ENVIRONMENT COMMERCE CZ

# Waste water treatment plants ENVIROTECH with vertical farms


Ing. Ivan Bidenko, Ph.D.CEO


25 YEARS ON THE MARKET R&D - ENGINEERING - CONSTRUCTION - MAINTENANCE - OPERATING

# Smart city solution:

## WASTE WATER TREATMENT PLANT with VERTICAL FARM

## Classical WWTP

## ENVIROTECH HYBRID MBR

# *CONVENTIONAL WWTP*

- Low efficiency of water treatment
- Large areas of land required
- Does not elliminate odours or noise
- Has high maintanance cost

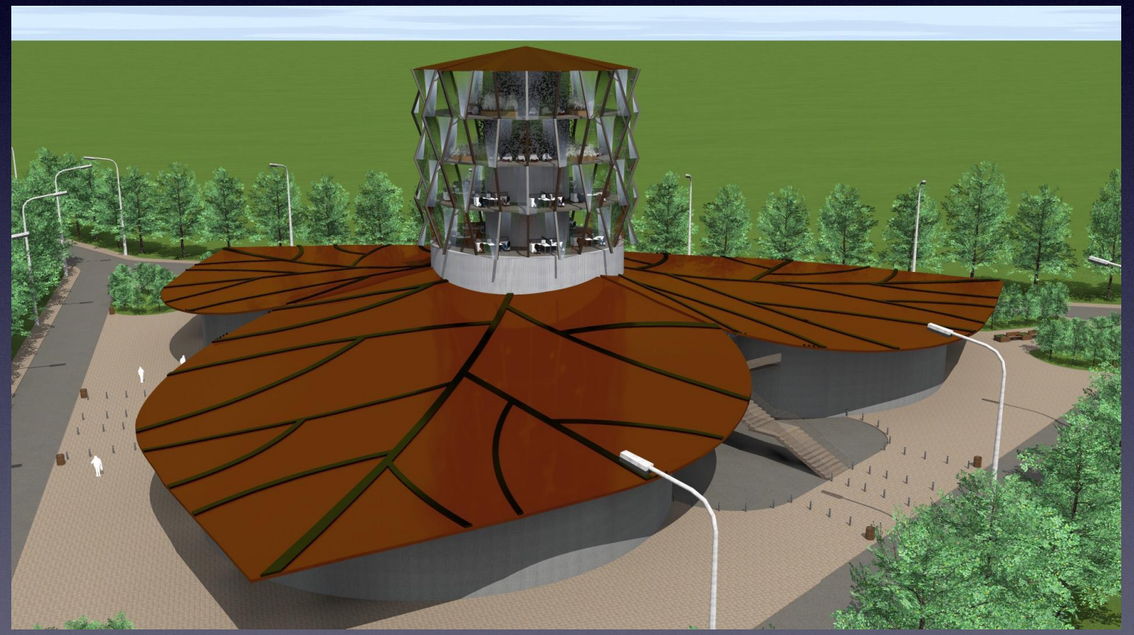
# *CONVENTIONAL WWTP*

- Has high operating costs
- Is an eyesore on the landscape
- Large amount of infrastructure required
- Large amount of canalization required

# ENVIROTECH HYBRID MBR

## We focused on REDUCING:

- Investment Costs
- Energy Requirements
- Operating Costs
- Land Size



**With Maximum Treating Effect As The Priority!**

# ENVIROTECH HYBRID MBR

## NEW SOLUTION

- Up-To-Date proven technology
- All-In-One Building Design for treating up to 100.000$m^3$/day
- Combination of advanced multistage processesin MBR HYBRID SYSTEM

# ENVIROTECH HYBRID MBR

- Reduces noise and odours
- Reduces running cost up to 50%
- Reduces maintenance cost Water is totally recyclable
- Have a greater loading resistance

# ENVIROTECH

## ENVIRONMENTAL INTEGRATED UTILITY CENTER

COMPLETE ECOLOGICAL
COST EFFECTIVE SOLUTION
FOR WATER, PLANTS, ELECTRICITY
HEATING AND COOLING

Fully enclosed design creates excellent conditions for growing plants in Envirotech Wastewater Treatment Plants

