IWEC

water reuse 3.0

Cooperation, Innovation and IWEC

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Rwb Vitens EUROSTEEL

IWEC project

Increased

Water

Efficiency with

Ceramic membrane technology

Backwash water treatment Wierden

www.iwec-water-reuse.eu

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Water reuse 3.0

conventional

water reuse 1.0

water reuse 2.0

water reuse 3.0

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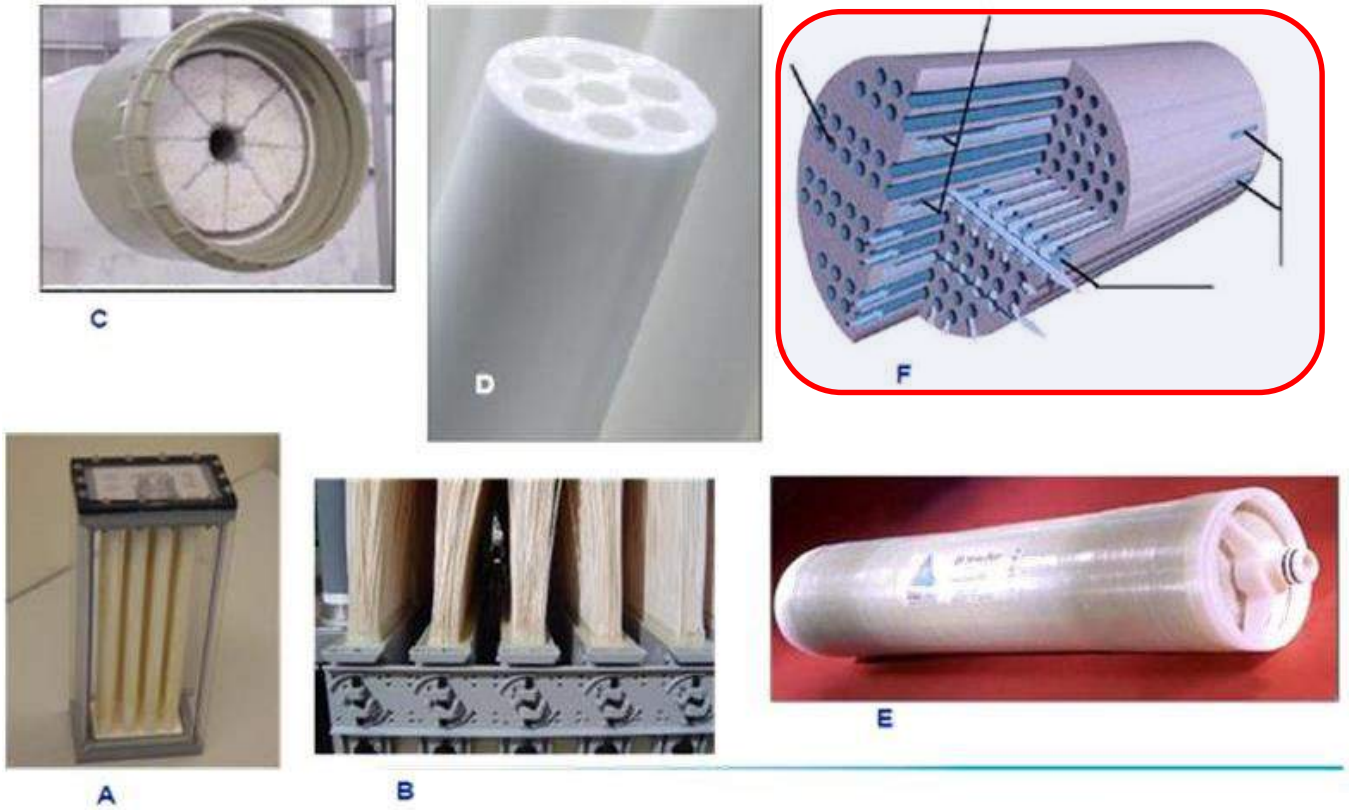
Comparative pilot test 2009



Vitens

Re-use of backwash water
Comparative study of 6 MF/ UF membranes

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RWB unable to convince .....

