A Caterpillar® publication for Power Professionals SUMMER 2020

RUNREADY™

SPECIAL**FEATURE**

CRITICAL FACTOR

CAT® RENTAL POWER HELPS MEDICAL PROVIDERS DURING THE PANDEMIC

CHP WEEK
JULY 13-17
CATERPILLAR TO HOST VIRTUAL WEEK OF CHP SOLUTIONS

SOLAR SOLUTION

Poultry farm saves on energy with Cat® solar panels

COST CUTTER

Cogeneration helps keep meat plant competitive

CAT®

Life Support

As the world struggles to cope with the devastating effects of the new coronavirus, the doctors, nurses and hospital support staff on the front lines who treat patients with COVID-19 are the true heroes during the pandemic.

Millions of healthcare workers—including emergency rescue personnel, law enforcement officers, and others who provide essential services—faced the challenge of providing care for patients with COVID-19, while often ill-equipped and poorly prepared, risking their own lives to save the lives of others.

Behind the lines, Cat® dealers played a critical role, as they helped meet the temporary power needs at field hospitals, screening tents and drive-up testing facilities across the globe. Not only did they ensure rapid deployment of rental power and stationary generator sets, but they provide the necessary personnel and technical support to connect the power and make sure it's ready when needed.

In the words of Yancey Rental Power manager Drew Eckford:

"It's really about follow-up, follow through, and truly caring for our customers during this time when lives are on the line.

"We're all in this together—any of us could be affected at any moment. There are a lot of people that would avoid even the thought of going around a hospital right now, and our people are out there servicing these locations in order to make sure that we can help our community in a time of absolute need."

As we face this uncertain time, it's reassuring to know that Cat power and the people behind it are there when called upon.

John Rondy, Editor
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DID YOU KNOW?

The legendary 1977 New York City blackout could have been much worse if not for Cat® dealer H.O. Penn, who sold more than 500 diesel-electric generator sets in the New York metropolitan area. While there was looting and vandalism, two Cat D398 Generator Sets that kept New York City police headquarters fully operational. And at many hospitals, like Northern Westchester Hospital Center in Mount Kisco, doctors went on delivering babies, performing surgery, and staffing emergency rooms because the Cat gensets were supplying power. When the blackout hit on July 13, a Cat D353T generator set enabled fans attending a Mets game at Shea Stadium to be evacuated safely.

COOL UNDER PRESSURE

Dealer delivers temperature control solutions

Energyst is a Cat® rental company for power generation and temperature control serving Western Europe.

At the end of March, Energyst was asked to provide temperature control and air handling systems to a special wing established to treat critically ill COVID-19 patients at a hospital in Delft, just outside The Hague in the Netherlands.

After receiving the request from hospital officials on a Sunday, Energyst delivered the necessary equipment and performed the setup the following Tuesday, according to Dennis Brands, a temperature control application engineer for Energyst. The Cat dealer provided heat pumps and small air handler units which were placed inside the patients' rooms to deliver warm or cool air to critically ill COVID-19 patients. The airhandlers installed in the patients' rooms are designed to create negative pressure to prevent the Covid-19 virus from spreading.

"When these urgent requests come in, it's unbelievable the team spirit and the willingness that our people have to make it happen on short notice," says Rob Munsters, an international applications manager for Energyst. "My colleagues stepped into the car, drove to Delft, and in the end, it was all installed and commissioned just two days later on Tuesday."

In a separate instance, Energyst partnered with another rental company to deliver four 500 kW chillers and air handlers to a temporary morgue established in Northern Ireland.

"The chillers were spread around Europe—three of them were in Germany and one was in the Netherlands," Munsters said. "So when we got the order from the customer, we immediately transported all the chillers from the different depots to our main depot in Holland. We tested them at -15° C because we wanted to be sure that when they were installed in Belfast they were 100 percent ready for the application. I think all of this was accomplished in three days from the order to the moment that they were delivered."

