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The Heat Pump Award (HPA)

Winning projects of 2022



Cover photo: Building - Front View, Floating Office Rotterdam. Picture by Marcelij Zerman

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The Heat Pump Award

Awarding the most outstanding heat pump projects

The **Heat Pump Award (HPA)** is an EHPA project which recognises the most efficient, smart and sustainable Heat Pump project at local level.

The HPA was launched in 2011 under the name of Heat Pump City of the Year (HPCY) Award to highlight cities and regions that have put in place an energy efficient project which takes advantage of Heat Pump technology.

The international appeal of the award has grown year after year and now attracts participants from all over Europe and beyond.

The Heat Pump Award Ceremony takes place every year.



Heat Pump Award Ceremony 2022, Atomium, Photo by Vivian Hertz

The award aims to:

1. Collect best practice examples of Heat Pumps in urban areas to present to EU authorities.
2. Create role models for those who still hesitate to change.
3. Raise people's awareness of the potential of Heat Pumps.
4. Recognise the innovative and continues work in the sector.

Since 2011:



253

Submissions

(each year we receive
more than the previous)

193

Participating cities

39

Participating countries

From Europe and beyond

In 2022:

Five different projects were recognised in five different categories:

- **Heat Pump City of the Year Award:** heat pump projects deployed at local level and with the city support.
- **Decarbuilding Award:** smart use of waste heat and heat pumps in industrial processes.
- **Decarindustry Award:** projects developed on residential and tertiary sectors.
- **Lighthouse Heat Pump Award:** innovative heat pump projects that present a high-level of creativity to solve a unique problem.
- **People's Choice Award:** the most popular heat pump project elected online by the audience.



Decarbuilding Winner 2021 - Award Ceremony 2021 - Photo by Vivian Hertz

Apply now!

1 Download your Application template at hpa.ehpa.org

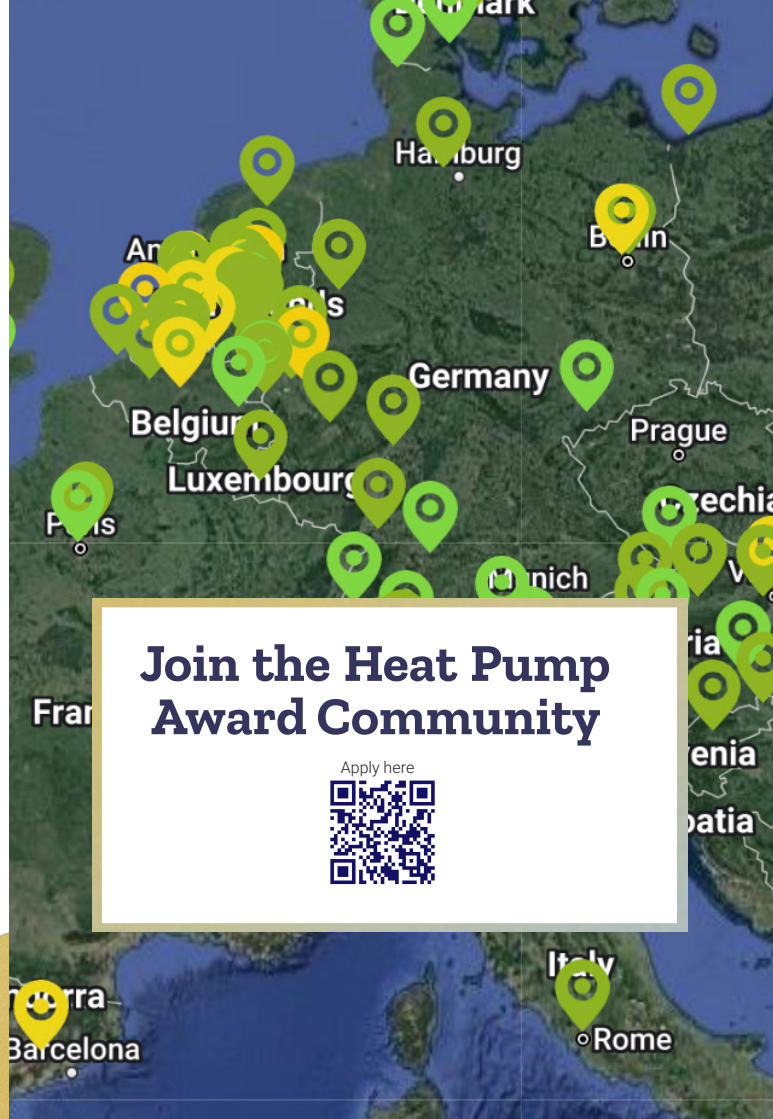
2 Fill in all the Information and Resources (e.g. Pictures) required, indicate in which of the category you want to submit your project (max 1), and use the PowerPoint presentation as a way to showcase and underline the importance, work done and results of your project.

