

Flootech

CREATING VALUE BY CLEANING WATER

Hannu Turunen / April 11th 2019

Flootech in brief

over
50
years of
experience



OVER
1000
global
references
of water
management
solutions for
different
applications

GLOBAL PRESENCE
40+ sales representatives
around the world



14 own patents



20
ENGINEERS



Extensive,
CAREFULLY
SELECTED
and verified
PARTNER
NETWORK OF
Local and
International
Manufactures

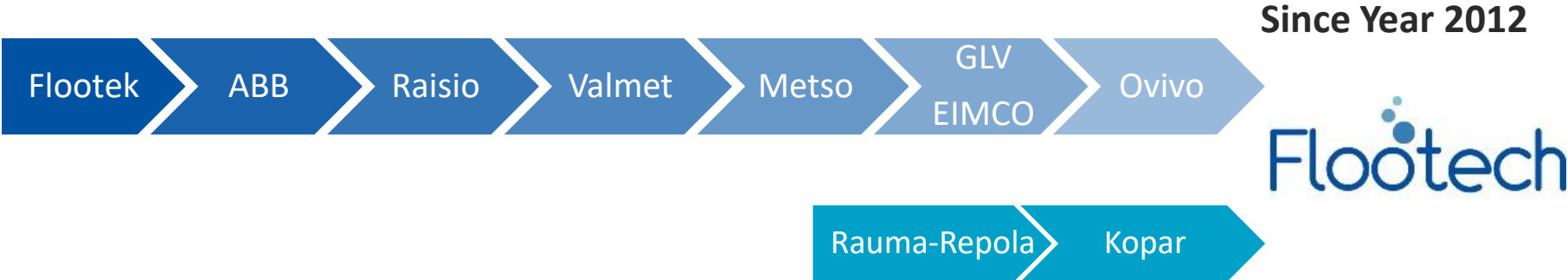
We Specialise
in design, engineering,
project management and
services

**Comprehensive
PRODUCT OFFERING**
for water, process water, wastewater,
BFW, CPP, FGC and water recycling

SERVING BOTH
industries and
municipal sector

WE HAVE
ISO 9001:2015
CERTIFICATION

Flootech – over 50 years of water management





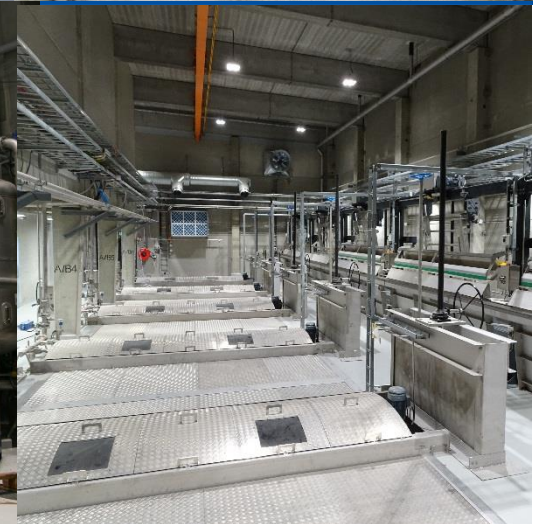
We have a **profound understanding** of our clients' processes and needs

Due to our long experience in the water management and industries, we have the expertise to find the right solution for each requirement - anywhere in the world.

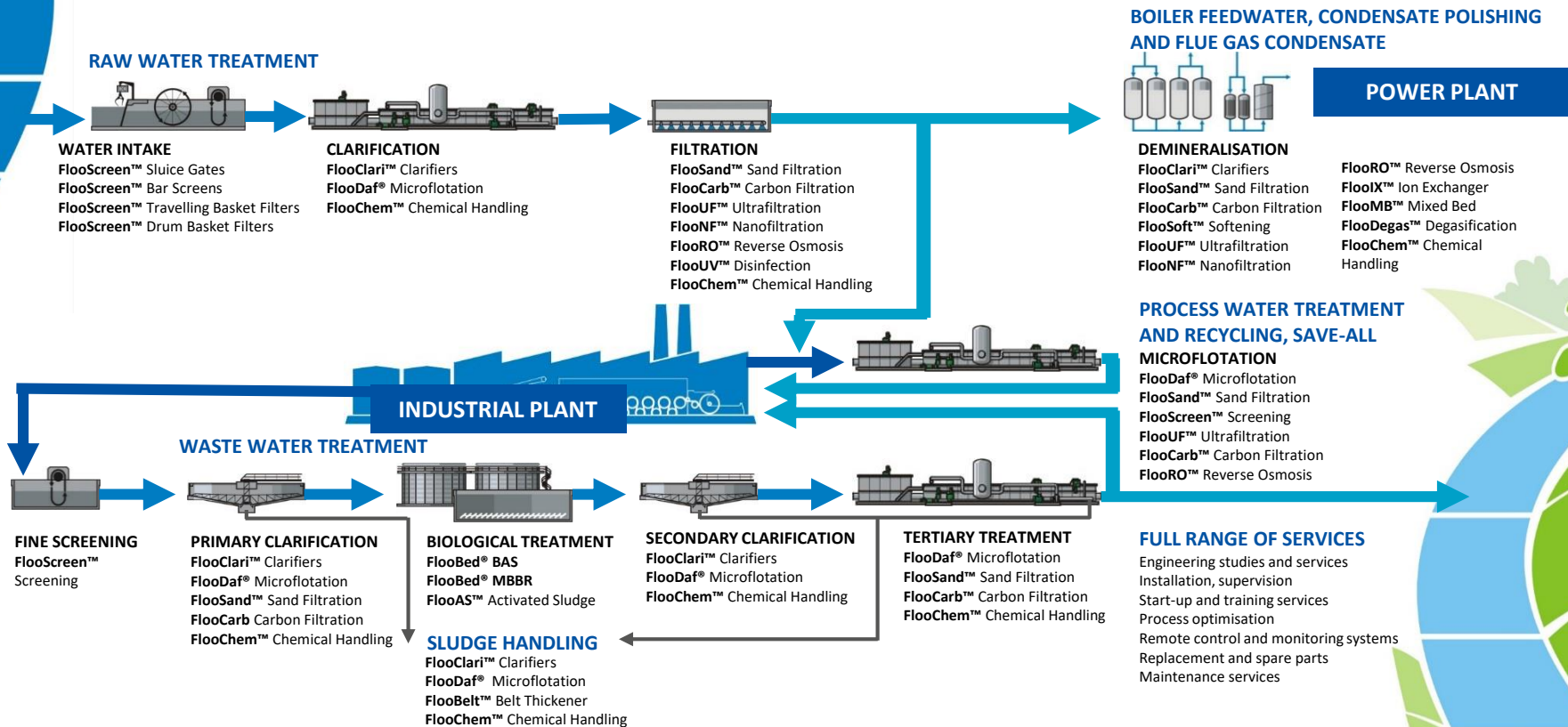
Flootech solutions

We offer solutions for

- Intake screening
- Raw water treatment
- Boiler feed water treatment
- Condensate polishing
- Flue Gas Condensate treatment
- Process water recycling
- Wastewater treatment
- Sludge handling
- Chemical handling
- Parts and Services



