

ADB e-Marketplace

**BIOPOLUS**

TECHNOLOGY

March 2021

JOHN TURNER

TURNING YOUR WATER STARVED INNER CITY  
INTO AN OASIS

A 21<sup>ST</sup> CENTURY SOLUTION TO A MILLENIUM OF  
CHALLENGES

The opportunity of presenting the **BIOPOLUS**  
technology during  
**“International Women’s Month”**  
should come as little surprise if you understand the  
plight of **“Women’s Groups” (The SDG’s)**  
and water and sanitation supply in many Asia/Pacific  
communities

This is **THEIR** concern.

THAT  
70%++ of the World's Population of  
7 Billion  
**still practice open defecation!!**

This is **THEIR** concern.

THAT

70% ++ of ALL polluted waste streams enter  
your canals, rivers, groundwater and seas.

**UNTREATED !!**

The women's groups tend to not only accept  
**responsibility,**  
but they are also willing to take  
**ownership**  
of these essential life support services.

Let us provide at local level the kind of solution that allows these groups to develop self sufficiency and dignity into their daily lives,  
also help them to meet the main SDG's

*The Septic Tank as a default treatment is no longer “FIT for PURPOSE”  
and should be assigned to the history books.*

# **BIOPOLUS** TECHNOLOGY OFFERS

an opportunity to address all these problems – including retrofitting being readily accommodated within any rural or city development plans.

## INTEGRATING WATER TREATMENT AND REUSE INTO URBAN ENVIRONMENT

### FUTURE-PROOF

Engineered ecosystems, interconnected into a decentralized network of high tech infrastructure solutions, transforming urban areas into smart, sustainable, circular economies.

#### MODULAR IN FUNCTION

- ✓ WATER TREATMENT
- ✓ WATER RECYCLING & REUSE
- ✓ ENERGY RECOVERY
- ✓ RESOURCE RECOVERY
- ✓ FOOD PRODUCTION
- ✓ COMMUNITY

#### VARIABLE SHAPE & FORM

#### WASTEWATER TREATMENT

Smaller, nicer, and more efficient.  
Fits into any urban area

#### RETROFIT

Free up High Value Land  
for Redevelopment





**BIOPOLUS** Technology, is here to disrupt our everyday  
W & WWTP process thinking, just as other technological  
advances are doing: -

TESLA EV's  
Machine Learning. Artificial Intelligence,  
Monitoring and Control,  
Remote Working, WFH, Etc.

.

**BIOPOLUS** Technology, is here to disrupt our everyday  
W & WWTP process thinking,

(If TESLA built WWTP's he would probably choose BIOPOLUS)

Source Control – Modular Construction – Decentralization  
the basic feed in to the “Circular Economy” Infrastructure

Applicable in the Rural, Semi-Urban and Urbanization Inner City Infrastructure. Returning Local Control to Local Communities.  
Creating Local Employment Opportunities, an ROI and Income Generation.

The Concept is brought to you through 100 years of experience of Industrial Water Treatment Processes and Technology

*THE TRADITIONAL APPROACH – RELIES ON*

Centralized Planning, and implementation of Municipal WWTPs are still unable to meet the environmental challenges of Rapid Urbanization.

In addition, they fail to meet the challenges of “Circularity” with their “Once through your meter” High Energy, End of Pipe, Linear Engineered Economic Mind Set.

