

# Company sews up savings with solar power and energy efficiency



Christian E. Benson (center), Frost River proprietor and businessman, worked with Cassie Theisen (left) and Paul Helstrom (right), Customer Programs and Services representatives for Minnesota Power, to install solar energy, high-performance production equipment and energy-efficient LED lighting at the outdoors gear manufacturer in Duluth.

Frost River Trading Co. prides itself on producing rugged canoe packs, duffels and shoulder bags “The Old Way,” with seams that don’t rip, sidewalls that don’t tear and straps that don’t break. Located in a renovated, century-old building in Duluth’s Lincoln Park Craft District, the company delivers old-fashioned quality in innovative new ways, using state-of-the-art solar energy, high-performance production equipment, and energy-efficient LED lighting.

Frost River’s strong commitment to sustainability is enough to satisfy the most ardent outdoor enthusiasts and nature lovers. It is empowered, in part, by an ongoing relationship with Minnesota Power, a utility leading the way in the clean-energy transition and the first utility in Minnesota to deliver 50% renewable energy. Minnesota Power’s Conservation Improvement Program helps commercial customers identify and complete energy-efficiency upgrades and renewable energy projects that benefit the environment and make business sense. It’s all part of the company’s *EnergyForward* strategy and vision for 100% carbon-free energy by 2050.

“Minnesota Power tries to be there as an unbiased energy adviser, helping customers make energy-related decisions and save money by leveraging our programs and resources,” said Paul Helstrom, Customer Programs and Services representative for Minnesota Power. “Frost River is a great example and a great story.”

The lead character is businessman and proprietor Christian E. Benson, who purchased Frost River in 2009 and brought the failing company back to life. Armed with a degree in marketing, a minor in physics and a dozen years of experience working for a Twin Cities area engineering firm, he saw an opportunity and grabbed it—despite no real knowledge of sewing or the softgoods industry.

“The last time I had run a sewing machine was my home economics class in the seventh grade,” Benson said. “But I liked manufacturing. The engineering firm I had worked for designed and manufactured photoelectric sensors, electrical components and that sort of thing. I figured manufacturing is manufacturing, whether you’re using diodes, resistors and capacitors or cotton,

leather and brass. You bring raw materials in, add value to them, send them out the door and repeat.”

Energy is a major expense for any business, but it is particularly important for manufacturing companies like Frost River to manage energy usage and keep production costs down. One of the first energy-efficiency improvements Benson made at Frost River was to install electronically commutated motors (ECMs) on sewing machines. ECMs can modulate speeds based on actual need at any given time, so they use less energy than standard motors which always operate at 100%. He also invested in a high-efficiency canvas cutter, which improved yield by 20 to 25%.

More recently, the company embarked on a major project that culminated in summer 2021 with a grid-connected rooftop solar electric system.

Minnesota Power first talked with Benson about installing solar photovoltaics at Frost River about five years ago, but one major hurdle was the roof on the building was not structurally strong enough to support the array.

The COVID-19 pandemic opened the door to change. While state mandates forced many businesses, including Frost River’s onsite retail store, to shut down in 2020, the company’s manufacturing capacity was deemed an essential service. It switched gears, producing personal protective equipment such as masks and face shields through some of the darkest days of the pandemic. Looking around at the shuttered storefronts of his friends and neighbors in the Lincoln Park Craft District, Benson decided to invest his good fortune in a brighter future, one powered by solar energy.

“I felt it was necessary to lean forward and continue to do what we could to keep the neighborhood moving in a positive direction by showing investment,” Benson said. “We pushed up plans for solar energy because there was talk of the federal solar tax credit going from 26% (of total project cost) down to 24 or 22%. Do the math, and that is a big difference.”

Work began in the summer of 2020, when Frost River’s retail store was closed. Structural engineers raised and reinforced

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**Paul Helstrom**, Customer Programs and Services representative for Minnesota Power

Minnesota Power solar energy experts like Paul Helstrom (right) worked with Christian E. Benson to install a new solar energy system on the roof of Frost River.

the roof to handle the weight of photovoltaic panels as well as Duluth's heavy snow. The new bay trusses allowed for R38 insulation in the cavity and R11 roof decking foam (a combined insulation rating of nearly R50).

"We put a 2021 cap on a 100-year-old building," Benson said. "Our goal was to reduce energy consumption and waste before we installed the solar."

Frost River also converted nearly all interior lighting to LEDs with occupancy sensors. The LED lighting upgrades are saving Frost River an estimated 28,000 kWh per year, reducing monthly electric demand by more than 8 kW, and offsetting annual energy costs by approximately \$2,400. Lighting choices qualified for nearly \$1,825 in Power Grant rebates from Minnesota Power.

The new 40 kW DC/28.8 kW AC solar energy system came online in May 2021. It features 100 Jinko 400W modules and two SolarEdge 14.4k inverters. Minnesota Power's solar energy experts helped facilitate a smooth, seamless connection.

"There is a whole process we go through to connect the system, and this building had some challenges to the configuration," Helstrom said. "Our engineering group worked with the installers to find a solution and make sure the inverters would operate correctly with our system."

"It really is fun to work with a group like Minnesota Power that is focused on supporting businesses and entrepreneurs in developing within old, existing infrastructure," Benson said. "It's not easy for them."

Frost River's solar energy system is connected to a bidirectional meter. The electricity it generates is primarily consumed onsite. Any extra is sent to Minnesota Power's electric grid, offsetting the amount of electricity Frost River needs to purchase on days when the company uses more than the system produces.



Efforts continue to improve overall energy efficiency in the facility. The company recently purchased a new CAD leather cutting machine (Gerber Taurus II) and is planning to install additional LED lighting in the basement and office areas. It also is considering electric air source heat pump water heaters for select parts of the building. These improvements will save energy and may qualify for additional rebates from Minnesota Power.

"Environmental stewardship is a multifaceted journey and one that Frost River and its customers take very seriously," said Cassie Theisen, Customer Programs and Services representative for Minnesota Power, adding that a large part of that journey is effectively managing energy. "I really love it when customers look at multiple aspects of their energy usage, and that's exactly what is happening here. Frost River is not just doing one thing, it is looking at energy usage from every angle with renewables, energy-efficient lighting, upgrades to process equipment, and more."

Minnesota Power recently selected Frost River as the site for one of 20 electric vehicle (EV) charging stations installed across the region.

"Working with Minnesota Power is really easy. I'm impressed that they are always telling us about opportunities and justifying upgrades so businesses like ours get the money. It is a nice balance," Benson said. "This team is focused on making sure we are not leaving opportunities out there."

That is a good fit, both for Frost River and its customers.

"Consumers ultimately make choices based on a variety of things," Benson said. "The outdoor industry is very progressive in pursuing green initiatives that benefit the planet. Our customers, partners and neighbors appreciate that we make a long-lasting product and we make it in a responsible manner."



Paul Helstrom (left) Minnesota Power Customer Programs and Services representative, and Christian E. Benson of Frost River check out the EV charging station Minnesota Power installed at the back of the Frost River building in Duluth.

## For more information:

Take the first steps toward managing energy use and costs at your business. Get started by filling out our free online pre-application at [www.mnpower.com/BusinessPreApp](http://www.mnpower.com/BusinessPreApp)