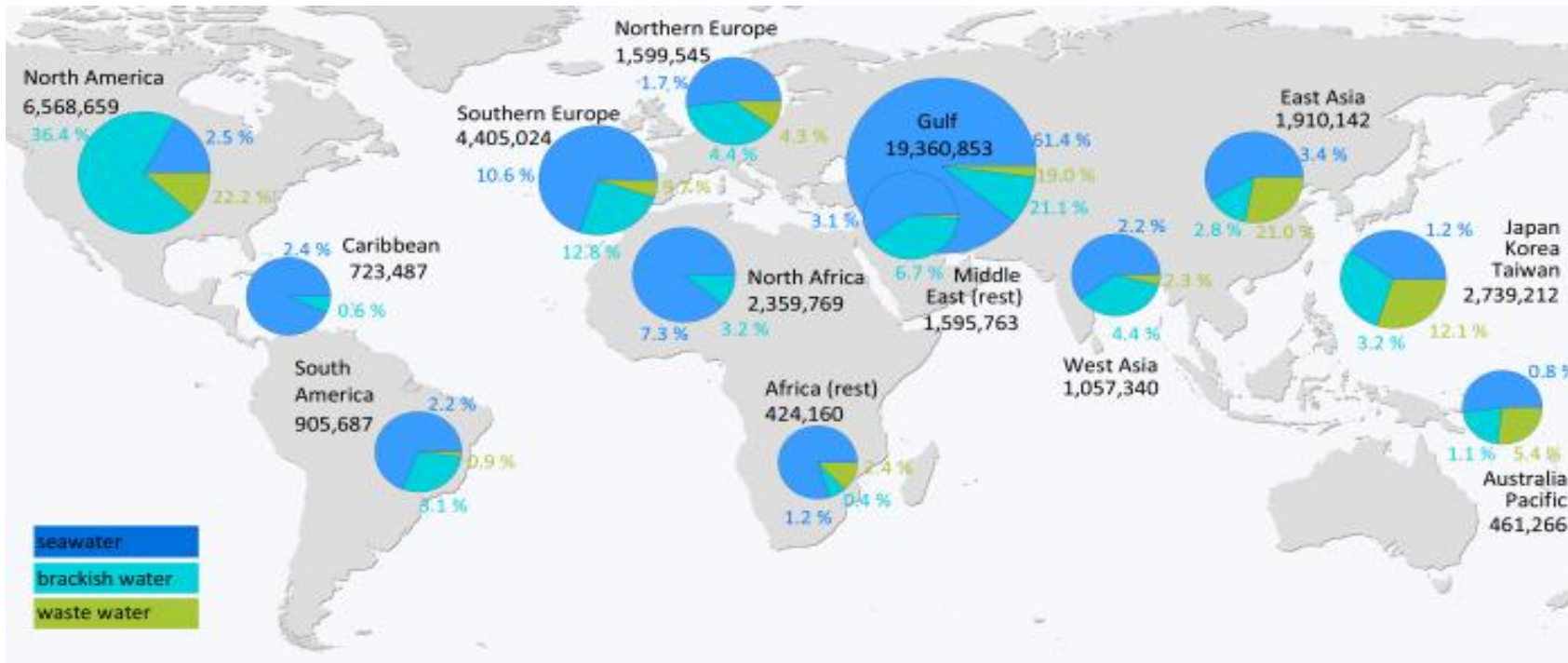
- Selective bio-based PO_4^{3-} -adsorbent (ferritin)
- adsorption – desorption process
- Easy regeneration
- Standardized equipment, low investment cost
- Environmentally friendly
- **Biofouling growth rate is reduced 4-6 times**

Ferritin



Currently > 15,000 RO systems installed globally Market is forecast to grow at 15%/year

