Photo Credit: Metal Technologies Inc.

Case Study: Metal Technologies Inc.

Leveraging Load Flexibility Makes Metal Caster a Good Neighbor and Better Business

Metal Technologies Inc.'s benefits from managing its energy effectively and efficiently come in two types of green: money and sustainability.

An exclusively electric melt foundry operator, **Metal Technologies** earns revenue, reduces energy costs and helps its communities and the environment by enabling **grid operator PJM** to keep the lights on when the power grid is stressed.

"Flexing our load in times of extreme grid events is valuable for everybody," said Nick Heiny, vice president of administration and general counsel at Metal Technologies. "We can contribute to our sustainability goals, be

Photo Credit: Metal Technologies Inc.

Grid operators like PJM increasingly value—and reward—the help that customers such as Metal Technologies provide because the grid needs more flexibility to maintain balance during rapid shifts in supply and demand.

a good neighbor to the community and help our business compete in a globally competitive marketplace."

Benefiting from Load Flexibility

PJM pays Metal Technologies for participating in **three grid services programs** through CPower: Capacity Performance, Economic Load Response and Synchronized Reserves. Metal Technologies also practices peak shaving, or peak demand management, in PJM. That is, the company conserves electricity during peak grid stress to reduce the capacity charges that PJM levies based on the amount of electricity a customer uses during those peaks.

Grid operators like PJM increasingly value—and reward—the help that customers such as Metal Technologies provide because the grid needs more flexibility to maintain balance during rapid shifts in supply and demand as the nation transitions to clean energy. Intermittent renewable generation accounts for an increasingly larger share of the nation's energy mix as demand for electricity increases.

"For us, flexibility means being a good neighbor," Heiny said. "We're typically the largest load in the areas in which we operate. So, if the grid is stressed, like during a winter storm, we can support the communities we're in by curtailing our load so that residents and businesses don't lose power."

Metal Technologies also reduces its cost of electricity by using less. "The economic benefit we've realized from participating in emergency demand response helps us compete," Heiny said.

"We face lots of competition from all corners of the world. Given that our commercial customers are very price conscious and that every penny matters to them in terms of the cost of their product, being able to both provide a benefit to the towns we operate in as well as reduce our net cost per kilowatt hour is very

attractive for us," he continued.

Advancing the company's sustainability goals is also a priority—and achieving them is rewarding both environmentally and financially.

"We are North America's first foundry with a carbon neutral iron casting because we are exclusively electric melt and our customers are demanding more and more sustainability efforts," Heiny said.

"Enrolling some of our load in flexibility programs helps us differentiate ourselves from competitors that use metallurgical coal or coke instead of carbon-neutral casting as we do."

Leveraging Demand Loads

With **five foundries and two machining centers** in the United States and Mexico, **Metal Technologies provides** gray iron, ductile iron, austempered, or enhanced, ductile and value-added machining for a variety of industries, including automotive, industrial and railroad customers.

Collectively, the company's five foundries pull 100 to 110 MW of demand, Heiny estimated. Of that, the largest foundry pulls 28 to 30 MW and does 10 million to 12 million kWh a month. "There's a lot of load that we can flex," he said.

Based at Metal Technologies' headquarters in Auburn, Ind., Heiny constantly looks for ways to leverage the company's loads. He works with operations teams to reduce electricity usage costs and improve efficiency through load flexibility while also collaborating with environmental teams to enhance sustainability.

Photo Credit: Metal Technologies Inc.

"Decision-making is a collective process. If I have an idea, I'll discuss it with my VP of operations first. Then we may talk about it with a plant manager and our environmental team," Heiny said.

"Our environmental team works hand-in-glove with us in measuring our emissions for our sustainability goals and helping our customers complete their sustainability work."

Securing support at the plant is essential to starting new energy savings measures. "We make sure that plant management teams understand what we're doing, why we're doing it and what the benefits are for both the grid and their facilities," Heiny said.

Conveying the community impact of curtailing electricity in grid emergencies has been particularly helpful in gaining buy-in among plant personnel. "Everyone lives locally and knows that the plant consumes about as much power as their town of 8,000 to 9,000 people," Heiny said.