Water Purification Unit

Threegeneration Unit

Compressor

Sludge Dewatering

Grit Separation Unit

Screening

Tertiary Treatment Filters

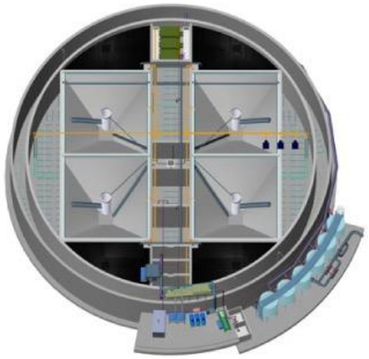
Chlorination

Microsieve Filtering

Fully automated system for onsite
and distance control and monitoring
Online Analysers
IP Camera monitoring

Existing ENVIROTECH Wastewater Treatment Plant in Repino, Russia

Operations and Maintenance Rooms



Wastewater Treatment Technology

Highly efficient Wastewater Treatment
Seawater Desalination and Water distribution
Fully automated water treatment and Recycling

Excellent Conditions for growing plants
Threegeneration - Combined Production
of Electricity and Heating or Cooling

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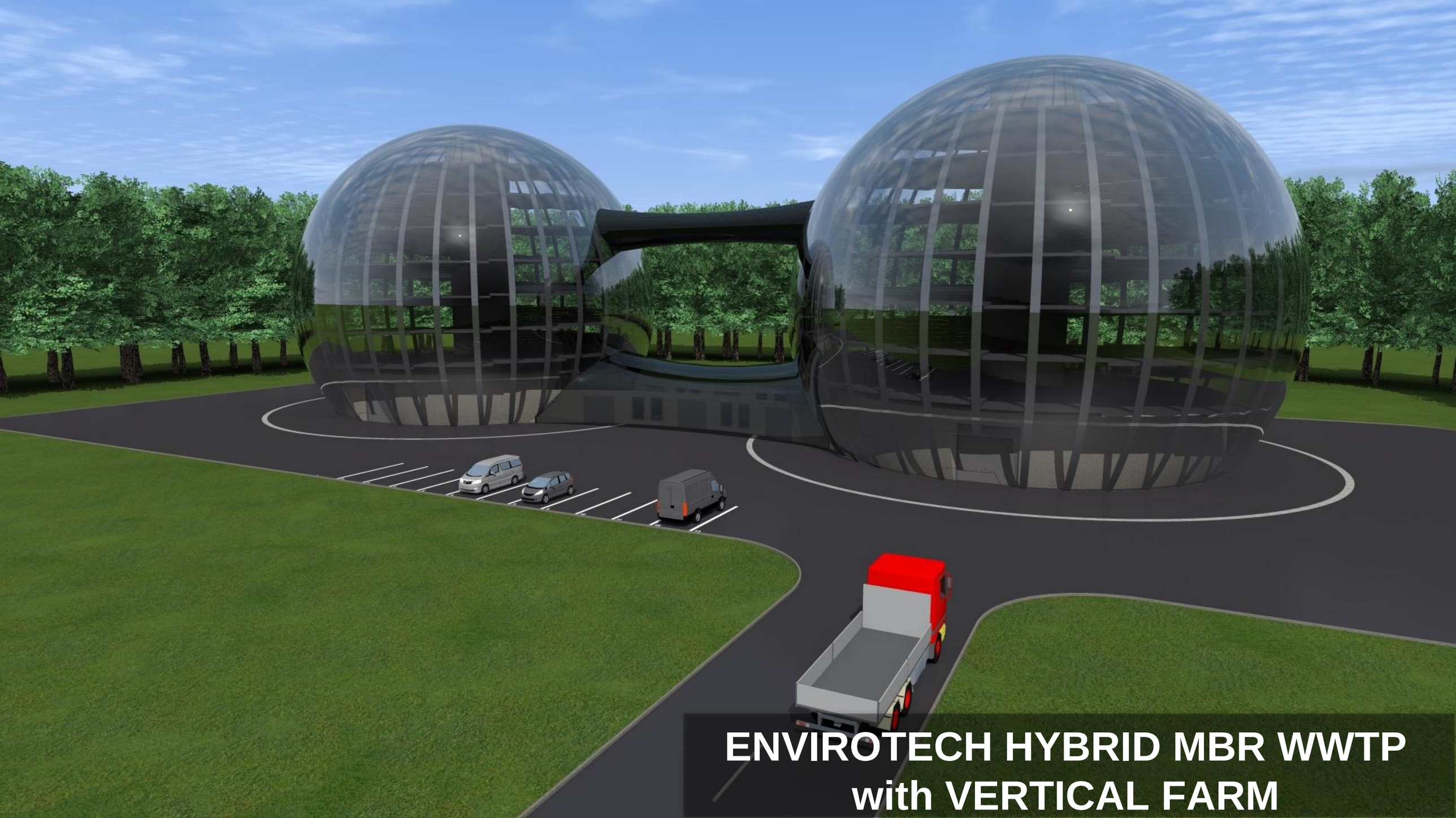
# ENVIRO TECH

