

Bioenergy villages using solar thermal in Germany

Responsible organization

Solites - Steinbeis Research Institute for Solar and Sustainable Thermal Energy Systems

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Model description

The first bioenergy village (Jühnde) was established in 2006. Since then the model was replicated over 130 times. Bio energy villages are self-powered: 100% of the electricity demand as well as at least 50 % of the heating and DHW demand are covered thanks to locally produced renewable energy. Usually the initiator is not a company but dedicated citizens in co-operation with the community, local craftsmen, building companies and consulting engineers. Registered co-operatives are the most frequent form of organization chosen because they offer the citizens a high degree of co-determination and influence in combination with a limited liability risk. The financial ambition is not profit maximisation but achieving a long-term favourable price (cost-covering) using renewable energies.

Though the exact concept depends on the surrounding conditions, the villages have one thing in common: a district heating network for a collective heat supply. A very frequent model is a fermentation plant producing biogas out of agrarian substrata. A cogeneration plant is feeding the generated electrical power into the electric grid to gain compensation according to the EEG (German Renewable Energy Act) and the waste heat is distributed by a district heating net. Wood chips boilers in combination with solar thermal collectors represent an alternative to fermentation plants for supplying heat. The first bio energy village using biomass and solar thermal energy in Germany is located in Büsingen. For electric power supply, photovoltaic and/or wind power are usually used.

There are four contracting parties involved: the raw-material supplier, the operating company of the fermentation plant / wood chips boiler / solar thermal system, the operator of the district heating / electric circuit and the households. The raw-material supplier provides biomass to the fermentation plant or to the wood chips boiler. The operating companies feed the heat into the district heating net and the district heating operator transfers the heat to the households.

The supply with biomass, the heat and electricity production and the distribution can be run by the residents of the village. For tax and liability reasons there are typically separated companies for each part.

Swot analysis

Strengths	<ul style="list-style-type: none"> • The projects are developed thanks to the citizens pressure • Voluntary working of the residents cuts costs • Social cohesion is strengthened • Collaboration of the citizens helps to achieve better acceptability • Improved regional economy
Weaknesses	<ul style="list-style-type: none"> • Residents are 'semi-professional'
Opportunities	<ul style="list-style-type: none"> • Combination with solar heat possible (long-term stable heat costs) • Potential of biogas limited and under pressure
Threats	<ul style="list-style-type: none"> • Economic feasibility depends on subsidies
Improvements/recommendations/lessons learned	

Replication potential

There are plenty of bio energy villages in Germany. They vary in size, plant components and technology, type of deployed biomass and the legal form of the organisations. There is a potential and a trend for more bio energy villages since there is still enough biomass available.

Links to web site and/or documents for more detailed information

<http://www.wege-zum-bioenergiedorf.de> (in German language)

<http://www.bioenergiedorf-buesingen.de> (in German language)