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GERBIO
German Society for Sustainable
Biogas and Bioenergy Utilisation

Germany - National Energy Policies Supporting AD

- Overview - Biogas in Germany
- Renewable Energy Act 2004/2009
- Renewable Energy Act 2012
- Outlook/Future Challenges



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Activities of GERBIO related to Biogas technology

- Know-How transfer (international workshops, study tours, training)
- Support of small scale installations
- Contacts to experts in planning, design and construction
- Contacts to specialized companies
- Networking with members in different regions nationally and internationally

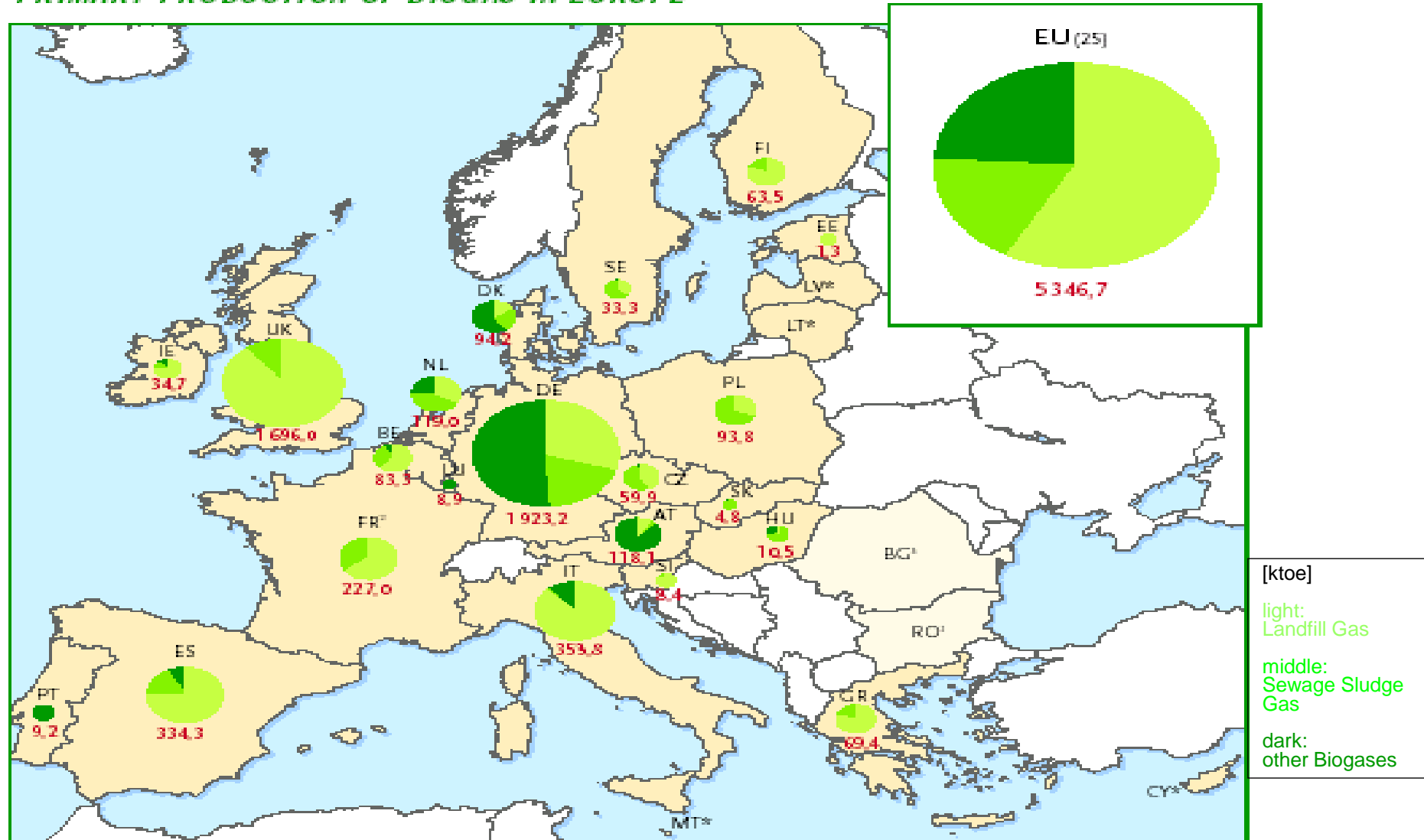




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PRODUCTION PRIMAIRE DE BIOGAZ EN EUROPE
PRIMARY PRODUCTION OF BIOGAS IN EUROPE





