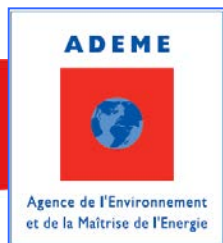


France Report

Bern, Switzerland, April 2013



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→ 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

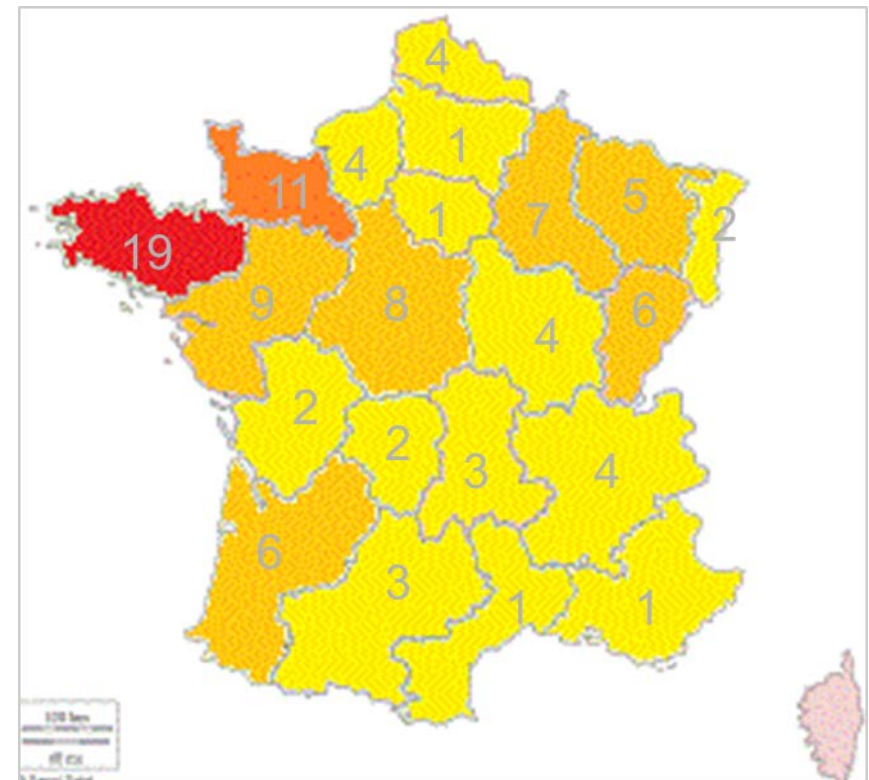
→ List of buyers of last report published (June, 12)

→ GrDF designated as the manager of the GoO register (December, 2012)

AD plants in operation (estimated by ADEME, December 2012) :

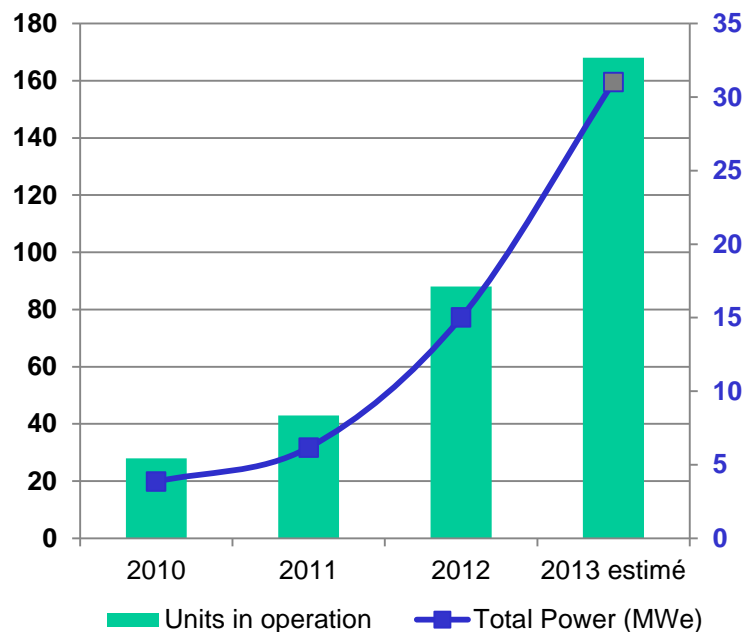
- ⋈ On-farm ≈ 90 (average of 170 kWe)
- ⋈ Centralized ≈ 15 (av. of 1,2 MWe)
- ⋈ Industrial ≈ 80
- ⋈ WWT ≈ 60
- ⋈ MSW : 11 (4 biowaste & 7 grey waste)
- ⋈ Landfill ≈ 245 including 90 with energy recovery

