

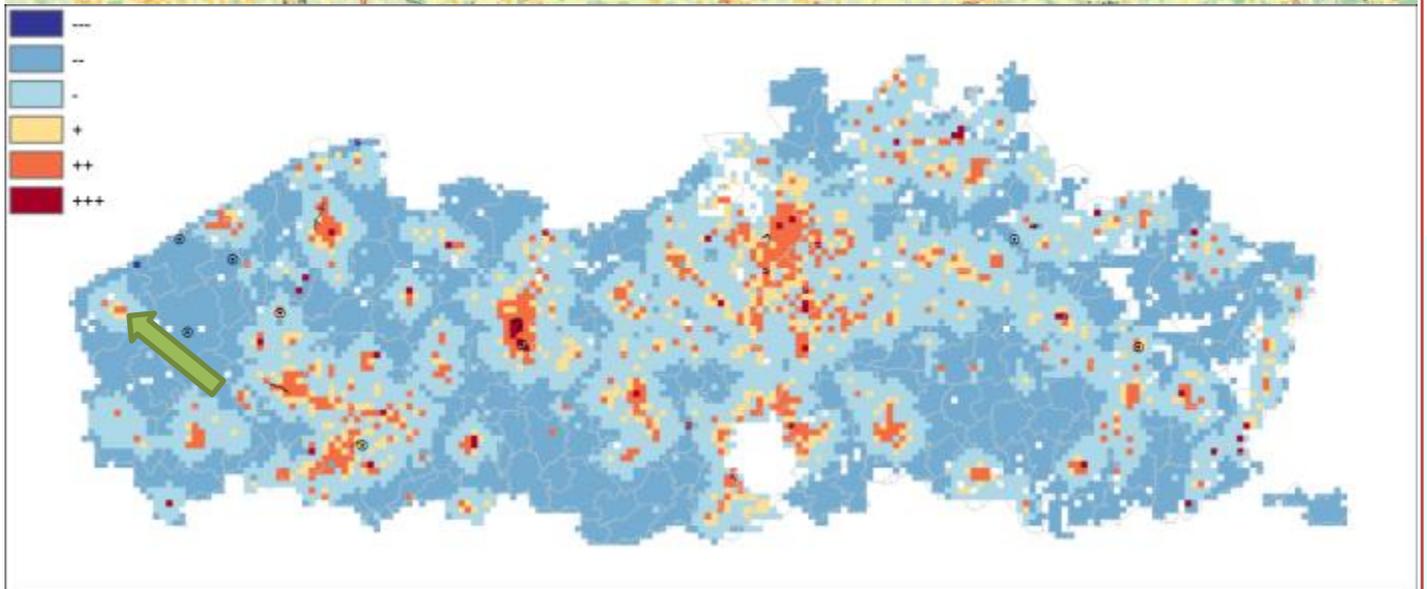
City	Veurne, BE
Supporting partner	VITO

Map showing local heating and cooling demand and supply

Veurne is a town located in the very western part of Belgium. It is a very rural area; Veurne has about 11,400 inhabitants on 96,34 km² (population density of approx. 115 inhabitants / km²). Most of the inhabitants live in the town centre, which is surrounded by meadows and small villages; the area covered by infrastructure is 10.24 km².



Peta, the Pan-European Thermal Atlas: renewable energy
Disclaimer: The data provided on this website is indicative and for research purposes only. No responsibility is taken for unintended purposes.



The heat consumption of Veurne amounts to 338 GWh (final energy – 2013 data), which leads to an average heat density for the town of 33.0 GWh/a.km² or 9.17 TJ/a.km² (only taking the covered surface into account). About 60% of the heat is consumed industrial companies (SMEs mainly); about 35% is consumed by the residential, commercial and public sector. The remaining 5 % is consumed by the agriculture. About 9% of the heat is from renewable sources, which is mainly solid biomass sources that are combusted as a fuel.

	Final (GWh)		Fuel (GWh)	Elec. (GWh)
Electricity	107	Residential	78	20
CHP heat	2	Commercial	40	28
Fossil fuels	304	Industry – non-ETS	197	53
Renewables	31	Agriculture	22	5
TOTAL	444	TOTAL	338	107

Both the extract from the Pan-European Thermal Atlas as the Flemish Heat Map indicate that the heat density of Veurne is high enough to consider a district heat network

The picture of the town below provides more details on the fabric of the town:



The symbols depict following aspects:

- Big yellow triangle: indicates a new urban development (450 living units) on a site of an abandoned sugar refinery

