Iberia

Creating a global clean energy hub

Cleantech *for* **Iberia**

Cleantech
for **Iberia**

Coalition

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Cleantech for Iberia

- The leading voice of the Iberian cleantech ecosystem, bringing together top cleantech:
    - **Investors**
    - **Policymakers**
    - **Researchers**

- Supported by Breakthrough Energy founded by Bill Gates to develop and scale clean energy solutions and European Climate Foundation.

- Part of Cleantech for Europe, leader of the Cleantech movement in Europe, with growing hubs in UK, France, Germany, Nordics, Baltics, Italy and Iberia.

Building a community

Scale-ups

Universities

Incubators

Banks

Investors

Philanthropies

Cleantech for Iberia is a coalition of leading investors, scale-ups, universities, incubators, banks, philanthropies across Spain and Portugal

Our objectives:

- Build a breakthrough ecosystem fostering
- co-investment and deal flow expansion

- Be a bridge between cleantech community and policymakers

Focus on:

- Green reindustrialization and adoption of cleantech

- Unlocking cleantech investments

Coalition

Cleantech investors, innovators, banks, universities, incubators, philanthropies and family offices from Spain and Portugal

Breakthrough Energy | BBVA | zubi group | AITANA | HCapital YOUR EQUITY PARTNER | NZV

GNE VENTURES | SEAYA | AXON | a&g | KiraVentures | Klima ENERGY TRANSITION TECH FUND

Plexigrid | H2SITE | PLASTIC ENERGY | Matteco | RONDO | 1s1 Energy

CIRCULAR RESOURCES | RE>GA energy | MALTA | Stegra | BUILD TO ZERO | FertigHy

DEMETER FINANCING A SUSTAINABLE FUTURE | ie UNIVERSITY | NOVA NOVA UNIVERSITY LISBON | unicorn Factory Lisboa

Cleantech for Iberia is supported by

Breakthrough Energy

And powered by

Cleantech Group

Creating a global clean energy hub making the Iberian peninsula a leader in clean industry

Leading Iberia's Cleantech Revolution

- **Orchestrating** funders, innovators, researchers and policymakers

- **Leveraging** capital and scaling solutions with the highest climate impact

- **Advocating** for the adoption of the most ambitious environmental solutions

- **Attracting** breakthrough climate innovations

- **Boosting** deal Flow

- **Channelling** talent where climate impact is greatest

Enabling this scale-up requires a systematic shift in policymaking

Industrial policy:

- **Close the time gap** between ambitious targets and ecosystem needs
- **Ramp up reindustrialization** through policies to address the full value chain and project development costs
- **Connect Iberia globally** by coordinating planning for long-term infrastructure
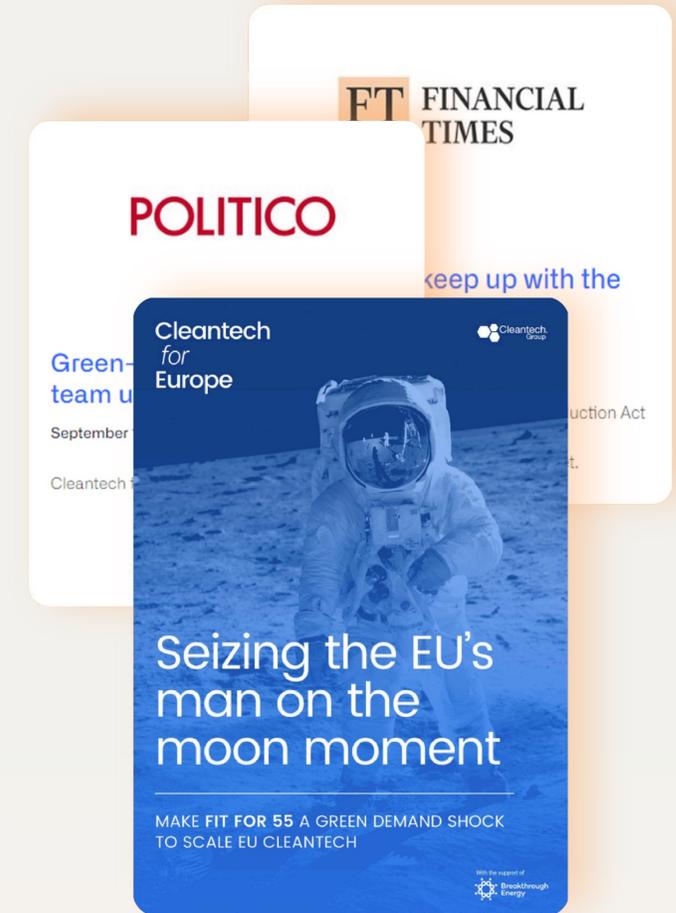
Funding for clean technologies:
Need public support to de-risks investment and mobilize private sector funding