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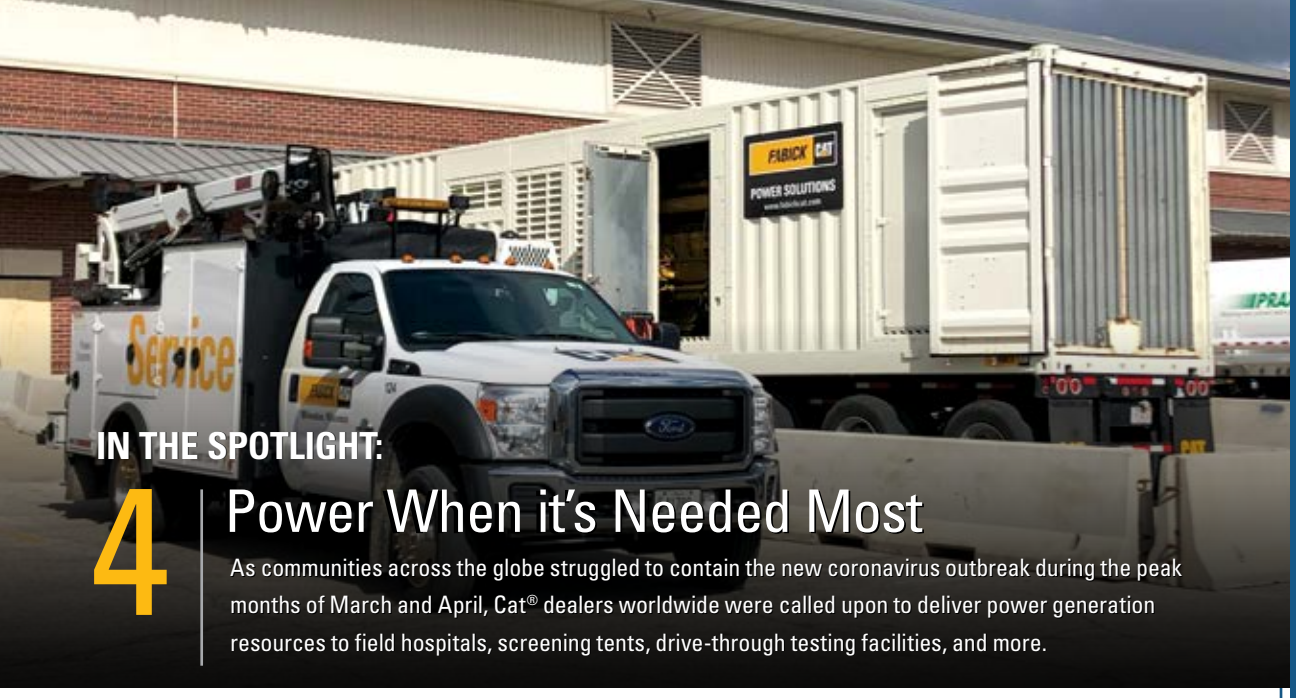

FEATURES

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CRITICAL FACTOR

CAT® RENTAL POWER HELPS MEDICAL PROVIDERS GET THROUGH THE PANDEMIC

As communities work to contain the spread of the new coronavirus outbreak, Cat® dealers are there to ensure that hospitals and COVID-19 testing facilities stay powered, grocery stores stay stocked, and vital infrastructure stands ready for those who need it.

Cat dealers across the globe responded in March and April by marshalling resources and deploying rental power and support services in a timely fashion. Cat rental power modules have become a fixture at temporary field hospitals, medical screening tents, drive-through centers that test people for COVID-19, and more.

The following is a snapshot of the ways that Cat dealers in North America, and around the world, have responded to the crisis with rapid deployment of power and product support.

FABICK CAT // WISC.

As government entities take extraordinary measures to contain the outbreak of the new coronavirus, temporary facilities to treat and screen patients are springing up around the globe to head off the contagion.

In Milwaukee, Wisc., a massive exposition center has been converted by the U.S. Army Corps of Engineers into a 1,000-bed facility for coronavirus patients who are not exhibiting acute symptoms in order to prevent nearby hospitals from being overwhelmed.

Preparing the facility at Wisconsin State Fair Park for coronavirus patients meant bringing in equipment commonly found in hospitals. Crews worked to install HVAC, plumbing, electrical, and Internet support services for healthcare providers while mapping out space for the intake and outflow of patients.

As a partner and supplier to the electrical contractor on the project, local Cat dealer Fabick Cat and its power systems team were called upon to immediately deliver six megawatts of stationary power to the site to serve as backup should grid power fail.

A common denominator in the creation of these temporary facilities is rapid deployment of resources and personnel to get them up and running. From the time the agreement was reached on April 10, Fabick Cat had three business days to deliver. The proposed solution was to utilize three Cat XQ2000 power modules to bring the site fully up and running in a week.

Due to pre-existing rental agreements, the dealer did not have the necessary enclosed power modules available in its inventory, but was able to quickly leverage the Cat dealer network to procure the generator sets and supporting equipment from as far away as Massachusetts, New York, and Florida.

"Our project managers, engineers, and technicians all rallied together with the dealer network and pulled equipment together in short order," said Sal LaFace, general manager for Fabick Power Systems.

Once the mobile generator sets were received at Fabick's Milwaukee facility, technicians performed four-hour, 100 percent load bank tests and provided 52-point inspection services to ensure the reliability of the equipment to the highest degree possible.

"Fabick Cat has been in business for over 100 years, and our motto is 'To Ever Serve Our Customers Better,'" LaFace said. "Our community and our country are in a position of extreme need, and we are proud to support this effort."

> **"Our community and our country are in a position of extreme need, and we are proud to support this effort."**
>
> **SAL LAFACE**, General Manager, Fabick Power Systems

CGT S.p.A. // ITALY

In a region of Northern Italy hit especially hard by the COVID-19 pandemic, a field hospital established by Italy's historic mountain infantry—the Alpini—has treated the sick since opening on April 6 in a formerly vacant wing of a convention center in Bergamo Province.

Nestled in the foothills of the Alps in Northern Italy, the Lombardy region was the area hardest hit by the global pandemic in Italy.

Construction of the field hospital in Bergamo was spearheaded by the Alpini, a historic mountain military corps founded in 1872 to protect Italy's border with France and Austria-Hungary. As part of the army's infantry corps, the specialty unit distinguished itself in combat during World War I and World War II.

Today, the Alpini is best known for its voluntary work in disaster relief. Their

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distinctive feathered hats are a fixture at emergency sites across Italy, a country afflicted by more natural calamities than any other in Europe. Wherever there is an earthquake or a flood, through its association of veterans, the Alpini are always present.