Flootech solutions for industrial sectors and power plant

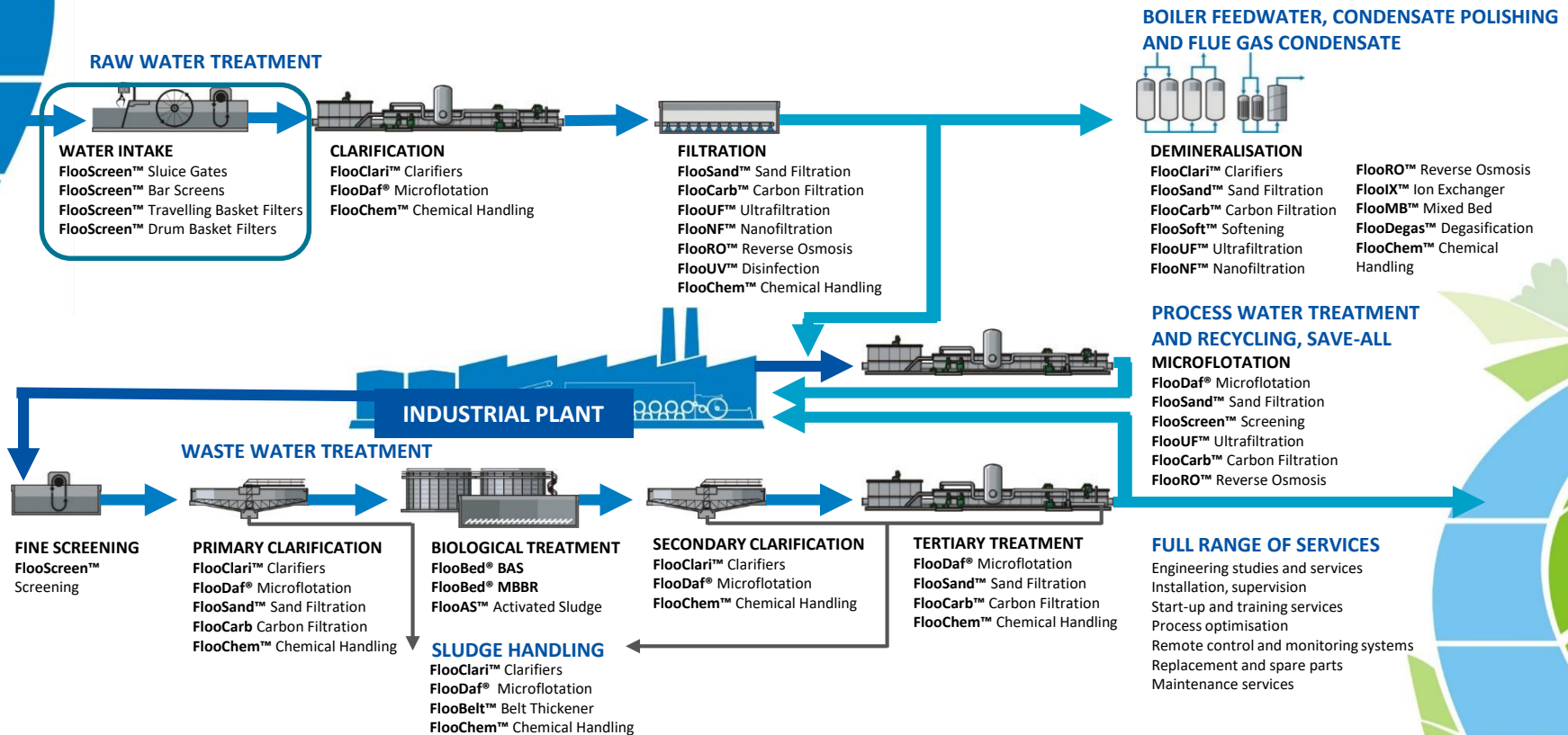


Global presence

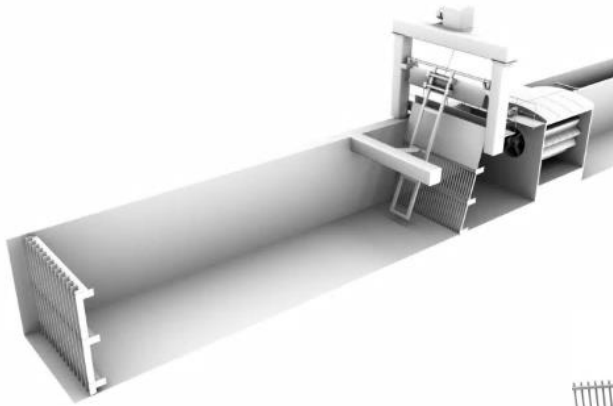
OUR SALES REPRESENTATIVES



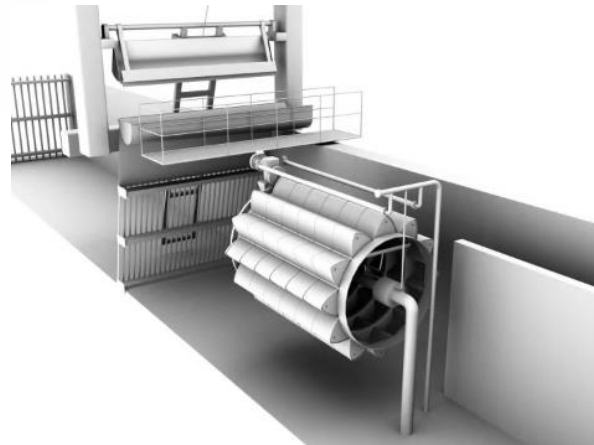
Water treatment – Intake Screening



Solutions for Raw Water Intake Screening



Manual and Automatic Bar Screening

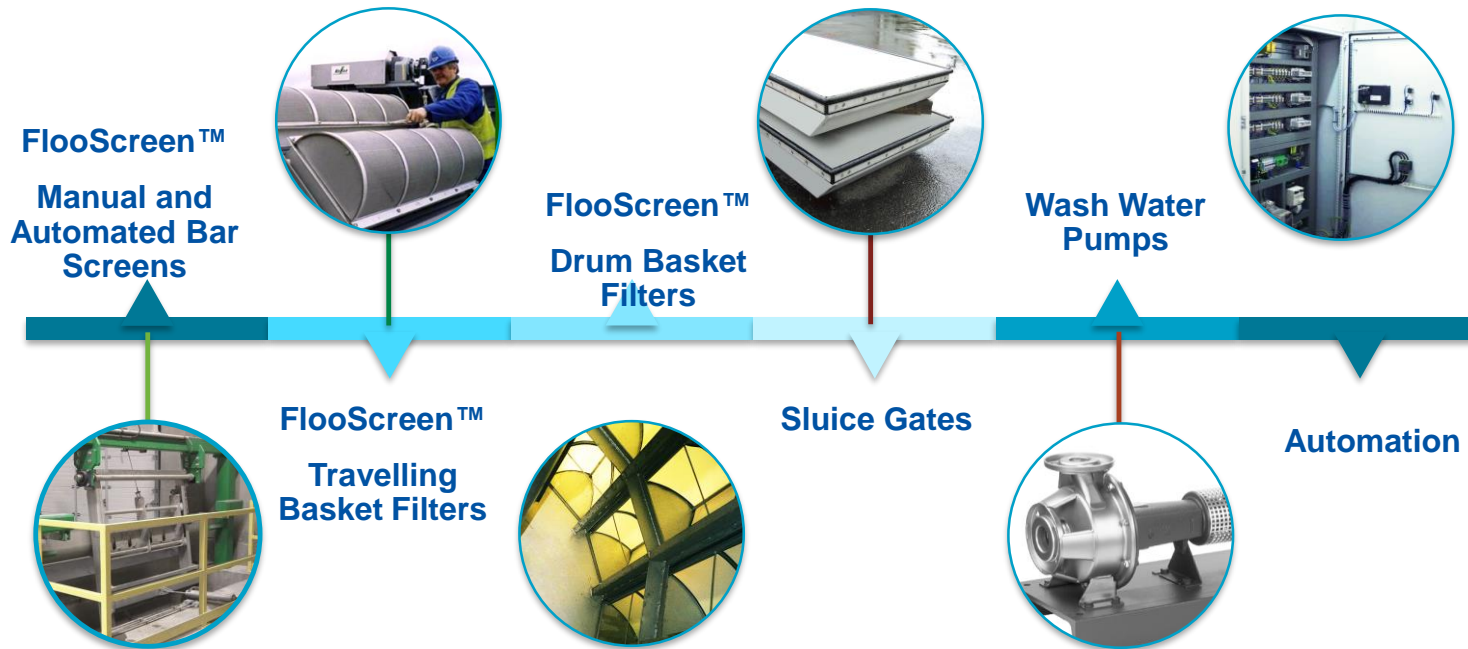


Drum Basket Filtering



Travelling Basket Filtering

FlooScreen™ Products for Raw Water Intake Screening

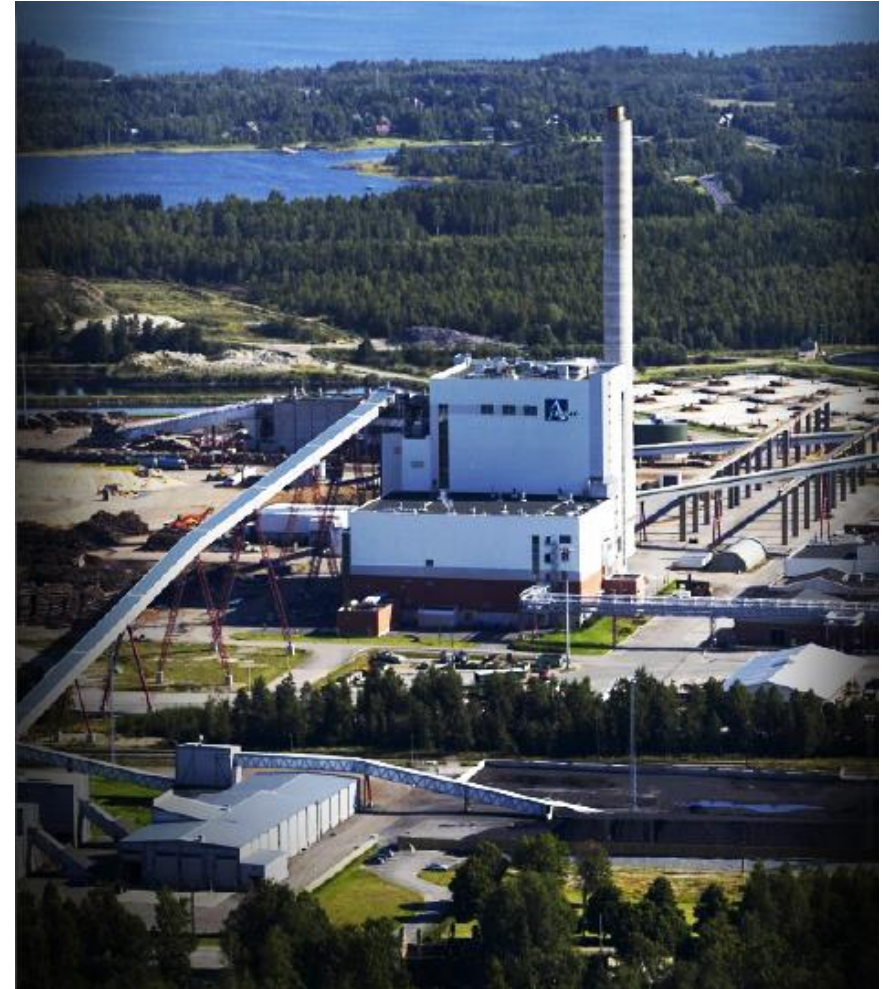


Alholmens Kraft Power Plant

World's largest biomass power plant,
550 MW

Installed base:

- 1 x Automatic bar screen 4.7 m x 7 m
- Capacity 8 m³/s
- 2 x Travelling Basket Filter 2.5 m x 46 baskets, each 4 m³ / s



Metsä Fibre Äänekoski Mill



Bio-Product Plant

The largest pulp mill in the world 1.2 Mton pulp

Installation:

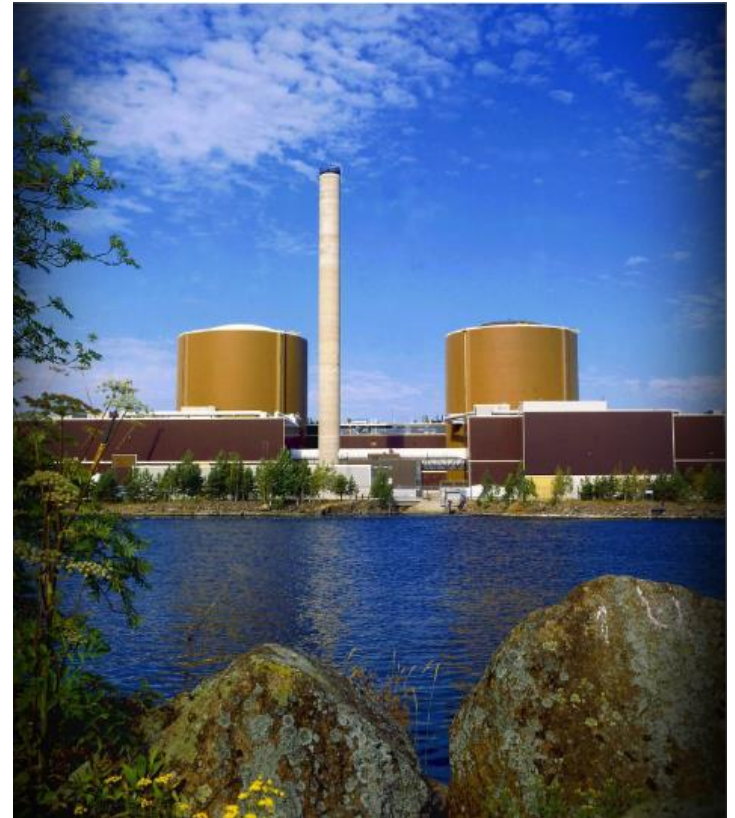
- Capacity 10 m³/s, 0,2 mm
- 6 x Fine bar screens 4100 x 2000 mm
- 5 x Drum basket filters 2,4 m x 4,0 m
- 18 x Sluice gates, Lifting hatches, Filling Valves

Fortum Power and Heat Oy, Loviisa

One of the world's best nuclear power plants in terms of availability

Modernization of:

- Eight (8) Automatic Bar Screens, size 4.0 m x 6.0 m.