Skills and retraining:
Refocus to integrate a qualified workforce for the growing industries of the future
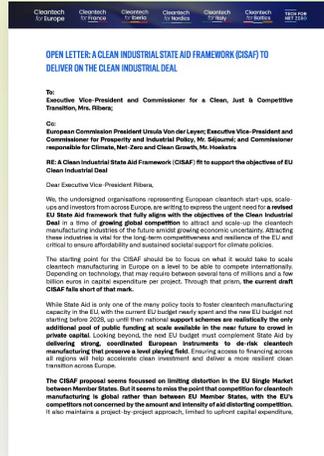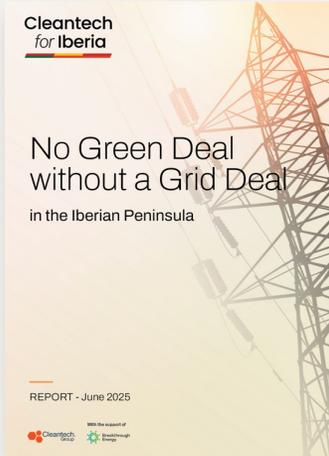
Sectoral regulations:
Stable regulation and certification fit for Iberia's leading innovative technologies
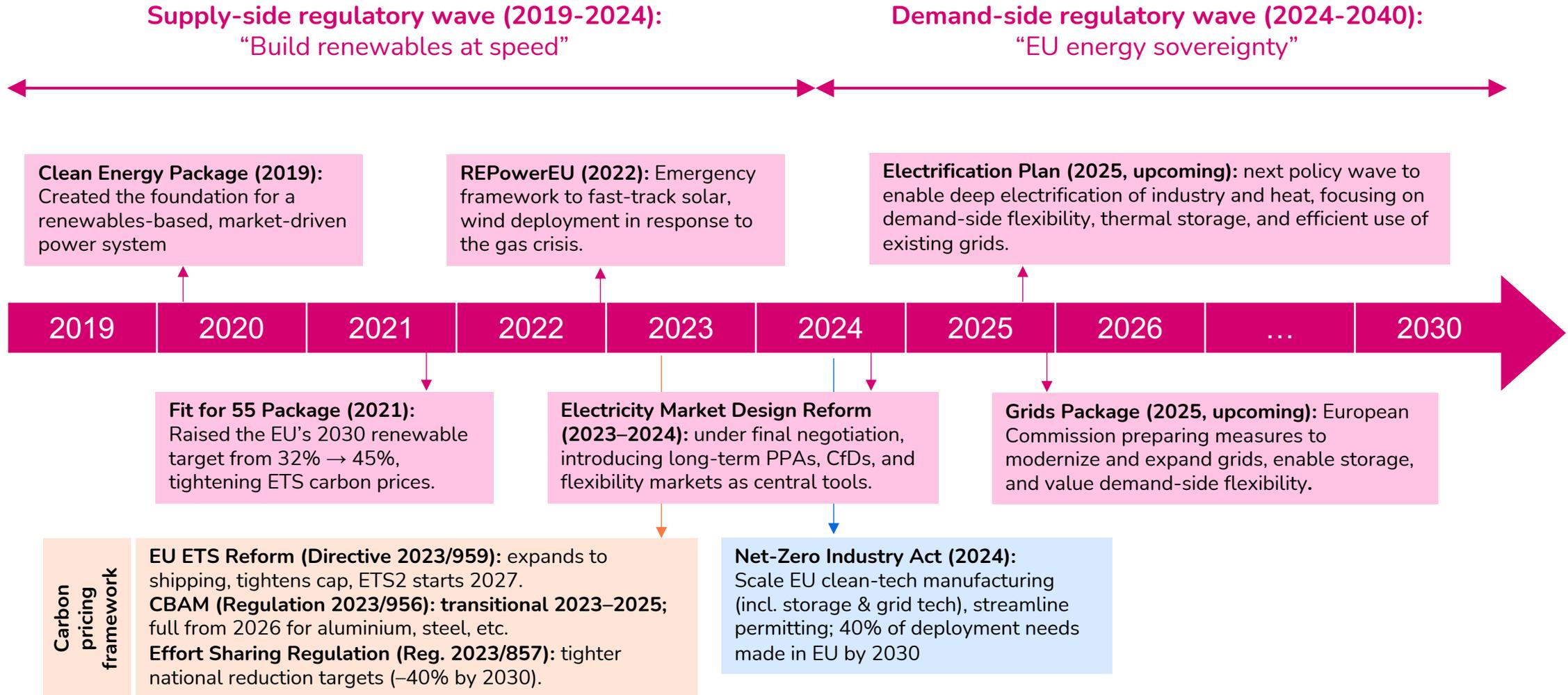
Leading the Conversation on Clean Technologies

