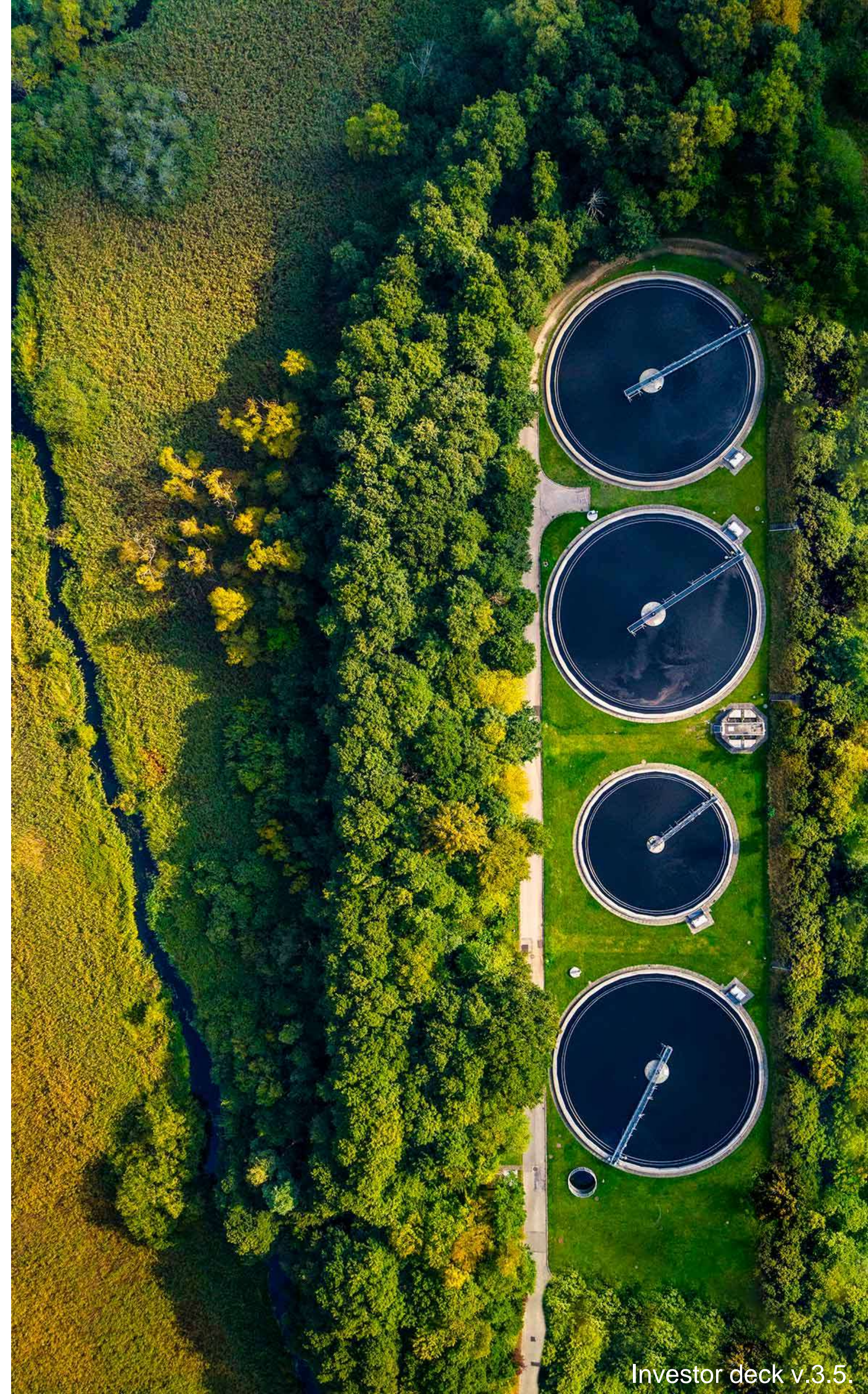




EMPYRIO

Enables sustainable clean water in small cities

BY ON-SITE LOW-COST UTILIZATION OF SEWAGE SLUDGE



6 CLEAN WATER
AND SANITATION



UNITED NATIONS
SUSTAINABLE DEVELOPMENT GOALS

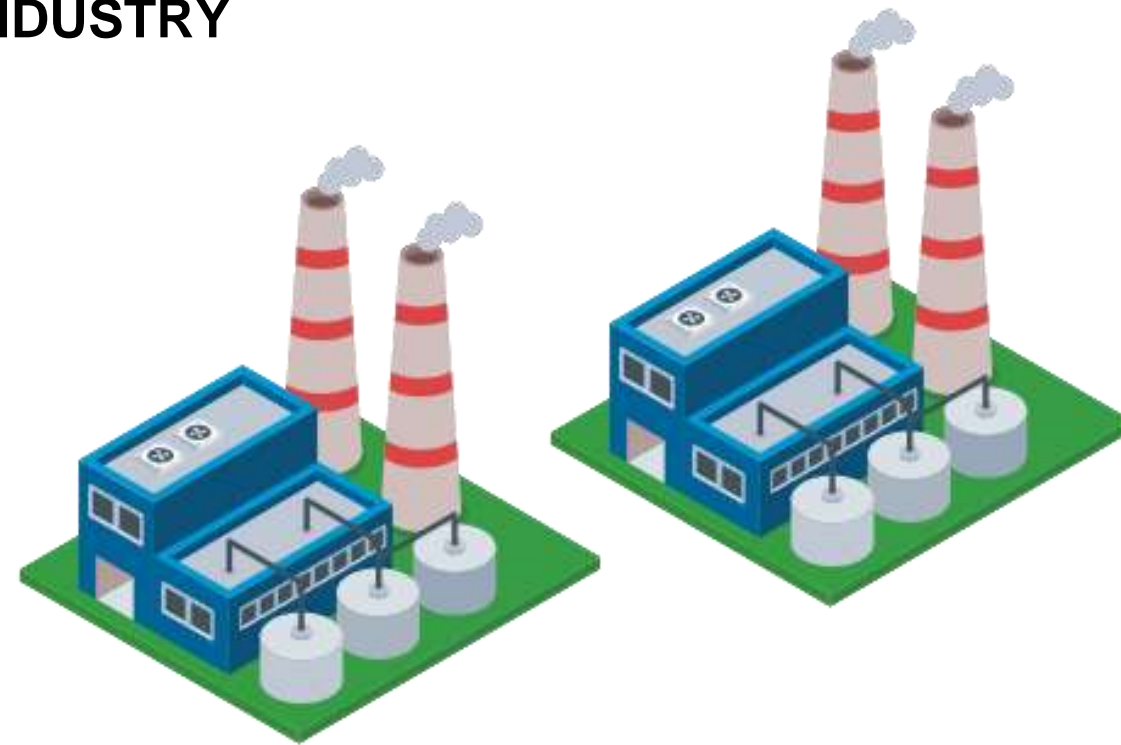
**Ensure access
to water and
sanitation for all**

The demand for water has outpaced population growth, and half the world's population is already experiencing severe water scarcity at least one month a year.