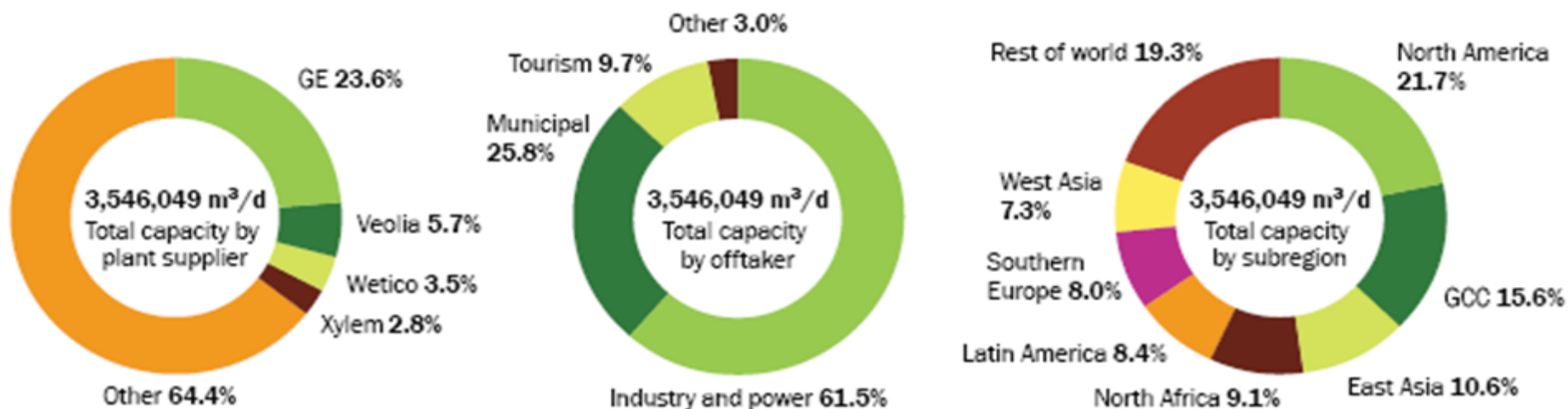
- Currently RO Systems with a total capacity of 54 million m³/day are installed. This is forecasted to grow to 195 million m³/day by 2020
- Market value RO systems 7,7 billion \$/yr 2010, 39.5 billion by 2020
- Installed RO Systems (> 15,000 units):
 - New units <10,000 m³/day capacity: 400/year, 65% in industry water supply, 28% municipal
 - New units > 10,000 m³/day capacity: 50-100 /year, largely municipal water systems
- >65% of the RO systems are impacted by biofouling
- Membrane replacement market: 1.4 billion \$/year, CAGR 12% (2016)



Sources: water technologies market report, 2010, PRLOG, GWI

Market Approach

Contracted SWRO and BWRO plants with a capacity of less than 10,000m³/d since 2007

