

<b>City/region</b>	Maria Laach am Jauerling (Lower Austria)
<b>Supporting partner</b>	AIT

**Map showing local heating and cooling demand and supply**

	City only	Neighbourhood only	Individual installation		
			No details	Additional Info	Monitored data
<b>H/C demand</b>	X				
<b>H/C infrastructure</b>			X		
<b>Sustainable H/C potential</b>	Energy efficiency				
	Excess heat		X		
	Geothermal				
	Bio-energy				
	Solar thermal				

Heat demand (whole region Lower Austria):  
2012: 16,649.3 GWh/a  
2025: 14,629.5 GWh/a

The economic potential for district heating for a connection rate of 90 % and a heat demand density of  $\geq 10$  GWh/km<sup>2</sup>a is about 11.800 GWh/a. With a connection rate of 45 % and a heat demand density of  $\geq 20$  GWh/km<sup>2</sup>a it is about 3.200 GWh/a.

The village centre of Maria Laach which is connected to the DH network is located inside the blue rectangle.

The district heating grid of the plant Maria Laach has an overall length of 1.5 km and over 30 heat consumers are supplied. The main heat consumers are restaurants and hotels with a heat demand between 120 – 215 MWh/a, primary school MWh/a, municipality office 115 MWh/a, multifamily apartments 110 MWh/a, business enterprises, parish office/church and single family houses. The age and energy consumption situation is very heterogeneous reaches from old heritage buildings, hotels, public buildings to low energy single family houses and apartment buildings. The total heat demand of the consumers are 1,650 MWh/a and 1,200 MW heating output is connected. The heat losses of the distribution are approx. 18 %.

The only energy suppliers are 2 biomass boilers with a heating output of 440 kW and 280 kW.

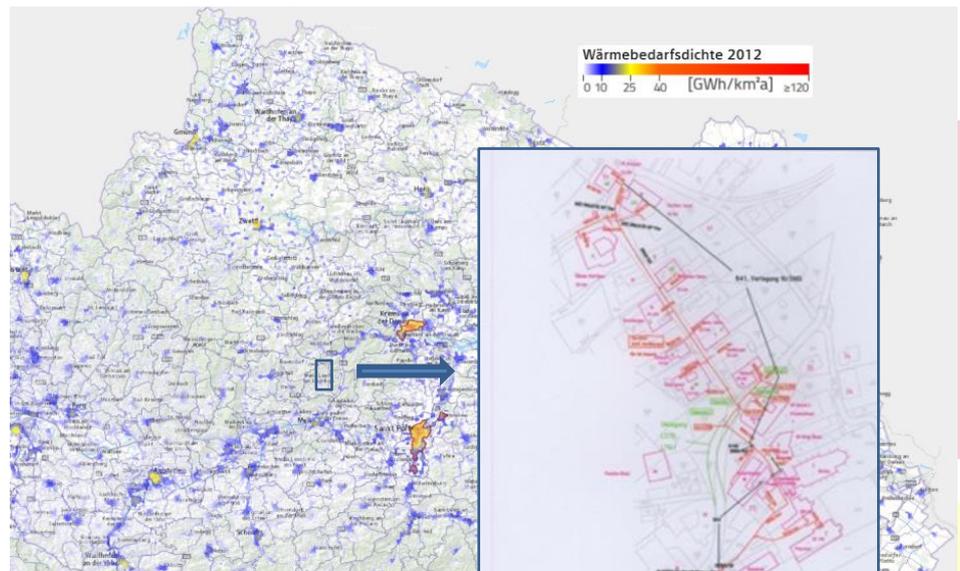
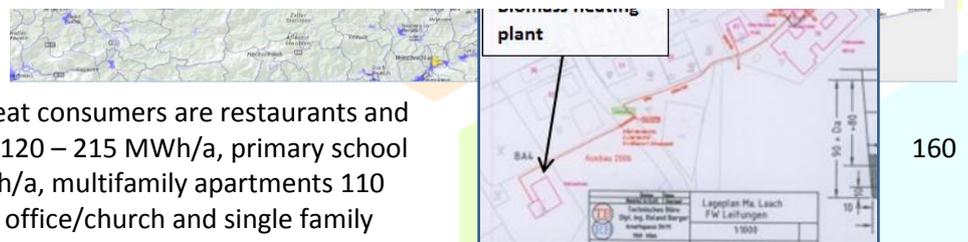


Figure 12: Heat requirement density of Maria Laach in 2012 and district heating network of Maria Laach with drawn in biomass plant location (Sources: <http://www.austrian-heatmap.gv.at/karte/>; Bioenergie NÖ reg.Gen.m.b.H.)



