Inbicon demonstration plant

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Inbicon (subsidiary of DONG Energy)
Inbicon Biomass Refinery™

Agenda

• Demonstration plant in Kalundborg, DK
• Technology
• Commercialisation
• EU funding
Inbicon Biomass Refinery™
Demo Plant in Kalundborg 7. January 2009
Inbicon Biomass Refinery™
Demonstration Plant in Kalundborg NOW
Inbicon Biomass Refinery™
Inauguration in November 2009
Inbicon Biomass Refinery™
Inauguration of the Demonstration Plant
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Inauguration of the Demonstration Plant
Inbicon’s proven technology:
Demonstration Plant 2010 – 100 T/day

Input:
30,000 t wheat straw

Output:
5.4 mill. l ethanol
13,100 t lignin pellets
11,250 t C5-molasses

Enzyme suppliers:
Danisco Genencor
Novozymes

Investment:
€53 mill., incl.
€10 mill. DK gov't support

Demonstration supported with €9.1 mill by EU 7th FP under Kacelle project
Inbicon Biomass Refinery™
Our Goal is Optimal Use of Biomass

- Cellulosic biomass (Waste/residue)
- Ethanol replaces oil in transportation
- C5 molasses increases food production or replaces more oil in transportation or produces bio-chemicals
- Lignin biofuel replaces coal in power and heat generation
Inbicon Biomass Refinery™
Multiple Feedstocks Tested, Wheat Straw Optimised
Inbicon Biomass Refinery™
Advantages of the Technology

• Simple process → based on only water, enzymes and yeast
• High dry matter in all process streams
  → saves water and energy
• Low enzyme consumption
• Integration advantages with power plant
• Integrated contamination control
• CO2 reduction of 85%
Inbicon’s proven technology:
Gradual Up-Scaling – Key to Success
Inbicon Biomass Refinery™
Global project developments
Inbicon’s proven technology:  
How did it all start?

Late 90'ies: First ideas of combining ethanol and power production
2002-06: EU-project (IBUS)
2003: First pilot plant
2005: Second pilot plant
2007: Inbicon A/S established - DONG Energy 100 % owner
2009: Opening of demonstration plant
2010: First license contract

Approx. 60 employees
Inbicon Biomass Refinery™
Success story in EU funding projects

10 X multiplication effect of original EU investment:

Initial technology project: "Co-production biofuels", budget €13.5m, EU contribution (FP5): €6.5m

Demonstration plant: Budget €40m, Danish gov't support €10m

Total project expenditure till end of 2009: +/- €65m

New projects based on the initial project:

**HYPE**
Develop consolidated and more cost-effective bioprocessing, budget €5.4m, EU contribution €3.6m

**Renescience**
Pre-treatment of waste with enzymes for introduction in pressurised gasifiers, budget €7.3 million, contribution from Danish sources approx. €3.8m

**2nd generation biofuel for cars of the future**
Comparison of pretreatment technologies, budget €5.6m, DK gov't contribution approx. €2.8m

**Biomass for biofuel and bioethanol on pilot scale**
Optimisation, budget €1m, contribution from Danish sources approx. €0.8m

**Kacelle**
Demonstration and optimisation of the Kalundborg demonstration plant
FP7 contribution: €9 m
Making ethanol work for the world™

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