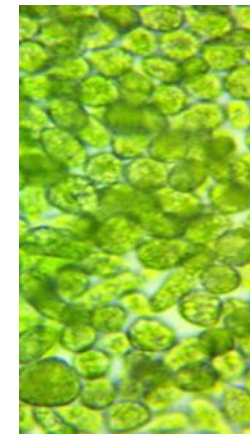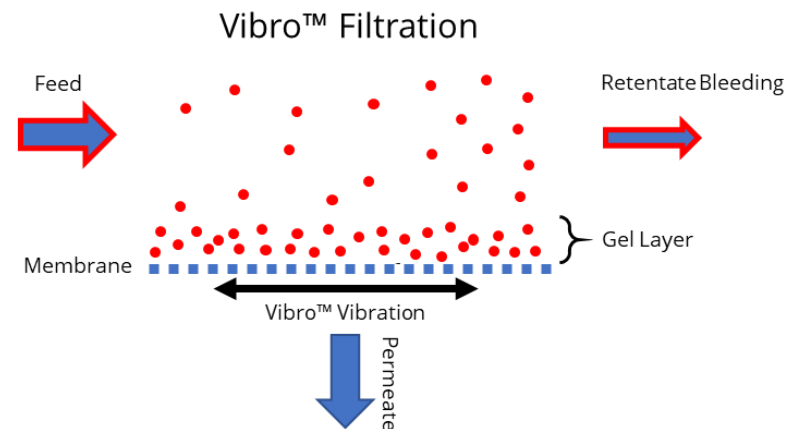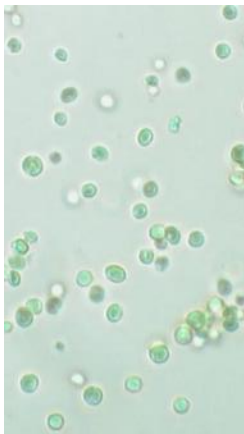# SANI Membranes

Vibro Filtration for Algae Harvest, Concentration and Refinery

Vibro™ Filtration

Feed

Retentate Bleeding

Gel Layer

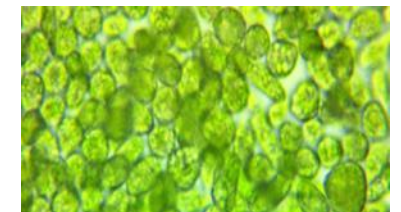Membrane

Vibro™ Vibration

Permeate

For more information: info@sanimembranes.com
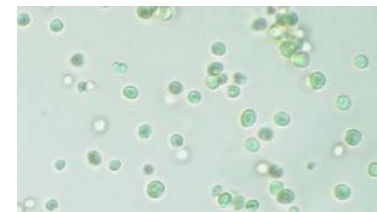
Capabilities of the Vibro Units
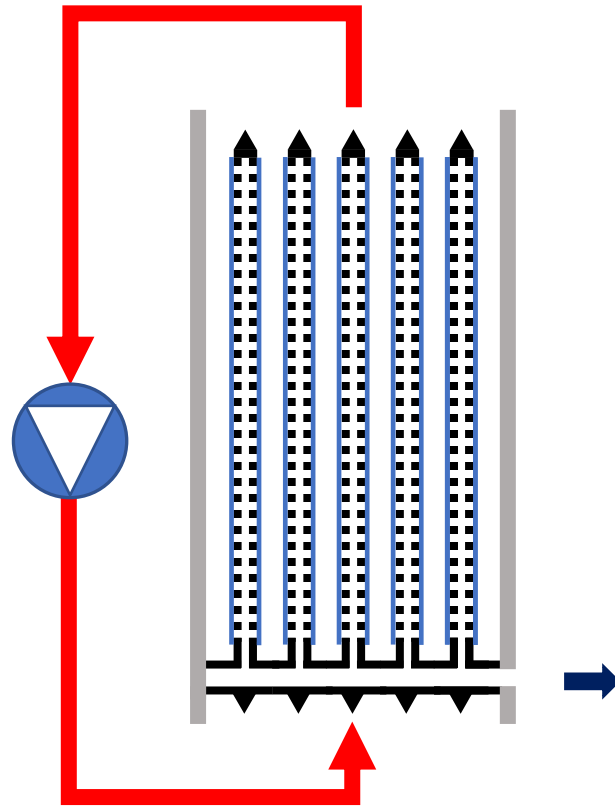

