

Country Report Switzerland

Ludlow, April 18, 2008

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Feed-in law by January 2009

- The electricity produced from renewable energy of all new plants built after January 1, 2006 or significantly extended plants has to be accepted by the grid operator and recompensated at the cost of production
- Renewable energy plants are those using solar and wind energy, geothermal power, small hydro power up to 10MW, biomass and biomass containing wastes
- The compensation is calculated on the basis of reference plants utilizing the most efficient technology.
- The compensations has a cap at 0.6 cts/kWh of electricity consumed in Switzerland (corresponding to approx. 320 Mio. SFR per year or 260 Mio US\$)

Feed-in law: Electricity from biogas

The retribution is based on the calculated equivalent power in relation to the respective class of power:

Electric power	Basic compensation [UScts./kWh]	Agricultural bonus [UScts./kWh]
<= 50 kW	24	15
<= 100 kW	21.5	13.5
<= 500 kW	19	11
<= 5 MW	16	6
> 5 MW	15	0

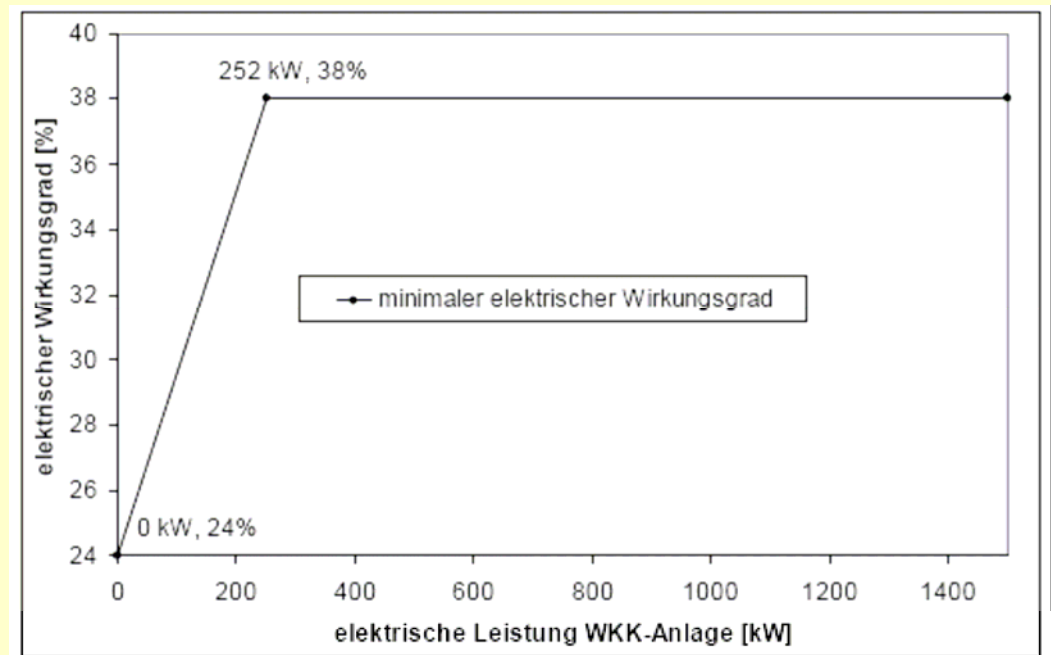
The agricultural bonus will be retributed only under condition that

- The major substrate is animal manure and waste from agricultural production
- co-substrates + energy crops < 20% (fresh weight)

Feed-in law: Electricity from biogas

Three minimal energetic requirements have to be fulfilled in order to apply for the feed-in tariff:

1. The process heat has to be provided by RE
2. 50% of the gross heat production has to be utilized on top of process heat
3. There is a requirement for energy efficiency of the CHP:



Mineral oil tax reduction by July 2008

- Renewable fuels with a positive LCA will be free of mineral oil tax.
- Renewable fuels are: Biodiesel, BioEtOH, Biogas, BioMeOH, Synfuel, Bio-hydrogen
- Minimal requirement for a positive LCA:
 - from well to wheel < 40% GHG of fossil fuels
 - from well to wheel less pollution than fossil fuels
 - no endangering of tropical forest or biological diversity
- Renewable fuels from waste material are accepted w/o LCA
- Natural gas and LPG will have a tax reduction of 0.4 SFR/l gasoline eq. (actually the tax is 56 cts./l petrol eq.)

