France Report

Bern, Switzerland, April 2013

French Environment and Energy Management Agency
Olivier THEOBALD and Guillaume BASTIDE
olivier.theobald@ademe.fr
tél.: +33 (0)241 204 312
→ Decree “double valorization”
  - Published at the end of February 2013
  - Injection and CHP production are possible on the same site (forbidden before)
  - Feed-in tariff including both electricity production and injection

→ Reflection on WWTP sludge currently in progress
→ “Energy, Anaerobic Digestion and Nitrogen” Action Plan
  - Announced by the government at the end of March
  - Targets (AD):
    - promote the development of “collective on-farm units” with 1,000 units expected by 2020
    - promote the use of digestate
    - create, through innovation, a French equipment network

→ List of buyers of last report published (June, 12)

→ GrDF designated as the manager of the GoO register (December, 2012)
AD plants in operation (estimated by ADEME, December 2012):

- On-farm ≈ 90 (average of 170 kWe)
- Centralized ≈ 15 (av. of 1,2 MWe)
- Industrial ≈ 80
- WWT ≈ 60
- MSW : 11 (4 biowaste & 7 grey waste)
- Landfill ≈ 245 including 90 with energy recovery
On-farm AD in operation

On-farm AD units
units number and MWe in operation, ADEME December 12

Energy from biogas
- Drying: 60%
- Livestock buildings: 13%
- Local heating networks: 11%
- Greenhouses: 9%
- Others: 7%

Installed Power
Units number and MWe in operation, ADEME December 12

Characteristics
- Continuously mixed
- $P_{\text{mean}} = 180 \text{ kWe}$
- $V_{\text{energy}} = 64\%$

Feedstock
- Manure: 63%
- Agro-food wastes: 9%
- Green wastes: 4%
- Energy crops: 11%
- Others wastes: 13%
Upgrading plants in operation

Lille (biowaste, 108,000 T/y)  
V = 700 Nm³/h  
water scrubber (Flotech), injection

Claye-Souilly (household waste, landfill)  
V = 100 Nm³/h  
PSA + membrane (Cirmac), vehicle fuel

Forbach (biowaste, 45,000 T/y)  
V = 50 Nm³/h (→ 100)  
membrane (Air Liquide), injection

Bioénergie de la Brie (on-farm, 12,000 T/y)  
V = 100 Nm³/h  
Membrane (Air Liquide), injection (starting)
**AD Investment costs (2009)**

- on-farm and centralized:
  - 8 600 €/kWe for 100 kWe
  - 5 600 €/kWe for 500 kWe
  - 5 200 €/kWe for 1MWe

- MSW: 540 €/T treated

**New studies**

- Economics data for 50 plants: investment, benefits and costs (2013)
- Technical, economical and environmental monitoring of biomethane production and injection facilities (2013-2016)
- Technical, economical and environmental monitoring of small scale and innovative on-farm AD plants (2013-2015)
- Estimation of the potential feedstock for AD
Focus

Technical, economical and environmental monitoring of biomethane production and injection facilities (2013-2016)

- Call for tenders (France and EU)
- Have a feedback on the first biomethane injection units in France (10 units max.)
- Pros/Cons of different technologies
- Do an overview on technical parameters and costs
- Make recommendations for the construction and the exploitation of upgrading and feed-in plants
- Update the feed-in tariff by ordinance, if necessary
→ Objectives

- Have a methodology for the study
- Write targets for production by 2030 on the national and regional levels
- Make recommendations for the use at a regional level to promote “territorial” projects
- All feedstock investigated except grass, fruits and vegetables, cultivated algae