

Global Nutrition Provider



 Dairy
  USA
  HeatSponge

Overview

This facility specialises in soy protein extraction to produce dairy-free products. By integrating innovative HeatSponge units, the facility achieved a significant reduction in energy consumption and emissions, supported by cost savings and a rapid payback period.

The successful implementation highlights the potential for scalable solutions in industrial operations and reinforces the customer's commitment to achieving Net-Zero emissions by 2050.

Impact

- ▶ 50% project funding through a localised initiative
- ▶ < 2 years payback period
- ▶ 621 tonnes of CO₂ reduced annually (5% reduction)
- ▶ \$87,915 in annual savings

Solution

The customer upgraded from legacy single-stage non-condensing economisers to our two-stage HeatSponge units adding minor modifications to fit the existing infrastructure. To better serve the customer, the Turn-key project included an offset of the HeatSponge outlet to align with the existing roof penetrations.

Two-stage economisers are an advanced solution designed to maximise energy recovery from exhaust gases by utilising multiple water heat sinks. This application used two separate heat sinks.

In a conventional single-stage feedwater economiser, energy recovery is limited to the temperature difference between the exhaust gas and the feedwater entering the economiser. For this application, those temperatures were 204°C (400°F) and 108°C (227°F), respectively.

By introducing a second stage with water entering at a much lower temperature of 10°C (50°F), the economiser continues to recover additional energy from the exhaust gas after it exits the first stage. This lower water temperature also facilitates the condensation of some vapour generated during fuel combustion, enabling latent heat recovery in addition to sensible heat recovery.

The efficiency benefits of this approach are substantial. While single-stage feedwater economisers typically deliver an efficiency improvement of 2.5% to 3%, the inclusion of a second condensing stage often boosts overall efficiency by up to 10%.

The HeatSponge's innovative design also allows for straightforward in-house maintenance, eliminating the need for third-party services. Using compression fittings, individual tube elements can be replaced without requiring welding, unlike traditional economisers that necessitate replacing the entire heat exchanger bank.

A localised incentive program promoting energy efficiency awarded the project 50% funding after verifying that the HeatSponge achieved 5% gas savings and 5% CO₂ emissions reduction.

