

# Country Report Switzerland

Eskilstuna, April 20 to 22, 2006

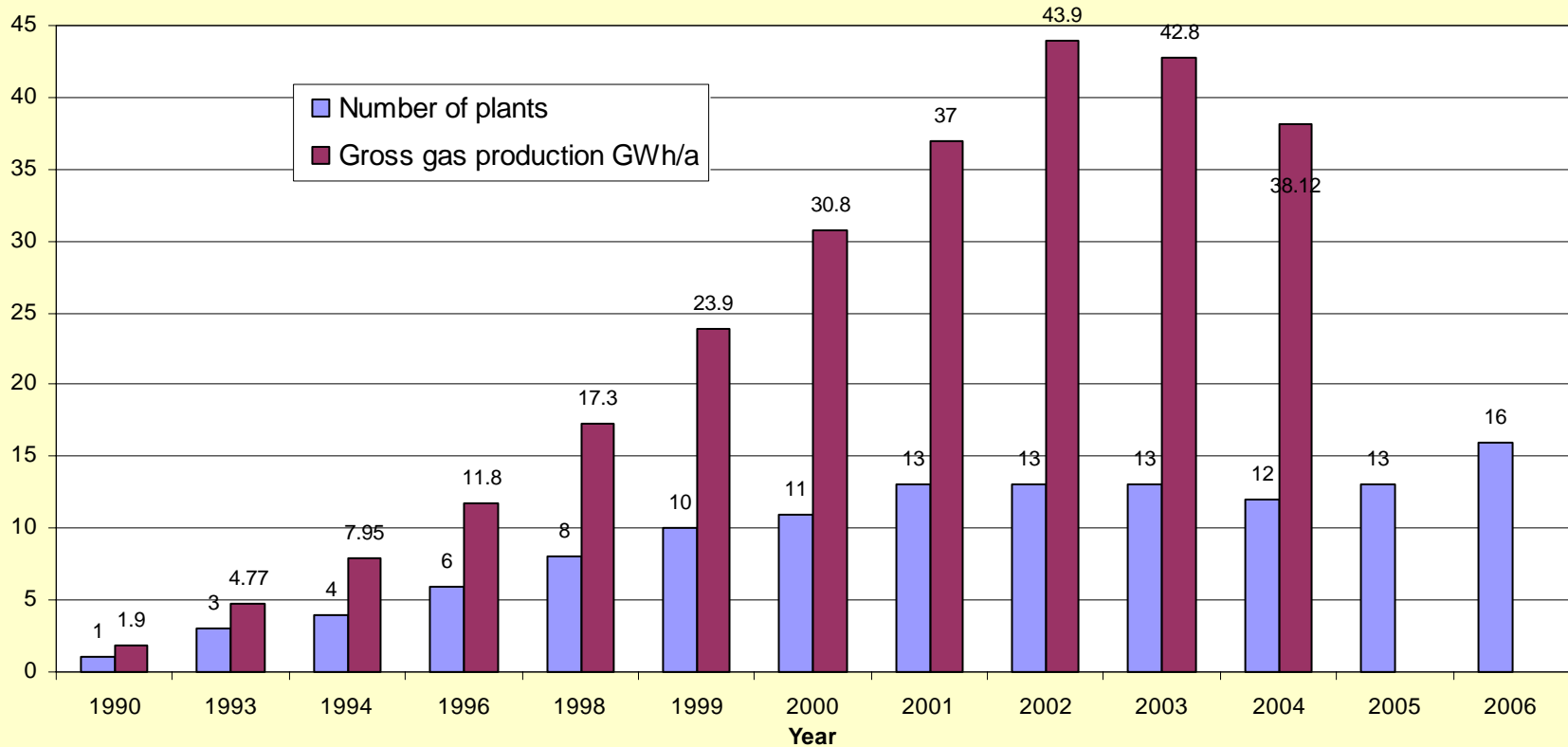
Arthur Wellinger  
Nova Energie Ltd.



