

The Industry Challenge

- ▶ Food production is one of the most **thermally intensive manufacturing sectors** — ovens, fryers, dryers, pasteurizers, sterilizers, smokers, curing lines and boilers continuously exhaust massive volumes of heated air and flue gases directly to the atmosphere.
- ▶ **Energy is the #2 operating expense** after raw materials, with natural gas and thermal processes accounting for 8–15% of total production costs.
- ▶ Grease-laden, cooking oil-rich, powder-laden, particulate-heavy, and high-humidity exhaust streams have historically **defeated conventional heat recovery systems** — causing fouling, clogging, and costly downtime.
- ▶ Intensifying **regulatory requirements, retailer sustainability mandates, SBTi targets**, and consumer demand for low-carbon products are compressing margins and raising the stakes on decarbonization goals.

The ThermStar™ Solution

- ▶ The **ThermStar System™** is a closed-loop thermal energy recovery platform engineered specifically for food and beverage manufacturing exhaust streams where conventional heat recovery technologies have historically struggled. The system recovers thermal energy from ovens, fryers, dryers, pasteurizers, sterilizers, smokers, curing lines and boilers and delivers it where it creates the greatest operational value.
- ▶ **Implemented and proven applications** include preheating process air and preheating process water.
- ▶ **ThermStar System™ integrates proven Lepido® heat recovery technology** from Enjay Systems into a complete thermal energy recovery platform including system and controls integration providing long-term performance optimization.
- ▶ **Patented Particle Repellant Geometry (PRG)** combines staggered tubular geometry, engineered airflow pathways and finless heat transfer surfaces designed to reduce particle adhesion while maintaining long-term thermal performance.

Proven Performance

Up to 57%

Reduction in Natural Gas Consumption

<3 yr

Typical ROI

200+ Global

Installations since 2021

99.9%

System Uptime

8

 International Awards
Across **6** Countries

 At **24/7** Industrial

Production Environments

Why ThermStar™ for Food Production

Engineered Specifically for Particulate Laden Exhaust: PRG thrives where grease, oils, fats, powders, dust, moisture and other airborne particles quickly foul conventional heat exchangers.

Minimal Production Disruption Designed for continuous 24/7 duty cycles of food manufacturing facilities. Systems are typically rooftop mounted to avoid plant disruption.

Accelerate Decarbonization Goals: Directly reduces Scope 1 CO₂ emissions. Supports SBTi commitments, ESG reporting, CDP disclosures, and retailer sustainability scorecards.

Advisory Led Implementation: Norrel™ provides thermal energy advisory, system integration, implementation coordination, commissioning support, and ongoing performance intelligence.

Applications Spotlight

Bakery & Snack Production	Oven and drying line exhaust heat recovery.	Meat & Poultry Processing	Cooking, smoking, and rendering process exhaust recovery.
Dairy & Beverage	Pasteurization and sterilization waste heat recovery.	Prepared Foods & Frozen	Fryer and blancher process exhaust recovery.
Ingredient Drying & Grain Processing	Dryer and dehydrator process exhaust recovery.		

"Every BTU vented to the atmosphere is margin lost. ThermStar™ puts it back to work."

Schedule Your Complimentary Thermal Energy Recovery Screen

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