

Forrajera 19 Hermanos

Manufacturing



The Challenge

Forrajera 19 Hermanos has a motto: "Don't lower the goal. Increase the effort!" The 20-year-old livestock feed company based in Jalisco, Mexico applied the same consideration when looking for an energy solution that would help them reduce costs and align with their company's values and vision of producing balanced foods through innovation without harming the environment.

With its plant, consuming an average of 570 kWh of electricity at \$3.44/kWh from the local CFE (Comisión Federal de Electricidad) network, the company knew it could do better, and so in 2019, they partnered with DTC Ecoenergía to design and install an onsite combined heat and power (CHP) system.

The Solution

Built in two stages, the first installation was built around three highly efficient Capstone C200 microturbines in 2019, followed by an additional C200 in early summer 2020. The entire configuration covers 98% of the plant's electricity consumption and 68% of its billable demand. The equipment uses approximately 4,200 GJ (112,399 m³) of natural gas per month, which is supplied as compressed natural gas through mobile storage units. From there, the fuel passes through a decompression unit on site and then on to fuel the microturbine.

For maximum efficiency, the microturbine-based CHP configuration captures waste heat generated by the turbine and produces hot air at 280°C (536°F) with an energy of 2.97 GJ / hour. The hot air is then channeled to a Cain Industries steam generator that serves as an auxiliary to two existing boilers in the Forrajera, used in the heating and cooking of its feed production.

Power Profile

Customer

Forrajera 19 Hermanos

Location

Tototlan, Jalisco, Mexico

Commissioned

December 2019

Fuel

Compressed Natural Gas

Technologies

■ 4 C200R Microturbines

Capstone Turbine Distributor

DTC Ecoenergía

"The market environment for cogeneration makes it an ideal solution for the Mexican industrial manufacturing sector. The clean and green microturbines will provide on-site combined heat and power that is far more efficient and environmentally beneficial than the local CFE utility."

— Alejandro Munoz Barba, CEO
DTC Ecoenergía





The microturbine-based CHP system at Forrajera 19 Hermanos was able to decrease their electricity bill by 93% and save more than \$700,000 pesos (\$32,200 USD).

The Results

In contrast with the plant's original utility-provided setup, the new system has offered impressive returns. Within just a few months of operation, the microturbine was generating approximately 362,535 kWh per month, generating with a power of 565 kWh. As a result, La Forrajera was able to reduce the amount of energy purchased from CFE to less than 5%, decreasing the company's electricity bill by 93% and saving more than \$700,000 pesos (\$32,200 USD) per month.

The system's added efficiency also reduces the amount of fuel consumed by roughly 4,000 liters (1,057 gallons), thereby saving as much as \$170,000 pesos (\$7,600 USD) per month.

"The market environment for cogeneration makes it an ideal solution for the Mexican industrial manufacturing sector," commented Alejandro Muñoz Barba, President of DTC Ecoenergía. "The clean and green microturbines will provide on-site combined heat and power (CHP) that is far more efficient and environmentally beneficial than the local CFE utility," added Mr. Barba.

All combined, the return on investment is expected to be less than 2 years with an internal rate of return of 54%. It's a win-win-win scenario where the Forrajera set the goals high with regard to efficiency, cost savings and environmental benefit and found a solution that delivered success in all three areas.■

Capstone C200R Microturbine



A C200R Microturbine provides up to 200 kW of electrical power and contains the world's largest single-unit air bearing microturbine.