VLAAMS-BRABANT

Interreg North-West Europe
Co-funded by the European Union

AquaCOM

Aquathermal Energy at Rotselaar's mill site

From Technology to Business Case

Ecopower cv

Ecopower cv

- Post questions in the chat
- Slides and recording will be sent afterwards

Let's connect

Colette Van Loy

Project Responsible District Heating

colette.vanloy@ecopower.be

Ecopower cv

Ecopower
history

- **1991**
  Birth of citizen cooperative Ecopower
  ‘Investing together in renewable energy’
- **2003**
  Electricity supplier
- **2021**
  Heat supplier
- **2024**
  72.000 members en 60.000 electricity clients

→ Together we create ecological
and social added value

Burgercoöperatie
voor hernieuwbare
energie.

Investments

1 installation
75 kW

1 installation
> 6000 MWh/jaar

243 big installations
17 MWp

26 turbines
53 MW


Rotselaar Mill Site (Belgium)


1217


1985


1985


1992


1995


2024

Where we started with AquaCOM in 2023

"Ecopower will invest in an aquathermal system that will deliver 100% renewable heat to the entire Rotselaar mill site, covering both space heating and sanitary hot water needs."

Mapping the mill site

- Different owners / residents & Decisions
- Heat demand 180 MWh/y
- Gas & wood driven
- 50°C-test positive
- Some dwellings don’t have central heating
- Air heat pumps (outdoor units) not allowed

What is the **effect** on the **river** water?

Open vs. **Closed** aquathermal system

Source heat net
vs.
Low T (40°C)
vs.
High T (60 °C) net

How can we drive maximum **engagement within the mill site community** and ultimately convince them to connect?

How do we **dimension the system** (heat exchanger, heat pumps, buffer tanks, heating network, etc.)?

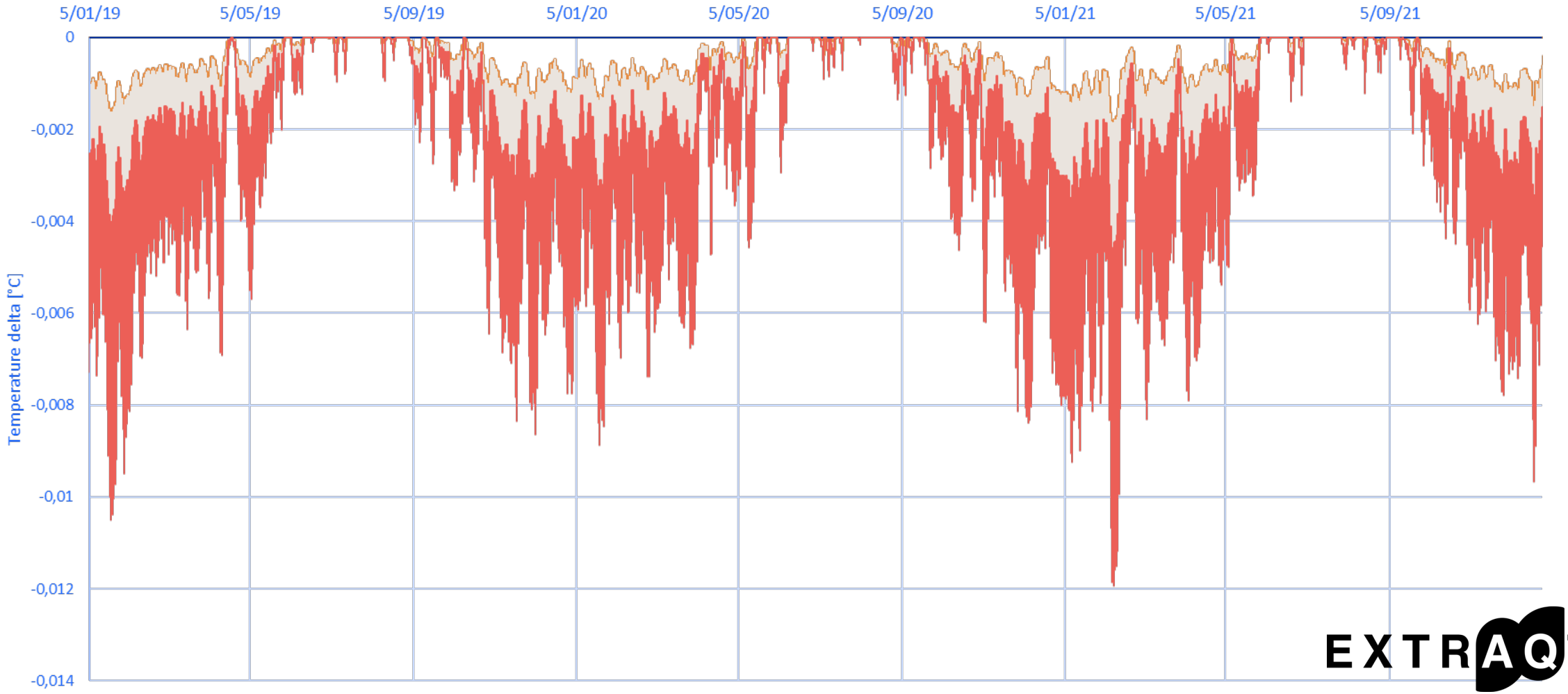
Will the heat pump be able to work with **low river temperatures**?