So, when the local chapter of the National Alpini Association put out a request for 12 additional builders to join their group of about 100 volunteers, more than 200 responded to donate their time and materials, said Sergio Rizzini, the general director of the National Alpini Association's field hospital division.

Wearing the iconic pointed green hat with black feathers, current, former, and reserve infantry members of the Alpini led a 300-volunteer effort to complete the 144-bed hospital in seven days. Volunteers wearing leather bracelets engraved with the words "Mola mia"—or "Never give up"—worked a total of 16,000 hours to complete the hospital, Rizzini said.

Italy's Cat dealer, CGT S.p.A., lent its support to the field hospital, donating five rental power generator sets—including three XQE250 models and two XQP275s—along with cables and ancillary equipment required to connect the gensets. The mobile Cat gensets will provide backup power in the event that grid power is lost, says Matteo Cattagni, rental power manager for CGT.

> **"To be able to pitch in and do our part as a Cat dealer and provide needed equipment and support this effort is something that makes us all very proud."**
>
> **MATTEO CATTAGNI**, Rental Power Manager, CGT

Because Italy was placed under a strict lockdown, making arrangements to transport the equipment to the site involved receiving clearance from local authorities, Cattagni said.

"That means we have more people working all day just to arrange a transport, and that is something that we normally make with a phone call," Cattagni said. "Now you have to send emails and wait for a response. So, everything has been more difficult and takes longer, but these are the conditions we must operate under until the virus disappears."

Realizing the gravity of the situation, CGT was happy to provide the equipment and product support services to the field hospital free of charge.

"Being part of the solution is something that provided a lot of energy to all of us at CGT," Cattagni said. "We are a for-profit company, but it's important to help others in such a difficult time."

Michele Tresoldi, an administrative manager in CGT's Energy Division, is also a member of the Alpini. In a teleconference interview, he sat beside Rizzini, both wearing their Alpini hats.

"The Alpini have a long history of service in our country, banding together and helping out in times of crisis," Tresoldi said. "And to be able to pitch in and do our part as a Cat dealer and provide needed equipment and support this effort is something that makes us all very proud."

CGT S.p.A • Bergamo Province, Italy

N C MACHINERY // WASH.

The first confirmed case in the U.S. of the global pandemic of coronavirus disease 2019 (COVID-19) was announced by the state of Washington on January 21. Until mid-March, Washington state had the highest absolute number of confirmed cases and the highest number per capita of any state in the country.

At Camp Murray—which serves as home to the Washington National Guard south of Tacoma—Cat dealer N C Power Systems supplied an 80 kW rental generator that supplies power to four small portable structures that are being used to sterilize personal protective equipment (PPE) to help contain the outbreak in western Washington state and beyond.

N C Power Systems • Seattle, WA

> **"Our top priority is to keep our employees healthy while taking care of our customers. Currently, all our facilites remain open to serve their needs, and we have the resources in place to minimize any disruptions."**
>
> **MARK KEELER**, Vice President, N C Power Systems

Hospitals send the N95 masks to Camp Murray for sterilization.

The decontamination system is able to clean and sterilize up to 80,000 protective N95 respirator masks every day, according to Katy Delaney, a spokesperson for the Battelle Critical Care Decontamination System. Hospitals have had to ration masks and other medical protective gear due to a national shortage.

"We are facing a challenging time, and safety is our top priority," said Mark Keeler, vice president of N C Power Systems. "Our top priority is to keep our employees healthy while taking care of our customers. Currently, all our facilities remain open to serve their needs, and we have the resources in place to minimize any disruptions."

YANCEY POWER // GA.

As the number of infections from the COVID-19 coronavirus continued to mount in Georgia during the first week of April, two Atlanta-area healthcare organizations turned to Yancey Power Systems to assist with the setup of medical screening tents.

While approaches to adding surge capacity vary by organization, the tents utilized at one Atlanta acute care hospital and at an outpatient healthcare network are designed to screen people for the deadly disease. Those who test positive for COVID-19 are admitted, while non-infectious patients are evaluated and treated on-site or sent to a safe location for further evaluation and treatment. The goal is to provide treatment with a limited risk of exposure to COVID patients.

For this site, Yancey provided a Cat XQ125 mobile generator set to feed a 12-ton A/C unit along with a 75 kVA transformer, which connected to a splitter with GFCI outlets that provide multiple connection points around the tent for medical equipment. The setup also includes a 500-gallon fuel tank for extended generator run time.

Yancey combined efforts with another vendor so that the generator and the tent were presented to hospital facilities staff as a package to make the process simpler.

"In our walk-throughs of each site, we designated where all of the equipment needed to go, keeping in mind that they'll need to run this for about two months," said Peter Moore, a healthcare account manager for Yancey Power Systems. "We pointed out that if they are going to run 24 hours a day for that period of time, the generators will need

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Yancey Power Systems • Atlanta, GA

to be serviced. So, we developed a plan to access all the units and pull them out and service them."

At three separate locations at the network healthcare clinics around Atlanta, Yancey provided XQ125 rental generators, ancillary connections, and a 500-gallon fuel tank to serve medical screening tents set up in the driveway of the facilities.

