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Waste Management & Energy
Prof. Dr.-Ing. Frank Scholwin

Overview of German Biogas Situation, perspectives and research activities

Frank Scholwin

12.10.2012 www.biogasundenergie.de Güstrow/Rostock

Institute for Biogas, Waste Management and Energy

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Long term experiences in consulting and research.

National and international mulidisciplinary network.

Services for systems integration.

Networking.

Knowledge Transfer.

Publication.

History of Renewables

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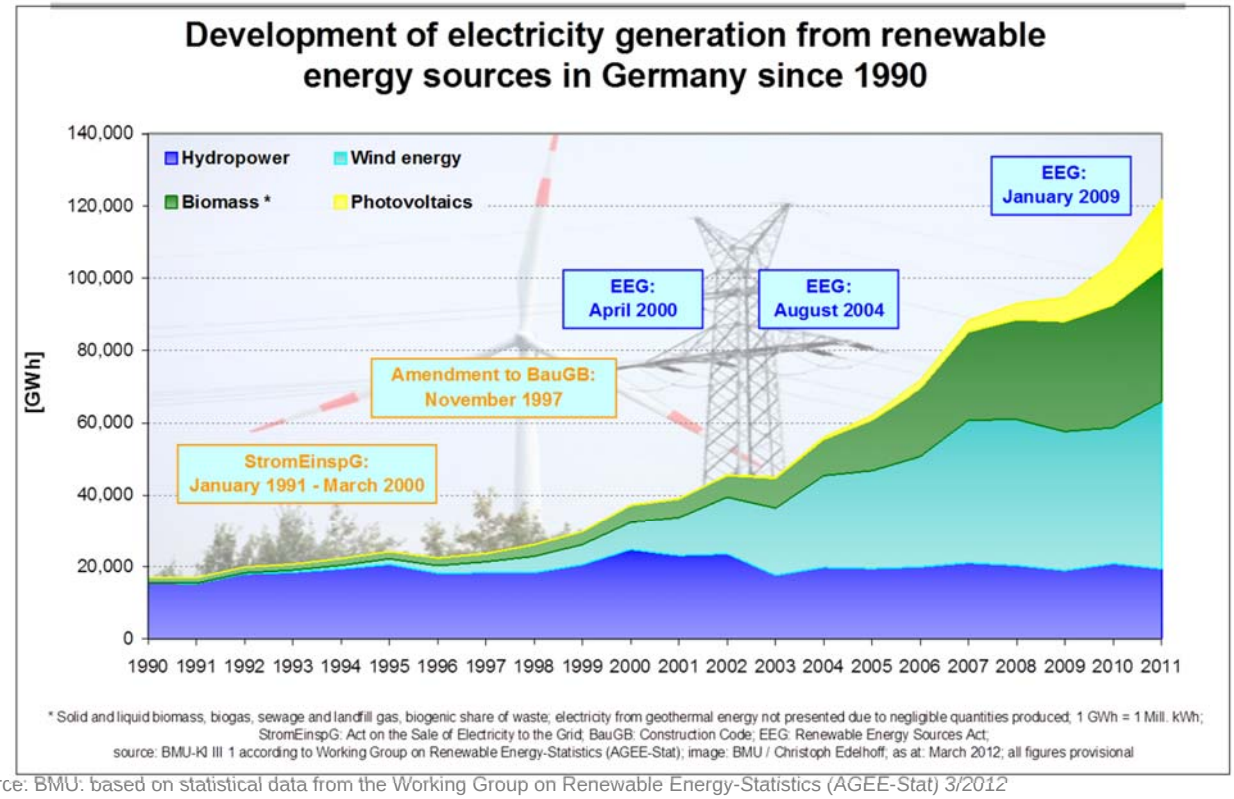

Source: BMU: based on statistical data from the Working Group on Renewable Energy-Statistics (*AGEE-Stat) 3/2012*

