



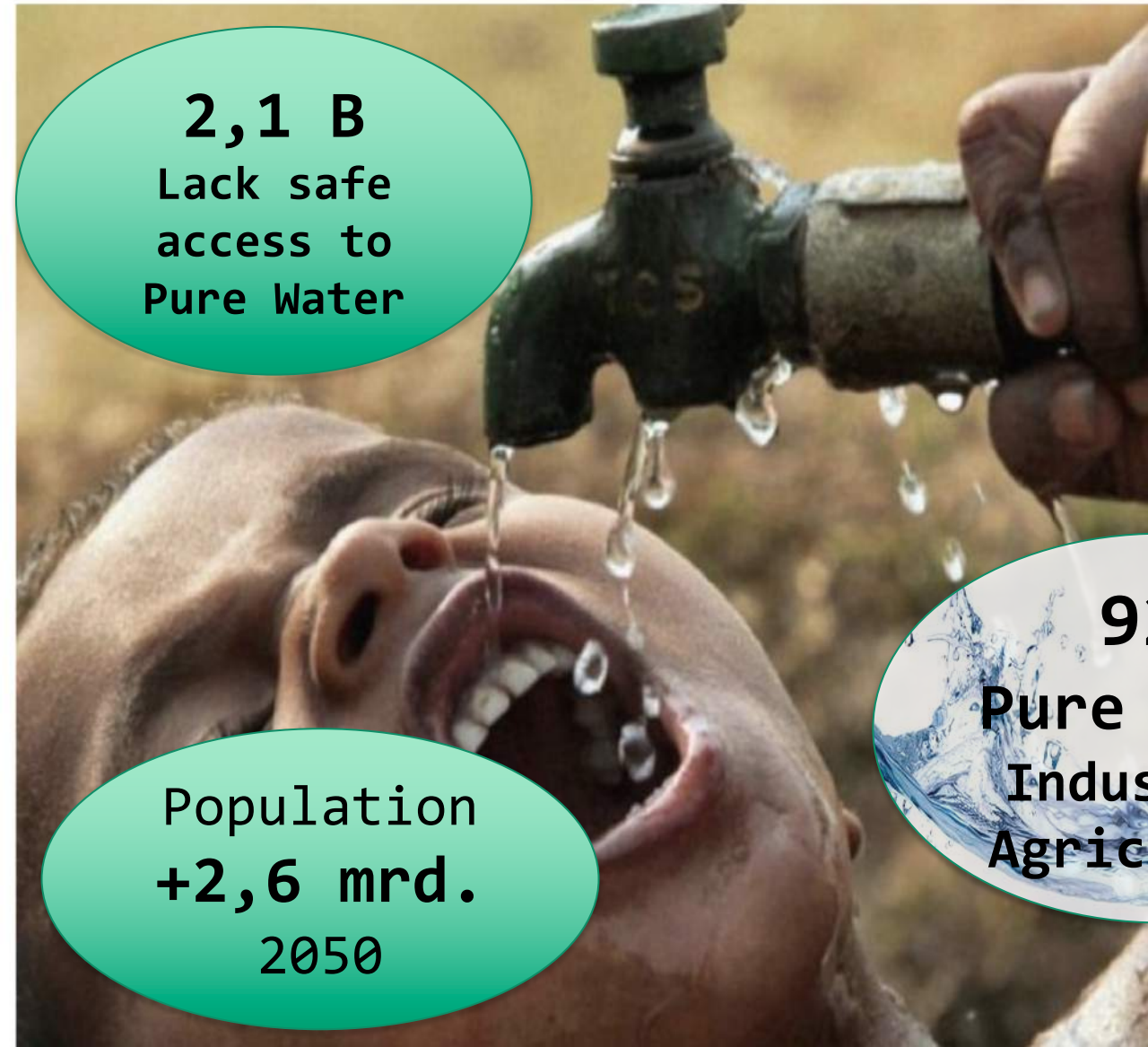
# REDONO

## GIVING BACK TO NATURE

SUSTAINABLE INDUSTRY AND AGRICULTURE  
WITH FUTURE FARMING TECHNOLOGIES

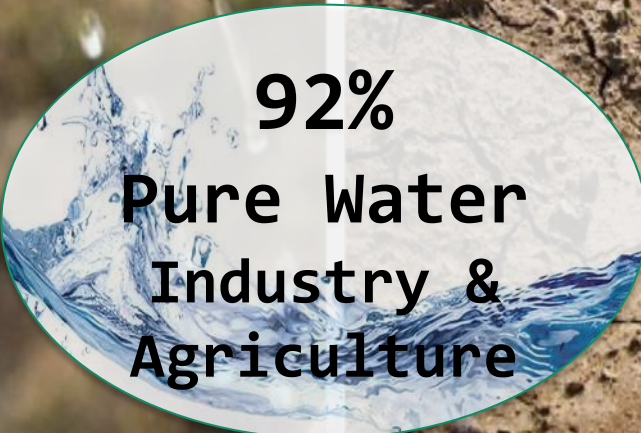


# GLOBAL CHALLENGES



**2,1 B**  
Lack safe  
access to  
Pure Water

Population  
**+2,6 mrd.**  
2050



**92%**  
Pure Water  
Industry &  
Agriculture



**Urbanisation**  
**70%**  
Living in cities  
2050

**70%**  
More  
Food  
2050

# REDONO

## 8 GOALS TO TRANSFORM OUR WORLD



### SUSTAINABLE DEVELOPMENT GOALS



# SUSTAINABLE INDUSTRY AND AGRICULTURE WITH FUTURE FARMING TECHNOLOGY

## BIOFEED

FROM INDUSTRIAL SIDESTREAMS TO  
ORGANIC LIQUID FERTILIZERS

## HYDROHUMALA

INDOOR HYDROPONIC FARM  
FOR GROWING FRESH HOPS



# REDONO

GIVING BACK TO NATURE

 URBAN CROP  
SOLUTIONS

INDOOR VERTICAL FARMING  
TURNKEY SOLUTIONS  
FOR URBAN FOOD PRODUCTION

 Varicon  
aqua

BIOALGAE  
MICROALGAE PRODUCTION, CO<sub>2</sub>-UTILIZATION AND  
BIOTECHNOLOGICAL WATER TREATMENT SOLUTIONS

