



Örnsköldsvik
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Poster no. 4

Evaluation of the French biomethane production from WWTP

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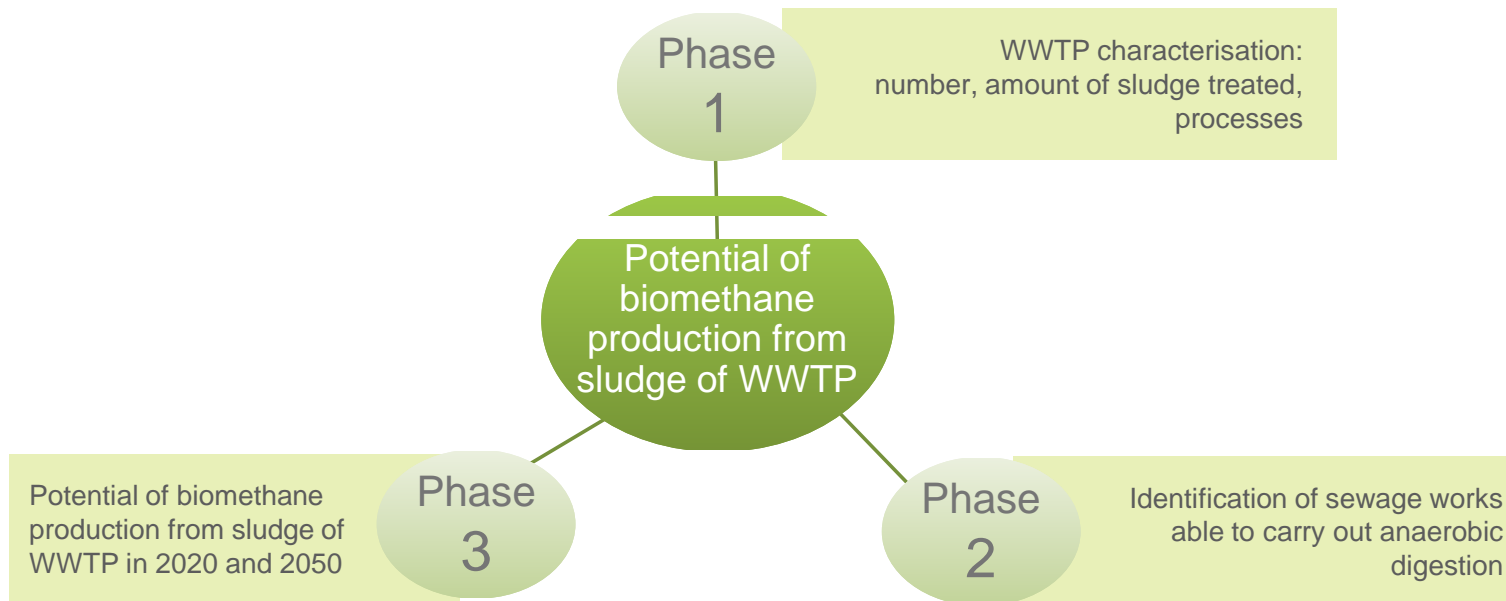
Study carried out on behalf of ADEME and GrDF by GREENBIRDIE and CRIGEN (GDF SUEZ)



1 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.



2

Typology of Waste Water Treatment Plants (WWTP) in France



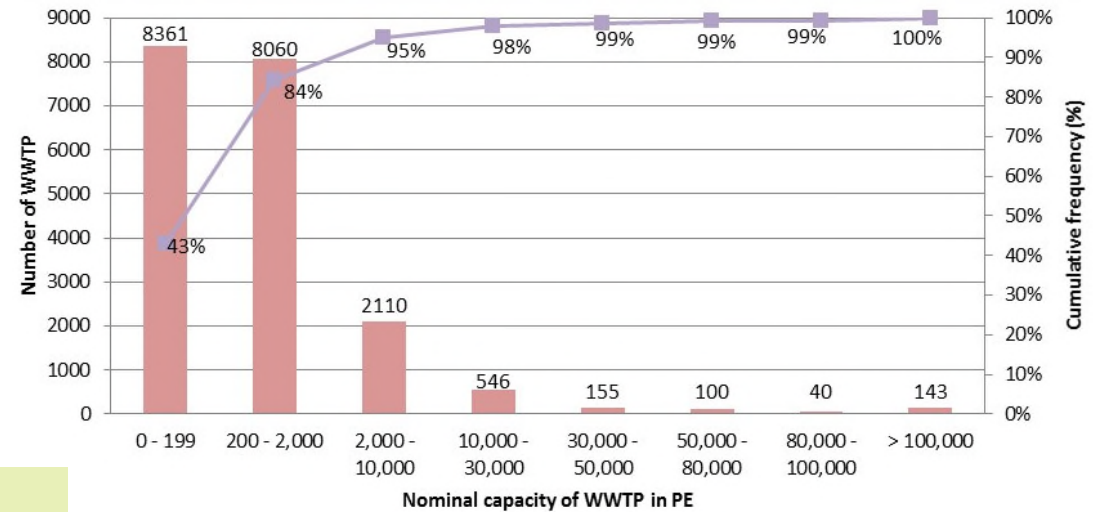
Distribution of WWTP depending on their nominal capacity :