Wärtsilä Diesel, Power Plant, Jamaica



Power barge (Dr Bird II) with net output of 49.5 MW, located in the Old Harbour Bay, St. Catherine, Jamaica

Power barge is self-contained floating facility with three medium speed diesel engines using diesel or heavy fuel oil

Installed base:

- 1 x Sluice gate 2.0 x 1.5 m
- 1 x Manual Bar Screen, 2.0 x 1.5 m
- 1 x Automatic Bar Screen 2.0 x 2.0 m
- 1 x Travelling Basket Filter 1.0 m x 34 baskets / 20 m²

Neste Oil, Bio-Diesel Refinery, Finland



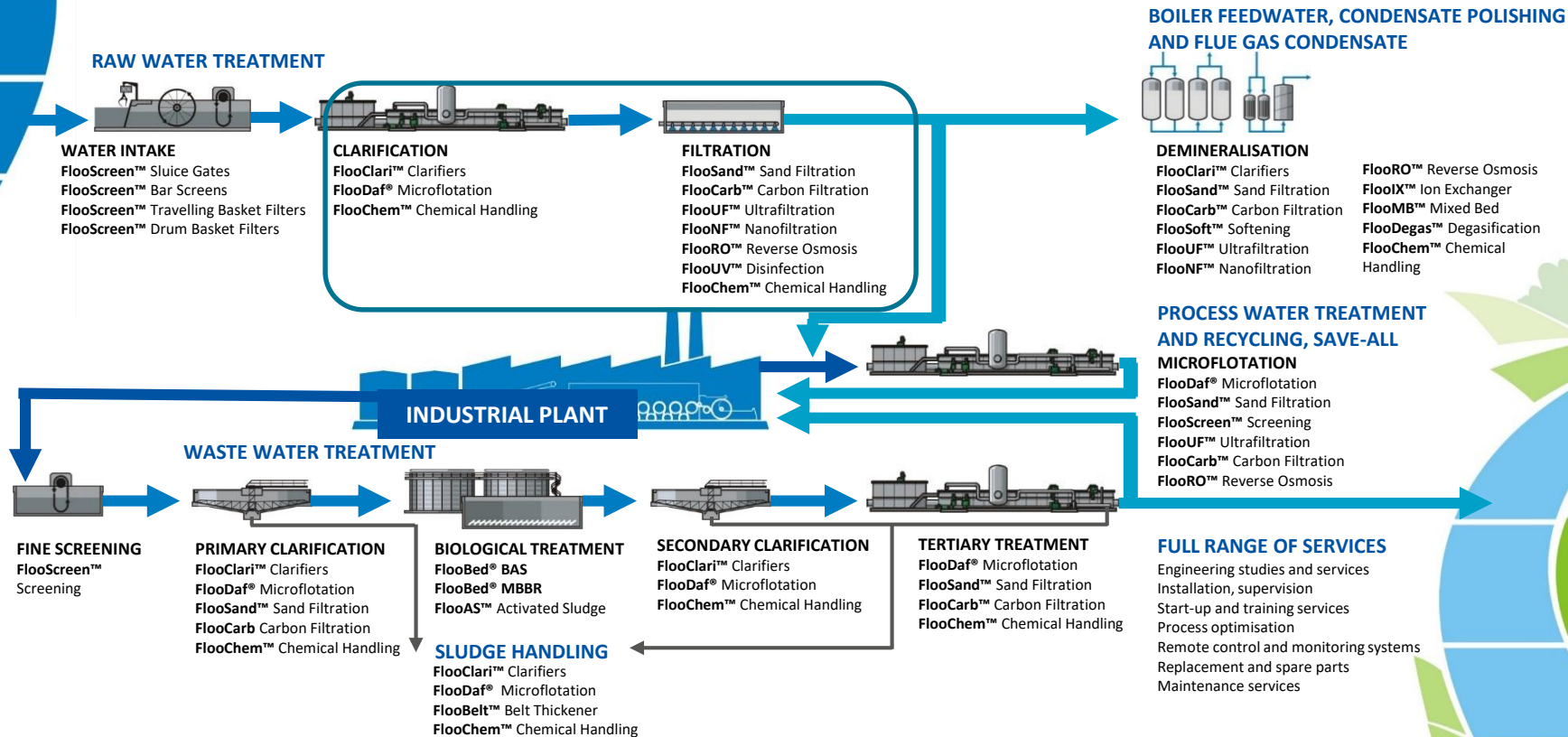
Neste Oil Porvoo Refinery's diesel line uses residue oil to produce sulphur-free, clean motor fuels, particularly diesel fuel. The fuel meets the latest environmental requirements in Europe and North America.

Installation:

- Capacity 8,3 m³/s
- 2 x Travelling Basket Filters 3.0 m x 52 / 91 m²
- 2 x Sluice Gate 2,3 x 4,4 m
- 2 x Sluice Gate 3,3 x 4,5 m

