

Microgrid Solution Improves Power Resiliency & Operational Efficiency

A typical industrial manufacturer uses electrical power in multiple applications throughout the facility, including lighting, HVAC, automation, and office operations. Not all equipment associated with manufacturing and operations is used simultaneously on any given day. Additionally, the time of year affects lighting needs and HVAC demands.

Trystar sought to gain insight into its own aggregate and average energy demands, and then created its own microgrid system solution to efficiently and sustainably address its operations and production needs.



Trystar's Faribault MN facility is partially powered by wind and solar energy.

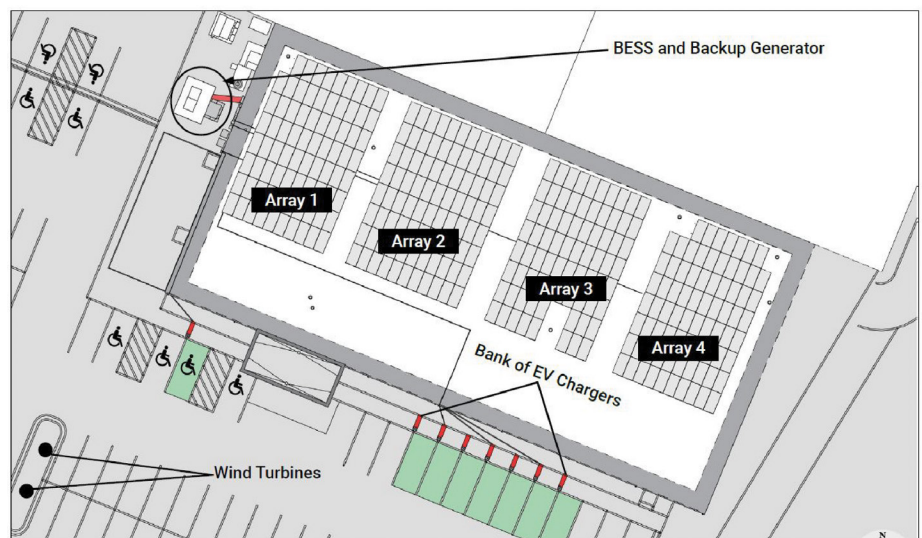
Trystar's Microgrid Design & Purpose

While designing the microgrid for its Faribault MN manufacturing facility, Trystar saw the requirement for a high-power transfer switch to transfer power between the backup generator and the utility to ensure reliable backup power to the facility. The team designed and implemented a custom automatic transfer switch that was integrated into the microgrid. **As a result, Trystar's own working microgrid serves a three-fold purpose:**

- Providing its own power resilience using reduced carbon emission solutions to shave its peak power requirement for the facility, and thus lowering utility costs.
- Demonstrating Trystar's capabilities in resilient energy system solutions to prospects and customers ... a show-piece operating in real-time.
- The innovative technology used to develop and integrate the custom automatic transfer switch has resulted in a successful expansion of the company's transfer switch product offering.

Trystar's Microgrid Scope

- (320) Solar Arrays (132 kW Potential)
- (2) Wind Turbines (7.0 kW Potential)
- (1) 350 kW Natural Gas Backup Generator
- (1) 232 kWh Lithium Ion Phosphate BESS
- (8) 32 Amp EV Charging Stations

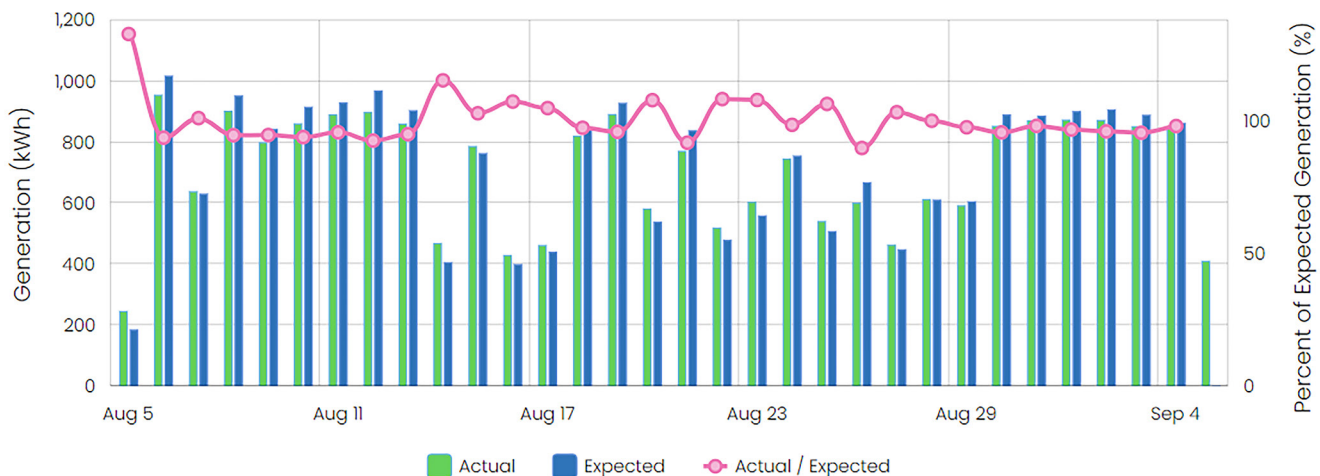


Solar arrays 1 - 4 are on the roof of the single-story office section of Trystar's Faribault facility, and generate 132 kW of combined potential output.

Renewable Energy That's Intelligently Controlled

Trystar's microgrid has a smart energy management system that ensures energy is distributed efficiently and effectively. The system constantly monitors energy production and consumption, adjusting energy flow accordingly. For example, if energy demand is low, the excess energy produced by the solar panels and wind turbines will be stored in the batteries for later use. Conversely, if energy demand is high, the smart system will prioritize energy delivery to the areas of the facility that presently require the most energy.

The illustration below is a real-time example of the Expected and Actual power generated by the Trystar microgrid (approx. 800 kWh/day, on a clear day), during the month of August 2024.



This graphic represents a portion of the total electrical power required. That said, Trystar expects its microgrid to provide a first-year offset of 185,000 kWh of electricity that would otherwise require to be generated by the local utility.

To put that into perspective, generating 185,000 kWh of electricity annually equates to the CO₂ emissions from burning 146,859 pounds of coal, from consuming 303 barrels of oil, or from consuming 14,753 gallons of gasoline.

Custom Solutions At Scale

Trystar's working microgrid is allowing the company to reduce its carbon footprint, increase its energy independence and resilience, and save costs.

As an element in Trystar's sustainable journey, this microgrid is a learning laboratory which allows the company to create and validate new, sustainable energy system solutions ... scaling and tailoring those solutions to each customer's specifications.

In addition to having its own working microgrid, Trystar also designs and manufactures many other custom electrical and renewable energy solutions!



Faribault microgrid's Energy Management System, housed within the facility.