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North-West Europe
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AquaCOM

A Look into the World of

AquaCOM

Aquathermal Heating and Cooling for Energy Communities

2023 - 2027

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Introducing the AquaCOM project …

Aquathermal energy technologies enable the extraction of heat or cold from water – surface water from the sea, rivers, canals, lakes, etc. – and subsequent processing, through heat pumps, to support local or district heat networks.

The AquaCOM Interreg NWE project aims to empower energy communities in North-West Europe to use aquathermal energy to sustainably and efficiently heat their community. In this project, partners from Ireland, France, Belgium, the Netherlands and Germany work together. Our Irish partner Ballyhoura Development CLG is this project's coordinator. The duration of the AquaCOM project is 48 months – from July 01, 2023 to June 30, 2027.

AquaCOM is developing replicable governance and technical models for aquathermal energy and providing training and capacity building activities for energy communities. Through these activities, project partners seek to prove that aquathermal energy can be adopted on a widespread, sustainable basis.

These replicable governance and technical models are developed and tested in three pilot sites: *the watermill of Rotselaar in Belgium*, *the harbour of the island Vlieland in the Netherlands* and *the harbour city of Lorient in France*.

Introducing the AquaCOM project ...

Sixteen Early Adopter communities within North-West Europe were selected through an open call. At their own sites, these governance and technical models can be replicated after getting training and participating in the capacity building activities developed in the project.

In this magazine, the AquaCOM consortium introduces you not only to our three pilot projects, but also to the sixteen Early Adopters.

Follow the journey of our project, pilots and Early Adopters on our website (https://aquacom.nweurope.eu/), where you also can subscribe to our AquaCOM newsletter.

On social media, stay on the outlook for **#AquaCOM** and **#AquathermalEnergy**.

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PILOTS

AquaCOM is developing replicable governance and technical models for aquathermal energy. These models are developed and tested in three different pilot sites: the harbour city of Lorient in France, the watermill of Rotselaar in Belgium, and *the harbour of the island Vlieland in the Netherlands.*

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PILOT LORIENT

Situated in the Morbihan department, the Lorient pilot site is one the three pilot sites of the AquaCOM project, highlighting the potential of aquathermal energy as a sustainable heating and cooling solution. Surrounded by ocean and rivers, Lorient explores innovative low-carbon energy systems using marine surface water. Supported by SPL BER and the AquaCOM consortium, this large-scale initiative seeks to serve as a replicable model for regions with similar geographic and energy challenges.

The port of Keroman (photo credits to Lorient Agglomération).

Aquathermal initiatives and motivation

The project aligns with Lorient Agglomeration's Territorial Climate-Air-Energy Plan (PCAET), focusing on decarbonization and the integration of renewable energy. By using heat pumps to extract thermal energy from marine surface water, the project will supply this energy to the local district heating network, operated by SPL BER. This would demonstrate the scalability of aquathermal solutions and their potential to transform urban energy use.

With the expertise of the technical design office S2T, SPL BER is currently conducting a feasibility study that will evaluate the potential for aquathermal systems at four key sites:

- **An old U-boat facility**, with deep, perpetually submerged infrastructure, making it the most promising candidate.
- **A naval wet dock**, primarily supporting military maintenance.
- **A leisure port**, catering to recreational maritime activities.
- **A fishing port**, a cornerstone of Lorient's maritime economy.

This study will analyse both the technical feasibility and economic sustainability of these key sites. It will determine whether a heat-only system is a viable option, given France's electricity prices, or if combined heating and cooling solutions are required. The feasibility study restitution is due in September 2025.

PILOT LORIENT

Challenges

The Lorient pilot site aims to support regional decarbonization efforts and contribute to PCAET goals. However, several challenges must be addressed:

- **Balancing heating and cooling demand**: Ensuring both functions are optimized for a sustainable business model.
- **Economic viability**: Current electricity prices may hinder the feasibility of heat-only systems.
- **Stakeholder engagement**: Familiarizing stakeholders with aquathermal technologies and addressing perceived risks or uncertainties.

The feasibility study's results will be critical in addressing these challenges and shaping the project's direction.

Strategic vision

Lorient would like to position itself as a local pioneer in aquathermal energy innovation, leveraging its maritime heritage and location. By demonstrating the feasibility of this large-scale project, both the city and the SPL BER hope to inspire similar initiatives in neighbouring regions and meaningfully contribute to the energy transition. This project reflects Lorient's commitment to exploring sustainable, low-carbon solutions that align with its environmental and energy ambitions, even as it acknowledges the challenges and uncertainties ahead.

Pictured here is the Leisure Port of Lorient (photo credits to Lorient Agglomération).

PILOT ROTSELAAR

The watermill of Rotselaar (Belgium) is a national monument with a history dating back to the 12th century. The last renovation was done in the early 1990s. Apart from the flour mill, the complex now hosts a cohousing project with nine dwellings, a small-scale hydropower installation, a bakery with a wood-fired oven, a small organic farm, an organic vegetable and fruit shop and several meeting rooms. While most of the buildings are heated with fossil gas, some of the buildings are heated by burning wood, which is abundantly supplied by the river Dijle.

Pictured here is the watermill of Rotselaar (photo credits to Ecopower).

Ecopower cv, one of the largest renewable energy communities of Europe, was founded here in 1991 and owns the hydropower installation. The water turbine from 1902 produces up to 500.000 kWh of energy per year, which is inserted into the public electricity grid. This energy, along with production from wind turbines and PV installations, is supplied to more than 70.000 co-operators of Ecopower (households) across the Flemish Region. The AquaCOM project gives Ecopower the opportunity to build its first district heating project utilizing aquathermal energy. A heat exchanger will be placed in the water to extract heat from the river, which will be fed into a heat pump. The green electricity generated by the watermill will power the heat pump, raising the temperature so mill site inhabitants can enjoy 100% green heat. Because of the limited required capacity and the ease of maintenance, a closed loop system was chosen, where a heat exchanger is placed in the river. This heat exchanger will be installed just behind the existing trash rack cleaner that filters debris from the water before it enters the hydropower installation. Additionally, a decision had to be made regarding the temperature regime of the heating network. One option was to choose a low-temperature heating network with a booster heat pump for each dwelling. However, since it concerns the heating of existing buildings that require a higher temperature, and because not all households have space for a booster heat pump, it was decided to install a single central heat pump that will supply the heating network with 55°C.

PILOT ROTSELAAR

This allows residents to directly heat their homes and produce hot water. Moreover, a 3D-scan of the mill site was conducted, and 2D-plans of all the buildings were drawn to facilitate the design of the heat network.

From the end of 2025 onwards, the mill site's residents will be able to enjoy 100% sustainable heating. The integration of the aquathermal energy system, along with the central heat pump powered by the hydropower installation, will ensure green and efficient heating for the entire complex. This transition will not only reduce the carbon footprint of the community but also showcase the viability of renewable energy solutions in historic and residential settings.

Community engagement

As the mill site inhabitants will be the end users of the aquathermal heating installation, it is essential to keep them well-informed and actively involved in the decision-making process. To ensure the success of the project, regular dialogue sessions are scheduled to update the inhabitants of the co-housing project and receive their feedback on our plans.

During the Mill festivities in August 2024, around 1,500 visitors and members of the press were provided with detailed information about aquathermal energy. Throughout the event, informative displays and interactive activities were set up, allowing attendees to explore and learn about this innovative technology. People from all over the Flemish region attended the festival to learn more about aquathermal energy.

Mill festivities in August 2024

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PILOT VLIELAND

The harbour area on Vlieland faces several challenges that have driven the exploration of a sustainable heat concept. In 2020, microbial corrosion was discovered as a cause of dam wall deterioration, necessitating restoration of the dam in the coming years. Additionally, the urgency to transition away from natural gas by 2050, as set by local climate targets, has increased due to rising energy costs.

The idea was developed by the Municipality of Vlieland, the Vlieland Energy Cooperative and the Vlieland Harbor Foundation. The initiative is part of a broader ambition outlined in Vlieland's Heat Transition Vision to make the island energy neutral. The proposed energy concept involves installing energy-generating dam walls and integrating thermal solar energy, wastewater heat recovery and a smart grid. Divided into three phases, the project would cover various buildings within the harbour area and potentially extend to the nearby town of Oost-Vlieland.

Promising opportunities

The pilot on Vlieland presents several promising opportunities:

- **Sustainable heat generation**: By integrating energy-generating dam walls, solar thermal collectors and wastewater heat recovery, the project can significantly reduce dependence on natural gas, aligning with Vlieland's energy goals.
- **Innovative funding**: The Waddenfonds may cover up to 90% of eligible costs, lowering financial risk and improving the project's viability.