# POSSIBILITIES SUSTAINABLE INDUSTRIES WITH FUTURE FARMING TECHNOLOGIES

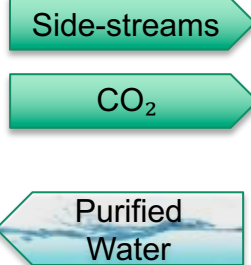
Aquaculture



Breweries



Biofuels industries



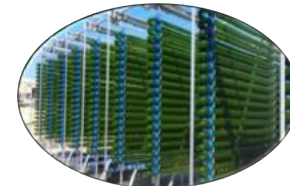
**BioFeed**

Production of Organic Fertilizers from industrial sidestreams



**BioAlgae**

Microalgae cultivation and water purification



**Vertical Farms**

Indoor Hydroponic Farms for cultivating plants

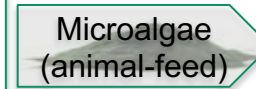


**HydroHops**

Hydroponic farms for cultivating hops



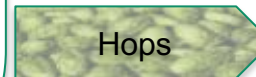
Traditional Farmers



Animal and Fish farmers



Restaurant & Local food shops



Breweries



# REDONO SOLUTION FOR SUSTAINABLE BREWERY

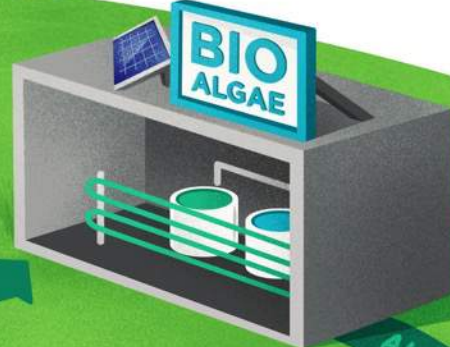


PURIFIED WATER

Fresh organic hops

CO<sub>2</sub>

GIVING BACK TO NATURE



SIDESTREAMS

Fertilizer

Fertilizer

Fertilizer

ALGAE

FOOD PLANTS

Fish- and animal feed

SITRA  
Metropolia

# WHY BREWERIES?

## Water Footprint

It takes roughly **75 liters** of water to make a pint of beer.