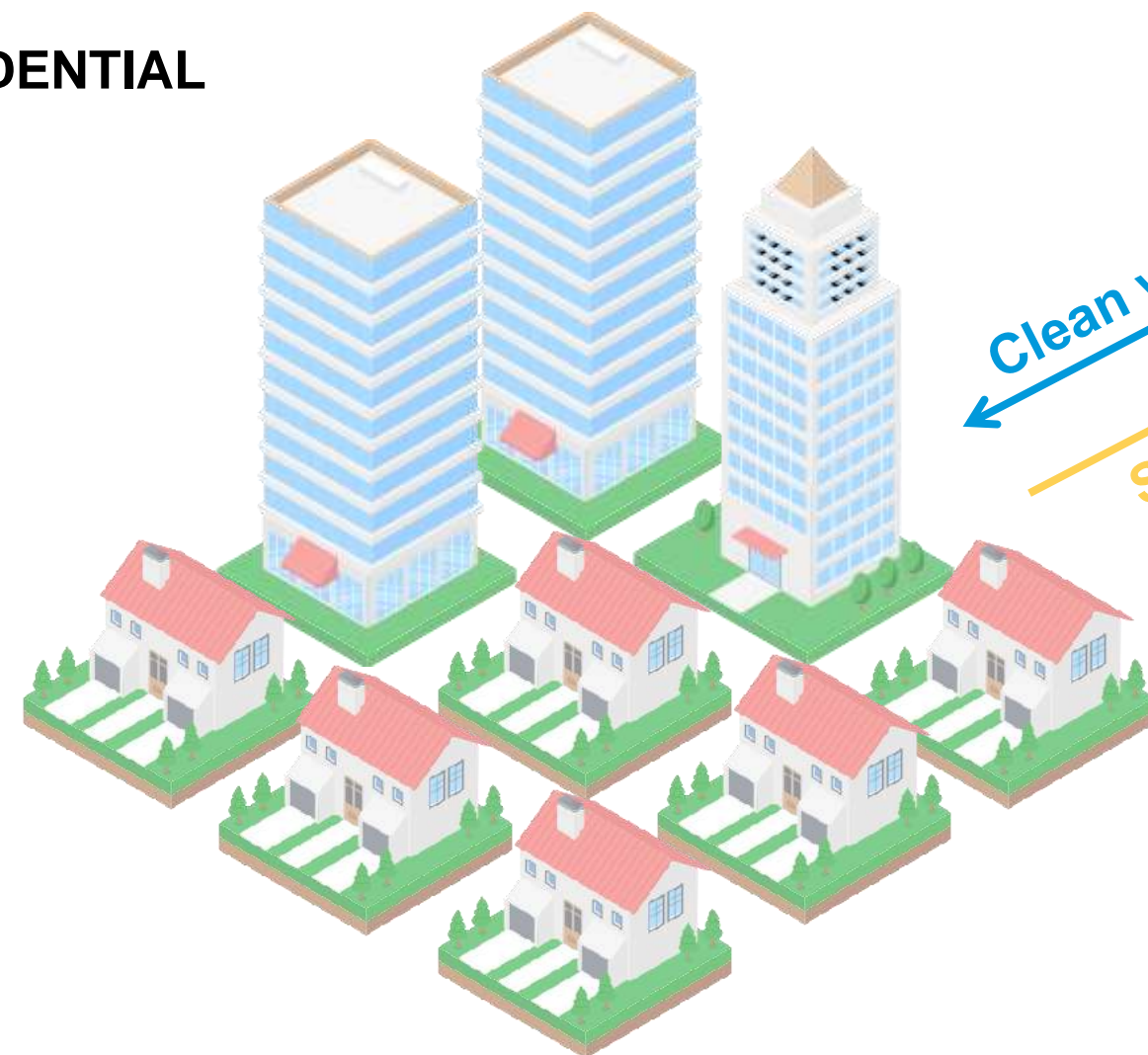
Water and sewage management

PERFORMED BY WASTEWATER TREATMENT PLANTS

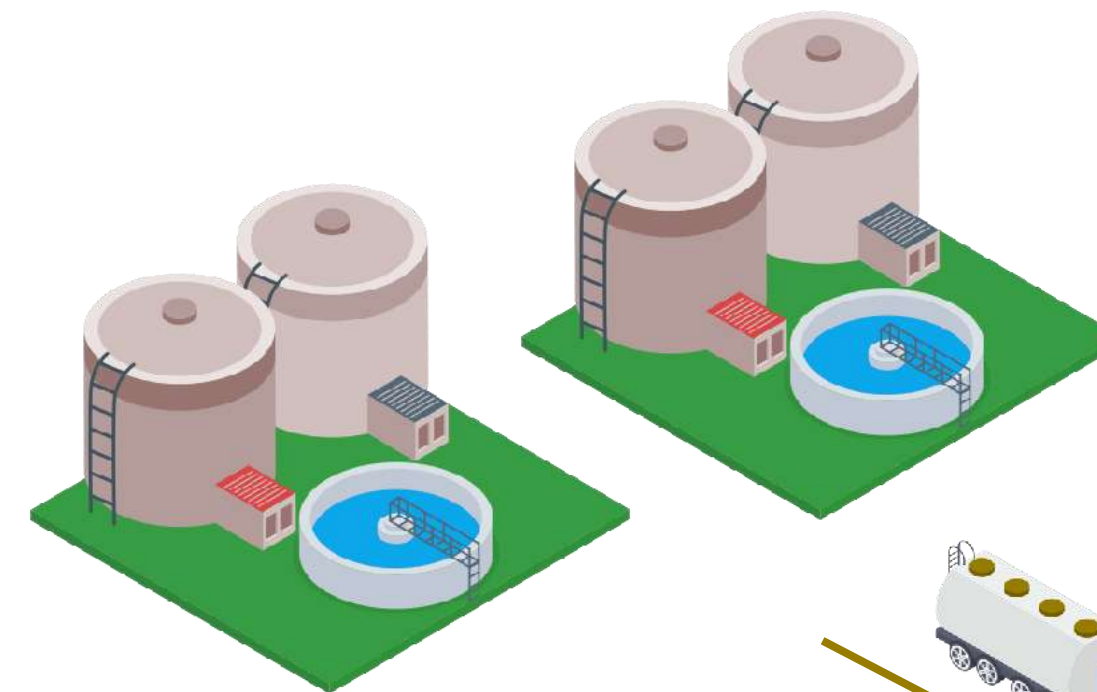
INDUSTRY



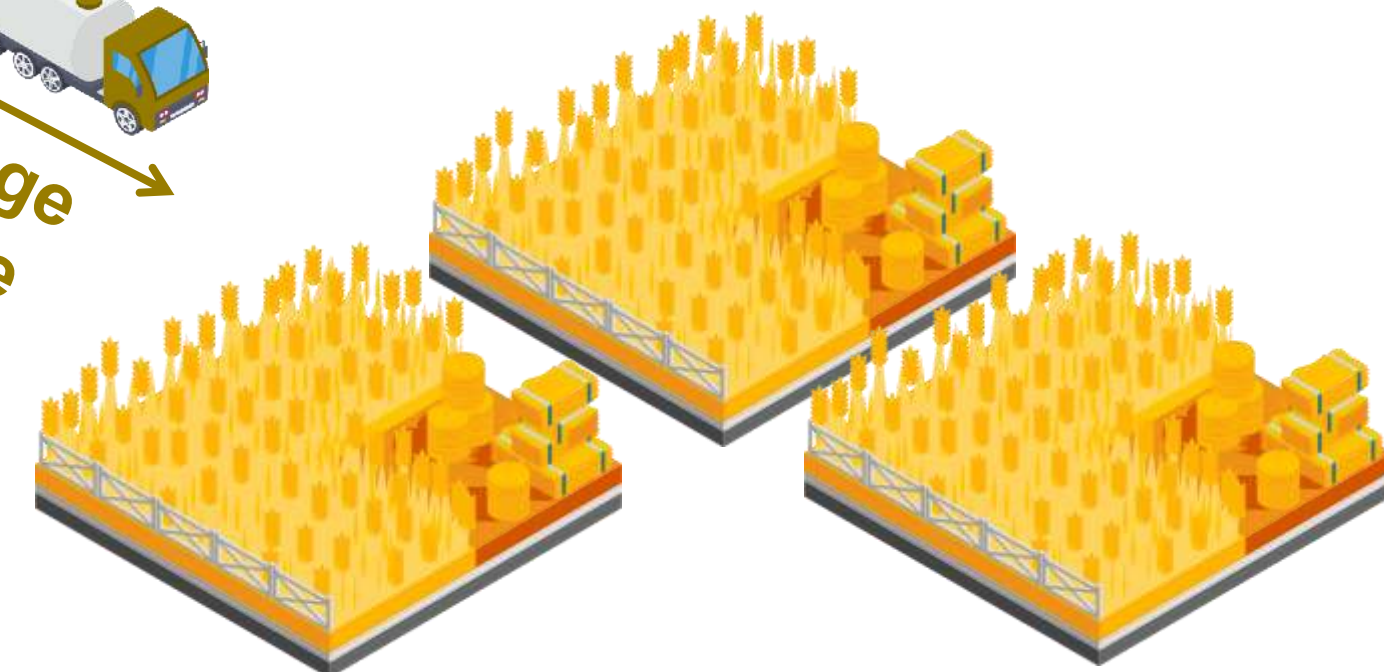
RESIDENTIAL



WASTEWATER TREATMENT PLANTS



AGRICULTURE



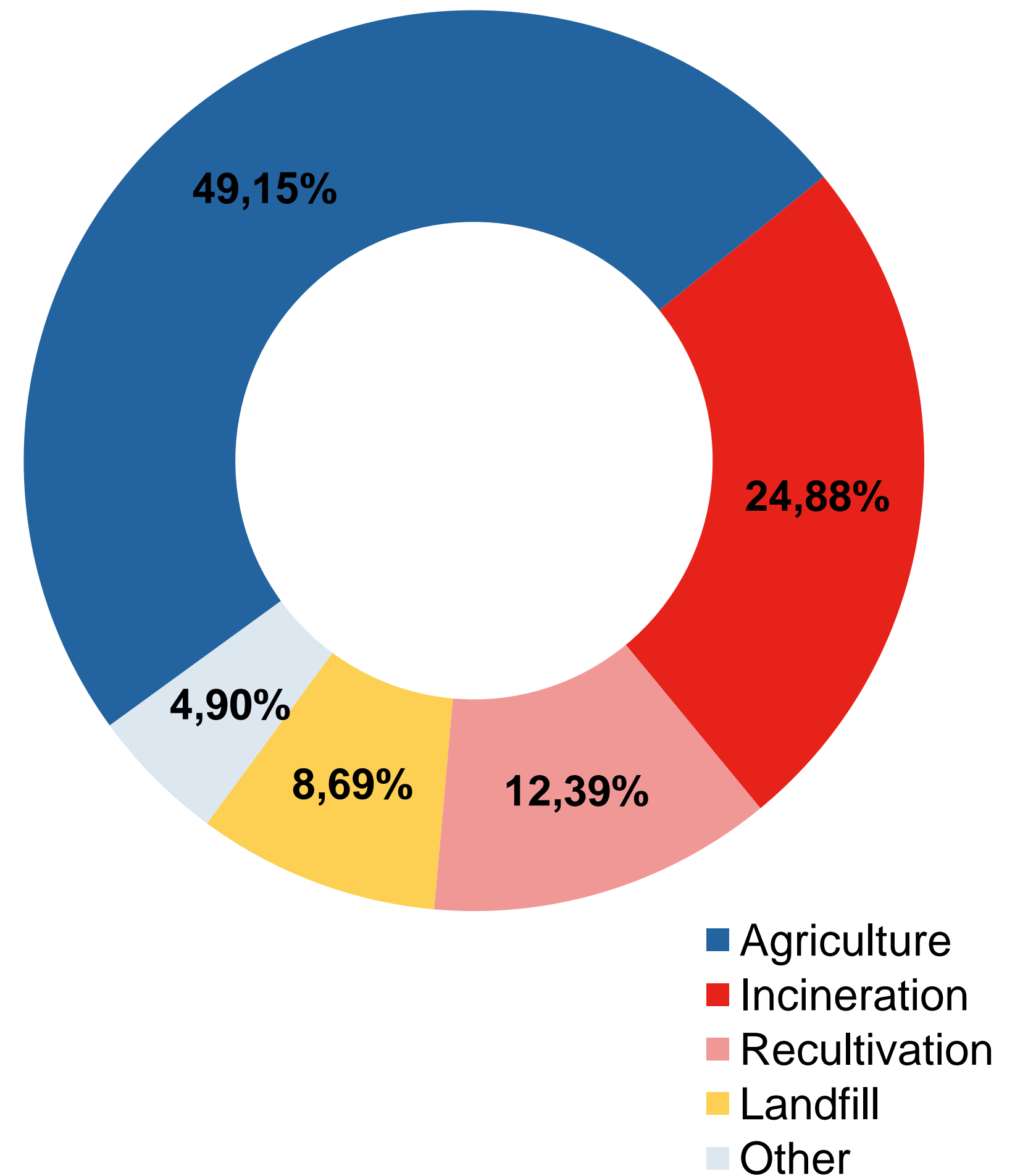
Sewage comes from Factories and Residents to WWTPs. WWTPs returns