Dam wall with microbial corrosion.

- **Smart Grid development**: Implementing a smart heat network allows for efficient heat distribution, which is optimized across a variety of demand levels and prioritizes renewable energy sources.
- **Local collaboration and replicability**: The project's collaborative approach and technical design could serve as a model for similar initiatives in the Wadden region, which faces comparable sustainability and energy challenges.

Challenges

Despite the potential for success, the project also faces technical and financial challenges:

- **High initial costs**: The required investment is substantial, even with added subsidies. Securing low-interest funding is essential, as higher borrowing costs could affect financial sustainability.

PILOT VLIELAND

- **Technology dependence**: The effectiveness of energy-producing dam walls and heat storage facilities remains to be proven on a larger scale, especially in maritime environments.
- **User participation and demand uncertainty**: Phase 3 relies on a significant portion of Oost-Vlieland residents joining the heat network, which might not materialize. Lower user participation could impact cost recovery and the network's efficiency.
- **Seasonal demand variations**: Variability in heat demand and renewable heat generation means that storage solutions are critical to managing supply effectively. Ensuring efficient heat storage for year-round use remains a priority.

The heat concept is technically and financially viable, especially with phased implementation allowing for adjustments based on early-stage findings. While the initial phases show strong potential for cost recovery, the extended payback period of Phase 3, expected around 20 years, underscores the need for secure financing and robust user engagement strategies. Overall, the project could mark a significant step toward Vlieland's sustainable energy future, if managed effectively.

Pictured below is the harbour of Vlieland.

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EARLY ADOPTERS

AquaCOM is providing training and capacity building activities for energy communities. Sixteen Early Adopter communities were selected, where the governance and technical models for aquathermal energy can be replicated after participation in the training and activities.

EIGEN WARMTE BALK

Balk is a village in the water-rich southwest of the province of Friesland. Energie Coöperatie Gaasterland took the initiative in 2021 to develop, realize and manage a 70-degree heat network for the 1,400 older residences in the centre of the village. Here, local direction and control in both the development and operation phases is the starting point. Aquathermal energy from the Luts river and industrial residual heat are the sources for the heat network. The newer residences on the outskirts of Balk have sufficient insulation to become natural gas-free by switching to an individual heat pump.

The cooperative is working closely with the municipality of De Fryske Marren, housing corporation Dynhus (owner of 600 homes in the planning area), AVK Plastics (supplier of residual heat), local interest Balk Vooruit and entrepreneurs' association Eigen Haard / De Stikke. Funds for the development phase are acquired through a municipal subsidy (for the first three years) and a loan from the national Development Fund Heat for the years after. Eigen Warmte Balk is the second project in the Netherlands to receive such a loan. A project team of four experts from the village is developing the project, with external expertise being hired if necessary. Residents of Balk are closely involved in the project through meetings, a six-weekly digital newsletter, an annual newspaper, the project's website and other social media. 17 volunteers form a feedback group for the project team and contribute ideas in smaller groups on subtopics such as the organization of a heat company, technology and communication and participation. The sketch design for the heat network is ready and we are now working on a tender to get to a preliminary design.

The opening of our information point; the alderman virtually turns off the gas supply along with the future generation we are doing it all for.

EIGEN WARMTE BALK

Motivation for the project

Our aim is to become natural gas free and CO2 neutral as a village by 2030. In addition, the socio-economic factor also plays a role. Research shows that in Balk, 10% of the inhabitants suffer from energy poverty. The homes in the heat grid area are all older and poorly insulated. A heat network is the only viable option here to become natural gas-free, because an individual heat pump combined with the necessary insulation is unaffordable. If our project fails, the basis for a heat network will disappear. Some individuals will then choose another solution, but those who cannot afford it will be left with the risks of unstable and high natural gas prices.

In short, our ambition is to offer residents in the heat grid area a sustainable alternative before 2030. Additionally, as a project group it is very rewarding to take on such a challenging project for the village. It shows how much knowledge there is within the village! This knowledge is also necessary, because the project is complex and entails technical, financial, organizational, communicative and legal aspects.

Challenges

Balk is one of the first villages to develop a heat grid. This is difficult because the heat demand per hectare is lower than in urban areas. A good business case with good heat rates for residents is key. Also, we need to find enough homeowners to connect to the heat grid. One-on-one conversations with homeowners are crucial to properly convey what switching to a heat grid will mean for them.

Regarding aquathermal energy, a challenge is that our river has no specific flow direction. It changes depending on what is desirable in terms of water management at the time. This creates a challenge in terms of inlet and outlet of aquathermal energy.

Pictured here is the river Luts, which will be an aquathermal energy source for this project.

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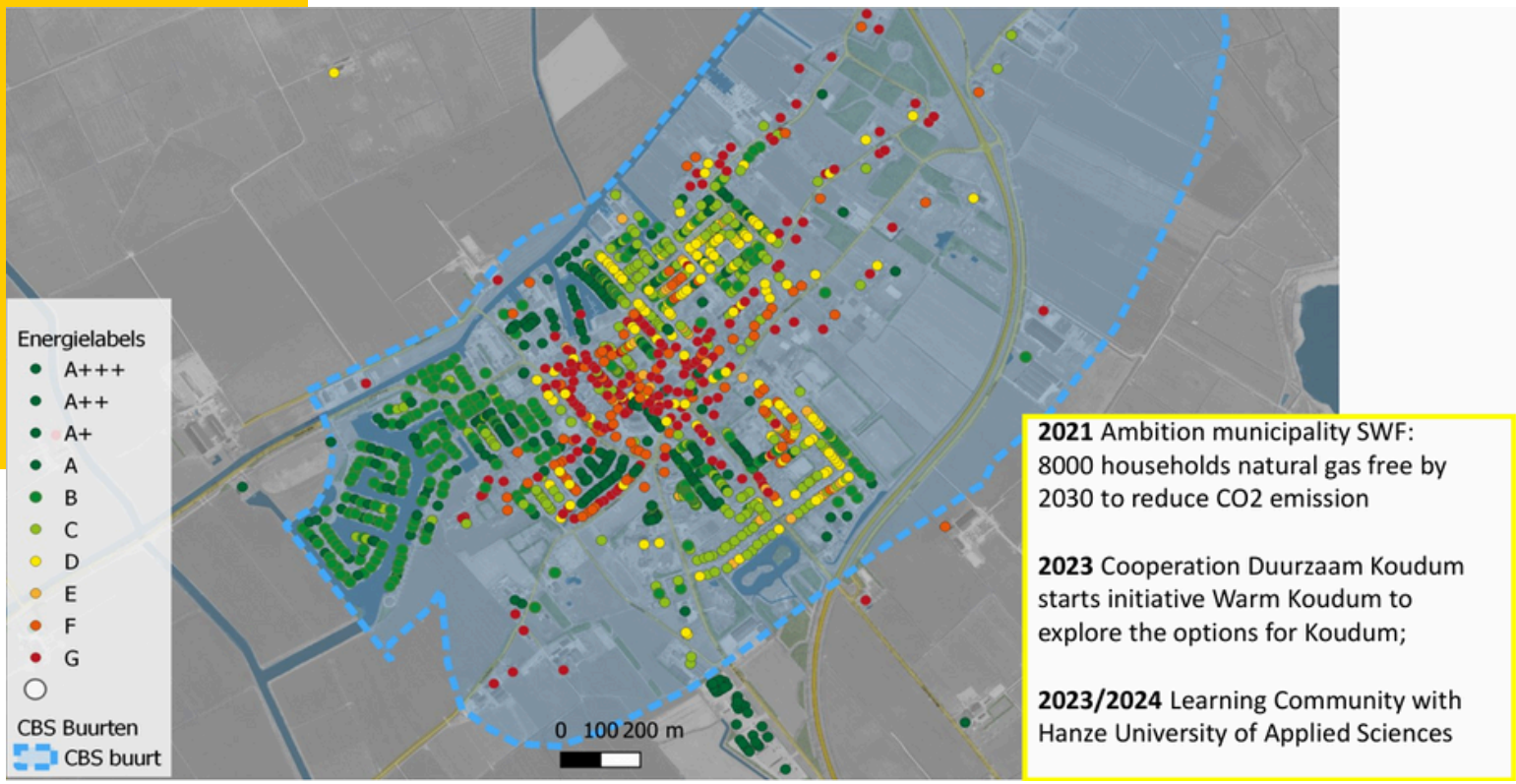
WARM KOUDUM

Koudum is a small village (with approximately 2575 inhabitants) in Fryslân, The Netherlands, that is located in between several lakes and the Ijsselmeer lake. Warm Koudum, our working group focused on sustainable energy use, is working towards a fossil free, sustainable, and affordable way to heat our village. A group of initiators from the village is working closely with the municipality of Súdwest-Fryslân (SWF) and the Hanze University of Applied Sciences to explore different options to achieve this goal. Koudum is a small village located in the south-west of the province of Fryslân in a rural area with an abundance of lakes and canals. Therefore, using aquathermal energy seems like an excellent heating opportunity.