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Biogas in Germany End 2010:

Amount: **6.000 Biogas Plants**

Installed electrical capacity: **2.280 Megawatt (~ 2,3 Gigawatt)**

Power production: **12,5 Mrd. Kilowatt hours = Electricity for
4,3 Mio. Households**

Agricultural Area: **ca. 750.000 ha for Biogas**

Feed into the natural gas grid: **50 Biomethane feed in stations
(95 Mio. m³/a)**

Biogas filling stations: **2 in operation, further in planning**

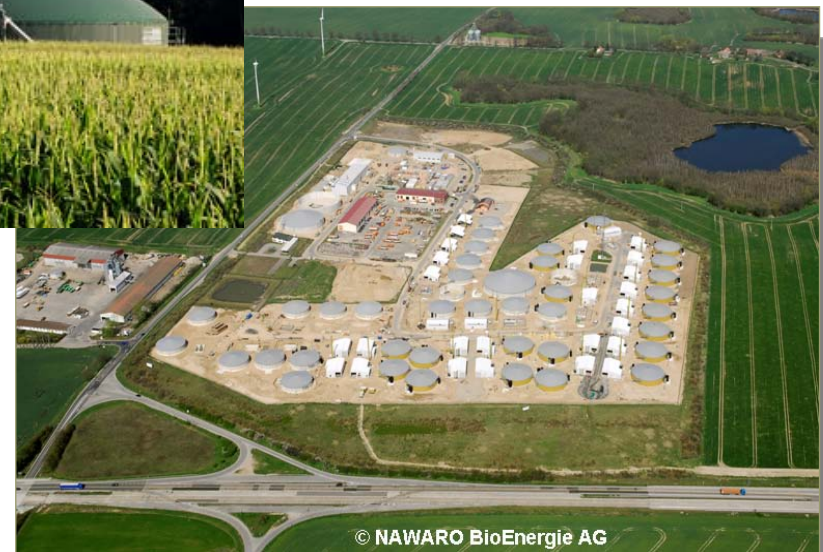
Employment places: **ca. 19.000**



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Agricultural Biogas Plants = Farm Scale Biogas Plants?