160  
and

## Current challenges - opportunities

Each building is supplied by a substation and controller. The data of the substations and heat meters are collected and logged by a visualisation system. The biomass boilers are connected to an 8 m<sup>3</sup> buffer storage tank that has the function of load compensation, buffers peak loads and sums up the heat of the biomass boilers. A high grade of the substations are also equipped with a buffer storage tank and used as common buffer storage tank for the biomass plant. The operation focus is on a high utilisation of the biomass boiler and biomass as raw material.

By a look at the operation temperatures a relatively high return temperature of 65 °C is common. There is potential for improvement. With reduction of the return temperature also the heat losses and electricity demand for grid pumps could be reduced and will open the possibility to feed in low temperature sources.

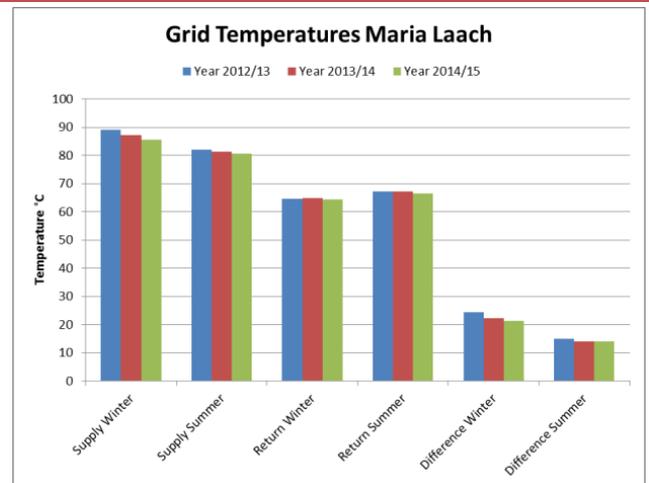


Figure 13: Grid temperatures Maria Laach (Source: AGRAR PLUS Beteiligungsgesellschaft m.b.H.)

Relevant stakeholder for this project and mainly addressed in the STRATEGO project is AGRAR PLUS.

AGRAR PLUS was founded in the year of 1985, by an initiative of Lower Austrian Councillor responsible for agricultural affairs. His aim was to create a contact point for all persons who are interested in establishing communal biomass district heating plants and also to create an independent advice centre providing support in the examination and development of ideas and concepts.

The tasks of the company are beside the development and realization of concepts for the market, the development of new or alternative agricultural products, coordination of planning, management, financing and supplying of bioenergy projects and running, taking over and negotiation of all involved businesses. The goals of the company are the successful realization of agricultural projects concerning heat or electricity from biomass or biogas, the manufacturing and marketing of agricultural products, the participation in creating a positive atmosphere together with the concerned institutions, to acquire know-how for innovative projects and to be link between agriculture and economy as well as between science and practice.

AGRAR PLUS is one of the leading companies in Lower Austria for realizing bioenergy projects and developed more than 30 district heating systems fired by wood chips in the last 5 years. The main task of the work is to help persons as an independent consultant to realize economic projects. The broad and long term know-how about biomass and biogas plants is shared in different national and international projects. AGRAR PLUS manages the Bioenergie NÖ reg. GenmbH biomass plant Maria Laach am Jauerling. Due to the long term project development and accompaniment of biomass district heating grids, the technical problems at the substations and consumer heating systems are well known.

## Identified project

Two main problems are occurring:

- High return temperatures: A relatively high return temperature of 65°C over the whole year is common.
- High heat losses: The heat losses in the primary network are with about 18 % rather high and also the losses on the secondary side, between the substation and the customers heating system are very high.