Development of biogas plants in Germany

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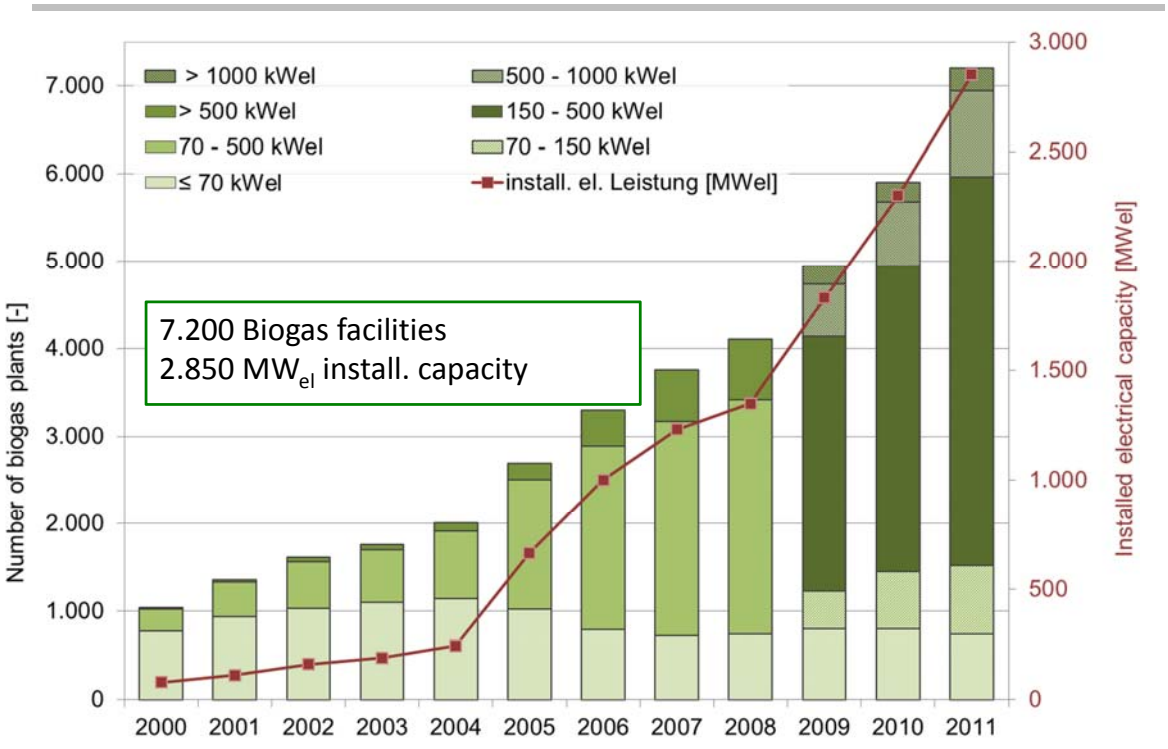

Source: DBFZ 2012

Biogas facilities in Germany

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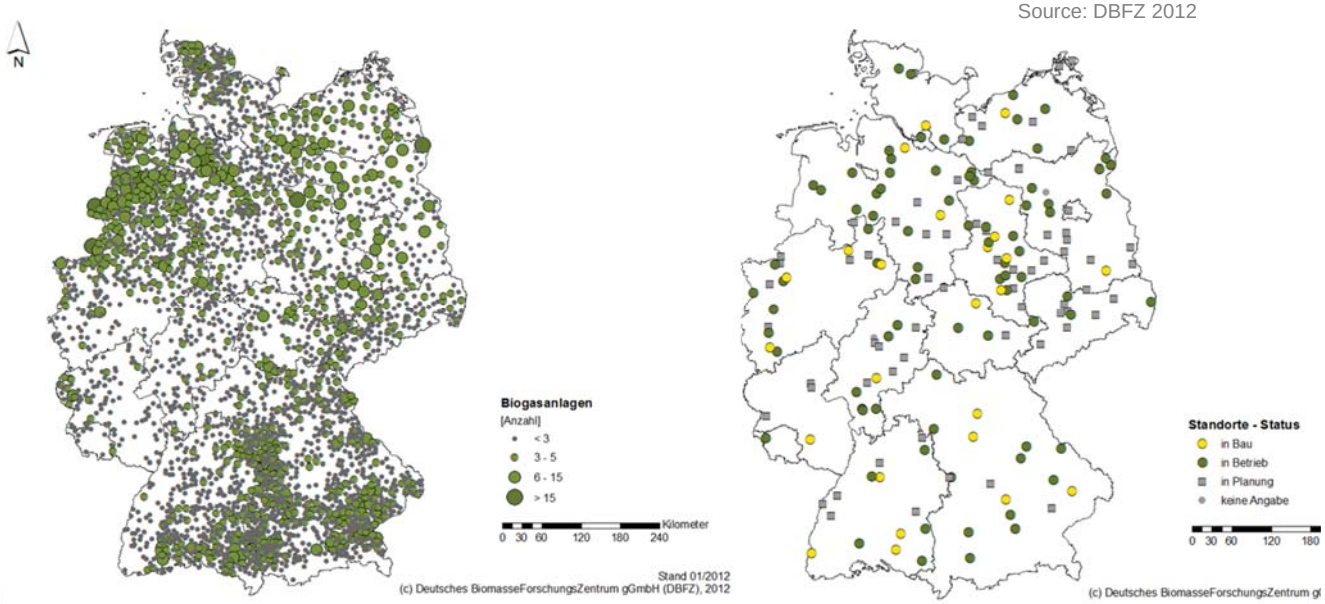
Around 7200 biogas plants with electricity production in CHP (combined heat and power) in front of the biogas plant