Combining this method with locally produced green gas and solar/wind energy sourcing heat pumps is a strategy that would allow us to make the most of the locally available resources.

We are looking into a collective heat grid solution for the central part of the village, where the buildings are closely spaced. These buildings and households generally have ineffective insulation and have a lower energy label, as can be seen on the map below. Next to this, we anticipate that an individual heating solution like an all-electric heat pump will be a more attractive solution for the better insulated houses at the edges of the village.



Map of Koudum with the energy labels of the residences.

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WARM KOUDUM

Motivation for the project

There are many reasons to want to reduce the use of fossil fuels: whether it is the desire to reduce our exposure to steep and uncontrolled gas price fluctuations or to reduce our CO2 emissions and slow down climate change or to become more energy self-sufficient. One thing is for sure: our energy system will have to change in the coming decades. This is something we feel is important to take ownership of, to have a say in shaping the future of our village.

The Koudumer Var, one of the possible aquathermal energy sources.

Challenges

The realization of a district heating grid does not happen overnight. It takes careful assessment to select the optimal energy mix. A solid business case that will provide houses and businesses with an affordable heating solution is important, so nobody gets left behind. One of the challenges is that there are very few working examples nearby for people to see the clear benefits. Political shifts, legal and policy changes provide an unstable investment climate and often make people prefer to wait until there is more stability and clarity. The challenges we foresee are many and come from various areas. These areas range from technical topics e.g. *"Can we harvest sufficient heat from the local waterways to heat the village? Should we include a seasonal water storage? How can we design the grid to have the least amount of energy loss?"* to operational questions e.g. *"Who could build the system?"* and financial inquiries *"How can we finance the project? How can we inform the people and come up with an attractive offer so they can make a choice in time?"* Additionally, once the new system is in place, more questions pop up. For example, *"How can we ensure that everything will run smoothly and that the system will provide sufficient heat on even the coldest winter days?"* Let's say there is more than enough work for us to do in the coming years!

ENERGIEK REAHÛS

Pictured here is the old type of wind turbine that will be replaced to suit the new plans.

Reahûs has been exploring sustainable energy for a long time. More than twenty-five years ago a proud population, of around 200 inhabitants of this small village, in the middle of the so called 'meadows area' of Fryslân, erected a wind turbine. This turbine generated not only green energy but also a small amount of money for the yearly summer party.

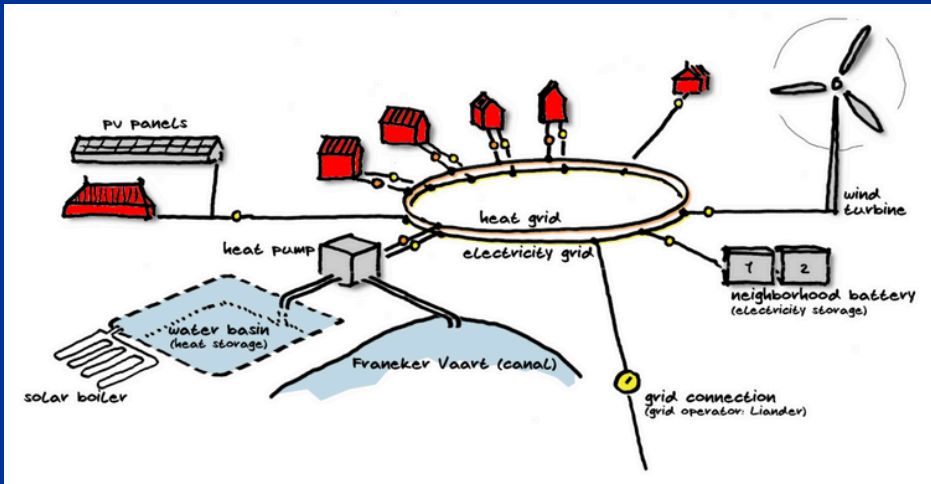
A few years ago, when this turbine reached the end of its operational life. When the energy cooperative of Reahûs were considering the replacement of the wind turbine they saw an opportunity to develop a broader plan to make the village energy independent, an 'energetic island'.

The cooperative recognizes that transitioning away from the natural gas grid would require improvements to the electricity infrastructure e.g. that the grid operator should not prioritise an 8 km cable for only 60 houses, Energiek Reahûs created a Plan of Approach to come up with a feasible and acceptable strategy for the residents of Reahûs to transition to a natural gas-free village. Within this strategy, a balance would have to be found in important factors such as affordability, reliability, sustainability, independence (in price and availability), spatial fit and timely feasibility, because these interests of the residents will always come first.

A great opportunity was seen in natural resources in the direct environment. A new, much larger wind turbine combined with solar panels could generate electricity and a central heat pump could extract heat from the canal 'Franeker Vaart', which runs next to the village. This canal is used as the highway for the transportation of cow milk to the factory in the city.

ENERGIEK REAHÛS

To investigate this opportunity, an idea was launched with aquathermal energy as the main heat source. An underground heat storage tank will be mainly filled with heat during periods of low electricity prices, which will occur mainly in summer when sun and wind will be highly available. During winter times, a heat grid can distribute the heat to the houses in the village. The houses situated further from the village may use the electricity to feed their own heat pump.



Visualisation of the idea for a new and sustainable way of heating for the entire village.

Collaboration

The inhabitants of Reahûs have been involved in the process since the start. An early survey which asked every household for their annual energy expenditure supported the idea of keeping this large sum of money available for our own collective energy solution. Because it is crucial for this plan to have the new wind turbine established, the workgroup has been focusing on this step first. It is up to the inhabitants to make a choice out of two locations of which the workgroup has investigated all the possibilities in advance. Involving the citizens of Reahûs is the way to move forward and find out what heat solution (or which combination of solutions) suits them the best. Because of the advantages of a collective system, such as a heat grid fuelled by aquathermal energy, the workgroup aims to make a proposal for the inhabitants for a competitive heat grid connection compared to any alternative.

Additionally, recently a connection has been found with the very similar village called Tirns, which is situated nearby along the canal. The intention now is to continue to work jointly on a sustainable solution for future energy.

GLENSTAL ABBEY

Glenstal Abbey Sustainable Energy Community (SEC) comprises the monastic community (27 monks), the school community (205 students), campus staff (100 employees) and a transient population of resident guests (12 per day). The SEC's work has been inspired by the Laudato Si encyclical of Pope Francis, published in 2015. The SEC published an Energy Master Plan in February 2023, which comprised a baseline energy audit, showing the proportion of energy use, between gasoil (50%), electricity (29%), LPG (16%) and auto diesel (4%). This plan also includes a register of opportunities, where past and current initiatives are listed. Examples of these initiatives include a wind turbine project (started in 2008 and re-examined in 2022) and a feasibility study for a solar farm.

The western half of the Abbey cloister was restored in 2005, and underfloor heating was installed. The church was renovated in 2006 and also has underfloor heating. The monastery library was built in 2000. These three buildings were selected for a new district heating system supplied by the heat from the water in the lake. The first system, installed in 2006, pumped the water up from the lake to the plant room, which included the heat exchanger and the water source heat pump. The pumping of the water up a steep gradient from 111 to 124 meters above sea level over a distance of 173m gave a COP of 1.5. This system was changed in 2016; the heat exchanger was relocated to the lake. This greatly simplified the pipe work in the plant room and led to a much higher operating efficiency, with a seasonal COP of 5.45.

Glenstal Abbey

Challenges

Challenges include optimising/minimising our heat demand. The castle building recently underwent a large renovation of the windows, stonework, battlements and walls. The school buildings have also been renovated and insulated in the past years. We hope these buildings might be supplied by an extension of the current aquathermal system.

Another challenge is how to source more heat from the water in the lake for the campus buildings. The lake is a fixed body of water of 2,357.97m^2, with a variable depth. The flow through the lake is constant for most of the year but can reduce in summer.

The Quickscan was used to estimate the potential of the lake to provide heat. Currently, the lake is providing 25% of the campus heating needs, but only 5% of the

GLENSTAL ABBEY

Campus energy demand. We aim to increase the coverage to possibly 50%.