## Research that shapes Iberia's narrative on clean technologies

EU´s electrification push: first supply, now demand

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Supply-side regulatory wave (2019-2024):
"Build renewables at speed"

Demand-side regulatory wave (2024-2040):
"EU energy sovereignty"

Clean Energy Package (2019): Created the foundation for a renewables-based, market-driven power system

REPowerEU (2022): Emergency framework to fast-track solar, wind deployment in response to the gas crisis.

Electrification Plan (2025, upcoming): next policy wave to enable deep electrification of industry and heat, focusing on demand-side flexibility, thermal storage, and efficient use of existing grids.

| 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | … | 2030 |

Fit for 55 Package (2021): Raised the EU's 2030 renewable target from 32% → 45%, tightening ETS carbon prices.

Electricity Market Design Reform (2023–2024): under final negotiation, introducing long-term PPAs, CfDs, and flexibility markets as central tools.

Grids Package (2025, upcoming): European Commission preparing measures to modernize and expand grids, enable storage, and value demand-side flexibility.

Carbon pricing framework

EU ETS Reform (Directive 2023/959): expands to shipping, tightens cap, ETS2 starts 2027.
CBAM (Regulation 2023/956): transitional 2023–2025; full from 2026 for aluminium, steel, etc.
Effort Sharing Regulation (Reg. 2023/857): tighter national reduction targets (–40% by 2030).

Net-Zero Industry Act (2024): Scale EU clean-tech manufacturing (incl. storage & grid tech), streamline permitting; 40% of deployment needs made in EU by 2030

Sector: Energy Storage

Key segments & Sub segments

- Energy storage is roughly divided into four subsectors: Electrochemical, chemical, mechanical and thermal. Overall, there are 992 companies classified under storage in our taxonomy.

- **Electrochemical:** Electricity is stored using electromechanical technology, such as batteries - the largest subsector under storage technologies, with lithium-ion batteries constituting the largest subsector

- **Mechanical:** Energy is generated by using mechanical processes and/or potential energy

- **Thermal:** Electricity is stored by heating up a material with good thermal properties (sand, silica, graphite) etc. - heat is converted back to electricity typically by using a steam turbine or generator