Around 83 Biogas plants with upgrading the biogas to biomethane in operation (further plants projected within the next years)

Source: DBFZ 2012



Biogas upgrading

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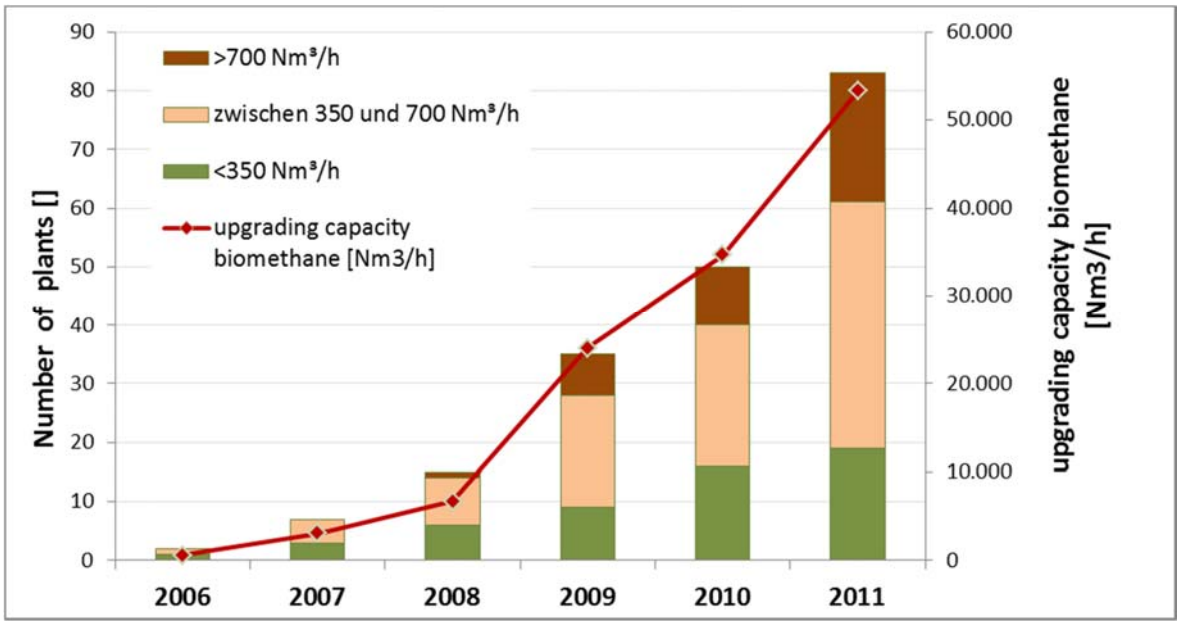
- Technology: mainly Amin scrubber, water scrubber and PSA
- Data base: 31.12.2011