- Higher initial investment costs
- Unknown long term performance
- Standardized cost calculations
- Conservative sector

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….. and needed help

- Support for first application
- Support to further market uptake
- Overcome critical barriers that hamper commercial success

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A cooperation started

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Rwb - developed technology for reuse of backwash water

EUROSTEEL - manufacturing skills in composition of key parts

Vitens - launching customer

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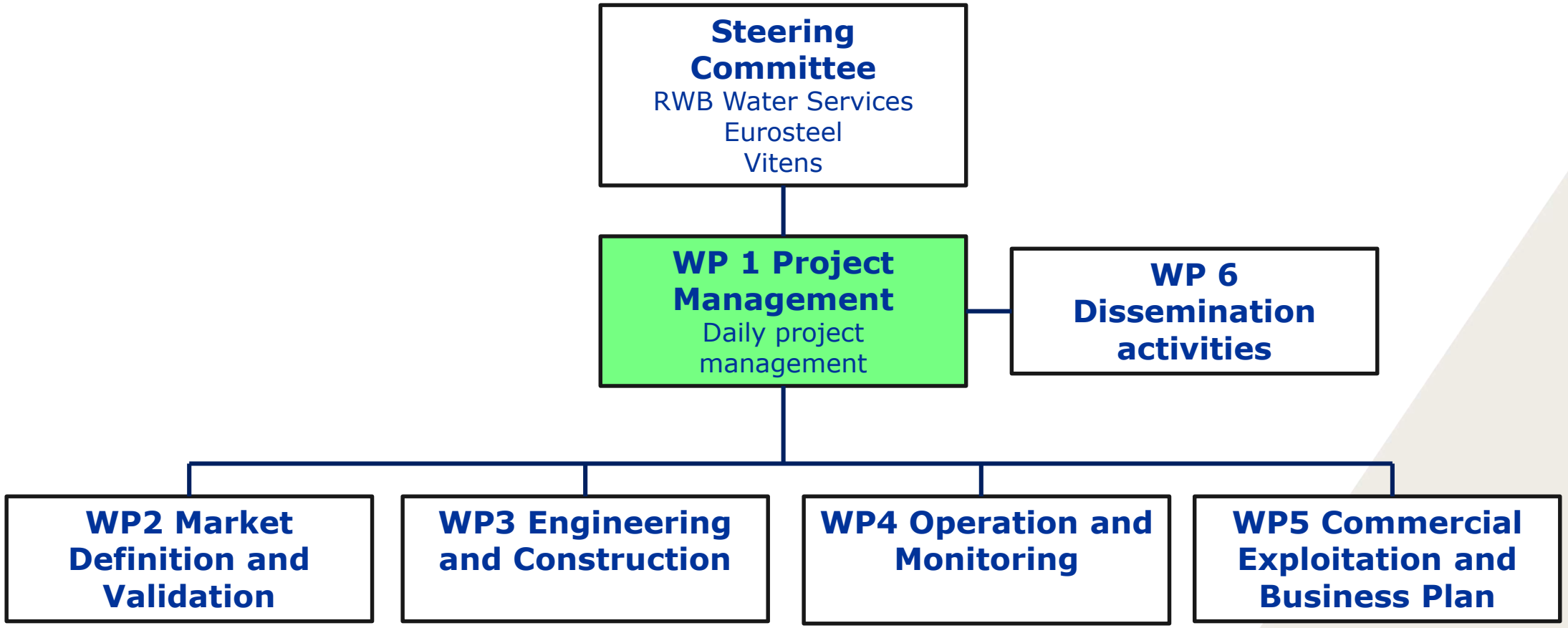
Workpackages



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Expected results

- Prove feasibility for reuse of over 1 billion m3 water ✓ **market validation**
- Reuse 1 million m3 groundwater during the project ✗
- Validate 30%/80% energy reduction (current practice/state of the art) ✓ **confident to succeed this**
- Validate 50% chemicals reduction ✓ **90%**
- Validate lower operational costs compared to state of the art ✓
- Investigate and disseminate the possibilities for IWEC in Europe, especially in the Netherlands, Germany, ~~Norway~~, Sweden, ~~Finland~~, Denmark and Belgium. UK ✓ **Started**

