BUILD TO ZERO · DS INDUSTRY 2026

ThermalBox®

Prefabricated thermal energy storage for industrial applications

Compact · Modular · Fully prefabricated · 95% efficient

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THE CHALLENGE

Industrial heat is the missing piece of decarbonisation

25,400

TWh/year

of combustion heat in the selected industries that must be decarbonised by 2050

8,400

TWh/year

below 400 °C: the first wave of heat decarbonisation, by 2030

3,800

TWh/year

in food & beverage and paper, which can electrify their steam with renewables

Source: UNFCCC (2021), Eurostat, JRC and others; global market estimate for 2030. Build to Zero analysis.

WHO WE ARE

Build to Zero: 15 years of molten salt, now serving industry

A Seville-based climate-tech company. We combine renewable electrification with long-duration thermal storage to deliver 24/7, zero-emission heat below 400 °C.

Members of **ETSI** and the **LDES Council**.

17+ GWh
of thermal storage deployed and operated

15 years
of concentrated solar power experience

60+
projects across five continents

25+
countries of operational experience

Track record built by the founding team prior to Build to Zero, in CSP, thermal storage and industrial energy infrastructure.

THE TECHNOLOGY

ThermalBox®: electrify, store and dispatch 24/7 steam

1. Electrify

An electric heater converts low-price renewable power into heat.

2. Store

Molten-salt tanks hold the energy at atmospheric pressure for 6 to 14 hours.

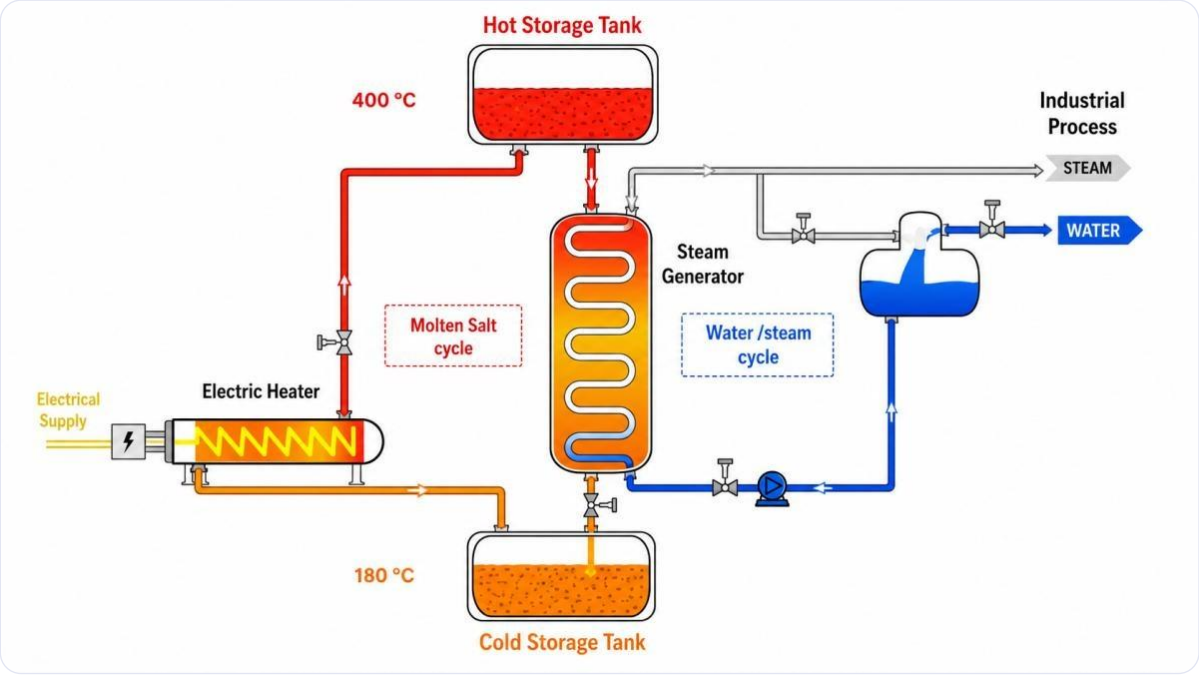
3. Dispatch steam

A once-through generator delivers firm process steam on demand, up to 20 barg.

De-risked by 15 years of CSP. Proven solar-thermal technology, productised for the first time.

HOW IT WORKS

Sensible-heat storage in molten salt, with gas-boiler dynamics



400 °C maximum
Carbon steel: lower cost

HITEC® salt
Non-toxic, non-flammable, 40+ years

10–110% load range
Same response as a gas boiler

No-shutdown maintenance
Removable cartridge heater

Protected IP: utility model ES1301891U (Spanish Patent and Trademark Office).