Presented here are the Quickscan results.

	Flow – 0 m3/s	Flow – 0.5m3/s
Heat Demand	10,539 GJ/Year	10,539GJ/Year
Heat Production	6,507 GJ/Year	1,592 GJ/Year

We also might consider bioglycol, a relatively new but promising technology, because it would be safer to use even in the absence of significant aquatic species. In addition, the campus does not extend to the watershed and water quality is heavily dependent on neighbouring farmers. Above the lake is a Special Area of Conservation for the Killarney fern and it is proposed to designate the area around the lake a Natural Heritage Area.

Furthermore, we debate the cutting of trees in the area. Some trees have recently been planted along the lake and pose a hazard, as they could fall into the heat exchanger coils and cause damage and leaks. Also, their foliage could reduce the solar radiation reaching the lake.

The lake, surrounded by trees.

Future plans

Next steps for our project include:

- Performing a Building Energy Rating on the castle and school buildings in spring 2025 along with a Mechanical and Electrical Assessment following completion of the current retrofits. This will help determine the heat demand for these buildings.
- Quantifying the additional heat that the lake can produce. More accurate measurements of the size of the lake and the flow rate are required.
- Considering options for connection to the district heating system for the school and castle. Currently they operate with two separate plants. The possibility of connecting the systems should be considered.
- Making a new connection with the school buildings for the placement of a heat exchanger in the lake.

SYNERGY CREDIT UNION

Synergy Credit Union Sustainable Energy Community is based in North Cork and is adjacent to the River Blackwater in Fermoy and the River Lee in Cork City. They serve a community of over 20,000 members in North Cork and 2,500 members in Cork City. This large and engaged membership base provides a strong foundation for collective energy initiatives, ensuring widespread community support and participation.

Located on the River Blackwater, Fermoy is a lively market town. Its charm lies in its historic architecture and natural beauty. Beyond its scenic appeal, Fermoy has a rich history that now intersects with an ambitious drive towards renewable energy.

Fermoy's ties to the River Blackwater trace back 800 years to when Cistercian monks built the Sancta Maria de Castro Dei abbey at Ashe Quay. Utilising the river's power through a weir, they laid the foundation for an energy-efficient legacy. In 1791, Scottish entrepreneur John Anderson purchased the site, revitalised the weir and established an industrial hub powered by the Blackwater. Anderson's efforts reflected a balance of industry and ecology, exemplified by a fish pass to help salmon navigate the river. Today, the river remains a draw for anglers and tourists, contributing to Fermoy's identity as a riverside community, blending heritage with recreation.

Motivation for the project

In 2022, Synergy Credit Union's Climate Change Committee formed a Sustainable Energy Community (SEC), which enabled them to engage with local stakeholders such as community groups, businesses, residents and farmers in the area. The SEC commissioned an Energy Master Plan (EMP) to guide local renewable initiatives. Currently, 68% of Fermoy's energy is grid-supplied, with only 26% from renewables, while fossil fuels, including coal and peat, constitute 15% of the mix.

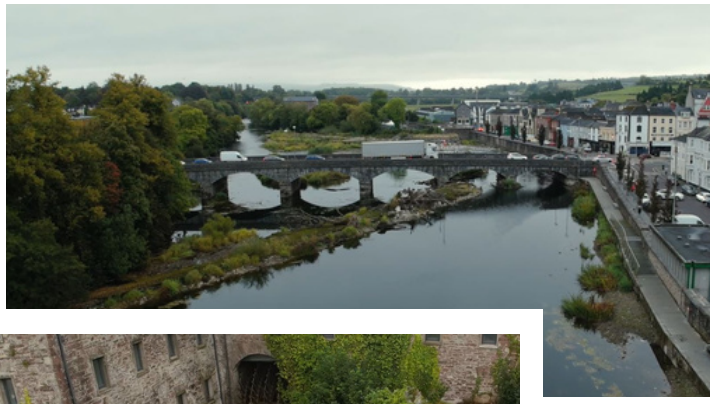
The EMP proposes innovative solutions, including using aquathermal energy from

The lively town of Fermoy and its weir.

SYNERGY CREDIT UNION

the Blackwater to power a district heating system. This network could link 80 properties —homes, businesses, and Fermoy's primary healthcare centre—providing eco-friendly, cost-effective heating and reducing CO2 emissions by 580 tonnes per year.

A key aim in Fermoy's energy vision is restoring the old mill on Mill Island. Once powered by the Blackwater, the mill now houses a primary healthcare centre, although the original mill wheel and channels remain intact and will require extensive work. Revitalizing the mill could attract locals and tourists by showcasing the town's history and its commitment to sustainability.



A closer look at the mill and weir of Fermoy.

Challenges

This vision faces challenges, primarily the deteriorating condition of the weir, which needs restoration to facilitate the aquathermal and hydropower initiatives. Although design and planning are complete, funding is still required for this project. Environmental considerations are also key, as the project must respect the river's ecological health and the interests of stakeholders such as Waterways Ireland, Inland Fisheries Ireland, the Environmental Protection Agency and local angling and fishing groups. To address these challenges, the SEC Committee is collaborating with Cork County Council, Ballyhoura Development and others to advocate for funding as well as resources. This renewable energy initiative offers a model for other Irish towns with natural resources. By aligning with Ireland's climate goals, Fermoy will demonstrate how rural areas can contribute to the national push towards a low-carbon future. Its blend of tradition and innovation, shown through the restoration of the mill and the pursuit of hydropower and aquathermal projects, will set a progressive example for sustainable development. Through this work, Fermoy embodies resilience and vision, inspiring other towns to explore sustainable energy solutions within their unique local contexts.

"A Model for Rural Ireland."

CROOM COMMUNITY DEVELOPMENT ASSOCIATION

Croom is a small town in the county Limerick, Ireland. The Croom Community Development Association (CCDA) has registered as a Sustainable Energy Community (SEC) with the Sustainable Energy Authority of Ireland (SEAI). Through this programme, the CCDA is seeking to quantify the carbon emissions of the town and establish the breakdown of fuel used. CCDA is assessing the benefits of commissioning an Energy Master Plan to establish an implementable plan to reduce carbon emissions of the town.

The CCDA is aware that the residential space and water heating contribute significantly to the town's carbon emissions. Croom has approximately 1.200 residents, with many of the houses being older stock, inadequately insulated and using kerosene for heating. Knowing that this will be an area of large interest for the Energy Master Plan, the CCDA is keen to explore innovative methods of efficiently heating homes using low carbon technology. With that in mind, becoming an Early Adopter for the AquaCOM project was a perfect fit.

The town lies on the banks of the river Maigue, with many homes next to or near the river itself. This makes it a compelling candidate for community heating using aquathermal energy. For example, there is a housing estate (with 44 houses) adjacent to the river on the edge of the town. Due to their close proximity to the river, these houses could be a great location for an aquathermal energy fuelled district heating project.

The town has used energy from the river Maigue in previous generations, which is evident from the two old mills directly across from each other. Unfortunately, one of the mills is derelict. However, the building attached to the second mill is used to this day by the local Family Resources Centre, although the mill itself is not operational anymore.

The river Maigue.

At this stage, CCDA is looking at the feasibility of using aquathermal energy as part of the town Sustainability Plan. Recently, one of the CCDA members, Sybren Oggel, travelled to the Netherlands to meet the AquaCOM partners and other Early Adopters. Sybren spent three days exploring the viability of this technology for Croom.

CROOM COMMUNITY DEVELOPMENT ASSOCIATION

Sybren presenting during the meet-up in Vlieland, the Netherlands.

Challenges

Initial calculations have shown that despite significant fluctuations in water level and temperature, the river is sufficient to support the heat demand of the town. Aquathermal energy and district heating are not commonplace in Ireland yet, so the technical input from EXTRAQT, one of AquaCOM's partners, has been very valuable. It is believed that, should this project be successful, the town can harvest energy from the river once again. However, this project would need to be feasible, practical and cost-effective. With that in mind, some barriers that require further investigation as the AquaCOM project moves forward include:

- **Biodiversity**: The Maigue river is rich in biodiversity and has salmon migrating upstream every year. Careful attention will need to be given to any environmental impact an aquathermal project might have on the river.
- **Disruption to the town**: The impact of digging up roads in the town in order to lay pipes as well as connection to each house still needs to be considered.
- **Community engagement**: This kind of project will require complete buy-in into the project by the residents. When the time is right, CCDA will be including the community through public consultation.
- **Additional works**: The buildings close enough to the river to avail of aquathermal energy are older stock homes and would require retrofitting to improve the insulation levels and energy efficiency. Although there is a robust retrofitting industry and decent grants to undertake these measures, a cost-benefit analysis would need to be undertaken to ensure this heating method is as cost effective or more than other low carbon heating methods.