purified water back. But waste - sewage sludge is generated and in most cases goes to the agricultural fields.

Sewage
Clean water

Clean water
Sewage

Sewage
sludge

Sewage sludge disposal routes in Europe



WASTE FROM WASTEWATER TREATMENT PLANTS

Sewage sludge is a resource and a problem

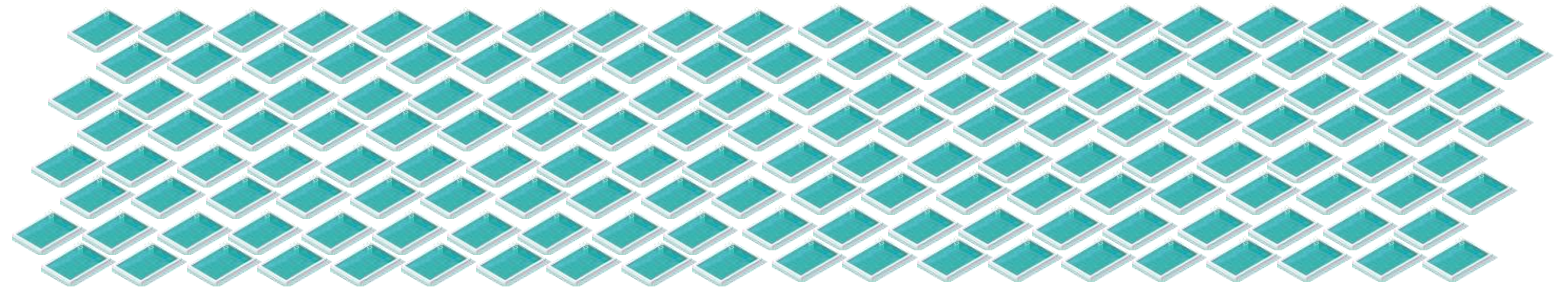
Huge negative impact on soil and climate