CO2 tax

- A CO2 tax has been introduced on fossile fuels for heating purposes on January 1st, 2008 of 12 US\$/to of CO2 (3 cts./l of light oil) and reaching a maximum of 36 US\$/to of CO2 (9 cts./l of oil) in 2010

Ordinance on utilisation of ABP

- Cat.3 material has to be sterilized at 121°C before or after digestion
- Cat.3 material digested on a WWTP is exempt from sterilization if the digestate is kept enclosed and subsequently incinerated
- Food remainings have to be heat treated before digestion unless AD occurs at 53°C or higher at a HRT \geq 24 hours
- On animal farms the digestion of food wastes is not allowed unless the hygenisation is completely separated (roads, fences,etc) from animal housing.
- Food and kitchen waste from households is exempt from any treatment if it is collected together with garden waste.
- Swiss kitchen waste can still be fed to pigs if
 - it is hygienized (20 minutes at 100°C)
 - the roads from and to the heat treatment are completely seperated from animal transport and animal stables are not in contact with the raw product

Action plans

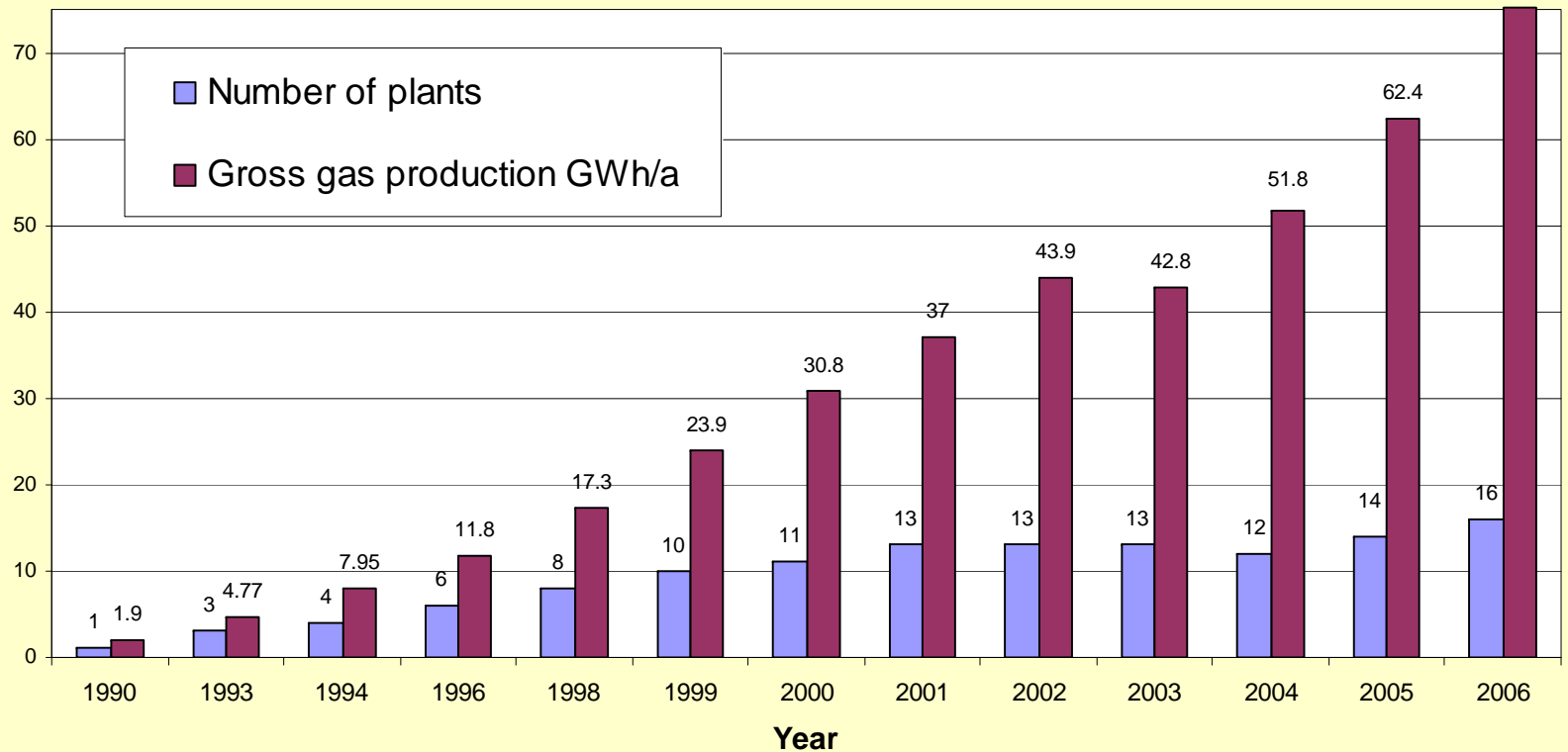
Two action plans have been launched: - Renewable energy
- Energy efficiency