# Green Waste: Nr of Plants & Energy Production

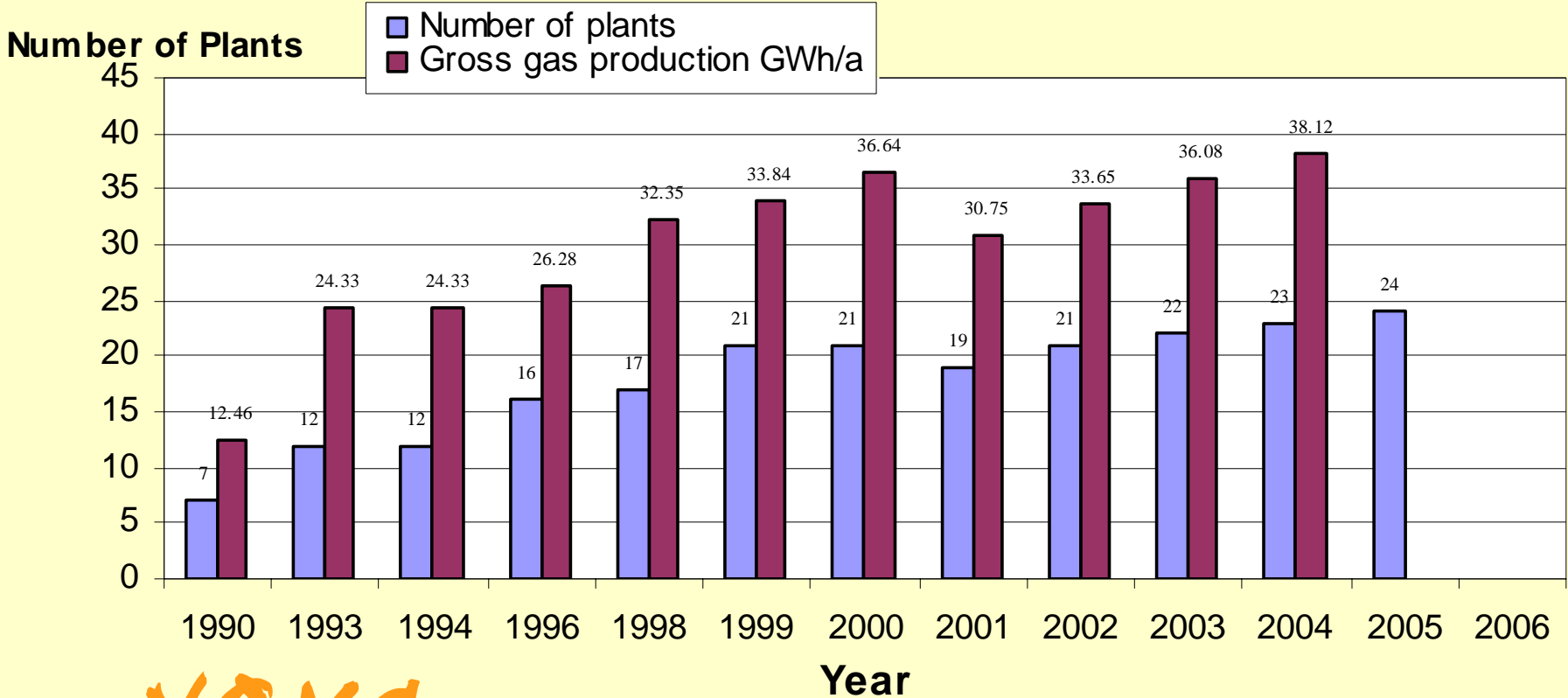
## Development of Plants Digesting Green Waste