Impact on water temperature

Study EXTRAQT

Interreg Co-funded by the European Union
North-West Europe
AquaCOM

Temperature decrease in worst-case and best-case scenario



EXTRAQT

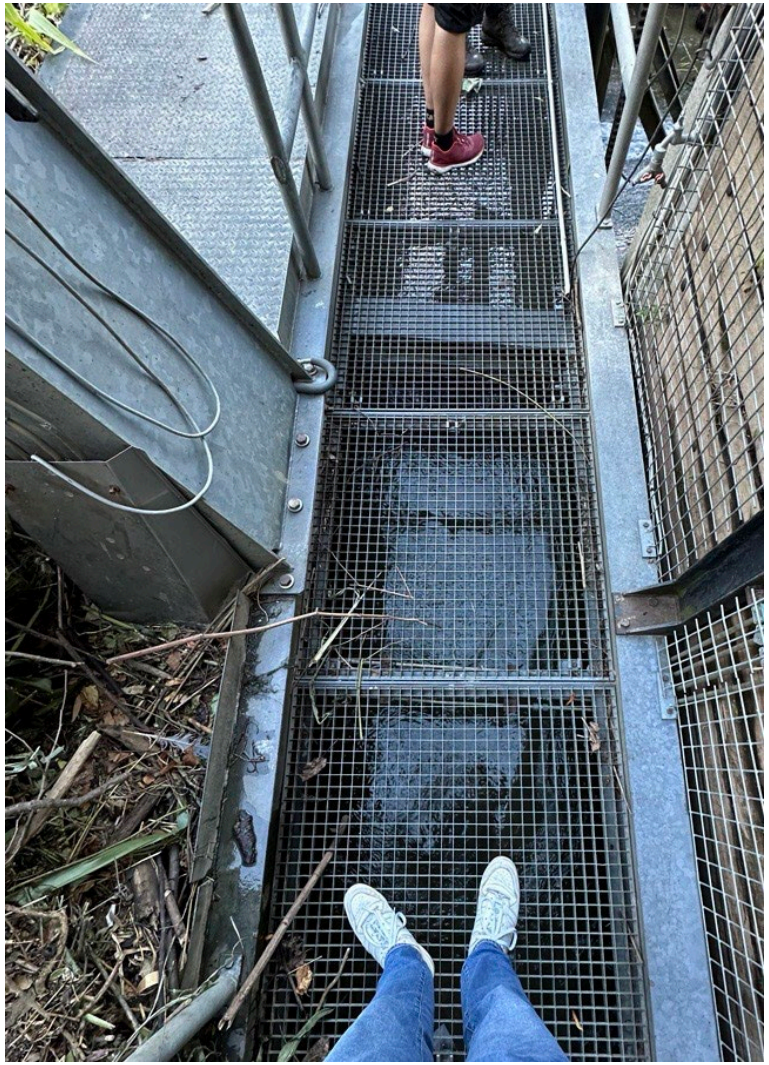
Closed loop system

Interreg Co-funded by the European Union
North-West Europe

AquaCOM

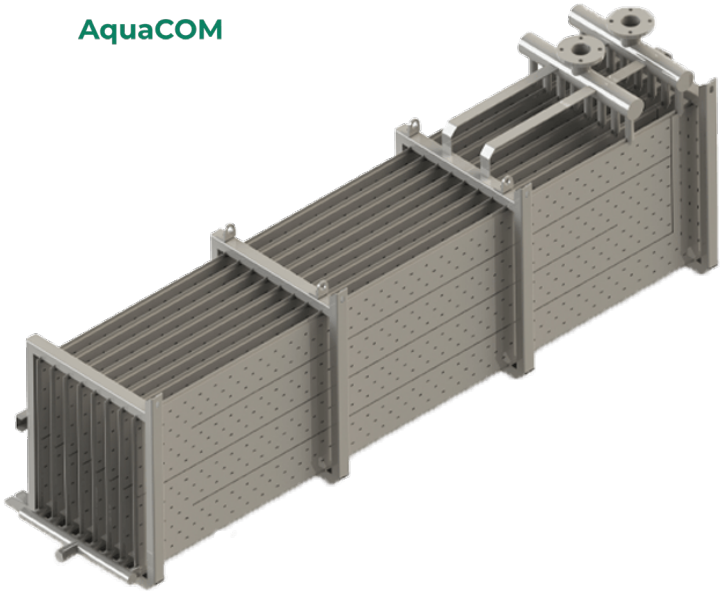
Ecopower cv

Closed loop system



Interreg North-West Europe
Co-funded by the European Union

AquaCOM



- Stainless steel
- 2000x1300x1000mm (1000 mm river depth)
- 80 kW at low flow
- 1100 kg net weight

Ecopower cv

Dimensioning the system

Van Marcke Engineering

Interreg North-West Europe
Co-funded by the European Union
AquaCOM

		40°C	60°C	Aardgas	Individuele WP
Financieel	Investering	220.531,00 EUR	213.930,00 EUR	N/A	195.293,00 EUR
	Energiekosten	4.240,93 EUR	3.787,79 EUR	10.533,00 EUR	13.264,58 EUR
	Operationeel	1.500,00 EUR	1.500,00 EUR	650,00 EUR	-
Sanitair Warm Water	Type	Booster	Satelliet	Gasketel/elek	Boiler
	Volume	Buffer (200l)	Instant ('onbeperkt')	Instant ('onbeperkt')	Buffer (200l)
Impact woning	Ruimtebeslag	1 m^2 (binnen)	-	-	1 m^2 (binnen) + 1 m^2 (buiten)
Klimaat impact	CO2 uitstoot	3,1 ton/jaar	2,8 ton/jaar	32,2 ton/jaar	-
Aandachtspunt					geluid

Total investment (currently): 350 k€

Ecopower cv

.	40°C		60°C	
	Verbruik	SPF	Verbruik	SPF
Circulatiepompen	3.401 kWh		2.929 kWh	
Centrale warmtepomp	34.315 kWh	4,02	60.201 kWh	3,29
Boosters	6.593 kWh	6,12	-	-
Totaal	44.310 kWh	4,54	63.130 kWh	3,13