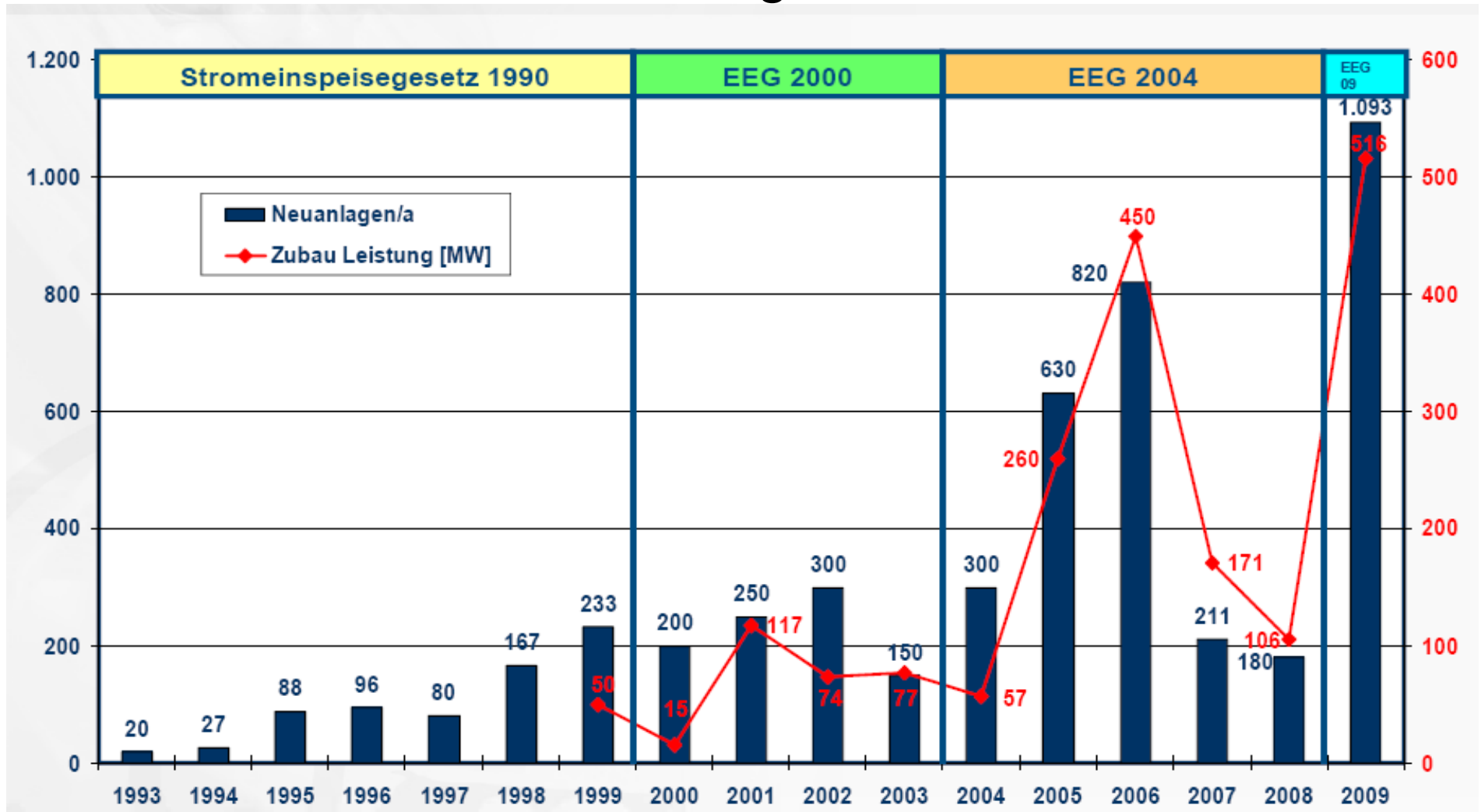




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Increase of the number of biogas plants related to changes in laws and regulations





German Feed in Tariff for Electricity from Biogas in € cent/kWh; fixed for 20 years



	EEG 2000	EEG 2004	EEG 2009
Basic Compensation up to 150 KW	10 ct	11,5 ct	11,67 ct
150 – 500 KW	10 ct	9,9 ct	9,18 ct
over 500 KW	9 ct	8,9 ct	8,25 ct
EnergyCrop-Bonus <500KW/<5MW	-	6/4 ct	7/4 ct
Manure-Bonus (> 30%) to 150 KW	-	-	4 ct
150 – 500 KW	-	-	1 ct
Technology Bonus	-	2 ct	2 ct
Landscape Maintenance Grass Bonus (> 50%)	-	-	2 ct
Formaldehyd Emission Limit Bonus (only BimSch-Anlagen < 500 KW)	-	-	1 ct
Heat Utilisation-Bonus <20MW	-	2 ct	3 ct
Degression	1,00%	1,5% (only Basic C.)	1% (also Boni)



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Renewable Energy Act (EEG) 2012

- NEW Requirements to get feed-in tariff
 - Maximum of 60% (mass) corn and grain
 - Minimum 60% heat utilisation or 60% (mass) use of liquid manure

Basic Feed-in Tariffs (ct/kWhel.)

Installed capacity	EEG 2012	EEG 2009
0-150 kW	14,30	11,67
151-500 kW	12,30	9,18
501-5000 kW	11,00	8,25
5001-20.000 kW	6,00	7,79



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Renewable Energy Act (EEG) 2012

Substrate Bonus - on top of Basic feed in
tariff (ct/kWhel.)