Harvest and Concentration

- Nannochloropsis: 1 g/l → 190 g/l

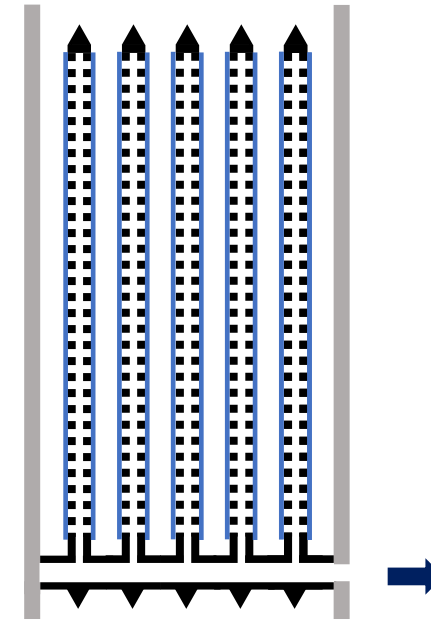- Chlorella: 50 g/l → 290 g/l

- Several other algae and cells tested

Further refining possible w. same solution

Cross Flow Filtration vs. Vibro™ Filtration

Vibration of the membrane relative to the media

- Fast flow creates turbulence and pressure loss

- Circulation pump affects product and uses energy

- Energy extensive cooling is needed

- Vibration creates turbulence on surfaces

- No pressure loss - uniform TMP

- Turbulence only where needed! – minimal cooling needed

Unique Vibro™ technology features

- **High concentrations, viscosities and solids loads** – Unique Free Flow Plates

- **Easy maintenance, simple systems**

- **Less Energy;** Turbulence only where needed, no Pressure Loss
  – Reduced energy consumption by 50-90% and NO cooling needed

- **Sharper cut-off** - 100% uniform TMP – improved or new MF and UF opportunities

- **Outstanding MF filtration, high transmission** - very low TMP in the entire system

- Sanitary – GMP - Shorter cleaning time, less water & chemicals,

  100% Drainable – no product loss; gentle product handling,

  Fully recyclable – one polymer only,

  Small foot print, etc. etc....

From Lab scale to Production

Vibro-Lab

Laboratory series:

Unique scalable continuous filtration solutions

From **8 ml** dead volume retentate

Unit size from 35 to 3.500 cm^2

Vibro-I

Industrial series:

Unequaled performance in simple continuous MF & UF solutions

Microfiltration with up to **100% API Transmission**

Unit size from 7.5 to 80 m^2
System size as big as you want

The Vibro™-Lab35P

Extreme low volume, super simple process

- Benchtop system with **8 ml dead volume**

- Filter with **35 cm²** membrane for all thinkable MF and UF applications

- Process development, membrane selection, CIP studies etc.

- Portable and easy to use. Start-up in 5 min.

- High viscosity, high concentration and high solids load

- Simple feed system with for batch or continuous filtration, diafiltration etc.

The Vibro™-Lab3500

Disruptive in size, simplicity and process

- Benchtop system with **0.35 m²** membrane

- High viscosity, high concentration and high solids load

- Portable and easy to use. Start-up in 5 min.

- For all thinkable MF and UF applications

- Process development, membrane selection, CIP studies etc.