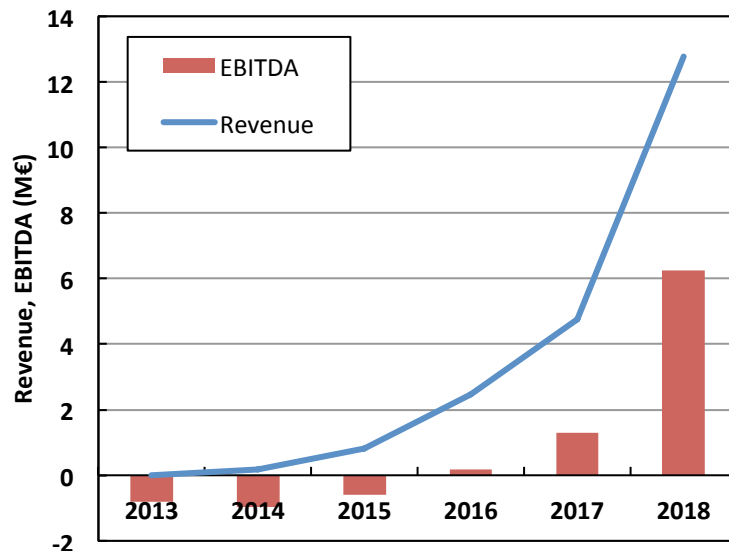
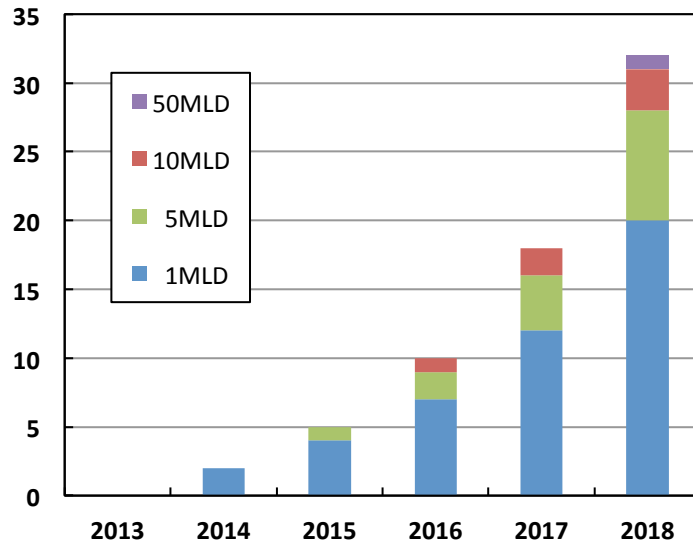


Source: GWI

- Small scale industrial plants in Northern and Southern Europe
- Target market with a small OEM or services supplier (e.g. Evides Industry water)
- Focus on fresh water / brackish water ROs (more attractive business case)
- Later, generate traction from large suppliers and grow into large installation market
- Finally, target the municipal water market