It was identified that the source of these problems are planners and installers which are not aware of the special needs of DH networks in connection with the installation of the secondary side respectively the consequences if they are not fulfilled.

The aim is to develop an agenda for an education module or workshop which addresses the planners and installers.

## Business model

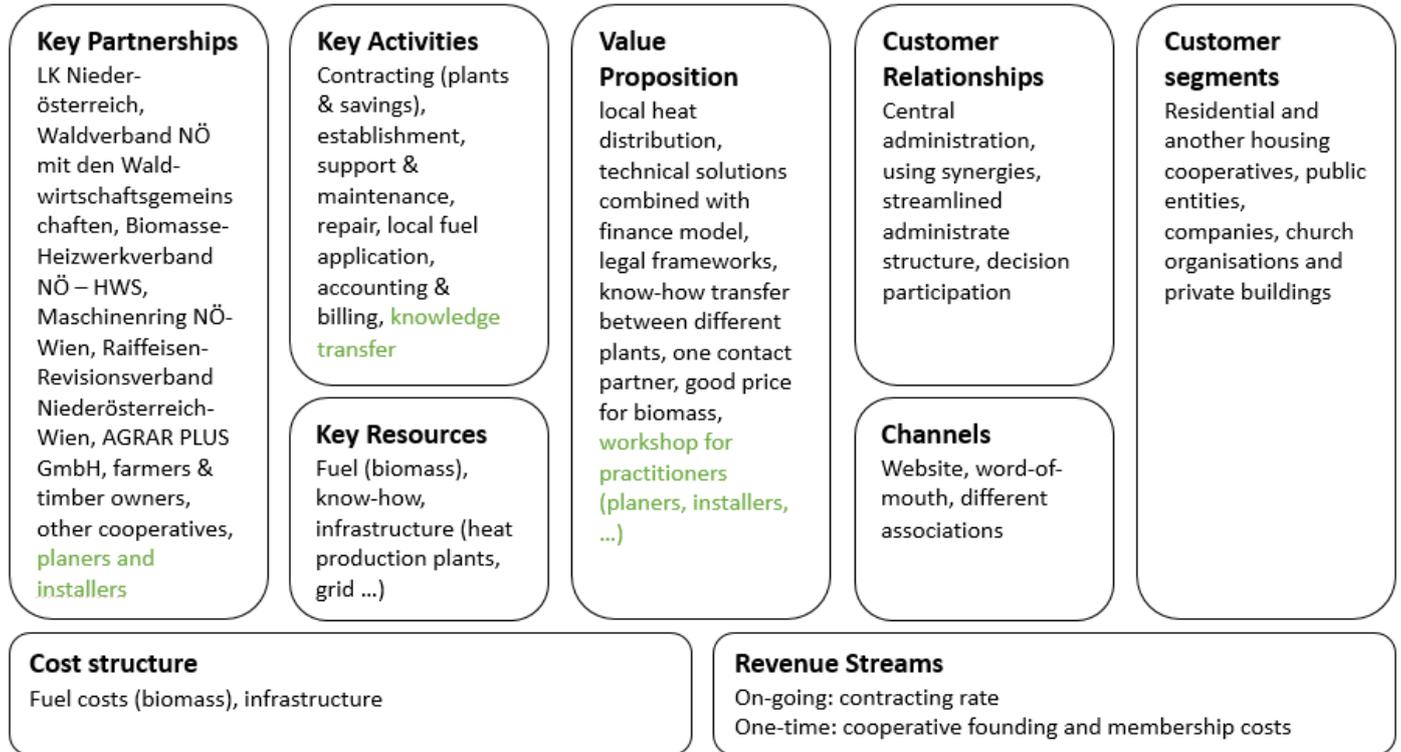


Figure 14: Business model of Maria Laach (Source: own visualisation)

### Key Partnerships

The main key partners of Bioenergie NÖ are farmers, timber owners and different regional associations who contribute also something to advertising and dissemination issues. In some cases, the farmers and timber owners are both biomass supplier and heat customers.

#### The new business model:

In future, practitioners (planers, installers ...) should be more integrated in cooperations in order to improve the knowledge of the needs of efficient DH-grids and to reduce the losses and increase the temperature spread on the secondary side.