## MIXED USE REAL ESTATE – MODULAR APPROACH

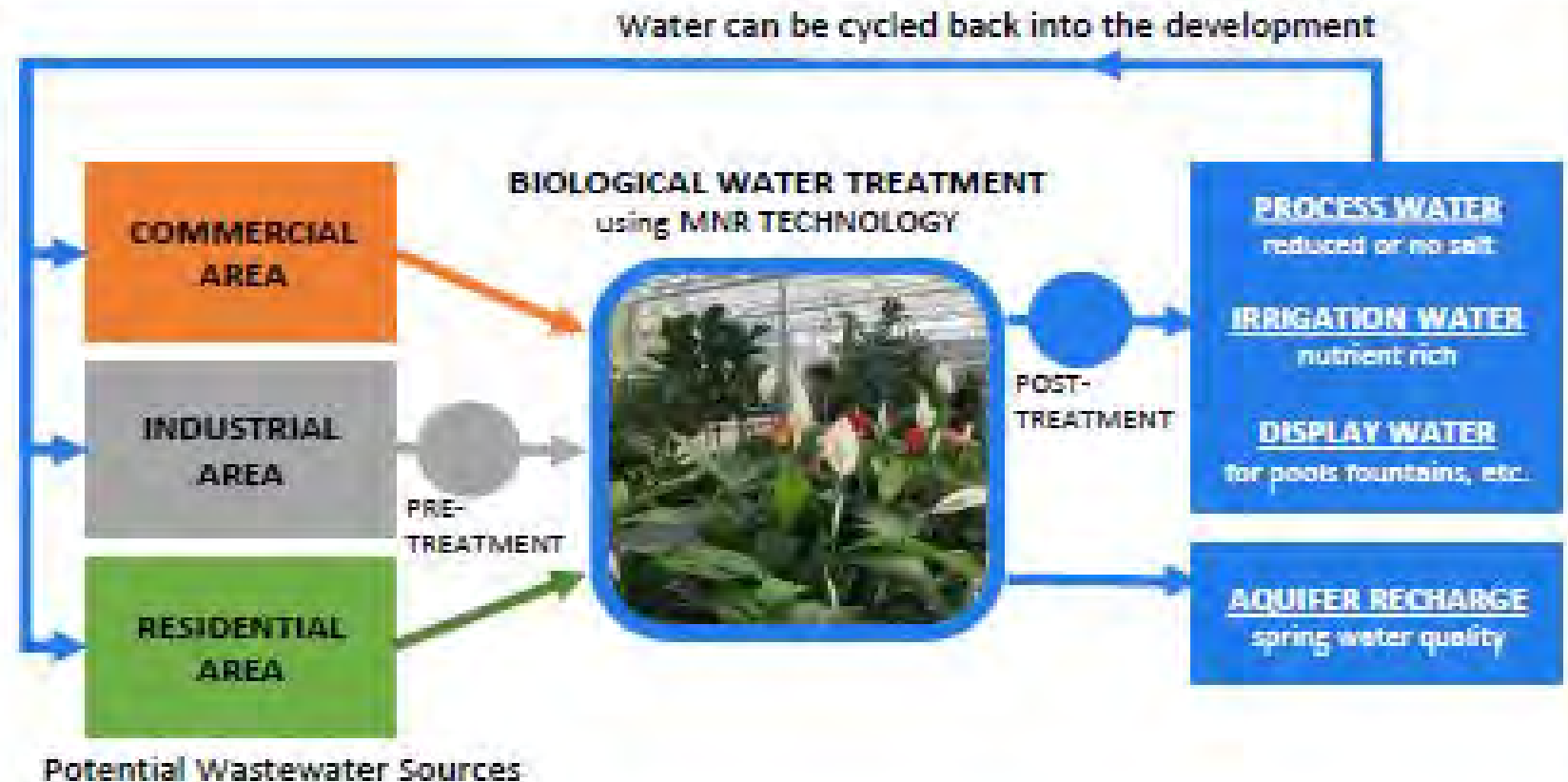
### WATER-BASED URBAN CIRCULARITY FOR A SUSTAINABLE DEVELOPMENT



Above: Interior view of a 20,000 PE Netherlands facility treating mixed industrial and municipal wastewater.

#### CIRCULAR SOLUTION for:

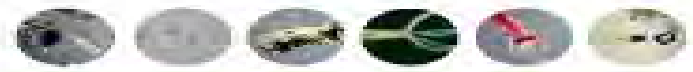
- WATER RECYCLING
- ENERGY RECOVERY
- ORGANIC RESOURCE RECOVERY



**METABOLIC NETWORK REACTOR (MNR)**

Patented 3rd generation integrated fixed-film activated sludge (IFAS)