3 You must select 1 of the following categories to apply:

- Heat Pump City of the Year,
- DecarbBuilding,
- DecarbIndustry,
- Lighthouse Heat Pump Project.

4 Fill in the form to the right of these instructions, with:

- Your Name;
- Your Email;
- Objective: HPA2023 Application- Title of your Project;
- Attach the filled-in PowerPoint Template (max 10MB).
- Click 'Submit Project'



Join the Heat Pump Award Community

Apply here



About EHPA

Our Mission

In a fully decarbonised Europe, heat-pump technologies are the number one heating and cooling solution, being a core enabler for a renewable, sustainable and smart energy system. They integrate multiple energy sources, bridging the electric and thermal sector on a local and regional level (micro grids, DHC). Heat pumps are easy to install and widely used in all thermal applications (buildings, transport, white goods) and industrial processes. Refrigerants and other components are available in sufficient quantities. The technology is recognised for its merits in legislation and existing energy models.

Our Vision

EHPA will be a forward-looking association aiming at putting heat pumps at the centre of the energy system by communicating the benefits of heat pumps, providing relevant information and being a reference point and integrator to all stakeholders.



Keep up-to-date with EHPA activities

Scan for direct links





Awarded Projects

Heat Pump City of the Year Award

"Castle Park Water Source Heat Pump Project"

Description

This project is believed to be the largest single water source heat pump installation in the UK.

It consists of 3 main elements:

- 1.The Abstraction platform sits slightly above the water in Bristol Harbour and supports the pipework which is submerged. This takes water from the harbour and pumps it into the main energy centre.
- 2.The main energy centre is a custom-built structure which houses the 3MW water source heat pump and associated plant and equipment. Vital Energi's in-house architectural & structural engineers developed the design working closely with the BCC & the Environmental agency to create a steel frame and block building which was later cladded in cedar.
- 3.The prefabricated plant room which is the main interface point to the new district heating network. The plantroom also provides addition load during peak periods and planed maintenance events.

Water is taken from the river via the abstraction pipework.



Copyright - Vital Energi



The water is filtered at this stage to prevent debris from entering the system and is passed through the water source heat pump where the latent heat reacts with ammonia and creates low pressure vapour which can be compressed to a high-pressure vapour of around 110°C.

Heat from the water source heat pump is directed into a thermal store which then feeds into the Bristol Heat Network, making the overall system lower carbon and demonstrating large scale heat pumps can be plugged into existing city-wide schemes.

Service delivered

The Castle Park System will produce 3MW of low-carbon heat and hot water which will be added to the existing Bristol Heat Network which currently services 1,000 homes and businesses.

In addition to carbon, the project receives RHI (Domestic Renewable Heat Incentive) and has been designed to deliver more affordable heat and to help combat fuel poverty.

The system will therefore make a strong contribution to both lowering emissions and reducing fuel poverty.



Technical details

Castle park has been designed to contribute to the existing heat network, demonstrating that renewables can be integrated into existing heat networks, providing a valuable case study for heat pumps.

The Water Source Heat pumps feed a thermal store which releases heat into a district heating connection which ties in with the wider Bristol Heat Network.

On efficiency

- 1x3MW Heat Pump
- Main energy sources: Electricity and heat from water in shoreham Harbour
- 3.18 COP

Benefits at the local level

In 2018 Bristol City Council declared a climate emergency and set targets of reaching carbon neutrality by 2030. The Bristol Heat Network is one of the core ways Bristol are reducing their carbon and by harnessing renewable energy, it is possible to drive the carbon intensity of the heat network down even further. The project also serves as proof of the viability for other identified areas of the city, to reach our ambitious net zero targets.



