DRIVING SUSTAINABLE INNOVATION

MAGALDI®
DEPENDABLE ENERGY STORAGE

GREEN THERMAL ENERGY 24/7
FOR A DECARBONIZED FOOD & BEVERAGE INDUSTRY

Thermal energy represents the majority of the food & beverage industry's energy consumption, with most plants relying on low-to-medium pressure steam (120–180 °C) for core operations such as refining, pasteurization, sterilization, cooking, etc.

To ensure steam availability throughout all production stages, gas boilers (or cogenerators) must be kept in continuous operation, adjusting their output to match demand with frequent load variations. This operating mode results in significant fuel waste, higher maintenance costs, and a consequent increase in CO_2 emissions.

Magaldi provides a greener and safer alternative to conventional steam generation. Our MGTES (Magaldi Green Thermal Energy Storage) – the world's first fluidized sand thermal battery – offers a practical and scalable solution to replace fossil fuel–based heat with dispatchable, renewable-derived thermal energy, available 24/7 and without direct emissions.

Charged with renewable electricity during low-cost, high-availability hours, **MGTES** releases stable heat with fast ramping capability to match batch starts, CIP cycles, or peak steam demand - fully compatible with food & beverage applications.

BUSINESS CASE IN ITALY
KEY TAKEAWAY

Italian market ideal for small scale deployments not relying on national grid.

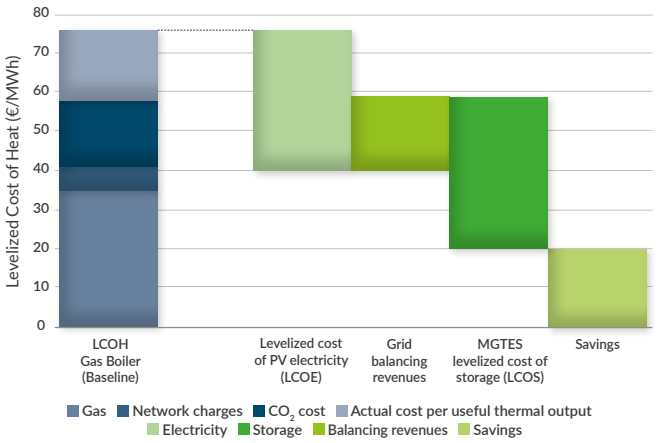
Highly competitive heat supply with co-investment in renewable technologies:

- **> Long term investment in PV array**
- **> Long term investment in MGTES Technology**
- **> Currently supported by strong governmental programs**

Risk mitigation from the energy market price (crisis scenario).

COST/REVENUE ANALYSIS

> GAS BOILER vs. PV+ MGTES



Replacement of the existing gas boiler.

The CAPEX values shown refer to illustrative scenarios for projects located within Special Economic Zones (ZES) in Italy and include reductions from applicable incentives and subsidies.
These simulations are intended for illustrative purposes only and do not represent a binding offer. Technical and commercial conditions may be subject to change and must be verified on a case-by-case basis.

ACCESS TO DECARBONIZATION INCENTIVES

- European Heat Auction: up to 20-25 €/MWh for first 5 years.
- Regional CapEx support: up to 80% for ZES and special areas.
- Budget Law – Green Investments: +180% up to €2.5M, +100% from €2.5M to €10M, +50% from €10M to €20M.
- EIB decarbonisation loans: highly favourable interest rates.
- Energy Efficiency: up to 40€/MWh in case of an eligible project.

BENEFITS AT A GLANCE

DECARBONIZATION & COMPLIANCE

- Replace fossil-fired steam with renewable-derived thermal energy.
- Cut Scope 1 & 2 emissions to near-zero when powered by green electricity.
- Meet tightening regulatory requirements.
- Enable transparent ESG reporting with clearly measurable carbon footprint reductions.
- Streamlined permitting process for easier regulatory approval.

COST SAVINGS & OPERATIONAL FLEXIBILITY

- Energy cost arbitrage: charge during low-price periods, discharge at peak hours.
- Shield operations from volatile gas prices and carbon taxes.
- Pair with on-site PV or wind, maximizing selfconsumption and reducing grid withdrawal.
- Additional revenues by providing grid services (demand response, peak shaving, frequency regulation).

PROCESS RELIABILITY & PRODUCT QUALITY

- Stable steam pressure and temperature for critical processes, reducing thermal variability that can affect product quality.
- Continuous steam supply even during renewable fluctuations, ensuring uninterrupted production and foodsafety cycles.
- Scalable autonomy of up to 20 hours based on the installed capacity and state of charge (SoC).
- Inert materials ensure a contamination-free process, with no risk of fire or hazardous substances

DURABILITY, RESPONSIVENESS & MODULARITY

- +30 years design lifetime with no performance degradation under typical operating conditions.
- High cycling capability, with fast and flexible ramping thanks to simultaneous charge/discharge.
- Scalable modules from 5 to >100 MWh thermal capacity, matching site-specific loads.

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