SCALE OF SLUDGE

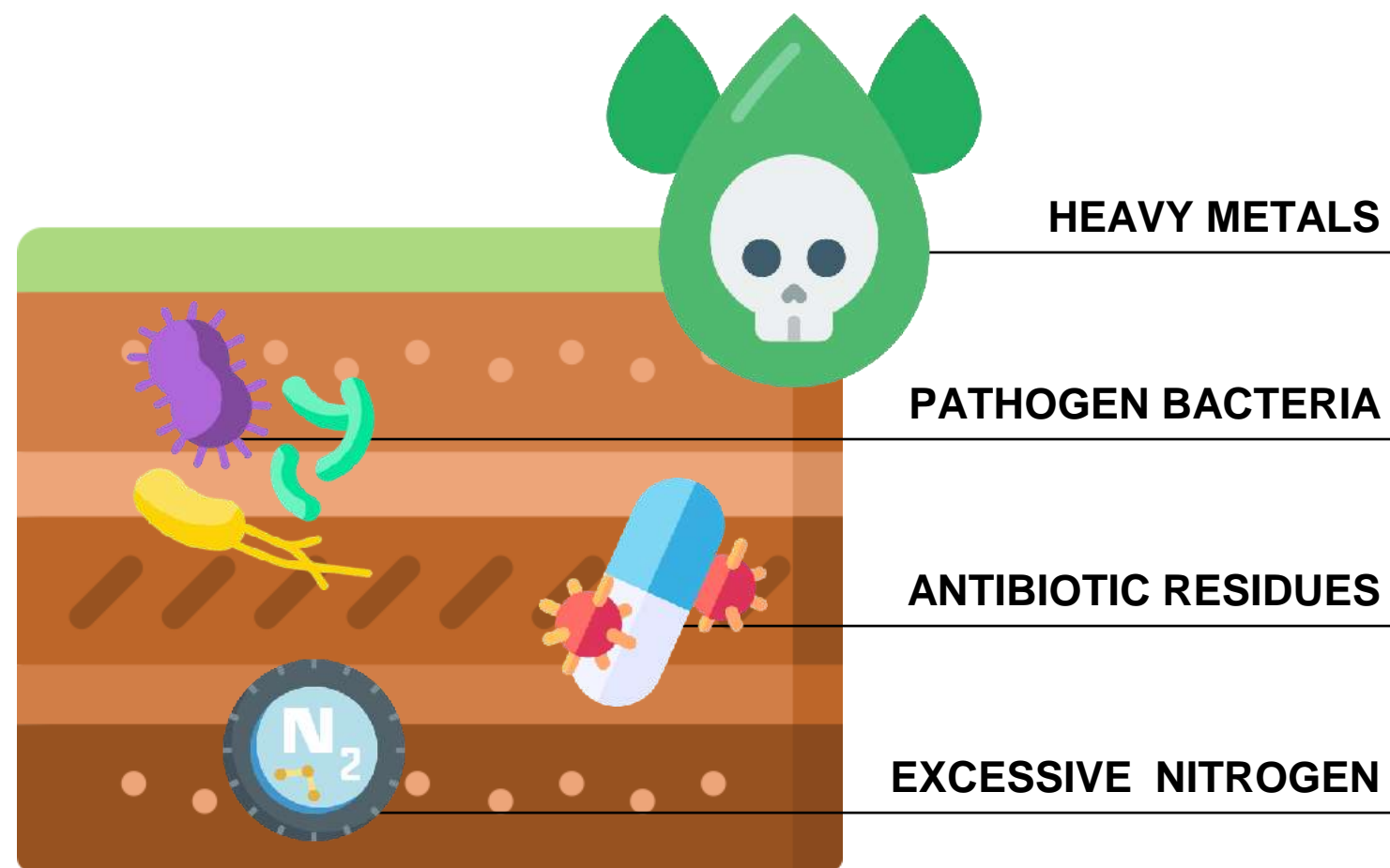
150_{MLN} T

sewage sludge is produced worldwide annually

are equal by volume to 300.000 Olympic swimming pools



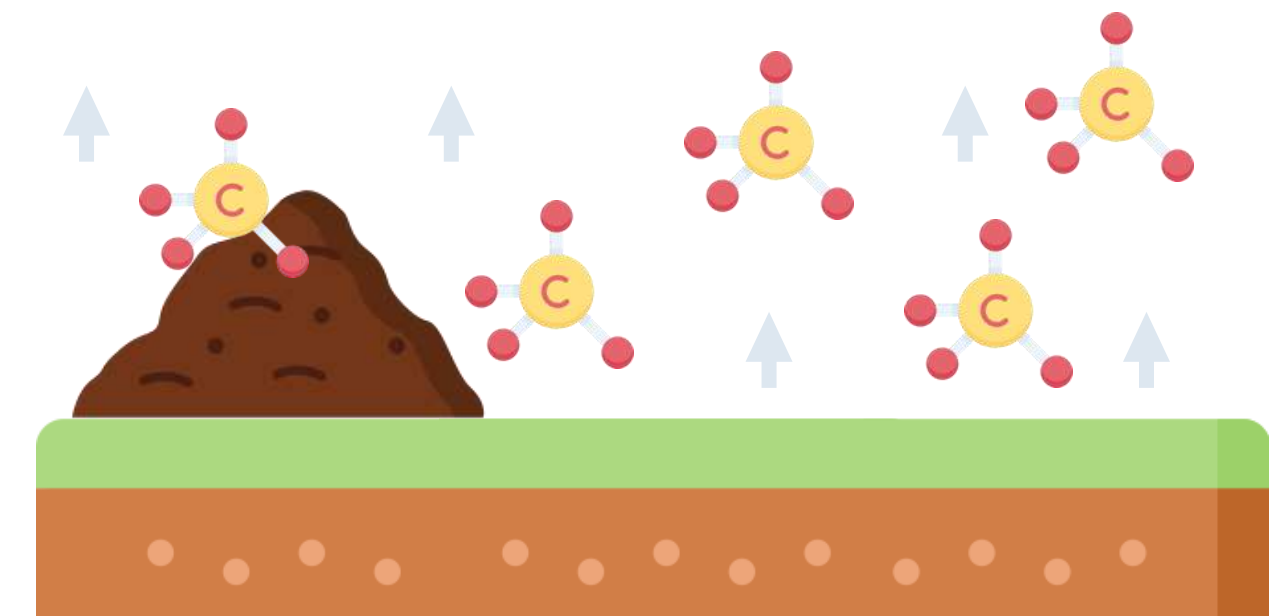
CONTAMINATION



Soil poisoning

The use of sewage sludge as fertilizer has serious consequences in terms of soil poisoning and consequently food poisoning. Eco farming prohibits use of sewage sludge as fertilizer, due to its challenging nature.

