

At a glance

Location

Mohsogollokh Village, Republic of Sakha, Yakutia, Russia

Commissioned

January 2011

Fuel

Natural gas

Technologies

- Two Capstone C1000 Power Packages.
- Two UT-76 heat recovery units manufactured by Uhta Experimental Mechanical Plant in Russia.

Results

- The CHP system generates 2MW of high-quality electricity for onsite boiler equipment.
- 3,400kW of thermal power generated by the 2 microturbines is used 3 ways: to increase efficiency of the plant's boiler, heat the manufacturing facility, and provide heat to several village buildings.
- The microturbines fulfill 100% of the boiler equipment's power needs.
- The CHP system achieves nearly 90% efficiency.
- The cement plant is expected to reach return on investment in 3 years.

Yakutcement Cement Manufacturing Facility

With frigid subzero temperatures dominating winter months, the remote Mohsogollokh Village in the Republic of Sakha – Yakutia, Russia, is a place of harsh weather and a historically unreliable and expensive centralized power grid. Extreme weather conditions that often reach -60°C (-76°F) have deteriorated the local utility grid to a point of feeble performance, resulting in frequent, crippling blackouts.

To establish power stability and reduce energy costs, Yakutcement – the local cement and crushed stone manufacturing business – installed two Capstone C1000 Power Packages in a highly efficient combined heat and power (CHP) application. Today, the Capstone CHP system provides uninterrupted electric and thermal power to the plant while warming the frigid town of 7,000 residents.

“The Capstone Microturbines significantly increased the reliability of our boiler house,” said Andrey Naumov, Chief Power Engineer at the facility. “We’re a very important facility to the local communal infrastructure because we supply heat not only to our plant but also to the nearest village.”

The two megawatt (MW) microturbine power system has operated as a prime power source since January 2011, relieving the manufacturing plant from debilitating blackouts. With promised power reliability and a safeguarded heat supply for the village, the cement plant, which employs a majority of local residents, is considered a community hero.

The natural gas-fueled Capstone microturbine system also features two UT-76 heat recovery units manufactured by Uhta Experimental Mechanical Plant (Russia) that together produce 3,400kW of thermal power.



“Today the facility saves money as the cost to generate onsite electricity using microturbines is substantially less than the local grid electricity rates.”

— Alexander Skorokhodov, President,
BPC Engineering

The CHP system’s 2MW of high-quality electricity provides 100 percent of the boiler equipment’s power needs. The microturbines’ exhaust heat is diverted to the common circuit of the boiler, which increases the entire system’s efficiency to nearly 90 percent. The boiler house provides heat to the administrative and manufacturing facilities at the cement plant and also several buildings in the Mohsogollokh Village.

The power provided by the reliable Capstone microturbines is extending the boiler equipment’s service life. The result is less maintenance and reduced service costs. “The Capstone microturbines generate high-quality electricity for the boiler’s equipment prolonging its lifecycle and reducing risks of emergent maintenance,” said Naumov. “This solution allowed us to cut off our power costs comparing to the existing utility rates and increase energy efficiency through the rational use of fuel resources.”

The CHP system is housed in a specially-designed building near the facility’s boiler house. Because each C1000 is comprised of five 200kW Capstone C200 microturbines, the power system features internal redundancy that allows separate C200s to be placed out of service for routine maintenance without shutting down the entire microturbine power station. This dexterity ensures round-the-clock, highly reliable power for the boiler’s equipment and a much-needed heating supply for Mohsogollokh Village.

“The Capstone power system improves the reliability of the heating supply for Mohsogollokh Village for which the Yakutcement plant is the main enterprise,” said A.Z. Mamedov, Yakutcement General Director. “Independent distributed generation power for the plant’s boiler house ensures power reliability, availability, and redundancy, which are necessary for continuous development of the Yakutcement plant and the Mohsogollokh Village.”



Yakutcement, the local cement and crushed stone manufacturing business, installed two Capstone C1000 Power Packages in a highly efficient CHP application.

“Fulfilling 100 percent of the boiler equipment’s power needs, the CHP system only uses the local grid for backup power,” said Alexander Skorokhodov, President of BPC Engineering, Capstone Turbine’s distributor for the Russian region. “Today the facility saves money as the cost to generate onsite electricity using microturbines is substantially less than the local grid electricity rates.”

With energy efficiency reaching 90 percent, increased power reliability, reduced maintenance costs, and power generation costs cheaper than grid rates, the cement plant is expected to reach return on investment in a just three years.

Yakutcement is the second largest industrial facility in the Republic of Sakha that has installed Capstone C1000 microturbine systems. Today, nearly 50 Capstone microturbines operate at different facilities across the Republic of Sakha.

“Capstone microturbines are becoming mainstream in Russia,” said Skorokhodov. “They have proven to withstand the harsh conditions of our climate, making them a survival tactic for businesses with remote locations and unreliable power.” ■