## Carbon Footprint

Approximately **500g** of CO<sub>2</sub>-emissions is produced for a pint of beer.



## Wastewaters

Average brewery produces roughly **3 pints of wastewater** for every pint of beer.



# WHY HYDROPONIC FARMING?



	<b>Traditional</b>	<b>Greenhouse</b>	<b>HYDROPONIC FARM</b>
Growth cycle	70 days	40-50 days	21 days
Water consumption per crop	35 L	15 L	1.5 L
Number of crops per square meter	18	25	250-300
Crop cycles	Seasonal	Seasonal	Year-round
Pesticides/Herbicides	Often	Less often	None
Location	Open field	Open field	Anywhere
Post-harvest handling	High	Medium	Low





**Production of Liquid Fertilizers.  
Capacity 4.000 m<sup>3</sup>/year.**

Module size: 20' sea container (length 6 m).

Fully automated and controllable system.

Can be powered by solar energy.

Suitable for industries such as breweries, fish farms, bioethanol plants, biogas plants and other organic industries.

Redono's patent pending method for the BioFeed-unit can be used to produce liquid fertilizers from industrial sidestreams, such as from Tornion Panimo's brewery, biofuels industries and agricultural sidestreams. This concept will be demonstrated together with Metropolia's department of Clean technologies.

In the BioFeed unit the organic sidestreams are first pretreated to ensure good quality liquid fertilizer production. The pretreatment process contains electrocoagulation, removal of solids, nitrification with biofilter and UV-disinfection.

After the pretreatment we have a nutrient rich water solution, from where we can further optimize and control the desired recipe for either **liquid plant fertilizer** or **microalgae growth medium**.

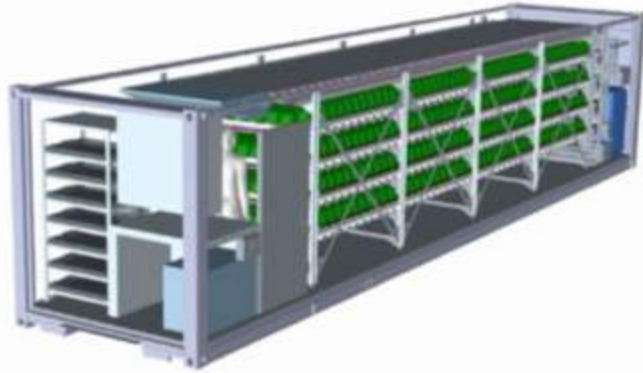
**HydroHumala** farm is a indoor hydroponic hops farm for a year round production hops. The PILOT will demonstrate the proof-of-concept, by producing fresh hops for Tornion Panimo's brewery.



## NEW TYPE OF BEER TO THE FINNISH BEER MARKET

HydroHumala PILOT will produce approx. 40 kg of fresh hops for Tornion Panimo. Tornion Panimo can then produce 3000 liters of a new type of beer, using 100% fresh hops, instead of dried hops.

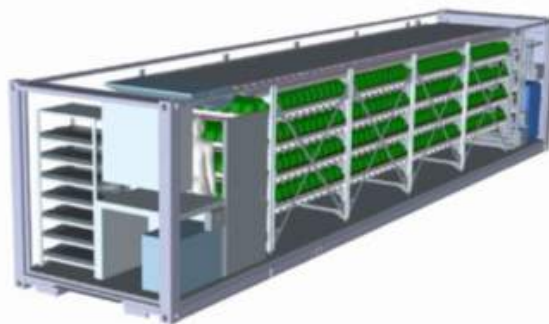
# VERTICAL FARMING SOLUTIONS



## FarmFlex



## FarmPro



## PlantFactory



**40-foot shipping container.  
50m<sup>2</sup> growing surface.  
960-1.900 plants/growing cycle.  
14.400-28.800 plants/year.**

**40-foot shipping container.  
80m<sup>2</sup> growing surface.  
1.600-3.600 plants/growing cycle.  
24.000-60.000 plants/year.**