CCDA is very excited to continue working with the AquaCOM team on this project and hopes that Croom could be one of the first communities in Ireland to implement this technology.

THE KYLEMORE TRUST

Kylemore Abbey is a monastic estate and visitor attraction located in Connemara, Ireland. Originally built in the 1860s as Kylemore Castle, in 1920 it became home to a community of Benedictine of Nuns (*The Irish Dames of Ypres*) who fled Belgium when their monastery was destroyed during World War 1. They established the Estate as a girls' school and Benedictine monastery.

Due to changing social patterns, Kylemore Abbey School closed in 2010. Looking to the future, the Benedictine community prioritised heritage, hospitality and education - restoring the estate; creating successful artisan craft and tourism enterprises; and establishing a partnership with the University of Notre Dame, allowing students and faculty to pursue academic activities at Kylemore Abbey.

Lithograph of the Abbey.

Today, Kylemore Abbey is owned by The Kylemore Trust, a registered charity. It is one of Ireland's most beloved heritage attractions, welcoming over half a million visitors each year. At its heart is a new purpose-built monastery for the growing community of Benedictine of nuns. As stewards and custodians of this place, The Kylemore Trust, led by the Benedictine nuns, has as one of its central tenets the protection, preservation and promotion of the beauty and unique biodiversity of the estate, as enshrined in its charitable objectives. The aim is to make Kylemore an exemplar of conservation and biodiversity in action, and a national leader in sustainable tourism.

Kylemore Abbey is a major engine of the economy, directly employing 120 staff and generating 1.200 indirect jobs in one of the most socio-economically disadvantaged areas in the West of Ireland. A recent Economic Impact Study (2019) confirmed that Kylemore's activity is worth over €60M to the local economy.

Motivation for the project

In 2020, using the UN Sustainable Development Goals (SDGs) as a framework, the Kylemore Trust launched a Sustainability Plan. The plan focuses on 8 of the 17 SDGs: P*artnership for the Goals*, *Good Health and Wellbeing*, *Clean Water and Sanitation*, *Affordable and Clean Energy*, *Climate Action*, *Life on Land*, *Decent Work and Economic Growth* & *Responsible Production and Consumption*. Key deliverables include finding innovative ways to reduce waste and carbon emissions, and to support and enhance biodiversity of the Estate, while ensuring sustainable visitor and education activity can flourish.

Kylemore Castle's associated building stock is Victorian in design with poor insulation levels – something which offers challenges

THE KYLEMORE TRUST

when using heat pumps. In addition to the Abbey, there are multiple other buildings on the Estate, including the new monastery, education & retreat centre (2024), café & craft shop, and a garden tea house developed in the 1980s and '90s. It is worth noting that the Victorian builders used innovative solutions and the latest technology of the period to address local challenges, such as micro-hydroelectric generation, water conservation, heated glasshouses and other strategies to be self-sufficient and environmentally aware.

Presently, Kylemore Trust is working on a Masterplan that will guide development over the next 20 years. It will look at selective retrofitting, development of new passive energy buildings, and a range of sustainable energy needs in context. Thus, the AquaCOM project is both a timely and transformational opportunity for Kylemore Abbey.

Liz McConnell is The Trust's Executive Director. Encouraged by colleagues at closeby Glenstal Abbey, Liz and her team are exploring how aquathermal energy can be optimised beneficially at Kylemore. Liz travelled to The Netherlands to meet AquaCOM partners and other Early Adopters and to learn and explore the viability of this technology. Initial calculations have shown that the lake would have the capacity to be a substantial heat source. The Kylemore Trust will continue to work with the project's partners to establish what is technically possible, financially feasible and most importantly for the Abbey, environmentally friendly.

The Trust aims to lead the way for Irish tourist sites who share Kylemore's commitment to sustainable tourism by reducing carbon emissions through aquathermal energy. The Trust believes that sharing details of an aquathermal project with over 500,000 annual visitors is a way to raise awareness and promote the possibilities of aquathermal energy for all. The Kylemore Trust is excited to work with the AquaCOM team these next years and hopes that Kylemore Abbey can be one of the first tourism sites in Ireland to implement this technology.

AURAY QUIBERON TERRE ATLANTIQUE

Auray Quiberon Terre Atlantique (AQTA) is a community of 24 municipalities founded in 2014 with a mission to promote sustainable development in the region. AQTA is actively developing renewable energy projects in alignment with its Territorial Climate, Air, and Energy Plan (PCAET), adopted in 2020. Today, 27 energy audits, 9 renewable feasibility studies, 5 renewable energy projects and several wood-energy heating networks have been carried out since this pact was signed. Our future ambition is to develop aquathermal energy in the area.

Currently, we do not have a specific aquathermal project in development, though several of our municipalities are situated along the Atlantic coast and near the Sal and Loc'h rivers. We are aware of both the energy needs and the resources available, making aquathermal technology a promising consideration for our community.

Motivation for the project

As an Early Adopter, we are very interested in exploring the potential of aquathermal energy and gaining insights into what could be achieved through this technology. We believe that opting for an affordable, sustainable, local, and low-carbon energy source is key to achieving our climate goals. By the end of our partnership, we aim to position aquathermal energy as a choice for our stakeholders to help decarbonize our buildings.

Pictured here is a delegation of the AQTA team.

AURAY QUIBERON TERRE ATLANTIQUE

Challenges

We are currently establishing a “Local Public Company” to lead our renewable and district heating projects. We hope this creation process will go smoothly.

However, we anticipate resistance from stakeholders who may be hesitant to adopt aquathermal energy due to unfamiliarity or perceived risks.

Be that as it may, we feel confident that we can overcome this challenge. Our objective is to be well-prepared to present the advantages and potential risks of this technology, allowing us to confidently advocate for aquathermal energy as a viable and promising heating solution.

The area where the Auray Quiberon Terre Atlantique community is located.

“WITH THE SUPPORT OF AQUACOM'S PARTNERS, WE BELIEVE WE CAN FACILITATE MORE PRODUCTIVE DISCUSSIONS AROUND AQUATHERMAL ENERGY.”

MORBIHAN COUNCIL

Conseil Départemental du Morbihan is a member of the AMORCE association: France's leading network for information, experience-sharing and support for local authorities and players in the fields of energy transition, local waste management, the circular economy and sustainable water management.

The House of the Department Morbihan.

Motivation for the project

The departmental council has already implemented renewable energy projects with wood, solar and geothermal pumps on its buildings. The Morbihan department currently has no finalized plans for an aquathermal project, but we are considering installing an aquathermal energy system in one of our buildings in the near future. Potential sites identified include a high school, offices and/or a cultural centre. Several of these sites (at least four) are located adjacent to either a pond or the ocean, making them prime candidates for an aquathermal solution.

Our goal is to tap into a more affordable, reliable, sustainable and low-carbon energy source to replace fuel oil or gas. We already operate a successful geothermal installation (*pictured on the next page*); however, our studies on two additional projects have revealed that drilling costs for dry-well geothermal energy are prohibitively high. Aquathermal energy could offer a viable alternative. As an Early Adopter, we are actively gathering insights on existing aquathermal solutions, completed projects and upcoming initiatives.

MORBIHAN COUNCIL

Within the next two years, we aim to identify locations within our property portfolio that are most compatible with aquathermal systems. This would allow us to systematically evaluate and consider aquathermal installations for suitable buildings.

Challenges

We do foresee some possible obstacles in the future, including regulatory approvals, particularly environmental and operational regulations. Additionally, we suspect some financial obstacles, such as the costs of specialized studies (e.g., environmental impact assessments). As for the energy costs, as long as the levelized cost of heat over time is comparable to or lower than current energy costs, we expect few barriers. However, if the overall costs prove to be significantly higher, convincing local elected representatives may become difficult, as there is currently no political mandate pushing in this direction. This is not to say that we won't be able to overcome these challenges.

"WE BELIEVE WE CAN SUCCEED IN RAISING AWARENESS AMONG ELECTED REPRESENTATIVES AND BUILDING INTERNAL SUPPORT TO GAIN APPROVAL FOR AN AQUATHERMAL SOLUTION."

Pictured here are the PV panels that were installed in Plescop's school.

This is the geothermal heat pump that is in place in Lorient's high school.