"At most hospitals, if we're servicing their generators, we have to be a trusted partner. If the generators fail when they're needed, our customer's job is on the line," Moore says.

"If there's no power in a healthcare facility, peoples' lives are at stake. You have to earn trust with the facility operations' team. They have to know that they can rely on you when the chips are down, that you're going to respond when they need you. And that's what we're doing; we're helping them navigate uncharted territory."

AL-BAHAR // UAE

United Arab Emirates (UAE) was the first Middle East country to report a coronavirus-positive case, following the coronavirus outbreak on Jan. 29 after a family of four arrived from Wuhan, China.

As the Cat dealer in the Persian Gulf region of the Middle East, Al-Bahar operates in UAE, Kuwait, Qatar, Oman and Bahrain, and has adapted swiftly to provide support to its customers during the coronavirus pandemic.

Drive-through clinics were built and medical staff drafted in from private hospitals to make mass testing possible. The country has carried out temperature checks, nasal swabs and basic blood tests on as many as 35,000 UAE residents per day.

Al-Bahar provided assistance by supplying rental power generators to the Abu Dhabi Distribution Company, which is managing the power supply to five drive-through COVID-19 testing centers in the capital city of UAE. The Cat C13 gensets were delivered between April 12-19, and are equipped with an Automatic Transfer Switch (ATS), which enables an automatic transfer of power in the event of a grid power failure. Each unit is capable of supplying enough power for the entire drive-through setup.

The Cat dealer's mission through the current crisis—'If you are working, we are'—reflects the priority Al-Bahar has given to support its customers during these challenging times.

"We mobilize, deliver, install, maintain and manage the generators to ensure they are running all the time," said Mohamed Kaddour, Vice President of Energy & Transportation for Al-Bahar. "We are providing an end-to-end solution during this critical time."

As a precautionary measure to combat COVID-19, workers' accommodation facilities in Abu Dhabi have been equipped with quarantine facilities for foreign workers who have recently travelled from abroad.

Over a three-day period, the Cat dealer also provided a total of 17 MW of rental power at the two quarantine facilities established 100 kilometers outside of Abu Dhabi. The gensets were mobilized April 17 and installation was concluded April 20. The Cat units are operating as prime power with redundancy at the 2,700-room facility.

Al-Bahar performed delivery, installation and commissioning of the generator sets. The power solution included:

- 10 Cat C15 gensets (@500 kVA)
- Four C32 gensets (@1000 kVA)
- Eight 3512 gensets (@1500 kVA)

Also, Al-Bahar supplied generators to two COVID-19 field clinics located in Kuwait and run by the Kuwaiti Army. This includes two Cat C18 gensets and a C13.

"Although our commitment to provide customer support remains unchanged, we know the way businesses will now function has changed," Kaddour says. "Al-Bahar and Caterpillar are taking all necessary actions to provide uninterrupted access to the products and services our customers need to get the job done safely and effectively."

Al-Bahar • Abu Dhabi

For additional reports of Cat® dealers providing assistance during the coronavirus pandemic, go to:
cat.com/en_US/by-industry/electric-power-generation/Articles/Testimonials/global-covid-19-support-from-cat-dealers

COMBINED HEAT & POWER

Caterpillar to host virtual CHP Week July 13–17

In Combined Heat and Power (CHP) applications, Cat® gas generator sets simultaneously provide electricity and heat energy for a facility's thermal requirements.

Where grid power and boilers provide less than 50 percent efficiency, Cat cogeneration projects can offer energy efficiencies up to 90 percent.

Many industrial facilities such as manufacturing plants, refineries, and regional district heating plants can double efficiency and reduce operating costs by implementing a Cat CHP system. Other commercial facilities that can benefit from cogeneration include resorts, shopping malls, high-rise office buildings, universities, data centers, and hospitals.

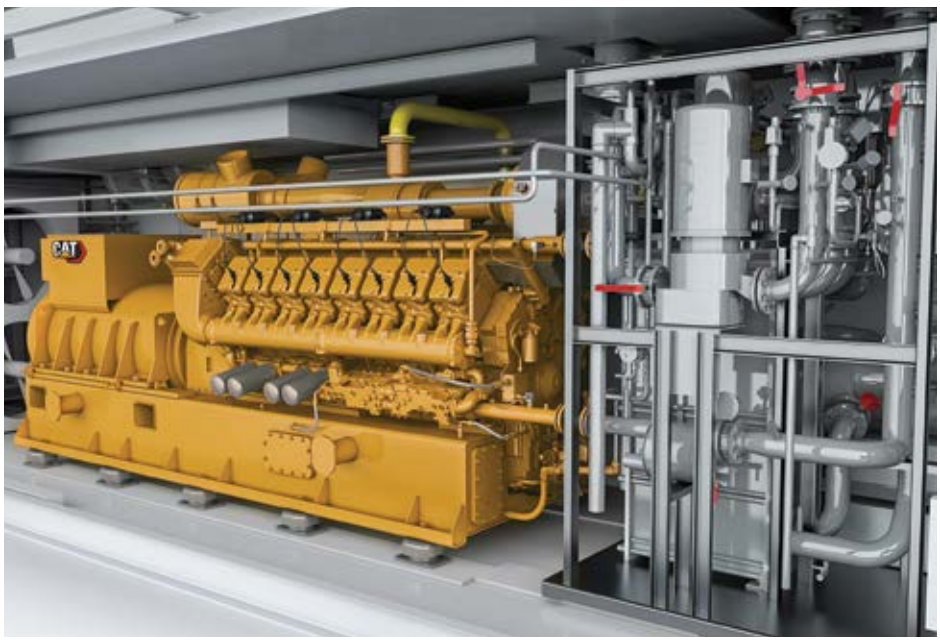
From July 13-17, Caterpillar is hosting a virtual Combined Heat and Power Week to drive awareness of CHP and introduce their new U.S.-sourced containerized CHP solution.

