



# IEA Bioenergy Task 37

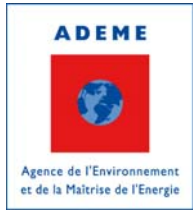
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## French Report Istanbul, April 13 to 15th 2011

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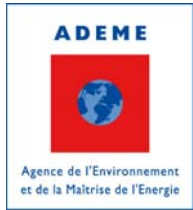


# Biogas Plant Inventory

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## AD plants in operation (ADEME, 2011) :

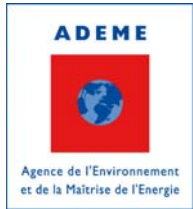
- On-farm : > 30 (average of 150 kWe, 7000 tons)
- Centralised : 5 (average of 1,1 MWe, 25 000 tons)
- Industrial : 88
- Sewage sludge : 74
- MSW : 9 (3 biowaste & 6 grey waste) – 710 MT/yr
- Landfill : 262 inc. 71 with energy valorisation



## Up-grading plants in operation

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- 1 landfill (Claye Souilly) : 100 m<sup>3</sup>/h of biomethane (PSA and membrane)
- 1 biowaste (Lille) : 1.200 m<sup>3</sup>/h (water scrubber)
- 1 municipal sludge (Lille-Marquette) : 100 m<sup>3</sup>/h (water scrubber)  
closed until 2014

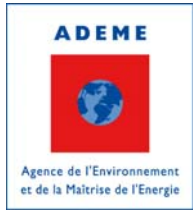


## Gas production 2008

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(French Ministry for Environment and Energy, 2009)

- Raw biogas production : 3.300 GWh
- Energy production : 1.290 GWh
- Electricity production : 660 GWh inc. 77 GWh CHP
- Amount of heat recovered : 630 GWh inc. 70 GWh CHP
- Up-graded to biomethane (2011)
  - no amount injected into the natural gas pipeline
  - very low amount used as vehicle fuel

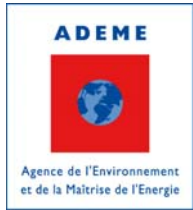


## Performance data :

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French Ministry for Environment and Energy, 2009

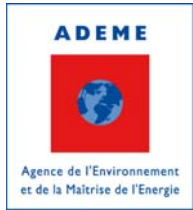
- electrical efficiency : 15,0 %
- total energy efficiency : 39,1 %
- emissions : nd



## Economic Data :

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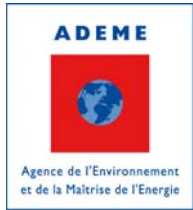
- *Investment costs*
  - on-farm AD and centralised :
    - 8 600 €/kWe for 100kWe
    - 5 600 €/kWe for 500 kWe
    - 5 200 €/kWe for 1MWe
  - MSW AD : 540 €/t treated
- *Up-grading*
- *Operating Costs*



## Economic Support Data :

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- Electrical feed-in tariffs : new regulation in progress (attended on april 2011)
  - 20 % of increase
  - incentive for use of animal manure
  - maximum : 20.1 c€/kWh
- Up grading feed in tariffs : new regulation in progress (attended on july 2011)
  - maximum 103 €/MWh
- Investment grants
  - No change since the last meeting



## National Strategy/Support for Exploitation of Biogas :

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### **national WG on up-grading and grid biomethane injection :**

- leaders : French Environment and Energy Agency and GrDF (gas grid distribution operator)
- definition of technical specifications to inject biomethane into the grid

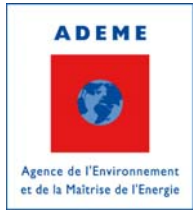
Ex.: standardization of feasibility studies ; content limit in O<sub>2</sub> ; control quality of biomethane ; standard contracts ;

- creation of a web site (attended in June)

### **• the situation today :**

- around 140 up-grading projects
- 70 % on farm or food processing industry
- 75 % with a flow rate > 100 m<sup>3</sup>/h biomethane

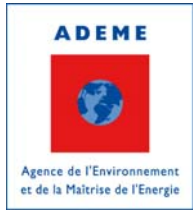




## Challenges :

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- *AD plant permitting*
- *Environmental licenses*
- *Grid connections (electricity, heat, gas pipeline)*
- *Digestate utilisation*



## Research Activities :

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- Study on **digestate valorization** (DIVA program):
  - Inventory and characterize different types of digestate and management
  - Evaluate the capacity of digestate to be used on soils or to be transformed in commercial products
  - Realize a technical, economical and environmental balance of digestate post treatment compared with direct spreading
  - Set up a regulation to permit a evolution of digestate from a waste to a product
  
- Total cost : 3.8 M€ ; Total subsidies : 1.23 M€ (National Research Agency)

