

EUROPEAN ENERGY VENTURE FAIR 2005

BioGasol

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**The European Energy
Venture Fair 2005**

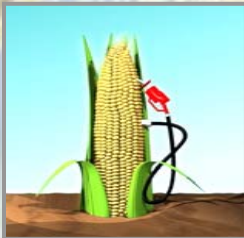
**September 27th 2005
Zurich, Switzerland**

BioGasol

2nd gen. bioethanol technology

Main drivers for lignocellulosic bioethanol technologies:

- Cheaper
- Access to a larger array of low cost and abundant feedstocks
- No conflict with land use for food and fodder
- Improvement of local environment
- Greater CO₂ reduction potential



Current Technologies

Starch Ethanol

Substrates: Corn, Grain, Sugarcane...

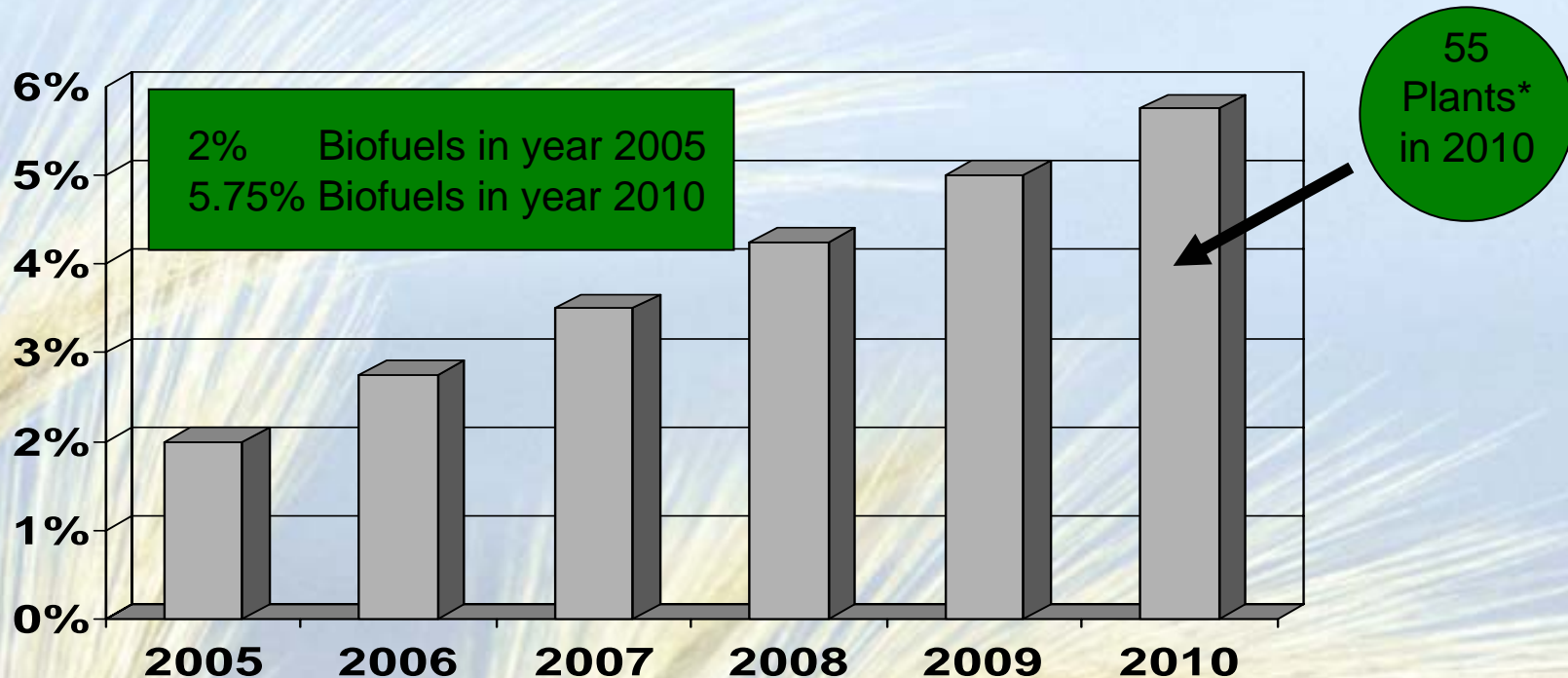


Future Technologies

Lignocellulose Ethanol

Substrates: Stover, Straw, Bagasse, Wood...