**Up to 130.000m<sup>2</sup>  
growing surface.  
5.000-6.1M plants/growing cycle.  
75.000-91.5M plants/year.**

# THE PURE LOCAL

## Urban Farming as a Service

Lettuce



Herbs



Microgreens



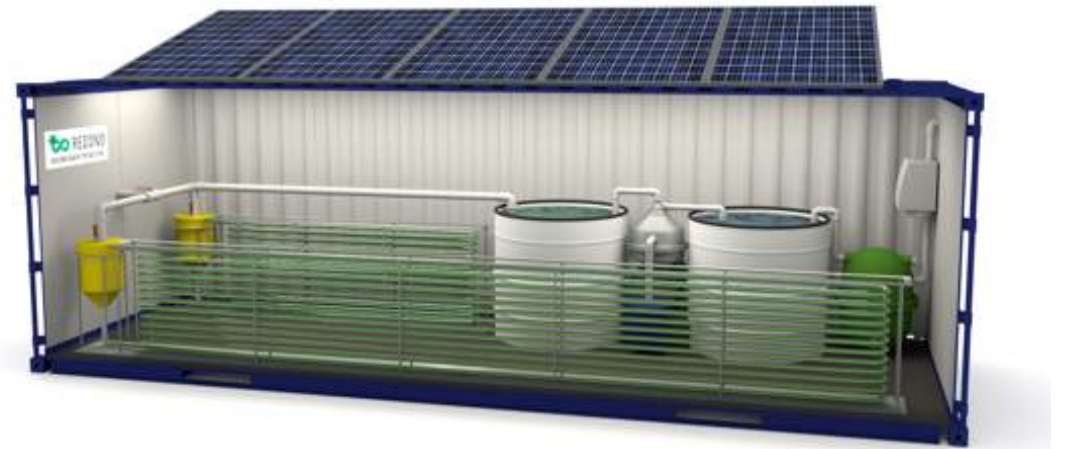
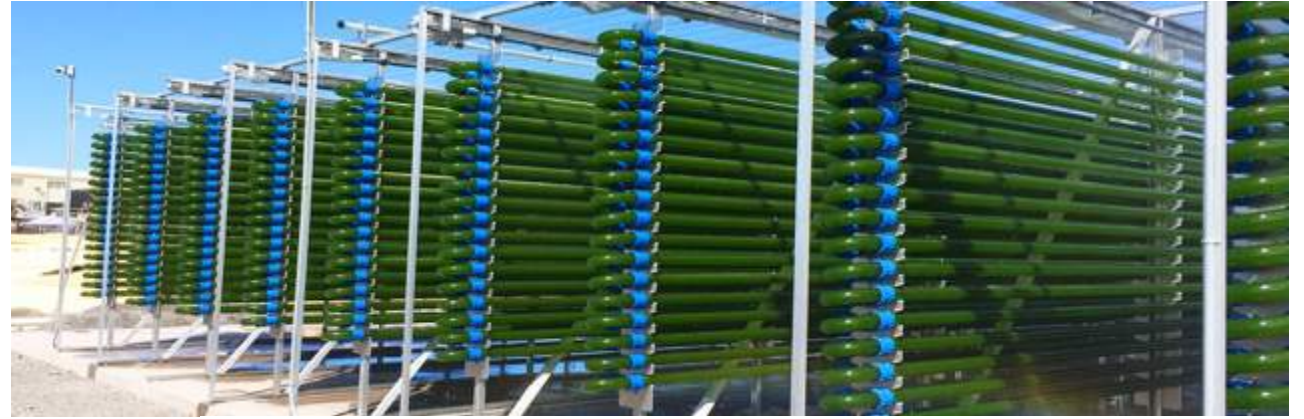
Berries