- Full observation membrane surfaces during operation

- Flexible feed systems with countless process possibilities: wit or without feed pump, batch or continuous filtration, diafiltration etc.
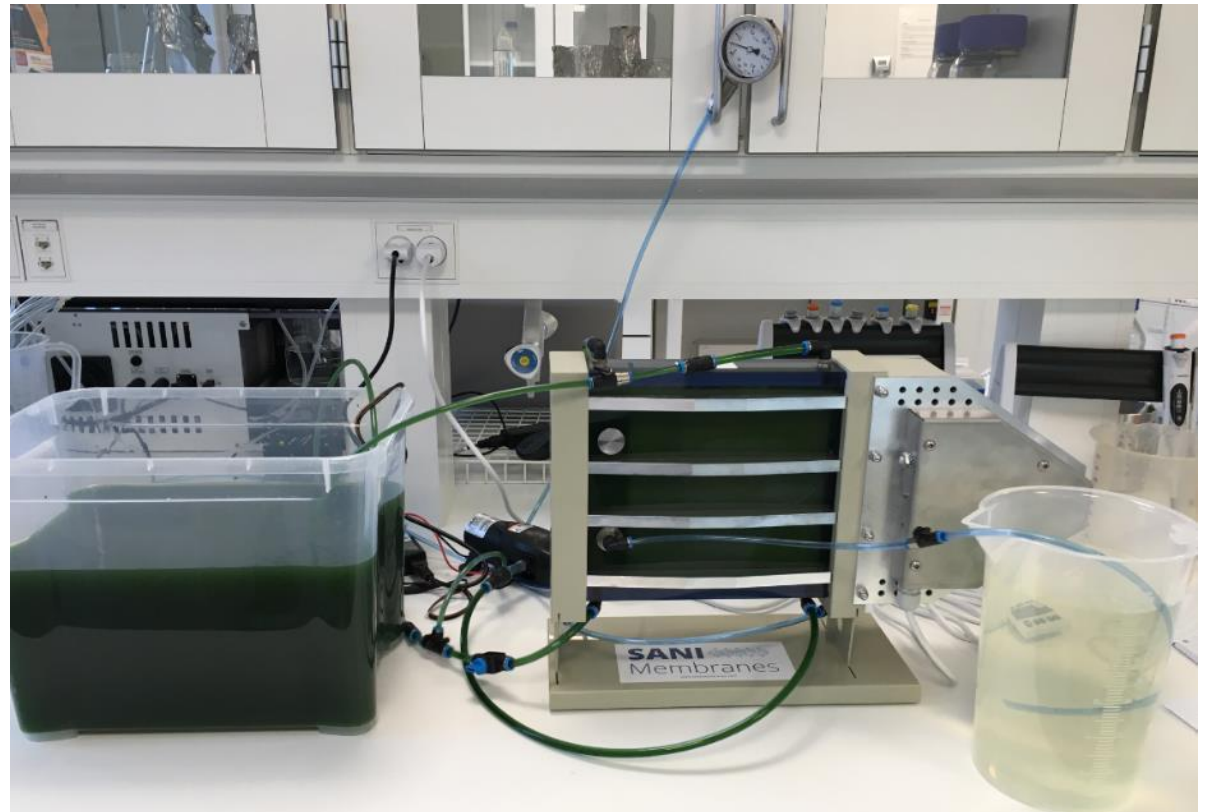
The SANI Vibro™-LE

Disruptive in size, simplicity and process

- Process development; product & CIP studies etc.

- Small scale production

- Small, Fast, Easy pilot trials

- Portable and easy to use. Start-up in 5 min.