Methane emissions



Large problems for small cities

SOLUTIONS OF LARGE CITIES DOESN'T WORK FOR SMALL AND MEDIUM CITIES



CROWDED MARKET



EU LARGE CITIES

140

more, than 250.000 inhabitants

Traditional incineration (FBC), Hydrothermal Carbonization (HTC) and other solutions are cost efficient only for utilization of large volumes of sewage sludge.



EU SMALL AND MEDIUM CITIES

2122

less, than 250.000 inhabitants

Small and medium cities have to transport sewage sludge to closest large incineration plant or to the agricultural fields.

UNDERSERVED HUGE WORLDWIDE MARKET

- Sewage sludge transportation
- High gate fees
- Heavy metals, microplastics, antibiotics
- Excessive nitrogen
- Methane emissions
- Odours and sanitation problems

Empyrio has a solution

FOR SMALL AND MEDIUM CITIES WITH 20.000 – 200.000 INHABITANTS



Compact on-site sewage sludge utilization system for small and medium size wastewater treatment plants

COMPETITIVE ADVANTAGES

2x TIMES

lower utilization costs
(150-220 € / tDS)

SMALL

volumes utilization
(500+ tDS / a)

3 YEARS

pay-off period

AUTONOMOUS OPERATION

no need for additional energy resources and raw materials

AUTOMATED PROCESS

no additional personnel required

80% WATER CONTENT

high-moisture sewage sludge utilization

COMPACTNESS

20 and 40-foot containers allocation

FLUE GAS

advanced flue gas treatment system
(in partnership)

INTEGRATION

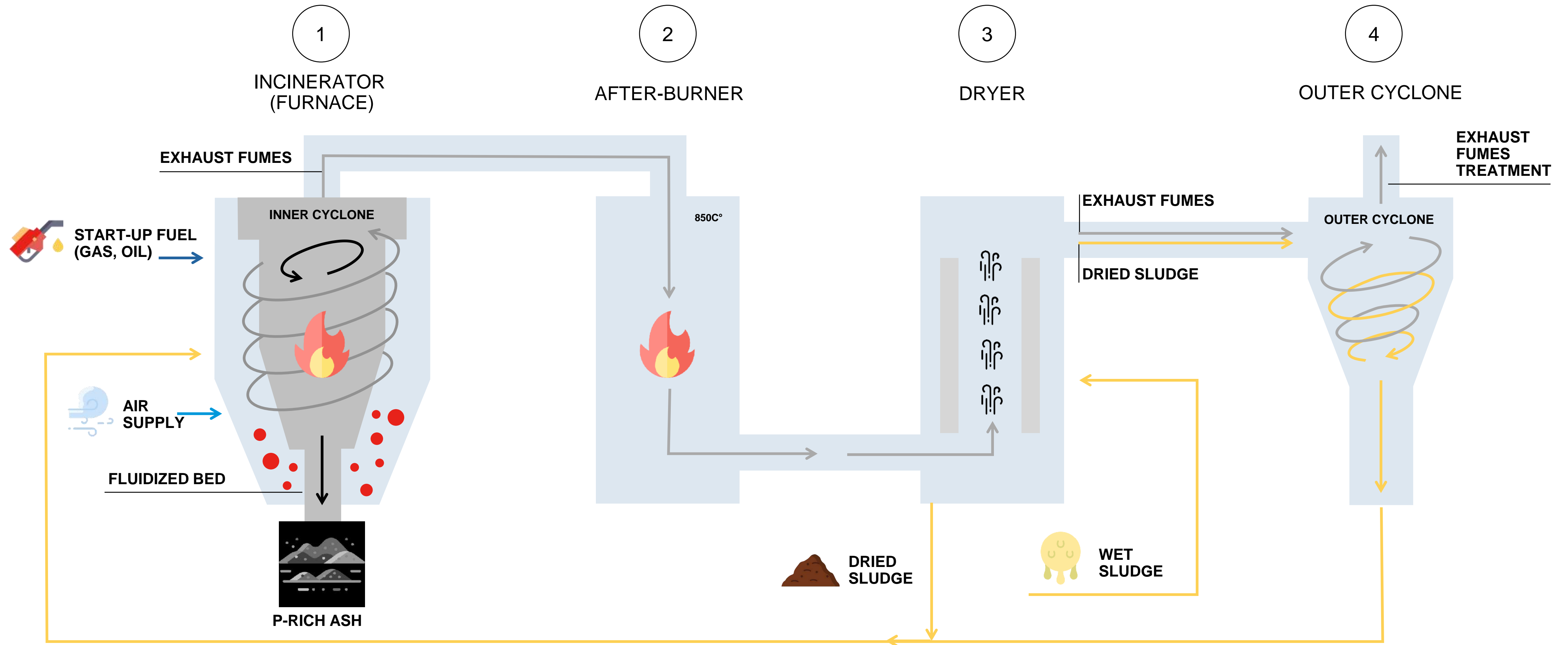
into existing treatment process

SUCCESSFULLY TESTED PROTOTYPE SYSTEM



Innovative IP pending solution

COMPACT, ECONOMICALLY FEASIBLE & ENERGY POSITIVE SOLUTION



Support and recognition

BY PRE-SEED, ACCELERATORS AND GRANTS



Commercialization Reactor

50k € pre-seed convertible loan for markets and applications development in 2018.



Investment and Development Agency of Latvia

37k € grant for business trips and patenting in 2018-2020.



Norway grant

129k € for prototype development in 2022-2024.



X2.0 accelerator - Manufacturing and Circular Economy call

30k € for project development in 2023.



EIT Climate-KIC

59k € grants and accelerations in 2019 for Stage 2 and in 2020 for Stage 3 (the first in Latvia)



PARSEC accelerator

10k € grant for project development.



Poland Prize accelerator

48k € for Polish market development in 2022-2023.