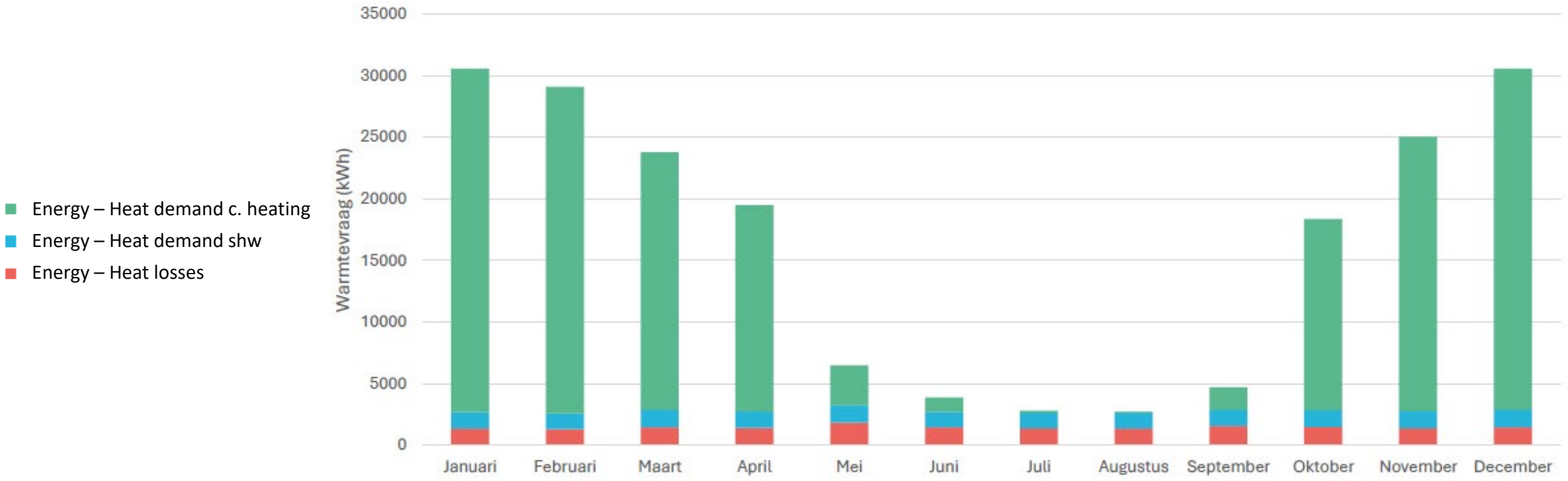
	40°C	60°C	Aardgas
Energieverbruik			
Collectief verbruik (kWh)	37.717	63.130	
Particulier verbruik (kWh)	6.593	0	
Aardgas (kWh)			150471
Totaal primaire energie (kWh)	**44.310**	**63.130**	**150.471**
Elektriciteitskost			
Collectief (EUR/jaar)	2.263,01 EUR	3.787,79 EUR	
Particulier (EUR/jaar)	1.977,92 EUR	0,00 EUR	10.533,00 EUR
Totaal (EUR/jaar)	**4.240,93 EUR**	**3.787,79 EUR**	**10.533,00 EUR**
Onderhoud/facturatie (EUR/jaar)	**1.500,00 EUR**	**1.500,00 EUR**	**650,00 EUR**

	40°C net	60°C	Individuele WP
Stookplaats			
Warmtepompen	51.255 EUR	51.255 EUR	99.879 EUR
Buffer	14.755 EUR	6.317 EUR	Nvt
Toebehoren	10.774 EUR	10.774 EUR	Nvt
Leidingnet			
PEX (district heating)	23.291 EUR	23.291 EUR	Nvt
C-staal verzinkt	10.546 EUR	10.546 EUR	Nvt
Woningen			
Installatiemateriaal	42.674 EUR	36.305 EUR	95.414 EUR
Booster/Satelliet	59.826 EUR	68.032 EUR	Nvt
Energiemeting	7.410 EUR	7.410 EUR	Nvt
Totaal	**220.531 EUR**	**213.930 EUR**	**195.293 EUR**

Heat demand vs. Heat losses 60°C

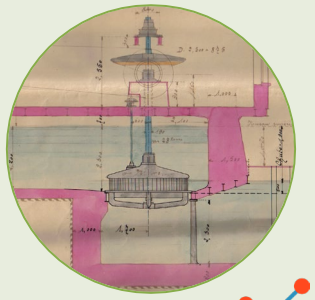
Study Van Marcke Engineering

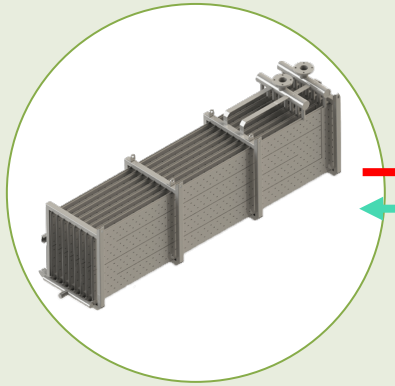
Interreg North-West Europe
Co-funded by the European Union
AquaCOM