Water treatment

Chemical treatment and filtration



Water treatment in Power plants

Chemical Treatment and Filtration



Floodaf® Coagulation



Floodaf® Microflotation



Floodsand™ P Sand filtration



Floodsand™ C Sand filtration



Floodsand™ G Sand filtration



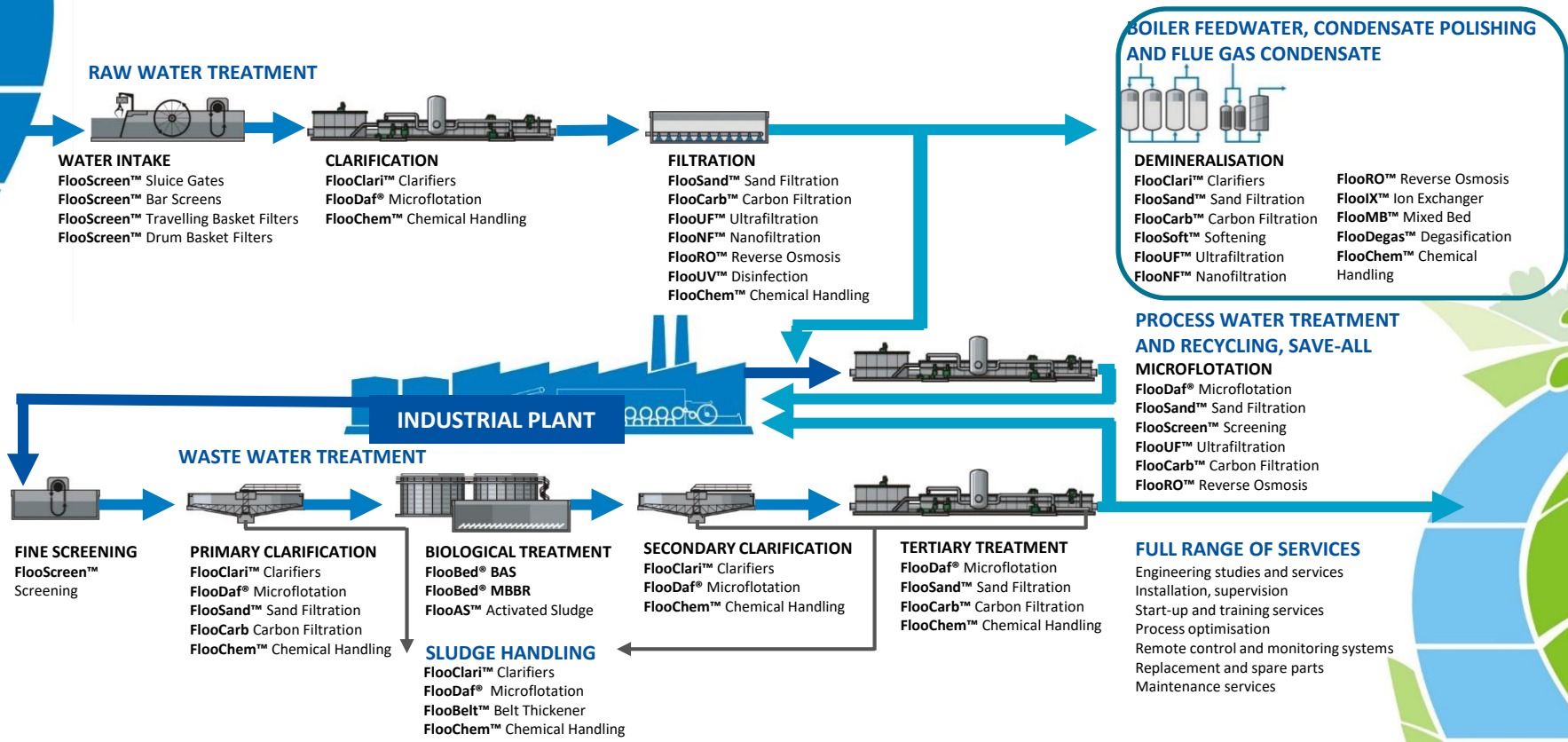
Metsä Fibre Kemi Mills Water treatment Plant

- Raw Water Treatment
 - FlooDaf® Microflotation 972 m3/h
 - Floosand™ Sand filter 972 m3/h
 - Two lines, one line operates in temperature over 50 C
- Dosing
 - PAC, NaOH, H2SO4
 - Oxygen scavenger



Water treatment in Power plants

Boiler Feed Water, Condensate Polishing, Flue Gas Condensate



Water treatment in Power plants

Demineralized water treatment, CPP, FGC



Cartridge Filters



FlooUF™



FlooSoft™



FlooRO™



FlooMB™



FlooAC™



FlooIX™



FlooEDI™



FlooDeGas™

Water treatment in Power plants –Auxiliary systems



Sampling / analyzing



HEX



Chemicals



Dosing



Automation

Jönköping Energi AB

Demineralized Water Treatment Plant

- 1 x Heat exchanger
- 2 x Softener
- 2 x Cartridge filter
- 2 x High pressure pump
- 2 x FlooRO™ Reverse Osmosis 2 x 13,9m³/h
- 2 x EDI
- 2 x FlooMB™ Non-regenerable Mixed Bed



Plant data:

35 Mwe

65 MW district heat

Fuel - biomass

Raw water – city water / flue gas condensate

Skövde Värmeverk AB, Sweden

Demineralized Water Treatment Plant

- 2 x Softener
- 2 x Cartridge filter
- 2 x High pressure pump
- 2 x FlooRO™ Reverse Osmosis double pass
- 2 x FlooMB™ Non-regenerable Mixed Bed



Plant data:

35 Mwe

65 MW district heat

Fuel - biomass

Raw water – city water

TSE Naantali

Demineralized Water Plant

- 3 x 50% Water softener
- 2 x 50% Reverse Osmosis
- 2 x 50% Electro-deionization including reject circulation unit
- 2 x 100% Non-regenerable Mixed Bed
- Heat exchanger, Clean process water circulation tank
- CIP cleaning unit



Plant data:

145 MWe

250 MW district heat

Fuel - multifuel

Water – city water

Hamburger Hungaria, Hungary

Demineralized Water and Condensate Polishing Plant

Demineralized Water Plant

- 2 x 100% Multilayer filter as a pre-treatment
- 2 x 100% Cation – Anion lines (SAC – WBA/SBA)
- 1 x 100% Membrane degasser unit
- Polishing Mixed Bed

Condensate Polishing Plant

- 3 x Heat exchanger for cooling
- 3 x 50% Hydroanthracite filter
- 1 x 100% Cation – Anion line (SAC – SBA)
- Common Mixed Bed for CPP and DWP



Plant data:

42,3 MWe

172,5 MWf

Fuel - biomass

Water – city water

Riikinvoima

Flue Gas Condensate Treatment

- FlooSand C1.0 sand filter with 1,0 m² filtration area
- Sand washing and recycling system
- Feed, filtrate and reject pumps
- Coagulant dosing system



Plant data:
90 GWh electricity
180 GWh district heat
Fuel - Waste
Water – flue gas condensate

Stora Enso Varkaus Demineralized Water Treatment Plant

- Plant capacity 2 x 70 m³/h
- Cartridge filters 2 pcs
- Reverse osmosis 2 pcs
- Mixed Bed exchangers 2 pcs



Plant data:

50 MW

Fuel - wood based biomass

Water – chemically treated water from mill
raw water plant

Borås Energi AB, Sweden

Flue Gas Condensate and Demineralized Water

- Back wash filters
 - Softening
 - Ultrafiltration
 - 2-pass reverse osmosis
 - Electrodeionization
 - Non-regenerable MB
- Back wash filters
 - Cartridge filters
 - Selective ion exchangers



Plant data:

120 MW

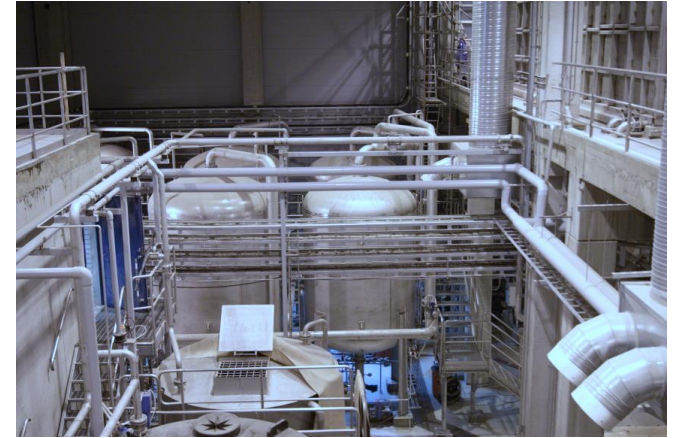
Fuel - wood based biomass

Water – flue gas condensate, city water as back-up

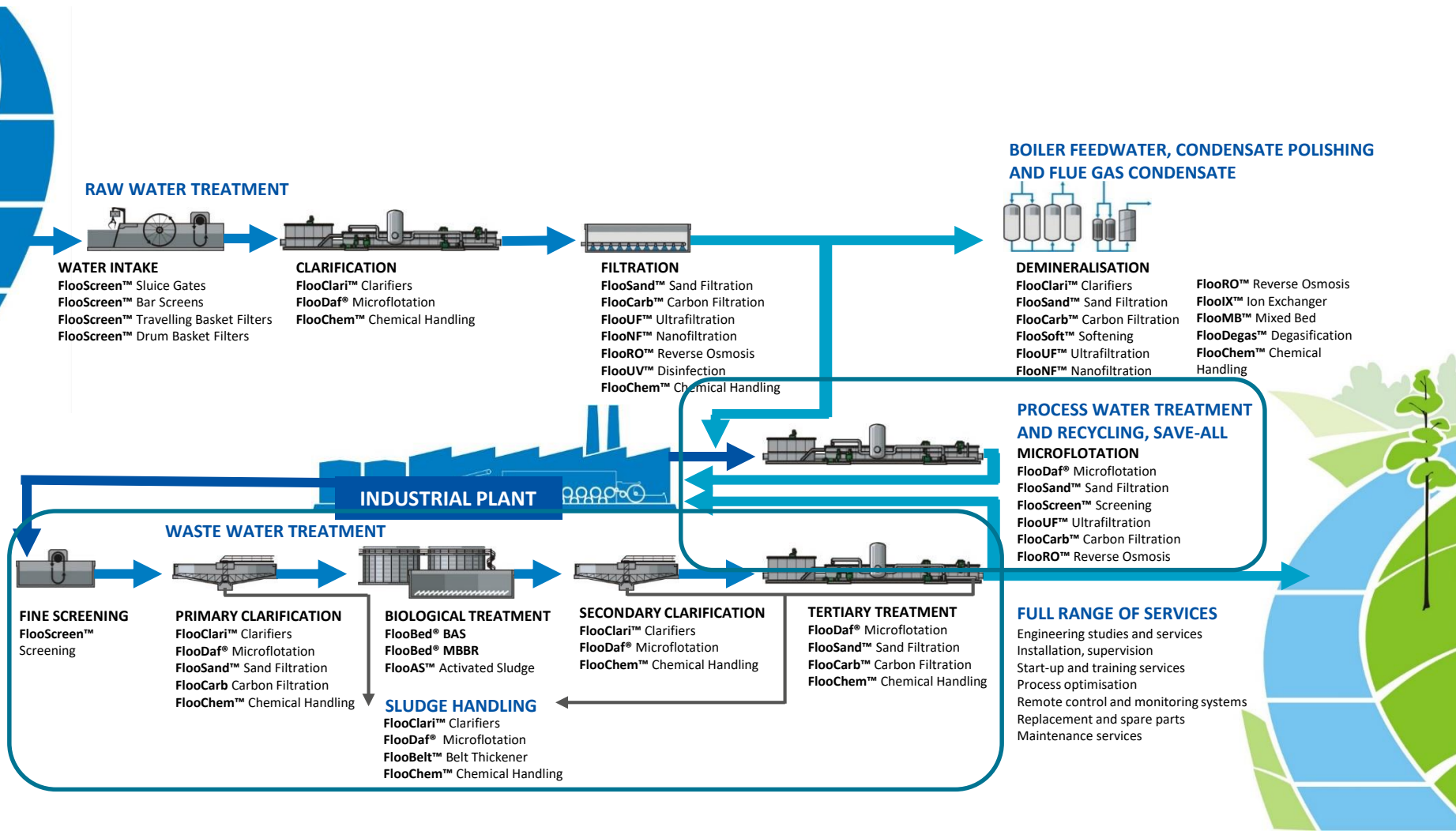
Metsä Fibre Kemi mills

Water treatment and Demineralized Water Plant

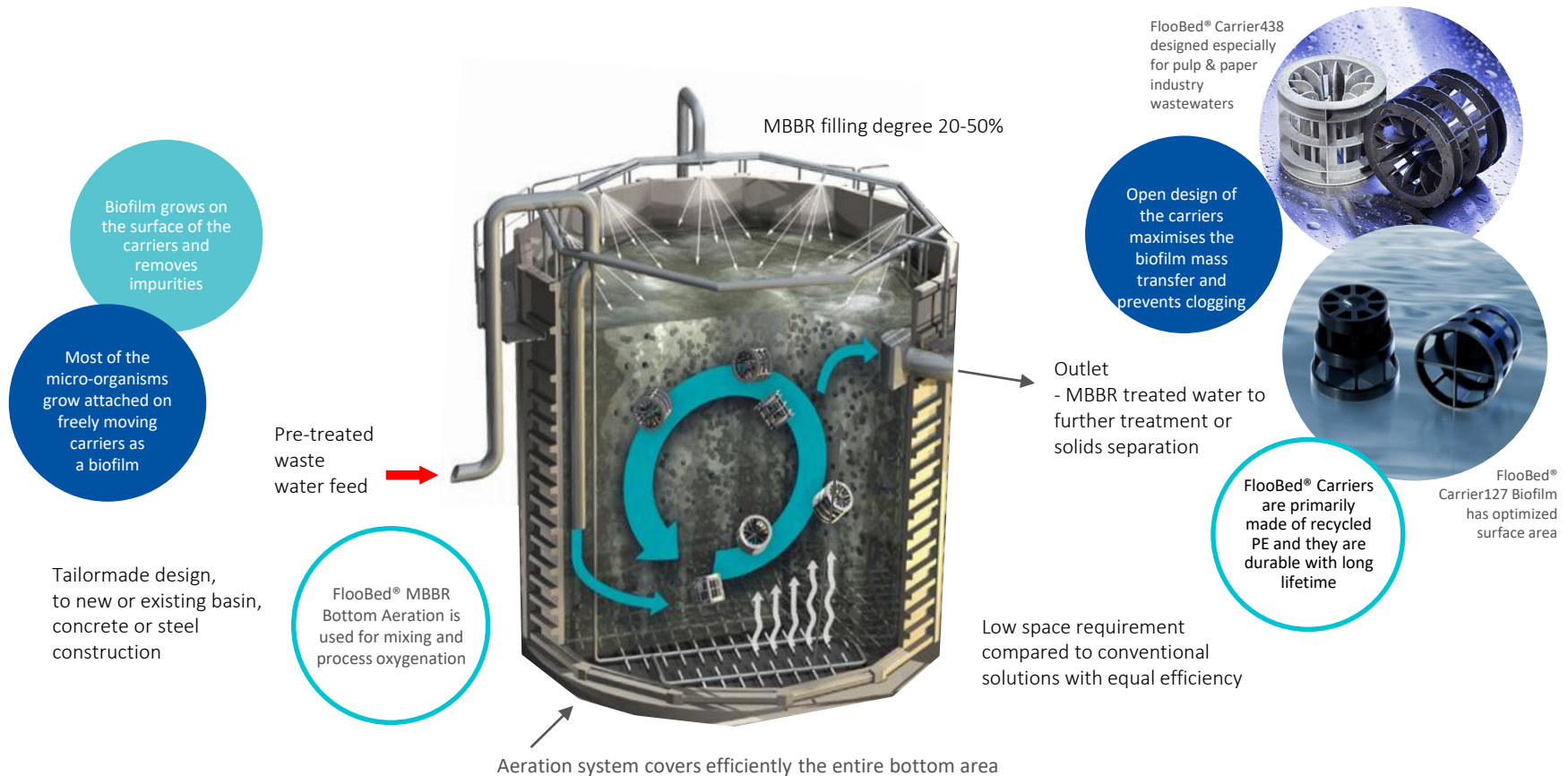
- Demineralization
 - FlooIX™ Ion Exchangers 2 x 234 m3/h
 - FlooMB™ Mixed Bed 2 x 234 m3/h
- Condensate Polishing
 - Cartridge filter 2 x 252 m3/h
 - FlooMB™ Mixed Bed 504 m3/h
- Dosing
 - PAC, NaOH, H2SO4
 - Oxygen scavenger