- High viscosity, high concentration, high solids load

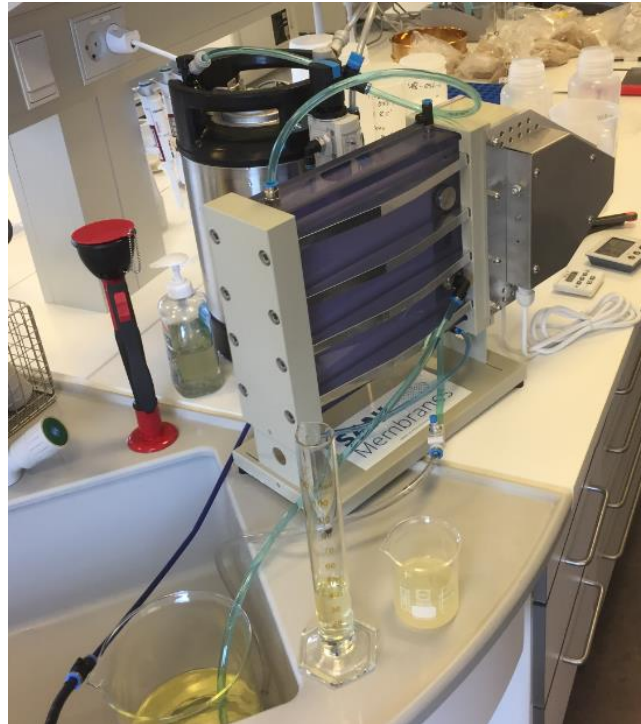**Harvest** of **Micro Algae 0,1%** ➡ **15% DM** from the ReMAPP project
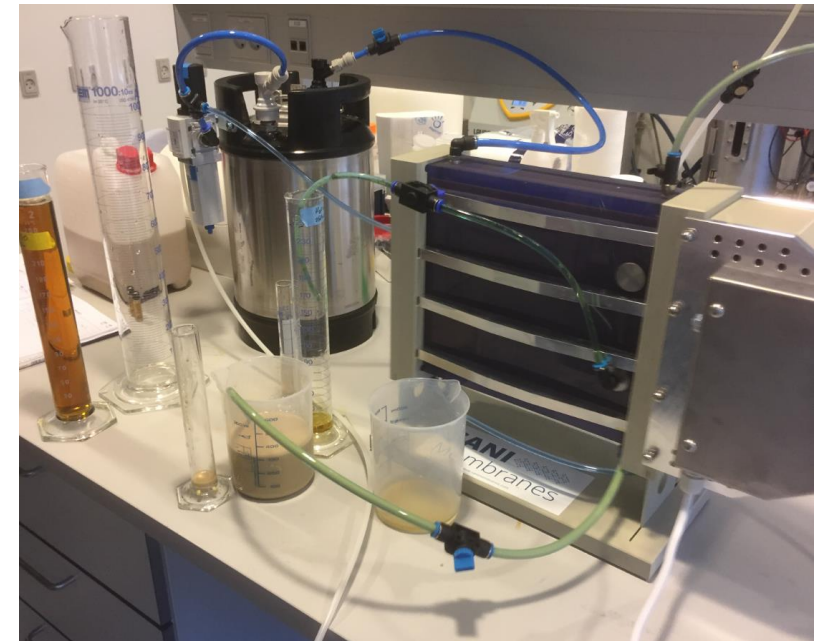
The Vibro™-Lab3500