CITY OF LORIENT

The City of Lorient has been active within the energy transition for over thirty years. They are a member of the French association AMORCE and European city network Energy Cities. The City of Lorient has been trying to implement aquathermal energy since the conglomeration signed an ambitious environmental pact called Climate-Air-Energy-Plan (PCAET) in 2019. The community has the goal to use this technology for heating. As both the city and the conglomeration are shareholders of the Société Publique Locale Bois Energie Renouvelable (SPL BER), we asked them to implement that technology on our behalf.

For now, studies have been started in the following areas:

- Scorff-Péristyle, a 7GWh district heating grid (not suitable for environmental restrictions)
- PenHer, a 5 GWh district heating grid (not suitable for environmental restrictions)
- K3 – submarine spot, a 1 to 2 GWh local district heating and cooling grid (under study)
- Les 7 ports (the seven harbours), a 35GWh district heating and cooling grid (under study)

The City Hall of Lorient.

CITY OF LORIENT

Motivation for the project

Replacing fossil fuels in our buildings with the help of an affordable, sustainable, local, and low-carbon energy source is one of the conglomeration goals. That's why we want to look into aquathermal energy as a new opportunity, as we already have buildings supplied by wood-fired district heating as well as geothermal and solar projects for our heating needs. With the increase of heating activity in areas near water bodies, aquathermal energy is seen as a reliable and suitable alternative.

As an Early Adopter, we are excited to get insights on existing aquathermal solutions, completed projects, and upcoming initiatives. Within the next two years, we are hoping to see the SPL BER achieve our orders as well as receiving the necessary technical knowledge and skills to be able to understand the technology for ourselves. We would like to have aquathermal energy systemically be taken into account as a choice when we are considering the decarbonisation of our buildings.

"AS AN EARLY ADOPTER, WE ARE EXCITED TO GET INSIGHTS ON EXISTING AQUATHERMAL SOLUTIONS, COMPLETED PROJECTS, AND UPCOMING INITIATIVES."

Challenges

Where we stand now, we anticipate that the projects will not be politically supported by the other stakeholders, despite the fact that the city is the driving force behind them. In the case of heating networks (with or without aquathermal energy), the city of Lorient is not the only beneficiary and sometimes has to deal with other stakeholders that might not be on the same page.

We are also looking ahead to the next environmental studies, which will be crucial, as the last ones proved unsuccessful for the projects. Additionally, final costs are definitely a concern.

However, what we hope to get from our participation in this project as an Early Adopter, is that we will have a better chance to overcome some of these challenges. With the help of AquaCOM's partners, we think we can strengthen our knowledge and educate local elected representatives and decision-makers about the important decisions for our future.

CONSEIL RÉGION BRETAGNE

The Brittany region, situated in the northwest of France, comprises four departments: Ille-et-Vilaine, Morbihan, Côtes-d'Armor, and Finistère. Renowned for its stunning coastline and rich maritime heritage, Brittany is deeply committed to sustainable development. This commitment is reflected in the adoption of Territorial Climate-Air-Energy Plans (PCAETs) by our energy cooperatives. Aligned with our Regional Port Strategy (2023–2033) and broader energy transition objectives, we are pursuing initiatives that harmonize economic, energy, and environmental goals. Among these efforts is the development of aquathermal energy systems across the region.

Motivation for the project

Currently, we are conducting six feasibility studies—three centred on port areas and three on canals—to explore the potential of aquathermal energy. These projects, supported by SPL BER (the regional public company for wood and renewables) and EXTRAQT, are independent of the AquaCOM initiative. By leveraging the thermal energy of local resources such as oceans and inland waterways, we aim to position aquathermal energy as a low-carbon, sustainable solution for heating and cooling infrastructure.

Our vision aligns with that of other Early Adopters: to significantly reduce carbon emissions from buildings and infrastructure by integrating renewable technologies into Brittany's energy landscape. This strategy underscores our broader commitment to local, innovative energy solutions that benefit both stakeholders and the environment.

"WE ARE STRONGLY COMMITTED TO LOCAL, INNOVATIVE ENERGY SOLUTIONS THAT BENEFIT BOTH STAKEHOLDERS AND THE ENVIRONMENT."

However, as aquathermal technology is relatively new to us, we seek a deeper understanding of its technological, operational, and financial aspects to facilitate informed discussions with local stakeholders.

CONSEIL RÉGION BRETAGNE

Challenges

Innovation is a cornerstone of Brittany's regional energy strategy, and exploring emerging solutions is central to this vision. Yet, the adoption of novel technologies like aquathermal energy can encounter resistance from stakeholders, often due to unfamiliarity with the technology or perceived risks.

We believe that the results from our feasibility studies will provide the evidence and confidence needed to scale up aquathermal energy systems to additional sites, thereby contributing to Brittany's energy transition goals.

Supported by the AquaCOM project and leveraging regional expertise, we aim to overcome potential resistance, establish aquathermal energy as a viable solution, and ensure it plays a key role in Brittany's sustainable energy future.

Coastline of the Brittany region.

CAMPINA ENERGIE

Pictured here is the team behind Campina Energie.

Campina Energie is a citizens' cooperative in the Flemish region of Kempen that brings people together to invest in renewable energy production and to reduce dependency on fossil fuels. Since its founding in 2015, the organization has grown to 2,000 members. Through projects in wind energy, solar energy, and renewable heating, Campina Energie is already making a substantial contribution to the sustainability of energy use and supply in the region.

Campina Energie manages 62 large-scale PV projects (4,9 MWp) and holds 4,8 MW in wind projects. In terms of renewable heating, Campina Energie manages heat production for a local gym and holds shares in one of Europe's largest solar mirror installations. Campina Energie aims to further promote the decarbonization of heating and cooling and is working towards new projects in this area.

Campina Energie also offers citizen services to inform and independently support individuals with energy-efficient renovations and solar panel installations. Additionally, it applies its expertise to guide collective renovation projects in collaboration with local governments.

The returns from our projects enable us to pay a dividend to our members, support them in saving energy, invest in new initiatives, and respond to societal needs. While profit maximization isn't our primary goal, we aim to maximize the impact in terms of reducing fossil fuel dependency and building widespread support for the energy transition. Even if a project's financial yield seems modest, the benefit to the climate is significant.

Motivation for the project

Campina Energie is participating in the AquaCOM project to expand its green heat initiatives. While we have not yet gained experience with aquathermal projects, we are highly motivated to learn more about the technology and launch our first aquathermal energy project. Our region, the Kempen, has several interesting water bodies, such as the Albert Canal (Belgium's largest canal), the Dessel-Schoten Canal and the Grote and Kleine Nete rivers. All of these could offer significant potential for aquathermal energy.

The Albert Canal.

CAMPINA ENERGIE

Additionally, the Kempen region is home to numerous abbeys and castles with moats or other water bodies, which could serve as promising pilot locations for a small-scale aquathermal project. Campina Energie sees these sites as valuable opportunities to explore the potential of aquathermal energy on a small scale. Campina Energie is actively seeking a suitable site to develop an aquathermal project and hopes to leverage these local water resources to advance sustainable heating solutions.

Castle of the Dukes of Brabant in Turnhout, an example of a site with potential for aquathermal energy in the Kempen.

As part of this project, we also aim to gain valuable insights into the key parameters that influence the feasibility of aquathermal energy projects.

By understanding these factors, we will be better equipped to identify and select the most suitable sites for future initiatives.

Challenges

One of the main challenges we face when developing aquathermal energy projects in the Kempen is finding a location that combines sufficient potential in terms of the water body with a significant heat demand close by. To ensure a financially viable project, we require a site with substantial and consistent heat consumption. Ideal candidates include properties such as castles or apartment buildings situated near the water.

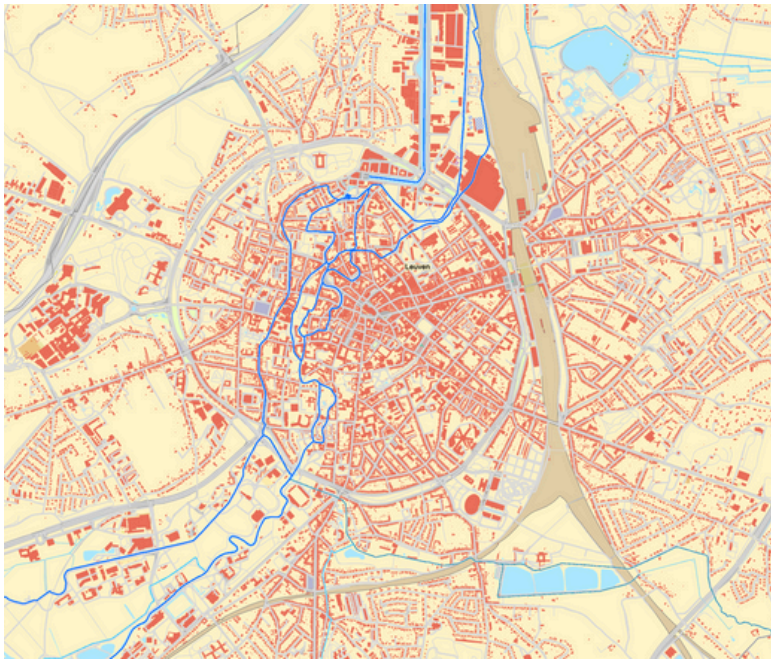
For larger-scale aquathermal energy projects, an additional challenge is the involvement of multiple stakeholders, including local governments and industrial players. Furthermore, in such cases, the heating network component often becomes larger, more complex and more expensive than the aquathermal energy system itself.

