

Vocational School Lüchow, Germany

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Wendland-Elbetal – A Pilot Region for Renewable Energy

Wendland Elbetal is one of 25 pilot project areas supporting the extension of renewables in Germany. They are backed up by the *Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz* (i. e. ministry of food, agriculture and consumer protection) and by the *Fachagentur für nachwachsende Rohstoffe* (a special agency for renewables).

The pilot project focuses on six main aspects:

- learning and researching:** the focus is on trying to improve the efficiency of a biogas plant and to enhance biogas digestate processing technologies.
- using given knowledge:** the academy for renewable energies in Lüchow is intended to become a base for knowledge exchange and education.
- mobilizing experience:** the aim is to implement a net of the cng gas stations and to win regional marketing partners.
- learning from each other:** exchanging knowledge with other regions and institutions is promoted by technical visits.
- model villages:** in addition to existing villages that entirely rely on bioenergy, other villages are supported on their way to become energy independent.
- for diversity and landscape:** discussion groups between farmers, plant operators, local authorities and conservationist are set up with the intention to help them find common ground.



Source: <http://www.bioenergie-wendland-elbetal.de/handlungsfelder-bioenergieregion.html>

The area belongs to the district Lüchow-Dannenberg which is located in the north-east part of Lower Saxony. Renewable energies are present in our area (current status: 2015) in many different ways:

- 35 biogas plants producing 120.000 MWh electrical energy.
- About 630 photovoltaic plants and 70 wind turbines with a power production of 300.000 MWh.
- Four bioenergy villages which supply themselves almost completely with electrical energy and heat.
- Four biogas filling stations for environmentally friendly mobility.
- The Academy for Renewable Energies which offers a master degree via distance learning courses.

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Infrastructure of Renewables within the Region

Biogas plants

In Lüchow-Dannenberg there are 35 biogas plants with a power generating potential of 16.000 kW corresponding to an amount of 120.000 MWh electrical energy. From those 22 developed concepts on how to use the heat and 15 of these provide heat via local heating networks. The other 7 of the 22 biogas plants use the heat for fermentation residue drying or for heating buildings on site (such as stables).

About 45% of the renewable energy in our area is generated by biogas plants. The concentration of biogas Plants is with 0,24 kW_{el}/ha of land area above the average of 0,18 kW_{el}/ha in Lower Saxony.

Two biogas plants, one in Dannenberg and the other one in Lüchow, feed their methane directly into the natural gas grid. The picture shows one of these biogas plants. On the right one can see a gas storage balloon.



Source: http://www.biogas-kanns.de/images/scaled/Luechow-Gesamtansicht_275x180.jpg

Biogas filling stations

The first biogas station was built in 2006 in Jameln. This particular one was a pilot project run by the Region „Aktiv Wendland/Elbetal“, the „E.ON Avacon AG“, and the „RWG Jameln“.

The second one was built by „Kraft und Stoff GmbH“. Meanwhile, there are two more biogas stations – one in Clenze and another one in Lüchow. Eventually, the number of biogas-run-vehicles per person is 4 times higher in our region than elsewhere in Germany.



Source: <http://www.bioenergie-wendland-elbetal.de/interaktive-karte.html>

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Wind power

In Lüchow-Dannenberg a large part of the renewables is generated by wind turbines. The table shows the 71 wind energy plants in the county with an installed total power of 11.300 kW.

Village	Number of wind turbines	Installed power per system (kW)	Village	Number of wind turbines	Installed power per system (kW)
Jeetzel	3	600	Lüchow-Tarmitz/Künsche I	6	2.000
Klennow	1	1.300	Lüchow-Tarmitz/Künsche II	7	2.000
Luckau-Steine/Bülitz	4	500	Trebel-Tobringen	7	800
Luckau-Beesem	3	1.500	Lemgow-Schweskau	8	2.000
Woltersdorf-Thurau	7	2.000	Lübbow-Bösel	9	2.000

Photovoltaic

Photovoltaic-systems are installed on many private houses and public buildings. In Grabow there is a very large open area plant with an output of 1 MW on a 2 ha area.