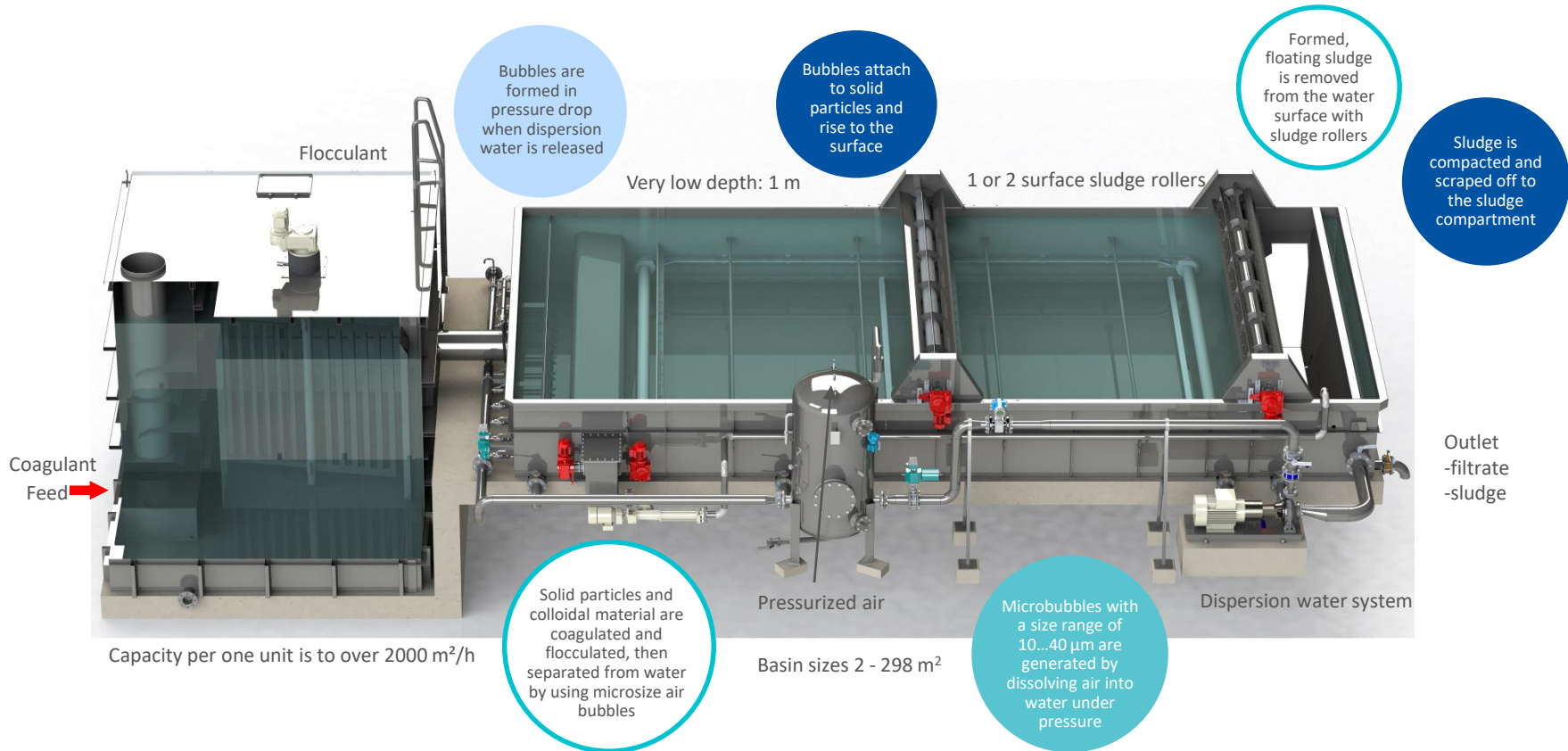
Process Water and Wastewater treatment in Industrial sectors



FlooBed® MBBR process



FloDaf® microflotation process



Selected References

Pulp&Paper industry

Raw water treatment

Boiler Feed Water

Condensate polishing

Process water treatment and recycling

Wastewater treatment

Chemical handling

Kartonfabrik Buchmann GmbH KG, Germany

FlooBed® BAS Wastewater Treatment Solution



Holmen Paper Madrid, Spain

FlooBed® and FlooDaf® Wastewater Treatment Solution



SCA Sahagun, Mexico

FlooBed® MBBR and FlooDaf® microflotation

Process for PM Save all and DIP White water treatment and recycling

- 2 pcs. FlooDaf® B 126 Microflotation

Process for ETP and Reuse

- FlooDaf® B35 Microflotation
- FlooClari™ Clarifier
- 2 pcs. 800m³ FlooBed® Bioreactors
- FlooDaf® B35 Microflotation with coagulation



Oji Paper, Pan Pac, New Zealand FlooBed® BAS Wastewater Treatment Solution

Client's need:

BCTMP process effluent volumes and composition will exceed the capacity of the existing site effluent treatment plant

Flootech solution:

FlooBed® BAS Biological wastewater treatment plant

FlooBed® MBBR

FlooAS™ Activated Sludge

FlooDaf® Microflotation for primary clarification

FlooClari™ Clarifier for secondary clarification



Selected References

Oil&Gas, Petrochemical industry

Oil removal

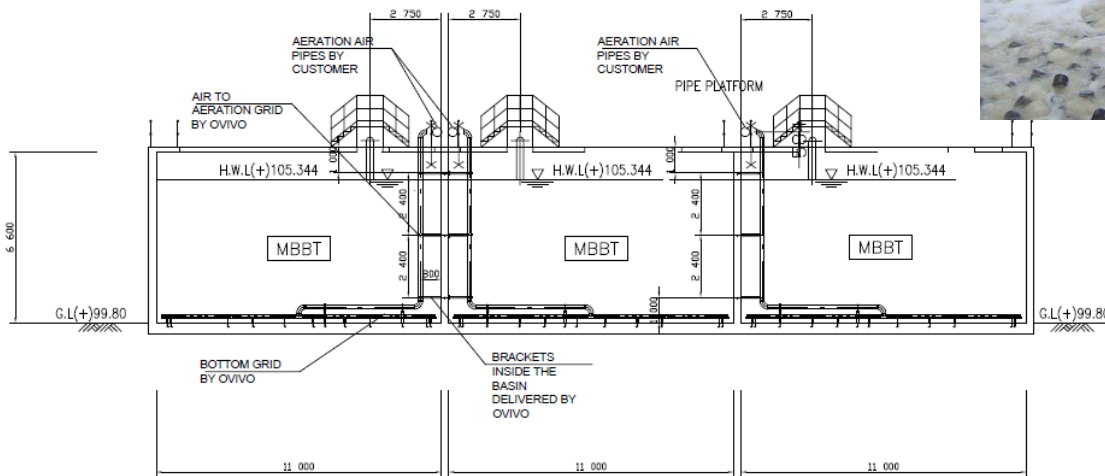
Wastewater treatment

Chemical handling

Takreer Ruwais Refinery, U.A.E

FlooBed® MBBR Wastewater treatment

- Abu Dhabi Oil Refining Company (Takreer)
- Location: Ruwais, United Arab Emirates
- Flow: 21 600 m³/d
- Total of 3 FlooBed® MBBR lines, 3 x 715 m³