Copyright - Vital Energi

VITAL
ENERGI

Goram
Homes



Location: Bristol, United Kingdom

Project start date: 29/01/2021

Funding of the project:

- HNIP (Heat Networks Investment Project)
- RHI (Domestic Renewable Heat Incentive)

Project website:



Decarbuilding Award

"Postipuisto, New circular economy Solution"

Description

Recycling makes sense even in energy production. The project involves a heating and cooling solution for a new apartment building. Completed in 2021, the system utilizes the building's waste heat in various ways. The building, which is located in Helsinki's Postipuisto district, has a total of 113 apartments as well as a grocery store.

The beating heart of the system is a high-capacity heat pump. Besides ground source heating, the unit can utilize waste heat from the building's wastewater and apartment cooling as well as the grocery store's refrigeration equipment. The recycled energy is used for heating the building, producing domestic hot water, and, in the summer months, for apartment cooling. District heating is used for backup in case there is a fault and to provide supplementary heating during the coldest days of winter. On days when the building generates more heating than it consumes, the surplus

heat can be sold as district heating and channeled into Helen's district heating network.

Service delivered

This new circular economy solution – a perpetual motion machine for property owners: heats, cools and produces heat for the district heating network carbon-neutrally. With this solution, the property owners can utilize the energy in need and the rest will be stored for later use.

The system provides apartment heating in winter, hot tap water and comfort cooling during summer to the tenants and cooling for freezers to the local grocery store.

Furthermore, building owners can sell excess heat to the district heating network the system is integrated into.

Technical details

Energy solution used in the Postipuisto apartment building

- **Heat sources:** Ground source heating, wastewater, condensation heat from a grocery store's refrigeration equipment, apartment cooling and district heating as a secondary and backup heat source.
- **Heat sink:** Heating, domestic hot water, and the local district heating network.
- **Cooling sources:** Domestic hot water production and boreholes for ground source heating.
- **Cooling sink:** Apartment and space cooling.
- **Energy class:** Class A building, annual consumption 9500 m² < 75 kWh/m².



Location: Helsinki, Finland
Project start date: 12/2020
Funding of the project: Private
Project website:



	Capacity	Heat source	Heat sink	COP
Heating mode	115 kW (heating)	3/0 °C (ground)	30/55 °C (building)	3.2 (heating)
Cooling mode	100 kW (cooling)	12/7 °C (cooling)	40/80 °C (district heating)	4.9 (total)

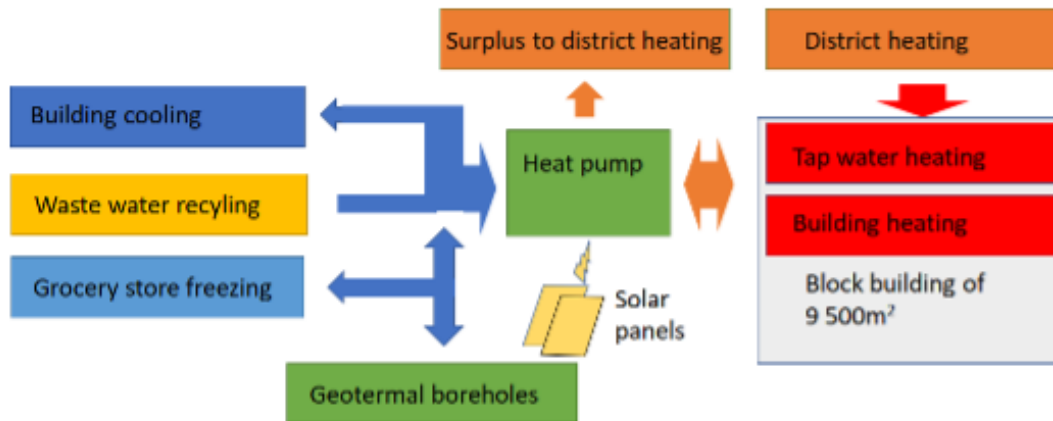
Developed jointly by Oilon and Helen based on the principles of circular economy, the solution is the result of long-term product development between the partners, with a unified focus on heat pump technology and waste heat recovery. The most innovative aspect of the system is that different heat sources can be utilized in different combinations at different times of the year, resulting in optimal performance and minimizing the building's carbon footprint. This is made possible by an Oilon ChillHeat heat pump, which can adjust its output intelligently from very low levels to maximum capacity within a wide range of temperatures.

