

CATALOGUE OF HEAT PUMP INSTALLATIONS



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This catalogue of installation showcases the versatility of Ecoforest heat pumps, capable of delivering maximum efficiency to the end user while simplifying system design, enabling compact technical rooms that are easy to implement for installers.

Backed by over 30 years of innovation, Ecoforest has evolved from its early commitment to pellet stoves to its current leadership in the development of advanced heat pump solutions using sustainable refrigerants such as R290 and R454B.

The result is a heat pump solution fully integrated into the sustainability strategy of each project, contributing, together with other key elements such as photovoltaic systems, insulation or mechanical ventilation, to the achievement of net-zero buildings. Notable examples include Passivhaus homes in Northern Ireland and Spain. In the commercial sector, projects such as Prague Bubny railway station or the Gönyű National Public Port in Hungary stand out as benchmarks of energy efficiency in service buildings.

Even under highly demanding conditions, such as refurbishment projects, Ecoforest heat pumps demonstrate outstanding performance in complex installations, from residential developments with 181 apartments such as the Efisa Tower in Spain, to large-scale district heating networks reaching 2 MW, such as the Royal Alexandra and Albert School campus in the United Kingdom.

In line with Ecoforest's technological and innovative DNA, the company's in-house technical office provides tailored technical support for non-standard system designs, including complex multi-residential buildings with dual thermal lift in Spain.

These projects highlight Ecoforest's value as a trusted partner, capable of combining comfort, energy savings and sustainability in high-quality heat pump installations, as Ecoforest continues the development of its next-generation heat pump model, exceeding current industry standards.



Single-family



New-build



*Brine-to-water
heat pump*

New Domestic Home for Daly Family

Location:	Lisburn, Northern Ireland
Year:	2020
Type of installation:	ground-source system
Power:	3.5 kW
Model:	ecoGEO B4 1-9 HTR EH
Services:	heating, domestic hot water (DHW), active and passive cooling, pool
Installer:	Daly Renewables Ltd.
SPF:	5.29

New Domestic Home for Daly Family



New Domestic Home for Daly Family



A ground-source heat pump and solar PV delivering ultra-low-energy living in a Northern Ireland Passive House

This detached Passive House in Northern Ireland demonstrates how a ground-source heat pump, when fully integrated with solar photovoltaics, can deliver year-round heating, cooling and domestic hot water at extremely low running costs.

The Ecoforest ground-source heat pump supplies a total conditioned floor area of 390 m² (4,200 ft²) across the main house, and a detached house and home office. Thanks to the very low building heat demand of just 11 W/m², underfloor heating and intelligent photovoltaic hybridisation via ecoSMART, the annual cost for heating, cooling and domestic hot water for a family of six is approximately €156.

The system maintains stable indoor comfort throughout the year, typically around 23°C, while summer temperatures never exceed 25°C despite the presence of large areas of south-facing glazing.

Installation needs

Heating, cooling and hot water for 390 m² at just €156 per year

The Ecoforest ground-source heat pump is located in a dedicated plant room at the rear of the house. The heat pump is connected to a horizontal closed-loop ground-source collector system consisting of 600 metres of 40 mm pipework. It supplies space heating, space cooling and domestic hot water to the main dwelling as well as heating and cooling to a separate garage and home office building. Heat distribution throughout all spaces is provided by an underfloor heating and cooling system.

System control is managed by three Ecoforest Th-T thermostats, which independently

regulate the ground floor, first floor and garage. A 500-litre Ecoforest hot water cylinder provides domestic hot water storage, and the system includes two spare pipe connections ready for the future addition of a hot tub or outdoor swimming pool.

The heat pump is hybridised with a 5.67 kWp DC photovoltaic array connected to a 3.68 kW AC inverter. An Ecoforest ecoSMART energy manager continuously monitors photovoltaic production and communicates with the heat pump to maximise self-consumption of renewable electricity.



Actual photographs of the installation



*Smart PV hybridisation
with an average system
efficiency (SPF) of 5.29*



System description

The Ecoforest ground-source heat pump provides four core functions: space heating, space cooling, domestic hot water and the option to supply future pool or spa heating. The ecoSMART energy manager allows surplus photovoltaic electricity to be converted into stored thermal energy.

The domestic hot water base setpoint is 45°C, but when at least 0.5 kW of surplus solar power is available for more than five minutes, the ecoSMART system raises the hot water temperature to 58.5°C. Once this higher hot-water temperature has been achieved, the system also increases the space-heating setpoint from 20.5°C to 22°C. This strategy enables both the DHW tank and the building fabric to act as thermal batteries, capturing and storing free solar energy for later use.

Cooling is provided through a combination of passive and active modes. In passive cooling, heat is exchanged directly with the ground at very low energy input, while active cooling is used when higher cooling capacity is required. The control system automatically switches between these modes to maintain comfort. As a result, the internal temperature of the house never exceeds 25°C in summer, even with large south-facing windows and high solar gains.

Efficiency

The house was designed to Passive House principles, with triple-glazed windows, a highly airtight timber-frame structure and minimal thermal bridging, resulting in a very low thermal load of just 11 W/m². The underfloor heating system is supported by carefully selected screeds, with 100 mm on the ground floor to provide thermal mass and a slow heat release of six to ten hours, and 50 mm on the first floor for faster response in bedrooms. This allows the system to make optimal use of off-peak electricity and surplus solar energy.



The Ecoforest heat pump achieves an average seasonal performance factor of 5.29, reaching up to 7.2 during cooling operation in summer and around 4.0 in spring. High photovoltaic utilisation further reduces electricity demand, with up to 60% solar surplus in late spring. As a result, annual heating, cooling and domestic hot water costs are limited to approximately €156, proving that true comfort and ultra-low energy consumption can go hand in hand.





Single-family



New-build



*Brine-to-water
heat pump*

Largest Residential Ground-Source Heat Pump Installation in Spain

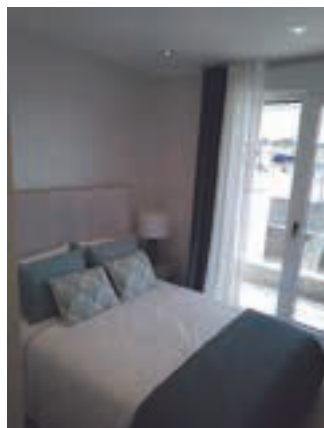
Location:	Madrid, Spain
Year:	2021
Type of installation:	centralised ground-source system with individual heat pumps
Power:	3.43 MW
Model:	312 ecoGEO C3 1-9 HTR
Services:	heating, cooling, DHW
Installer:	Groen Energía S. L.

Largest Residential Ground-Source Heat Pump Installation in Spain



Largest Residential Ground- Source Heat Pump Installation in Spain

312 individual ground-source heat pumps delivering heating, cooling and domestic hot water in a sustainable residential development in Madrid



Célere Cortijo Norte, a newly built residential development in Boadilla del Monte, Madrid, represents the largest residential ground-source heat pump installation in Spain. Comprising 312 single-family homes, each with four to five bedrooms, the project delivers heating, cooling and domestic hot water (DHW) through individual compact heat pump units.

The development demonstrates how large-scale residential ground-source projects can combine energy efficiency, sustainability, and comfort. With a total thermal capacity of 3.43 MW, this installation significantly reduces energy consumption and CO₂ emissions while providing homeowners with complete control over their climate systems.

Actual photographs of the
installation



Installation needs

*A decentralised
ground-source
solution for large
residential demand*

Each dwelling in the development required a self-contained solution capable of providing space heating, cooling, and DHW. The homes feature low-temperature underfloor heating and cooling, optimized for heat pump operation and high system efficiency.

Following detailed energy assessments of the 312 dwellings, it was determined that each property required a heat pump capable of delivering between 1 and 9 kW of thermal power. The distributed design allowed for decentralised installations, eliminating the

need for a central plant room or complex energy distribution networks.

A critical factor in the design was the ground-source system. Borehole depths were tailored to the dwellings' energy demands, ranging from 95 to 125 metres, depending on the home's size and layout. The site's soil composition (arkose) was analysed to select the appropriate drilling materials and methods, and a 72-hour Thermal Response Test (TRT) was conducted to validate the thermal characteristics of the ground before finalising the design.



System description

The solution installed consists of 312 individual Ecoforest ecoGEO+ C31-9 kW compact heat pumps, each incorporating a 165-litre DHW tank. These compact, all-in-one units provide space heating, cooling, and hot water simultaneously thanks to the High Temperature Recovery (HTR) technology, which captures energy from heating or cooling processes and repurposes it for DHW production or heating a swimming-pool without additional energy input.

The geothermal system is based on 312 vertical boreholes, each equipped with single-U PE-100-RC piping, connected directly to the heat pumps within each dwelling. The underfloor heating and cooling system enables low-temperature operation, maximising COP and reducing electricity consumption.

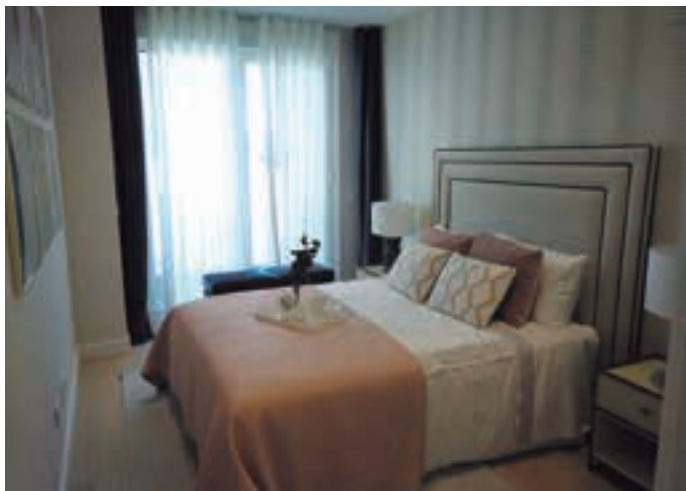
All units include inverter-driven compressors with wide modulation ranges, allowing the output to adjust precisely to real-time demand. Cycle inversion technology enables rapid switching between heating and cooling, while the compact design ensures minimal visual and acoustic impact. Additionally, the heat pumps are fully compatible with photovoltaic systems, storing excess solar energy as thermal energy within the integrated 165 litres-DHW tanks.

*3.43 MW of installed
thermal capacity with
zero on-site emissions*

Efficiency

The decentralised, ground-source system provides multiple efficiency benefits. By combining individual heat pumps with underfloor heating and low-temperature operation, energy consumption is minimised while comfort is maximised. The installation avoids the emissions associated with conventional natural gas systems, achieving an estimated reduction of 618 tonnes of CO₂ per year across the development.

Financially, the system generates significant savings for residents, with average annual reductions of around €2,100 per dwelling compared to conventional systems rated at energy class F. The upfront investment is offset by these long-term savings, demonstrating the cost-effectiveness of large-scale ground-source residential installations.





Single-family



New-build



*Brine-to-water
heat pump*

Net-Zero Comfort in Extreme Climates: 23 °C All Year Round

Location:	Huesca, Spain
Year:	2023
Type of installation:	Ground-source system
Power:	9 kW
Model:	1 ecoGEO ⁺ Compact 1-9 HTR
Services:	heating, cooling, DHW
Installer:	Climaelec Soluciones Energéticas
SPF:	4.8

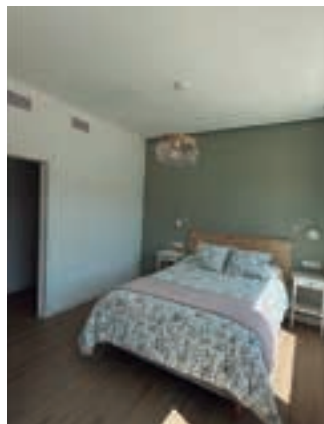
Net-Zero Comfort in Extreme Climates: 23 °C All Year Round



Net-Zero Comfort in Extreme Climates: 23 °C All Year Round



*How a ground-source
heat pump and solar
hybrid system deliver 365
days of efficiency and
independence*



In Aratorés, in the Spanish Pyrenees, a net-zero 180 m² Passivhaus demonstrates how an Ecoforest ground-source heat pump can deliver year-round comfort with virtually zero energy cost. The home is maintained at a constant 23 °C for all 8,760 hours of the year, despite a demanding alpine climate requiring around 7,000 kWh of heating and 2,300 kWh of cooling annually.