Source: <http://geotec-solar.de/html/projekte.html>

Firewood

In Lüchow-Dannenberg, which is rich in forests, many private houses are heated with firewood in the form of pellets, logs or wood chips. There are many suppliers, who extract their resources from the local forests.

According to a survey conducted in 2010, there are 75 wood chip and 581 pellet heaters in Lüchow-Dannenberg. Additionally, there are 39.414 fireplaces which are heated with logs.

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Bioenergy villages

In our area there exist four bioenergy villages: *Volkfien*, *Breese in der Marsch*, *Quickborn* and *Jameln*. A bioenergy village covers his energy requirements (electricity and heat) with at least 50% from regional generated renewable energy. The citizens are included by the decision processes and they support the idea of renewable energy very active.

The biogas plants are almost in the owned by citizens which use the energy, or they are property of local farmers. The sustainable organic material which is used by the plants comes from the surrounded area. The measures of energy efficiency and energy saving are regularly tested and implemented. The generating of warm and electricity from organic material can be completed by using renewable energies.

Volkfien:

Since 2005, 74 inhabitants and 24 households are to 90% supplied by a biogas plant (500kW). Silages of grass and corn, liquid manures of cows and pigs and dung from cattle farming are used as substrates. The biogas plant heats also a pig stall during the winter and a corn drying system during the summer. The energy concept of Volkfien has been rewarded in the year 2010 by the biological-region Wendland-Elbetal. Since that time Volkfien is one of the bioenergy model villages in the region.

Breese in der Marsch:

Breese in der Marsch with his population of 220 citizen and 90 households is supplied by the heating network of a biogas plant with 500 kW. The power requirements are covered to 100 % by the biogas plant and some photovoltaic systems. The village Gümse has also been connected to the heating system since autumn 2011. For this purpose an additional wood chip heating was installed. At present the "Breese-Gümse heating system" with a peak power of 2 MW supplies 100 residential units, two pig farms, a kindergarten, a restaurant and the leisure center.

Quickborn:

The village Quickborn with his 420 citizens has two biogas plants. Since 2009 one biogas plant delivers energy to 83 households. During winter it is supported by an additional wood chip heating system. The other plant covers some stalls and a residential building. 220 citizens (90 households) are supplied by the heating system of the 500kW biogas plant. The power requirement is covered fully by the biogas plant and some photovoltaic systems. Also this plant is supported by a wood chip heating.

Jameln:

In the year 2005 an agriculture cooperative started to run a biogas plant. This system supplies some nearby households, the rooms of a culture association, commercial premises of the agriculture cooperative and its biogas fuel station.

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Companies, Organisations and Institutions

Dreyer & Bosse Kraftwerke GmbH

The *Company Dreyer & Bosse Kraftwerke GmbH* situated in Gorleben produces customized combined heat and power plants (CHP) as well as biogas conditioning systems for customers worldwide. The company was founded in 1997 and has more than 100 employees.

S+S Energietechnik GmbH

The *Company S+S Energietechnik GmbH* situated in Grabow near Lüchow develops, implements and maintains photovoltaic systems within the region. The company was founded in 1996.

Regionen Aktiv Wendland/Elbetal e.V.

This organization shows commitment for different goals:

- Changing the regional conventional agriculture to organic farming (50% area share) as well as animal welfare in farming.
- Supplying the region with 100% renewable energies.
- Reducing conflicts between agriculture and nature conservation as well as establishing ecological fisheries and forestry.
- Enhancing the quality of touristic offers and the quality of the active public live by networking, improvements and new marketing strategies

Academy for Renewable Energy

The *Academy for Renewable Energy* offers a master degree program in renewable energies. It is accompanied academically by the *College for Applied Sciences in Hamburg*. The learning program conveys broad and complex knowledge in wind, solar and bioenergy. Renewables are considered both from a technical and an economical perspective.