Poster no. 4

Evaluation of the French biomethane production from WWTP

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Study carried out on behalf of ADEME and GrDF by GREENBIRDIE and CRIGEN (GDF SUEZ)
Objectives of the study

Objectives and challenges:
- Assess the potential of biomethane produced from sludge of Waste Water Treatment Plants (WWTP),
- Establish a hypothetical perspective of this potential for the years 2020 and 2050.
Typology of Waste Water Treatment Plants (WWTP) in France

Distribution of WWTP depending on their nominal capacity:
- 19,521 WWTP operating in France,
- 84% of WWTP (16,421 WWTP) have a capacity < 2,000 PE
- 143 WWTP have a capacity > 100,000 PE

Total and average amount of sludge produced depending on WWTP nominal capacity:
- The majority of sludge is produced by WWTP with nominal capacity > 100,000 PE (48%),
- Linear relationship between amount of sludge and incoming pollution load,
- Total production of 1,036,855 t sludge DM/yr,
- Methane theoretical potential of 2.13 TWh/yr (assumption: 192 Nm³ CH₄/tDM)

Distribution of incoming pollution load (in PE) in WWTP depending on their nominal capacity:
- 143 WWTP (> 100,000 PE) treat 72% of total pollution load
- 84% of WWTP (< 2,000 PE) treat only 3.9% of total pollution load

Current final usage of sludge:
- 65% spreading on the lands
- 30% incineration
- < 5% storage in landfills

Source: Data from portal on communal sanitation, French Ministry of Ecology, Sustainable Development and energy, 2014
• For a WWTP without anaerobic digestion, installation of a biogas plant with upgrading biogas and injection of biomethane into the gas grid is relevant (from an economic point of view) from 60,000 PE.

• For a WWTP with anaerobic digestion, installation of a biogas plant with upgrading biogas and injection of biomethane into the gas grid is relevant (from an economic point of view) from 45,000 PE.

• For a WWTP without anaerobic digestion, installation of a biogas plant with double valorisation of the biogas produced is relevant (from an economic point of view) from 100,000 PE.

• For a WWTP with anaerobic digestion, installation of a biogas plant with double valorisation of the biogas produced is relevant (from an economic point of view) from 120,000 PE.

=> Thereafter, the threshold of 60,000 PE is chosen as the threshold for the profitability for biomethane injection (this threshold is about 100,000 PE for a double valorisation).
**Conclusion**

- Potential of production of biomethane for injection from WWTP sludge:
  - 2020: 0.09 to 0.57 TWh/yr,
  - 2050: 0.62 to 1.81 TWh/yr.

**Potential of biomethane from WWTP sludge injectable into the gas grid in 2020 and 2050**

**Assessment of the potential of biomethane produced from the French municipal sludge**