

# POWER PROFILE

**Customer:** Snowbird

**Location:**  
Snowbird, Utah

**Customer Business Issue:**  
Reduced carbon emissions, sustainability

**Solution:**  
Cat® G3520H gas generator sets (2)  
Cat G3512 gas generator set  
Cat Switchgear (15 kV, 24 kV)

**Cat® Dealer:**  
Wheeler Machinery



*Every season, Snowbird makes measurable operational improvements, reducing waste, becoming more energy efficient, and improving air and water quality.*



*The new plant cuts the resort's carbon footprint in half, saving 62,000 dekatherms of natural gas each year.*

## POWER NEED

Growing up in Salt Lake City, Dave Fields loved to ski on Utah's self-proclaimed "Greatest Snow on Earth." He grew up skiing at Alta in Little Cottonwood Canyon—known for having some of the deepest snow in North America—where his dad worked for 30 years.

After getting a degree in communications and working the first part of his career as a sports journalist, Fields saw how excited his wife was to work at a ski area. Having that perspective led him to pursue a career change, ultimately landing a job as an assistant in the Snowbird public relations department.

Now, two decades later, Fields serves as the president and general manager responsible for running one of America's greatest ski resorts.

Adjacent to Alta, Snowbird is perennially recognized by ski industry magazines for its exceptional snowfall, challenging terrain, and accessibility from the Salt Lake City International Airport. In 2008, Outside magazine named Alta-Snowbird the number one ski destination in North America.

Encompassing 2,500 acres and with a 3,240-foot vertical drop, the multi-facility winter and summer resort is primarily known for winter powder skiing and snowboarding. During other seasons, Snowbird also hosts hikers, mountain bikers, fishermen, and other mountain vacationers. The facilities include ski lifts, hotels, condominiums, a world-class spa, restaurants, and other resort-related retail businesses.

While he oversees day-to-day operations, Fields is focused on preserving and building the legacy established by its founders.

"Whether it was Dick Bass and Ted Johnson—who founded this place in 1971—or our current owners, it's about the families who are dedicated to Snowbird," Fields said in an interview with Ski Utah the year he assumed the top job in 2019. "That has been a consistent theme running throughout Snowbird's history. I was raised in a family of skiers. I work for people who were raised here as part of a family of skiers. And the people who work here are incredibly dedicated to making it the best it can be.

"So when we're making decisions about this place, it's not necessarily with a mindset of driving quarterly earnings—it's about preserving Snowbird as a generational thing," Fields said. "What are we doing that will protect this special place for our kids, our grandkids? And that's how

our owners (John and David Cumming) think about this place, and it's how I think about it too. We are stewards of an incredible place that's so much more than an asset or a holding. It's a special place where we grew up, and we want our kids and grandkids to be able to grow up here just like we did."

Snowbird's "Play Forever" initiative recognizes that the health of both the environment and local community is vital to the future of the mountain. Snowbird holistically invests in environmental sustainability projects, participates in scientific research, and proactively advocates for policy change to help create a more resilient world.

"When we are long-term planning and considering a capital investment, we look at the environmental impact on every decision we make," Fields says. "The core of Play Forever is that the approach we take is for the long haul. It's all about what we can do to minimize our carbon footprint as we operate day-to-day."

Every season, Snowbird makes measurable operational improvements, reducing waste, becoming more energy efficient, and improving air and water quality. The resort was recognized by Outside Online in its list of "America's 10 Most Eco-Friendly Ski Resorts" in 2018.

"The ironic part about the ski industry is that we're very power intensive," Fields says. "We utilize a lot of energy operating snowcats and chairlifts, and heating and cooling buildings.

"Our co-founder, Dick Bass, believed that we needed to be a responsible steward of this great natural resource," Fields says. "Here at Snowbird, we carry on that legacy by looking for opportunities at every juncture to be the most energy-efficient company we can.

"I'm learning a lot more about climate change. I've been going to lectures and it's really kind of staggering when you look at the next 10, 20, 30, 50, and 100 years," he says. "So, it's something that really resonates with me as leader of this company and with our employees. They want to know that we're doing everything we can. The climate in Utah is changing rapidly, and we recognize that we need to take deliberate action now."

## SOLUTION

In June 2021, Snowbird opened a 5.3 MW distributed energy facility called Snowbird Power Systems, powered by three Cat® gas generator sets. As the latest in a series of major sustainability initiatives undertaken by the

# POWER PROFILE

## Customer: Snowbird

resort, Snowbird Power Systems is housed in a spacious 8,700 square-foot building designed to withstand harsh winter conditions.

Cat dealer Wheeler Machinery built and installed the new custom-designed cogeneration facility that features synchronized and paralleled Cat gas gensets, including two Cat G3520H units as well as a Cat G3512H genset.

The plant includes Cat switchgear, high-efficiency boilers, heat exchangers, pumps, control valves, and electronic controls. The new Snowbird Power Systems facility enables Snowbird to make its own power and recycle the waste heat created from power production to heat its buildings and water, rather than using other energy sources to create it separately.