EU Directive, March 12, 2003



Report from ECN "Prospects and barriers for 2005", April 2005:

"EU biofuel production will probably be 1,5% in 2005"

*150 mill. L/year

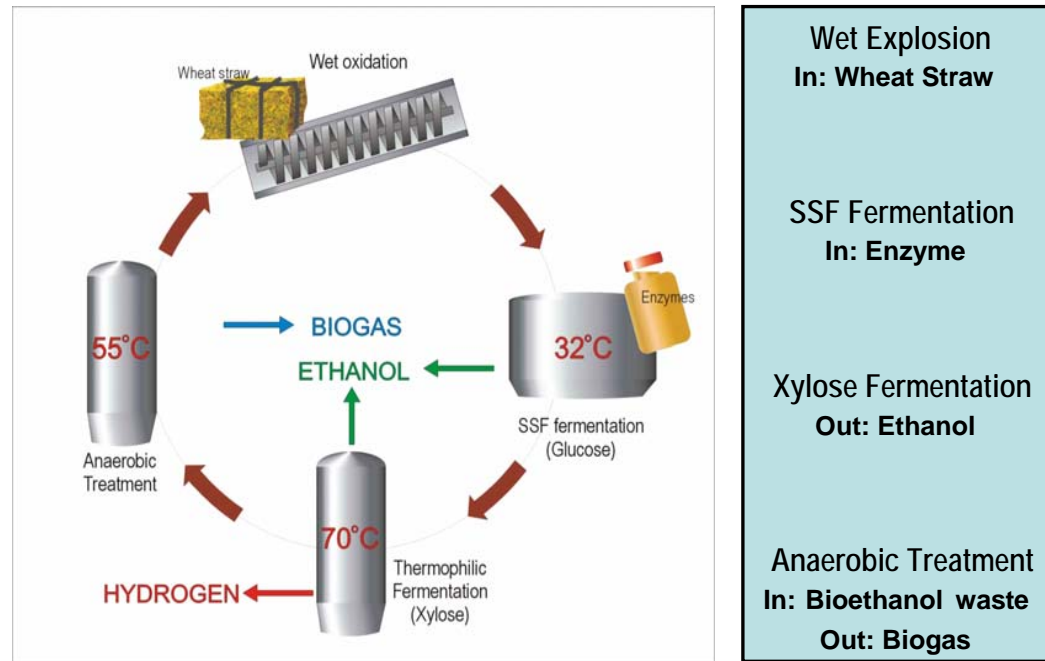
Business model for BioGasol

Engineering and technology company

- Proprietary process equipment like pretreatment reactors xylose reactors
- Licenses to BioGasol's process technologies including detailed design of proprietary process equipment

BioGasol's process concept

The BioGasol Ethanol Process



All carbohydrates in the raw material are converted into ethanol (and hydrogen) while the unused fraction is converted into methane.

