

## **Country updates:**

### **Germany**

P. Weiland

Federal Agricultural Research Centre (FAL)  
Institute of Technology and Biosystem Engineering

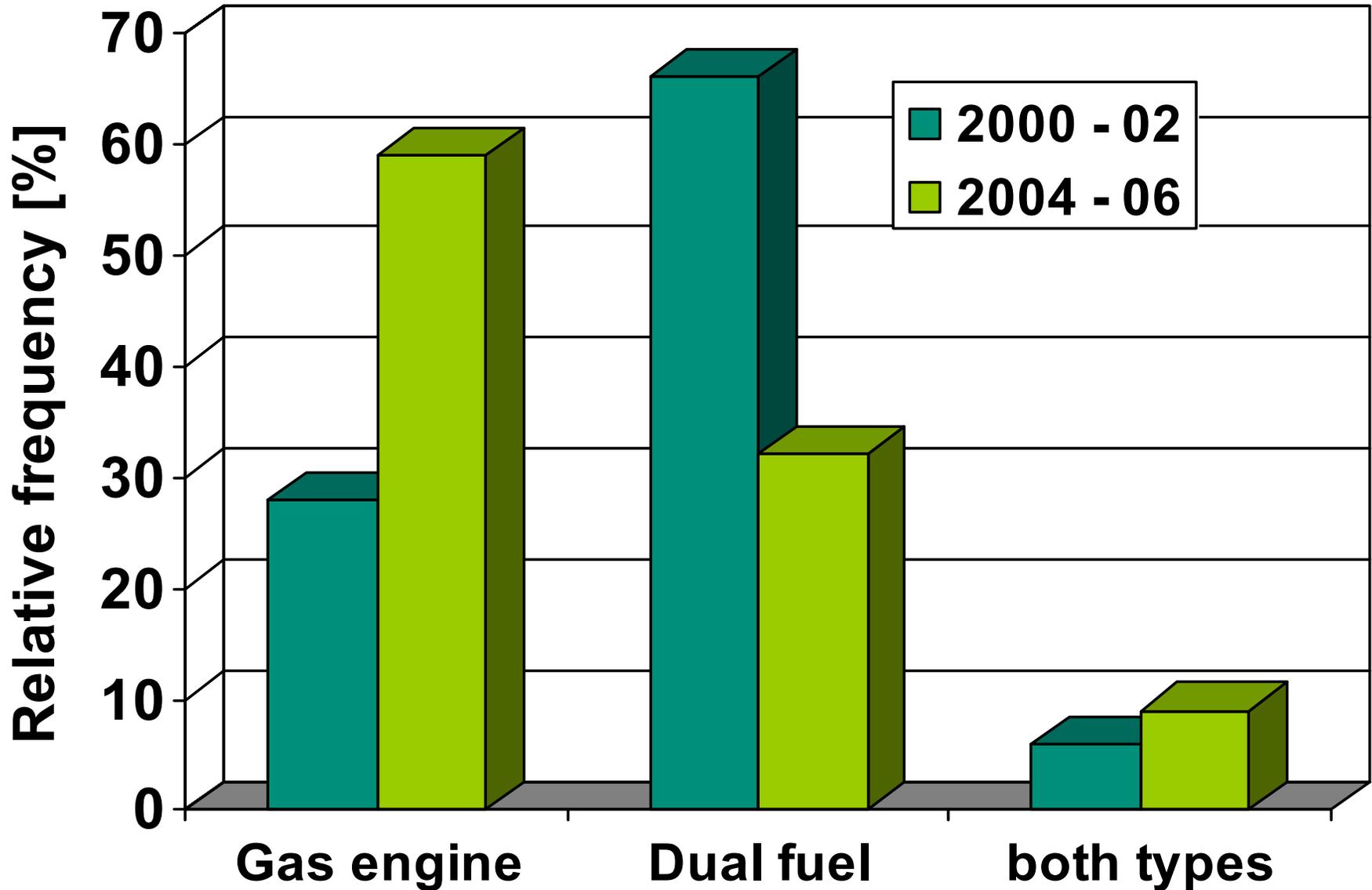


- **The market for biogas plants is booming and the number of installed biogas plants increased continuously.**
- **Per month about 50 new plants go in start-up.**
- **At the end of 2006 probably about 3.500 plants will be in operation.**
- **Most of the new installed biogas plants have an electrical 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).**

- **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 kW<sub>el</sub> and for continuously operated plants between 700 and 1.500 kW<sub>el</sub>.**
- **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.**

- **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 strong increasing and the application of dual fuel engines is decreasing.**

# Engine type applied in CHP



- Due to the heat utilization bonus (CHP-bonus) of 2 Cent/kW<sub>eI</sub> 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 feed biomethane into the gas grid using pressure swing adsorption with carbon molecular sieves.**