on-farm and centralized units number by county



On-farm AD units

units number and MWe in operation, ADEME December 12



Characteristics

continuously mixed

$P_{\text{mean}} = 180 \text{ kWe}$

$V_{\text{energy}} = 64\%$

Feedstock

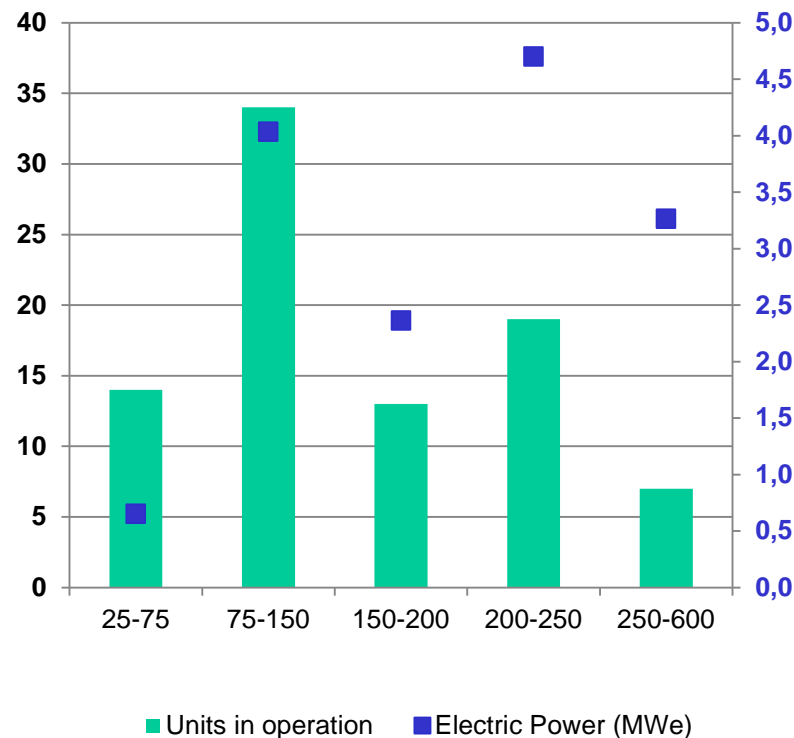
Manure : 63%
Agro-food wastes : 9%
Green wastes : 4%
Energy crops : 11%
Others wastes : 13%

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



Lille (biowaste, 108,000 T/y)
 $V = 700 \text{ Nm}^3/\text{h}$
water scrubber (Flotech), injection

Claye-Souilly (household waste, landfill)
 $V = 100 \text{ Nm}^3/\text{h}$
PSA + membrane (Cirmac), vehicle fuel

Forbach (biowaste, 45,000 T/y)
 $V = 50 \text{ Nm}^3/\text{h}$ ($\rightarrow 100$)
membrane (Air Liquide), injection

Bioénergie de la Brie (on-farm, 12,000 T/y)
 $V = 100 \text{ Nm}^3/\text{h}$
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

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

- Call for tenders (France and EU)
- Have a feed-back 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

Estimation of the potential feedstock for AD

→ 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