MF: Apple juice clarification

MF (Transmission):
Clarification of a protein stream

UF:
Concentration of a protein stream

Vibro™-I MF & UF Pilot units

Vibro-I Feed System

Vibro-I units:
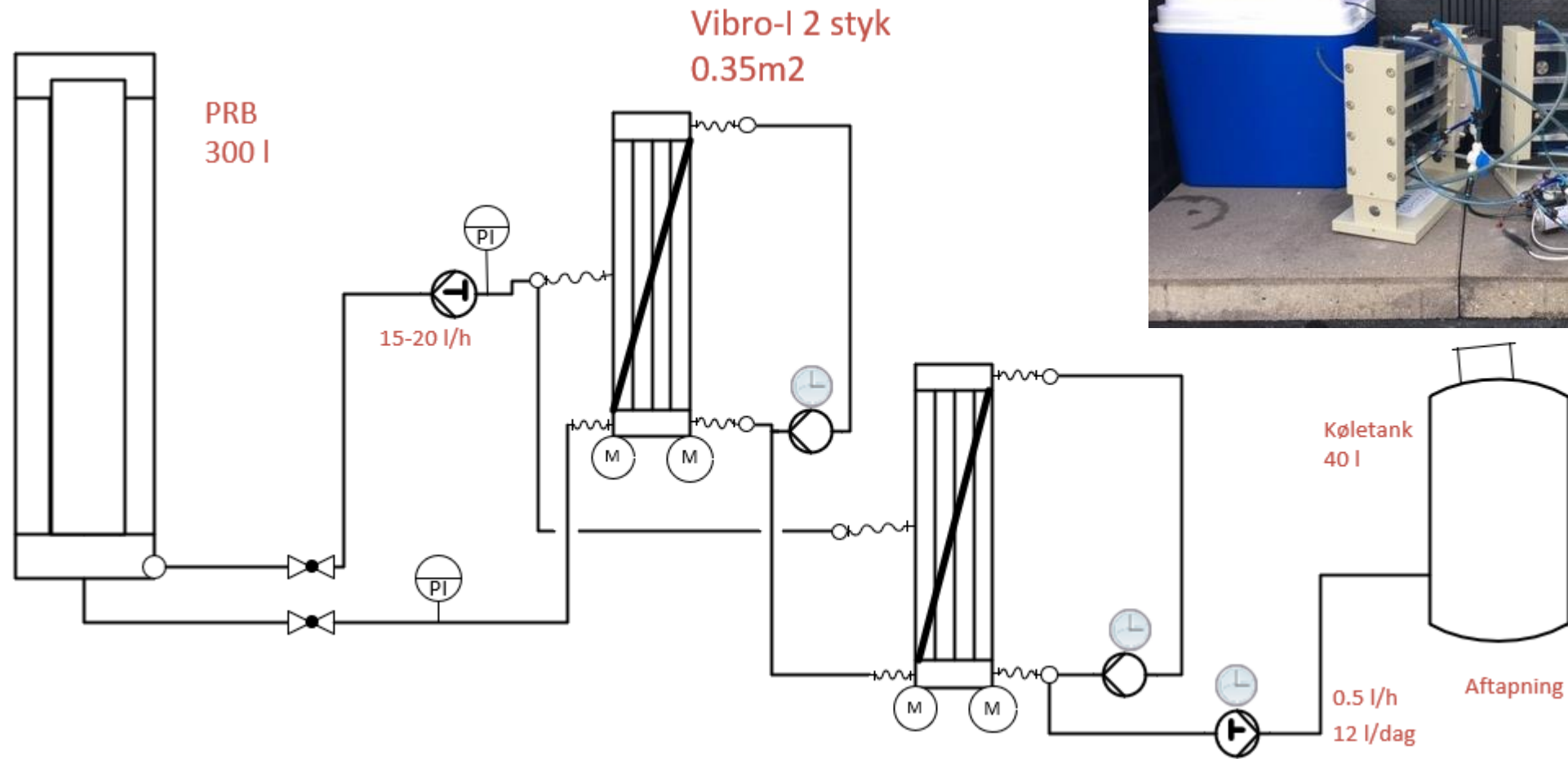
Fully Customized Pilot

Micro Algae Harvesting & Concentration

Harvesting from Tubular or Open Pond Systems and Concentration of to slurry with 150 g/l algae.
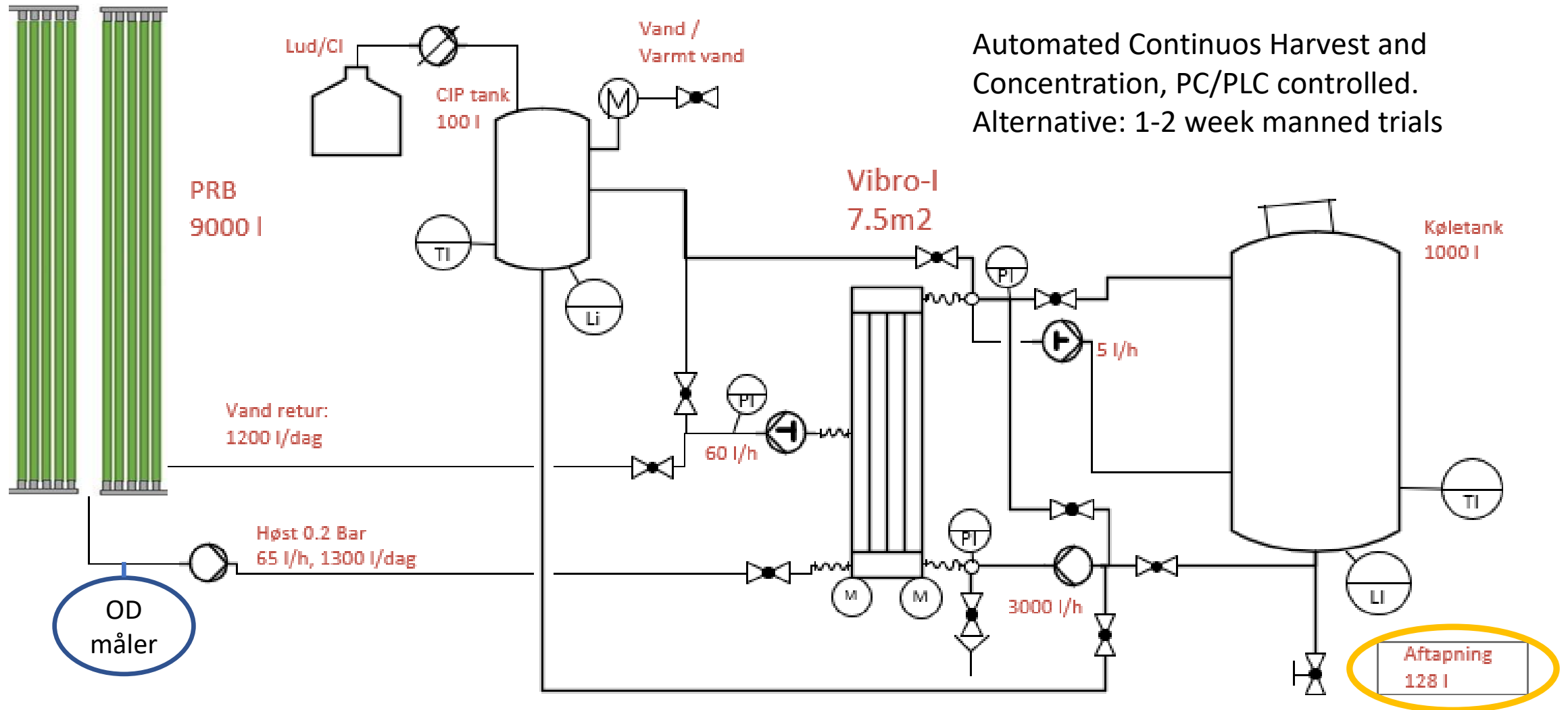
> 100% viability + reusable water