Number of Plants



# Industrial Waste: No of Plants & Energy Production

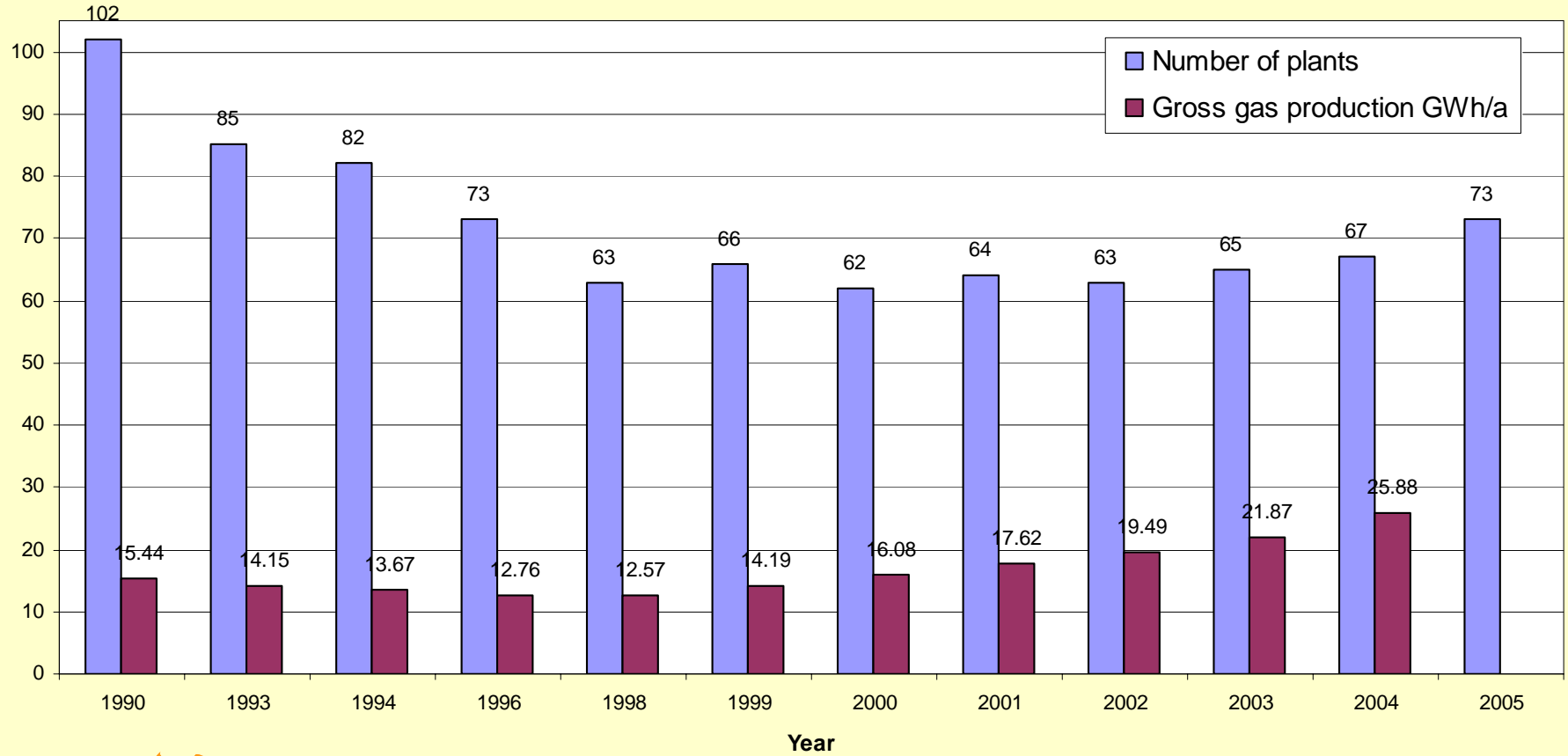
## Development of Industrial Plants



# Agricultural Waste: Number of Plants & Energy Production

## Agricultural Plants

Number of plants

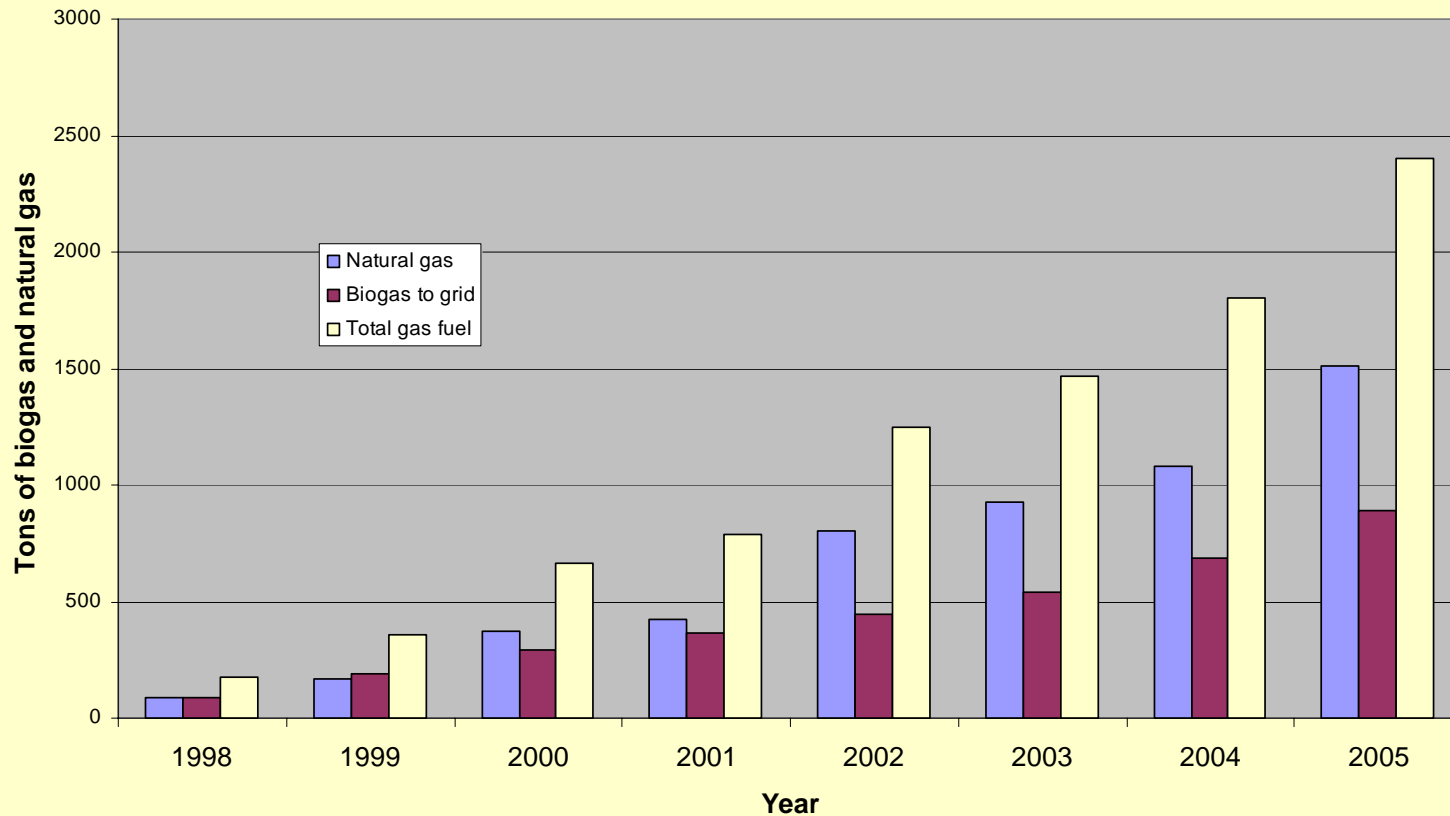


# Biogas fuel in Switzerland (Dec 03/05)

	2003	2005
Number of gas vehicles	730	1900
No of upgrading plants	5	7
