

EFFISLUDGE FINAL CONFERENCE

The role of biogas production from industrial wastewaters in reaching climate neutrality by 2050

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Opportunities of renewable gas production from wastewater (*Mieke Decorte, Technical Manager*)

Biogas production in EU policy framework (Marco Giacomazzi, Policy Officer)



Opportunities of renewable gas production from wastewater (Mieke Decorte, Technical Manager)

INTRODUCTION

Industrial wastewaters = wastewater with a **high organic load**.

The purifying process has a high energy demand. The higher the organic load, the higher the energy demand for the purification process.

However, the higher the organic load, as well **the higher the biomethane potential** of the respective stream.





INDUSTRIAL WASTEWATERS

Industrial wastewater originate from a range of industries.





EBA WORKING GROUP 'WASTEWATER'

The EBA working group 'wastewater' with experts from the field have calculated the **total biogas and biomethane potential from industrial wastewater** and investigated the **further advantages AD brings** for treating industrial wastewaters:

- Renewable energy production
- 6 GHG emission mitigation
- Reduced electricity consumption
- Lower excess sludge production
- Creation of local jobs





Without anaerobic digestion

Microorganism use oxygen to aerobically digest the organic load of the wastewater. Oxygen is bubbled in the wastewater and this process consumes electricity. The more microorganism, the more sludge.





INDUSTRIAL WASTEWATER TREATMENT





It is possible to recover **142 TWh of biogas per year** by valorizing industrial wastewaters, from the spirits, biodiesel, pulp and paper, beer, vegetable oils, ethanol, meat and cheese sectors.

The details of the calculation are given in **our paper**.

Most biomethane potential studies in Europe do not yet consider biomethane from industrial wastewaters.

	Average
Sequential crops	459
Agricultural residues	295
Manure	246
Food waste	119
Industrial wastewater	142
Sewage sludge	30
Gasification	383
Total	1,673



RENEWABLE ENERGY PRODUCTION

The number of AD facilities currently in operation in SME's is estimated around 1,000 units.

Market penetration **is below 10%** at EU level.

➔ The majority of the potential remains untapped.





GHG EMISSION MITIGATION

When producing renewable gas from industrial wastewater, **GHG emissions are saved** in different ways:

- Reduced energy consumption for wastewater treatment (less aeration needs)
- Replacement of fossil energy sources
- Methane emissions are saved by bringing the wastewater to a closed and controlled environment





Aerobic wastewater treatment generally has a high energy demand.

By implementing AD, the **waste degradation is switched** from oxygen-based oxidation to an oxygen free fermentation process.

The need for the highly energy-intensive step of oxygenation is reduced.



Treatment of industrial wastewater consumes up to **5-6 kWh of electricity per m³ of wastewater**, mainly for aeration.

By implementing AD, it is possible to **decrease electricity consumption by 75%**.

This corresponds to **32 TWh annually at EU level**.



Aerobic biological treatment technologies based on the widely applied activated sludge process generate **large quantities of excess sludge**.

This **sludge requires treatment** in the form of dewatering, drying, AD and/or incineration.

When implementing AD, the amount of sludge is **reduced by up to 70-80%**, meaning thus reduced cost for sludge processing as well.



CREATION OF LOCAL JOBS

It is estimated around **20,000 direct jobs** can be created spread among 85,000 SME's when untapping the full potential.

Additionally, **indirect jobs are created** such as provision of micro-nutrients, laboratory analysis, equipment maintenance and consumables in general.





CONTRIBUTIONS TO CLIMATE NEUTRALY BY 2050

- 142 TWh of renewable energy can be produced
- Electricity consumption can be reduced by 32 TWh annually
- Sludge production can be reduced by up to 70-80%.
- 20,000 direct local jobs can be created.
- **GHG emissions** are avoided.







Biogas production in EU policy framework (Marco Giacomazzi, Policy Officer)

The EU Climate Law





The voice of renewable gas in Europe

The EU Fit-for-55 Package

IN JULY 2021, THE EUROPEAN COMMISSION ADOTED 14 PROPOSALS TO DECARBONISE RELEVANT SECTORS BY 203



Energy, transport, heating and cooling, land-use, forestry, emission trading and effort sharing

MAIN TARGETS

- Renewable energy from 20 % in 2020 \rightarrow 40 % in 2030
- Annual average increase of renewable energy in industry of 1.1 % and 50 % for renewable hydrogen by 2030
- GHG emission savings in ETS sectors from 21 % in 2020 \rightarrow 61% in 2030
- Energy efficiency from 20 % in 2020 \rightarrow 32-39 % in 2030





The RED II (EU) 2018/2001 e the RED III (EU) .../...

THE EBA's RECOMMENDATION

- Introducing a target on renewable gas injected in the gas grid of 11% by 2030 with 8 % secific target of biomethane
- Encourage and scale-up capacity of sustainable biogas and biomethane :
 - Getting the member states to cover CAPEX and OPEX for the production of renewable energy from waste and residues, in particular bio-waste from separate collection ; sequential crops (Intermediate Crops With Energetic Vocation – CIVE in France) ; manure ; sludge and waste water
- Ensure legal certainty and operational clarity for trading of biomethane when injected in the gas grid → acknowledging the Guarantee of Origins
- Strongly decarbonise heavy duty vehicles and shipping with biomethane, BIO-LNG and other innovative renewable fuels (BIO-LPG)





The way forward

THE EUROPEAN PARLIAMENT AND MEMBER STATES WILL ENTER NEGOTIATIONS ONCE THEY AGREE ON A POSITION

- Presidency of the Council 2022:
 - January June: France
 - July December: Czech Republic
- European Parliament
 - Pieper Markus EPP
 - Torvalds Nils Renew Europe
 - Thaler Barbara EPP
 - Fitto Raffaele ECR
 - Picierno Pina







The voice of renewable gas in Europe

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