As part of the AquaCOM project, we are therefore focusing on a smaller-scale pilot project with a high likelihood of realization, aiming to demonstrate the feasibility and effectiveness of aquathermal energy in this context.

CITY OF LEUVEN

As a local government, the city of Leuven facilitates the establishment of new energy communities and supports and closely collaborates with existing energy communities. The main partner of the city is Energy Cooperation Oost-Brabant (ECoOB), a fast-growing local energy cooperative with close to 1200 members who invested in 62 PV-installations.

Both the city and ECoOB have come in contact with aquathermal technology before. The city supported a realized aquathermal energy project called "Dijlemolens". ECoOB and the city also aim to co-invest in a district heating project with multiple sources (both aquathermal and geothermal energy).



Map of Leuven.

The city of Leuven also facilitates the small communities of multi-family housings in the city's ambition to get their heat-supply fossil-free. Since the river Dyle is a main river meandering through the city, aquathermal energy is one of the main natural heat sources for thermal energy for these and other communities.

The Leuven Climate Contract.

"100 CLIMATE-NEUTRAL AND SMART CITIES BY 2030"

The city of Leuven was selected in 2022 for the EU mission '100 Climate-Neutral and Smart Cities by 2030'. The Leuven Climate Contract is the plan developed by the city of Leuven, Leuven 2030, and more than thirty key stakeholders to achieve this mission. The goal is to achieve an 80% reduction in CO2 emissions by 2030.

The transition to green heating and the renovation of apartment buildings are key focus points in this Leuven Climate Contract. In the densely built city centre, only limited 'natural' heat sources are available, with aquathermal energy being one of them.

CITY OF LEUVEN

The Dyle River flows through Leuven, and the city is currently working with ECoOB to explore the implementation of district heating networks in certain parts of the city. Many apartment buildings are also located near this river. As part of Leuven's renovation and heating strategy, the sustainable transformation of large collective heating systems of these apartment buildings represents a significant challenge.

The city of Leuven is already guiding and supporting several associations of apartment co-owners situated along or near the Dyle in their renovation ambitions. This could lead to more concrete aquathermal projects, following the example of the already completed 'Dijlemolens' community project.

Pictured here is the location of the 'Dijlemolens' community project.

Challenges

It proves to be very challenging to convince associations of apartment co-owners to work on sustainable energy solutions. The current gas-to-electricity price ratio in Belgium, factor 4, significantly hinders the shift to electric heat pump technology. Additionally, the use of a new and unfamiliar technology such as aquathermal energy deters co-owners of apartment buildings.

The flowrate of the waterbody also poses a challenge. The river Dyle has several branches meandering through the city. Not every branch has a constant flow. Thus, each possible project-case needs to be checked.

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ZUIDRANT-W

ZuidtrAnt-W was founded in October 2019 by ten members of the energy cooperative ZuidtrAnt to participate in Warmte Verzilverd bv. Through this company, we collaborate with our partners Ecopower and Kelvin Solutions to capture surplus heat from industrial processes in order to heat buildings and provide sanitary hot water.

ZuidtrAnt-W is an energy cooperative, an initiative by citizens who pool and manage funds for sustainable energy projects. These include energy-saving projects and investment projects related to renewable energy.

Our cooperators receive a dividend when profits are made. ZuidtrAnt-W is a cooperative with a social purpose, meaning that a part of our profits is invested in a social cause chosen at the annual general meeting.

ZuidtrAnt-W fully supports the ICA definition of a cooperative: "A cooperative is an autonomous organization of persons who voluntarily unite to meet their common economic, social, or cultural needs and aspirations through a jointly-owned and democratically controlled enterprise."

Warmte Verzilverd is a collaboration between the citizen cooperatives Ecopower and ZuidtrAnt-W, and the technical experts from Kelvin Solutions. This district heating system uses industrial waste heat from the Agfa-Gevaert factory in Mortsel. Agfa-Gevaert has been focusing on energy efficiency for years, but there is still a lot of untapped potential. This project makes meaningful use of the waste heat from the chimneys by capturing and transporting it.

This helps avoid the use of fossil fuels and focuses on sustainable heating. In the first phase, we focus on new residential areas and businesses in the nearby surroundings.

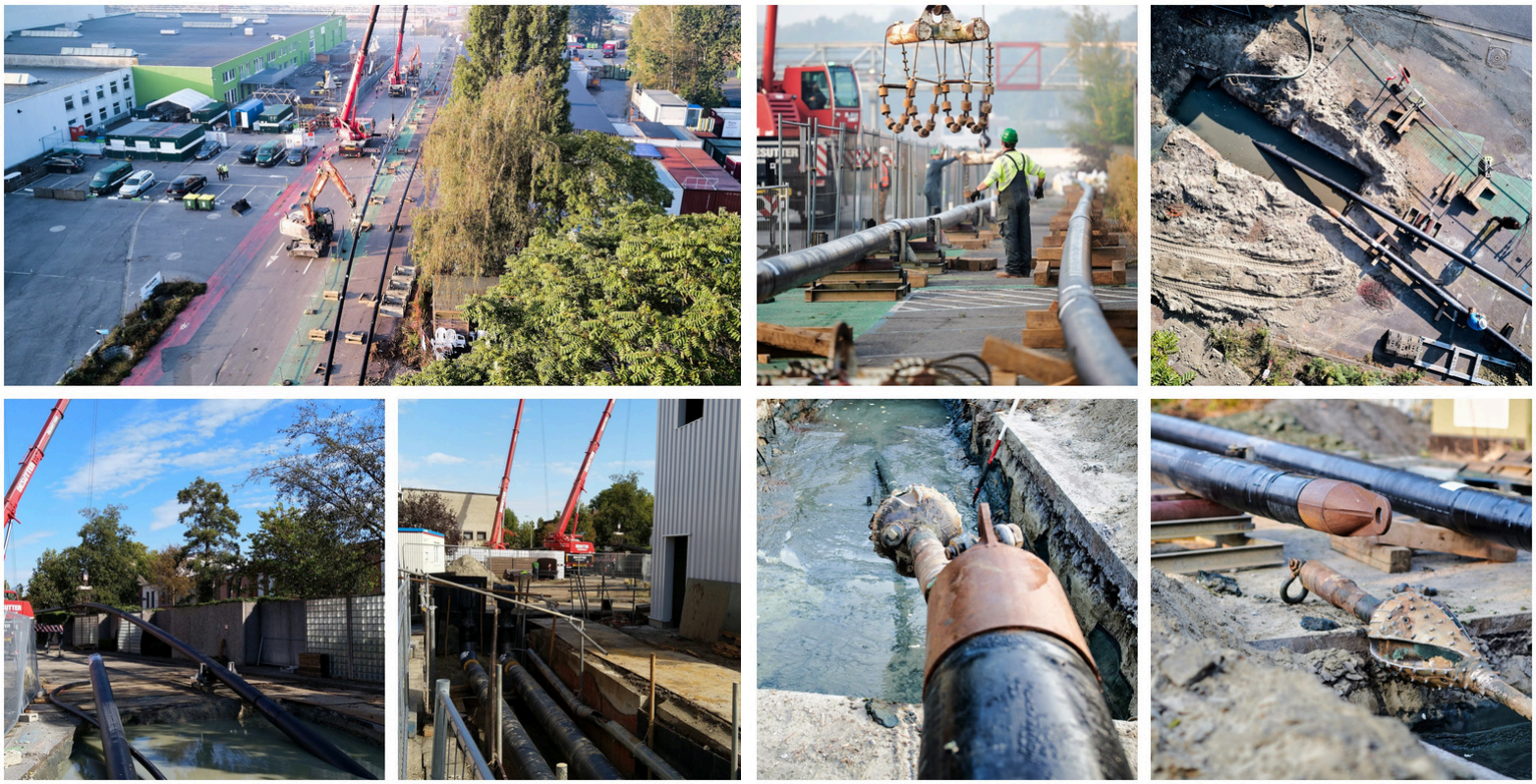
Motivation for the project

A 2015 study by VITO on residual heat potential revealed that Agfa-Gevaert generates a significant amount of residual heat in the heart of a densely populated area. At the same time, a new residential development of more than 350 homes was planned nearby. Local authorities joined forces and commissioned a detailed follow-up study, which concluded that it could be a viable project to connect these new homes, along with several SMEs, to the residual heat network.