EXCELLENT CONDITIONS FOR GROWING PLANTS IN FULLY ENCLOSED WASTE WATER TREATMENT PLANT


Fertilizers from stabilized dewatered activated sludge


# ENVIROTECH HYBRID MBR


ENVIROTECH HYBRID MBR WWTP
with VERTICAL FARM

ENVIRO TECH

# WASTE WATER TREATMENT PLANTS - ENVIROTECH
## REPINO - ST. PETERSBURG, RUSSIA

ENVIROTECH

# WASTE WATER TREATMENT PLANTS - ENVIROTECH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# WASTE WATER TREATMENT PLANTS - ENVIROTECH


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# WASTE WATER TREATMENT PLANTS - ENVIROTECH
# TECHNOLOGY SOLUTION SUPPLY - KAZANLAK, BULGARIA


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# WASTE WATER TREATMENT PLANTS - ENVIROTECH
## THE PALM ISLAND, DUBAI - UNITED ARAB EMIRATES

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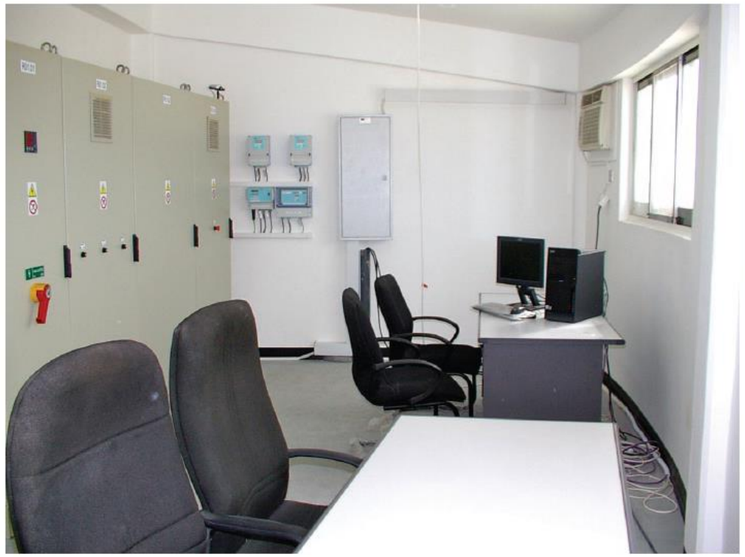

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# WASTE WATER TREATMENT PLANTS - ENVIROTECH
## PARADISE BEACH RESORT, SV. VLAS - BULGARIA

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# WASTE WATER TREATMENT PLANT - ENVIROTECH BULGARIA - ARKUTINO RESORT


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# WASTE WATER TREATMENT PLANTS - ENVIROTECH
## NEUGEPUELZIG, GERMANY

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# WASTE WATER TREATMENT PLANTS - ENVIROTECH
## WEIDENSDORF, GERMANY

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# WASTE WATER TREATMENT PLANTS - ENVIROTECH
## DROUZKOVICE, CZECH REPUBLIC

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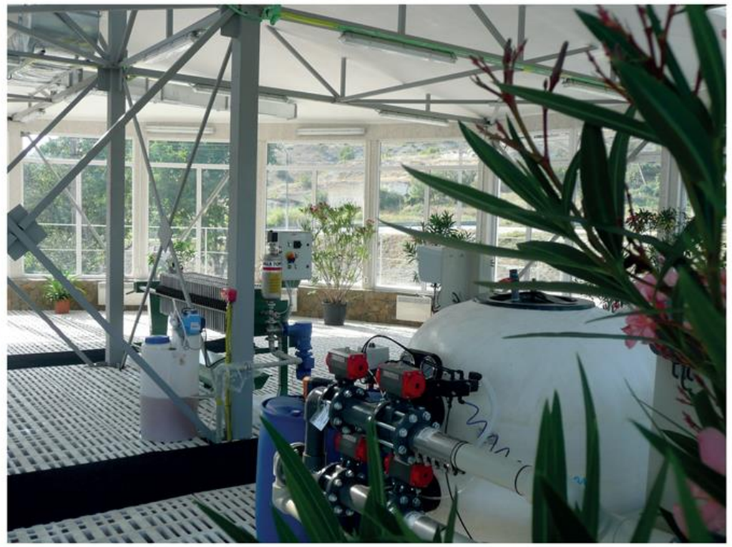
# WASTE WATER TREATMENT PLANTS - ENVIROTECH
# VERHNE SADOVOE - UKRAINE