Source: DBFZ 2012

Biogas upgrading technology and plant number

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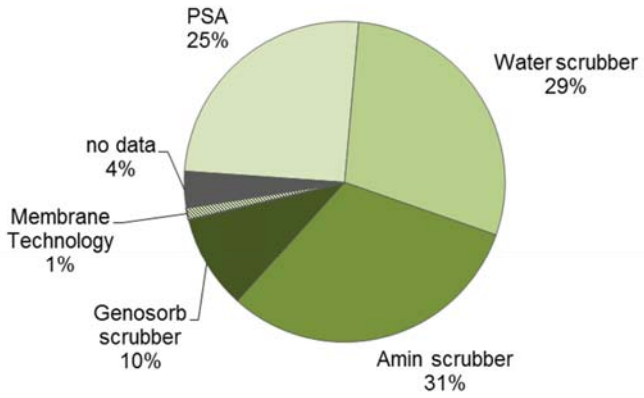
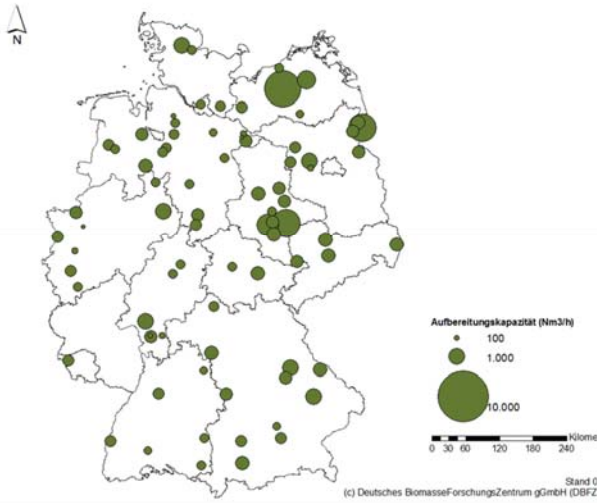
- Technology: mainly Amin scrubber, water scrubber and PSA
- End of 2011: 83 biomethane plants with upgrading technology
- Total upgrading capacity biomethane (12/2011): ~ 460 Million Nm^3/a





Source: DBFZ 2012

Biogas market in Germany

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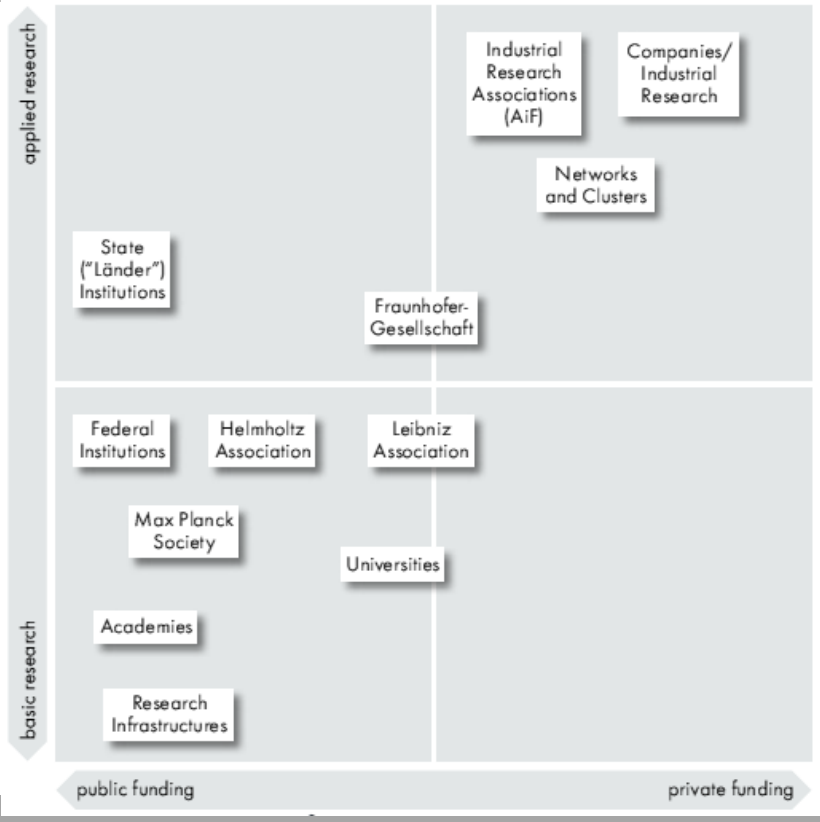
- Mainly the legislative framework force this development of renewable energy sources for electricity production in Germany
- Increasingly importance for Biogas development in Germany esp. due to the Renewable Energy Act
- biogas for electricity production in 2011 (17,5 TWh) contribute with 14,4% to total electricity production of total renewable energy sources in Germany (121,9 TWh in 2011)*
- Share of renewable energy sources to total electricity production obtain 20% in 2011*
- To raise the efficiency of biogas utilization and to improve the flexibility of its use alternative utilization of biogas become more interesting → more than 80 plants upgrading the biogas are in operation
- Biogas and biomethane are technical efficient options to apply significant volumes in the medium term and will be play an important role within the total energy systems
- Biogas is a promising option for energy supply

