Bee Aggressive

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A modern 45,000 square foot facility that employs over 70 skilled workers including a neurotoxicologist, a limnologist, an oceanographer, a hydrologist, biologists, engineers, and factory-trained service technicians sits in a small city of 18,000. Dickinson is home to SolarBee, Inc., a world leader in improving water quality in a green and sustainable manner. Its SolarBee machines are capable of using solar power instead of grid power to accomplish long-distance circulation (LDC) to circulate water reservoirs to provide an energy-efficient, chemical-free solution for improving water quality. With wastewater, potable water, lakes, and raw drinking water divisions, SolarBee has won several environmental awards and was recognized as one of the top 50 water tech companies set to lead a new era in water management by The Artemis Project in 2009, 2010, and 2011. Each year, The Artemis Project brings together industry experts to gather the most important innovations in water technology, their benefits, and the teams behind them. Joel Bleth, co-founder and president of SolarBee, says that LDC “is effective at solving some of the world’s toughest water quality problems, while greatly reducing energy and chemical costs usually associated with water treatment.”

“LDC pulls water from a fixed depth and moves it in a near-laminar flow through long distances, resulting in thorough mixing that’s important for water quality,” he says. “LDC is a patented technology that achieves high flow rates up to 10,000 gallons per minute with minimal power because the water is moved mostly horizontally instead of vertically. In wastewater, each SolarBee typically provides enough mixing to replace 30-50 horsepower of aerator run time 24 hours per day.” In recreational and drinking source water lakes, each SolarBee can eliminate toxic blue-green algae blooms for 35 acres. And in potable water storage tanks, each SolarBee can help keep the water fresh and free of harmful bacterial growth. SolarBee credits a USDA Rural Development loan guarantee for its success and was recently named a “rural manufacturing success” by the White House.

Guaranteeing Success

Bleth started a company called Pump Systems, Inc. with Willard Tormaschy, a fellow industrial engineer, right out of college in 1978. After designing and building custom pumping systems for a number of years, they brought the SolarBee product line to the market in 2001. Due to widespread internet exposure, SolarBee was soon larger than Pump Systems, Inc., which led them to split the companies in 2007 so that each could retain its own focus. They were given an opportunity to sell the pump company, and at that point, the question of financing for SolarBee became a separate concern. SolarBee’s local bank suggested that SolarBee look toward a USDA loan guarantee, realizing that the development of the new technology would require a large amount of capital to develop the necessary inventory and

equipment, and that the collateral for a loan would be unique to SolarBee's industry. "It really was what launched SolarBee into the business," Bleth says. "If we had not received the USDA guarantee, our company would likely be five years behind where we are today and would employ only half as many people."

According to Jasper Schneider, state director of USDA Rural Development in North Dakota, the agency provides financing to build economic opportunities through business development, strategic planning, and technical support. Financing is provided to entities through loans or loan guarantees, which are made in partnership with banks and credit unions. "By investing in projects such as SolarBee, we support the growth of businesses that keep our rural communities thriving," says Schneider.

SolarBee's contribution to rural America goes beyond just employing 70 people. "One area where we've been able to give back is to offer the use of our facilities," Bleth says. "We've developed an extensive safety training program, and are happy to share it with other folks in the community." SolarBee's Dickinson headquarters was built for a mining equipment manufacturer and so has very tall sidewalls—nearly three stories in height. Working at heights, in confined spaces, and over water has required SolarBee to develop a comprehensive safety program. The indoor rappelling, rope, and harness training facilities that SolarBee's service crews utilize are opened up to other companies in the area, and the local fire department, to utilize as well.

In addition to offering the use of the facility to local organizations, SolarBee also contributes to local civic and educational programs, disaster relief efforts, and industry groups like the American Water Works Association and Rural Water Association, at national, regional, and state levels in almost all 50 states. "SolarBee contributes to the success of rural America by being an economic, intellectual, and social asset to each community where we do business," Bleth adds. "SolarBee contributes by being an expert resource, usually for free, for water quality improvement issues for every community that requests our help."