PRODUCT, NOT PROJECT

Two standardised models, 100% factory-built

Type 1

3 MWe / 3 MWt / 14 MWht

3 MWe electric heater · 3 MWt evaporator · 14 MWht storage

Type 2

6 MWe / 5 MWt / 28 MWht

6 MWe electric heater · 5 MWt evaporator · 28 MWht storage

- **Serial manufacturing:** standard components, repeatable assembly, digital traceability.
- **Short lead times:** 12–14 months to deliver a unit, versus years for bespoke builds.
- **Cost benchmark** in the 150–400 °C range, thanks to a low-pressure design.
- **Own factory:** up to 12 units per year on a single shift.
- **Small footprint:** 120–180 m² per unit, depending on the model.

THE BUSINESS CASE

From the client's hourly data to an investment decision

INPUT · CLIENT

Starting data

- Steam demand
- Electricity demand
- Electricity tariff
- Available power
- Renewable generation

BUILD TO ZERO

Simulation & optimisation

- Real grid constraints
- Unit optimisation
- Renewable integration
- Dynamic scenarios

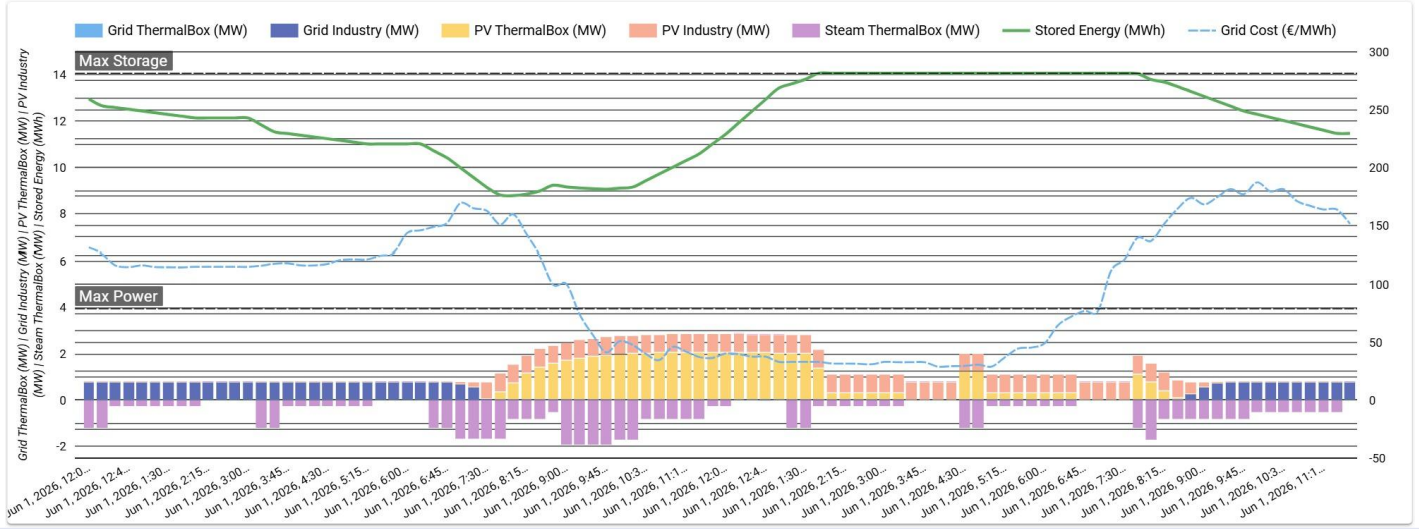
OUTPUT

Business case

- Design and sizing
- Steam cost vs. gas
- Savings, payback and grants

ETESAI® · A REAL DAY OF OPERATION

Charges energy when it is cheap, delivers steam when it is needed



Night
Steam for each batch comes from storage

Morning
Prices rise: steam keeps coming from the salt

Midday
PV and low prices: recharges to full

Evening
Prices rise again: discharges once more

ALREADY OPERATING

The first unit already fully replaces a fossil boiler

24/7 steam at a chemical plant, built on components proven for 15 years in concentrated solar power.

95%
power-to-heat efficiency

+90%
availability

24/7
continuous steam



THE BUSINESS CASE

Five levers that make electric steam competitive

Lever	How it works
Electricity price	ETESAI® charges in the cheapest 15-minute periods of the day-ahead, intraday and balancing markets
Own renewables	Uses surplus from on-site solar PV
Avoided gas and CO_2	Less fuel and lower emission costs, with ETS2 from 2027
Public funding	FEDER 21-27 funds via IDAE (up to 85% in less-developed regions) and the Innovation Fund
Energy savings certificates	Spanish CAEs are compatible with FEDER 21-27 funds and shorten payback

Acesur
INNOVAMOS POR TRADICIÓN

CASE STUDY

Acesur, Vilches (Jaén, Spain)

Set to become the world's first olive oil plant to decarbonise its industrial process with thermal energy storage

Under construction · start-up late 2027



ACESUR · CONTEXT

A layered decarbonisation strategy

SINCE 2021

Decarbonisation Plan

Energy efficiency, more renewables and progressive emission cuts across its production sites.

RENEWABLE POWER

3.65 MWp agrivoltaic plant with 3 MWh batteries

Next to the plant, with 100% of the olive grove still in production. €2.8M IDAE grant.