Installed capacity	Class 0	Class 1	Class 2
<500 kW	0	6	8
500-750 kW	0	5	8 (manure 6)
750-5000 kW	0	4	8 (manure 6)

Class 0: Biowaste, most residues of agricultural production
Class 1: Energy Crops
Class 2: Manure, intermediate crops, silphium perfoliatum



Source: www.wikipedia.org

No additional bonuses on top!! (except upgrading to biomethane 3-1ct)



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Renewable Energy Act (EEG) 2012

Exceptions

- Plants up to 75kW and min 80% (mass) Manure
=> 25ct/kWh – no other boni on top
- From 2014 no more feed-in tariff for plants >750kW –
market-bonus and flexibility-bonus

Feed-in tariffs for biowaste (min 90%) plants [ct/kWh]

Installed capacity	EEG 2012	EEG 2009
0-150 kW	16,00	11,32
151-500 kW	16,00	8,91
501-20 000 kW	14,00	8,00



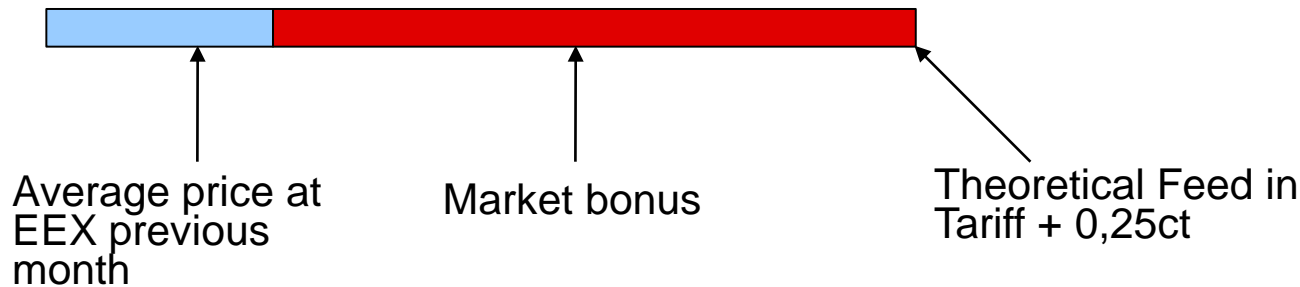
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Renewable Energy Act (EEG) 2012

Market Bonus, Flexibility Bonus

Market Bonus: Obligatory for new plants over 750kW from 2014



Flexibility Bonus: in combination with Market Bonus

- for extra capacity that is not regularly used
- grid owner has automatic access to the extra capacity
- Bonus about <math><1\text{ct}(\text{€})</math> for every kWh



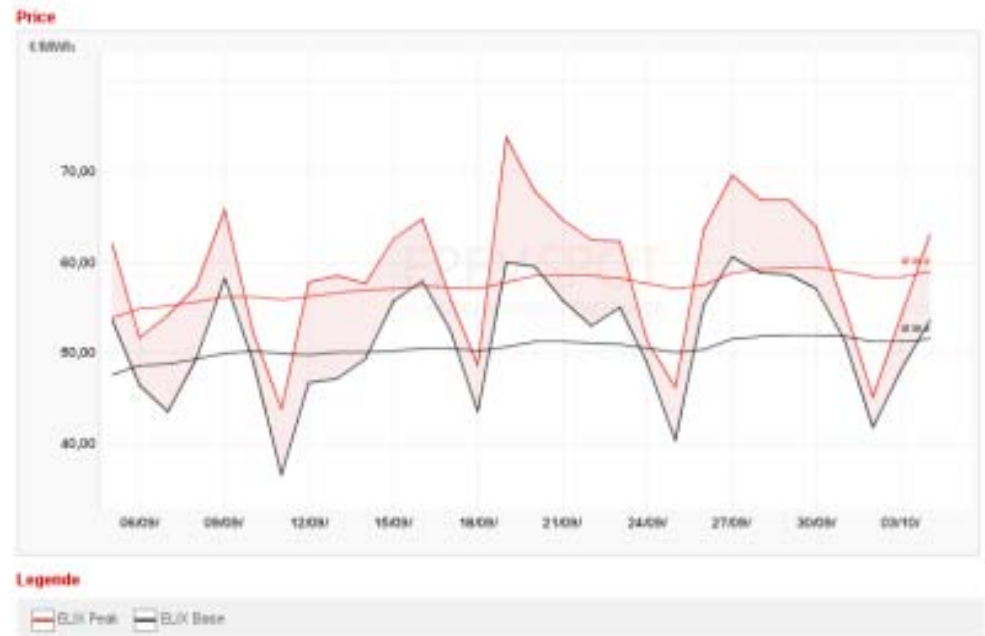
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Outlook / Future Challenges

