Country updates:

Germany

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Biogas plants

- The market for biogas plants is booming and the number of installed biogas plants increased continuously.
- Per month about 50 new plants go in start-up.
- At the end of 2006 probably about 3,500 plants will be in operation.
- Most of the new installed biogas plants have an electrical capacity of 500 kW.
- Nearly all new plants are operated with energy crops with and without addition of manure.
- Most plants use 2-3 different energy crops (maize silage, grain, grain crops silage, grass silage.)
Fermenter types

- Wet fermentation is the dominating technology, but many dry fermentation systems are in construction due to the technology bonus of 2 Cent/kWh.
- The capacity of discontinuously operated percolation reactors is mainly between 50 and 200 kWel and for continuously operated plants between 700 and 1.500 kWel.
- The definition of „dry-fermentation“ (input > 30% TS) is under discussion. A more stringent definition is expected within the next month, which take into consideration additional efficiency criteria.
Gas utilization

- The gas is mainly used in CHP-stations, but new applications have come in operation:
  - Biogas upgrading to vehicle fuel in Jameln using the Selexol process
  - Biogas upgrading and feeding into the gas grid in Pliening, Kerpen and Straelen (end 2006) using the pressure swing adsorption process (PSA).
- The application of CHP with gas engines is strongly increasing and the application of dual fuel engines is decreasing.
Engine type applied in CHP
Heat utilisation

- Due to the heat utilization bonus (CHP-bonus) of 2 Cent/kW$_{el}$ by external heat utilization the installation of drying units and local heating grids increased considerably.
- The first Bioenergy Village Jühnde (first self sufficient village) is now for 1 year successful in operation and several villages will follow this model.
- New technologies are tested in order to achieve a higher electrical efficiency (e.g. ORC-technology).
The legal basis for feeding biogas into the gas grid come into force on 1 October 2006 (Gasnetzzugangsverordnung, Gasnetzzugangsmodell).

- The input of biogas into the gas grid has priority.
- Biogas can be traded within the market district without limitations.

The utilization of biomethane as vehicle fuel is tax free up to 2018, whereas from 1 August 2006 for biodiesel a tax (9 Cent/l) has to be paid.

Up to 2010 CNG should contain 10 % Biomethane (self-liability of the gas companies).
Biogas production is strong increasing in Germany using maize silage as the main substrate.

Actually a number of R&D projects deal with the evaluation and growing of energy crops.

Dry fermentation is of increasing interest and several discontinuously and continuously operated plants are in construction.

The first biomethane filling station has been opened in July 2006 using the Selexol upgrading process.

Up to the end of 2006 three biogas plants will fed biomethane into the gas grid using pressure swing adsorption with carbon molecular sieves.