Throughout CHP Week, Caterpillar will launch new CHP content, including:

- An video showing how CHP works
- A CHP Feasibility Calculator
- A CHP White Paper
- A CHP Podcast
- CHP Testimonials

A 90-minute CHP webinar will be held on Thursday, July 16 featuring Caterpillar dealers Carter Cat and Peterson Cat making the case for CHP and discussing the 10 essential design elements of a successful CHP installation.

As part of the program, David Gardiner, founder of the CHP-Alliance, will talk about CHP Opportunities in North America and discuss legislative issues. Caterpillar Engineering Manager John Hibler will give a brief overview



of the new Cat G3520 with CHP enclosure, and then all speakers will host a 20-minute CHP Q&A session. 1.5 ECU credit hours can be earned through attending the webinar. **(To register for the CHP Webcast, go to Cat.com/CHP and click on the CHP Webinar link.)**

Each day, Caterpillar will ask CHP-related trivia questions from the U.S. Department of Energy or the U.S. Environmental Protection Agency. Cat Electric Power Facebook followers can comment on a Facebook post. If you answer correctly, you will be entered to win a Cat Home and Outdoor Generator set which will be given away daily.*

In addition, Caterpillar will hold a daily raffle for Cat branded coolers, and Cat branded Realtree Camping gear. A youth component provides the opportunity to get kids involved with sustainability-related kids' activities, where they can win a variety of Cat branded kid's toys such as a sand and water table and a workbench.

To participate in CHP week, follow Caterpillar's Electric Power Division on Facebook at ***Facebook.com/Caterpillar.ElectricPower. #CatCHP***

**Caterpillar and Cat dealer employees as well as government officials are excluded from winning Cat giveaways.*

SOLAR SOLUTION

POULTRY FARM SAVES ON ENERGY WITH CAT® SOLAR PANELS

Farming has run in Roger Shocklee's family since the late 1800s, when his great grandfather worked the land in western Kentucky.

As a fourth-generation farmer, Shocklee bought the original six acres from his grandfather in 1991 while continuing to work at his day job in the mining industry. Five years later, he purchased the rest of the farm in Livermore, Ky. and started working it full-time after he decided to raise chickens—constructing two poultry barns at the end of 1996. Ten years later, he added two more of the structures.

As a contract farmer for a national food company, Shocklee raises nearly 500,000 chickens annually at his facility 20 minutes south of Owensboro, Ky. Five times a year, he is provided with a flock of chicks, which take anywhere from 48 to 51 days to raise. There are approximately 25,000 chickens in each of the 20,000-square-foot poultry houses, which measure 500 feet long.

As Shocklee's integrator, the food company provides the chicks and the feed, while he provides the buildings, labor, water and electricity to heat and cool the low-slung poultry houses.

Buck Creek Farm follows a set protocol to raise the chickens. There are temperature standards to maintain during the growing cycle, and the poultry buildings are climate controlled.

"Essentially, we have a cooling system to keep the chickens cool in hot weather, and of course we have a heater to keep them warm in the cold weather," Shocklee says. "It's all computer controlled. If we have an extremely hot, humid spell, and if chickens are close to market age, it becomes more difficult to maintain their comfort.

"With poultry being in a closed, confined building, we have no room for mechanical breakdown as far as electrical energy," he says. "We have fans running 24/7 to keep ventilation adequate. So, it's very critical to have a solid, dependable electrical supply on the farm."

The farm's energy bill is its largest expense, representing about 50 percent of total operating costs. And four years ago, Buck Creek Farm saw a 42 percent increase to its utility bill when several large industrial users dropped off the local power grid.

Net metering a powerful idea

Last April (2019), Shocklee saw a social media post from the ag manager at Cat® dealer Boyd Cat (formerly known as Whayne Supply.) The Facebook posting touted Cat solar panels as economical way to offset energy costs.

"Solar energy appealed to me," Shocklee says. "Not only is it a convenient form of renewable energy, but I saw it as a way to insulate me from future price increases."

Shocklee was put in contact with Boyd Cat renewable energy rep Steve Killian, who provided him with a financial assessment of the costs involved in installing a solar array, as well as the logistics involved.

Ultimately, the idea made a lot of sense in that a 25 percent grant was available from the USDA Rural Energy for America Program, as well as a 30 percent federal income tax credit. What's more, Shocklee learned he would receive a one-to-one energy credit from the utility for every kilowatt he put back on the grid—a concept known as net metering.

"So when you're not using energy, you're actually pushing energy back to the utility—turning the meter backwards—and the utility is giving you a one-to-one credit on your energy bill," Killian says. "So, if you're getting charged 12 cents a kilowatt from the utility, they're going to credit you the same amount for whatever you give back to them."