### Key activities

Bioenergie NÖ provides two models of contracting. On the one hand plant contracting and on the other hand energy savings contracting. In the first one, Bioenergie NÖ builds up heat production plants on-site and operates it also. Basis is a classical heat supply contract. The second one, includes the services of the first variant plus the whole customer system (internal heat distribution, hydraulic installations, measuring and control technology ...). The basis is also a heating supply contract which includes gained efficiency effects. Furthermore, Bioenergie NÖ does not only the plant maintenance and repairs but also the accounting and billing as they are a central contact partner.

The new business model:

Due to the planned workshops, it is necessary, that also practitioners are integrated in the planning phase and also lessons learned have to be disseminated through all stakeholders to reach the aim of lower return line temperatures.

**Key resources**

The most important resource is biomass as fuel to produce heat. Through the long-lasting know-how, all partners profit from synergies. This includes proven frame conditions and also supporting from the first step (concept and planning phase) to the daily operation and optimization of the district heating plants. For refinancing, it is very important that the whole infrastructure is in a good condition and the components work faultless.

**Value Proposition**

The main duty of Bioenergie NÖ is, that the consumers have a reliable heat distribution for heating and hot water preparation. That means, the district heating grids has two requirements: functionality and profitability. This should be reached through optimum constructional, technical and logistics solutions with a clear finance model and a foreseeing, sustainable economic concept. A basis for this builds the optimization of the usage and price of wood chips and reducing the operational costs through synergy effects. Bioenergie NÖ promotes the knowledge transfer and lessons learned between the different local plant operators.

The new business model:

As the DH-grid in Maria Laach (and also others of Bioenergie NÖ) has to struggle with high return line temperatures and high losses on the secondary / customer side, a workshop is planned in September 2016 in which these topics should be dealt with. The workshop will focus on practitioners, especially on planners and installers concerning the customer side because they deliver too high return temperatures. It is planned, that such a workshop should take place every year to enhance the awareness of good planning / secondary installations and the importance of low return line temperature for efficient district heating grids.

**Cost structure**

The highest costs results from the needed infrastructure and the biomass procurement.

**Customer relationship**

Each biomass plant is self-responsible for its own economic success. Nevertheless, Bioenergie NÖ is the central partner for accounting and higher procurement to keep a loan administration structure. In addition, each group is represented in the cooperative society, which means every plant has a representative and participates in decisions. Through this system, each project benefits from the pool of experience of the whole network and keeps its independency.

**Channels**

The most customers know Bioenergie NÖ as it is represented in different associations concerning biomass and farmers issues. The company and its activities are disseminated via word-of-mouth and of course through the website.

**Customer segments**

The project "Multi level actions for enhanced Heating and Cooling plans – STRATEGO" (IEE/13/650/SI2.675851) is co-funded by the Intelligent Energy Europe Programme of the European Union. Project website : [www.stratego-project.eu](http://www.stratego-project.eu)

The customers' structure is mostly built up from cooperatives (residential and another housing), public entities, church organisations and private buildings. The farmers and timber owners are members of the cooperative Bioenergie NÖ and therefore they are shareholder of this legal cooperation. In some cases they are also heat consumer itself.

### Revenue streams

For refinancing, Bioenergie NÖ has two revenue streams. The first one is the on-going through a monthly contracting rate and the second one the cooperative founding and membership costs which has to be paid one-time.

### Results of the stakeholder meeting

Date	02/04/2016
Participants	AGRAR PLUS, AIT, AEE INTEC, QM Heizwerke
It was agreed that it should be an education module of one day which includes practical parts. The topics that should be addressed were defined. The first module should be realized in June/July 2016. In the next step the detailed content will be defined and AIT and AGRAR PLUS will search for suitable talkers and/or companies for cooperation.	

### Input into the local heating and cooling plan

Bioenergie NÖ reg. GenmbH / AGRAR PLUS has no local heating and cooling plan. Their main business is to foster people (mostly farmers and timber owners) who would like to build and operate a small heating grid. Actually they manage about 60 heat producing units with an average thermal heat power of 200 – 300 kW and quite compact grids with an average length of only 200 m. That means the promoter for building or expansion DH-grids are the customer itself.