Number of fuelling stations	35	60
Share of biogas	45%	37%
Price at pump station	Biogas: 0.67 €/kg (0.56 €/l petrol equivalent) Natural gas: ca. 1.00 €/kg (0.64 €/l petrol equivalent)	

# Gas as fuel in Switzerland

Fuel gas







Biogas covers 37% of the fuel gases in the grid  
(3 to 4% more for direct utilization)

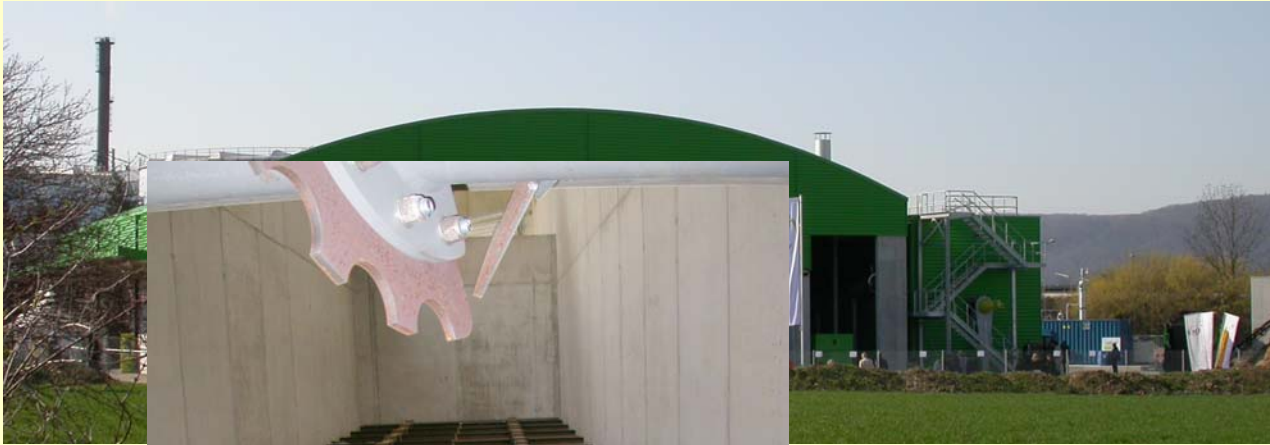
# The number of brands and models is increasing