An Ecoforest ecoGEO⁺ 1-9 heat pump, integrated with a 10 kW photovoltaic system and battery storage, allows the building to generate more electricity than it consumes. Intelligent surplus management converts excess solar power into usable thermal energy, making the project a real-world example of net-zero operation in a high-performance residential building.



Actual photographs of the installation



*Zero-energy heating,
cooling and hot
water*

Installation needs

The system is designed for projects where high thermal comfort and energy autonomy are required. A 100-metre vertical geothermal borehole provides a stable renewable heat source throughout the year, even in extreme winter conditions. The heat pump supplies heating, cooling and domestic hot water, distributing energy through low-temperature underfloor heating on all floors for optimal efficiency.

A 165-litre heat-pump integrated hot-water cylinder reduces plant-room footprint, while a 500-litre buffer tank acts as a thermal battery for surplus photovoltaic production. The 10 kW solar array, battery and KNX-based energy management ensure that on-site generation, storage and consumption are continuously balanced and optimised.



System description

At the core of the installation is the Ecoforest ecoGEO⁺ Compact 1–9 ground-source heat pump with HTR technology. It harnesses the constant temperature of the subsoil to provide heating, cooling, and domestic hot water with exceptional operational stability and low running costs.

The unit is factory-fitted with an energy manager that communicates with the photovoltaic system, battery, and buffer tank to prioritise self-consumption. All Ecoforest heat pumps feature an energy manager that maximises the use of solar surpluses, storing excess energy as heat in the home and raising system outlet temperatures at no extra

cost. When solar production exceeds household demand, the system automatically increases the buffer tank setpoint, storing energy in the form of heat for later use. Users can monitor temperatures, production, and system performance in real time via the Ecoforest mobile app, ensuring full operational transparency.

For enhanced performance, this model includes HTR technology, an Ecoforest-exclusive system that recovers waste heat to provide domestic hot water or heat the pool at virtually no additional cost. This waste heat recovery delivers outstanding efficiency and performance.



Efficiency

The project achieves an impressive seasonal performance factor (SPF) of 4.58, exceeding 5 in milder months such as September and October, a remarkable result for a high-altitude location. Over one year, the home consumed 7,280 kWh of electricity: 64% directly from PV, 23% from the battery and only 13% from the grid, whereas it achieved a total of 10,900 kWh exported annually which results in a positive production of 3,620 kWh, electricity bills are reduced to zero while a second property's energy costs drop by 90%.

Compared to an estimated €3,700 per year for conventional comfort systems, this integrated ground-source and solar solution delivers maximum savings, proving that true net-zero performance is both achievable and commercially attractive.



*Smart integration
for maximum self-
consumption*



Single-family



Retrofit



*Air-to-water
heat pump*

High-Efficiency R290 Air-Source Upgrade with ecoAIR⁺ PRO

Location:	Baden-Württemberg, Germany
Year:	2022
Type of installation:	air-source system
Power:	18 kW
Model:	ecoAIR ⁺ 3-18 PRO
Services:	heating, DHW
Installer:	Enrgi gmbh
SCOP:	4

High-Efficiency R290 Air-Source Upgrade with ecoAIR⁺ PRO



High-Efficiency R290 Air-Source Upgrade with ecoAIR⁺ PRO

Sustainable heating solution with heat pumps for residential retrofits

Replacing gas with renewable air-source heat pumps



This project consists of the modernisation of a residential heating system through the replacement of an obsolete gas boiler with an Ecoforest R290 ecoAIR⁺ PRO air-to-water heat pump.

The new system fully covers the annual heating demand of approximately 14,000 kWh, delivering a reliable and sustainable solution. By integrating renewable air-source energy, the installation significantly reduces CO₂ emissions while improving comfort levels and ensuring long-term operational efficiency for the end user.

Installation needs

The semi-detached house required a compact and efficient heating solution capable of operating with limited installation space and adapting to variable seasonal loads. The main objectives were to eliminate fossil fuel dependency, reduce energy costs and maintain high indoor comfort, without the need to upgrade the radiators, which is enabled by the high outlet temperature of R290.

Additionally, the system had to ensure low noise levels, high reliability and compatibility with existing distribution systems, while complying with current environmental standards and future energy regulations in Germany.

System description

The installation is based on an ecoAIR⁺ 3-18 PRO heat pump using natural refrigerant R290 (propane), combined with 500-litre DHW and buffer tanks, and managed by the CM control unit.

This configuration provides flexible modulation of output power, optimised domestic hot water production and stable performance throughout the year. The integrated control allows precise system management, enhancing reliability and simplifying operation and maintenance.



Efficiency

The ecoAIR⁺ PRO system operates with a SCOP of 4.0, demonstrating excellent energy efficiency under real operating conditions. Thanks to inverter technology and advanced control logic, the heat pump continuously adapts its output to actual demand, minimising energy consumption and operating costs.

The use of air-source energy combined with high-efficiency components ensures a reduced carbon footprint and positions the system as a fast and future-proof solution for residential heating.



◀
Actual photographs of the installation

Going beyond with a SCOP of 4.0 with the ecoAIR⁺ PRO range



Single-family



Retrofit



*Air-to-water
heat pump*

Sustainable Heat Transition on a Farm with Heat Pumps and PV Hybridisation

Location:	Allgäu, Germany
Year:	2025
Type of installation:	air-source system
Power:	18 kW
Model:	1 ecoAIR+ 3-18 PRO
Services:	heating and DHW
Installer:	enrgi GmbH

Sustainable Heat Transition on a Farm with Heat Pumps and PV Hybridisation



Sustainable Heat Transition on a Farm with Heat Pumps and PV Hybridisation

Air-source heat pump and PV integration for modern low-carbon operation in Germany

Replacing oil with efficient air-source heating



In Allgäu, 2025, a small farm underwent a complete heat transition, replacing its outdated oil heating system with a modern air-source solution. An ecoAIR⁺ 3-18 PRO heat pump combined with the HK-EH-S 20 hydrokit now provides heating, domestic hot water and electricity.

A rooftop PV system further enhances sustainability. The upgrade delivers efficient, environmentally friendly operation while integrating renewable electricity, demonstrating how traditional farm buildings can transition to low-carbon energy solutions.

Installation needs

The project required a full replacement of the old oil boiler while accommodating the farm's existing structure, including a roof nearly 90 years old. Space for the heat pump and hydrokit had to be carefully managed. The system needed to deliver reliable heating and DHW throughout the property, while also integrating with a new photovoltaic array to maximise self-consumption and take advantage of available subsidies.



System description

The ecoAIR⁺ 3-18 PRO air-source heat pump works in combination with the HK-EH-S 20 hydrokit to provide heating and domestic hot water. A PV system installed on the roof generates renewable electricity to support the heat pump, further reducing reliance on the grid. The system is compact, efficient and fully integrated, combining multiple functions in a single, space-saving installation suitable for a small farm building.

All Ecoforest air-source heat pumps are monobloc units, meaning all key components are integrated within the outdoor unit. Inside the installation, the internal unit ensures the optimal functioning of the system together with other accessories as DHW or buffer tanks. The wide array of Ecoforest air-source elements ensures a bespoke installation, in this case the HK-EH-S includes the control system and main hydraulic components.



◀
Actual photographs of the installation

Integrated PV system for renewable electricity

Efficiency

The integrated system achieves high energy efficiency by pairing air-source heating with solar power. The ecoAIR⁺ PRO heat pump provides variable-output heating and DHW on demand, while the PV system offsets electricity consumption.

This combination reduces fossil fuel dependence and carbon emissions, delivers significant operational savings, and qualifies for a 55% state-level subsidy in Germany, making the system economically attractive as well as environmentally sustainable.



Single-family



New-build

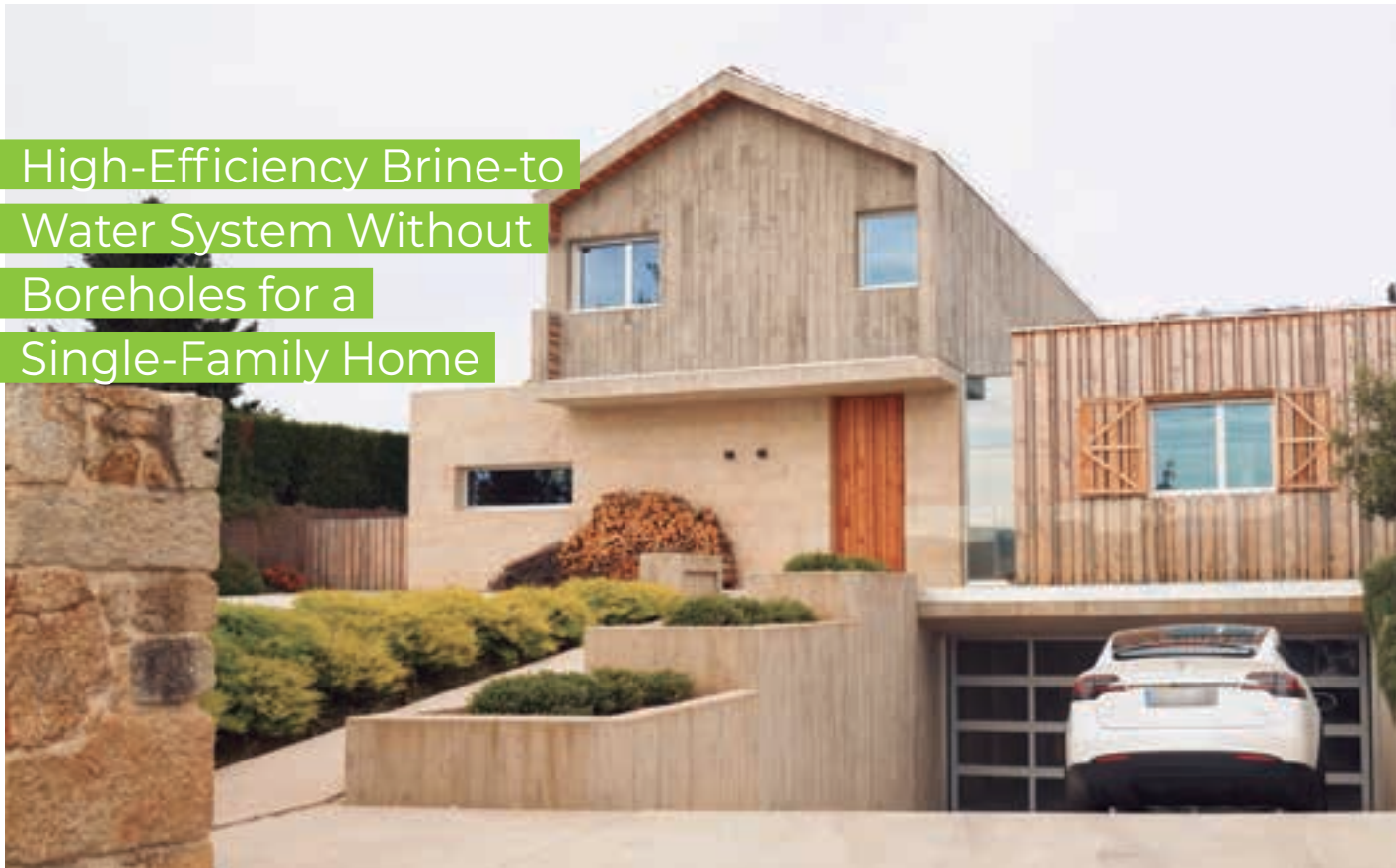


*Brine-to-water
heat pump with
air collection*

High-Efficiency Brine-to-Water System Without Boreholes for a Single-Family Home

Location:	Nigrán, Spain
Year:	2023
Type of installation:	Brine-to-water system with air collection
Power:	12 kW
Model:	1 ecoGEO ⁺ B4 3-12 HTR EH
Services:	heating, cooling, DHW
Installer:	Pansogal
SPF:	4.2

High-Efficiency Brine-to-
Water System Without
Boreholes for a
Single-Family Home



High-Efficiency Brine-to-Water System Without Boreholes for a Single-Family Home



Brine-to-water heat pump with air-unit, photovoltaic integration and HTR heat recovery

This newly built single-family home in Nigrán, Spain has adopted an advanced renewable energy system that delivers heating, cooling and domestic hot water with very high efficiency and reduced installation costs.