Prime minister of Ukraine on site visit

ENVIRO TECH

# WASTE WATER TREATMENT PLANTS - ENVIROTECH
## SMECNO, CZECH REPUBLIC

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# WASTE WATER TREATMENT PLANTS - ENVIROTECH
## ROSTOV n. DONOM, RUSSIA

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# WASTE WATER TREATMENT PLANTS - ENVIROTECH
# ROSTOV n. DONOM, RUSSIA

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# WASTE WATER TREATMENT PLANTS - ENVIROTECH
## OIL COMPANY JUGANSKNEFTEGAS - PIONERNIJ, RUSSIA

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# WASTEWATER TREATMENT PLANTS - ENVIROTECH
# LASPI - UKRAINE

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# WASTE WATER TREATMENT PLANTS - ENVIROTECH
## PERSTEJN, CZECH REPUBLIC

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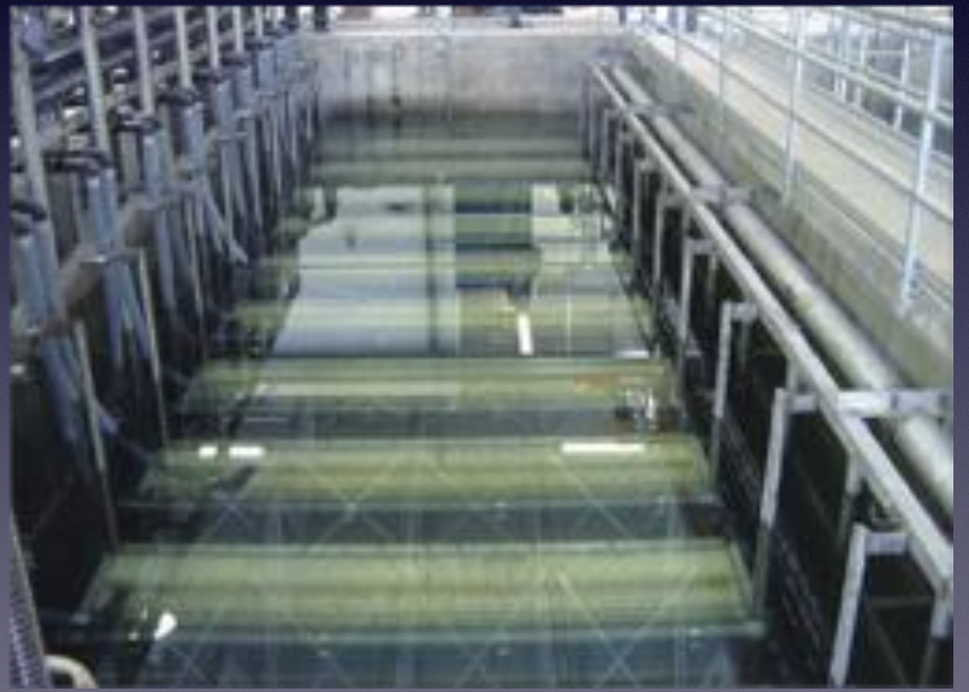
# WASTE WATER TREATMENT PLANTS - ENVIROTECH
# FRONTOVOE - UKRAINE

# What are the advantages of MBR Waste Water Treatment?



Recent years in the field of wastewater treatment technologies and wastewater treatment processes is increasingly gaining ground applications called membrane treatment processes
or so MBR (membrane biological reactors).

The nature of their application lies in the possibility to separate strictly activated sludge from the treated water using specially manufactured plastic nano – membranes with mesh size of from 0.01 microns to 0.07 microns.

The great advantage of membrane processes is the possibility to increase the concentration of activated sludge compared to conventional systems up to 2-4 times. This leads to the fact that the organic load supplied to unit volume is proportionally higher, and thus treatment plant has a  smaller volumes and as a result of this, lower investment costs.