	Passenger cars	Light transporters
	2	2
	4	2
	7	2
	3	1
	1	2
	1	1
	3	0
	3	0
		
		2

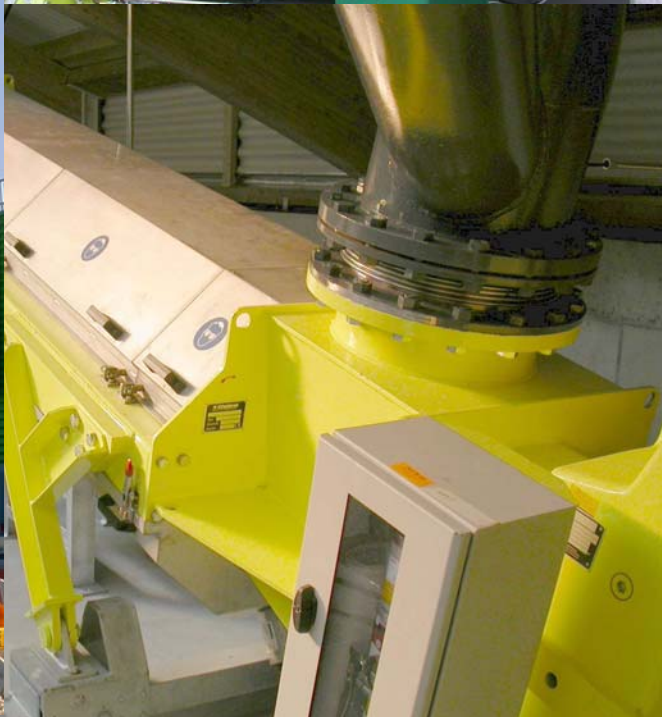
# Busses and Trucks

	Busses	Trucks
	4	2
	2	2
	2	1
	2	0
	0	2

# Inauguration of new plant of 15'000 TPY



**NOVA** E n e r g i e

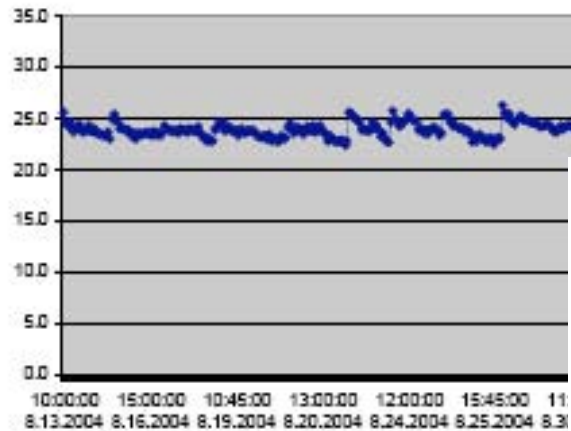


# Research Projects: Co-digestion & Capstone

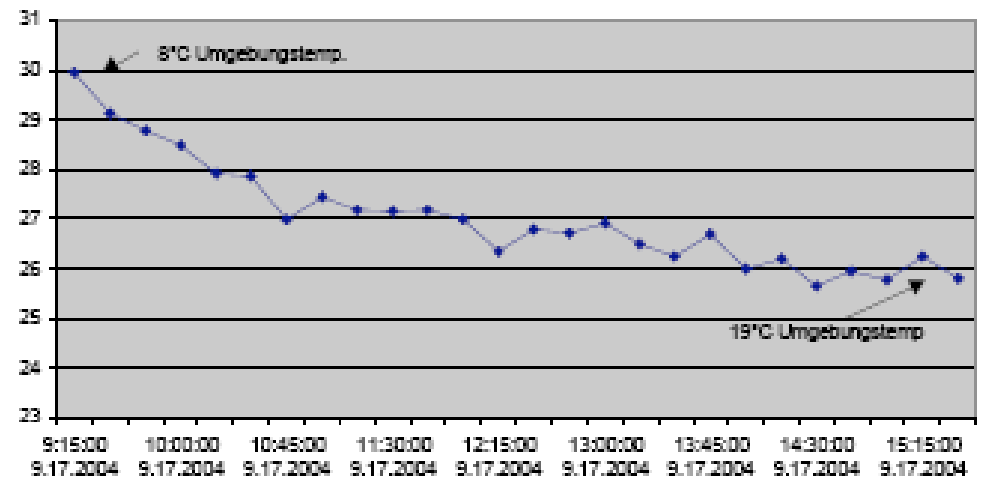
- Used vegetable oil was added to a WWTP
- 15% of VS was optimal for gas production and process stability
- Biogas production could be increased by 30%
- A 30kW Capstone microturbine was tested over 2 years
- Average electric efficiency remained constant at 25%
- Absolute minimal maintenance was confirmed over 2 years
- Dewatering, filtering and compression of the biogas was a real challenge