By combining a brine-to-water heat pump with air collection and on-site photovoltaic generation, the project achieves a low-carbon, future-proof solution with excellent seasonal performance and high levels of self-consumption.

Installation needs

The property required a compact, high-performance solution capable of supplying year-round comfort without the space or civil works normally associated with conventional geothermal boreholes. The system also needed to integrate with photovoltaic generation and battery storage to maximise the use of on-site renewable electricity while ensuring stable operation and long-term reliability.



Geothermal performance without drilling



Actual photographs of the installation



System description

The installation is based on an ecoGEO⁺ 3-12 HTR EH water-to-water heat pump combined with an AU12 aerothermal unit, which replaces traditional geothermal boreholes by capturing energy from the air. This hybrid approach preserves the key advantages of geothermal technology, including high efficiency, long service life and low acoustic impact, while significantly reducing installation complexity and cost.

The system provides heating, cooling and domestic hot water and incorporates Ecoforest's HTR technology, which recovers residual heat from the compressor to generate DHW and pool heating at virtually no cost. In addition, an exclusive defrost method temporarily stops the compressor instead of reversing the cycle or activating electrical heaters, maintaining stable operation while minimising energy consumption.

The heat pump is integrated with an 8 kW photovoltaic array and 7 kW of battery storage, all managed by Ecoforest's e-manager software, included as standard in all heat pumps. This energy management system converts solar surplus into stored thermal energy in both a 150-litre buffer tank and the DHW tank, optimising self-consumption and system efficiency.

*Up to 5× energy
amplification with heat
pump and integrated
renewables*

Efficiency

The installation achieves a seasonal performance factor of 4.2 and reaches a coefficient of performance of 5 during the summer months, meaning that every kilowatt of electricity consumed can generate up to five kilowatts of thermal energy.

By combining heat pump technology, aerothermal collection, heat recovery and intelligent photovoltaic management, the system delivers high efficiency, low operating costs and a significantly reduced carbon footprint.





Multi-family



New-build



*Brine-to-water
heat pump with
air collection*

Heat Pump and Solar Energy System with a Multi-Source Collection

Location:	Medicina, Italy
Year:	2022
Type of installation:	PV-hybridised heat pump with a multi-source collection system
Power:	12 kW
Model:	1 ecoGEO ⁺ 3-12
Services:	heating, active and passive cooling and DHW
Installer:	Studio Tecnico Garelli, Per Abitare srl, Design Bagno srl, Geo-net slt
SPF:	4.8

Heat Pump and Solar Energy System with a Multi-Source Collection



Heat Pump and Solar Energy System with a Multi-Source Collection



Heat pump and solar energy with a multi-source collection system and hybridised both with photovoltaic and solar thermal energy

In Medicina, Italy, a 397 m² multifamily villa features a state-of-the-art hybrid heating system. The ecoGEO+ 3-12 brine-to-water heat pump integrates with a 7 kW photovoltaic array and solar thermal panels, providing heating, active and passive cooling, and domestic hot water.

Multiple collection sources, including boreholes, an AU12 unit, irrigation exchangers, and the outdoor pool, enhance performance. Custom digital controllers and sensors ensure seamless operation, demonstrating Ecoforest's versatility in delivering efficient, smart, and fully integrated energy solutions

Installation needs

This villa required a highly adaptable installation capable of combining multiple energy sources. The system had to integrate photovoltaic electricity, geothermal boreholes, solar thermal panels, and additional exchangers while covering heating, cooling, and DHW demands.

Custom monitoring and control devices were implemented to manage the hybrid system efficiently, optimising energy savings and supporting the villa's smart-home requirements without compromising comfort.

►
Actual photographs of the installation

System description

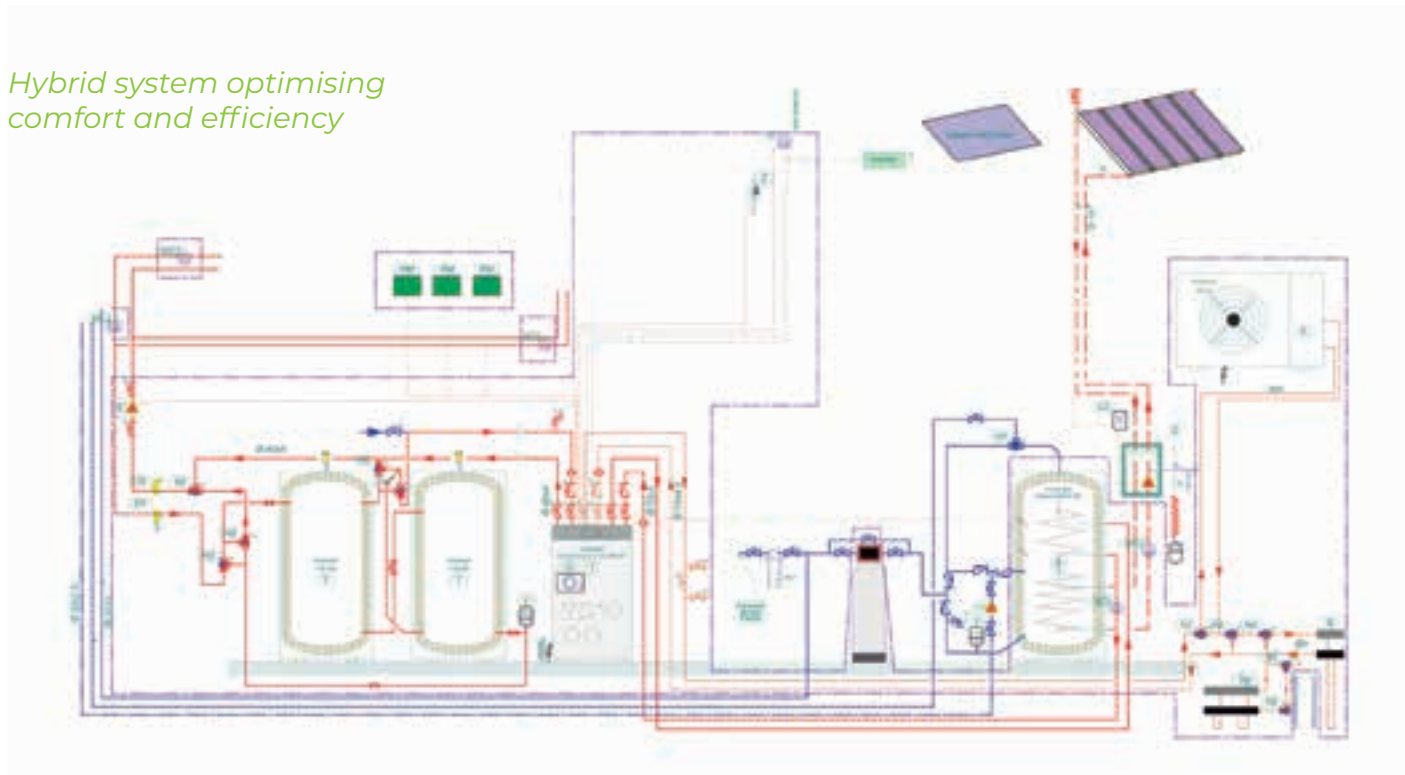
The installation features a 12 kW ecoGEO⁺ 3-12 heat pump, hybridised with PV and solar thermal energy. Energy collection is drawn from multiple sources: boreholes, the AU12 unit, a well exchanger, irrigation system exchanger, and the outdoor pool during winter. Advanced digital controllers

and a network of sensors coordinate the system for precise heating, cooling, and DHW management. The solution demonstrates Ecoforest's flexibility, enabling customised integration with smart-home devices while maintaining high performance across diverse energy inputs.



Installation scheme

Hybrid system optimising comfort and efficiency



Efficiency

The villa achieves a remarkable SCOP of 4.8, supported by the hybrid PV-thermal system. Annual electricity consumption is significantly reduced, with the heat pump providing high heating output and dynamic DHW management. CO₂ emissions have been cut by over 70%, underscoring the system's environmental impact.

The integration of multiple sources with smart controls ensures maximum energy efficiency, comfort, and economic savings. The villa achieved the A4 energy rating, with certified consumption of 25 kWh/m², proving Ecoforest solutions combine sustainability, innovation, and profitability.



*Significant energy
and carbon savings*





Multi-family



New-build



*Brine-to-water
heat pump with
air collection*

Exceptional Performance and Comfort Powered by Ecoforest

Location:	San Sebastián de los Reyes, Spain
Year:	2022
Type of installation:	Ground-source system
Power:	300 kW
Model:	3 ecoGEO+ HP3 25-100 kW
Services:	heating, cooling, DHW
Installer:	Geoter
SPF:	6.7

Exceptional Performance and Comfort Powered by Ecoforest



Exceptional Performance and Comfort Powered by Ecoforest



High-efficiency ground-source heat pumps deliver heating, cooling, and hot water for 56 modern homes in Madrid



A 56-unit residential project in San Sebastián de los Reyes, Madrid, relies on a cascade of three Ecoforest ecoGEO⁺ HP3 25-100 kW heat pumps.

Delivering heating, active cooling, and hot water, the system meets 100% of the building's energy demands. Certified BREEAM and rated energy A, this building exemplifies sustainability, comfort, and operational efficiency, achieving high SPF values and significant annual energy cost savings.



Installation needs

The building's climate system integrates 6,700 m² of underfloor heating, double-flow ventilation with heat recovery, and high-quality thermal insulation. Geothermal energy is captured via 32 boreholes, 125 m deep each.

The installers looked for a minimal disruption and seamless integration with the modern architectural design while providing a robust, long-lasting renewable energy system, designed to meet all comfort needs.



Actual photographs of the installation

Installation recognised by BREEAM certification and an ecoAWARD





*Seamless integration
and maximum
efficiency*

System description

Three high-capacity Ecoforest ecoGEO+ HP 25-100 heat pumps operate in cascade to meet 100% of heating, cooling, and hot water demands.

The water-to-water system uses geothermal energy as a constant base source, optimised with intelligent controls. Integrated with radiant floors, double-flow ventilation, and high insulation, the system maintains comfort while maximising efficiency year-round. Its design ensures replicability in similar multi-residential or commercial buildings.

When configured in cascades, ecoGEO+ HP units deliver exceptional scalability, allowing multiple pumps to work in tandem for high-demand applications while maintaining optimal efficiency. This configuration ensures redundancy, flexible operation, and continuous service even during maintenance, while reducing wear on individual units. Additional benefits include precise temperature control, inverter-driven energy optimisation, and compatibility with both ground-source and hybrid energy systems, making it ideal for sustainable, high-performance buildings.

Efficiency

The system achieves an SPF of 6.7 in July and an annual SPF of 5.3, representing a 36% energy cost reduction versus conventional gas and air-source systems. Annual savings reach €32,622. Combined with double glazing, heat-recovery ventilation, and radiant floors, the installation

reduces CO₂ emissions, delivers precise thermal comfort, and demonstrates how high-capacity, centralised ground-source heat pumps can provide sustainable, cost-effective solutions for modern residential developments.





