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Key Statistics Essent 2003

Power Capacity
5500 MW

Turnover:
7.1 billion €

Profit:
389 million €

Market Share
Essent Retail:

Green E © : 31%

Electricity : 26%

Gas: 24%

Heat: 16%

www.essent-finance.nl
Matching demand and supply

Essent Energy Trading
Sustainable Trading & Operations
A high fast growing demand: needs a flexible portfolio!
- wind, solar -> no control
- standalone biomass combustion, hydro -> low control
- co-firing biomass -> high control

800.000 household consumers:
Focus on ->
Sustainable biomass Co-firing
Biomass (Co-)firing in The Netherlands
> 20 MWe [2004]

Main fuel: Natural gas
Main fuel: Coal
100% Biomass

.....However, biomass is currently only co-fired in eight out of twenty five coal- and gas power plants.......

Source:
Incentives for biomass co-firing

- "Producer"
- "Consumer"
Co-firing: history and forecast (Cal-04 Q4)

Biomass history

- Investment @ CC
- Investment @ AC9
- Investment @ AC8
- Investment @ BS12
- No co-firing due to subsidy regime
- Accident AC9

GWh
BEC Power Plant
Technology: BFB Combustion
Capacity: 25 Mwe [1999-2000]
Fuel: 100% Bio-fuel ("forest residues, woodchips")
Bio-Fuel capacity 200-300 kton/yr
Amergas
Technology: CFB Gasification Unit
Capacity: app. 150 kton/year, app. 200 GWh/yr
Fuel: Demolition woodchips
Start-up: 2002-2005 !!!!!!!!!!!!!
Expected to reach 75% capacity in 2005
Solids co-firing options: 1-9

AC81: 5 (former 2, 3)
AC91: 9 (former 2, 3)
BS12: 1, 2, 3, 5, 6
Amercentrale Geertruidenberg

Amer Power Plant 8
Technology: PC Boiler
Capacity: 650 MWe
Fuel: Coal + Bio-fuel (Technology: hammermill [2004])
Bio-Fuel capacity 300 kton/yr

Amer Power Plant 9
Technology: PC Boiler
Capacity: 600 MWe
Fuel: Coal + Bio-fuel ("pellets") [2003]
Bio-Fuel capacity 300 kton/yr [2003] + 300 kton/yr [Apr 2005]
-> app. 160 MWe Bio of 600 MWe
Project Biologisch [2004]

Logistic system (storage capacity 20000 m3), unloading capacity 600-900 kton/yr, quay for 2 ships.
Borssele Power Plant 12
Technology: PC Boiler
Capacity: 400 Mwe (50% Essent owned!)
Fuel: Coal + Bio-fuel
Bio-Fuel capacity app. 60 kton/yr [limited by permit]
Clauscentrale Maasbracht

Claus Power Plant 9
Technology: PC Boiler
Capacity: 2*600 MWe
Fuel: Gas + Bio-oil Bio-Fuel limited to 300-400 kton kton/yr [limited by MEP-subsidy]
Development Bio-energy @ Essent

- Market development:
  - Waste processing
  - Commodity

- Acceptance/Transparency:
  - Low
  - High

- Number of stakeholders involved:
  - Low
  - High

- 2005: Green Gold Label
- 2004: IEA Task 40: sustainable trade
- 2003: Essent Green Gold Label ->
- 2002: Fair (Bio) Trade Project ->
- 2001: 1e ship Amer
- 1999: BEC Cuijk
- 1995: GS
- 1995: GS

22-6-2005
FAIR Biotrade project [2002-2004]

Subjects of publications by FBT project:
• life cycle inventory on woodpellets and palmkernelexpeller
• global potential study
• inventarisation of certification systems
• impact analysis of sustainability criteria

✓ by Universiteit Utrecht and Essent
✓ support by SenterNovem
✓ results see: www.fairbiotrade.org
Sustainable International Bio-energy Trade: Securing Supply and Demand

The future vision on global bio energy trade is that it develops over time into a real “commodity market” which will secure supply and demand in a sustainable way; sustainability is a key factor for long-term security.

This task aims to investigate what is needed to create that “commodity market” for bio-energy.

www.fairbiotrade.org
2004-2006
= TRACKING AND TRACE SYSTEM

• To ensure quality and sustainability

• Making use of existing certifications systems (where possible)

• Accreditation in Q4 2005 -> Green Gold Label foundation with independent advisory board (representatives from e.g. Probos, Houtindustrie Schijndel, Unilever, Solidaridad, Jongeneel Agencies Control Union)

• Already implemented practical system
Green Gold Label: Chain of custody

Agricultural product

Producer(s) | Factory | Storage | Port of loading (Storage) | Sea vessel | Sea vessel | Port of discharge (storage) | Power plant
---|---|---|---|---|---|---|---
Agri product | processing | | | | | | Rest product
Agri product | processing | | | | | | Rest product
Agri product | processing | | | | | | Rest product
Certificate | Transport | | | | | | Rest product

Forestry product

Producer(s) | Factory | Storage | Port of loading (Storage) | Sea vessel | Sea vessel | Port of discharge (storage) | Power plant
---|---|---|---|---|---|---|---
Rest wood | Wood pellets | | | | | | Cargo wood pellets
Rest wood | Wood pellets | | | | | | Cargo wood pellets
Rest wood | Wood pellets | | | | | | Cargo wood pellets
Certificate | Transport | | | | | | Cargo wood pellets

Green source checklist:
- G1: ..............................................................
- G2: ..............................................................
- G3: ..............................................................
- G4: ..............................................................
- G5: ..............................................................