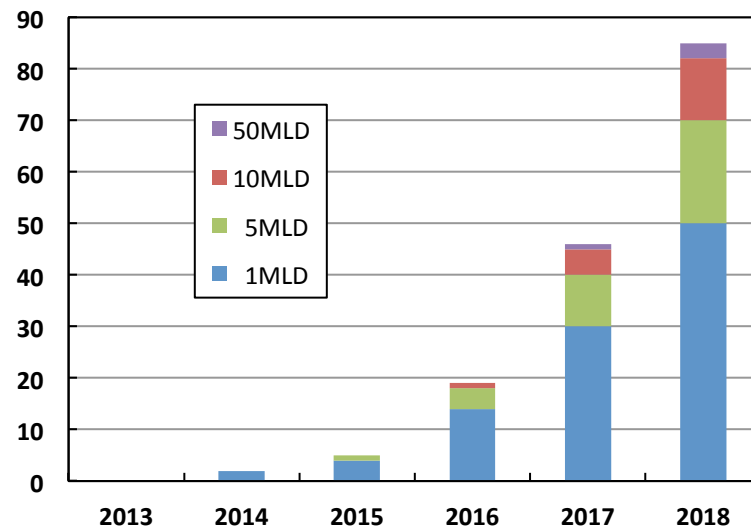


Financials – base case



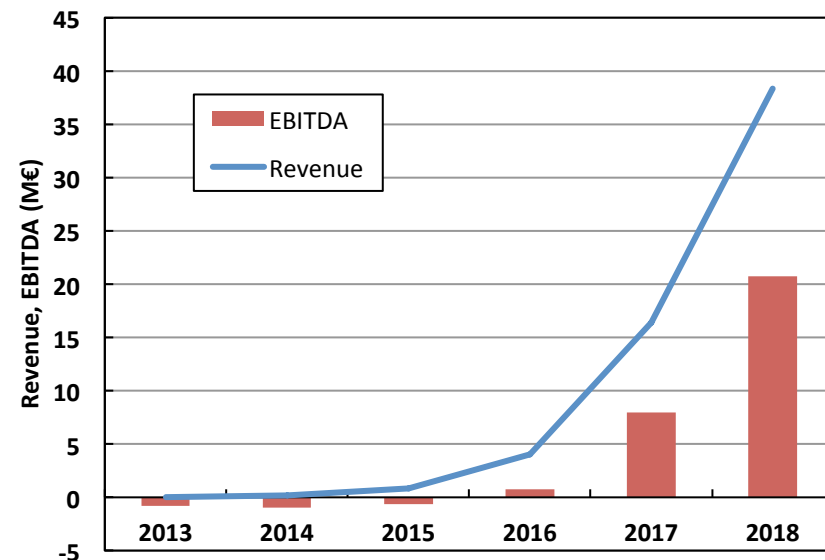
- BiAqua PRT resale price: $\sim 0.05\text{€}/\text{m}^3$
- Five years lifetime of adsorbent
- End user value $0.05\text{-}0.10\text{€}/\text{m}^3$
- Customer pay-out time of ~ 3 years
- Refresh after 5 years has lower cost
- Revenue growing to $>12\text{M€}$ in 2018
- $<1\%$ market share in 2018
- 30% EBITDA in 2017, 50% in 2018
- After 2018 rapid growth due to recurring sales

Financials – large customer traction



- Strategic cooperation with large supplier (GE / Veolia / ...) in 2015 a.b.
- Quick ramp-up of sales
- Earlier adaption into big municipal market
- Easy access to refit market

- Sales 2.5x higher in 2018
- Unaccounted benefits:
 - System integration
 - Lower sales cost
 - Project for mega plants?
- => Very scalable benefit model!





BiAqua's team has the knowledge and competences to drive the technology and business development

Management

- **Nityen Lal, CEO a.i.**, CEO of ICOS Capital, serial investor in water and clean tech
- **Wilbert van de Ven**, Technology Manager, former Manager Process Technology and Innovation, Vitens and PhD Membrane Technology
- **Monica Paravidono**, Research Manager, post doc and start up experience at TU Delft, PhD Biochemistry Genoa University

Expert Consultants

- **Peter Wessels**, water technology expert, DHV, Dutch drinking water companies, KWR Research Institute, 20 + yrs experience in design of water treatment plants
- **Hans Vrouwenvelder**, Biofouling expert, associated professor at Delft University and KAUST, Wetsus, KWR

Supervisory & advisory Board members

- **Lute Broens**, PhD and non executive chairman serial entrepreneur and expert in water technology business, XFlow, Norit, Pentair, member of boards of several international water institutions and committees.
- **Nityen Lal**, CEO of ICOS Capital, serial investor in water and clean tech
- **Prof Mark van Loosdrecht**, TU Delft, Group Leader Environmental Technology & water technology expert. Recent winner of Lee Kuan Yew Prize in Singapore
- **Prof Fred Hagen**, TU Delft, Group Leader Enzymology
- **Henk de Kraa**, CEO of Water utility Groningen, former director Evides and Delta, board member of Aafje Care and Arcus Project Development
- **Rop Zoetemeyer**, former CTO Purac, now Sr. Technology Advisor, non-executive board member of Dutch Rainmaker, advisory board member of Microdish, Board member of TOP Institute for Food & Nutrition (NL), Board Member ICOS Investment funds



What are we looking for?

- Funding to get BiAqua to rapid growth phase
- *First stage - 1M€*
 - Build and operate pilot plant
 - Produce technical quantities of ferritin
 - Scale-up of ferritin production
- *Second stage - 1.5M€*
 - Build and operate commercial demo
 - Business development
- Commercial and technical partners with sales network or matching technologies

BIQUA

A large, stylized blue brushstroke graphic that starts at the top left, curves down and then up, resembling a large letter 'A' or a similar shape, positioned over the word 'BIQUA'.

Wilbert van de Ven

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www.biaqua.nl