- 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 : $192 \text{ Nm}^3 \text{ CH}_4/\text{tDM}$)

Source : Data from portal on communal sanitation, French Ministry of Ecology, Sustainable Development and energy, 2014



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

3 Economic analysis results



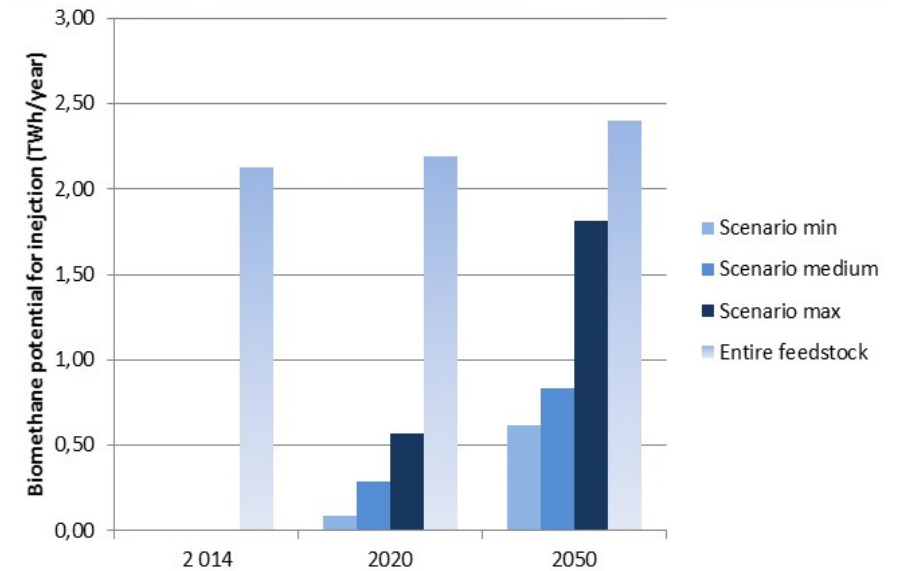
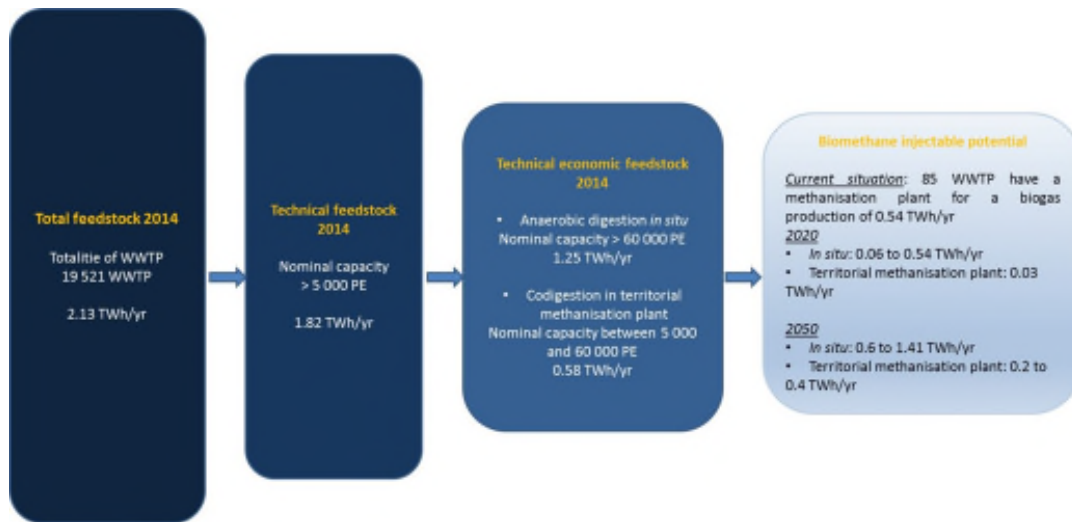
- **For a WWTP without anaerobic digestion**, installation of a biogas plant with upgrading biogas and injection of biomethane into the gas grid is relevant (from an economic point of view) from **60,000 PE**.
- **For a WWTP with anaerobic digestion**, installation of a biogas plant with upgrading biogas 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).

4 Conclusion

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



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