Shocklee opted in, and with Boyd Cat serving as the general contractor, the solar installation began in mid-September and was completed two months later. The 70 kW system features monocrystalline panels and inverters, which convert the DC voltage from the solar panels to AC voltage. That AC voltage is directly connected to and parallels with the grid.

The utility company, Kenergy, has a 30 kW maximum limit for net metering. The utility came out to Buck Creek Farm and installed three bi-directional meters (two 30 kW meters for the poultry barns, and another meter for the shop facility).

A wireless monitoring system enables Shocklee and Killian to keep tabs on how much power the solar array is generating and sending back to the grid.

"On the computer in my office we can look at each of the three meters and see how much energy he is buying from the utility and how much our solar is generating," Killian says.

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CUSTOMER PROFILE

Buck Creek Farm

Location: Livermore, Ky.

Solution: Cat® monocrystalline solar panels, inverters

"We can also determine how much energy was bought from the utility in the last 30 days, and what was generated by the solar, which provides the offset."

A standard solar panel (also known as a solar module) consists of a layer of silicon cells, a metal frame, a glass casing, and various wiring to allow current to flow from the silicon cells. Silicon is a nonmetal with conductive properties that allow it to absorb and convert sunlight into electricity. When light interacts with a silicon cell, it causes electrons to be set into motion, which initiates a flow of electric current. This is known as the "photovoltaic effect," and it describes the general functionality of solar panel technology.

"Solar energy appealed to me. Not only is it a convenient form of renewable energy, but I saw it as a way to insulate me from future price increases."

ROGER SHOCKLEE, Owner, Buck Creek Farm

The monocrystalline solar modules provide reliable energy in all climates and applications. Panels are tested to pass accelerated life and stress tests beyond industry standards. The Cat branded solar panels come with warranty protection and 25-year power assurance backed by Boyd Cat.

"My decision to implement a solar module system was reinforced by the fact that Caterpillar has been around for nearly 100 years," Shocklee says. "And Whayne Supply/Boyd has been around just as long. So that gave me confidence that our project would be supported in the future. And you're buying a project that's supposed to have a 25-year life expectancy, so that was important, too."

Four-year payback

During those 18 to 21-day intervals when Buck Creek Farm is not raising chicks, the extra power generated by the solar panels is sent back to the grid, producing an energy credit for Shocklee.

While his system did not become fully operational until early December, Shocklee estimates that the combination of tax and utility credits will reduce his energy bill by about 75 percent annually. Payback on the project should be achieved in four years. Over the 25-year life of the solar panels, the system is expected to provide a cumulative cash flow of $530,000.00 for Buck Creek Farm.

With a high concentration of poultry farmers in Western Kentucky—there are more than 850, according to Killian—solar energy makes sense for all the reasons that prompted Shocklee to invest in it. While utility rates will only increase as time goes on, solar energy provides a stable, renewable source of energy, and maintenance costs are minimal.

Even though Shocklee's solar array has only been generating energy for six months, he says he has already noticed a decrease in his energy bill.

"And I figure it will make my operation more valuable if I should ever choose to sell," he says.

COST CUTTER

COGENERATION HELPS KEEP MEAT PLANT COMPETITIVE

Established in 1994 by Dariusz and Janusz Zakrzewski, the Zakrzewscy Meat Processing Plant is a family business based in Kosów Lacki, Poland, 75 miles northeast of Warsaw. The company operates a modern plant, where the best meat production industry practices are combined with advanced technologies to make it one of the leading Polish meat producers.

Even as it must compete with large international meat producers, the family business has grown to establish a large customer base on four continents. Wide export certification helps the company reach a constantly growing group of customers in Europe, Africa, Asia and South America. Zakrzewscy's customers consist of meat producers, processing plants, exporters, wholesale traders and trade networks. Modern production and logistics departments enable the company to meet high customer expectations for product quality and deliveries.

Zakrzewscy's main activity involves livestock purchasing and slaughtering for their meat and skins processing and resale. The company provides supreme quality meat sides and quarters as well as meat portions, fully meeting Polish and international meat market requirements.

Zakrzewscy stays abreast of customer needs, and is able to respond with highly qualified personnel, a supreme quality guarantee and complete production repeatability. The reputation it has built over the last three decades is the result of many years of offering consistent reliability to both providers and customers, and providing the best raw materials along with constant development of applied technologies.

The plant meets environmental protection standards with respect

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CUSTOMER PROFILE

Zakrzewscy Meat Processing Plant

Location: Kosów Lacki, Poland

Application: Cogeneration

Cat® Equipment: CG170-12 gas generator set

to water usage and power/heat management. Technological solutions enhance production while reducing cost.

Offsetting electrical rate increases

At the end of 2018 and early 2019, experts and entrepreneurs closely followed developments on the Polish electric energy market, as many factors signaled significant increases in electricity prices. Various reports circulated about remedial mechanisms by which the government intended to support businesses by offsetting higher electricity costs.

This was a clear signal to industry that it was time to diversify their sources of energy to avoid increases in the cost of manufacturing.

Genset enclosure

The need to maintain lower operating costs prompted the Zakrzewscy Meat Processing Plant to explore new sources of electric power, which would serve to insulate the plant from fluctuations in its utility bill, according to plant director Mrs. Wladyslawa Grabska.