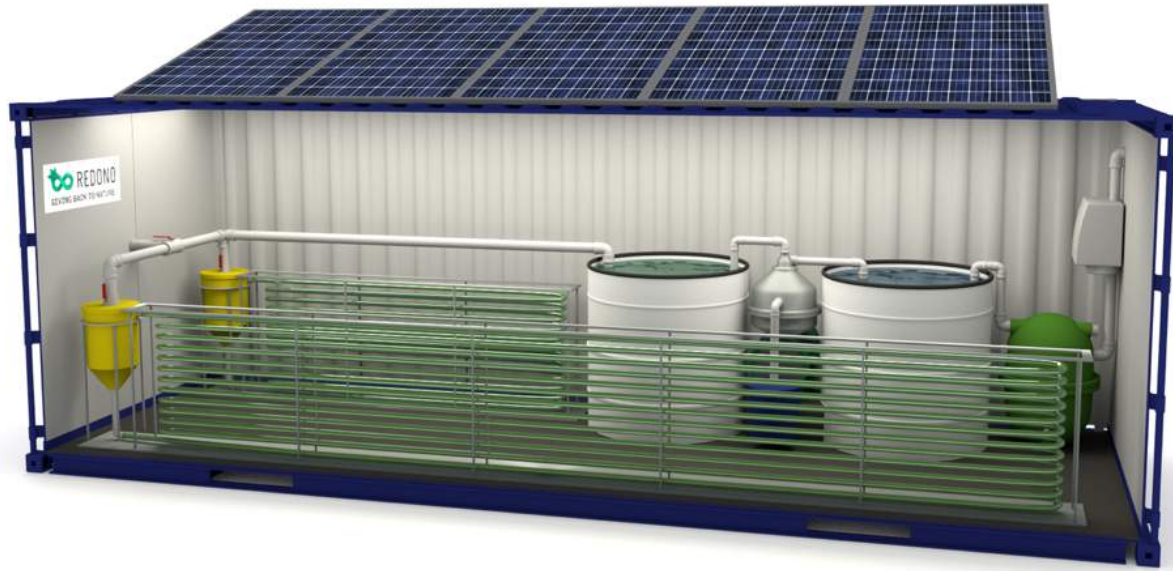


**Own recipes for  
Over 200 crop varieties**

**Sustainable Pure Local food production.  
Turn-key solutions with operational services for  
high quality and year round food production.  
From feasibility study to food production.**

# MICROALGAE PRODUCTION TECHNOLOGY





**Production of microalgae 1 kg/day.**  
**Water purification capacity 1m<sup>3</sup>/day.**  
**Utilization of CO<sub>2</sub>-emissions 2 kg/day.**

Module size: 40' sea container (length 12 m).  
Fully automated and controllable system.  
Can be powered by solar energy.