Wastewater treatment emits CO2 /greenhouse gases/, odors and produces large quantities of excess sludge. Their management requires additional funds for expensive operations and emerging greenhouse gases are the subject of deteriorating of climate conditions in the world.

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This unit preferably uses the CO2 produced in the treatment process of photosynthesis to speed up plant growing, utilizes heat from waste water /which is taken from purified water by means of heat pumps/ and subsequently is used to heat the greenhouse space located above the waste water treatment plant. This combined unit uses photovoltaic cells and batteries properly selected to enable sufficient intensity illumination using LED lamps , and especially the use of moisture from the environment of sewage and treated sewage and sludge as (fertilizer) and purified water for irrigation, thus achieving significantly better growing results with significantly better economic efficiency.

Such a solution, makes synergistic use of $CO_2$ produced during decomposition of pollutants to enhance the photosynthesis, but also facilitates the utilization of oxygen released by photosynthesis of plants where through blower is blown back into the aeration system of the unit.

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It is scientifically proven that the oxygen partial pressure in aeration systems increases the biological activity of microorganisms involved in the biological treatment. This has a positive impact on the economy operating plants, but especially on minimizing the release of greenhouse gases into the atmosphere, and the system as a whole to reduce dependence producing plants and crops to climatic conditions and seasonal variations. Heating of the greenhouse space by means of low-potential heat from the purified water and heat pumps and heat exchanger reduces the cost of crop production and increases the solubility of O2 in purified water (the lower the temperature - the higher solubility of O2 in water).

The system as a whole is also advantageous in that a drive compressors in heat pump uses the sun's energy from photovoltaic panels and batteries properly selected, that even in night mode, and after sunset drive compressors, heat pumps and also allow additional LED lighting in the vertical  farm located above WWTP.

The result of the proposed system is particularly eco-efficient water purification minimum $CO_2$ emissions into the atmosphere and the additional emission of $O_2$ from photosynthesis of the plants into the compressed air supplied into the water..
It should be stressed that this solution also enables shortening the carbon footprint of each kilogram of crop produced (in America, for example, the average carbon footprint is 1500 miles), because everything can be produced at minimal space and in city centers, and food is always fresh.

Can we combine smart and intensive ecology under one roof and produce fresh food effectively?

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# WWTP with VERTICAL FARM can help to achieve all 3R (reduce, reuse, and recycle)