Multi-family



New-build



*Brine-to-water
heat pump*

Hippiements Ibiza: Sustainable Luxury Powered by a Ground-Source Installation

Location:	Ibiza, Spain
Year:	2021
Type of installation:	ground-source ecoGEO+ HP cascade
Power:	300 kW
Model:	3 ecoGEO+ HP 25 - 100
Services:	heating, cooling, DHW, pool
Installer:	Geoter, 3D3 Ingeniería
SPF:	5.1

Hippiements Ibiza:

Sustainable Luxury Powered by a Ground-Source Installation



Hippiements Ibiza: Sustainable Luxury Powered by a Ground- Source Installation

A benchmark residential development combining contemporary architecture, renewable energy and high-efficiency Ecoforest ground-source heat pumps



Hippiements is a luxury residential development in a prime Ibiza location, combining contemporary design with the spirit of the 20th-century hippie movement. The 63 residences, including 59 one- and two-bedroom suites and 4 penthouses with private rooftop gardens, integrate sustainable design at their core.

All heating, cooling, and domestic hot water (DHW) needs are supplied by a fully geothermal system, anchored by high-performance Ecoforest heat pumps, ensuring maximum efficiency and minimal environmental impact while preserving the island's aesthetic.

Installation needs

The project demanded a reliable, year-round climate solution for private residences, communal spaces, and a fully operational spa. Traditional systems were considered, but a geothermal installation combined with Ecoforest heat pumps offered superior comfort, efficiency, and minimal visual impact.

By locating all equipment underground, the system frees rooftop terraces for owners' use, maximising the appeal and value of the penthouses while maintaining a clean, uncluttered façade.

System description

The geothermal system is based on a ground-source field installed beneath the building, consisting of 24 boreholes, each 130 metres deep, connected to a single centralised heat pump system located in a dedicated plant room. This approach significantly reduces the number of individual units and distribution networks, simplifying the installation and streamlining subsequent construction works.

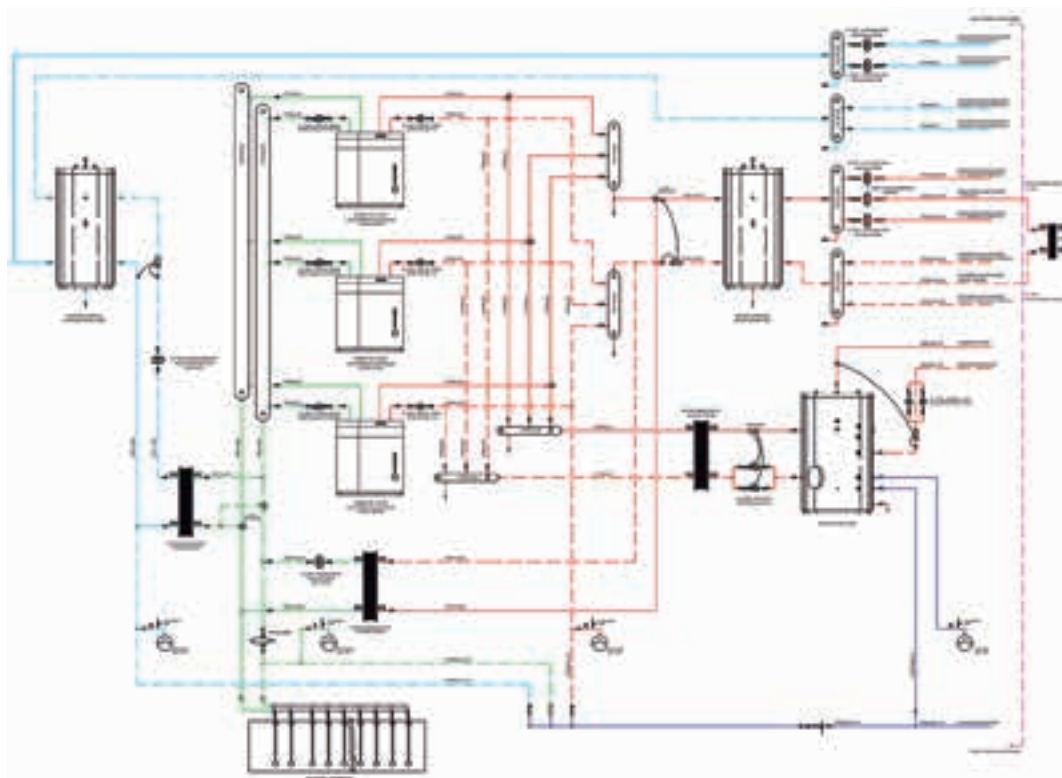
The energy production system provides a total thermal capacity of 300 kW through three ecoGEO+ HP brine-to-water heat pumps arranged in a cascade configuration, each with a capacity of 100 kW. These high-efficiency inverter-driven units dynamically adapt their operation to the building's thermal demand, ensuring maximum performance. The system is designed to cover 100% of the annual heating and cooling demand, optimising heat exchange with the geothermal field and enabling simultaneous production with full heat recovery, further enhancing overall system efficiency.

*Maximum efficiency,
minimum impact*



◀ Actual photographs of the installation

Installation scheme



*Ground-source
technology
enhancing comfort
and property value*

Efficiency

Hippiements achieves a Seasonal Performance Factor (SPF) of 5.1 thanks to the Ecoforest heat pumps, demonstrating exceptional efficiency across heating, cooling, and DHW production. Their advanced design minimises energy consumption, reduces CO₂ emissions, and ensures long-term reliability with low maintenance.

By combining ground-source energy with the maximal efficiency of Ecoforest technology, the project exemplifies sustainable luxury living where comfort, aesthetics, and environmental responsibility coexist seamlessly.





Multi-family



Retrofit



*Brine-to-water
heat pump with
air collection*

Decarbonisation of a Social Housing Building in Spain in a Dual Thermal Lift System

Location:	Pasaia, Spain
Year:	2023
Type of installation:	water-to-water system with air collection
Power:	48 kW
Model:	2 ecoAIR ⁺ 3-18 PRO and 8 ecoGEO ⁺ 1-6 PRO
Services:	heating and DHW
Installer:	Tecnalia, Alokabide, CARTIF



Decarbonisation of a Social Housing Building in Spain in a Dual Thermal Lift System

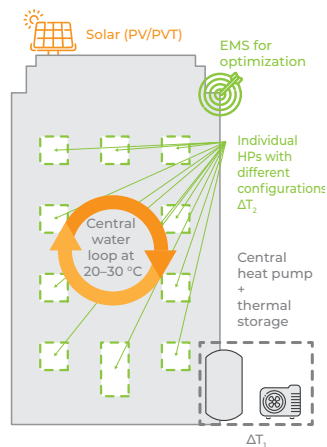
Decarbonisation of a Social Housing Building in Spain in a Dual Thermal Lift System

Sustainable heating solution with heat pumps for residential retrofits

Affordable energy bills in a social housing with minimal retrofit actions

A social housing building in Pasaia, Basque Country, has been fully decarbonised through an advanced Ecoforest heat pump solution based on a double thermal lift concept. The system replaces individual natural gas boilers with a centralised renewable energy plant that combines air collection and water-to-water technologies.

Awarded the 2024 European DecarBuilding prize by the European Heat Pump Association (EHPA), the project demonstrates how high-efficiency heat pump cascades can deliver reliable heating and domestic hot water while significantly reducing emissions and operating costs in multi-family buildings.



Installation needs

The building consists of eight dwellings that previously relied on independent gas boilers, resulting in high energy consumption and limited system efficiency. The refurbishment required a solution capable of supplying both space heating and domestic hot water, while maintaining existing radiators and minimising disruption to occupants. The design also needed to integrate photovoltaic generation and allow centralised production with individual metering and control, ensuring both comfort and fair energy distribution.

Innovative heat pump solution awarded at European level with the DecarBuilding Award

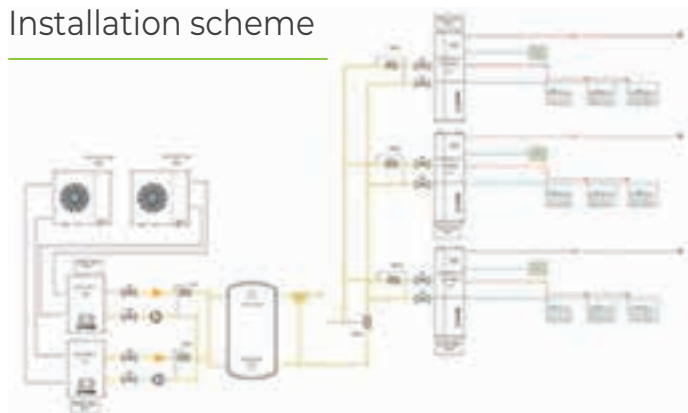
System description

The Ecoforest solution is based on a cascade system with two ecoAIR⁺ PRO air-to-water heat pumps that generate warm-temperature water and store it in a 2,000-litre buffer tank. This represents the first thermal lift. From this buffer, tempered water at around 20 °C is distributed to each dwelling, where individual ecoGEO⁺ PRO water-to-water heat pumps perform the second thermal lift to produce domestic hot water and heating at the required temperatures. The system is integrated with photovoltaic panels, batteries and an intelligent energy management system that prioritises the use of on-site renewable electricity.

Efficiency

By decoupling energy production from demand, the central heat pumps operate during the warmest and most favourable hours, significantly improving their coefficient of performance. This strategy aligns heat generation with peak photovoltaic output, maximising self-consumption and reducing reliance on the electrical grid. Low-temperature distribution minimises thermal losses, while the use of natural refrigerant R290 allows high supply temperatures without replacing existing radiators. The result is a highly efficient, low-carbon solution ideally suited for the renovation of multi-family residential buildings and easily achieved with Ecoforest heat pumps.

Installation scheme





Multi-family



Retrofit



*Air-to-water
heat pump*

Comprehensive Energy Transformation for 159 Homes

Location:	Madrid
Year:	2025
Type of installation:	air-source heat pump
Power:	210 kW
Model:	2 cascades of 4 ecoAIR ⁺ 3-18 PRO
Services:	DHW
Installer:	Sunflower Energías
SCOP:	3.67

Comprehensive Energy Transformation for 159 Homes



Comprehensive Energy Transformation for 159 Homes

*High-efficiency air-source
heat pumps and solar
PV delivering low-carbon
domestic hot water in
urban Madrid*

*80.8% reduction in
energy costs*



The Butarque residential complex in Madrid (Spain) has undergone a high-impact energy refurbishment, replacing an obsolete gas and thermal panel system with a fully electrified air-source and photovoltaic solution. The project serves 159 dwellings and is focused on domestic hot water production.

Eight ecoAIR⁺ 3-18 PRO heat pumps, combined with a rooftop photovoltaic plant, now deliver reliable, low-carbon performance. This installation has achieved outstanding energy, cost and emissions reductions and has been recognised with the inclusion in the ANESE guide as a replicable success story for the residential sector.

Installation needs

The existing infrastructure was based on decentralised gas boilers and thermal solar panels, which were inefficient, costly to operate and difficult to maintain. The renovation required a centralised system capable of supplying domestic hot water continuously to all 159 homes while integrating renewable energy.

Space, acoustic performance and rooftop availability were carefully assessed to accommodate both the heat pumps and the photovoltaic array. The system was designed to minimise disruption to residents while enabling a seamless transition from fossil fuels to an all-electric, renewable-ready solution.

System description

The installation consists of eight ecoAIR® 3-18 PRO air-source heat pumps delivering a combined thermal capacity of 210 kW. These units use natural refrigerant R290 (propane), which provides excellent thermodynamic performance, enabling higher efficiencies and reliable operation even at elevated water temperatures, while maintaining an extremely low global warming potential.

The heat pumps are supported by a photovoltaic system made up of 120 solar panels, which supplies the majority of the electrical demand required to run the system. Designed for year-round operation, the solution delivers domestic hot water with minimal reliance on the public grid. Smart integration between heat pumps and PV generation ensures maximum use of self-produced renewable electricity, further enhancing overall system sustainability and operating cost efficiency.

Efficiency

The transformation has resulted in a dramatic reduction in energy consumption and operating costs. Annual energy use has fallen from 308,857 kWh with the previous gas system to just 93,593 kWh with the new air-source solution. Of this, 95% is covered by on-site photovoltaic generation, leaving only 4,679 kWh per year drawn from the grid. This delivers annual savings of over €20,500 and reduces CO₂ emissions by 46.7 tonnes per year, representing an 88.8% improvement in environmental performance.