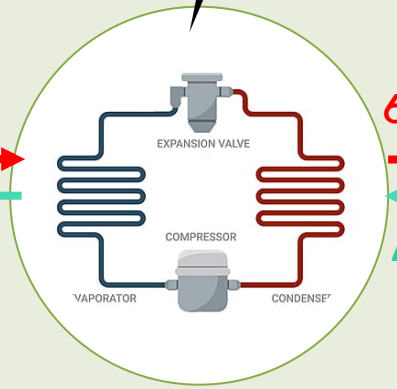


Ecopower cv

AquaCOM: Green heat at the Rotselaar Mill site

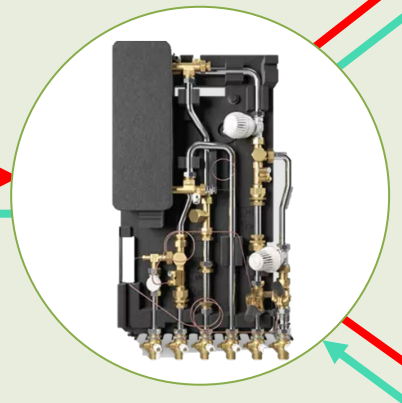






60 °C

47°C

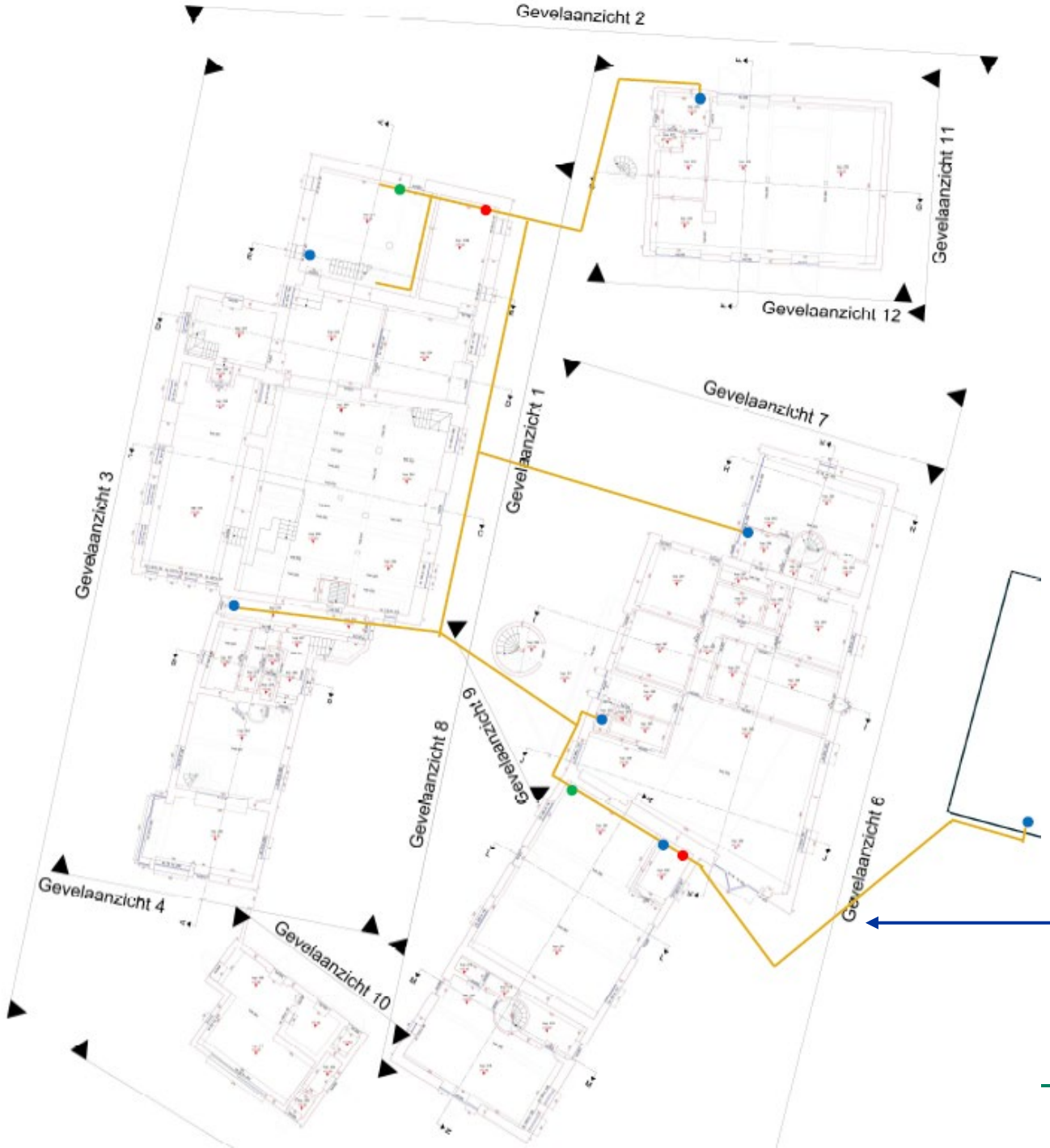


VLAAMS-BRABANT

Interreg North-West Europe

Co-funded by the European Union

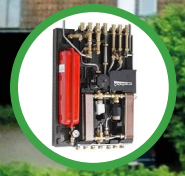
AquaCOM

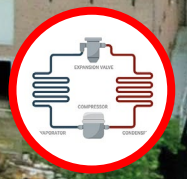


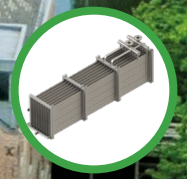
Horizontal directional drilling under Molenstraat to connect neighbours across the street