Plants to provide root surfaces and air quality control



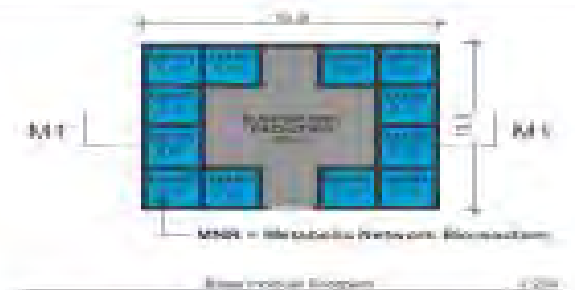
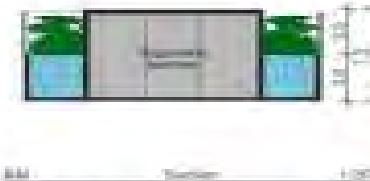
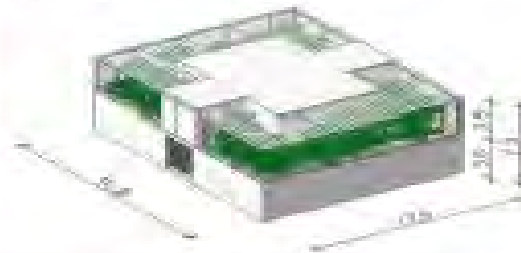
Engineered ecosystem using 2-3,000 species

**NATURAL AND SYNTHETIC PLANT ROOTS TO PROVIDE SUFFICIENT SURFACE FOR MICROBIAL GROWTH**

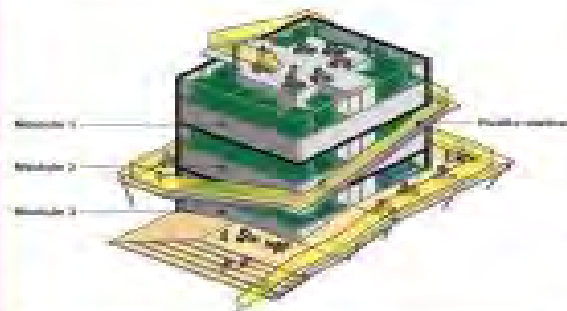
- ✓ **COMPACT TECHNOLOGY FOR A SMALL BUILDING FOOTPRINT**
- ✓ **MODULAR AND FLEXIBLE IN DESIGN**
- ✓ **CIRCULAR SYSTEM**
- ✓ **WATER RE-USE**
- ✓ **BEAUTIFUL ENVIRONMENT FOR EASY INTEGRATION**
- ✓ **ODOR FREE**
- ✓ **EFFICIENT AND ECONOMICAL**

## Variations on the Base Module

Base Module



The base module capacity ranges from 500 m<sup>3</sup>/day to 1000 m<sup>3</sup>/day, which is equivalent to 2500 - 5000 person equivalents (PE). The actual capacity depends on the influent water parameters and temperature, and the desired effluent requirements.



The modular nature of the MNR reactor technology allows for maximum architectural flexibility, where the facility can be arranged in a vertical or horizontal layout depending on space availability.

In the event that construction occurs in phases, the facility can be designed to expand with the growing development.

Additional functions for energy recovery, and organic waste recovery can also be added to meet the needs of the community.



**MODERN URBAN DEVELOPMENT****Vinhomes Smart, CityThanh Xuan District, Hanoi City, Vietnam****VINHHOME WASTEWATER TREATMENT FACILITIES USING MNR TECHNOLOGY**

<b>FACILITY 1</b>	(Smart City)
<b>CAPACITY:</b>	17,000 m <sup>3</sup> /d 140 000 PE
<b>FACILITY 2</b>	(Smart City)
<b>CAPACITY:</b>	10,800 m <sup>3</sup> /d 90 000 PE
<b>FACILITY 3</b>	(Grand Park)
<b>CAPACITY:</b>	13,500 m <sup>3</sup> /d 110 000 PE
<b>WW TYPE:</b>	Municipal



The Vinhomes Smart City is a large-scale complex of high-class apartment buildings, modern commercial centers and office buildings built and installed using advanced technologies.

Biopolus MNR wastewater treatment technology will be used in three wastewater treatment facilities located at two Vinhomes Urban Development projects. Two of the facilities are located in Vinhomes Smart City, a development designed specifically for residents to enjoy a high tech urban lifestyle in a green living space.