The focus is on efficiency and substitution of fossil fuels for heat by renewables: **Until 2020 RE are to be increased by 50% from 16.2% to 24% of total energy consumption.**

Two actions are relevant for biogas: A feed-in tariff for biomethane and a regionalized biomass strategy.

Green Waste: Nr of Plants & Energy Production

Number of plants



Green Waste: Nr of Plants & Energy Production

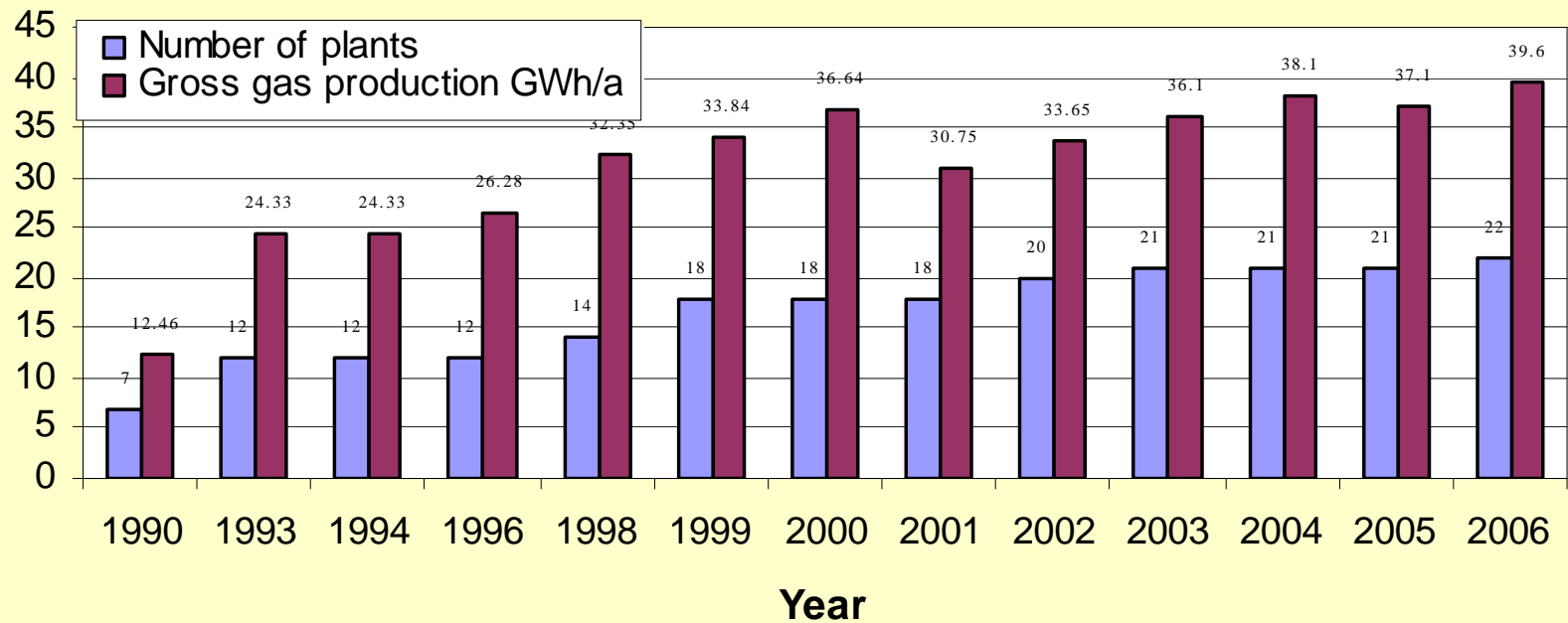


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Industrial Waste: No of Plants & Energy Production