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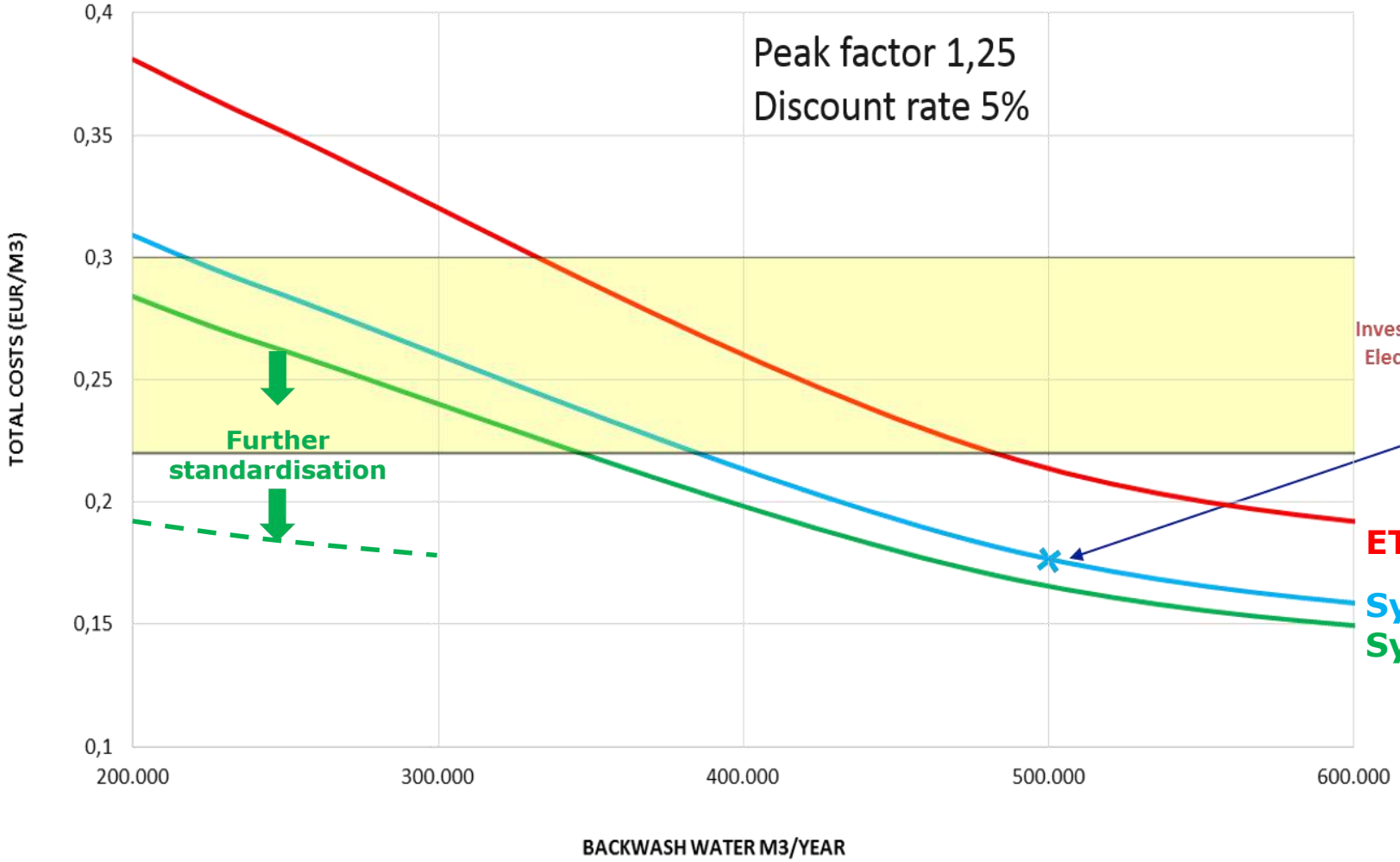
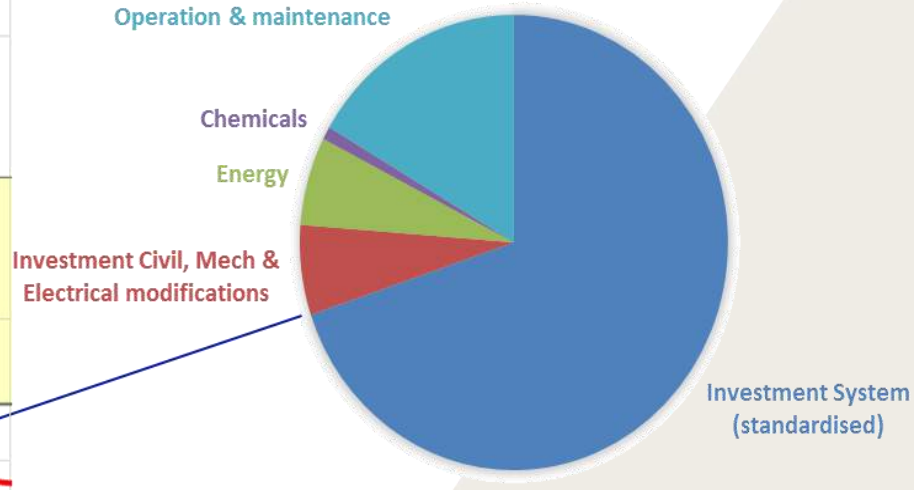
Total costs per re-used m³ backwash water