*Featured in the
ANESE guide as a
replicable success
story for the
residential sector*





Multi-family



Retrofit



*Air-to-water
heat pump*

Sustainable Heating for Multi-Family Buildings with a Quick Installation

Location:	Wejherowo, Poland
Year:	2025
Type of installation:	cascade of air-source heat pumps hybridised with PV
Power:	96 kW
Model:	4 x ecoAIR ⁺ 6-24 PRO
Services:	heating and DHW
Installer:	Instalex Przedsiębiorstwo Usługowe, EXO Energy System
SPF:	3.33

Sustainable Heating for Multi-Family Buildings with a Quick Installation



Sustainable Heating for Multi-Family Buildings with a Quick Installation

ecoAIR⁺ 6–24 PRO and photovoltaic hybrid system in Wejherowo

R290 propane: natural refrigerant for high efficiency



In Poland, a modern renewable installation was developed for a multi-family building with a total surface of over 2,300 m². The system is based on four Ecoforest ecoAIR⁺ 6–24 PRO air-source heat pumps, delivering central heating and domestic hot water for all residents.

The project demonstrates how air-source technology combined with intelligent control and renewable integration can replace traditional district heating, offering a future-proof solution for collective residential buildings seeking lower emissions and operational costs.

Installation needs

The installation required a high-capacity system capable of supplying heating and DHW for multiple dwellings while ensuring comfort and efficiency. Four stainless steel DHW tanks of 1,000 litres each were installed to guarantee sufficient storage and peak demand coverage.

The system had to integrate with photovoltaic panels and support smart energy management. Flexibility, scalability and compatibility with existing infrastructure were essential to ensure a smooth transition from the former district heating network.

System description

The system consists of four ecoAIR⁺ 6–24 PRO air-source heat pumps operating with natural refrigerant R290 (propane). Their modular design allows precise load management and redundancy, while the versatility of this model allows it to meet both low and high demand levels.

The heat pumps supply central heating and DHW through four large storage tanks. Integration with photovoltaic panels enables renewable electricity to power the system. Smart control manages production, storage and consumption, optimising performance while maximising the use of locally generated solar energy.



Efficiency

Thanks to R290 technology, the system achieves high efficiency with a low environmental impact. Propane offers excellent thermodynamic performance, reduced global warming potential and future regulatory compliance. ecoAIR⁺ 6–24 PRO units can be cascaded up to six systems, achieving up to 144 kW.

The hybrid operation with PV further reduces electricity costs and grid dependency. Compared to the previous district heating system, the building now benefits from significantly lower operating costs, improved energy autonomy and a more sustainable, resilient heating infrastructure.





Multi-family



Retrofit



*Brine-to-water
heat pump with
air collection*

Torre Efisa: A Blueprint for Net-Zero High-Rise Renovation

Location:	A Coruña, Spain
Year:	2026
Type of installation:	high-power air-collection heat pumps hybridised with PV
Power:	200 kW
Model:	2 ecoGEO+ HP3 20-85 kW
Services:	heating and DHW
Installer:	Iberdrola, Seingenia, SITAG

Torre Efisa: A Blueprint for Net-Zero High-Rise Renovation



Torre Efisa: A Blueprint for Net-Zero High-Rise Renovation

How heat pumps, solar integration and intelligent energy management transformed a 1970s complex into a low-carbon, high-efficiency landmark

Halving energy bills while reducing CO₂ emissions by 90%



The Torre Efisa complex in A Coruña has undergone a major energy refurbishment that demonstrates how large residential and commercial buildings from the 1970s can be transformed into efficient, low-carbon assets. The project covers 181 homes and 72 commercial units across seven towers and combines envelope upgrades with high-performance heat pumps and solar generation.

By replacing obsolete fossil-fuel systems with renewable technologies, the complex has achieved a drastic reduction in energy demand, operating costs and emissions while improving comfort and long-term asset value.

Installation needs

The scale and urban setting of Torre Efisa required a carefully engineered solution that could be installed without major structural disruption. The system was designed around air-source thermal capture, avoiding the need for geothermal drilling while retaining the efficiency of water-to-water heat pumps.

A central plant room was created to serve the entire site, with advanced digital controls allowing the installation to adapt in real time to energy demand and solar availability. Specialist commissioning ensured that the system was optimised for local climate conditions and photovoltaic production.

System description

The Torre Efisa system is based on two high power Ecoforest ecoGEO⁺ HP heat pumps installed in cascade, delivering 200 kW of thermal output for heating, cooling and domestic hot water. The hybrid setup uses eight AU22 aerothermal units, avoiding costly geothermal drilling while maintaining water-to-water efficiency.

The installation includes an advanced digital control system with ecoSMART easynet for remote monitoring, ecoSMART Supervisor for cascade management and ecoSMART e-source for intelligent aerothermal control. Energy is stored in four 5,000 litre buffer tanks, enabling surplus solar electricity from 55 rooftop PV and 154 BIPV façade panels to be shifted to periods of demand, optimising renewable self-consumption.



▲ Actual photographs of the installation

Efficiency

By combining high-efficiency Ecoforest heat pumps, on-site solar PV and BIPV generation, and four 5,000-litre buffer tanks, Torre Efisa operates close to net-zero energy. The system's energy manager continuously monitors the balance between solar production and grid supply, activating a "surplus mode" to store excess electricity as heat.

Annual heating demand has dropped by over 75%, carbon emissions by more than 90%, and residents' energy bills by 50%. Each unit of electricity is converted into multiple units of usable heat, making the building highly resilient to rising energy costs and minimising environmental impact.

200 kW of renewable heating power for a mixed-use urban complex



Multi-family



New-build



*Brine-to-water
heat pump with
air collection*

Simultaneous Heating and Cooling for a Multi-Family Building with Air Collection

Location:	Tilburg, Netherlands
Year:	2023
Type of installation:	ecoGEO ⁺ HP 25-100 cascade with air collection and PV hybridisation
Power:	400 kW
Model:	4 ecoGEO ⁺ HP 25-100
Services:	heating, cooling, DHW
Installer:	Vaanster

Simultaneous Heating and Cooling for a Multi-Family Building with Air Collection



Simultaneous Heating and Cooling for a Multi-Family Building with Air Collection

Centralised ecoGEO+ HP cascade with PV hybridisation

This project consists of a high-rise residential development equipped with a centralised energy system based on four Ecoforest ecoGEO+ HP1 25-100 heat pumps operating in cascade with PV hybridisation and aerothermal sources.

The installation provides simultaneous heating and cooling, as well as domestic hot water, for 78 apartments across a 20-storey building. Designed as a high-efficiency collective solution, the system ensures stable comfort throughout the year while significantly reducing energy consumption and carbon emissions through the use of renewable energy.

High-performance cascade for multi-dwelling comfort with drycoolers



Installation needs

The building required a central system capable of supplying heating, cooling and DHW to multiple dwellings with very different demand profiles. Key requirements included high reliability, continuous operation, and the ability to deliver simultaneous thermal services while ensuring individual control at apartment level.

The system also had to be scalable, future-proof and compatible with underfloor heating and cooling, ventilation units and auxiliary radiators, while minimising plant room space and operating costs.

System description

The installation is based on four ecoGEO⁺ HP1 25-100 kW water-to-water heat pumps, connected to two independent dry coolers and producing heating and cooling into separate buffer tanks.

The cascade is managed by ecoSMART Supervisor, which ensures balanced operating hours across all units, optimises partial load operation and maximises system lifespan and efficiency. Energy is distributed via inertial circuits to each apartment, where individual double-flow ventilation units manage space conditioning.

►
*Actual
photographs of the
installation*



Efficiency

The cascade configuration allows the system to adapt dynamically to real demand, activating only the necessary units and maintaining all heat pumps within optimal operating ranges. Thanks to inverter technology, simultaneous production of heating and cooling, and PV hybridisation the installation achieves very high seasonal efficiency and reduced electrical consumption. This approach guarantees lower operating costs, improved system durability and a substantial reduction in CO₂ emissions compared to conventional centralised solutions.





Multi-family



New-build



*Brine-to-water
heat pump with
air collection*

Hybrid Ground-Source & Air-Source Energy Solution at Madrid

Location:	Madrid, Spain
Year:	2021
Type of installation:	ecoGEO ⁺ HP with hybrid collection (air-source and ground-source)
Power:	500 kW
Model:	5 ecoGEO ⁺ HP3 25 - 100
Services:	heating
Installer:	Geoter

Hybrid Ground-Source & Air-Source Energy Solution at Madrid



Hybrid Ground- Source & Air-Source Energy Solution at Madrid

*Efficient, sustainable
climate control for 92 eco-
sustainable homes*



The residential development located in La Fortuna, Rivas-Vaciamadrid, near Madrid city centre, comprises 92 eco-sustainable single-family homes with three and four bedrooms, organised around a central communal area with sports and leisure facilities.

The project incorporates a pioneering hybrid renewable energy system, combining ground-source and air-source collection systems to deliver high-efficiency heating and cooling via underfloor systems to all dwellings and shared areas, ensuring year-round comfort and reduced energy consumption.

Installation needs

The scale and energy demand of the development required a robust and flexible climate control solution capable of providing continuous base load coverage while efficiently managing peak demand.

Site conditions, subsoil characteristics and sustainability targets led to the selection of a hybrid system, where ground-source energy supplies the primary thermal demand and air-source energy complements the system during periods of higher load or favourable outdoor conditions. The solution also needed to minimise operational complexity, maximise reliability and integrate seamlessly within the residential environment.

*Integrated hybrid
system with
ecoSMART e-Source
Management*

Actual photographs of the
installation



System description

The installation consists of a geothermal capture field formed by 32 vertical boreholes, each 125 metres deep, designed based on detailed geological analysis and building demand calculations. This field supplies five ecoGEO+ HP ground-source heat pumps with a total installed thermal capacity of 500 kW, arranged to operate with inverter technology for modulating performance.

Aerothermal integration is achieved through two external air heat exchange modules of 121 kW each, installed on the roof and connected to the same production system. An intelligent control system manages the hybrid operation, automatically selecting between ground, air or hybrid collection modes depending on environmental conditions and system demand.

The installation is managed by the ecoSMART e-source, an advanced source manager specifically designed for ecoGEO+ HP heat pumps. This system enables the integration of up to three different collection methods (ground, air, phreatic) within a single hybrid installation, offering high versatility for optimised energy use. The ecoSMART e-source continuously monitors the building's thermal demand, prioritising the primary source and activating or deactivating secondary sources as required, ensuring efficient operation and cost savings.



Among its exclusive functionalities, the ecoSMART e-source incorporates an advanced defrost system, allowing sequential defrosting of air units without cycle inversion or compressor interruption, even when multiple air sources are employed. This ensures uninterrupted operation, maximises system efficiency, and provides reliable climate control for all connected areas, including communal facilities.

Efficiency

The system is designed to cover 100% of the heating and cooling demand of the development while optimising energy performance throughout the year. Ground-source energy performance a stable and highly efficient base load, available continuously, while air-source energy enhances performance during peak demand and favourable temperature ranges.

The inverter-driven heat pumps adapt output to real-time requirements, reducing energy consumption, extending equipment lifespan and ensuring high seasonal efficiency. The result is a highly efficient, resilient and sustainable climate control solution that delivers long-term operational and environmental benefits.

*High efficiency with
an ecoGEO⁺ HP
cascade*





Multi-family



Retrofit



*Brine-to-water
heat pump*

Preserving History while Protecting the Future with Aquathermy

Location:	Westerlo, Belgium
Year:	2022
Type of installation:	high-power water-to-water heat pump
Power:	50 kW
Model:	1 ecoGEO ⁺ HP 15-70
Services:	heating and DHW
Installer:	Eplucon Belgium, ECO-Technix and Extraqt
SCOP:	3.2

Preserving History while Protecting the Future with Aquathermy



Preserving History while Protecting the Future with Aquathermy

Sustainable aquathermy retrofit at the Castle de Merode

Runner-up project in the ecoAWARDS & selected in the EHPA awards



The retrofit of the Castle de Merode in Westerlo, Belgium, demonstrates how historic heritage can be preserved while embracing sustainable energy solutions. An ecoGEO⁺ HP 15-70 water-to-water heat pump was installed to provide heating and domestic hot water, significantly reducing environmental impact without compromising the building's architectural value.

