

Bardonecchia District Heating Plant

Government/Municipal

The Challenge

Bardonecchia, a high-altitude resort town in the Italian Alps, relies heavily on its district heating network to supply dependable thermal energy during long, severe winters. Demand from hotels, apartments, and tourist facilities continues to grow each year, placing greater pressure on the town's existing infrastructure.

At the same time, updated European policies—including the Efficient District Heating Directive (2012/27/EU) and the EU Emissions Trading System (EU ETS)—require operators to demonstrate higher overall efficiency and substantially lower emissions. For Energetica S.p.A., the district heating plant operator, this meant finding a solution capable of maximizing heat recovery while ensuring continuous operation for more than 8,500 hours annually in a remote, weather-challenging environment.

Energetica had already deployed Capstone microturbine technology at its Breuil Cervinia plant in 2016 and had firsthand experience with its reliability, low maintenance requirements, and performance in harsh alpine conditions. As Bardonecchia's energy needs increased, the operator needed to replicate those results while also achieving compliance with new EU regulations.



Energetica's decision to add a second C1000S in Bardonecchia is a direct result of the proven reliability and efficiency of Capstone technology in some of Italy's most demanding environments. The microturbines allow the plant to meet new EU efficiency and emissions standards while guaranteeing continuous service to the community."

— Ilario Vigani, Principal,
IBT Connecting Energies GmbH

Power Profile

Customer

Energetica S.p.A.

Location

Bardonecchia, TO, Italy

Commissioned

First C1000S - 2024

Second C1000S - 2025

Fuel

Pipeline Natural Gas

Technologies

- (2) C1000S Microturbines

Capstone Green Energy

Partner

IBT Connecting Energies GmbH

An aerial photograph of the Bardonecchia town and its surrounding mountainous landscape. The town is nestled in a valley, with buildings and roads visible. The surrounding mountains are covered in dense evergreen forests. The image is overlaid with a semi-transparent green filter.

**Smarter Energy
for a Cleaner Future**



Two Capstone C1000S microturbines power Bardonecchia's high-efficiency district heating network, delivering ultra-low emissions, 90% total system efficiency, and dependable operation in harsh alpine conditions.

The Solution

Following several years of successful operation at the Breuil Cervinia site, Energetica commissioned its first C1000S microturbine in Bardonecchia in January 2024. The strong performance of the first unit along with Energetica's positive experience as a long-standing IBT customer supported the decision to expand. The second C1000S was commissioned in April 2025, doubling the plant's capacity to 2 MW and strengthening the system's operational resilience.

In a district heating network, individual boilers are removed and replaced with a centralized hot-water distribution system. Capstone's combined heat and power (CHP) configuration enables heat to be produced at significantly higher efficiency levels, with superior control of emissions. With two C1000S units now operating, Bardonecchia can achieve around 90% overall system efficiency, maximizing thermal recovery and improving energy savings across approximately 350 connected users.

The microturbines' minimal maintenance requirements and high availability were also essential, as winter conditions can make the site difficult to access. IBT Connecting Energies GmbH supported the full deployment, including engineering, commissioning, and remote monitoring to ensure seamless integration and reliable year-round service.

The Results

The expansion of the Bardonecchia district heating plant has delivered clear improvements in efficiency, emissions performance, and overall system reliability.

Key results include:

- Approximately 90% total system efficiency, supporting compliance with EU district heating requirements and ETS obligations.
- Reliable, continuous operation supplying both heat and electricity throughout long alpine winters.
- Ultra-low emissions, significantly improving local air quality—a critical factor in a sensitive mountain environment.
- Reduced operating and maintenance burden, aided by Capstone's single-moving-part design.
- Increased energy security and redundancy, with two 1 MW microturbines providing stable service to more than 350 users.

The two-phase expansion in 2024 and 2025 demonstrates Energetica's ongoing commitment to deploying clean, efficient, and resilient energy solutions across its district heating networks. The Bardonecchia project further reinforces the value of Capstone microturbines for sustainable, high-performance heating applications in mountain communities.