Development of Industrial WWT Plants

Number of Plants



Industrial Waste: No of Plants & Energy Production



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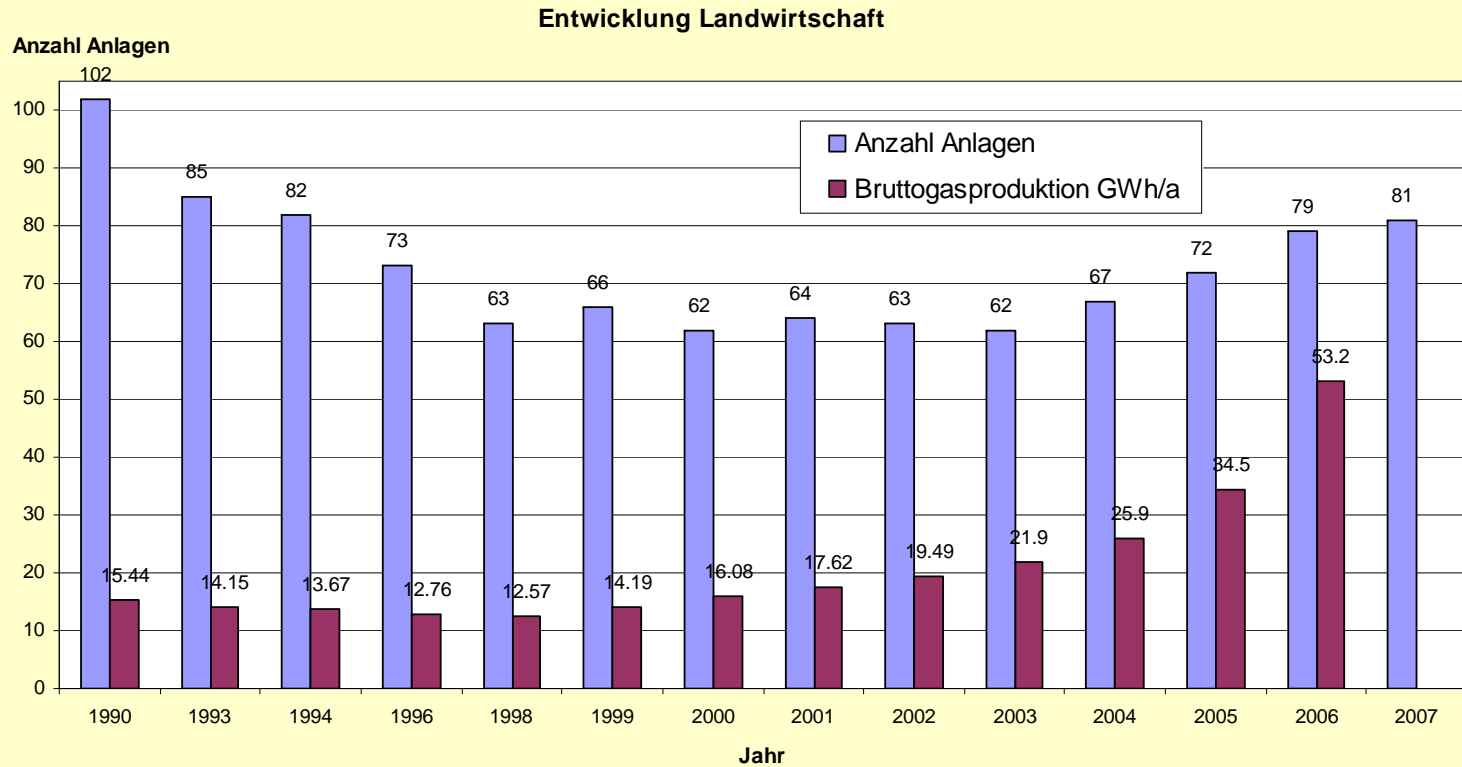
Emmi Milk Ltd

Agricultural Waste: Number of Plants & Energy Production



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Agricultural Waste: Number of Plants & Energy Production