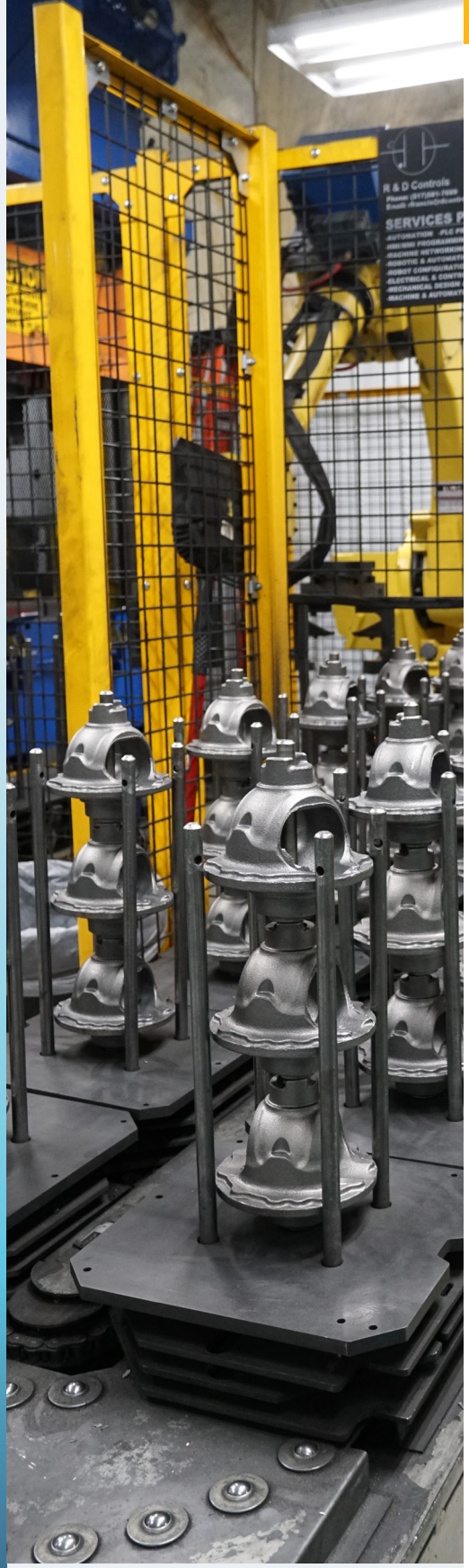

Photo Credit: Metal Technologies Inc.

Photo Credit: Metal Technologies Inc.

"They would much rather have us go down in the middle of an extreme weather event than have an entire neighborhood go down and maybe have an elderly grandmother losing air conditioning in a heat wave," he continued.

Plant personnel also welcome Heiny's suggestions because they have seen the benefits of prior actions. For example, after seeing how flexing load in emergency demand response events helped keep the lights on in communities during extreme weather, company leaders were willing to enroll in PJM's Synchronized Reserves program. In participating in Synchronized Reserves, energy users like Metal Technologies help balance the grid during short-term disturbances by curtailing load for up to 30 minutes within eight minutes of an event notification.

Improving Efficiencies

Metal Technologies began providing grid services and reaping the related benefits by enrolling in PJM's Capacity Performance, or emergency demand response, program. PJM's capacity demand response program helps the grid maintain year-round reliability by reducing demand through curtailment events.

Preparing for the company's first PJM test event for emergency demand response paid off both then and over time.

"There was a lot of backend work to make sure we set our firm service level appropriately because we have dust-collection equipment, plant

Photo Credit: Metal Technologies Inc.

background load and other stuff that we're required to run for our environmental permits," Heiny said.

"However, once we determined what we needed to run and what we would shut down when we got an emergency call, the hard work was done. Now, we have a plan in place and know what we will do to hit the load levels we need to hit."

Plants have also become more efficient. "It's helped us identify operational improvements that we never would have even thought to look at," Heiny said.

For example, Metal Technologies uses monitoring equipment to spot potential problems with its largest electrical motors early. "Large motors could cost tens or hundreds of thousands of dollars. Knowing there is a problem sooner may allow us to replace a bearing rather than the entire motor.

"That saves us costs and uptime while also helping our maintenance people stay on track and not get backlogged. It creates a smoother-running operation for us overall," Heiny said.