Algae Harvest and Concentration
ReMAPP / Food
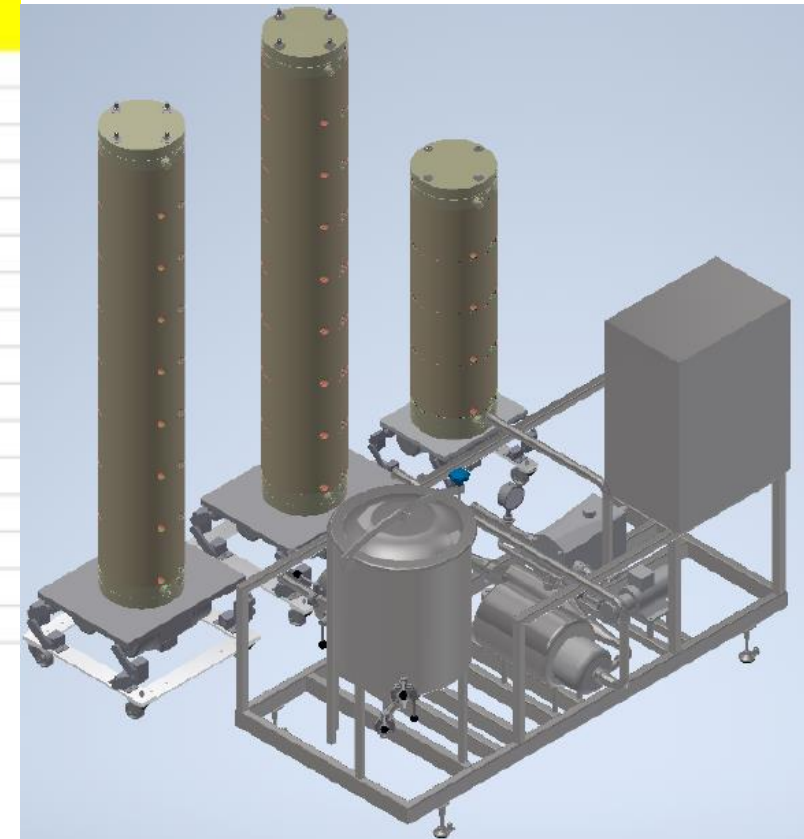TI Taastrup October 2020