In the solution, district heating is a secondary and backup source for the heating system; solar panels are in charge of providing part of the summertime electricity; heat pumps are the secondary source for cooling in case the geothermal energy needs back up, and the system's ground source heat pump bore-holes are used for thermal storage.

Any energy surplus is supplied to the district heating network.



System description



On winter heating energy is taken from:

- 1) Grocery store freezers
- 2) Wastewater energy recycling
- 3) Geothermal boreholes
- 4) District heating

On summer cooling cooling to building comes from:

- 1) Tap water production
- 2) Geothermal boreholes

Grocery store freezers take energy from boreholes
Surplus energy can be supplied to district heating

Decarbindustry Award

"The world's most environmentally friendly furniture factory"

Description

This project aims at turning The Plus factory in Magnor, Norway, into the world's most environmentally friendly furniture factory. The energy solution The Plus presents is "Paris Proof", meaning that the factory will generate 55 per cent less greenhouse emissions than a conventional one, this way meeting and exceeding the Paris Agreement's goal of cutting greenhouse gas emissions by 40 per cent by 2030 as well as meeting the EU's and Norway's enhanced target in the same period.

The Plus will be as well the world's first project of its type to achieve the very highest environmental BREEAM rating by meeting the requirements for classification as Outstanding. The factory will as well have a supplied energy requirement of 13 kWh/m² and therefore meets FutureBuilt's near-zero energy definition of 30 kWh/m² by a substantial margin. In practice, the building will not need any heating until the outdoor temperature falls below 5 degrees.



The Plus factory in Magnor, Norway



Service delivered

Heat pumps and chillers using the refrigerant R290 are used to produce process heating and cooling for the production line. Comfort heating and cooling is provided to the building through waste heat combined with free heating and cooling from geothermal wells.



Location: Magnor, Norway

Project start date: 2021

Funding of the project: Private

Website:



The Plus factory in Magnor, Norway



Ground source
10pcsX250meter.
Drilled energy wells

		ENRAD AB Verketstugatan 10 SÖK 62 Borås Sweden www.enrad.se/info/enradse		Rev. City Notes		Date
		P&I-Drawing Vestre A/S, Greiff AB High efficiency Geo-energy plant		Sign.		Date
Date 2012-02-28	Issued by J.M.H.	Approved by S.L.	Checked by J.M.H.	JOB No	Drawing No 2	

Lighthouse Heat Pump Award

"GEOLO: the long lifecycle of property begins underground"

Description

The Geolo energy solution, which is based on new technological innovations, utilizes carbon neutral, renewable geothermal energy with revolutionary pump technology innovation and enables more sustainable construction.

It has been designed as a standalone solution, which means it is movable from construction site to site. The solution produces optimal production conditions throughout the year during construction, including heating/cooling in the summer for the first time ever in history.

The geoenergy field is monitored and the energy station can be operated in an efficient way until -30 C degrees. If there is extra warm energy available, it can be reloaded back to the geoenergy field.

If there is extra warm energy available, we can reload it back to the geoenergy field. Energy is used with 100% efficiency.

Service is fully connected to the IT-system, including the new site equipment which is developed for the Geolo usage. Geolo managed service is steered through the IT-system with top of the business understanding of building circumstances and physics around the year.

KONSULTTITOIMISTO
EnerSys Oy

ROTOTEC
CLEVER GEOENERGY PIONEER

RAKSYSTEMS

Location: Finland, Vantaa

Project start date: 02/11/2021

Funding of the project: Private

Project website:



Service delivered

The project provides services in **3 different areas:**

1. Technology advancement for building period:

Geolo enables geoenery to be used for heating and cooling of the construction site, providing a sustainable and inexpensive solution for climate control. The system also enables optimal production conditions all over the year, which strengthens the predictability of the construction process and gives potential for enhancing productivity.

