Ephyra® sludge digestion technology

Turn sludge into new resources

THE CURRENT SITUATION

1 person

10-15KG

Sewage sludge per year[1]

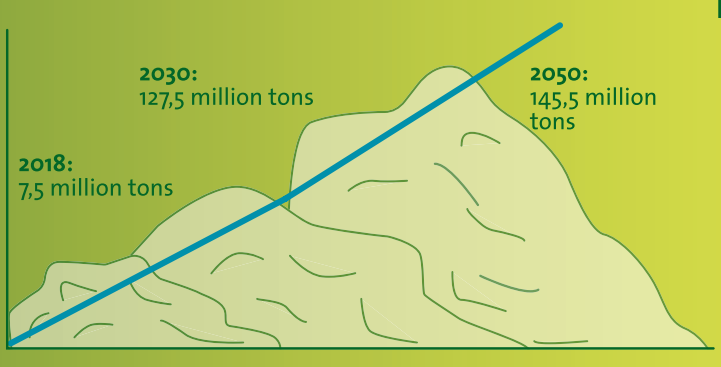
Sludge processing treatment and disposal

40-50%

of the total operating costs

WHEN YOU PROJECT THIS ON THE WORLD...

SEWAGE SLUDGE PER YEAR WORLDWIDE



Estimated tons of dry mass of sewage sludge produced per year[2]

in Europe

+10

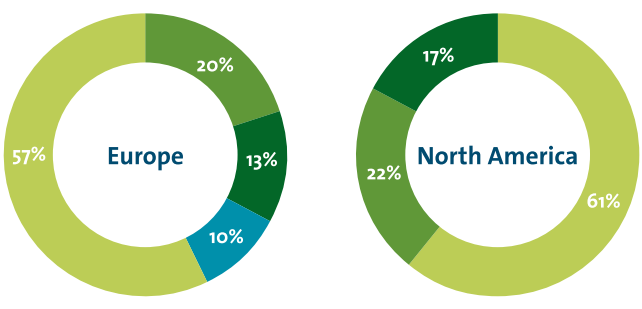
Million

in the U.S.

8

Million

MOST SEWAGE SLUDGE IS DISPOSED BY LAND APPLICATION
– MOVING TOWARDS INCINERATION



Global disposal methods sludge[3]

- Land application
- Incineration
- Landfilling
- Sea disposal

FACTORS ADDING TO COSTS OF SLUDGE PROCESSING

1. urbanization
2. limitation for agricultural land application
3. insufficient incineration capacity
4. increasing hauling costs
5. legislation

THE CHALLENGE

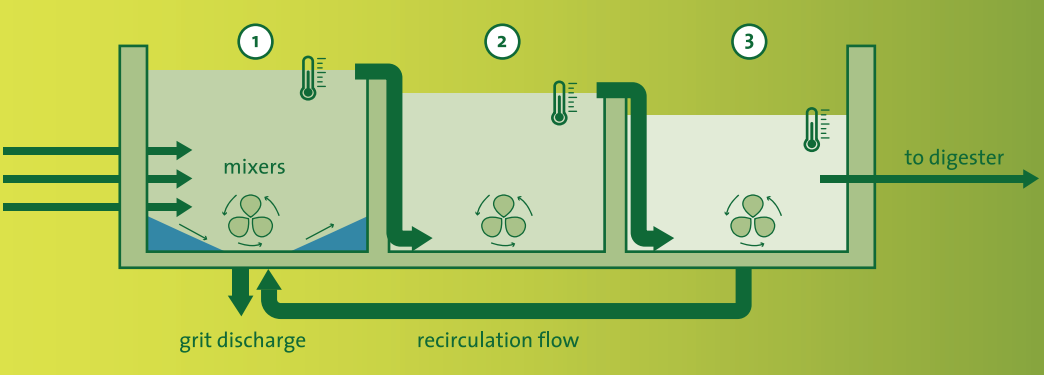
To process the increasing volume of **sewage sludge** more efficiently in **valuable resources** to protect our environment.

HOW CAN EPHYRA® HELP?

Ephyra® is a plug flow digestion technology that significantly improves the degradation of solids and increases the production of biogas. The dewaterability of the sludge will improve and less chemicals are needed, all resulting in a much lower operational cost. Furthermore, the Ephyra® technology is easy-to-retrofit at existing facilities with an extremely small footprint, also ensuring low capital investment.

THE PROCESS

Multiple reactors in series to create plug flow conditions and a high rate sludge digestion in 3 steps:



Step 1

Starting with a high rate hydrolysis, liquefication and acidification step combined with initial methane formation

Step 2

In the following reactors the digestion process continues at high rate and increased methane formation

Step 3

In the last reactor the final last amounts of sludge are converted into biogas.

WHAT IS BEING SAID ABOUT EPHYRA® TECHNOLOGY?

"By integrating Ephyra® into the treatment scheme, Zuiderzeeland Water Authority has doubled its capacity for sludge digestion and increased biogas production by 75%. In addition, the reduced retention time within the Ephyra® tanks also saves a lot of space."

- Ben Roelfzema, Purification Process Technologist at Zuiderzeeland Water Authority

"Ephyra® is the most cost-effective digestion technology with significant more sludge degradation, highest biogas yields, better final dewatering and lowest chemical usage, all within the smallest footprint."

- Dr. ir. André Visser, Senior Process Engineer / Market Manager at Royal HaskoningDHV

WHAT ARE THE RESULTS?

+10 to +20%
more sludge degradation

+1 to +3%
better sludge dewatering

+20 to +30%
higher biogas production

5-8 days
much shorter retention

Strutive
option for P-recovery

-20%
lower chemical (PE) consumption

option for Bioclass A solids for agriculture

www.royalhaskoningdhv.com/ephyra

[1] Prasad, M., de Campos Favas, P., Vithanage, M. and Mohan, S. (2019). Industrial and Municipal Sludge - 1st Edition. Available at: www.elsevier.com/books/industrial-and-municipal-sludge/vara-prasad/978-0-12-815907-1
[2] U.S. EPA. (2006). Emerging Technologies for Biosolids Management. Available at: www.epa.gov/sites/production/files/2018-11/documents/emerging-tech-biosolids-management.pdf
[3] Allied Market Research 2016