The project shows that even protected monuments can contribute to the energy transition through carefully designed, innovative technologies.

Out-of-the-box installation with an open-loop collection in the castle moat

Installation needs

The castle presented multiple constraints, including strict heritage regulations, the need to maintain radiators as emitters and limited options for external infrastructure. Boreholes were impossible due to the surrounding moat, and air-based systems were rejected for aesthetic reasons. The solution had to integrate seamlessly with the historic fabric, operate quietly and ensure reliable performance across large interior spaces.

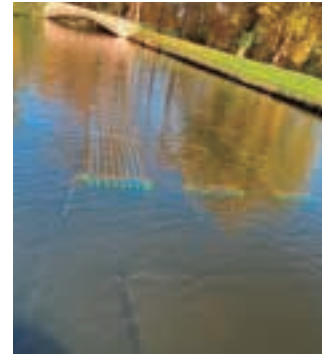
System description

The solution was aquathermy. This system extracts thermal energy from the 5,000 m³ moat using specially designed water collectors. Heat is transferred through a closed-loop pipe network to an ecoGEO⁺ heat pump. The system is hybridised with the existing gas installation and supported by cogeneration and nearby solar panels, ensuring operational stability even in extreme weather conditions.



Efficiency

Despite technical complexity and conventional radiators, the installation achieves a SCOP of 3.2. This results in an estimated 50% reduction in CO₂ emissions compared to the previous system. The hybrid design guarantees year-round efficiency, combining renewable energy sources with backup systems to deliver sustainable performance in a demanding historical environment.



Actual photographs of the installation



Multi-family



Retrofit



*Brine-to-water
heat pump*

Historic Renovation with High-Efficiency Ground-Source Technology

Location:	Csécse, Hungary
Year:	2023
Type of installation:	cascade of three domestic heat pumps with HTR
Power:	66 kW
Model:	3 ecoGEO+ B4T 5-22 HTR EH
Services:	heating, active cooling and DHW
Installer:	Green Watt Zrt. And Geo Concept Kft.
SCOP:	4.7

Historic Renovation with High-Efficiency Ground-Source Technology



Historic Renovation with High- Efficiency Ground- Source Technology



*Water-to-water heat pump
cascade at historic castle
with excellent performance*

The reconstruction of the Keglevich Castle in Csécs, Hungary, illustrates how modern renewable technologies can be successfully integrated into historic buildings. A cascade of three ecoGEO+ water-to-water heat pumps was installed to provide heating, active cooling and domestic hot water, ensuring high comfort levels while fully respecting the architectural and aesthetic value of the 1920s castle.

The project proves that efficient and sustainable energy solutions are perfectly compatible with heritage renovation when supported by accurate engineering and system design.

Installation needs

The main challenge of the project was the limited and complex technical space. The plant room had to be located in a former vaulted cellar, requiring a precise 3D layout to ensure correct positioning and maintenance access for all equipment.

The system also had to meet strict visual and structural requirements while delivering year-round heating, cooling and DHW. Redundancy and operational reliability were essential to guarantee continuous service in a residential historic building.



System description

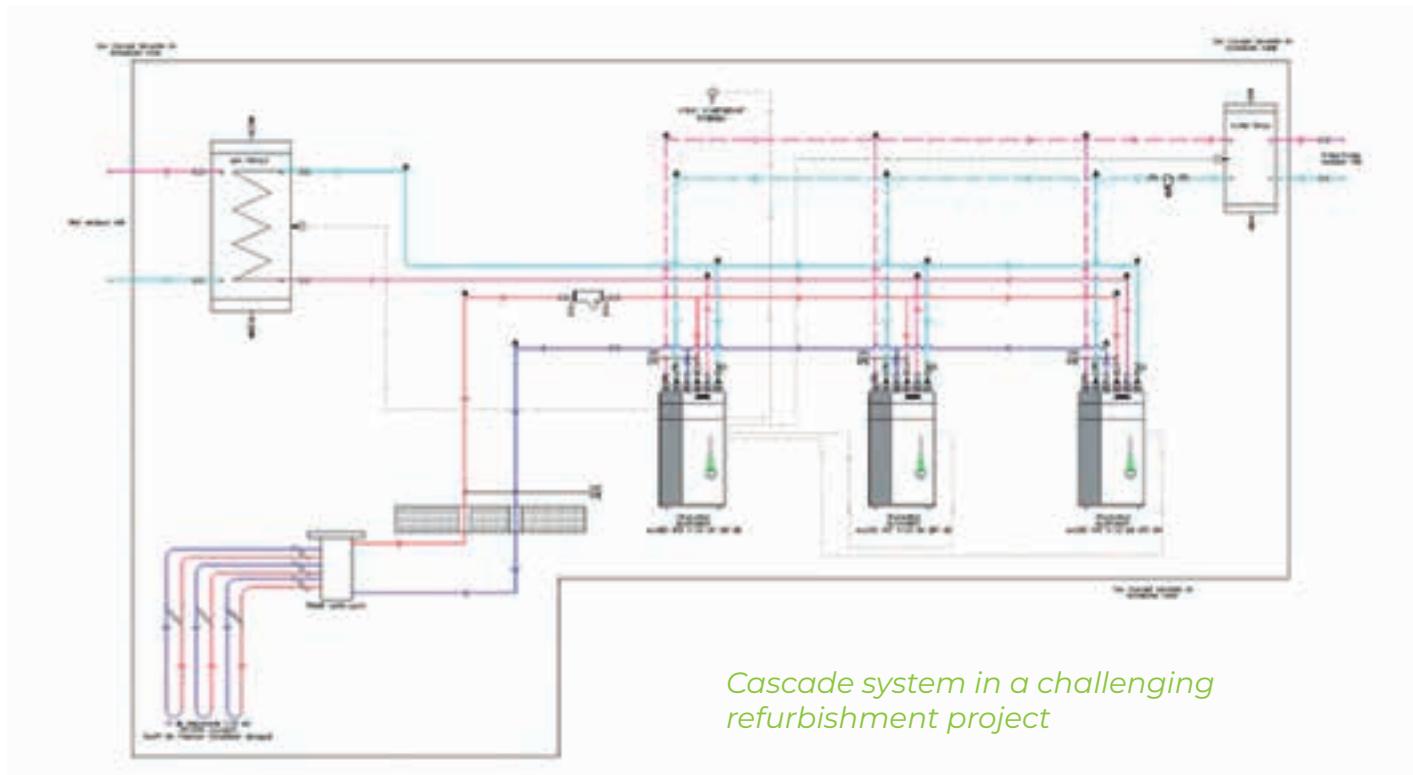
The installation includes thirteen vertical boreholes, each 100 metres deep, supplying renewable energy to three ecoGEO+ B4T 5-22 HTR EH heat pumps operating in cascade. The system is complemented by two 500-litre carbon steel buffer tanks. This configuration allows balanced load distribution, increased system resilience and optimised performance in both heating and cooling modes, all within a reduced technical room footprint.

The integration of HTR (High Temperature Recovery) technology further improves the overall efficiency of the system. By recovering excess thermal energy generated during cooling operation, the heat pumps can simultaneously produce domestic hot water at higher temperatures at virtually free cost.



Actual photographs of the installation

Installation scheme



Efficiency

Despite the building's age, the system achieves an excellent SCOP of 4.7. The cascade design ensures high efficiency, strong redundancy and stable operation throughout the year.

*Winner of the
ecoAWARD for the
project inception*



The solution significantly reduces energy consumption and emissions while delivering reliable comfort, demonstrating the effectiveness of well-engineered ground-source systems in demanding refurbishment projects.





Commercial



New-build



*Brine-to-water
heat pump*

Industrial Ground-Source Efficiency at Gönyű National Public Port

Location:	Győr-Károlyháza, Hungary
Year:	2017
Type of installation:	ground-source ecoGEO ⁺ HP
Power:	500 kW
Model:	1 ecoGEO ⁺ HP3 12-40
Services:	heating, passive and active cooling and DHW
Installer:	Geo Concept Kft., Green Watt Zrt.
SCOP:	6.4

Industrial Ground-Source Efficiency at Gönyü National Public Port



Industrial Ground- Source Efficiency at Gönyű National Public Port

Ground loop heat pump system for a high-performance control building in Hungary

Passive cooling for maximum energy savings



The Gönyű National Public Port in Győr, Hungary, is a benchmark project for industrial ground-source installations. Designed as a modern, energy-efficient facility, the building integrates an ecoGEO+ HP3 12-40 heat pump with a ground loop system to provide heating, cooling and domestic hot water.

The project demonstrates how smart engineering and sustainable design can significantly reduce operating costs while delivering high performance in a demanding industrial environment.

Installation needs

From the outset, the investor aimed to maximise energy efficiency through both architectural and technical solutions. The building features high-performance insulation and glass façades with a grid-based shading system to control solar gains throughout the year. Extensive earthworks required for the port development created the opportunity to implement a horizontal ground collector system, avoiding the higher costs associated with vertical drilling and optimising the available land.

System description

A total of 1,360 metres of 40 mm diameter piping was installed at a depth of four metres to form the ground loop. The ecoGEO+ HP3 12-40 heat pump supplies heating, DHW, passive cooling and active cooling. The system also manages mixed circuits and an external passive cooling heat exchanger, eliminating the need for additional control units and simplifying system operation.

The sustainability aspect was addressed through an integral approach: even the architectural solutions were aimed at energy efficiency with well-insulated glass facades with a special grid-like shading system, which shades in the summer and allows sunlight in during the winter.

The system makes use of passive cooling by directly circulating refrigerant fluid from the ground loop through a heat exchanger, without activating the compressor of the heat pump. This allows the building to be cooled using the naturally lower temperature of the soil, significantly reducing electrical consumption compared to conventional active cooling.



*2018 Construction
Industry Level Award
& XXII Hungarian
Real Estate
Development Level
Award*

Efficiency

The favourable sizing and placement of the collector field ensure stable primary-side temperatures, resulting in exceptional efficiency. The system reaches an SPF of 6.4, with reaching 9.9 in May. Passive cooling further reduces energy demand, leading to an estimated payback period of around two years compared to conventional gas and split cooling systems. The integral sustainability of the harbour won the 2018 Construction Industry Level Award and the XXII Hungarian Real Estate Development Level Award.



Commercial



Retrofit



*Brine-to-water
heat pump*

Royal Alexandra and Albert School, a 2.2 MW Heat Network

Location:	Reigate, UK
Year:	2022
Type of installation:	Ground-source system
Power:	2.2 MW
Model:	combination of ecoGEO HPs depending on the building
Services:	heating, DHW

Royal Alexandra and Albert School, a 2.2 MW Heat Network



Royal Alexandra and Albert School, a 2.2 MW Heat Network

Drastic energy savings in a large state combining multi-use buildings

High-capacity multi-source renewable heating system



At the Royal Alexandra and Albert School, a landmark low-carbon retrofit replaced oil-based heating with a fully renewable heat pump network delivering 2.2 MW of thermal capacity. By capturing energy from lakes and deep boreholes across the 100-hectares estate, the system will displace 750,000 litres of heating oil annually and cut heating-related carbon emissions by 90%.

Designed and installed by ISO Energy and powered by Ecoforest heat pump technology, the project demonstrates how large, heritage-sensitive building complexes can transition to clean, reliable and financially viable renewable heating.

Installation needs

The school estate comprises 18 buildings including boarding houses, classrooms, and sports facilities, all previously dependent on oil-fired boilers. The scale and architectural sensitivity of the site required a decentralised solution with multiple plant rooms and discreet energy collection.

Thirteen plant rooms were designed to ensure resilience and zoning flexibility. Extensive groundworks were needed to access renewable heat sources without disturbing the historic landscape, while upgrades to insulation and lighting were carried out to maximise overall system efficiency.

