

POWER PROFILE

Customer: Utah Municipal Power Agency

Location:

Provo, Utah

Customer Business Issue:

Air quality and balancing electrical load demand and energy costs through peak load shaving

Solution:

Five Cat® G3520H gas generator sets, 15 kV utility paralleling switchgear; Turnkey plant construction, including plant design, delivery, setup, installation, operation and maintenance

Cat® Dealer:

Wheeler Power Systems, a division of Wheeler Machinery Co.



Powered by five Cat® G3520H generator sets, the Provo Power Plant is now considered the cleanest burning natural gas-fired power plant in the state.

POWER NEED

Provo Power is the largest municipally owned electric utility in the state of Utah, providing reliable electricity at a competitive price to the residents and businesses in Provo—Utah's third largest city. The municipal utility operates and maintains over 35,000 meters, 380 miles of distribution lines, 48 miles of high voltage distribution lines and 18 substation transformers. One of the utility's primary customers is Brigham Young University.

Provo is a member of the Utah Municipal Power Agency (UMPA), a consumer-owned corporation whose other members include the nearby communities of Spanish Fork, Salem, Manti, Nephi and Levan.

UMPA's services include: generation asset development, transmission services, energy market transactions, project financing, legislative action, regulatory compliance, legal and engineering support, and energy efficiency and renewable programs. The agency schedules all city power resources, plus other member resources as needed.

In 2016, Provo's former power plant was demolished after serving the community for more than 75 years.

"Everything was crumbling down around us, so we decided it was best to start from ground zero and build a new plant," said Kat Kinford, an energy efficiency coordinator with Provo Power.

Previously, the old power plant contributed to air quality issues in the Utah Valley.

Provo is situated at the base of the Wasatch Mountains. The mountain slopes and the valley below act like a bowl and create inversions during winter months, which can trap pollutants near the valley floor. With no way to dissipate, these pollutants can lead to coughing and increased asthma attacks for residents. While power plants aren't the biggest contributor to smog in the valley, reducing those emissions does help make the air cleaner for over one million Utah residents.

SOLUTION

In late November 2017, UMPA brought a new state-of-the-art power plant online. Powered by five Cat G3520H generator sets, the Provo Power Plant is now considered the cleanest burning natural gas-fired power plant in the state. Annually, it produces the emissions equivalent of eight automobiles, and produces more power (13 MW vs. 10 MW) than the plant it replaced.

Cat dealer Wheeler Power Systems, a division of Wheeler Machinery Co., led the turnkey construction project in Provo, acting as construction manager.

"As we looked at what their needs were, it was more for quick response and good reliable power at a very economical strike price," said Ken Green, business development manager for Wheeler Power Systems. "The Cat product we installed here was new and really matched their requirements."

As Provo has continued to grow over the last 25 years, having its own source of generation means it can provide cheaper power during times when wholesale electrical rates are high—typically in the heat of summer and the colder periods of winter.

Peak shaving systems use generators and paralleling equipment, which allows the generator to monitor the electric grid, startup as necessary and synchronize frequencies with the grid.

Peak shaving is used to reduce electrical power consumption during periods of maximum demand on the power utility, thus saving substantial amounts of money due to peaking charges. Peak demand typically occurs between 3 p.m. and 8 p.m. during July and August, which is the same time non-industrial consumers typically demand the maximum power for family activities and air conditioning.

Typically, power companies have a tiered rate structure which involves not only the amount of electricity consumed, but also takes into account when the electricity is consumed. It is common for a facility participating in peak shaving to experience a net energy savings of between 10 and 30 percent of their electricity bill.

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While renewable energy resources are being integrated into the electrical grid, those resources are heavily dependent on the sun shining and the wind blowing. That's where a power plant like Provo City Power comes into play.

"If one of those resources go down, the utility is trying to balance the load on the grid, and they are looking for additional sources," says Shane Minor, a government and utilities representative with Wheeler Power Systems. "It can be somewhat lucrative for a municipal utility to play that market."

Additionally, the new plant also provides black start capability in the event of a power outage from the grid. The state-of-the-art facility is operated remotely from UMPA headquarters in Spanish Fork.

RESULTS

"UMPA made a commitment to use the cleanest emission control technology and install the most efficient generating equipment in order to meet the needs of its customers," said UMPA power resource manager Kevin Garlick.

UMPA's post combustion emissions aftertreatment technology reduces nitrogen oxide emissions by 93 percent, carbon monoxide emissions by 90 percent and formaldehyde emissions by 90 percent. Further, the ecoCube System converts nitrogen oxide into nitrogen and water vapor, reducing smog.

"Overall, the new plant reduces emissions by 97 percent, representing a quantum leap from the former facility," Garlick says.

"We also applied the current neighborhood design standard and camouflaged the new power plant between the new Provo Recreation Center and the new Provo Power facilities," Garlick said. "We appreciate Provo City's support in hosting and siting the project and Wheeler Machinery's management of the construction project."

By serving as construction manager, Wheeler Power Systems applied its experience and expertise in the design of the plant, and hired preferred subcontractors. Now that the plant is completed, UMPA has the comfort in knowing

it can call on the Cat dealer anytime to resolve issues.

"One of the things we've learned in the generation business is that having good partners is critical to our success, and when we decided to build a plant, one of the things we wanted to do was to select a vendor that really took our needs into consideration," Garlick said. "I've known Ken Green and the Wheeler Cat people for years, and I have seen them do a lot of different projects for other cities in the state of Utah. "I've always been respectful of their work and the value they add with their superior customer service."

Wheeler provides ongoing maintenance and technical support, ensuring that the Cat G3520H generator sets are ready to run at all times. Due to its efficiency and emission control technology, the project has garnered widespread acclaim from state and local stakeholders.

"I appreciate UMPA's investment in the cleanest technology available to provide peaking power for their Wasatch Front customers," said Bryce Bird, air quality director with the Utah Department of Environmental Quality. "This action represents what is necessary to be able to accommodate growth while addressing our current air quality challenges. The use of state-of-the-art emissions controls in transportation, industry, commercial and residential applications will allow our communities to thrive while continuing to reduce overall air pollution emissions."

Utah continues to seek innovative solutions that enable the state to balance energy and environmental goals as it looks to meet the demands of a rapidly growing population, said Laura Nelson, the Governor's energy advisor and executive director of the Governor's Office of Energy Development.

"Projects such as UMPA's clean natural gas power plant help strengthen Utah's energy diversity," Nelson said. "It fits with the Governor's 'all of the above' strategy to create the most efficient and sustainable outcomes to power Utah's thriving economy and high quality of life."



Provo Power is the largest municipally owned electric utility in the state of Utah, providing reliable electricity at a competitive price to the residents and businesses in Provo.

"In a volatile energy market, UMPA and Provo Power have an asset they can count on for years to come," Green says. "The addition of the Cat product represents a reliable, long-term investment that will provide sustainability to their energy portfolio—one that allows them to provide economical energy to the people of the Utah Valley."

For more information, please visit cat.com/powergeneration