Ecopower cv

February 2025: Request for quotation for the 4 parts of the installation







VLAAMS-BRABANT

Interreg North-West Europe

Co-funded by the European Union

AquaCOM

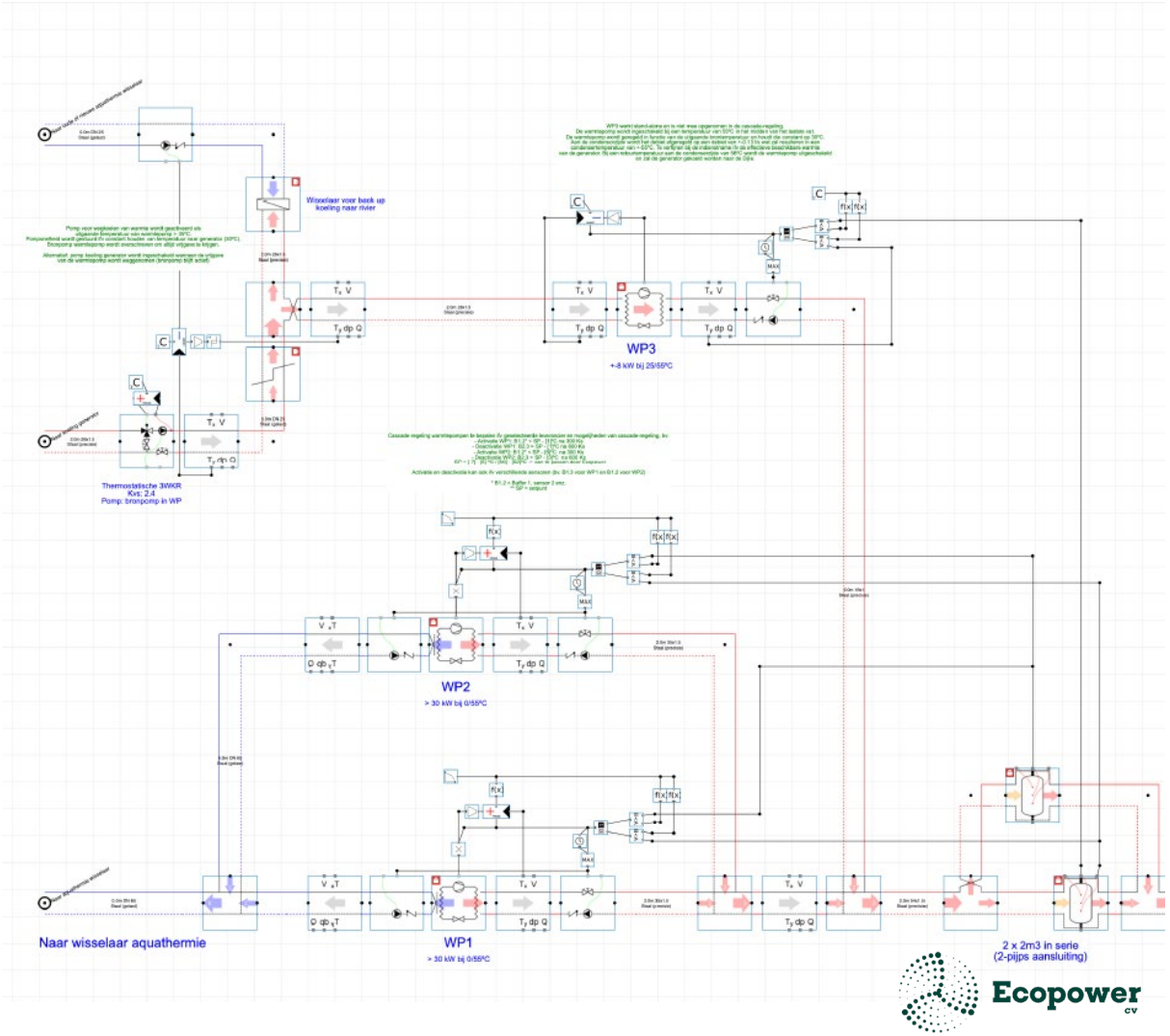
Extra study

Voxergy - Simulation with digital twin

Interreg North-West Europe
Co-funded by the European Union
AquaCOM

Tip: Partner up to get support during the dimensioning process

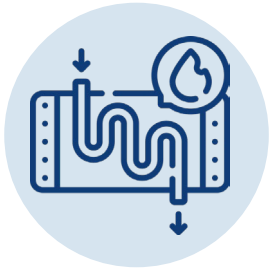
this will help optimize both CAPEX and OPEX while ensuring the installations reliability.



Ecopower cv

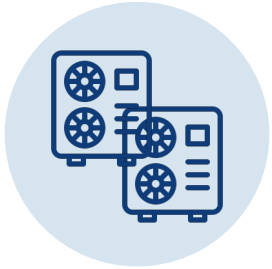
Key learnings extra study

Interreg North-West Europe
Co-funded by the European Union
AquaCOM



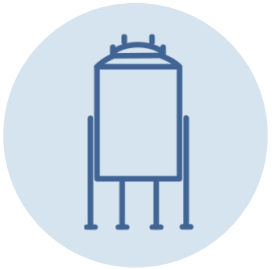
Use direct heat delivery sets

Lower T to min of 50°C

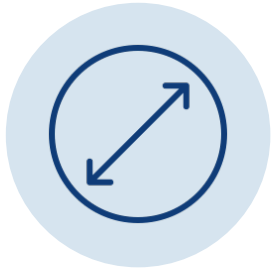


Use cascade of at least 2 heat pumps

Use R290 (propane) heat pumps



HP capacity decreases when buffer increases
6000 L buffer = 60 kW HP



Decrease heat net cross section

Ecopower cv

Ecopower as ESCO

- Project success is closely tied to active and ongoing **engagement** with residents and owners
- **Open dialogue** is crucial to building trust and transparency
- **Biannual updates and open conversations** with residents and owners
- **Feedback** on key aspects such as technology, maintenance, pricing, …
- Goal is to offer a **strong proposal** - technical as well as financial - to owners and residents

Key Learnings

- Effect on the **water temperature** is minimal
- Connecting **existing residential homes** requires a unique approach
- **Extensive analysis** required before a proposal can be offered to heat users
- Active and ongoing **engagement** with residents and owners is key to success
- In Belgium a **tax shift** is needed to make sustainable heating projects financially possible
- **In-depth analysis** (digital twin / different simulations) is needed before sending out a request for quotation
- The **feasibility** of this project is highly dependent on financial support from **Interreg NWE**.

VLAAMS-BRABANT

Interreg North-West Europe

Co-funded by the European Union

AquaCOM

THANK YOU

Ecopower cv