Cat® dealer Eneria came to Zakrzewscy's assistance by offering the highly efficient Cat CG170-12 generator set. The combined heat and power (CHP) system is fueled with liquefied natural gas (LNG).

The 1 MW system required expert planning and installation.

"Adaptations were necessary to ensure that the system would work efficiently and safely in conjunction with prevailing conditions at the plant, while at the same time meet criteria for noise levels so as not to create a nuisance to plant employees," Grabska said. "All of those goals were achieved thanks to the applied expertise from the power systems professionals at Eneria."

Eneria not only guaranteed maximum use of the system's potential, but also adapted it to the individual needs of the plant. Technicians developed a number of unique structural features to adapt the CHP system to the buildings and existing installations. That eliminated any potential problems with access, which could hinder operation of the system, or the entire plant.

Cat dealer specializes in cogeneration

Thanks to the installation and final commissioning of the cogneration system in October 2018, the Zakrzewscy Meat Processing Plant has become the Polish leader in innovative energy solutions. The distributed energy system installed by Eneria was the first gas-fueled combined heat and power unit that operated for more than 12,000 hours on LNG.

Heat is recovered from the engine and the exhaust to produce hot water for both sterilization and production purposes in the plant. The waste heat is sent to a thermal storage tank, which enables the Cat generator set to operate at full load during a low heat demand period.

"The price of electric power has a significant impact on operating costs. So, the range of solutions offered by Eneria includes those that may greatly reduce the uncertainty of electrical bill amounts, which is so burdensome for business."

LESZEK NICGORSKI, CEO, Eneria CAT

"We are closely monitoring the situation on the Polish energy market," said Eneria CEO Leszek Nicgorski. "We are aware of the great significance that our customers attach to it. After all, it is the price of electric power that has a significant impact on their operating costs. So, the range of solutions offered by Eneria includes those that may greatly reduce the uncertainty of electrical bill amounts, which is so burdensome for business.

"Entrepreneurs may choose from many combined heat and power systems, which can be easily adapted to their needs and requirements," Nicgorski said. "This will let them focus again on their own business."

Thanks to its skilled technicians, Eneria can quickly and efficiently adapt its products to the individual needs of its customers. As was the case with the Zakrzewscy Meat Processing Plant, Eneria specialists provide expert assistance during the entire selection and installation

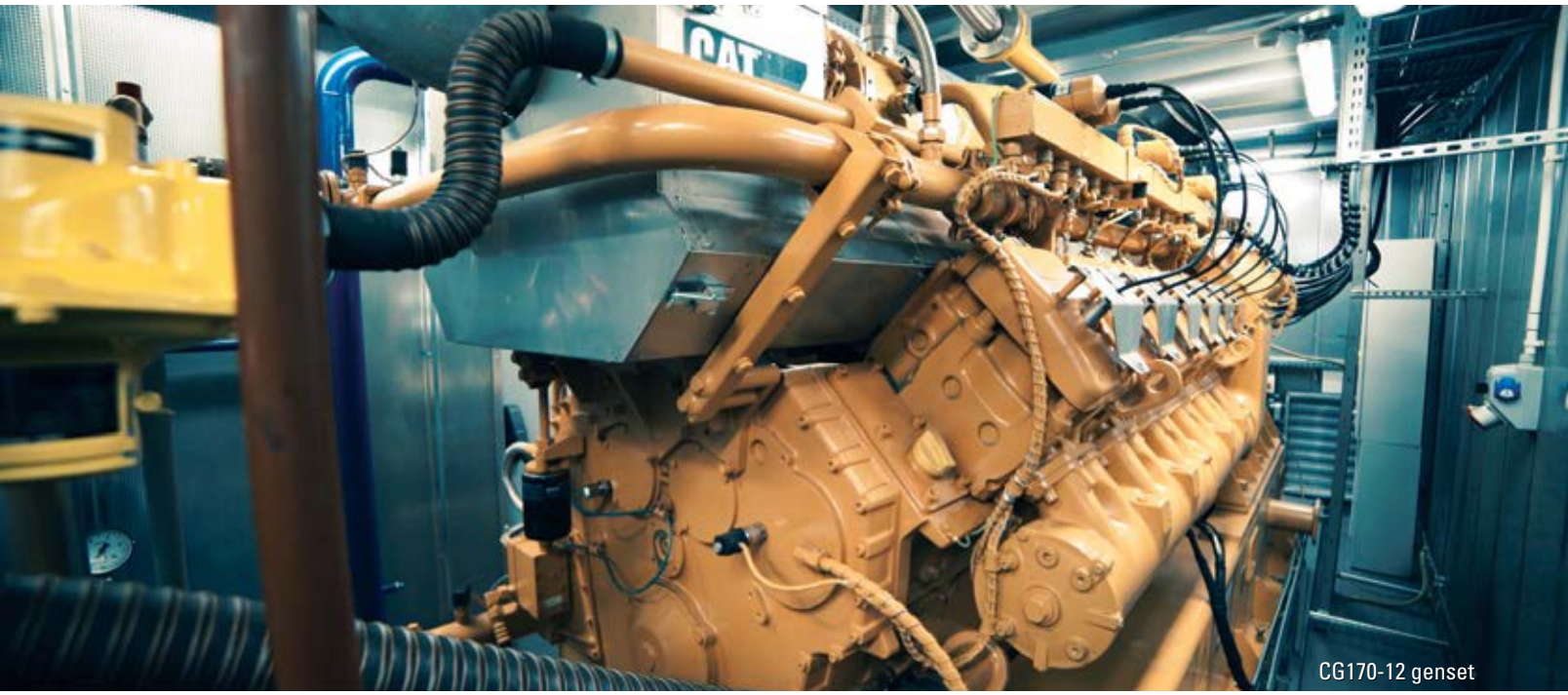
process, which enables making the best choices, resulting in greater profits while achieving maximum efficiency.