ETO with civil, M&E modifications

System with civil, M&E modifications

System without civil, M&E modifications

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Further standardisation for smaller plants

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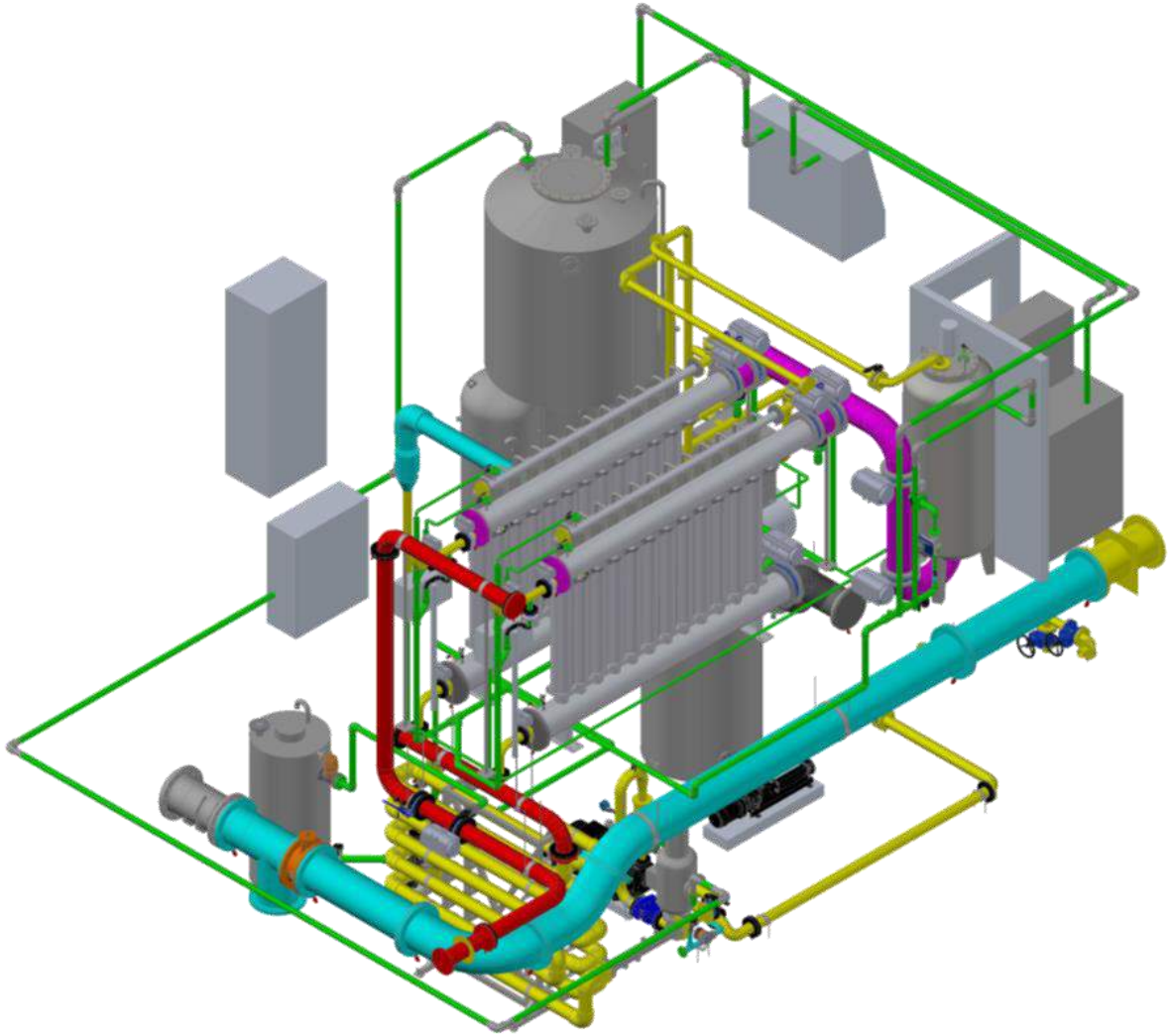