RENEWABLE HEAT

ThermalBox® for process steam

Electrifies steam generation and uses the agrivoltaic output. €2.3M from FEDER 21-27 funds via IDAE.

Sources: Óleo Revista (28/04/2026 and 20/10/2026); IDAE, file FEDER-PINALM-2025-002065.

ACESUR · STARTING POINT

24/7 steam from a gas boiler

25

GWht/year

of steam demand, currently met by a gas boiler

12–13

barg

saturated steam required by the process

24/7

continuous profile

with a fairly constant load

6.2TD

grid tariff

with power already contracted: no extra connection cost

Goal: decarbonise the steam without touching the process, and pay back the unit as fast as possible.

ACESUR · THE SOLUTION

A Type 1 ThermalBox® sized for Vilches

3 MWe
electric heater

3 MWt
evaporator

14 MWht
molten-salt storage (≈4.7 h at full power)

12–13 barg
saturated steam, 24/7

15 × 6 × 15 m
compact, fully prefabricated unit

95%
power-to-heat conversion

+90%
availability

Annual output is configurable. The unit could cover almost all the steam demand; actual output depends on grid connection limits and on the grid price cap set in ETESAI®.

Source: Build to Zero techno-economic proposal and IDAE resolution.

ACESUR · INTEGRATION

Grid, agrivoltaics and storage, orchestrated by ETESAI®

Grid

Main supply, with guaranteed renewable origin

Agrivoltaics

3.65 MWp with 3 MWh batteries: process and surplus

→

ThermalBox®

Charges in cheap or sunny hours and stores 14 MWht in salt at 400 ºC

→

Process steam

12–13 barg, 24/7, with the gas boiler as back-up

ETESAI® forecasts prices and solar output and decides every 15 minutes when to charge, to minimise steam cost.

ACESUR · WHY THERMALBOX®

Favourable results, even under conservative assumptions

CONSERVATIVE ASSUMPTIONS

- Forward power prices (OMIP 2027–35)
- Moderate gas price
- CO_2 at €56/t, the low-end ETS2 case
- No electro-intensive status
- Real grid connection limits

Lower steam cost than the gas boiler
Savings from the first year of operation

Short payback
Helped by FEDER 21-27 funds via IDAE and energy savings certificates

Large CO_2 reduction
Savings grow further if CO_2 costs more than €56/t

That is why Acesur chose to install ThermalBox® in Vilches.

Based on Build to Zero's techno-economic study for Acesur (Sept. 2025). Case-specific figures are confidential.

LESSONS LEARNED

What makes the Acesur case replicable in other plants

Start from real data

Hourly steam and power curves, not annual averages

Add on-site renewables

Storage turns midday solar surplus into night-time steam

Use public funding

FEDER 21-27 funds, Innovation Fund and CAEs turn a good project into a great one

Leave the process untouched

Same steam, same response; the boiler stays as back-up

PUBLIC FUNDING

Acesur is not a one-off: a pipeline already under way

AWARDED · FEDER 21-27

€13.2M

in FEDER 21-27 funds for 5 ThermalBox® projects in Andalusia and Castilla-La Mancha: 18 MW and ≈84 MWh

SELECTED · IF25

4

ThermalBox® projects among the 65 chosen in Europe's first industrial heat auction

UPCOMING · IF26

€600M

for 100–400 °C heat, out of a €1B budget. The call opens in December 2026

Does your plant use steam below 400 °C? IF26 is the next window.

Sources: IDAE, PINALM 2025 call; European Commission, Innovation Fund IF25 and IF26 Terms and Conditions (24/09/2026).

THANK YOU

Clean industrial steam, engineered as a product

Share your steam demand with us and we will send you back a business case.

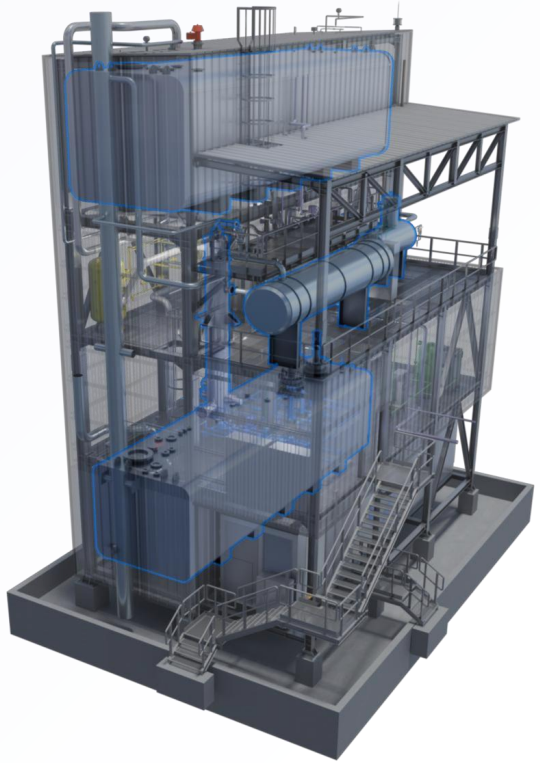
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