Pictured here is the buffer tank at the Agfa-Gevaert factory in Mortsel.

ZUIDRANT-W

Local cooperatives Zuidtrant-W and Ecopower, together with the technical experts of Kelvin Solutions, decided to take action and start working on making this heat network a reality. Now, several years later, we are proud to deliver heat to approximately 200 connections through our heat network, with more connections planned in the coming years.



The construction of the heat network.

Challenges

There are two specific challenges we still face with the heat network:

- **Connecting Existing Homes**
  - Retrofitting older buildings to make them compatible with the heat network, which often involves technical and financial challenges.
  - Encouraging homeowners to transition to the heat network by highlighting the benefits and providing incentives or subsidies.
- **Exploring Alternatives if Agfa Discontinues Operations**
  - Identifying and developing alternative heat sources, like aquathermal heat, in collaboration with Waterlink.
  - Ensuring a seamless transition to new heat sources to maintain reliability and meet future demand without interruptions.

MUNICIPALITY OF WICHELEN

The Municipality of Wichelen, nestled in the heart of East Flanders, Belgium, is renowned for its picturesque landscapes, tranquil atmosphere, and rich cultural heritage. The Schelde River, a defining feature of Wichelen, flows gracefully through the municipality, offering both natural beauty and untapped potential for innovative energy solutions. Historically being a cornerstone for trade and transportation, today the river continues to serve as a vital asset, enhancing the region's recreational and environmental value.

Wichelen's geographical location makes it well-suited to harness aquathermal energy from the Schelde. This sustainable energy source can transform the municipality's energy landscape, reducing its carbon footprint while contributing to long-term climate goals.

However, leveraging the Schelde's energy potential presents specific challenges:

- The Schelde is a navigable river with tidal influences, limiting the placement of individual aquathermal systems.
- A strategic, municipality-led approach is essential to ensure optimal implementation and integration.

To address these challenges, Wichelen envisions a collective aquathermal system as a cornerstone of a sustainable heating and cooling network. This vision aligns with the municipality's commitment to environmental stewardship and innovative energy solutions.

Pictured here is a part of the Schelde River.

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MUNICIPALITY OF WICHELEN

Together with its partner EXTRAQT, Wichelen has begun exploring the feasibility of aquathermal energy. Early investigations have highlighted the potential for aquathermal energy to become a primary source for a municipality-wide energy network, delivering clean and efficient heating and cooling to residents and businesses alike.

"A FUTURE OF ENERGY LEADERSHIP."

By participating in AquaCOM as an Early Adopter, Wichelen aims to:

- **Reduce CO2 emissions**: By leveraging aquathermal energy, Wichelen can minimize its reliance on fossil fuels, significantly lowering greenhouse gas emissions tied to energy production.
- **Accelerate project development**: Early detection and identification of viable aquathermal projects will streamline implementation timelines.
- **Achieve operational plans**: The municipality is focused on developing a realistic and actionable aquathermal plan, ensuring that these systems are fully operational and delivering tangible benefits by the project's conclusion.

Through its proactive approach, Wichelen positions itself as a forward-thinking energy municipality, setting an example for other municipalities in Belgium and beyond. By leveraging the power of the Schelde through aquathermal energy, Wichelen not only reaffirms its commitment to sustainability but also strengthens its role as an enabler of innovative energy solutions in its municipality.

Wichelen's journey towards a greener future underscores the importance of partnerships, planning, and bold ambition. With AquaCOM, the municipality is eager to turn its vision for a sustainable energy network into a reality, contributing to a cleaner, brighter future for all.

LOKAAL BESTUUR Wichelen
SCHELLEBELLE · SERSKAMP · WICHELEN

BÜRGERENERGIE HATTINGEN

Bürgerenergie Hattingen is an energy community based in the town of Hattingen, North-Rhine Westphalia, along the river Ruhr. The initiative for this energy community was taken in 2023 by three members of the local town council. Their initiative kept growing and on the 14th of May 2024 an association was founded that will enhance the creation of a local energy cooperative. Hattingen has an energy demand of 800 GWh/ year. However, only 3% of this demand is sourced sustainably (without greenhouse gas emissions). Our young association has strong ambitions to strengthen the energy transition in Hattingen towards renewable energy.

Both the association BürgerEnergie Hattingen e.V. and the corresponding cooperative, which is yet to be founded, should be perceived as a positive joint effort of the citizens, the city and the corporations in Hattingen. All of these groups will have to work together and participate to further the energy transition.

The cooperative, which is accessible to everyone, is intended to become a significant provider on the local energy market in order to generate tailor-made, cost-effective and sustainable energy for Hattingen. As a modern company, the cooperative aims to create jobs and add value in Hattingen. Additionally, we hope to become a source of inspiration and funding for BürgerEnergie Hattingen e.V. as well as the city's society within the next decade.

The team of Bürgerenergie Hattingen.

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BÜRGERENERGIE HATTINGEN

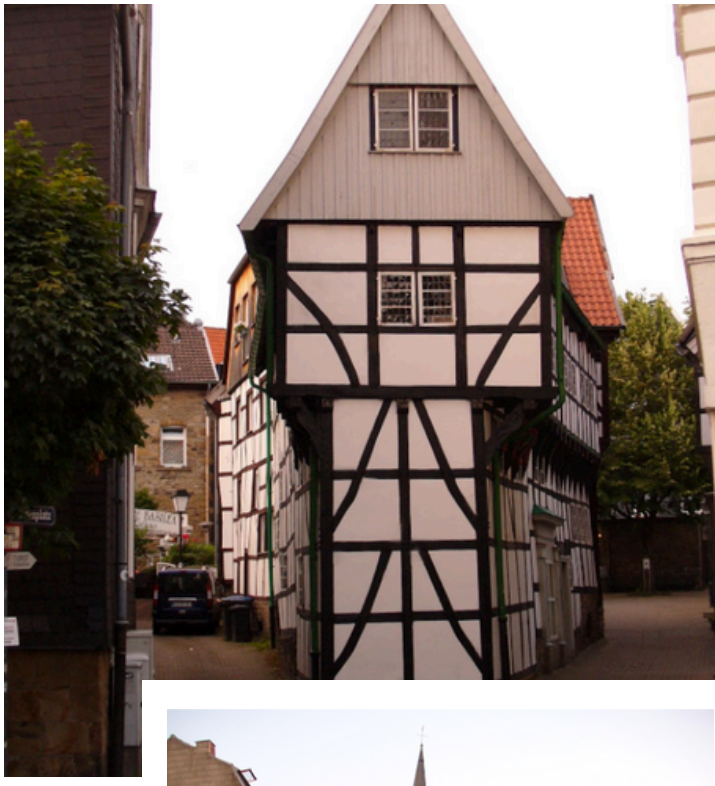
Motivation for the project

We are very happy to be able to take part in the AquaCOM project. The first event with all of the other Early Adopters in Vlieland was very exciting, insightful and fun. We have learned a lot and are now busy developing initial ideas for implementation in our area. We see high potential in implementing aquathermal energy in the close-by river Ruhr and are eager to learn more about potential implementation strategies and concretize our ideas throughout the project. At the same time, we are working hard on founding the cooperative in order to get the economic basis for implementing our future projects when they are ready.

We work towards the goal of achieving climate neutrality in Hattingen by 2045, in accordance with the legal requirements in Germany. Next to this, we aim to build connections and trust with the citizens of Hattingen so that we can get their democratic and economic participation, as this is a very important factor in the energy transition. Ensuring that energy prices remain optimal for the citizens of Hattingen is another main goal here.

Challenges

One challenge for us is how to motivate people, including those in administration, to promote these aquathermal energy projects, to provide concrete support and to get all of the different stakeholders to participate. Another big task is the establishment of the cooperative and the organization of the people who have already joined the initiative in our existing BürgerEnergie Hattingen association.



Pictures of Hattingen and the river Ruhr, captured by Rolf Novy-Huy.

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