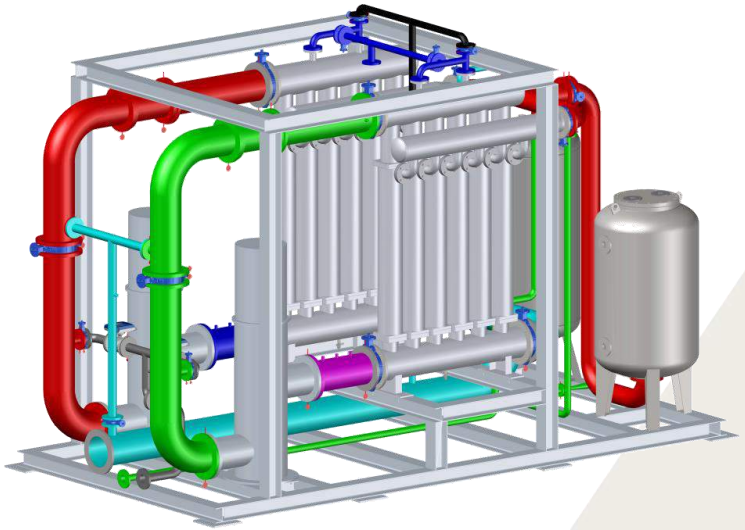

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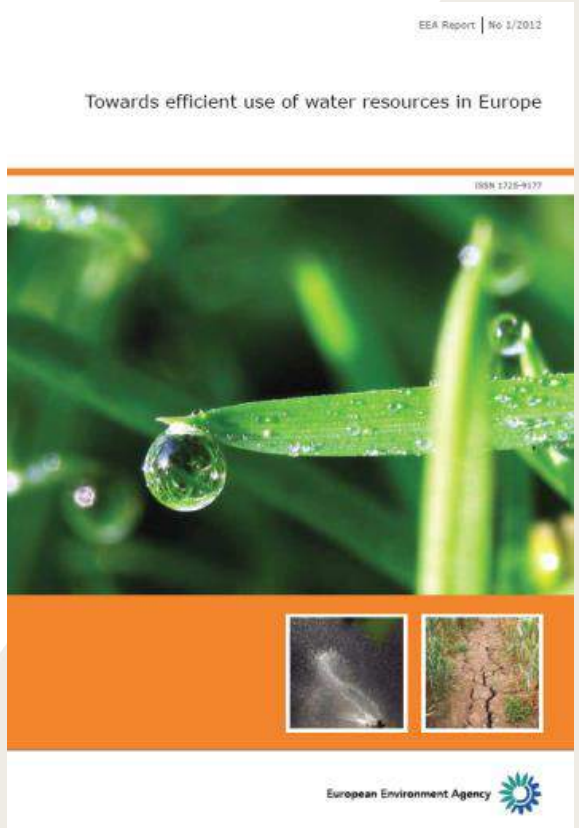
Market drivers

- Legislation
  - Groundwater is a protected resource ✓
  - Discharging waste water faces stricter regulations ✓
  - Groundwater tax ✗
- Waterscarcity ✓
- Corporate Social Responsibility goals ✓
- Total price per m^3
- Easier valorization of sludge from ceramic membrane plant