System description

Ecoforest water-to-water heat pumps provide a combined capacity of 2.2 MW, supplying space heating and domestic hot water across the campus. Thermal energy is extracted from two lakes and a pond via 20 km of submerged loop collectors. Across the state, 160 boreholes were drilled to 140 m to meet all the energy needs of the school.

A glycol-water mixture circulates through the loops, transferring stable ground and water temperatures to the heat pumps. This hybrid ground- and water-source configuration ensures high seasonal performance and operational reliability.

The reliability of the ecoGEO⁺ heat pump range enables high thermal outputs even in installations with complex energy sources such as this one, while also allowing full control of auxiliary equipment such as gas boilers or heating elements. The integration of an ecoSMART e-source in this project allows multiple energy sources to be combined, including ground-source and groundwater, as well as air-source where required. The system continuously selects the most efficient energy mix, optimising performance, reducing operating costs and maximising overall energy efficiency.

Efficiency

The system has eliminated the use of approximately 750,000 litres of heating oil per year and reduce CO₂ emissions by around 2,300 tonnes annually. With support from the UK Renewable Heat Incentive and a green energy loan from Lloyds Bank, the project achieves a payback period of around ten years. Beyond financial returns, the installation delivers long-term energy security and positions the school as a national benchmark for large-scale renewable heating in education, proving that sustainability and heritage can work hand in hand.



An ambitious decarbonisation project with a 10-year payback period



Commercial



Retrofit



*Brine-to-water
heat pump*

Bath Abbey Eco-Heating Retrofit

Location:	Bath, UK
Year:	2022
Type of installation:	Open-loop system
Power:	200 kW
Model:	2 ecoGEO+ HP 25-100
Services:	heating

Bath Abbey Eco-Heating Retrofit



Bath Abbey Eco-Heating Retrofit

*From Roman Springs
to Modern Heat Pumps:
Harnessing Thermal
Energy Efficiently*



Bath Abbey has undergone a major eco-friendly heating upgrade as part of its €22.3 million Footprint refurbishment project. The system harnesses Bath's famous thermal springs to supply heat to the historic Abbey and adjacent buildings. This world-first initiative replaces the outdated Victorian heating system, integrating modern underfloor heating and Ecoforest ground-source heat pumps while respecting the Abbey's historical and architectural integrity. By capturing renewable thermal energy, the project demonstrates an innovative approach to sustainable energy in heritage buildings.

Installation needs

The project required careful surveying of the Great Roman Drain, which carries hot spring water to the River Avon, to determine where heat exchangers could be safely installed. The high mineral and silt content of the water, corrosion risks, and health hazards necessitated a closed-loop design capable of handling the high inlet temperature in a water-to-water heat pump system.

Engineers needed to work seven metres underground in confined, humid conditions, adapting to archaeological discoveries, medieval mosaics, and historic floor structures. The goal was to integrate a sustainable heating system with minimal disruption to the Abbey and surrounding heritage features while ensuring the heat pumps could operate efficiently at elevated supply temperatures.



System description

At Bath Abbey, a 200 kW open-loop installation integrates two Ecoforest ecoGEO⁺ HP 25-100 brine-to-water heat pumps with advanced heat exchange technology. Every day, 1.1 million litres of geothermally heated water flow from the Roman Baths, much of it previously discharged to the River Avon.

When the Abbey floor was repaired, an eco-friendly underfloor heating system was installed. Thermal energy recovered from the Great Roman Drain now feeds low-temperature circuits across the Abbey and Kingston Buildings, replacing inefficient Victorian trench heating. The solution improves energy performance, reduces carbon emissions and establishes a scalable renewable heating model within a UNESCO World Heritage city centre.

*Shortlisted for the
BusinessGreen
Leaders Awards 2022*



Efficiency

By using thermal spring water and ground-source heat pumps, the Abbey reduces reliance on fossil fuels and electricity consumption.

The system delivers low-level, consistent heating across 815 m² of worship space, avoiding heat loss to high vaulted ceilings, and ensuring comfort while protecting the building fabric. The underfloor pipes are designed to last over 100 years, offering long-term energy and maintenance savings.

The Abbey now contributes to the Church of England's 'Shrinking the Footprint' carbon reduction campaign, with projected annual savings of around £30,000 and a significant reduction in its environmental impact.

The installation was shortlisted for the BusinessGreen Leaders Awards 2022 in the Renewable Energy Project category, recognising its innovative use of heat pumps and geothermal energy in a historic building.



Commercial



New-build



*Brine-to-water
heat pump*

High-Performance Ground-Source HVAC for Prague Train Station

Location:	Prague, Czech Republic
Year:	2025
Type of installation:	Cascade of ground-source high-power heat pumps hybridised with PV
Power:	261 kW
Model:	3 ecoGEO+ HP1 20-85
Services:	heating and cooling
Installer:	GT Energy

High-Performance Ground-Source HVAC for Prague Train Station



High-Performance Ground-Source HVAC for Prague Train Station

ecoGEO⁺ HP cascade delivers heating and cooling

Smart zoning and part-load efficiency for large-scale infrastructure



The modernised Prague–Bubny Railway Station in the Czech Republic sets a new benchmark for high-performance HVAC in large-scale transport hubs. Serving suburban rail, metro connections and public spaces, it is a key stop on the upgraded line linking central Prague with the airport and Kladno, while also acting as a major interchange with Metro Line C and the future Vltava Philharmonic Hall.

The project required a low-carbon, energy-efficient solution to manage fluctuating demand across vast open areas, delivered through three high-power ecoGEO⁺ HP heat pumps providing 261 kW of simultaneous heating and cooling, with part-load optimisation, intelligent zoning and readiness for future PV integration.

Installation needs

The station spans approximately 250 × 50 metres, with trains entering the interior, extensive glazing, and multiple usage areas including platforms, waiting zones and retail. HVAC needed to manage large, fluctuating thermal loads while maintaining air quality, acoustic comfort and stable temperatures.

The system also had to operate continuously, respond to dynamic occupancy and passenger flows, and allow for future scalability and renewable energy integration. Flexibility and reliability were critical for a high-traffic, multi-functional transport hub.

System description

The Prague–Bubny installation highlights the versatility of ground source heat pump technology in complex infrastructure projects. Three ecoGEO+ HP units operate with ground-source collection to provide heating and cooling across all station areas, using variable-speed compressors and cascade operation to optimise part-load performance.

Energy is captured through 25 horizontal ground loops installed beneath the track superstructure, each 150 long, complemented by recovered waste heat from railway signalling systems and air/water heat exchangers. The system supports passive and active cooling, hybrid PV operation and intelligent zoning, ensuring efficient, future-ready comfort through underfloor systems and air-handling units.

*Simultaneous
heating and cooling*

Actual photographs of the
installation



Efficiency

The HVAC solution at Prague–Bubny is designed to maximise energy efficiency while ensuring reliable performance in a demanding transport environment. The use of ground source heat pumps enables stable seasonal efficiency, reducing dependence on fossil fuels and lowering operational carbon emissions. Variable-speed compressors and part-load optimisation allow the system to adapt precisely to real demand, avoiding unnecessary energy consumption during off-peak periods.

Heat recovery from technical systems and readiness for photovoltaic integration further enhance overall system efficiency, delivering long-term operational savings and supporting the station's low-carbon strategy.





Commercial



New-build



*Brine-to-water
heat pump*

Sustainability in Sports Complex with Ecoforest Technology

Location:	Ascó, Spain
Year:	2026
Type of installation:	cascade of ecoGEO ⁺ HP
Power:	255 kW
Model:	3 ecoGEO ⁺ HP 20-85
Services:	heating, cooling, DHW
Installer:	Romà Infraestructures, Qualigeotermia, Quadrifoli

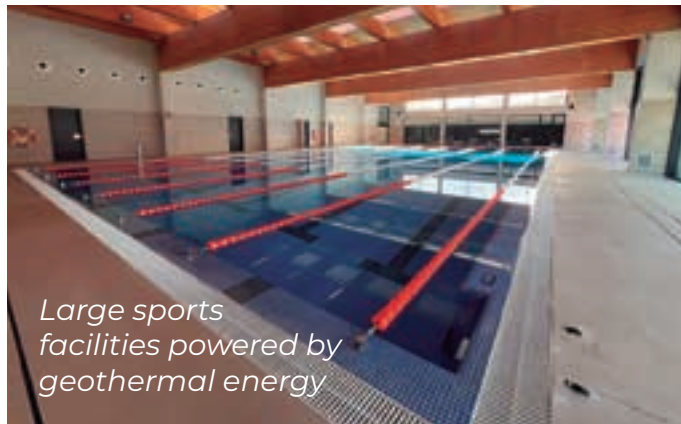
Sustainability in Sports Complex with Ecoforest Technology



Sustainability in Sports Complex with Ecoforest Technology

*High-efficiency ecoGEO+
HP heat pumps provide
simultaneous heating,
cooling, and hot water
across pools, fitness areas,
and saunas*

*Maximum-power
cascade for
continuous comfort
and multiple services*



The Vitea Sports Complex integrates a high-capacity ground-source solution based on a cascade of three ecoGEO+ HP 20-85 heat pumps, Ecoforest's highest power range for large-scale projects. The system delivers simultaneous cooling and heating, cooling and DHW, and even combined cooling, heating and DHW, meeting the high energy demand of the facility.

It also provides air dehumidification through cooling and sauna heating, ensuring stable comfort and high operational efficiency in a demanding environment. Thanks to ecoSMART easynet and ecoSMART Supervisor, the installation benefits from remote control, agile technical support and optimised energy management with minimal environmental impact.

Installation needs

The complex includes multiple areas with very different thermal requirements: a 25×12 m indoor pool, activity pool, fitness areas, rehabilitation rooms and saunas. This type of facility requires a centralised, high-power energy solution with maximum reliability and continuous operation.

The system must supply heating, cooling and DHW simultaneously, ensuring year-round comfort for users and staff, while supporting additional services such as sauna heating and air dehumidification. At the same time, it must guarantee controlled operating costs and a minimal carbon footprint.

System description

The installation is based on a cascade of three ecoGEO⁺ HP 20-85 water-to-water ground-source heat pumps, configured as a modular high-power system for large sports and wellness facilities. The geothermal collector field consists of 38 boreholes, each 125 m deep. The inclusion of HTR in these heat pumps further strengthens the ecoGEO⁺ HP capability for simultaneous cooling and heating. In this installation, up to three services can be delivered at the same time: heating, cooling and DHW.

The ecoSMART Supervisor manages cascade operation, balancing running hours across units to maximise lifespan while prioritising partial load operation for efficiency. ecoSMART easynet enables remote monitoring and control of the entire system, allowing real-time supervision, remote adjustments and technical support, reducing on-site interventions and improving overall system management.



Efficiency

The ecoGEO⁺ HP 20-85 cascade delivers outstanding seasonal performance, automatically adjusting output through inverter technology to match real demand in each area. Cascade operation ensures continuous service even during maintenance, increasing system availability and operational security.

By combining ground-source energy, simultaneous production, intelligent control and remote supervision, the installation achieves high energy efficiency, reduced operating costs and optimised resource management. It demonstrates how Ecoforest's high-capacity centralised solutions provide long-term value in large public projects, promoting the use of renewables in sports facilities with high energy demand.





Commercial



Retrofit



*Air-to-water
heat pump*

Sustainable Heating Retrofit for a Supermarket with ecoAIR⁺ PRO

Location:	Kressbronn, Germany
Year:	2026
Type of installation:	ecoAIR ⁺ 6-24 PRO cascade
Power:	72 kW
Model:	3 ecoAIR ⁺ 6-24 PRO
Services:	heating and cooling
Installer:	enrgi

Sustainable Heating Retrofit for a Supermarket with ecoAIR⁺ PRO



Sustainable Heating Retrofit for a Supermarket with ecoAIR⁺ PRO

High-efficiency R290 heat pumps deliver reliable heating and cost savings

Future-proof R290 equipment

Rapid and simple rooftop installation

This project involves the renovation of a supermarket belonging to the German retail group Edeka, which has replaced its conventional gas-based heating system with a sustainable solution based on Ecoforest ecoAIR⁺ PRO heat pumps using natural refrigerant R290.