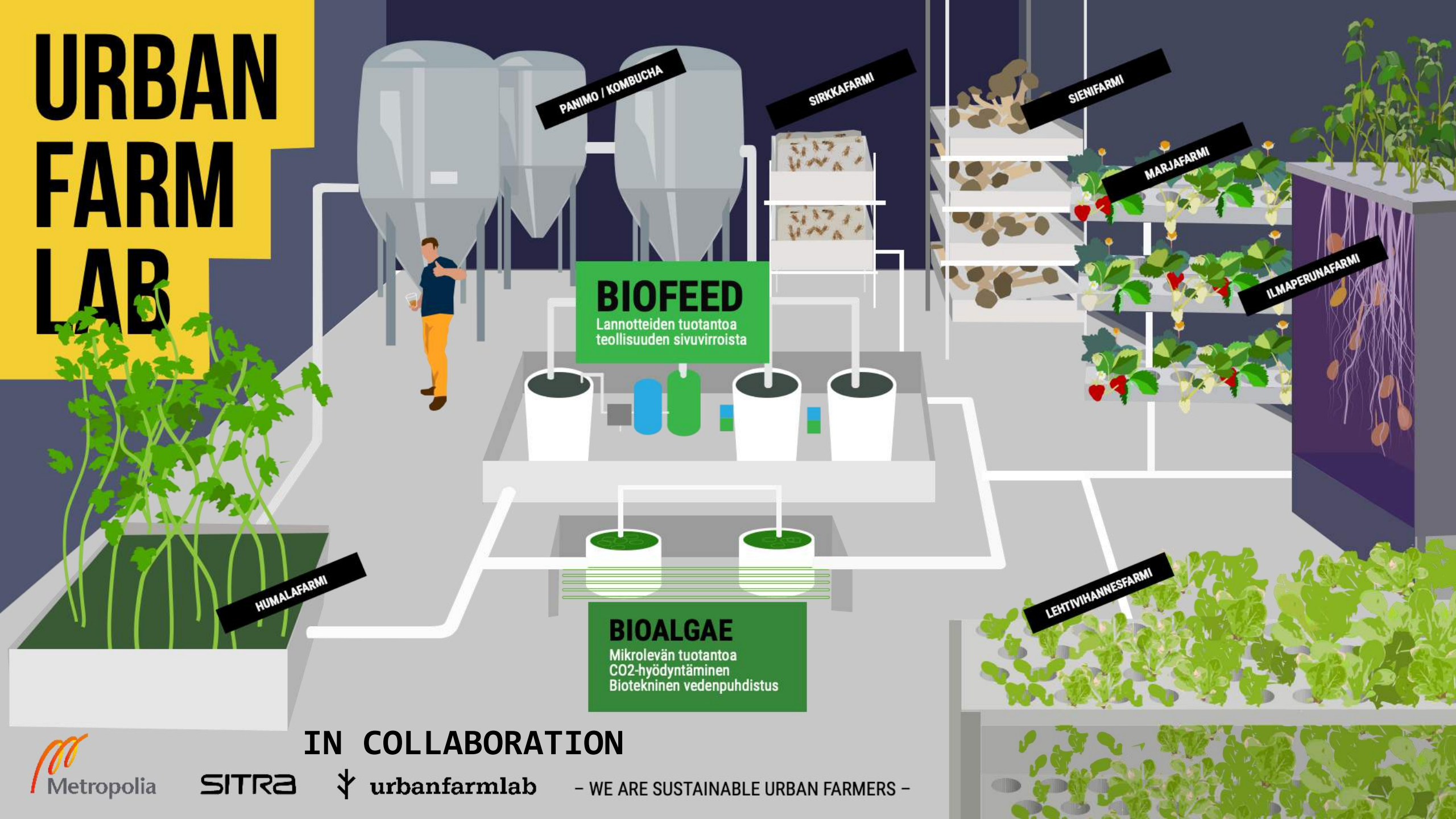
**BioAlgae unit is for cultivating microalgae**  
in the Varicon Aqua Phyco-Flow  
tubular photobioreactors (PBR),  
combined with high-tech LED-growlights.  
The produced microalgae can be harvested and the  
**effluent waters can be purified.**

BioAlgae unit can produce microalgae species,  
that contains high value in nutrition and  
other great health benefits.  
Algae can eventually be used in  
**new high-value products.**

The nitrogen and phosphorus in the recycled waters are used  
for the growth of microalgae together  
with the **CO<sub>2</sub>-utilization.** The recycled waters are eventually  
purified.

The BioAlgae unit can also work as a stand-alone microalgae  
production demo unit for our customers.

# URBAN FARM LAB



PANIMO / KOMBUCHA

SIRKKAFARMI

SIENIFARMI

MARJAFARMI

ILMAPERUNAFARMI

**BIOFEED**  
Lannotteiden tuotantoa  
teollisuuden sivuvirroista

HUMALAFARMI

**BIOALGAE**  
Mikrolevän tuotantoa  
CO2-hyödyntäminen  
Biotekninen vedenpuhdistus

LEHTIVIHANNESFARMI

IN COLLABORATION



SITRA

urbanfarmlab

- WE ARE SUSTAINABLE URBAN FARMERS -



# TEAM REDONO

## 8



**Henri Laine**  
CEO  
Chief Executive Officer



**Sam Clayton**  
CSO  
Chief Sales Officer



**Doug Brunson**  
COO  
Chief Operating Officer



**Kenichi Komatsu**  
CCO  
Chief Connectivity Officer



**Isa Qvist**  
CFO  
Chief Financial Officer



**Pasi Turkka**  
CMO  
Chief Marketing Officer



**Tiia Laine**  
R&D  
Cosmetics and SuperFoods



**Mikko Ahokas**  
Advisor  
Sustainable Brewery



# IN COLLABORATION





# REDONO

## GIVING BACK TO NATURE



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