# Research Projects: Co-digestion & Capstone

EL Wirkungsgrad [%]  
Beispiel 13. Aug. - 17. Sept. 2004

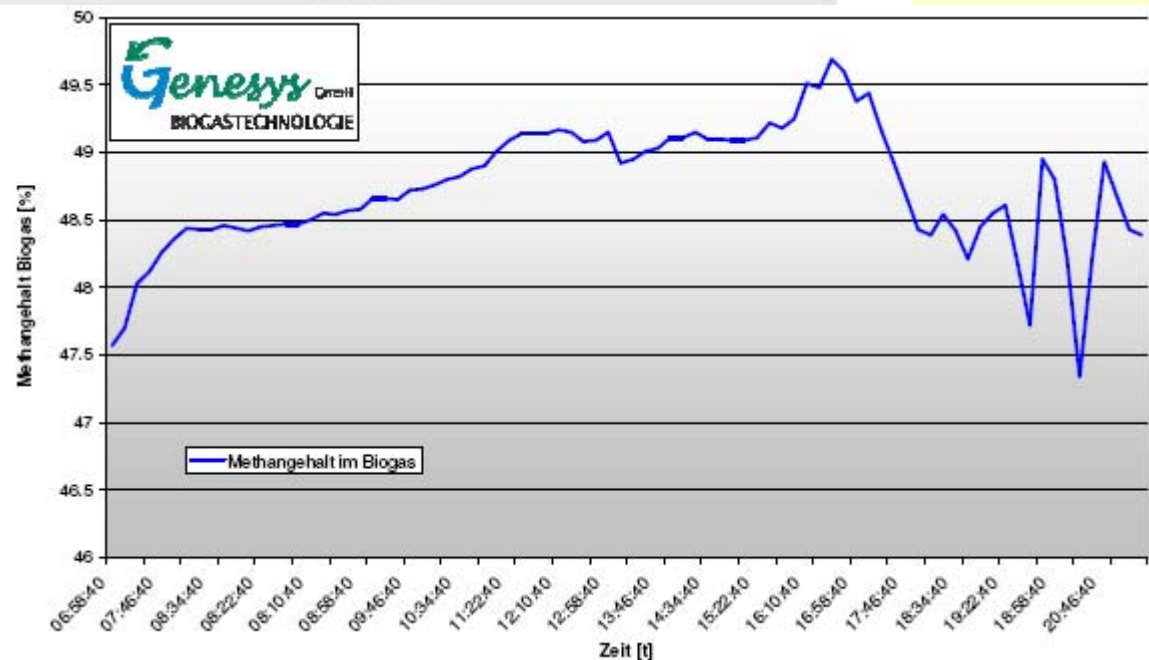
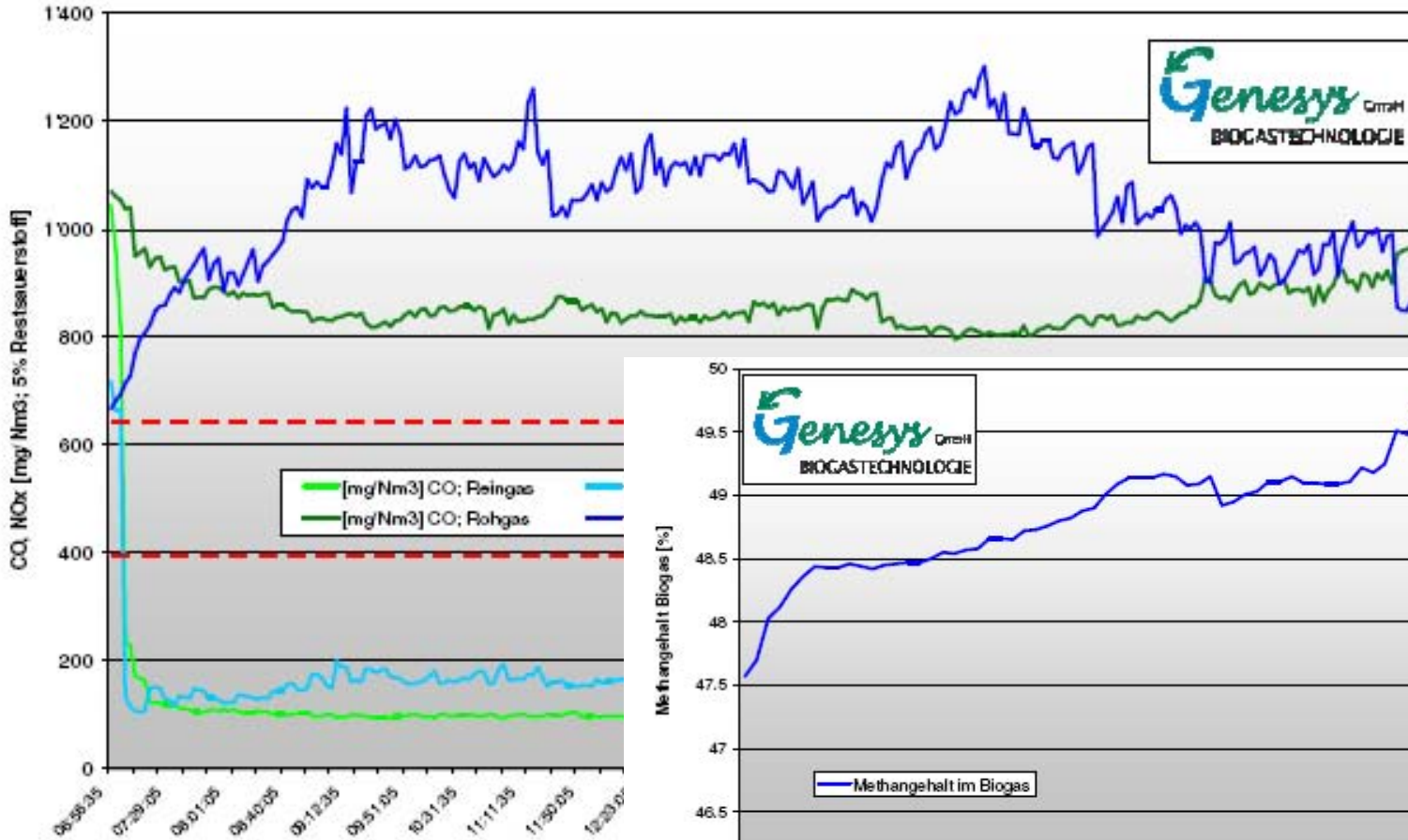


Leistung [kW]  
Beispiel 17. Sept. 2004



# Research Projects: SCR catalyst

Tagesauswertung 2.Juni 2004 Biogas-Katalysator Anlage Neukomm, Thayngen SH



NOVA Energie

Electric efficiency was around 39%

# Research Projects: SCR catalyst

Results of official monitoring:

	Legal limits [mg/nm <sup>3</sup> ]	measured [mg/nm <sup>3</sup> ]
Nox	400	183
CO	650	42
Dust	50	5
NH <sub>3</sub>	30	3