The new installation provides a total thermal output of 72 kW and ensures reliable and efficient space heating. By integrating renewable air-source energy, the system significantly reduces CO₂ emissions while improving indoor comfort and lowering operating costs.





Installation needs

The supermarket required a compact, efficient and cost-effective heating solution capable of operating continuously during opening hours and adapting to highly variable demand profiles.

The main objectives were to eliminate fossil fuel dependency, optimise energy consumption and maintain stable indoor temperatures for customers and staff. In addition, the system had to be suitable for rooftop installation, compatible with existing radiator-based distribution and able to minimise disruption during the retrofit process.

System description

The installation is based on a cascade of three ecoAIR+ 6-24 PRO air-to-water heat pumps, delivering up to 72 kW of thermal power. The units use the natural refrigerant R290 and are centrally managed via a CM indoor control module, ensuring coordinated operation and optimal load distribution.

The rooftop configuration simplifies integration, frees up technical room space and allows flexible system expansion through cascade management if future capacity increases are required.

Efficiency

Thanks to inverter technology and intelligent cascade control, the system continuously adjusts output to real demand, maintaining high efficiency at partial loads. With flow

temperatures of up to 70°C, the ecoAIR+ PRO units enable boiler replacement without modifications to the existing distribution system. The result is a highly efficient installation that delivers

significant energy savings, reduced operating costs and a lower carbon footprint compared to traditional gas-based solutions.



Commercial



Retrofit



*Air-to-water
heat pump*

High-Efficiency Heat Pump Solution for Supermarket Hot Water Production

Location:	Bath, Ireland
Year:	2023
Type of installation:	air-source installation
Power:	9 kW
Model:	1 ecoAIR ⁺ 1-9 PRO
Services:	DHW
Installer:	Efficient Renewables
SCOP:	3.7

Carndonagh

High-Efficiency Heat Pump Solution for Supermarket Hot Water Production



High-Efficiency Heat Pump Solution for Supermarket Hot Water Production

Replacing electric immersion heaters with the ecoAIR⁺ 1-9 PRO to reduce operating costs and carbon footprint

The ecoAIR⁺ PRO range provides a future-ready solution that combines operational efficiency, environmental responsibility and long-term cost stability

The installation of an ecoAIR⁺ 1-9 PRO heat pump to supply domestic hot water (DHW) for a supermarket facility was driven by the need for a continuous hot water supply, required for cleaning food-handling areas, equipment sanitation, staff facilities, and back-of-house hygiene.

The proposed solution replaced conventional electric immersion heaters with a high-efficiency air-to-water heat pump system, delivering a solution that was approximately three and a half times cheaper to operate than the previous immersion-based water heating.

Installation needs

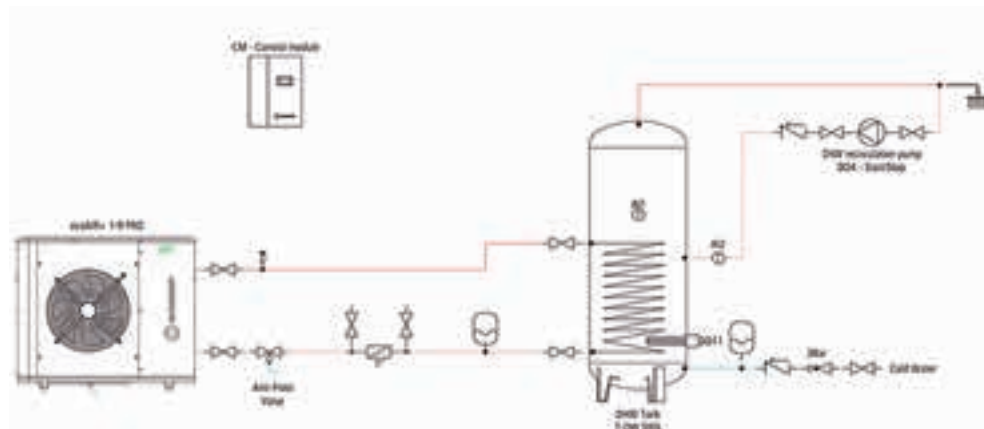
Supermarket hot water systems must provide a continuous and reliable supply, with sufficient capacity to meet peak demand while maintaining stable temperatures for hygiene and regulatory compliance. The ecoAIR⁺ 1-9 PRO has been selected because it is well suited to commercial DHW applications, offering flexible capacity and compact installation.

The system was integrated with the existing DHW tanks and will take over from the electric immersion heaters as the primary heat source. Connection to the building management system allows monitoring, scheduling and optimisation of hot water production to match the supermarket's operating profile.



Installation scheme

Hot water for demanding commercial environments while dramatically reducing energy costs



System description

The ecoAIR[®] 1-9 PRO is an air-to-water heat pump designed for professional applications that require reliable high-temperature water production and high seasonal efficiency. It uses R290 as an environmentally friendly refrigerant with a low global warming potential and an inverter-driven compressor that adapts output to real demand.

For this supermarket project, the unit heats a central domestic hot water storage tank, which then distributes hot water to food preparation zones, cleaning stations, washdown areas and staff facilities. Advanced electronic controls enable precise temperature regulation and provide the option for remote monitoring and system optimisation.

Efficiency

Electric immersion heaters convert electricity directly into heat and therefore have high running costs, particularly in buildings with large and continuous hot water demand such as supermarkets.

The projected operating cost of the heat pump system is around three and a half times lower than that of the existing immersion heaters. This improvement has led to significant reductions in energy expenditure, lower carbon emissions and a measurable improvement in the supermarket's overall energy performance.



Commercial



New-build



*Air-to-water
heat pump*

High-Efficiency Hot Water Production for a Thermal Spa

Location:	Ontario, Canada
Year:	2024
Type of installation:	air-source system
Power:	60 kW
Model:	3 ecoAIR ⁺ EVI 4-20
Services:	DHW
Installer:	GeoSmart Energy

High-Efficiency Hot Water Production for a Thermal Spa



High-Efficiency Hot Water Production for a Thermal Spa

ecoAIR® EVI heat pump cascade delivers high-efficiency domestic hot water for a thermal spa

*Efficiency for large
DHW demands*



This installation represents a milestone as the first project in Canada to deploy a cascade of ecoAIR® EVI heat pumps from 4 to 20 kW specifically designed for domestic hot water production in a thermal spa environment. Spas require large volumes of hot water to supply pools, showers, treatment areas and hygiene facilities, with continuous operation throughout the year.

The main objective of this innovative system is to significantly reduce energy consumption by using high-efficiency heat pump technology that transfers heat in a sustainable way. By introducing this solution, the spa improves its environmental performance while securing long-term energy savings and operational stability.

*An air-source heat
pump cascade
designed for extreme
climate conditions*

Installation needs

Thermal spa facilities place exceptional demands on domestic hot water systems, as water must be delivered at stable temperatures and in high volumes to ensure comfort, hygiene and uninterrupted service. In addition, Canadian climatic conditions require equipment that can operate reliably in very low outdoor temperatures.

The installation was therefore designed to guarantee continuous hot water availability while maintaining efficiency during peak demand periods and cold weather. The modular cascade layout allows the system to adapt to variable loads, ensuring that the spa can meet fluctuating usage throughout the day without wasting energy.

System description

The system is based on a cascade of ecoAIR[®] EVI air-to-water heat pumps ranging from 4 to 20 kW, optimised for domestic hot water production in commercial applications. These units are equipped with advanced compressors that allow stable operation even at very low ambient temperatures, which is essential for the Canadian climate.

The EVI technology enhances refrigerant injection, enabling higher outlet temperatures and improved performance under demanding climate conditions (up to 60°C without additional electrical support). The system is designed to work in coordination with DHW tanks, ensuring a constant and reliable supply across all spa facilities.

Efficiency

Compared with conventional heating technologies, the ecoAIR[®] EVI cascade delivers a substantial improvement in energy efficiency by extracting renewable heat from the air and upgrading it for hot water production. This allows each unit of electricity consumed to generate several units of useful heat, dramatically reducing operating costs.

The ability to maintain high performance in cold climates ensures that efficiency is preserved throughout the year. As a result, the spa benefits from lower energy consumption, reduced carbon emissions and improved long-term sustainability, reinforcing both its environmental credentials and its commercial competitiveness.



Commercial



Retrofit



*Brine-to-water
heat pump with
air collection*

Hybrid Ground-Source and Air-Source System for a University

Location:	Ourense, Spain
Year:	2021
Type of installation:	ground-source ecoGEO+ HP cascade
Power:	500 kW
Model:	5 ecoGEO+ HP 25 - 100
Services:	heating and cooling
Installer:	Energanova
SCOP:	3.7

Hybrid Ground-Source and Air-Source System for a University



Hybrid Ground- Source and Air-Source System for a University

A large-scale renewable energy project delivering high-efficiency climate control for public sector infrastructure in Spain



The University of Vigo required a modern and sustainable energy solution to upgrade the HVAC system of the Ferro Building, located on the North Campus in Ourense. The existing installation was based on outdated oil-fired boilers and conventional chillers, resulting in high energy consumption and limited efficiency.

This project represents one of the largest renewable HVAC installations in NW Spain. The solution implemented is a hybrid ground-source and air-source heat pump system, designed to cover most of the building's thermal demand while significantly reducing environmental impact.

Installation needs

*Over 700 MWh
of annual energy
savings and 223
tonnes of CO₂
avoided*

An energy audit commissioned by the project developer concluded that the existing HVAC system no longer met current efficiency and comfort standards. The original installation consisted of two 535 kW oil boilers for heating, seven air handling units with direct expansion, and two 332 kW chillers. The audit determined that the building's heating demand reached 86.7 kW, which required the installation of 36 boreholes and three aerothermal units, each with a 36.7 kW capacity.

Rather than being dismantled, the existing system has been retained as a backup to ensure operational reliability during peak demand periods. This approach guarantees continuous service in a public building, avoids unnecessary dismantling costs, and adds an extra layer of security. The combination of ground-source

and air-source collection allows the system to select the most efficient energy source at any given moment, maximising performance while reducing the number of boreholes and, consequently, the overall project cost.

The hybrid configuration is managed by an ecoSMART e-source, an advanced source manager specifically designed for ecoGEO⁺ HP heat pumps. The ecoSMART e-source integrates up to three different heat sources, including ground, air, phreatic, and solar, within a single hybrid installation, offering high versatility for optimised energy use. It continuously monitors the building's thermal demand, prioritising the primary source and activating secondary sources as required, ensuring efficient operation and cost savings

Actual photographs of the
installation





System description

The new thermal generation system is based on five Ecoforest ecoGEO⁺ HP ground-source heat pumps, each with a heating capacity of 86.7 kW. Energy is supplied through a hybrid system combining ground-source and air-source technologies.

Geothermal energy is captured via 36 boreholes, each 140 metres deep, located near the building. Three aerothermal outdoor units, dry coolers, installed on the rooftop, provide an additional 36.7 kW per unit.

This hybrid configuration dynamically selects the most efficient energy source at any given time, maximising performance while optimising investment costs. The new system is fully integrated with the existing distribution circuits, ensuring seamless operation with the building's current HVAC infrastructure.

*A hybrid solution
tailored for large energy
demand in public
buildings*

Efficiency

The hybrid ground-source and air-source solution enables an estimated annual energy saving of 701,045 kWh and prevents the emission of approximately 223.27 tonnes of CO₂ per year. This environmental benefit is equivalent to the annual carbon absorption capacity of more than 11,600 trees. Beyond the clear reduction in greenhouse gas emissions, the project delivers substantial operational cost savings and positions

the University of Vigo as a benchmark for sustainable energy management in public sector buildings. The Ferro Building now benefits from a future-proof HVAC system that combines high efficiency, reliability and environmental responsibility in line with Ecoforest's commitment to innovative renewable solutions.





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