Last investment round in 2022

BY DEEP-TECH INVESTORS

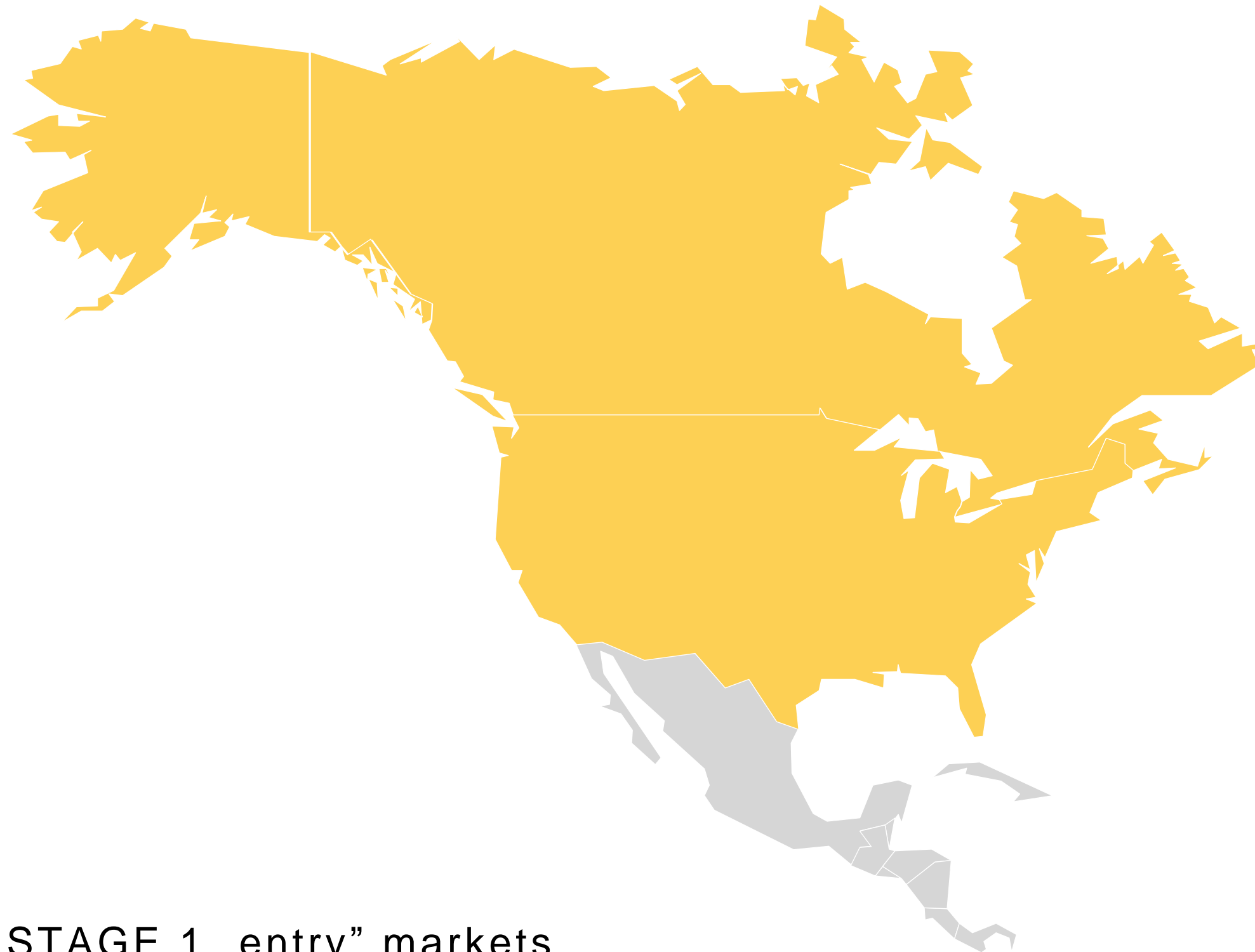


Global opportunities

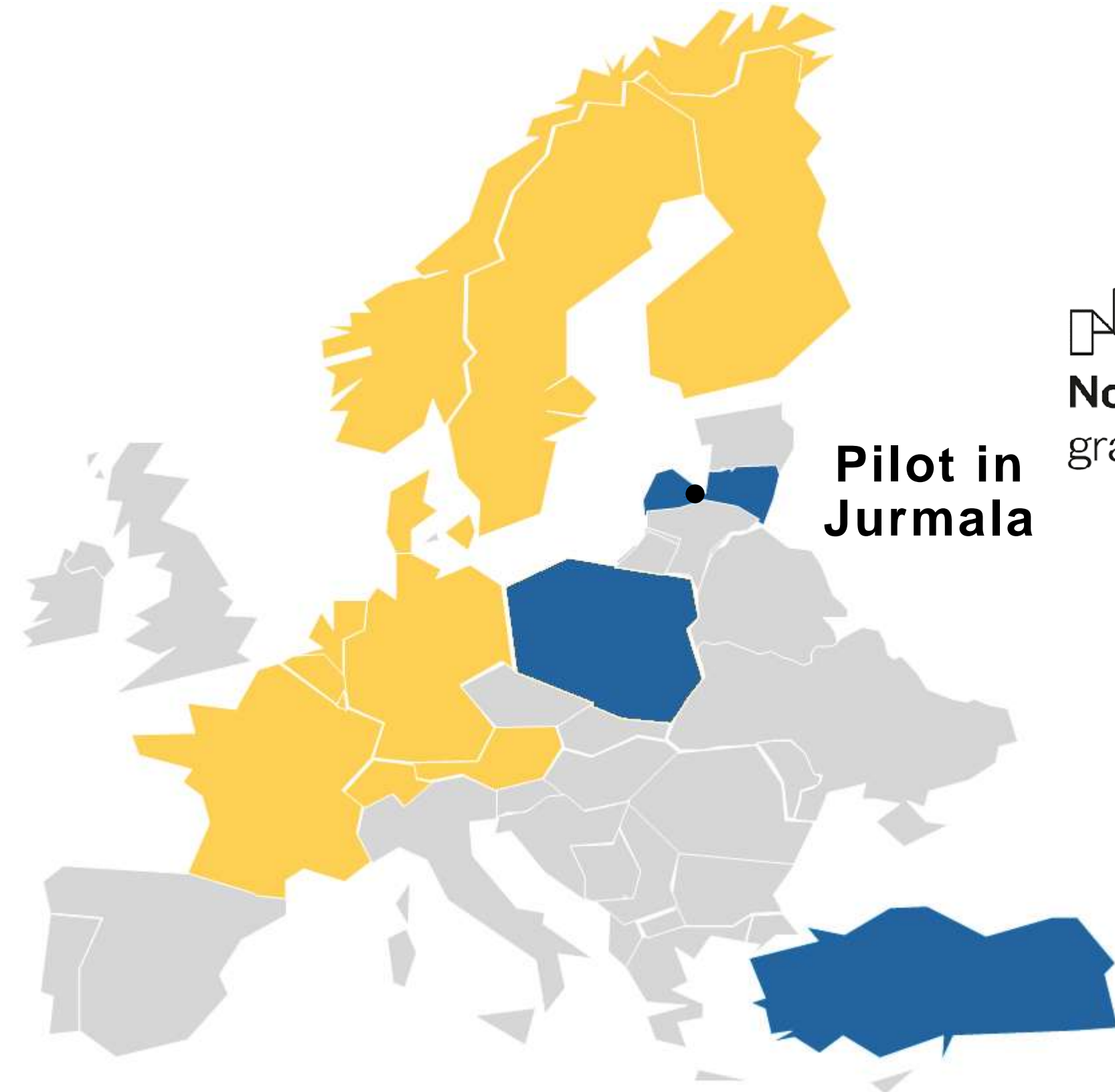
SCALING UP IN THE EUROPEAN AND NORTH AMERICAN MARKETS