Source: DBFZ 2012

Research in Germany



Source: www.research-in-germany.de

Research financing in Germany

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Governmental funding

Ministries and their authorities / assigned bodies, Deutsche Forschungsgemeinschaft

Federal states funding

Ministries and their authorities

State independent funding

foundations (independent, companie-owned), associations

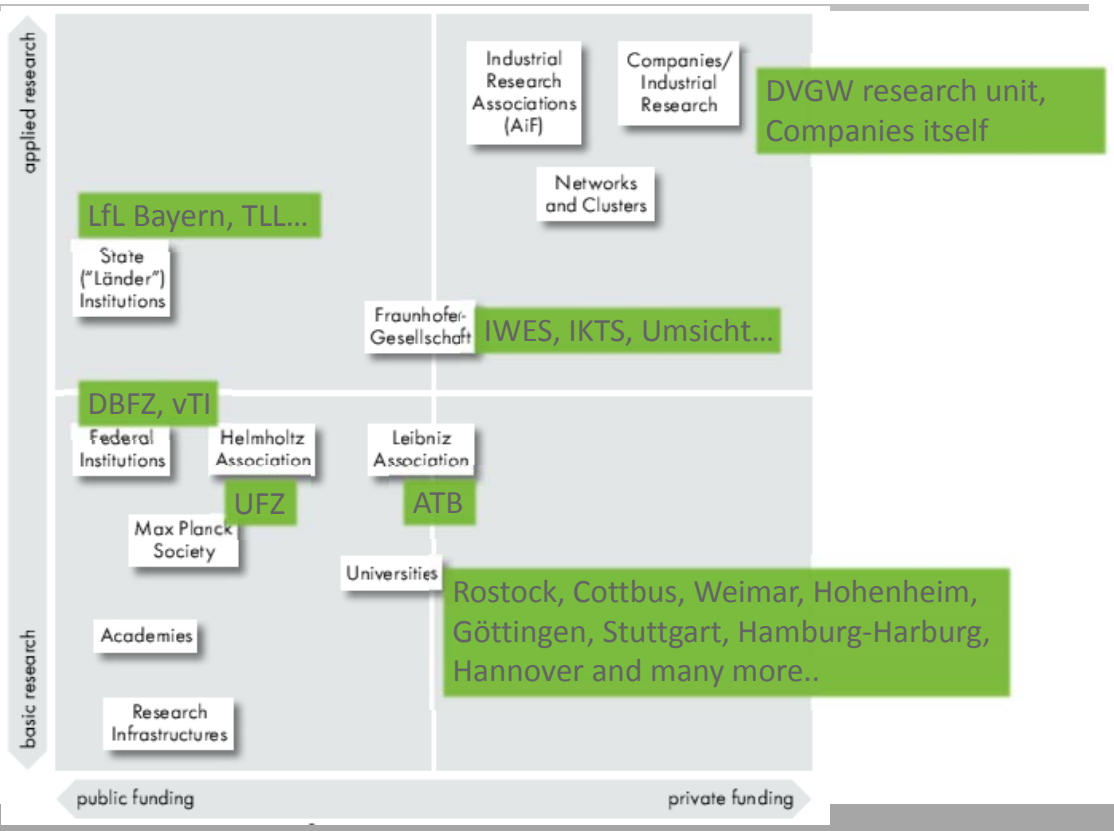
International funding

EU

Companies funding / payed research

not public

Main biogas research institutions



Biogas research funding in Germany

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Governmental funding

Ministries of Agriculture (FNR), Environment, Science, Economy

Federal states funding

very different, Ministries of Agriculture, Environment, Science, Economy

State independent funding

foundations (independent, companie-owned), associations

International funding

EU

Companies funding / payed research

not public

Main biogas research topics in Germany

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- Substrates supply („new“ energy crops)
- Storage of subtrates
- Substrates pretreatment (mechanical, thermal, chemical, Enzymes)
- Microbiology of fermentation process / addition of trace elements / disturbances of the process
- Modelling of fermentation process
- Fermenter design in dependency of substrates
- Residues aftertreatment
- Control equipment / measurement technologies
- Biogas cleaning
- Biogas upgrading (new technologies / improved technologies)

- Ecological effects / Sustainability criteria / biodiversity
- Emission measurements and evaluation / GHG balances

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Biogas – a key for future energy systems and nutrient cylces

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Biogas. Kreislaufwirtschaft. Energie.

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