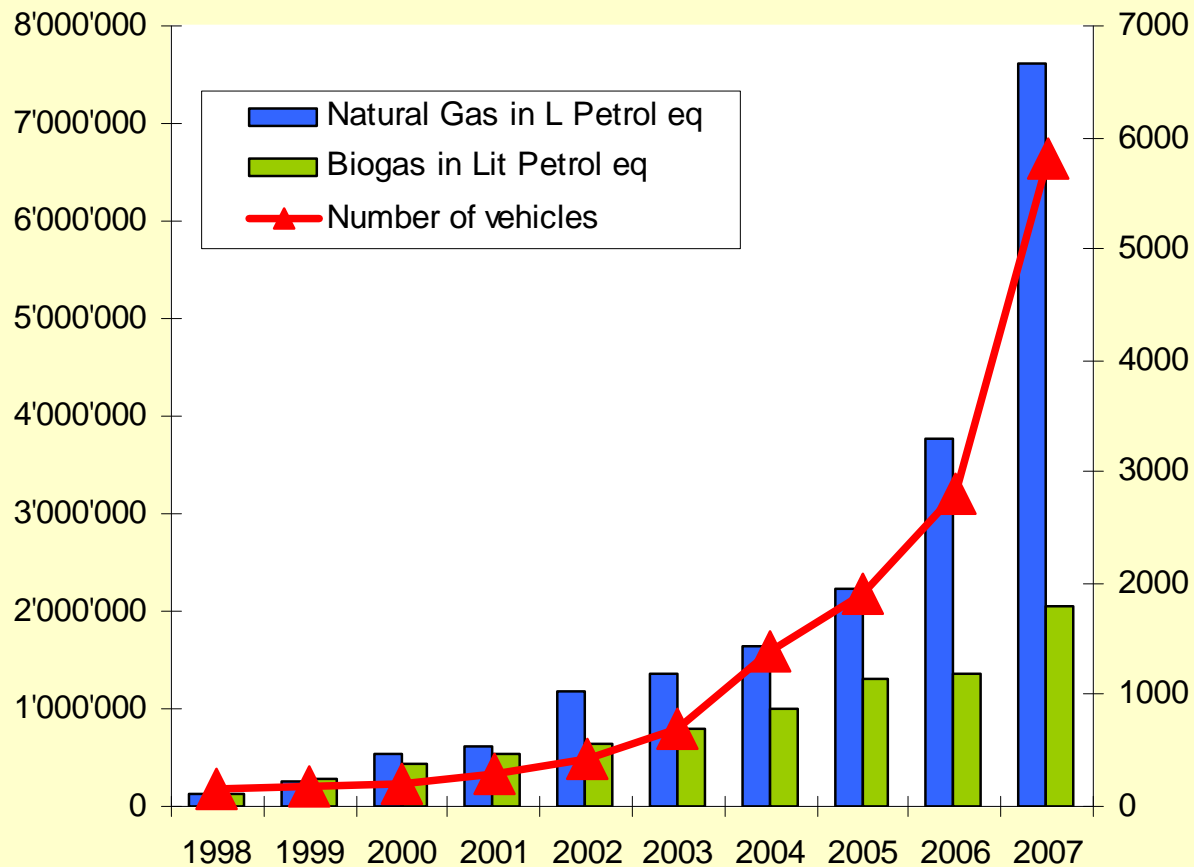
Agricultural Waste: Number of Plants & Energy Production

	In operation	Planification Construction	Extension	Project ideas	Layed down
Jan.2008	81	54	3	19	59

Biogas fuel in Switzerland

	2003	2005	2006	2007
Number of vehicles	730	1900	2400	5800
Number of upgrading plants	4	7	6	10
Number of pumping stations	35	60	70	100
Share of biogas [%]	45	37	26	21
Price at pump station	Biogas	0.62	0.64	0.8
in €/l petrol eq.	Natural Gas	1.32	1.32	1.34