Worldwide Water Quality

SolarBee has seven U.S. regional offices, and an international sales office in Fargo, ND. With sales in 15 different countries including France, China, and South Africa, Bleth says that about 15 percent of SolarBee's business is in international sales, and growing.

Due to the special considerations required for international sales, SolarBee's international sales, other than Canada, are conducted through a partnership firm based in Fargo that can handle language barriers, in-country service, currency exchange, duties and taxes, and shipping issues. Bleth explains that exporting requires special considerations for the manufacturing process as well, including certifications such as metric dimensions, crating issues, and the production of installation and service videos to aid in-country installers. While SolarBee was started with a focus on the North America markets, Bleth values its current status as an international manufacturer of green water quality equipment. "We are

grateful to have to have found a pathway to be able to help solve tough water quality problems for all people in need, regardless of where they are located."

Solar Versus Grid

Engineered for low power consumption, SolarBee's solar-powered, long-distance circulators have been improved continuously for the last 11 years. "Solar powered equipment is essential when you're in an area that has no electricity," Bleth says, "but it comes with a fair amount of skepticism sometimes, especially since there is hardly any other equipment in the world which can power a large water pump using just solar energy for 24 hours per day."

Early machines ran only during daylight hours, but in 2005 the company switched to 24 hour per day machines by adding a large battery and a custom-designed digital power management system. The digital controls protect the battery to achieve 8-10 years of battery life, and also allow the high-efficiency, high-torque brushless motor to operate 98 percent of the time, 24 hours a day, 7 days a week, almost anywhere in the world. The digital controls also have data logging features, LED self-diagnostics, and allow for machine self-cleaning, and remote monitoring and control of the machines.

At first, SolarBee machines were used only in remote locations where solar power was the only option. But recently more machines are being used in reservoirs where grid power is also available. "Our solar powered equipment is extremely reliable," Bleth adds, "but it comes with a higher cost, and it often makes more sense to use grid-power if it's readily available." Consequently, in the past two years SolarBee has focused on making a grid-powered "twin" for each of its machines, and calls these machines its "GridBee" line of equipment. The grid-powered units can typically be sold for about half the cost of solar powered units, due to savings from the various solar components that are not needed.

The first GridBee was a small lake machine produced for city park ponds and golf courses that didn't want visible solar panels sitting on the water. GridBee models have since been developed for wastewater and potable water as well. The GridBee product line now includes six different machine sizes, from 150 gallons per minute to 10,000 gallons per minute, with some variations for the different markets.

"GridBee models have every bit as much ability to solve tough water quality problems as the SolarBee line, and use many of the same patented features," Bleth says. "Though GridBee sales are growing, a number of customers still prefer solar-powered machines over grid-powered units when they have a choice. Even though the cost is more, they are happy to be doing something that is green and that has a payback."

A Bright Future

Having successfully served many municipalities for over ten years, SolarBee is continuing to see significant growth in a variety of markets. Awareness of difficult water quality problems is on the rise, and EPA-driven water regulations and

compliance are also increasing. Bleth says that SolarBee is experiencing a growth in industrial markets, though it has not actively marketed to industrial customers, particularly in industries such as refineries, pulp and paper, food and beverage processing, and chemical plants. “Many of the solutions we’ve engineered for municipal markets have direct crossover to these industries, including energy reduction, chemical reduction, permit compliance, water re-use, odor control, and sludge reduction,” he adds.

He also says that SolarBee’s reservoir water quality improvement equipment has allowed the company to serve a niche that few other companies are serving. “Every day we learn of new reservoir water quality problems worldwide,” Bleth says. “I’d like to say that’s because we do such a great job for our customers. But I’m pretty sure it’s also at least partly because so many people have no other company to turn to for the expertise and products that they need and we offer.”

“SolarBee is very optimistic for continued strong growth in the future.”

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