Village of Feldheim: Energy self-sufficient district of the town of Treuenbrietzen in Germany’s county Potsdam-Mittelmark

A joint project by the residents, the local Farmers’ Cooperative and

energiequelle
Feldheim ???
The Idea:

Regional regenerative energy supply
as an alternative for independent business cycles
in the periphery
Perequisites completed:

Performance by Treuenbrietzen’s urban district Feldheim:

**Feldheim Wind Farm**

- 43 wind turbines
- installed electric capacity: 74.1 MW
- starting up in 1995
- in 2010 last expansion so far
Performance by Treuenbrietzen’s urban district Feldheim:

*Relay station Feldheim is the basis of our own power supply network*

- **Voltage:** transformed from 30 kV to 110 kV
- **Rated output of the transformer:** 100 MVA
- **Wind turbines connected:**
  - 26 x Enercon E70 E4: 2 MW each = 52 MW, start up in March 2006
  - 3 x Enercon E82: 2 MW each = 6 MW, currently under construction
Perequisites completed:

Performance by Treuenbrietzen’s urban district Feldheim:

**EQ-SYS GmbH (Ltd.)**

- robotic production of **twin-axle solar tracking systems** (EQ-Mover) made of steel as well as standard mounting systems

- **area of one PV module = 60 m²**
  - dimensions: 11.74 m x 5.12 m
  - height of column: 3.29 m
  - total weight: 3.5 t

- **additional yield achieved by EQ-Mover: 40 %**

- **processing capacity per year: 5,000 t steel**

- **workforce number 2013: 21 employees + 2 trainees**

**start up:**
**spring 2008**
Perequisites completed:

Performance by Treuenbrietzen’s urban district Feldheim:

**Selterhof Solar Farm – former military area**

- setup of 96 EQ-Mover (twin-axle tracking systems)
- each mover yields **7.82 kwp** (34 PV modules)
- start up: November 2008
- 1. enlargement 2009: 188 new modules (8.05 kwp) with an additional capacity of 1.51 MW
- total capacity of the solar farm today: **2.26 MW**
**Perequisites completed:**

**Performance by Treuenbrietzen / Feldheim:**

**Feldheim Biogas Plant**

- Installed electric capacity: 500 kW
- **Input:** 8,600 m$^3$/a pig & cattle manure
  8,700 tons/a maize silage
  190 tons/a cereals
- **Output:** 15,500 m$^3$/a fertilizer
- **Energy production:**
  - about 4,000,000 kwh/a electric power
  - about 4.3 million kwh/a heat
  - local need for industry and private homes
  - about 3.76 million kWh/a for the heating grid

**Put into service:** December 2008
Perequisites completed:
Performance by Treuenbrietzen / Feldheim:
Feldheim local heating grid

- **Length:** 3,000 m
- **Connections:**
  - 39 private homes
  - 1 farm
  - 3 pigsties and cowsheds
  - 1 factory (EQ-SYS)
- **Connected load:** 1,600 kw\(_\text{therm}\)
  
  (basis = former boilers)
  
  demand = 2.88 million kwh
  
  399 kw\(_\text{therm}\) wood chip combustion

- **Retail price:**
  (including VAT)
  
  - **electricity** basic charge 5.95 €/month
    plus 16.6 cent/kwh
  - **heat** basic charge (dependent on scale)
    plus 7.5 cent/kwh

- **Put into service:** December 2009
Development of actual heat demand:

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Plan: Development of actual heat demand.
Development of actual heat demand:
Entwicklung Wärmebedarf 2010-2013

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Perequisites completed:

Performance by Treuenbrietzen / Feldheim:

**Feldheim Electricity Grid**

- **Length:**
  - 4,600 m low voltage
  - 2,600 m medium voltage

- **Connections:**
  - 38 private homes
  - 2 agricultural units
  - 3 communal facilities (road lighting, fire department, community center)
  - 1 producing firm
  - 1 biogas plant
  - 1 church
  - 1 waterworks

- **Backup:**
  - 90 % wind energy, 10% bio energy (basic load)
  - Reserve solar power if required

- **Owner:**
  - Energiequelle GmbH & Co WP Feldheim 2006 KG
  - [limited partnership with a limited liability company as general partner]

- **Retail prices:**
  - Electricity (about 30% cheaper)

**Construction time:** September 2009 – March 2010

**Put into service:** 28.10.2010 (due to obstacles in approval procedure)

**Annual electricity consumption of the village:**

1.100.000 kwh
Demand for Electricity, Development since 2011

Gesamtverbrauch AON Feldheim

- 2011 (432.182 kWh)
- 2012 (642.020 kWh)
- 2013 (855.951 kWh)

BF
31.01.2014
Demand for Electricity, Development since 2011

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- Feldheim Biogas Plant
- EQ-Sys GmbH [Ltd.]
- Heat Distribution Center
- Transformer 1 + 2

„Wind Farm Feldheim“ 43
WKA = wind energy converter
Approach towards an intelligent electricity & heating grid in Feldheim

New-Energy-Forum Feldheim NEF

Accumulator for electric power (Lithium Ion Battery)

Wind engines

Biogas plant

Woodchip combustion

Public grid

EQ-SYS (industry)

Farm buildings

Private homes

Teaching Coordination Agency
The Players

- Energiequelle GmbH [Ltd. Company]
  Kallinchen/Brandenburg

- Farmers Cooperative "Fläming" eG Feldheim
  Feldheim/Brandenburg

- Feldheim Energie GmbH & Co. KG
  Feldheim/Brandenburg
  with 49 limited partners, one of them the town of Treuenbrietzen, and an individually liable shareholder, the Energiequelle Verwaltungs GmbH [E. administration Ltd.]

Quote from the Articles of Association §4 (2):

„Strictly, only someone who is owner of a building having an entry in the land register, or owner of land, or leaseholder, or owner of a residential apartment in Feldheim may become a limited partner.”
Funding:

1. Overall investment costs for the heating network and connections

1,725,000 €

Limited Company Resources:
138,000 €

Earmarked Funds:
830,000 €

Public Subsidies EU/ national / federal:
about 50 %
(75% thereof EFRE and 25% state budget)

Remaining Funding:
Private loans
Funding:

2. **Overall investment costs for the electricity network and connections**

450.000 €

**Own resources:**

450.000 €

**Subsidies:**

None !!!
The Aim

A complete, safe, local power supply, absolutely independent of fossil and nuclear fuels, at stable, constantly low level tariffs!

Aim achieved on Oct.29, 2010 !!!
“If you can dream it, you can do it.”
Walt Disney

For us, it’s not a matter of dreams.
We know
that we cannot do everything;
but we should get on with what we can do,
and that is quite a lot!

Michael Knape
Thank you for your attention.

We look forward to seeing you in Feldheim!

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Hauptstr. 44
15806 Kallinchen, Germany

www.energiequelle.de

Municipality
Stadtverwaltung Treuenbrietzen
Großstr. 105
14929 Treuenbrietzen, Germany

www.treuenbrietzen.de