BioGasol is addressing the key issues

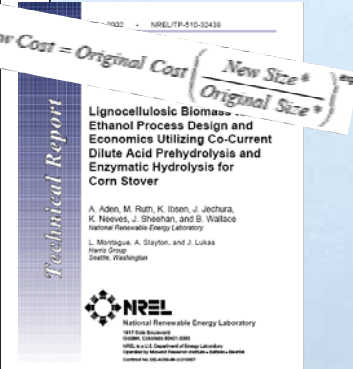
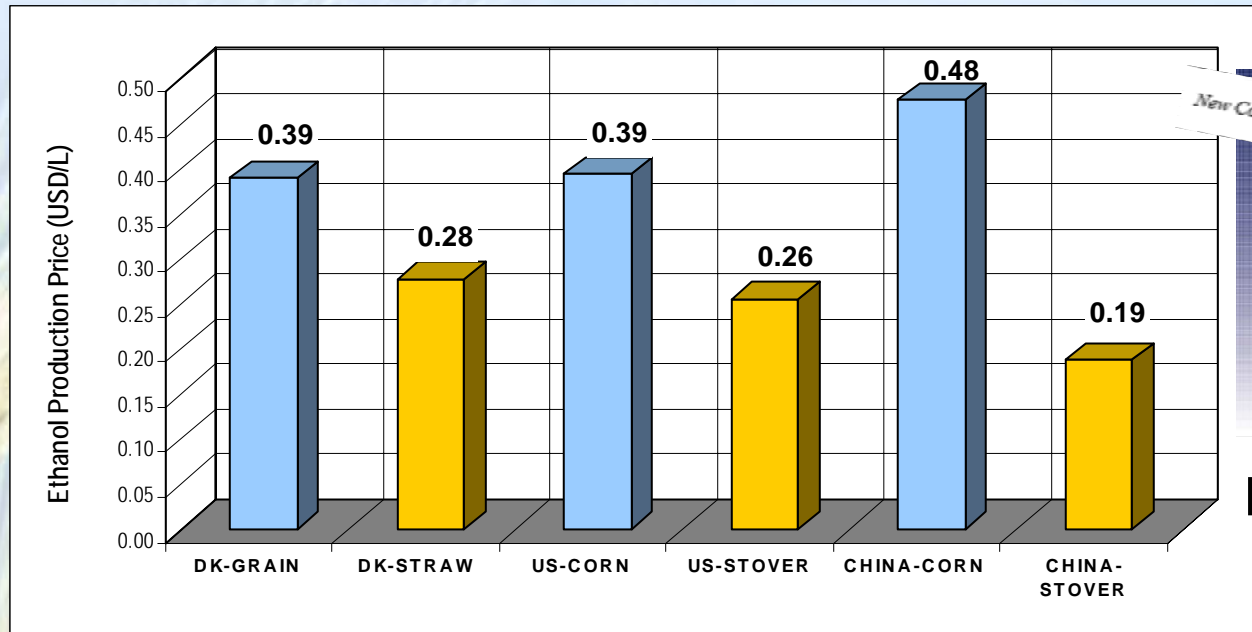
2nd generation bioethanol - Bottlenecks*:

- Improvement of the pre-treatment process
- Improvement of the xylose fermentation step
- Integration of hydrolysis and fermentation in fewer reactors to cut cost



* From Biofuels Under Development, CE, Delft, May 2005

BioGasol ethanol production price

USD per liter



NREL 2002

 Old technology
 New technology

Capacity (MMGY)	DK-GRAIN	DK-STRAW	US-CORN	US-STOVER	CHINA-CORN	CHINA-STOVER
27	0.43	0.31	0.44	0.30	0.51	0.23
40	0.39	0.28	0.39	0.26	0.48	0.19
69	0.29	0.21	0.30	0.18	0.40	0.12

With new developments: **0,28 USD/l**

German gasoline prices

Zusammensetzung des Verbraucherpreises für Superbenzin Association of the German Petroleum Industry MWV					
	Verbraucher- preis Ct/l	Produkten- preis Ct/l	Mineralöl- steuer Ct/l	Mehrwert- steuer Ct/l	Deckungs- beitrag* Ct/l
Feb 02	100,0	15,7	62,4	13,8	8,1
Mrz 02	103,6	19,0	62,4	14,3	7,9
Apr 02	108,8	21,9	62,4	15,0	9,5
Mai 02	106,7	20,6	62,4	14,7	9,0
Apr 05	119,7	30,3	65,5	16,5	7,4
Mai 05	119,4	28,4	65,5	16,5	9,1
Jun 05	121,8	32,5	65,5	16,8	7,0
Jul 05	125,7	36,2	65,5	17,3	6,7
		April to July, 2005 31,9			

BioGasol base case price - for same energy content : 29 Ct/l

Applications

Add-on to plants:

- **Existing starch based bioethanol plants**
- **Power plants using coal and/or biomass**

...and reeinfeld plants

Questions ?

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