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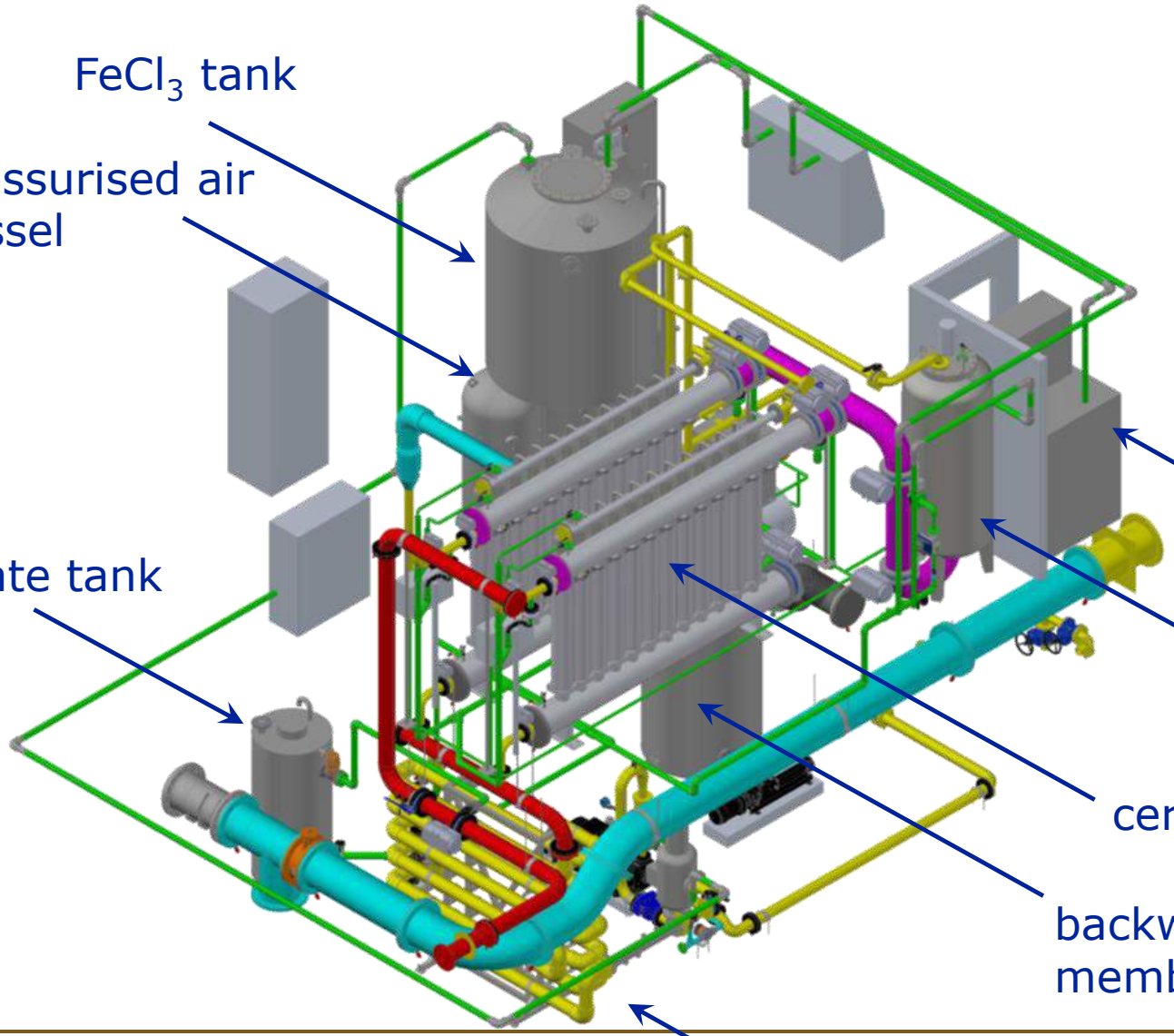
IWEC installation



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Process design parameters 1

- Iron content feed: 80 – 200 mg/l ✓
- Iron content permeate: < 0,03 mg/l ✓
- Turbidity: < 0,2 FNU ✓ **<0,1**
- Microbiological analyses: according to Dutch regulations ✓
- E-coli reduction: > log 4 ✓ **> log 8**
- Recovery: >98 % ✓ **99 %**
- Flocculant dosing: 2-4 mg/l ✓ **1-2, not required for ceramic membrane**

