

**IEA Bioenergy Task 37**

# Country Report

# Denmark

November 2010

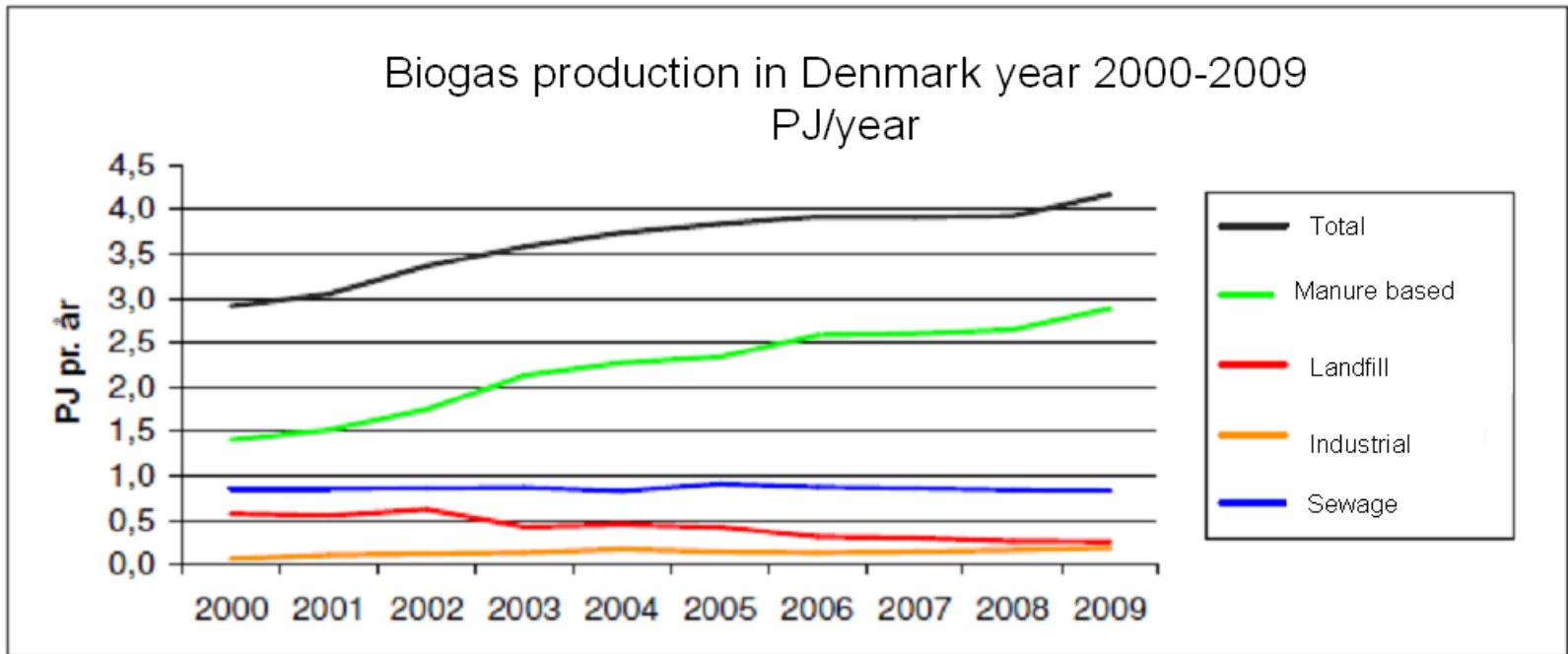
## Summary of AD Plants

- 76 Agricultural plants
- 5 Industrial plants
- 61 Sewage sludge plants
- 25 Landfill gas recovery plants

## New agricultural plants:

- 12 in construction (see table below)
- about 24 new initiatives

Future biogas plants	Tonnes biomass/day	Estimated energy prod. PJ/year
Brørup-Holsted Biogas Amba	1300	0,270
BSG Nakskov BioGas A/S	600	0,370
Djurs Bioenergi Amba (første af to anlæg)	477	0,172
Faaborg Biogas	1000	0,260
Give	590	0,160
Maabjerg Bioenergy, MBE Drift	1200	0,400
Nordfyns Biogas Amba	550	0,150
Nørager Bio- & Miljøanlæg Amba	275	0,100
Ringkøbing-Skjern		se tabelnote
Sydvestjysk Biogas Amba	2200	0,400
Sønderjysk Biogas Amba	1100	0,250
Thy, økologisk fællesanlæg	200	0,075
<b>Sum</b>	<b>9492</b>	<b>2,607</b>



Raw biogas production => 4,2 PJ

## Performance Data

- electrical efficiency 38-40%
- total energy efficiency 85-90%
- emissions: reduced emissions of CO<sub>2</sub>, CH<sub>4</sub> and NO<sub>2</sub>

**Average: 1 m<sup>3</sup> methane is converted to 3,8 kWh el and 4,7 kWh heat**

## **Economic Support Data**

### **Price guaranty for electricity produced on biogas**

- Present of 0,772 DKK/kWh
- Aimed in the future: 1,07 DKK/kWh

### **Investment grants**

-Not actual for the moment, but possibly re-introduced in the future, if the objectives of the Green Growth plan for the enlargement of the Danish biogas sector up to 2010 should be reached

**Operating Costs : approx. 3,8 DKK/m<sup>3</sup> CH<sub>4</sub>**

## National Strategy/Support for Exploitation of Biogas

- Price guaranty of 0,772 DKK/kWh electricity produced on biogas
- The Danish Government's Green Growth plan for the enlargement of the Danish biogas sector up to 2010
- Approx. 4 large co-digestion biogas plants to be established per year up to 2020
- 50% of the produced animal slurries and manures to be treated (compared to the present 3-6%)
- production of 12PJ from biogas, compared to 4,2PJ today

# Challenges

- **AD plant permitting - difficult to find a location for the plant due to negative public perception**
- **Creating the frames for utilisation of biogas to totally replace natural gas in the decentralised heat and power production**
- **Need for enhanced redistribution of digestate to crop farmers / digestate separation**
- **Finding a sustainable feedstock alternative for the co-digestion of the 25% organic waste (limitative factor)**
- **1,07DKK/ kWh el from biogas, necessary to have a sound economy**
- **Increasing the capacity of the Danish biogas plant suppliers**