Biogas plant assistance

EFFORTS IN DENMARK TO INITIATE BIOGAS INTEGRATION INTO LOCAL ENERGY PLANNING AND TO ASSIST INDIVIDUAL FARMERS IN DEVELOPING BIOGAS PLANTS.

Presentation by Leif Raun, Knowledge Centre for Agriculture.

Pescara, Italy, 26th of September 2012.

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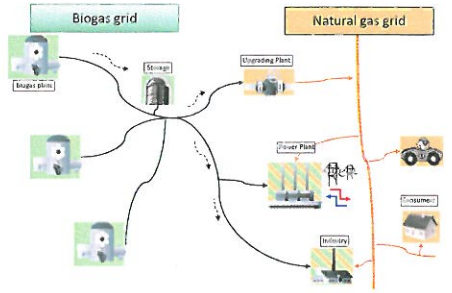
– **The Ringkoebing – Skjern model.**

Farmers new role as energy suppliers in stead of raw material suppliers.

- The local farmers union and individual farmers involved.
- Contact to the municipality since 2007.
- Numerous meetings with the city planners of the municipality 2010-11.
- Politician and city council supportive of the Ringkoebing-Skjern model.
- Creation of a PP company , Bioenergy Vest, owned by the municipality, the farmers union, the local business chamber and the managing director.
- The Municipality of Ringkoebing-Skjern issued 2020 100% RES from wind and biogas.
- August 2012 the first biogas plant of the R-S model was inaugurated by the Danish minister of Energy.

A new biogas infrastructure



Biogas plants and pipes

Players and their tasks

Municipality	Planning, approvals, financing
Farmers Union	Informing farmers, feasibility studies
Business council	Involving SME's
The power plants	Power plants adjustment to biogas, feasibility
National gas operator	Development of Green Gas Certificates – a trade model
Contractors	Constructing the biogas grid
Engineers	Trace and placement of grid and biogas plants
Financial players	Creating a new leasing model
12 SME's	Innovation, development of modules and services for biogas plants

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The biogas cluster

- Bioenergi Vest A/S
- Vestjysk Landboforening
- Ringkøbing Erhvervsråd
- Skjern Fjernvarmecentral
- Rhode A/S
- Combigas A/S
- Hegndal Agro
- Landia A/S
- AS/ Scan
- Assentoft Silo A/S
- Energinet.dk
- PlanAction
- Højmark Automatic A/S
- KH Nordtherm.
- Blue Planet Innovation

Blue Planet

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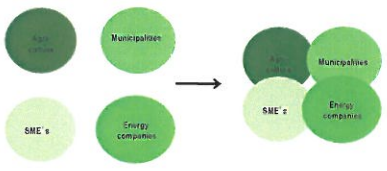
BIO-METHANE REGIONS

Biology link to Technology & Technology link to Sociology



BIOENERGI VEST

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The Ringkoebing-Skjern Model.

BIO-METHANE REGIONS

Masterplan.

46 plants, 160 km of piping, 100 mio. m3 methane/year. 1.500 new jobs. Price 110 mio. €

Phase 1.

5 plants in cluster with slurry piping to biogasplant. 35 km pipeing for raw gas to CHP.

1. Step 1 phase:

One farmbased biogas plant connected to a gas engine for power production and excess heat for pigstal heating. Proces heat from heat pumps powered by excess wind power. Production 13 mio. m3 /year. Price 12 mio. €.

Special containerrised Combigas plant developed for this purpose. 50% energy save + semiautomatic.

Customers:

Many access and exit points in the model for customers.

Bikogas: 11 CHP, proces industry (dairy, milk condensation), natural gas transmissikon net.

Biomethane: Garbage collecting company with 30 disposal trucks.

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The Ringkoebing-Skjern Model.

Company structure

1. NET (transmission – outsourced)
2. Trade
3. Leasing, owned by Biogas Vest
4. Innovation. Model management, technology innovation & extra biomass supply.
5. Service and daily operation and maintenance by Biogas Operation Co owned by the farmers.

The Ringkoebing-Skjern Model

A master plan for decentralized energy planning – dynamic energy planning.

- Decentralized biogas plants (1 or 5-8 farms joint for one biogas plant)
- Piping for slurry and biogas. No truck transportation as the centralized plants.

The Ringgkoebing-Skjern model now used in 4 municipalities in North and Central Denmark:

- Frederikshavn, Mariager Fjord, Thisted, Vesthimmerland
- counting 13 potential new biogas plants under development.

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Phase 1:

Organizing the local stakeholders:

- **The municipality (planing and politicians)**
- **Energy company**
- **Farmeres (union)**
- **SME's**

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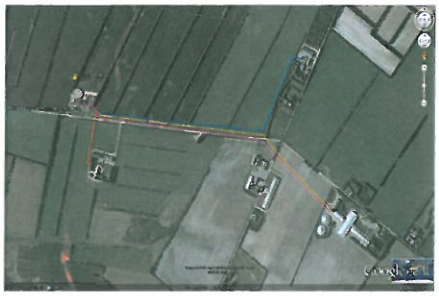
Phase 2.

- Project development
- Presentations to all stakeholders.
  - BPI municipality – technicians & politicians, EGY companies, CHPs. Business Councils.
  - VFL farmers and farmers union.
  - Farmers come to their local DLBR center for assistance.
- Involvment of other experts
- Technical assistance for the planning process
- Identification of financing and support
- Pre-feasibility 11
- Feasibility 10
- Business model
- Applications for approval 10
- Financing (2011 EUDP 0,7 mio. €)
- Procurement

Combigas demo plant August 2012

- 1,2 MW, 1,2 mio. m3 /year
- Modular
- Simi-automatic

Combigas piping system



Combigas plant inauguration

Combigas demo plant inauguration august 2012

- Speache by Danish Minister of Energy, Martin Lidegaards.
- https://vimeo.com/48472926/
- Preparing an investor video in DK and english.