

At a glance

Location

Sport Center Igora, Leningrad region
St. Petersburg, Russia

Commissioned

September 2008

Fuel

- Liquefied methane
- Liquefied propane-butane as back-up fuel

Technologies

- 30 Capstone C60 and 8 C65 Microturbines provide all power needs for the resort.
- Thermal energy from the microturbines heat buildings and supplies hot water through a combined heat and power (CHP) application.
- The system uses a Russian-manufactured heat exchanger.

Results

- The 2.32MW onsite power system covers all the ski resort's electricity needs.
- The microturbines power the hotel, ski lifts, cottages, office buildings, cafes, restaurants, skating rink, and illuminate the slopes at night.
- The power plant is a cogeneration application, where – in addition to producing electricity – heat exchangers capture the microturbines' thermal "waste" energy, which is then used onsite. More than 4MW of thermal energy provides the hot water supply and heat for several buildings including the hotel, restaurant, cafes, and swimming pool.
- The system has experienced 100% reliability since being commissioned.

Remote Russian Ski Resort

More than 50 kilometers north of St. Petersburg, Russia, and the nearest utility line, Capstone microturbines provide power that brings luxury to a remote, off-the-grid ski resort.

In November 2006, an onsite power system was installed at Sport Center Igora in the Leningrad region. The 2.3MW power plant consists of 30 Capstone C60 and eight C65 microturbines that are the sole source of power and heat for the luxury hotel and other resort facilities, located 54 kilometers from St. Petersburg – and the nearest power line.

"Our aim was to provide the ski resort with a reliable supply of power and heat," said Valeriy Ignatenko, Chief Power Engineer for the resort, who researched a variety of power systems before settling on Capstone microturbines. "The ski resort is far from the utility grid, so connection to the grid would be very problematic and not economically viable. We selected Capstone microturbines as the power-generating equipment because of their high level of reliability, ease of operation and maintenance, and low operational costs."

Fuel flexibility also was an important factor in the decision.

"Because of an inability to obtain natural gas, we decided to use liquefied methane since it's the most economically viable fuel for us," he said.

In addition to liquefied methane, the 38 microturbines can run on liquefied propane-butane as a back-up fuel. The Capstone system,



Thirty-eight Capstone microturbines provide the luxury ski resort, Sport Center Igora in Russia – 54 kilometers from the nearest powerline – with all its power needs at this CHP application.

which can interconnect up to 100 microturbines, offers flexibility beyond just fuel type.

“Power demand at a ski resort is not uniform, since power needs at night are less than during the day.”

The resort needed an integrated solution that met the flexibility requirements and also was a green energy source, according to Ignatenko.

“The environmental features of Capstone microturbines also are a great benefit. Sports and recreation facilities like the resort need power-supply equipment that emits low emissions and noise levels,” he said. “Microturbines were the ideal equipment that met all our requirements.”

The resort gathered initial information about Capstone microturbines from the internet and other mass-media sources.

“After we consulted with BPC Power Systems, we became even more confident in our choice,” Ignatenko said.



BPC Power Systems, Capstone’s distributor in Russia, installed the Igora system. BPC specializes in the construction, operation, and maintenance of distributed-power systems. They offer engineering, turnkey construction, and maintenance of power-generating sets that range from 30kW up to 100MW.

The company has completed more than 250 independent-power-supply projects with a total output power of 200MW. Clients include such major Russian corporations as Gazprom, Rosneft and Rostelecom, as well as dozens of smaller consumers such as public offices, malls, and entertainment centers.

“This is one of the largest microturbine systems in Russia and plays an important role in developing

tourism in the Leningrad region,” said Alexander Skorokhodov, General Director, BPC Power Systems.

“Implementation of innovative Capstone equipment at the resort demonstrates the importance of reliable, efficient, and green power for this type of facility.”

The resort, which opened in 2006, is one of Russia’s newest. It features seven lifts and 10 trails, but the focus is not just on skiing. There is an outdoor skating rink, indoor swimming pool, spa, and French restaurant, as well as a hotel and chalets for rent – some with their own banya (a typical Russian bathhouse/sauna).

Officially on-line in September 2008, the 2.32MW onsite power system covers all the ski resort’s electricity needs: powering ski lifts, hotel, cottages, office buildings, cafes, restaurants, skating rink, and illuminating slopes at night.

The microturbine power plant is a cogeneration operation that produces electricity and thermal energy. The thermal energy produced by each microturbine’s exhaust gas is captured and used onsite. More than 4MW of thermal energy provides the hot water supply and heats the hotel, restaurant, cafes, and swimming pool. The system uses a heat exchanger manufactured in Russia.

Ignatenko, the resort’s chief engineer, says Capstone microturbines offer improvements over traditional genset or engine systems.

“Capstone microturbines allow us to use the most economical fuel,” he said. “Low maintenance costs also are a great benefit. And, of course, the microturbines’ reliable and uninterruptible power supply is vitally important for a project like a remote ski resort.”

Routine maintenance is performed only twice a year.

“We’re pleased with the Capstone system because of the minimal maintenance, no need to replace lubricants and long periods between maintenance work,” Ignatenko said.

The microturbine system also allows the resort to be proactive.

“Our government hasn’t instituted any environmental restrictions to reduce greenhouse-gas emissions yet, but I’m sure that if they appear in the future, we’ll have no problem meeting the standards because the microturbines have excellent environmental features,” he said.

Overall, the resort is pleased with its choice of a microturbine-based power system.

“The performance, reliability, and operational features of Capstone microturbines fully meet our expectations,” Ignatenko said. ■