All sources are green flow sources? Ja

Green transport:
- G1: ..............................................................
- G2: ..............................................................
- G3: ..............................................................
- G4: ..............................................................
- G5: ..............................................................

Predestinate cargo shipped and received in clean and sound condition? Ja
The fingerprint samples have equal chemical results? Ja

"ESSENT green label" declared?
- Declaration number: ..............................................................
- Approved Non-certified green flow? (70/30 rule) Ja
- Approved under the number: ..............................................................
Current sustainability criteria by GGL

### Economic criteria
- Economic viability of bioenergy production
- Long term perspective
- Strength and diversification of local economy
- Reliability of resources
- Yields
- No blocking of other desirable developments

### Ecological criteria
- Protection of the atmosphere
- Preservation of existing sensitive ecosystems
- Conservation of biodiversity
- Conservation of soil erosion and fertility
- Conservation of ground and surface water
- Combating of deforestation
- Combating desertification and drought
- Landscape view
- Conservation of non-renewable resources
- Waste management
- Environmental additionally

### Social criteria
- Labor conditions
- Protection of human safety and health
- Rights of children, women, indigenous people
- Access to resources ensuring adequate quality of life
- Food and energy supply and safety
- Capacity building
- Combating Poverty
- Democratic participation
- Land ownership
- Community (institutional) well-being
- Fair trade conditions

### General criteria
- Compliance with laws and international agreements
- Traceability
- Avoidance of leakage effects
- Strengthening the role of non-governmental organisations
- Improvement of conditions at local level

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**Minimum conditions sustainable flow sources**

<table>
<thead>
<tr>
<th>Land use meets local legislation and rules</th>
<th>Production and processing is legal</th>
<th>Respect for land use rights of indigenous people</th>
<th>Maintenance and improvement of employees’ well-being and safety</th>
<th>Focus on optimisation of economic feasibility</th>
<th>Maintenance of bio-diversity reserves, soil, ecosystems and landscapes</th>
<th>Long-term management</th>
<th>Monitoring of ecosystem conditions</th>
<th>No negative influence on present ecosystems</th>
<th>Plantations complement existing ecosystems</th>
<th>Insight in processed and produced product streams</th>
</tr>
</thead>
<tbody>
<tr>
<td>GGLS 2</td>
<td>Organic</td>
<td>EUREPGAP</td>
<td>FSC</td>
<td>PEFC</td>
<td>CSA</td>
<td>GGLS 1</td>
<td>Agriculture</td>
<td>Forestry</td>
<td>Chain of custody</td>
<td></td>
</tr>
</tbody>
</table>

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22-6-2005
Essent’s Approach: “Sustainable Business Model”

- Building infrastructure for Biotrade on short term is necessary for the increase of biomass production and utilization on the long term.
  - Focus first on existing biomass residues or underutilized resources worldwide and existing infrastructures
    -> create demand, supply will follow

- International bio trade will create stable markets and contribute to sustainable development in importing AND exporting regions.

- Control the whole chain of custody, from resources to green power. Ensure sustainability (and supply)

- Essent’s EMG STO ambition -> “40% of supplied power will be sustainable in 2010”. (app. 8 TWh) [May 2005]
The need for supply......
...... The need for demand

- Third energy white paper of the Netherlands, published in 1995: 10% contribution from renewable energy sources in 2020 in the Netherlands was set (Ministry of Economic Affairs, 1995).

- For 2005, the Dutch government has set a of 6% renewable electricity, and targets of 9% renewable electricity supply in 2010, and 17% in 2020 (Ministry of Economic Affairs, 1995; Ministry of Economic Affairs, 1997; Ministry of Economic Affairs, 1999)

- Coal covenant between the power producers and the Dutch Ministry of the Environment, signed in 2002, in which the Dutch electricity production companies committed themselves to CO2-reduction of 3.2 Mton between 2008-2012

- Energy Transition...a number of experts formulated a biomass vision for the long term, supported by government and the market (Ministry of Economic Affairs, 2004c). The potential use and ambitions levels are high: possibly 30% of the total energy consumption of the Netherlands may be covered by biomass energy in 2040...

- 10 May 2005: Biomass projects on plants > 50 MWe (=cofiring) - > MEP=0 [reason: target 2005 will be reached. larger projects on hold]

Thank you.
Questions?

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