Gas as fuel in Switzerland



Biogas fuel in Switzerland



Carbotech 300 m³/hr



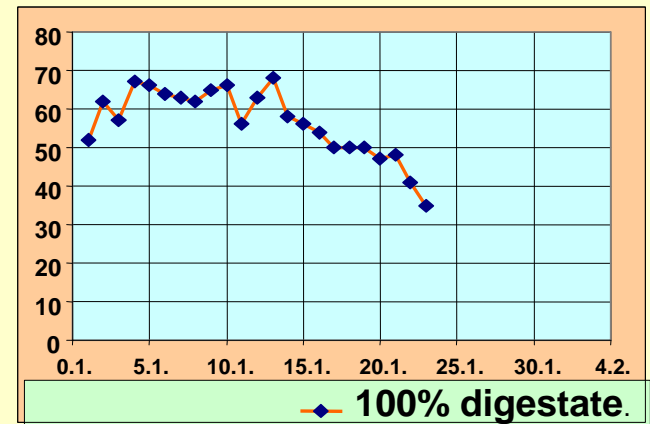
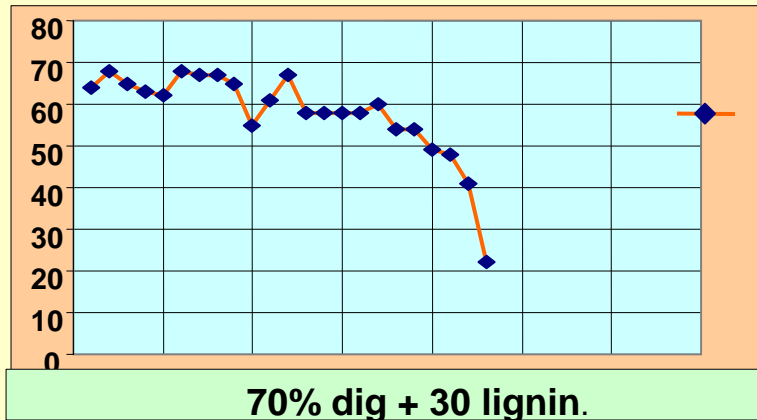
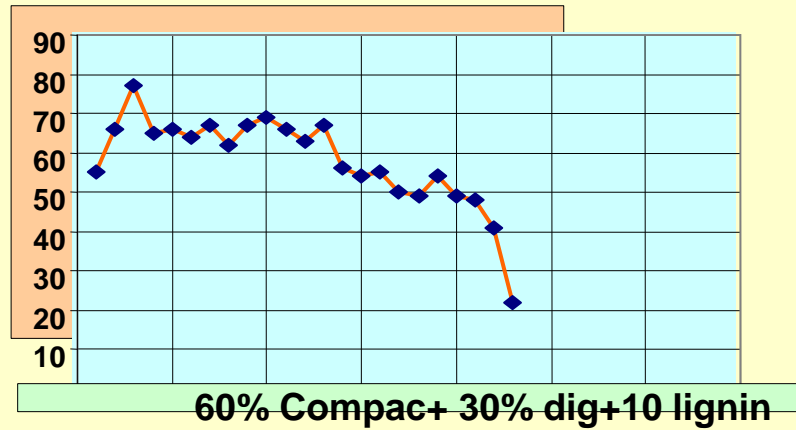
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Verdesis 240 m³/hr