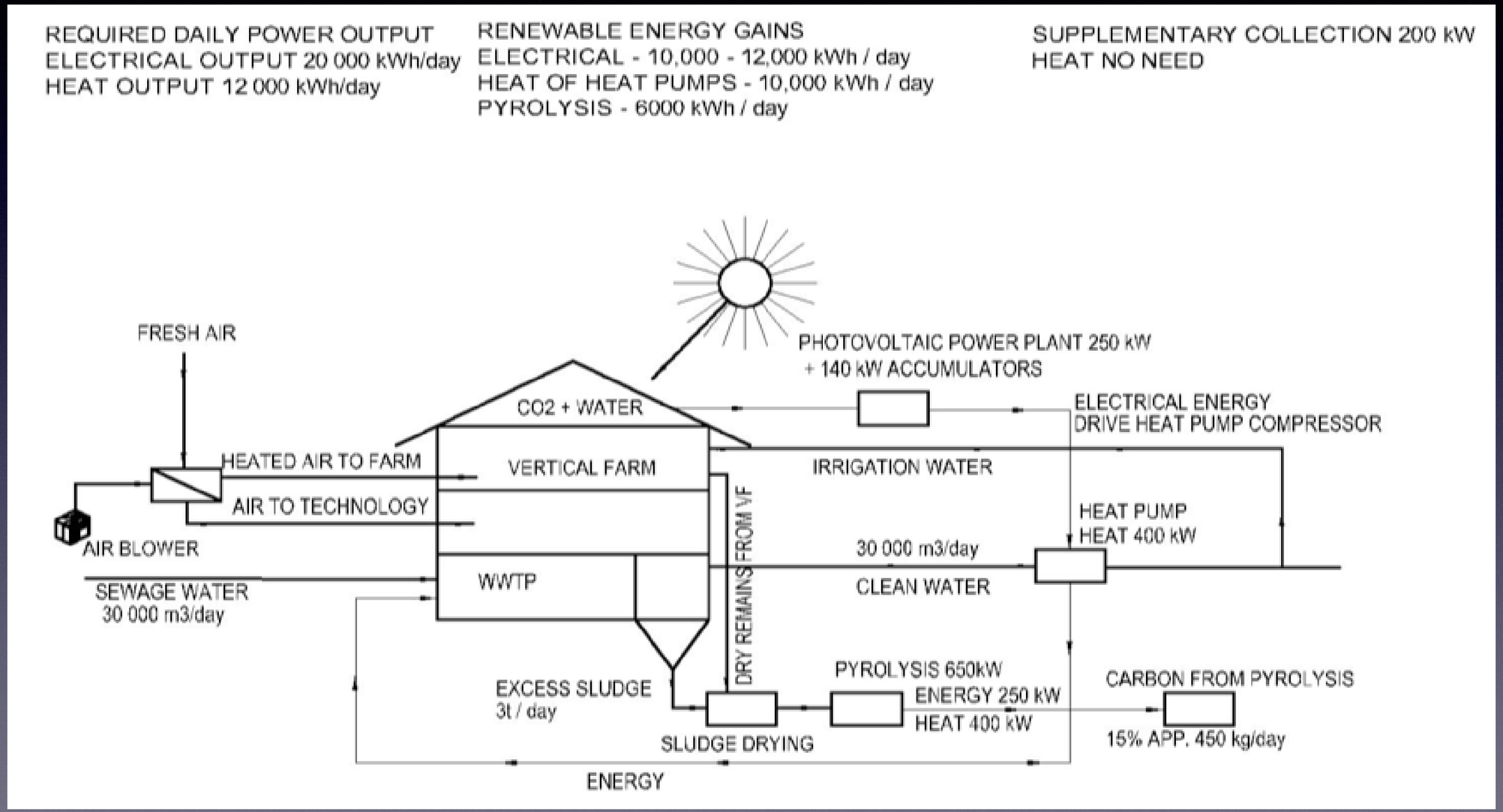
# The Vertical farming - Reasons

- by the year 2050, the population will reach 9 billion
- more than 60% people will live in big city agglomeration

# The Vertical farming - Advantages

- Enclosed and climate controlled, completely removing effect of external environment
- Minimum power usage for maximum plant growth
- Potential for use of green energy and the elimination of fossil fuel – carbon dioxide emision
- Utilisation of heat, energy and carbon dioxide from wastewater treatment to effective crop production