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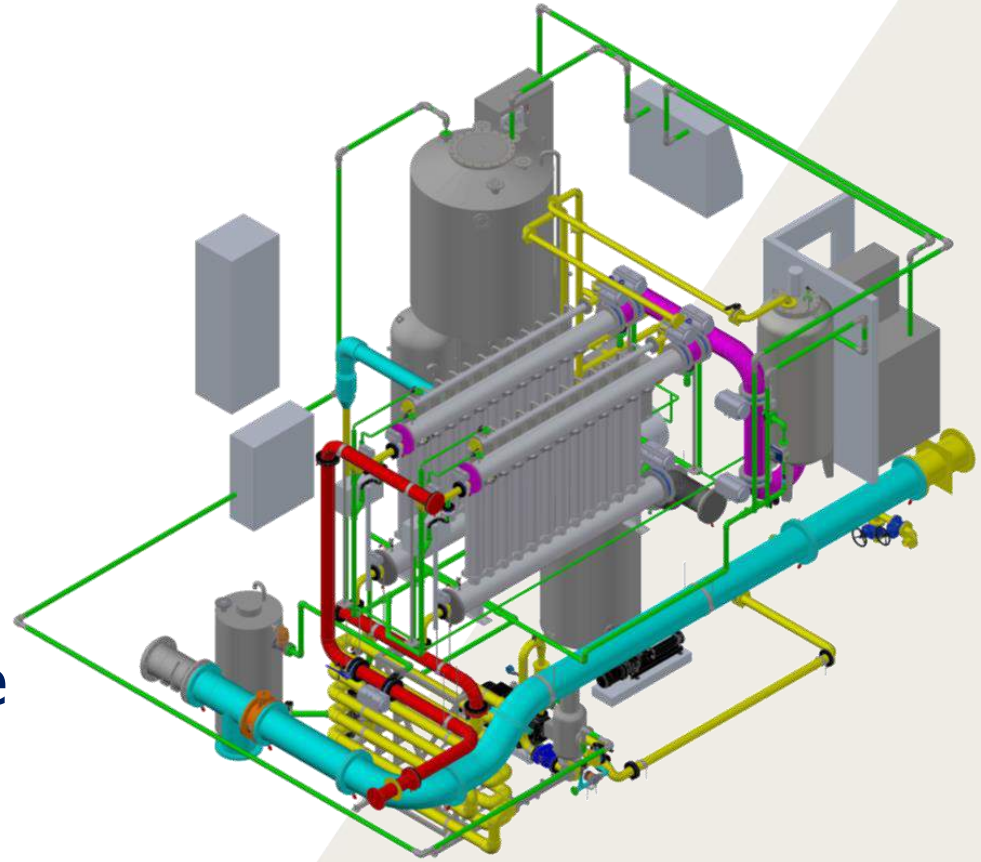
Proces design parameters 2

- Maximum capacity: 70 m^3/h
- Nominal capacity: 50 m^3/h
- Flux max: 115 lmh
- Flux nominal: 85 lmh
- Number of modules: 2
- Number of membranes: 2 x 12
- Membrane suface area 25 m^2
- Backwash volume: 1020 l/module



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Construction: 2014/6 – 2014/12

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Rwb EUROSTEEL Vitens

thank the European Union

Eco-innovation

When business meets the environment

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RWB thanks her partners

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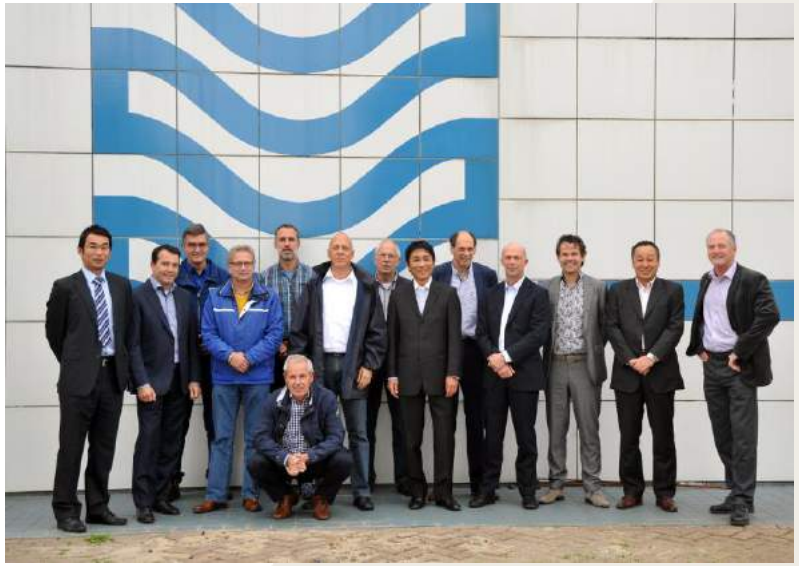

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Thank you for your attention !

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