

FOOD PRODUCTION

CASE STUDY:

LANTMÄNNEN

June 2025

Recovering thermal energy from process exhaust at Europe's largest pancake factory, producing 600,000 pancakes a day.

EXECUTIVE SUMMARY



EQUIPMENT & OPERATING CONDITIONS



Equipment

AMF Baking Oven used
for food production



Exhaust Airflow

9.7 m³/s or 20,550 CFM



Return Airflow

9.7 m³/s supply air to
production facility



Exhaust Air Temperature

40°C or 104°F



Return Temperature

16°C or 60°F



Particulates

Grease, fats, soot & high
levels of moisture



Operating Hours

20 hr/day x 5 days a week



Heat Recovery Model

2 x L50S Lepido units



PERFORMANCE DATA



Thermal Power Needed

355 kW



Heat Recovery Capacity

288 kW



Energy Needed

616,600
kWh/year



KEY RESULTS



Annual Energy Delivered

614,900
kWh/year



Annual Savings

\$67,600
per year

Based on \$0.11/kWh

THE PROJECT

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Background

Industrial baking operations generate significant volumes of warm exhaust air that can contain grease, fats, soot and high levels of moisture. This exhaust represents a substantial source of thermal energy that would otherwise be discharged from the facility.

The challenge

Conventional heat exchangers can be difficult to apply in these exhaust streams because particulates accumulate on heat-transfer surfaces, increasing pressure drop and reducing thermal performance. The resulting cleaning requirements, maintenance costs and risk of production disruption can make conventional heat recovery impractical.

At Lantmännen, the opportunity was substantial: approximately 20,550 CFM of exhaust air at 104°F, operating 20 hours per day, five days per week. The challenge was recovering that energy reliably from a grease-, soot- and moisture-laden exhaust stream without creating an unacceptable maintenance burden.



THE PROJECT

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The Solution

Two Lepido® L50S heat recovery units were installed in the baking process exhaust. Their finless Particle Repellent Geometry (PRG) is designed to allow particulate-laden air to pass through the heat exchanger while minimizing accumulation on the heat-transfer surfaces.

Installation

The Lepido® units were installed directly in the process exhaust duct serving the high-intensity production line. Recovered thermal energy is transferred through a closed-loop fluid run-around circuit to the supply air-handling system serving the production facility.

Because the exhaust and supply airstreams remain physically separated, there is no transfer of grease, particulates or odors from the process exhaust into the building supply air.





EXHAUST SOURCE

AMF baking oven
20,550 CFM
104°F process exhaust
Grease • fats • soot • moisture



HEAT RECOVERY

2 × Lepido® L50S units
Installed in process exhaust
288 kW heat recovery capacity



CLOSED-LOOP ENERGY TRANSFER

Run-around fluid circuit
Separates process exhaust from
building supply air



ENERGY REUSE

Recovered thermal energy delivered to
the production facility's building heating
at a 60°F supply-air setpoint



614,900 kWh/yr

of recovered thermal energy
delivered to the facility

RESULTS

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The installed system delivers approximately 614,900 kWh of recovered thermal energy annually, supplying 99% of the production facility's annual building heating demand.

By locating the heat recovery equipment close to the production line, the system reduced the amount of ductwork and piping required compared with routing recovered energy through a centralized mechanical room.

The decentralized configuration provides easier access to the heat recovery equipment and simplifies ongoing inspection and maintenance.

614,900 kWh/yr

Energy Recovered

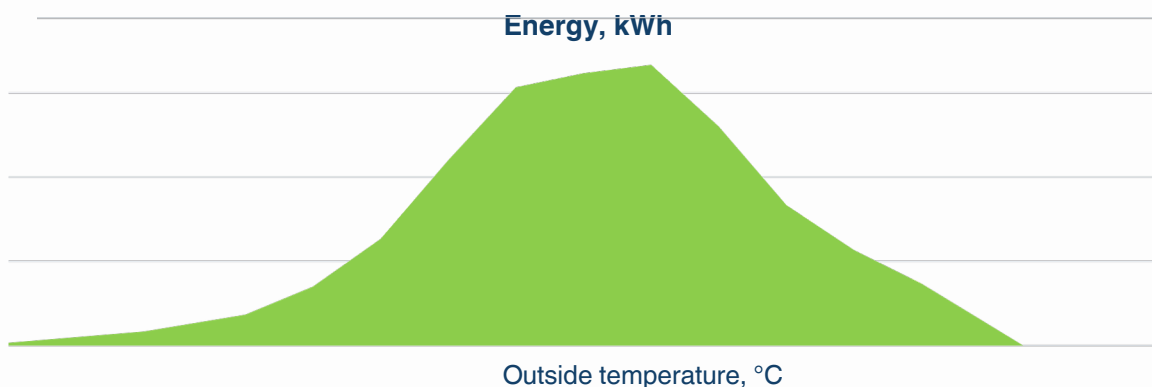
\$67,600/yr

Annual Energy Savings

~2.5 YEARS

Simple Payback

Based on electricity cost of
\$0.11/kWh



**Recovered process energy supplies 99% of the
production facility's annual building heating demand**



LEPIDO® BY ENJAY

Lepido® is a Swedish-designed air-to-fluid heat exchanger engineered specifically for heat recovery from particle-laden and high-fouling exhaust streams. Its patented Particle Repellent Geometry (PRG) uses a finless, staggered tube configuration designed to allow particles to pass through the heat exchanger rather than accumulate on conventional finned surfaces. It is at the heart of ThermStar.

The result is a heat exchanger designed to maintain airflow, limit pressure-drop issues and provide stable long-term heat recovery performance in food production applications where conventional heat exchangers can be difficult to operate reliably.

Other food manufacturing installations include:



BANKABLE ASSET CLASS

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PROVEN TECHNOLOGY. RECOGNIZED GLOBALLY. A CLEANER TOMORROW.

 Solar Impulse Efficient Solution Independently evaluated for its environmental and economic benefits.	MATURITY STAGE  TRL 9 TECHNOLOGY READINESS LEVEL Proven in real-world operating conditions.  CRI 5-6 COMMERCIAL READINESS INDEX Driving widespread deployment & "Bankable" asset class.	 Climate Solver Recognized for innovative solutions with significant potential to reduce greenhouse gas emissions and help build a more sustainable future.
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LET'S PUT WASTE HEAT BACK TO WORK.

DIRTY AIR. CLEAN ENERGY.

For any questions or inquiries,
please contact us:



ADDRESS

30 N Gould St, Suite R, Sheridan, WY 82801



PHONE

1-833-667-7359



WEBSITE

www.thermstar.com



EMAIL

info@thermstar.com



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