

RheinEnergie Cologne



With a capacity of 150 MW, Cologne's fluvial heat pump will be the largest of its kind in Europe. Located at the Niehl site, the facility will extract heat from the Rhine and provide climate-neutral energy to around 50,000 households. RheinEnergie commissioned Everllence to deliver the full turnkey system, including three 50 MW units, the building, piping, and all core components. The system is designed to reach up to 110 °C and cut approximately 100,000 tons of CO₂ emissions annually.

Key facts

- End customer: RheinEnergie (Germany)
- Application: 1,300 GWh of heat annually to around 50,000 households
- Scope of delivery: 3 x RG50 heat pump system incl. engineering, construction, installation, auxiliary equipment and commissioning
- Refrigerant: Natural
- Heat source: River water > 3 °C
- Heat sink: Water > 110 °C
- Heat output: up to 150 MW
- COP: ~2.5
- CO₂ savings: 100,000 t p.a.

Everllence

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Heat pump reference case

Project background

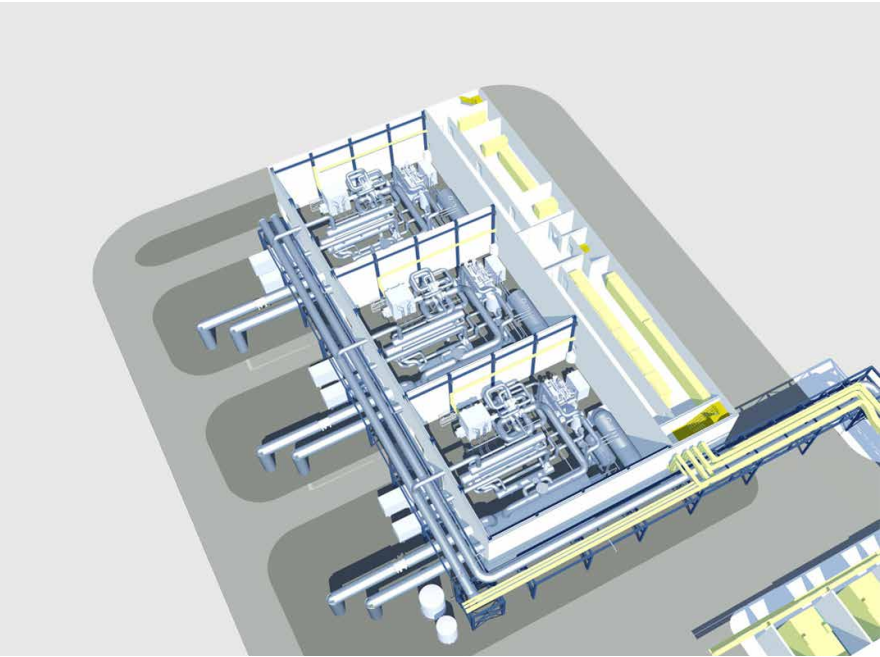
RheinEnergie commissioned Everllence to deliver Europe's largest fluvial heat pump, located at the Cologne-Niehl power plant. The turnkey project is a central part of the city's long-term decarbonization strategy and will provide climate-neutral district heating for around 50,000 households.

System integration & application

The large-scale heat pump system extracts thermal energy from the Rhine using a closed-loop cycle with a natural refrigerant. Three high-capacity units will raise the temperature of district heating water to over 110 °C, meeting network requirements while enabling responsive power balancing.

Operational impact & scalability

Once operational in 2027, the facility is expected to cut ~100,000 tons of CO₂ emissions annually. Designed as a blueprint for future district heating systems, the project sets a precedent for sustainable heating infrastructure in large urban areas.



Visualization of the Everllence fluvial heat pump system for Cologne-Niehl

Technical highlights

| | |
|--------------------------------|----------------------------------------|
| Heat source | River water (> 3 °C) |
| Heat sink temperature | > 110 °C |
| Total heating capacity | Up to 150 MW |
| Annual heat output | Up to 750,000 MWh |
| Refrigerant | Natural |
| Technology | RG50 integrally geared heat pump units |
| Electrical input | Renewable electricity |
| COP | ~2.5 |
| Annual CO ₂ savings | Up to 100,000 tons |

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