To date, Eneria has installed units with total combined power of more than 420 MVA, which is the most power installed in Poland by a single company.

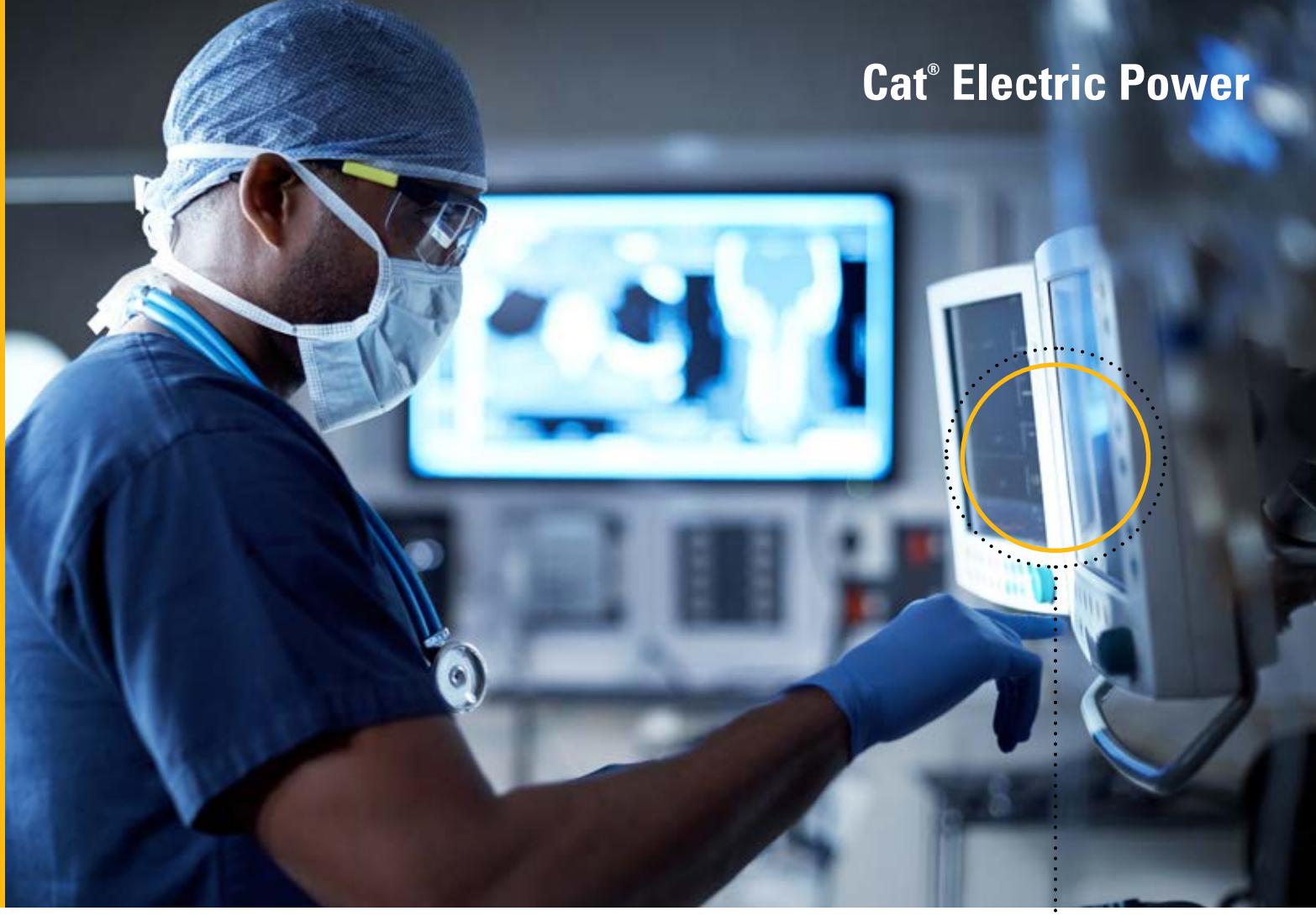
With the expertise and know-how of its Polish engineers, Eneria is able to offer comprehensive solutions ranging from project preparation and technical consulting to complete implementation, servicing, and after-sales support.

For the Zakrzewscy plant, partnering with Eneria not only allows the plant to maintain consistent production costs, but also provides the capability of operating in island mode in the event of a grid power outage.

In the final analysis, Grabska says the inherent advantages of CHP—cost savings and energy efficiency—along with the support of its local Cat dealer helps keep the Zakrzewscy Meat Processing Plant competitive with other international players in the meat processing industry.



CG170-12 genset



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