In a conventional power plant, 60-70 percent of energy produced is wasted as heat energy. By utilizing the waste heat from the generator sets, energy loss is dramatically reduced, raising the useful efficiency of combined heat and power to 80-85 percent.

The cogeneration system recovers heat from the Cat engines' exhaust, engine jacket cooling water, lube oil cooling water, and turbocharger cooling water to produce hot water for The Cliff Lodge—which includes more than 500 hotel rooms, 80,000 square feet of meeting space, three restaurants, two heated swimming pools, four hot tubs, and a robust system of subsurface piping that melts snow and ice on walkways.

"This new, cutting-edge system not only enhances the safety and experience of our guests," Fields says, "but also enables us to become more efficient with how we use energy at Snowbird."

The integrated system provides electricity for key resort operations, including Snowbird's iconic Aerial Tram and chairlifts. It also powers guest spaces throughout the resort, including The Cliff Lodge, The Inn, The Lodge at Snowbird, and Iron Blossam Lodge, as well as the Snowbird Center and Creekside Café & Grill.

"In the thick of winter, the distributed energy plant powers everything except our snowmaking operation," says Nima Mahak, director of village operations for Snowbird. "Otherwise, it powers all the hotels and the base village, all the ski lifts—pretty much the whole resort."

## RESULTS

The cogeneration plant reduces Snowbird's dependency on the traditional electric grid, meaning that the resort is almost entirely energy independent, more efficient, and coal-free. In all, Snowbird Power Systems can supply anywhere

from 60 to 90 percent of the resort's energy requirements during the busy winter season, and up to 100 percent of its summer energy needs.

The new cogeneration plant replaced a 1.9 MW system installed in 1986 that was powered by three Cat G399 gas generator sets. At that time, the cogen facility was considered a world-renowned engineering feat. Operating 24 hours a day, seven days a week, year-round, the old Cat generator sets logged nearly 300,000 hours of service, far exceeding the expected 120,000-hour operational life.

"Replacing our original cogeneration facility with a new plant that leverages the expertise and technologies from Caterpillar is a part of our commitment to the environment," Fields says.

The new plant significantly reduces the resort's carbon dioxide emissions (CO<sub>2</sub>) by half. The new and improved plant saves 62,000 dekatherms of natural gas a year—the equivalent of removing the emissions of 789 passenger vehicles for one year.

"It's a big upgrade; these new engines are about 60 percent more electrically efficient than our old plant," Mahak says. "We more than doubled the energy capacity of the plant, which means we can power a lot more of the resort than we previously could. And with our unique mountain location with heavy snowfalls, energy reliability is very important, especially when you have hotels full of guests.

"We know from our original plant that these newer Cat gensets are going to run a lot longer than their expected lives," Mahak adds. "We're really excited about this new plant, and a lot of that really comes down to Caterpillar making great engines—but also the expertise of Wheeler, their technician teams and our Snowbird power generation group.

"This was a once-in-a-lifetime project," Mahak continues. "It was a real pleasure working with the Wheeler team. They were here through rain or shine, pandemics and earthquakes, and through two big ski seasons where we had a lot of avalanches. So, it was really good having a partner that works with you through your resort operations to complete a project of this magnitude."

The power facility runs 24/7 and parallels with the utility grid. Depending on the level of power required at the resort, either just one, two or all three of the Cat generators might run at any given time.

"The fall and spring are our slower seasons where we don't run any chairlifts—we're just running one generator since the demands for

energy are smaller," says William Spencer, cogeneration plant manager. "But when we need to ramp up for summer and winter operations, including running the Tram and chairlifts, the rest of the generators automatically start up and come online."

The gensets are controlled by Cat switchgear, which provides the following advantages:

- High-speed integrated control systems
- Touchscreen monitor for easy operation
- View the status of the entire system at a glance
- Automates and controls the CHP system
- Manages building automation, pool, and spa

"The Programmable Logic Controller (PLC) looks at the amount of power that we're pulling off the grid. When it sees our power needs increase, it automatically triggers the switchgear to start another generator," Spencer says.

"Everyone involved in this project, from our team to our subcontractors and the folks at Wheeler, were focused on building a heavily automated system that could essentially run itself," Spencer says. "When things are going well, the plant is able to hum along and doesn't require us to do much manually."

Technicians from Wheeler Power Systems assist Snowbird with preventive maintenance at prescribed intervals, as well as providing technical assistance when needed.

"This is a fairly complex power plant with a lot of components that serve different functions, and there have been occasions when we've needed help from the Wheeler team, fast," Spencer says. "We have a long relationship with the service techs at Wheeler, and they take good care of us."

For Fields and his staff, it's about building on the legacy established by its founders, and ensuring that the resort continues to thrive well into the future.

"This new facility powered by Caterpillar engines is the epitome of the most efficient we can be in our environment today," Fields says. "It's our responsibility to leave this place better than we found it, and we believe this new facility will help us do that."

"We want to say thank you to Caterpillar and the crew from Wheeler Machinery for building this beautiful power facility—it's been an amazing partnership."