SANI - ReMAPP, 9.000 liter Bioreactor

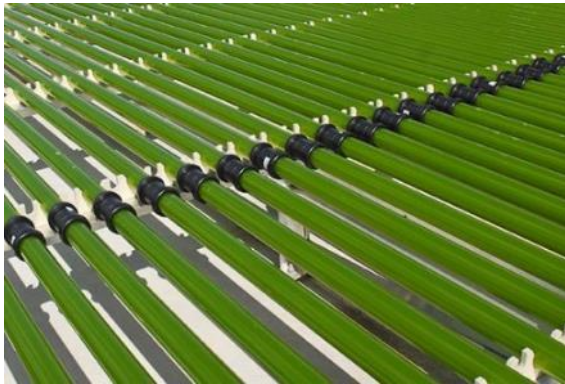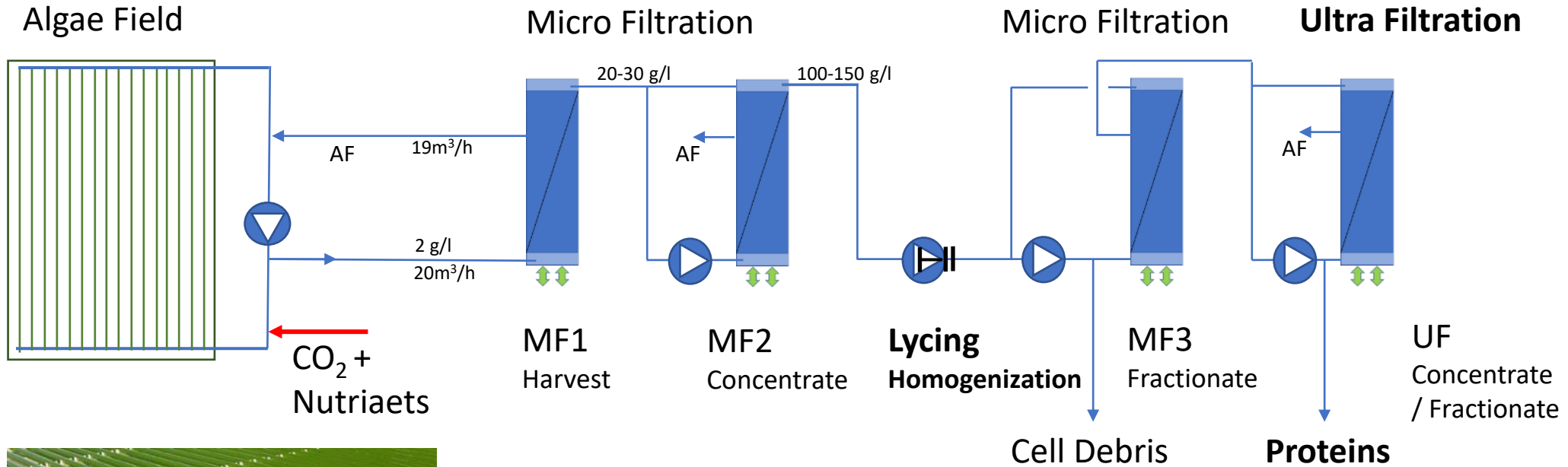Automated Continuos Harvest and Concentration, PC/PLC controlled. Alternative: 1-2 week manned trials

Design of a quarter Hectar plant

SANI Algae Processing
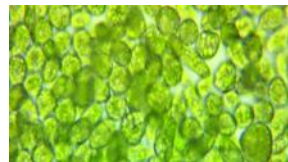

Algae Field

Micro Filtration

Micro Filtration

Ultra Filtration

20-30 g/l

100-150 g/l

AF   19m³/h

AF

AF

2 g/l
20m³/h

CO_2 +
Nutriaets

MF1
Harvest

MF2
Concentrate

Lycing
Homogenization
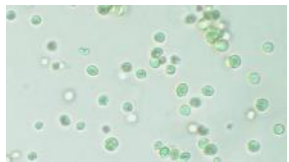
MF3
Fractionate
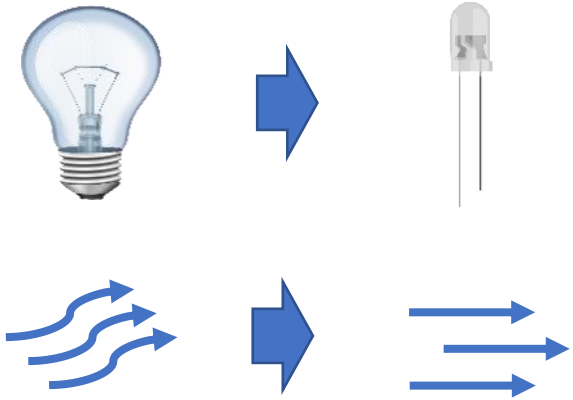
UF
Concentrate
/ Fractionate

Cell Debris

Proteins

Vibro Filtration for Algae Harvest, Concentration and Refinery

Thank You!

For more information:
info@sanimembranes.com

SANI
Membranes

MORE FILTRATION, LESS ENERGY

For more information:
info@sanimembranes.com