

Harbec Plastics

Manufacturing

The Challenge

The microturbine experience embarked upon by Harbec Plastics, a custom injection molding company based in Ontario, New York, is actually the story of two energy independence initiatives. The first started in the late 1990s, when Harbec's facility was experiencing brutally hot conditions. The company needed to air condition the space, but the cost to install and operate a system would exceed the company's budget. At the same time, the business was facing rising energy costs and frequent power outages and surges that caused over \$15,000 in damaged equipment in a single month.

Company founder Robert Bechtold decided it was time to retool the entire facility's energy profile and investigated several options. One solution that offered maximum immediate and long-term benefit was a hybrid combined heat and power (CHP) / wind system. This system, installed in 2001, proved to be an ultra-reliable, low emissions, and cost-effective source for the plant's primary power. Twenty-three years later, when Harbec Plastics was acquired by Addman Engineering, Bechtold decided to retain the energy assets and form an energy services company (Harbec Energy) that would supply power to the manufacturing site, along with other facilities within the industrial park.

Power Profile

Customer

Harbec Plastics

Location

Ontario, New York

Commissioned

2001; upgraded in 2015

Fuel

Pipeline Natural Gas

Technologies

- (8) C65 Microturbines

Capstone Green Energy Partner

RSP Systems



Our microturbine based system along with combined heat and power allowed us to reverse the reality that the rest of the world lives in, which is that the utility model throws away 75% of the energy it generates to deliver 25% to its customers. Using our own monitoring, we know that we were running often over 80% BTU efficiency. That's the exact opposite of the utility. It's a no-brainer, and a reality that needs to be further explored for the future of energy use."

— Bob Bechtold, President
Harbec Energy, LLC

An aerial photograph showing a large industrial facility with several buildings and a parking lot. In the background, a tall wind turbine stands against a clear sky. The entire image is overlaid with a semi-transparent green filter.

**Smarter Energy
for a Cleaner Future**



Harbec Plastics' original 25 C30 microturbines (left) were upgraded in 2015 with eight C65s (right) to expand capacity to support manufacturing needs while continuing to prioritize efficiency and sustainability.

The Solution

The original Harbec system featured twenty-five Capstone 30 kW microturbines, delivering 750 kW, and one 250 kW wind turbine. Together, they provided enough power to support the plant's manufacturing processes as well as its heating and cooling needs.

In this configuration, the natural gas-fueled microturbines were dispatched in 30 kW increments. If a load greater than 30 kW was needed for more than 15 minutes, a new unit was dispatched within three to five minutes, and vice versa—if the power need dropped, a unit was turned off. The building remained connected to the grid as a source of backup power, a connection that also allowed Harbec to export back to the utility any excess power produced by the wind turbine, sometimes as much as 250 kW.

For added efficiency, the system was designed to capture the exhaust heat from the microturbines and transfer it to heat exchangers that produced hot water used to heat the facility through radiant floor heating and a forced air system. In the summer, the hot water was channeled through an absorption chiller, providing cooled water for air conditioning.

This system ran reliably for over a decade, and in 2015, the company upgraded, replacing 15 of the C30s with eight C65 microturbines, which produced 520 kW of power to support expanded needs.

When Addman Engineering acquired Harbec Plastics in 2022, they opted not to take ownership of the energy assets, and Bechtold searched for a buyer that would keep this valuable system intact and in operation. When that didn't emerge, Bechtold decided to form Harbec Energy, a new Energy as a Service (EaaS) provider, essentially becoming the Addman facility's utility-alternative.

The Results

Though the project was initiated to improve the work environment for employees, Harbec leadership learned that taking responsibility for the way the facility used energy also improved the company's bottom line. By shifting the cost of their large utility-bill toward purchasing generating and heating/cooling assets, Harbec made a long-term investment in both price stability and energy independence. Not only did the system perform exceptionally well, but the payback on the upfront investment was just 2.5 years.

Thanks to a NYSERDA grant that enabled them to improve the efficiency of the system's heat exchangers, the system was able to run at 110% of rated capacity, which offered excess cooling capacity. Over the years, as gas prices increased, Harbec made use of the system's flexibility to alter the CHP operation so that it prioritizes thermal needs over electric production.

Overall, the system's environmental benefits have been noteworthy, producing less than 10% of the CO₂ of traditional sources of energy like coal and oil for the same amount of energy. And because heating and cooling are byproducts of the power generation process, the system's efficiency level is roughly 70%.

Having had the foresight in 2015 to purchase eight additional C65 Capstone units in case of an expanded need for capacity, Bechtold is currently exploring the option to bring the replaced C30 units back online to create a microgrid in support of an energy-sustainable industrial park.

In 2023, the U.S. Department of Energy's (DOE), Industrial Efficiency and Decarbonization Office (IEDO), recognized Harbec with the 2023 U.S. National Award for Energy Management. In fact, Harbec was that year's highest-performing U.S. entry for the award.