Demand controllers that lower peak demand by automatically managing large non-essential electric loads are key. "Power costs are such a large component of our cost of goods sold that we've always been cognizant of what our peak demand is and how to mitigate it. We may scale up half a megawatt one month and then scale down half a megawatt another

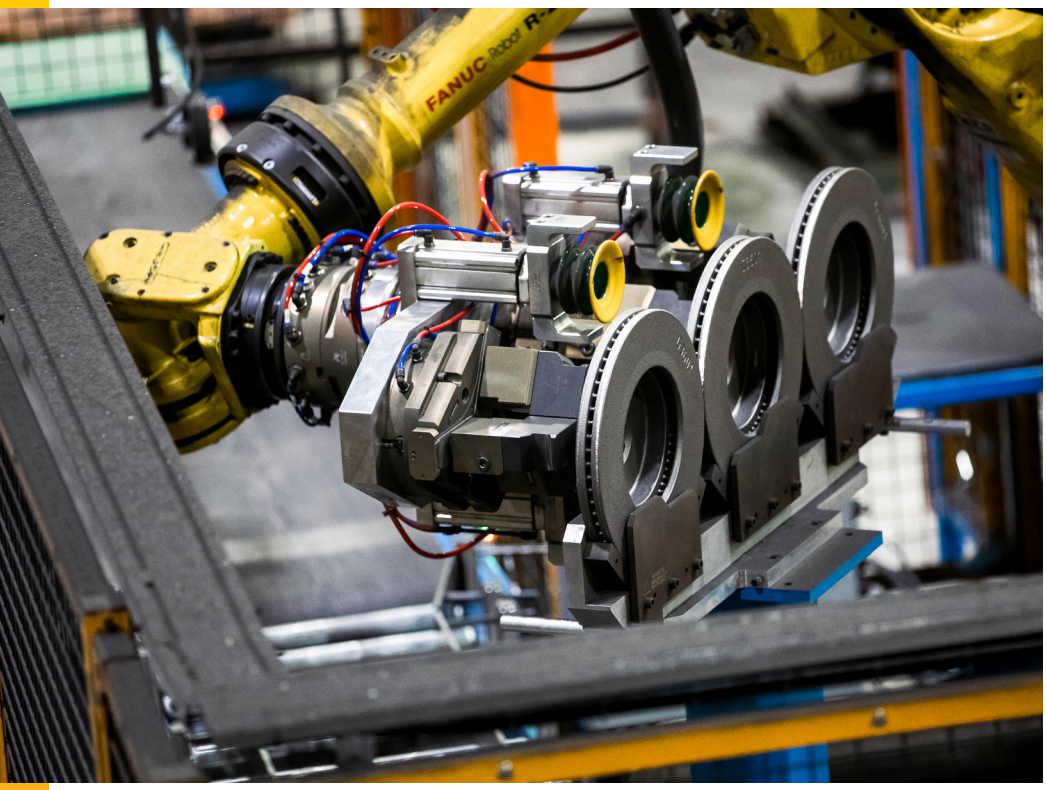

Photo Credit: Metal Technologies Inc.

CPower has also helped Metal Technologies enroll in grid services programs and participate effectively. "We would not have done as much as we have had CPower not helped us get programs going and work with our operations teams to prepare properly," Heiny said.

Metal Technologies maximizes its grid revenue and on-bill savings from the programs by using CPower's **EnerWise® Site Optimization** to quickly curtail industrial load when asked.

month as we try various production methodologies to ultimately reach that optimization standpoint," Heiny said.

Working with CPower

Heiny credits CPower for helping Metal Technologies create—and capitalize on—opportunities for leveraging its load flexibility in ways that help the company financially while meeting grid needs. CPower helped Metal Technologies become the first emergency demand response customer for one of its utilities, Indiana-Michigan Power of Michigan, for example.

"They were instrumental in getting that program approved and allowing us to participate," Heiny said of CPower. "That kicked off our recognition that companies like ours have quite a lot to contribute when it comes to a sustainable energy future and that we can be good neighbors for our community and meet our sustainability goals."

"EnerWise helps us better understand our current load profile and the financial returns from participating in economic demand response, synchronized reserves and emergency demand response," Heiny said. "Its visibility, ease of use and ability to share information across the company quickly through its pre-generated reports are quite helpful for us."

Metal Technologies plans to further leverage its load flexibility in the future. "Metal Technologies wants a sustainable future for our communities and world," Heiny said.

"Demand response and peak shaving are ways to both ensure our communities, schools, hospitals and homes do not suffer a brownout during grid emergencies as grid resiliency becomes more important due to changing generation mixes. We plan to continue engaging with CPower to find and execute ways to tailor our energy consumption to the changing market."

CPower

cpowerenergy.com

1001 Fleet Street, Ste 400
Baltimore, MD 21202