Peak Load/Regulating Energy

- Gas storage
- Good process regulation
- Access fees
- Workload
- Pooling





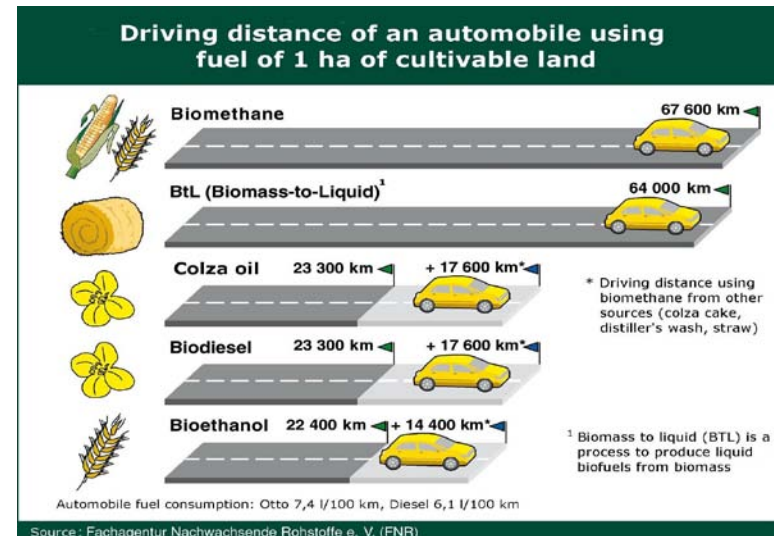
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Outlook / Future Challenges

Biomethane

- upgrading to about 98% methane
- several technologies available
- technology bonus
- use at point of better heat utilisation
- use as household heating
- use as fuel for NGVs (Natural Gas Vehicles)
- upgrading only feasible for larger scale





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Outlook / Future Challenges

Development of alternative substrates

- reduction ecological impacts
- positive reception of biogas in the public



Sorghum bicolor (Source: www.wikipedia.org)



Field margins or landscape maintenance
Material



Silphium perfoliatum (Source: www.wikipedia.org)



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Outlook / Future Challenges

Small scale plants max. 75kW

- 80% slurry/manure
- No obligation for heat utilisation
- At the moment several turnkey products are under development
- Utilisation of slurry/manure potential
- Investment costs?



Source: www.energiespektrum.de



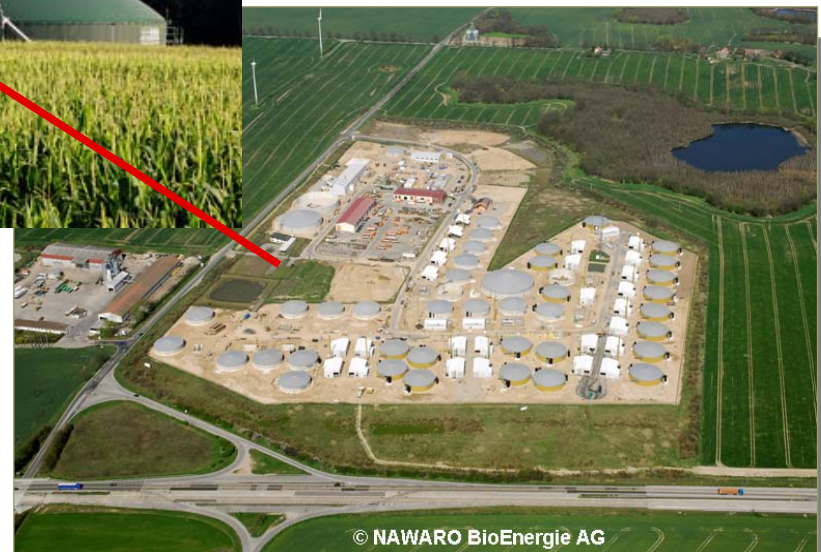
Source: bio4gas



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Future?





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THANKS
for your attention!

Welcome to cooperate

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