2. Construction in the right climate conditions: Geolo contributes to energy saving and the reduction of CO2 emissions during the construction period. It also plays a crucial role in ensuring a safe and healthy building for end users.

3. Benefits for customers: Geolo is a zero CO2 emission solution with renewable electricity that reduces the life cycle of CO2 emissions of buildings up to 2% - 4%. The solution also contributes to reducing the energy consumption significantly: the energy is produced by heat pump technologies and geoenery, therefore the need for other types of energy is reduced up to 70%, compared to other solutions.



New day is beginning together with Geolo by creating a cleaner climate & a better world for all of us

Technical Details

- **Energy station:** Geolo Energy Station is a fully portable heat pump system that enables the use of geoenery in the construction phase of a building independent of the building's own heating equipment. The heat pump equipment is installed inside a container and delivered to site by truck.

- **Components:** Main components are an air-to-water heat pump and a ground source heat pump using natural and low GWP refrigerants, respectively. The condenser of the air-to-water heat pump is coupled with the ground source heat exchanger. It also has TRT-measurement installed inside, so the condition of the energy field can be measured easily.

- **Power delivery:** Each Energy Station has a maximum heat output of 300 kW and a cooling output of approx. 70 kW. There is also a reserve available by electricity to cover momentarily needs. Multiple stations can be used to provide heat to the work site in the same fashion construction phase heating is usually implemented today. Geolo is working efficiently even at -30°C degrees temperatures.

- **Connections:** Geolo requires connections to the electricity grid, the borehole heat exchanger and the temporary heating network of the building. The energy station is otherwise plug-in capable and movable from site to site.

- **Efficiency:** Combining ambient air and a borehole heat exchanger as heat sources in an integrated manner to achieve a considerably higher heating efficiency around 1 COP better than existing commercial air-to-water heat pumps. The heating capacity is remarkably higher than what would be achieved by a traditional GSHP system. Geolo can also inject heat from ambient air back into the bedrock to ensure unchanged borehole HX performance for the end customer if necessary. Geolo Energy Station can provide cooling as well as heating, which is a novel service in construction phase.



Geolo installed on a construction site, November 2022

- **Operating:** Operating Geolo doesn't require any additional knowledge compared to traditional oil, gas or district heating solutions from the client/ construction site. Geolo total solution is remote monitored and maintained by the Raksystems Climate Solutions specialists together with Rototec and Enersys. It makes use of the boreholes built and dimensioned for the

building's use phase and augments the boreholes' heating capacity with ambient air to cover high heating needs of the construction phase in the subzero climate conditions. It is – also first time ever – able to do the cooling during the summertime which gives multiple benefits to be much more productivity potential and access to the higher quality.

People's Choice Award "Trane Thermal System - Broomfield College, Derby UK"

Description

Broomfield Hall campus is a public college that provides further education in agriculture, equine and horticulture education. A part of the UK government's Public Sector Decarbonisation Scheme (PSDS), this campus was awarded funds to carry out several decarbonisation activities including replacing the existing gas-fired boilers with heat pumps. This project was highlighted in the UK government's decarbonisation January 2022 summary report.

Service delivered

This renewable alternative to traditional gas-fired boilers will save the end-user annually 790,000 kWh in energy consumption and 160 Tons in CO² emissions.



Broomfield College facade



TRANE
TECHNOLOGIES



Location: Derby, United Kingdom

Project start date: 05/2022

Funding of the project: Public

Project website:



Technical details

The system utilizes a combination of air-source and water-source heat pumps in cascade configuration to provide 600 kW of heating. The combination of heat pumps in cascade provides up to 80°C of leaving water temperature to fully replace the building's existing gas boilers. On top of that, the new units operate with low-GWP refrigerants with low impact on the environment (R454B and R1234ze).

On efficiency

- Heating capacity: 600 kW
- Main energy sources: heat pumps use air and water as their main energy source alongside electricity
- System COP: 2.3
- TER (Total Efficiency Ratio) improved by 400% versus previous installation.



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