KNPC/SHELL MAA and MAB refineries, Kuwait FlooDaf® Microflotation for Oil Removal



شركة البترول الوطنية الكويتية
إحدى شركات مؤسسة البترول الكويتية
A Subsidiary of Kuwait Petroleum Corporation

- Flow 2 000 m³/d
- FlooDaf® microflotation 2 pcs
- FlooChem™ Chemical handling
- Plant engineering
- Instrumentation
- Automation

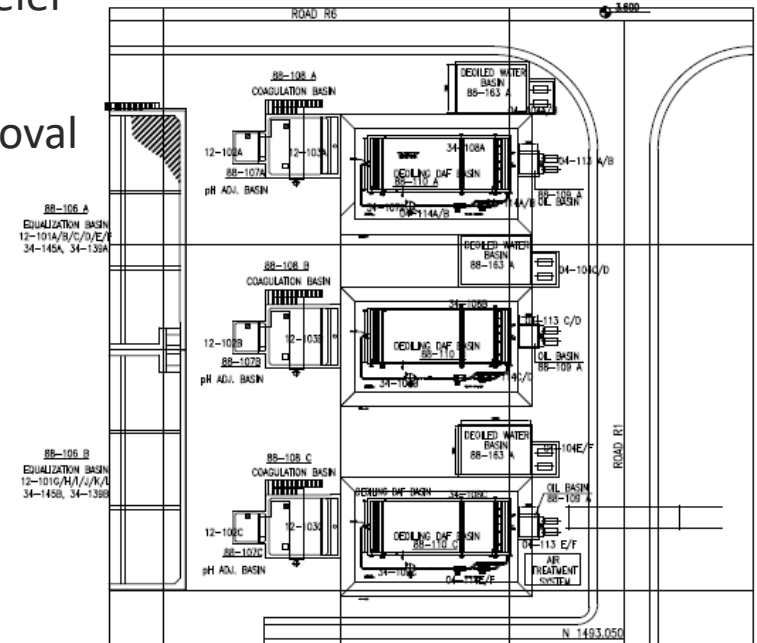


Flootech
Creating value by cleaning water

Marafiq Yanbu, Saudi Arabia

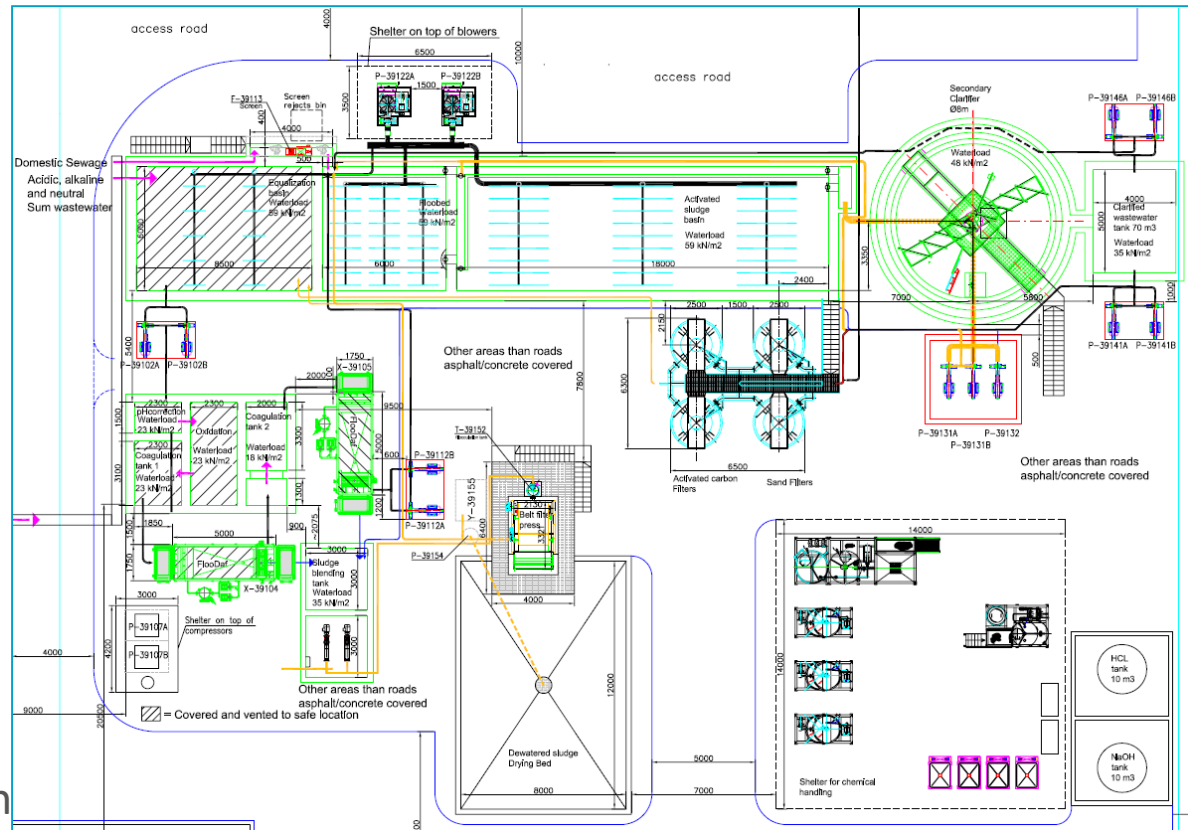
FloDaf® for oil removal

- EPC Contractor: SETE
- Involved engineering firms: ENOIA and Foster Wheeler
- End Customer: Marafiq Yanbu Saudi Arabia
- FloDaf® Microflotation units for oil and solids removal
- Flow 49 660 m3/d
- Total of three FloDaf® lines:
 - 3 pcs. coagulation + 3 pcs. FloDaf® B138
- Covered Concrete DAF basins (Zone Ex 0)



FlooBed[®] MBBR and FlooDaf[®] microflotation Refinery (TDI) in India

- Inlet flow 972 m³/d
- EPC Contractor: Laksel
- Complete wastewater treatment system delivery
- FlooBed[®] MBBR
- FlooDAF[®] Microflotation
- FlooAS[™] Activated Sludge
- FlooClari[™] Clarifier
- FlooSand[™] Sand filtration
- FlooCarb[™] Activated Carbon



4/3/2019

Selected customers



Contact Flootech

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Patrik Rehn
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Director, Technology



Hannu Turunen
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