# The Vertical farm concept schema




7
6
4
5

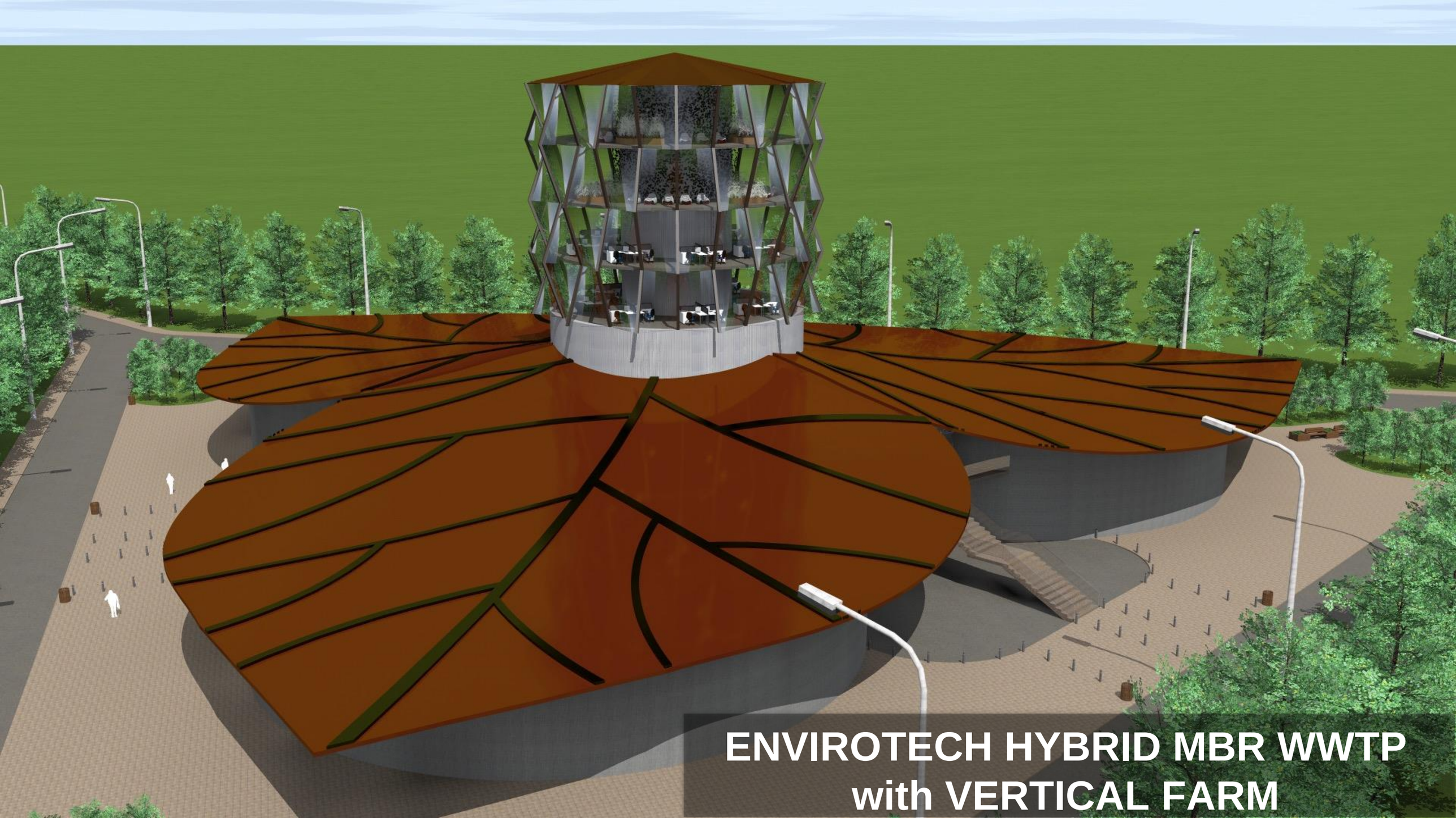

Optimum conditions for growing plants in specially designed nursery flower beds.


CHIVES
PEPPERS
BRUSSEL SPROUTS
TOMATOES
THYME
SPINACH
PEAS
LETTUCE
PEACHES
APPLES
CABBAGE
STRAWBERRIES
CHERRIES

## Mobile systems

# The future of
# WASTE WATER TREATMENT

# IS HERE.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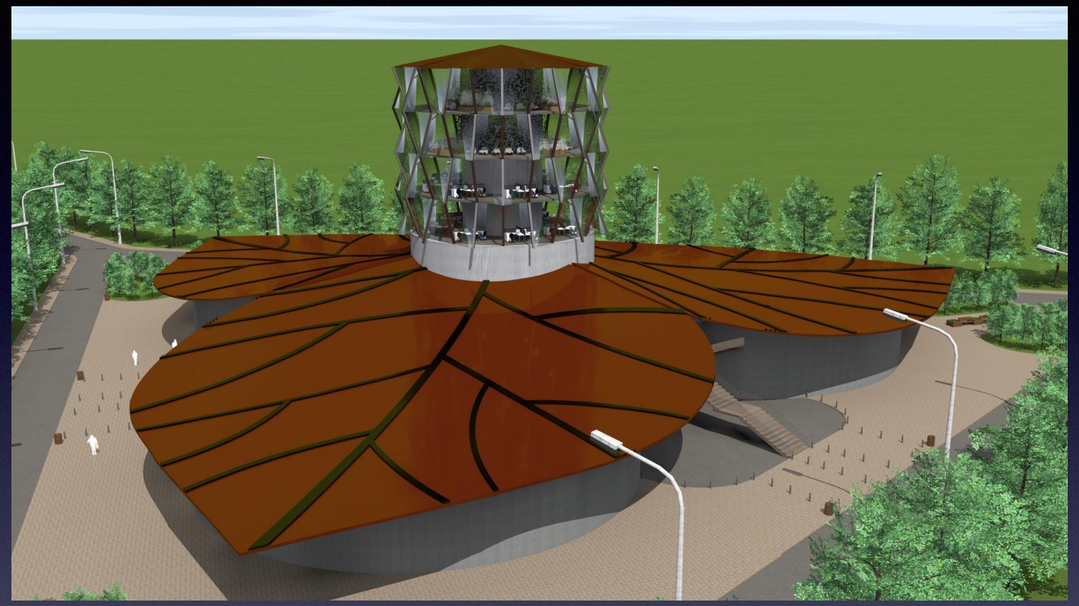

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