- Big yellow rectangle: indicates a new industrial development
- Red stars: indicate 2 CHP installations:
 - A 732 kW_e installation at a food company in the east of the town
 - A 291 kW_e installation at the hospital in the west of the town
- Red circles: indicates potential supply points of waste heat
- Blue circles: indicates food companies with a heat demand
- Blue triangles: indicates public buildings:
 - a hospital and a school nearby the industrial area in the south
 - a train station and a military airport in the north of the town
- Big blue rectangle: indicates an industrial area in the north
- Yellow triangle: indicate new public buildings
 - A new swimming pool, about 300 m north of the train station and east of the industrial area and the military airport

Mapping methodology

		City only	Neighbour- hood only	Individual installation		
				No details	Additional Info	Monitored data
H/C demand			X	X		
H/C infrastructure					X	
Sustain- able H/C potential	Energy efficiency					
	Excess heat			X		
	Geothermal					
	Bio-energy					
	Solar thermal					

An extract from the Pan-European Atlas was taken. It indicates the heating and cooling demand on a 1 km x 1 km network.

This extract was compared with the Flemish Heat Map of Flanders, showing areas of interest to develop district heating networks. This map is based on fuel consumption data: gas metering data for gas consumption collected by the local network operator and estimation of heating oil consumption based on electricity consumption. This map also takes the potential supply of excess heat of industry and CHP into account. It finally combines both data layers, together with cost characteristics to develop district heating networks to calculate and map the feasibility to develop such networks.

These maps are complemented with a map indicating the main supply points and demand points by using symbols.

Current challenges - opportunities

There are two heat clusters connected to the two industrial areas in Veurne:

- The south-east cluster: there are concrete project ideas to exchange heat from a food company to two other companies nearby. That heat could also potentially supply the new urban and industrial developments nearby
- The north-west cluster: the new swimming pool offers an opportunity to consider developing a DH network connecting it with the industrial companies nearby. This is currently not under consideration.

Areas of priorities

The focus is on the south-eastern cluster, in view of the specific project ideas that are raised by local stakeholders. The current project plans concern heat exchange between industrial companies, but the local authorities would like to investigate the feasibility of connecting the new urban and industrial development to this potential DH network as well. Especially the role of the local authority will be investigated in this case, as they are not directly involved in the current project ideas.

Identified projects

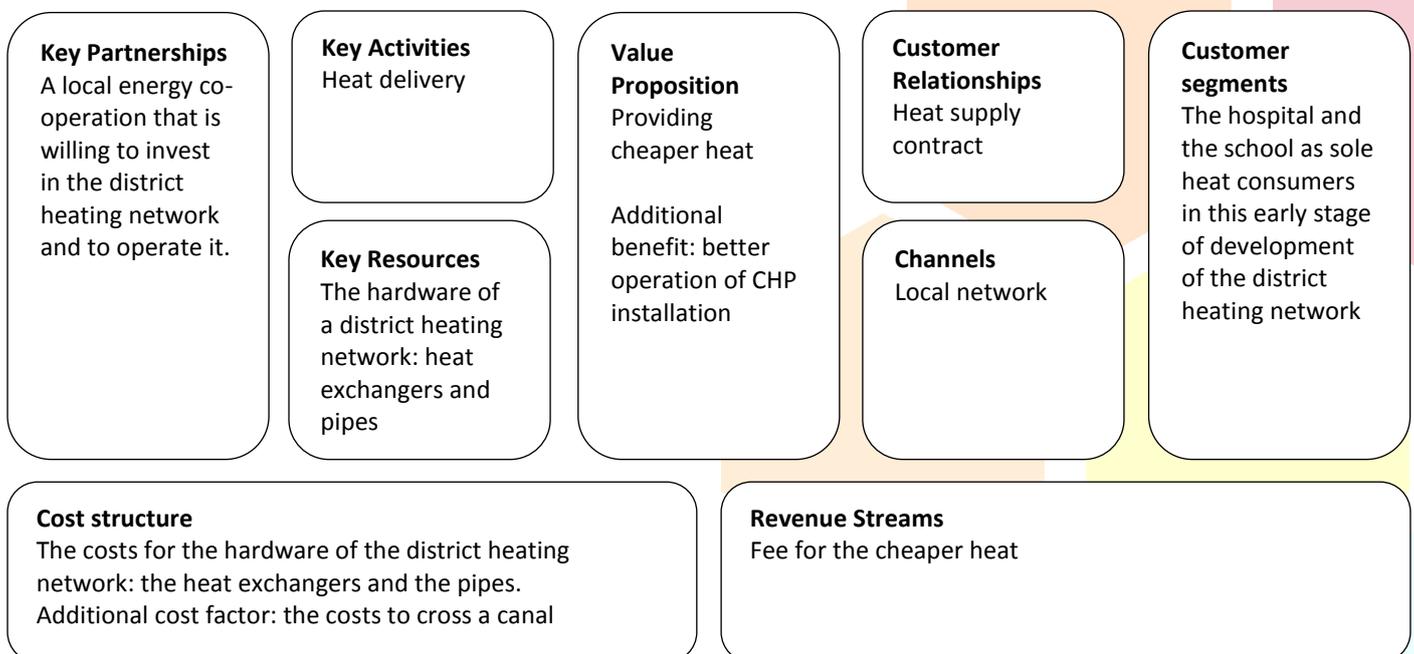
List of considered projects:

- Tapping waste heat from one industrial company to cover heat demand in another industrial company

Project 1

The project considers tapping excess heat from a food processing company and to bring it to a hospital and a school about half a kilometre east of the company.

Business model of project 1



Value proposition

The aim of the project is to provide cheaper heat to the hospital and the school than is currently the case. The added value for the industrial company is a premium for the delivery for the excess heat which is currently not valorised. As an additional benefit, the project allows a better operation of the CHP installation of the hospital as it will be connected to a bigger heat market, allow the CHP installation to have a higher number of operational hours.

Customer segments

This early development of a district heating network serves a very limited number of customers, all institutions in the services sector with a considerable cost for heating.

Key partnerships

The key partner in this project is a local energy co-operation. This co-operative company would invest in the infrastructure to tap the excess heat from the industrial company, to distribute it and to deliver it to the heat consumers.

Key activities

The key activity in this project is the distribution of the excess heat and the CHP heat to cover the heat demands of the heat consumers.

Key resources

The key resources are the investment in the small district heating network (length about half a kilometre), including the installations to exchange the heat between the heat provider and consumers and the network. Another key resource is the excess heat from the industrial company, that is currently not yet valorised.

Customer relationships

The customer relations are maintained by heat supply / heat delivery contracts. The energy co-operation would act as party in this project, managing these contracts.

Channels

It concerns a small project in rather a small town; the relation between the stakeholders is maintained by local networks with direct communication between the stakeholders.

Cost structure

The main cost components consist of investment costs in the district heating network: the heat exchangers and the pipes.

A complicating factor in the cost structure is the fact that a canal need to be crossed to bring the heat from the company to the hospital. The public body, in charge of the operation and maintenance of the canal, does not allow the attachment of the pipes to a bridge. Hence, drilling is needed to lay the pipes in the ground underneath the canal, which increases the costs considerably.

Revenue streams

The industrial company would be rewarded in this project for the excess heat that would be delivered to the grid. The heat consumers would pay for the heat they take from the district heating network; its price would be lower than the cost of heat produced by the current natural gas boilers / CHP.

The hospital would have additional benefits from an improved operation of its CHP installation in terms of a reduction of the electricity sales and an increase of the certificates. [In Flanders, a dedicated certificate scheme is in place to support cogeneration; the more operational hours the CHP installation can make, the more certificates it gets issued.]

The revenues for the energy co-operation would origin from a surcharge on the heat distributed. With these revenues, they can cover the investment costs in the district heating network.

Results of the stakeholder meeting

Date	Aug 2016
Participants	Representatives of Veurne, excess heat provider (industrial company), potential heat consumers (hospital, school), energy co-operation
<p>The outline of the project and the business model was discussed with the stakeholders.</p> <p>It turned out from the discussion that the additional costs for crossing the canal is a bottleneck in making this project profitable. It was hence decided to put this project on hold.</p> <p>New urban developments have been discussed nonetheless in this stakeholder meeting</p>	

Input into the local heating and cooling plan

The role of the City of Veurne has been analysed in the light of this potential development of a local heating network. This analysis is based on a recent report by UNEP (UNEP, 2015, District Energy in Cities - Unlocking the potential of energy efficiency and renewable energy). This report describes four potential roles local governments could take: as a planner and regulator, a facilitator of finance, a provider and consumer, and as a coordinator and advocate.

This analysis revealed that Veurne has a significant role to play as a **planner of heating and cooling** in the town.

- As a minimum, Veurne should integrate energy planning in urban planning. Veurne should, for every new urban development, investigate how heating and cooling should be organised, in the same way for instance as it investigates how the road infrastructure should be adapted. It should investigate alternatives next to the default option, which is the provision of natural gas.
- As a next step, Veurne should consider developing a holistic heating and cooling strategy for the whole town. This would provide a frame for local new urban developments and provide inspirations for alternative heating and cooling options.

New urban developments are of particular interest as there are no hidden costs of an already existing natural gas network yet. This offers the opportunity to opt immediately for a district heating network as such a network offers the opportunity to switch heat sources with the need to interrupt the heat supply to the consumers.