NORTH AMERICA

EUROPE



+



-  STAGE 1 „entry” markets
-  STAGE 2 „target” markets



Highly profitable target markets

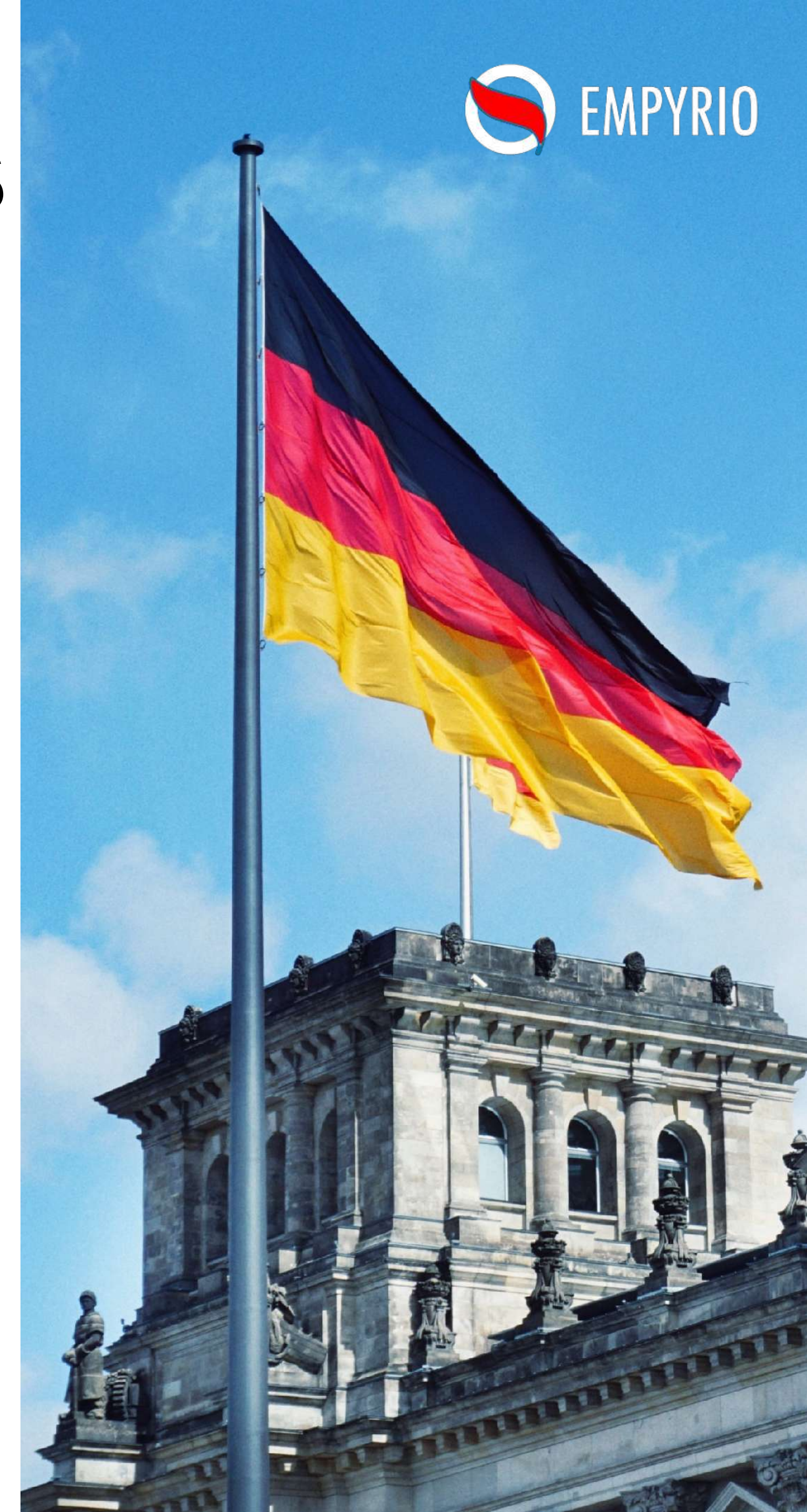
ARE VERY ATTRACTIVE, BUT ALSO CHALLENGING

ADVANTAGES:

- sewage sludge disposal regulations
- phosphorus recovery
- high utilization costs

CHALLENGES:

- high quality requirement
- flue gas treatment high standards
- good LOCAL sales and after-sales support
- mandatory references



Germany wants EMPYRIO

DUE TO THE ATTRACTIVENESS OF THE SOLUTION



“Interested in smaller incinerators...”

U.Zettl (Professor, representing 15 WWTPs)

“... there is no other combustion plant like yours ... a good alternative ...”

P.Heidecke (Federal Environment Agency)

“... open for a collaboration if references ... with sewage sludge exist.”

T.Giffey (CEO of Elbe-Elster wastewater treatment plant)

Balanced and competent team

WITH LONG EXPERIENCE AND KNOWLEDGE IN MANY AREAS



Alexander Belskis

CEO

[linkedin.com](#)

20 years of experience in international sales and marketing of industrial equipment. Management, financial and entrepreneurship skills with experience in several start-ups. Master degree in business administration.



Uldis Kalnins

CTO

[linkedin.com](#)

Ph.D. in Thermal Physics with more than 30+ years experience in engineering of equipment and automation for wastewater and sludge treatment industry.



Sergey Vilcek

CRO

[linkedin.com](#)

Ph.D. in Mechanical Engineering, development and production of non-standard equipment, work experience - more than 30 years. Co-author of multiple patents.



Christian Kabbe

Market expert

[linkedin.com](#)

Ph.D., sewage sludge treatment experienced market expert. Member of DWA (German Water Association) committees. Wide market contacts' network in Germany and EU.



Strong supporting partners

ACCELERATE COMPANY DEVELOPMENT



www.fergy.eu

Latvian company developing and manufacturing biomass boiler plants.

Empyrio has been co-operating with it for 4 years. A preliminary design of the Empyrio system has been carried out, the next phase will be to start the detailed design of the system components. This is the most cost-effective option for producing a system that can be sold worldwide.



www.sonutec.net

German engineering and manufacturing company for flue gas cleaning.

Supplier of flue gas cleaning solutions for the Empyrio combustion system. Negotiations are underway for the development and production of a complete Empyrio system for the German market.



www.antecbiogas.com

Norwegian biogas technology innovator with the potential to disrupt the biogas equipment market.

A partnership with tremendous business prospects, due to complementary technologies, providing a complete solution for biowaste treatment, energy generation and circular economy for customers in various industries.

MVP for quick market entry

WILL ENSURE EMPYRIO FURTHER DEVELOPMENT


MVP DESIGN STAGE

MVP READINESS STAGE

1ST ORDER STAGE

129k€ GRANT

March 2022
Norway grant contract signed. Funds raised will be transferred to the MVP design, production and field testing for sludge treatment and IP protection for the incinerator and dryer.



Norway grants

September 2022
SEED INVESTMENT
Seed funds raised for MVP Norway grant project realization.

December 2022
MVP DESIGNED
Design of the system completed.


2022

MVP PRODUCED
All system components are produced and ready for installation.

May 2023

October 2023
MVP INSTALLED
MVP installed, adjusted and tested at Jurmala wastewater treatment plant.

December 2023
PATENTS
Patents for incinerator received in the EU, USA, China etc. Patent applications for dryer are submitted.



2023

2-4 MLN € INVESTMENT
Seed+ investments received to realize 1st commercial order.