- ✓ INTEGRATED INTO HIGH TECH DEVELOPMENTS
- ✓ ODOR FREE
- ✓ NATURAL APPEARANCE
- ✓ STATE OF THE ART BIOLOGICAL WATER TREATMENT
- ✓ EFFICIENT & ECONOMICAL
- ✓ MODULAR DESIGN

**FACILITIES CURRENTLY UNDER CONSTRUCTION****PARTNERS: Green Journey**

Vinhomes, a subsidiary of Vingroup (market value of US \$16 billion) is the largest commercial real estate developer in Vietnam.



# FLEXIBLE TOUCH SCREEN FACTORY - INDUSTRIAL

Shenzhen, China



CAPACITY: 5,000 m<sup>3</sup>/d  
25,000 PE

TYPE: Industrial & Municipal  
INDUSTRY: Electronics

The dynamic growth of industrial parks in China creates new urban centers with diverse economic activity and residential life. This unique coexistence produces mixed industrial and municipal wastewaters, which require tailored, site specific engineering solutions.

Royole Corporation, one of the largest flexible touch screen manufacturers in the world, will have a new production line in a mixed residential/industrial park in Shenzhen Yu.

## TAILORED INTEGRATIVE WATER TREATMENT IN A HIGHLY-SENSITIVE URBAN AREA

**PARTNER:** Shenzhen DIDA Water Engineering

- ✓ INTEGRATED INTO OFFICE PARK
- ✓ SMALL 850 m<sup>2</sup> FOOTPRINT
- ✓ FREE VALUABLE AREA FOR FURTHER DEVELOPMENTS
- ✓ ODOR-FREE
- ✓ WATER TREATMENT
- ✓ EFFICIENT & ECONOMICAL
- ✓ NATURAL APPEARANCE



Biopolus technology installation; early phase of plant growth.

Site-specific and aesthetically pleasing **WASTEWATER TREATMENT** that perfectly fits into the dynamically developing, mixed office park.

# STRIJP-S - DECENTRALIZATION

## Eindhoven, The Netherlands



**CAPACITY:** 1,600 m<sup>3</sup>/d  
13,500 PE  
**TYPE:** Municipal  
**TOTAL SITE SIZE:** 30 ha

The Netherlands has one of the most efficient, centralized water management systems in the world. To take the next step toward a sustainable circular solution, an additional layer of decentralized and interconnected water treatment facilities are needed.

Strijp-S is the large urban rehabilitation project of a former industrial park, located close to the city center of Eindhoven.

### CENTER FOR THE DEVELOPMENT AND PRACTICE OF CIRCULAR ECONOMY VALUES & FUNCTIONS

- ✓ WATER TREATMENT & REUSE
- ✓ LIVING LEARNING LABORATORY
- ✓ FOOTPRINT ONLY 222 m<sup>2</sup>
- ✓ MODULAR & FLEXIBLE IN DESIGN
- ✓ EXPANDABLE IN SIZE & FUNCTIONALITY
- ✓ PARTNERING WITH KNOWLEDGE INSTITUTIONS

**PARTNERS:** Waterboard De Dommel, City of Eindhoven, Province of Noord-Brabant



FEASIBILITY & CONCEPT DESIGN

The first decentralized Dutch WATER TREATMENT & RECYCLING facility, with a pilot system for GROUNDWATER TREATMENT.

### INTEGRATING CENTRALIZED & DECENTRALIZED

Inter-connectable with other HUBs and with existing infrastructure

Video

[Preview YouTube video Biopolus - Hollandia](#)  
[Biopolus - Hollandia](#)

*And The LAST WORD's*

Women are more empathetic than men can ever  
be,  
their priority is their family's health and well being.

Responsibility for safe water supplies and  
sanitation services rest heavily upon their  
shoulders in many rural and semi-urban  
communities.

BIOPOLUS are YOUR Partners & Solution.

ADB e–Marketplace  
**BIOPOLUS** Technology  
March 2021

THANK YOU for YOUR ATTENTION & INTEREST

**PLEASE STAY WITH US FOR YOUR Q & A TIME**

IF YOU REQUIRE FURTHER DETAILS, PLEASE

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