Research results: post-composting

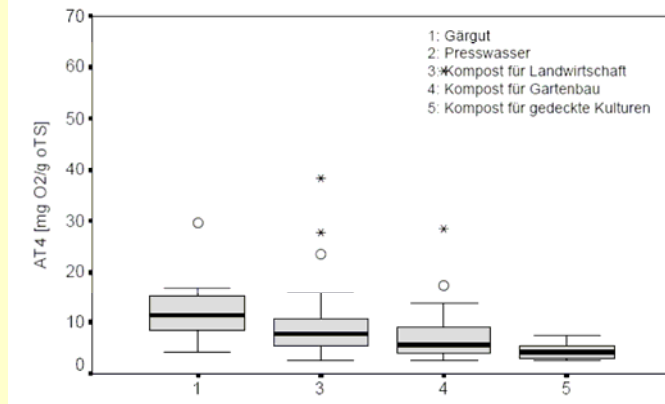


Research Projects: post-composting

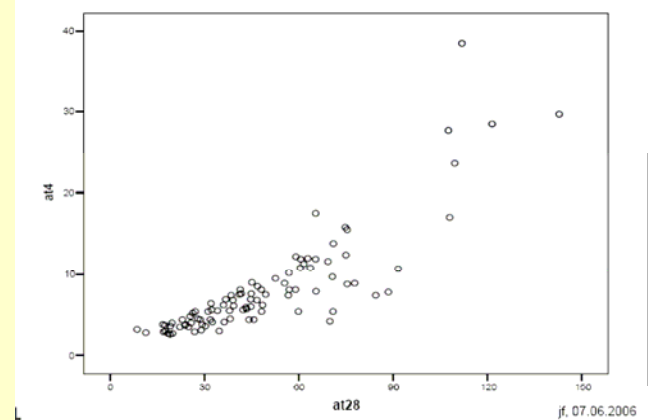


Research results: Biological activity

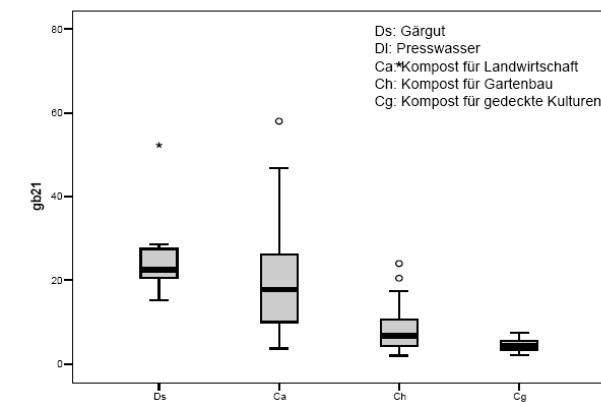
Biologische Aktivitäten von Komposten und Gärgut



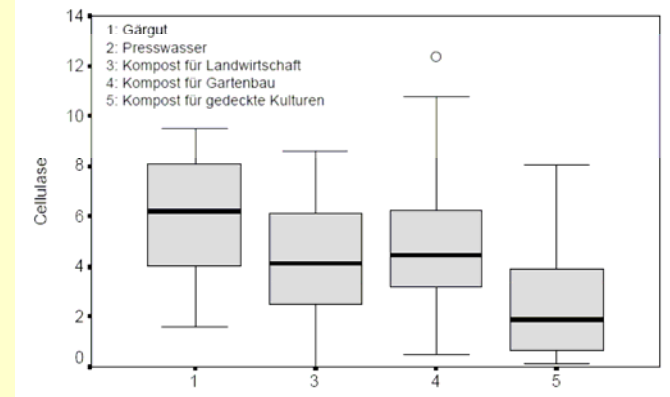
Biologische Aktivitäten von Komposten und Gärgut



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Biologische Aktivitäten von Komposten und Gärgut



Research results: CODIS 08

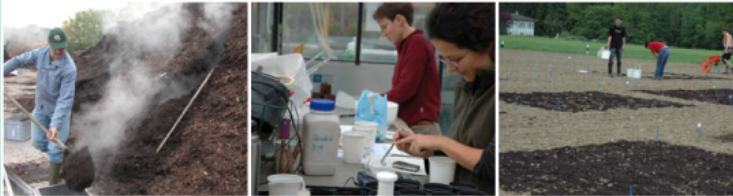
PROCEEDINGS



codis
2008


Compost and digestate: sustainability, benefits, impacts for the environment and for plant production

Proceedings of the international congress CODIS 2008
February 27-29, 2008, Solothurn, Switzerland



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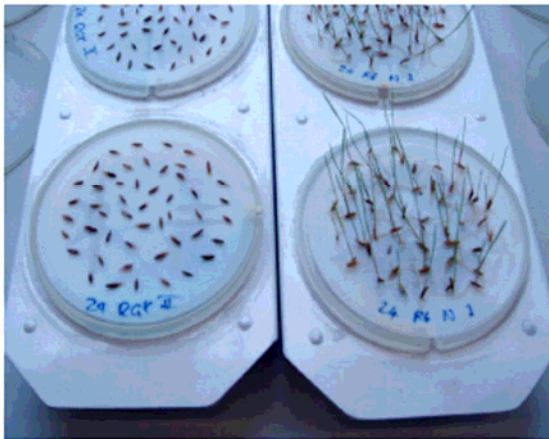
Swiss Confederation

Federal Office for the Environment FOEN
Swiss Federal Office of Energy SFOE
Federal Office for Agriculture FOAG

Research results: weed seeds

Einfluss der Biogasproduktion auf die Keimfähigkeit von Beikrautsamen

Teil 1: Veränderung der Keimfähigkeit von Beikrautsamen nach Durchlauf einer thermophilen Biogasanlage



Confirmed data from many earlier research:

- weeds are destroyed at mesophilic temperatures within 72 hours
- at thermophilic temperatures within 24 hours

Comparable results were achieved in pure water at the same temperature