

## 1.4 GERMANY: CASE STUDY 2. ENERGY COOPERATIVE KAPPEL

Case study report for Germany: Community owned energy project from initiation to completion  
Energy Cooperative Kappel

### 1 Introduction

Kappel is a 470-inhabitant village in the state of Rhineland-Palatinate, Germany. The local energy cooperative (Energiegenossenschaft Kappel eG) operates a district heating network based on local bioenergy.

### 2 Description of community

As of end 2018, the Energiegenossenschaft Kappel eG has about 100 members who are also shareholders. The three board members and five members of the supervisory board are elected by the general assembly. Following the German Co-Operative Act, each member has one vote, regardless of the number of shares held.

Any customer (=member) of the cooperative deposits a minimum of 2500 € (5 shares) and needs to contribute another 4600 € to the construction cost. The latter however is completely subsidised from the municipal budget.

### 3 Renewable Energy Project

The district heating network started operation in November 2015 and, as of January 2019, has a total length of 4.4 km and supplies heat to 93 buildings. Among them are 88 residential buildings, two community halls, a bakery and a poultry farm with butchery. Roughly 80% of the annual heat demand is supplied by a 600 kW biogas CHP. Two wood chip boilers of 500 kW each serve as peak load and back up capacities. In case one of the heat sources fails, the two remaining have enough capacity to cover the heating load of about 750 kW.

The biomass for the biogas plant is locally supplied manure and maize, while the wood chips are made from waste timber of the approx. 600 hectares of local forests.

The entire heating grid saves 600-700 tons of CO<sub>2</sub> emissions annually compared to oil-based heating systems.

### 4 Ownership structure and financial model used

The biogas plant is owned and operated by three local farmers, who sell the heat to the cooperative. The cooperative owns and operates all facilities in the heating centre (boilers, buffer tank, wood chip storage, pumps etc) and the heating grid itself. The heat transfer stations and all heating facilities on the customer side are in ownership of each customer.

Of the total invest of 2.1 million €, roughly one third is equity capital, put up by the cooperative members with a minimum deposit of 2500 € each as well as building cost subsidies of 4600 € per customer, which was provided by the municipality. Roughly half of the debt capital is covered with grant aids and repayment grants by the state-owned KfW bank and from the

state of Rhineland-Palatinate. The remaining are loans to be repaid from the heat sales revenues.

In the annual balance of the cooperative, repayments and interests amount to little over 50% of the total cost, while the purchase of wood chips and heat from the biogas plant accounts for about 20%. The rest are running costs and reserves.

In order to finance these costs, each consumer pays a basic charge of 280 € per year plus a kilowatt-hour rate of currently 8,9 Cent. Since the cooperative operates on a non-profit basis, profits exceeding the required reserve will be equally refunded to all members. This financing model puts the emphasis on annual turnovers rather than equity capital, enabling the participation of citizens with less financial reserves.

### 5 Implementation Process

Before the cooperative's foundation, local citizens were looking for opportunities to utilise excess heat from a farmer-owned biogas plant in the village as well as residual wood from the approx. 600 ha of local forests. In January 2013, an initial town hall meeting revealed large citizen interest in district heating. A local working group was established in order to put the project in concrete terms and issued a feasibility analysis by an engineering office. In order to provide insights to interested citizens, three study visits to similar, already established projects were organised.

In February 2014, the municipal council passed a resolution to subsidise all customers connecting to the heating grid with the amount of 4600 €. In March, 70 initial members founded the cooperative, the first construction phase started in July. In November 2015, the last grid section was finished and put into operation. In December 2018, 5 more buildings were connected. The cooperative is still looking for further members.

### 6 Project results: Lessons learnt & post-project benefits

The case of the energy cooperative Kappel demonstrates, how local citizens, businesses and the municipality can cooperate to establish an efficient and sustainable heat supply infrastructure with stable and affordable prices.

Along with the financing model, the municipal subsidies for the project proved effective, lowering the participation threshold substantially. It is part of the larger subsidy directive "Energy Saving for Everyone", which provides grant aids for investments in efficient heating systems and thermal building insulation, the renewal of white goods as well as energy consulting to all inhabitants of Kappel. Doing so, the municipal policy does not only promote renewable energy and energy saving, but also bolsters the local economy and quality of life in a rural area.

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