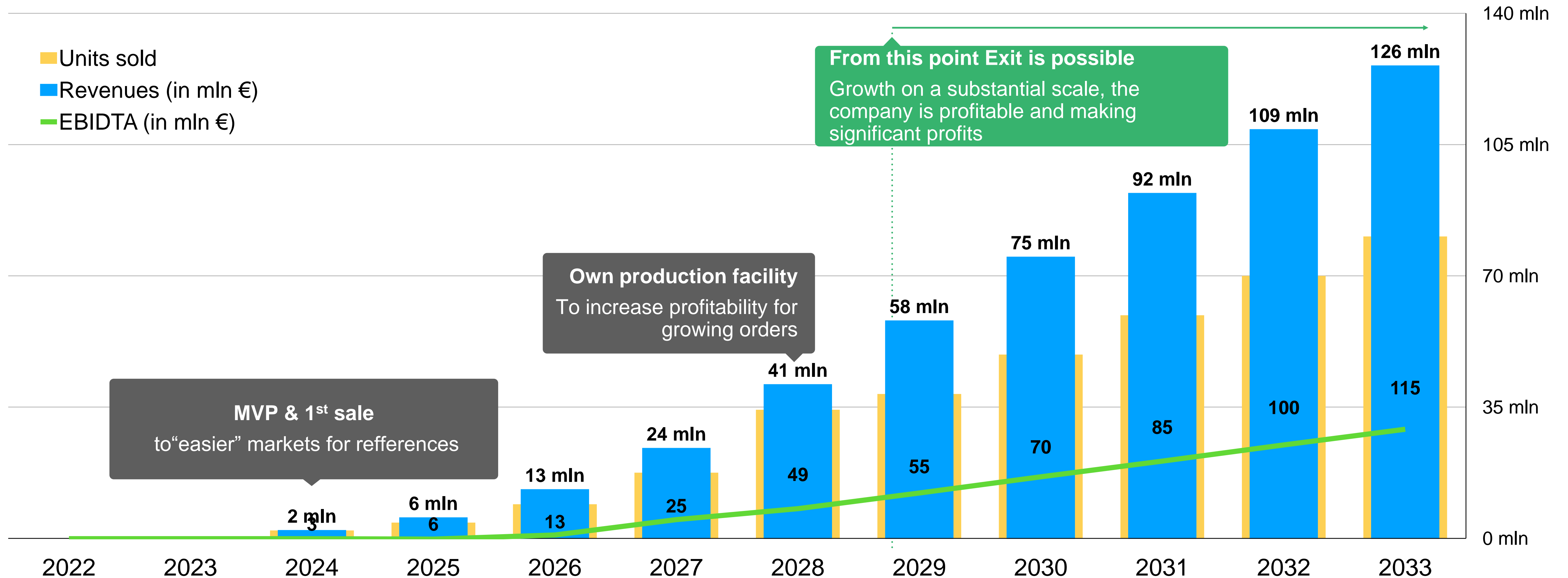
July 2024

August 2024
1ST COMMERCIAL ORDER
1st commercial order confirmed from “easier” market for the improved MVP concept and design.

2024

Market capture with growing revenues

STABLE REVENUE GROWTH WITH EXPANTION TO THE NEW MARKETS AND OTHER APPLICATIONS



Excited corporates

WITH EMPYRIO ACQUISITION POTENTIAL



www.veolia.pl

An international group operating in the water, wastewater, energy and waste management sectors.

Close cooperation will be realized during Poland Prize acceleration program in 2022.



www.nijhuisindustries.com

Provides solid and adaptive solutions for sustainable water use, energy and resource recovery.

A real-world case study for industrial sludge incineration using the Empyrio solution was negotiated in January 2022.



www.bigdutchman.com

The world's leading supplier of innovative equipment for modern egg, poultry and pig production.

Pilot performance demonstrations have been agreed for OEM production negotiations for the use of chicken manure.



www.suez.com

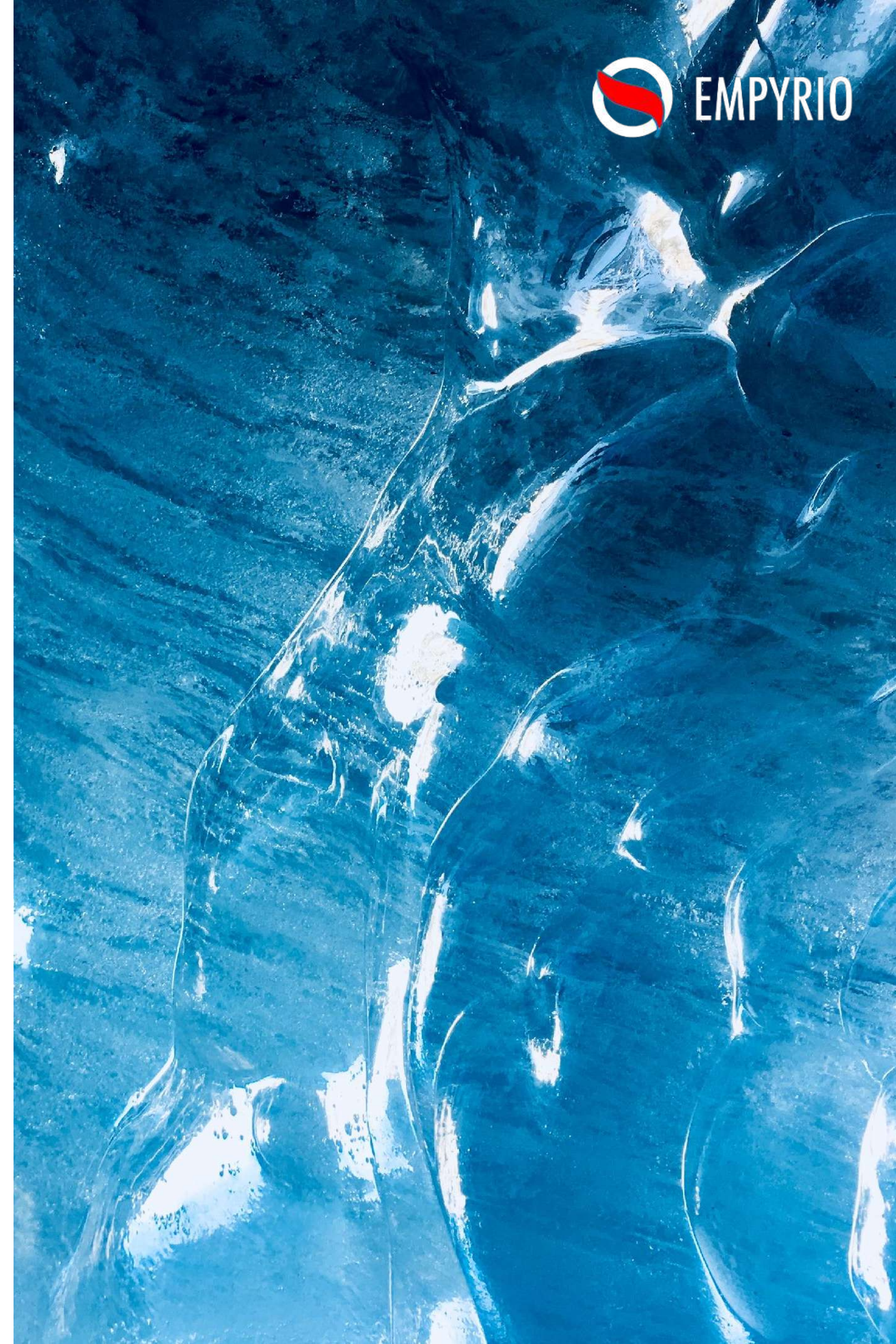
A global expert in the water and waste sector, in the process of merging with Veolia.

High interest in EMPYRIO solution due to "Market demand linked with the new Biosolids regulation in France."

Why Empyrio?

IS GOOD INVESTMENT OPPORTUNITY

- 1 **Underserved “blue ocean” market**
- 2 **Impacting on basic needs’ enviromental footprint**
- 3 **Early-stage opportunity in clean water and circularity**



Thank you for your attention!

IN CASE OF ANY QUESTIONS PLEASE CONTACT:

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