- **Chemical:** Energy stored in the form of chemical fuels that can be readily converted to mechanical, thermal or electrical energy for industrial or power applications
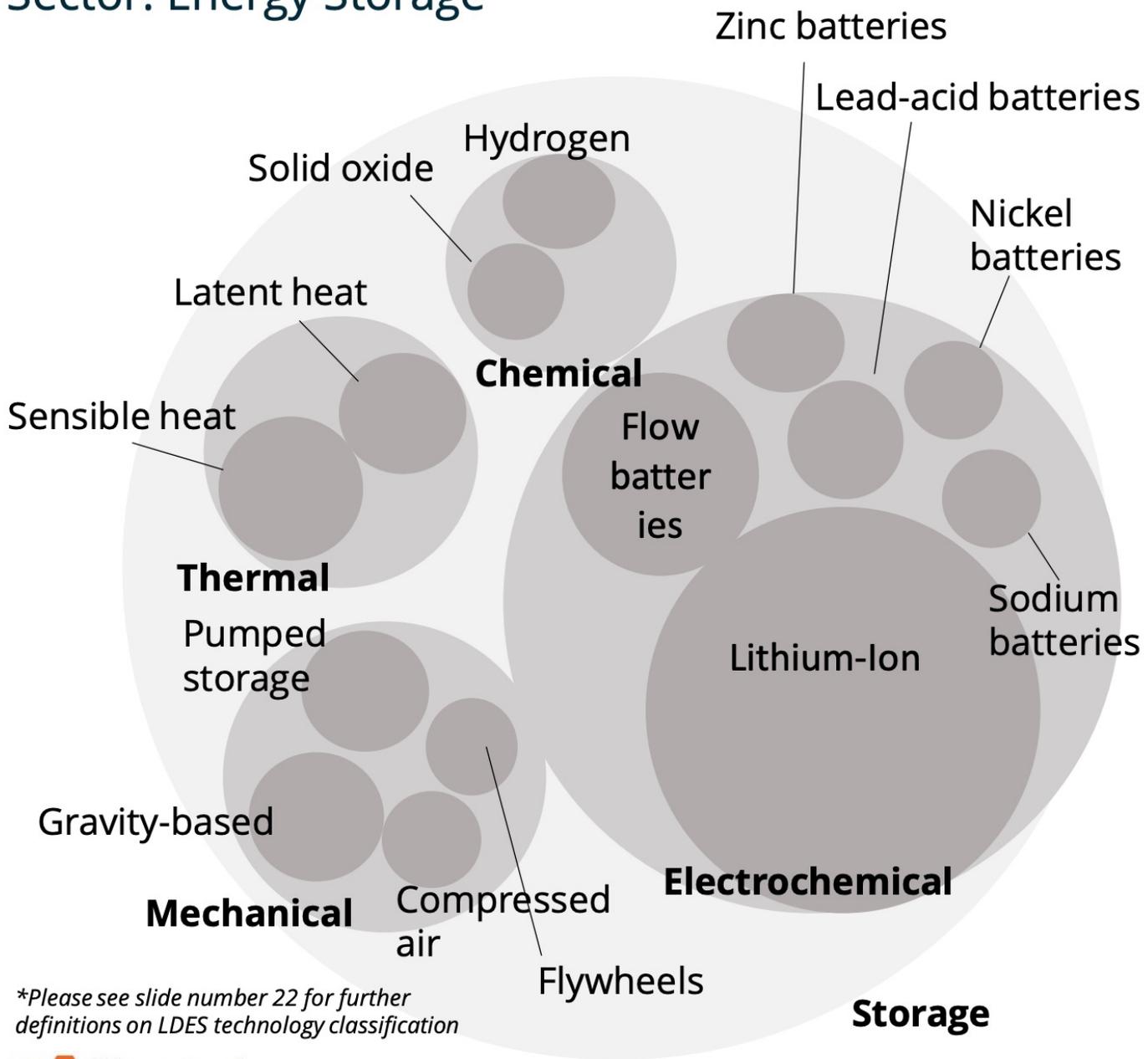
Please see slide number 22 for further definitions on LDES technology classification

Long duration storage: Technology Landscape
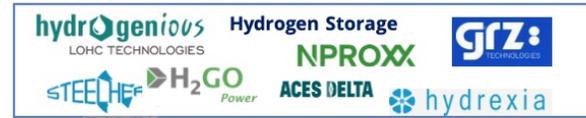
Industry has a **heat challenge**

INDUSTRIAL HEAT

Global Energy Demand

Transport	Industrial Heat	Buildings	Other
31%	24%	24%	21%

- Food & Beverage
- Chemicals
- Paper
- Alumina refinement
- Mining (e.g., nickel, lithium)
- Textiles
- Refining, Bio-fuels, E-fuels
- Auto, Tires, EV batteries
- Other (CPG, Pharma, etc.)
- Steel
- Cement
- DAC & CCUS
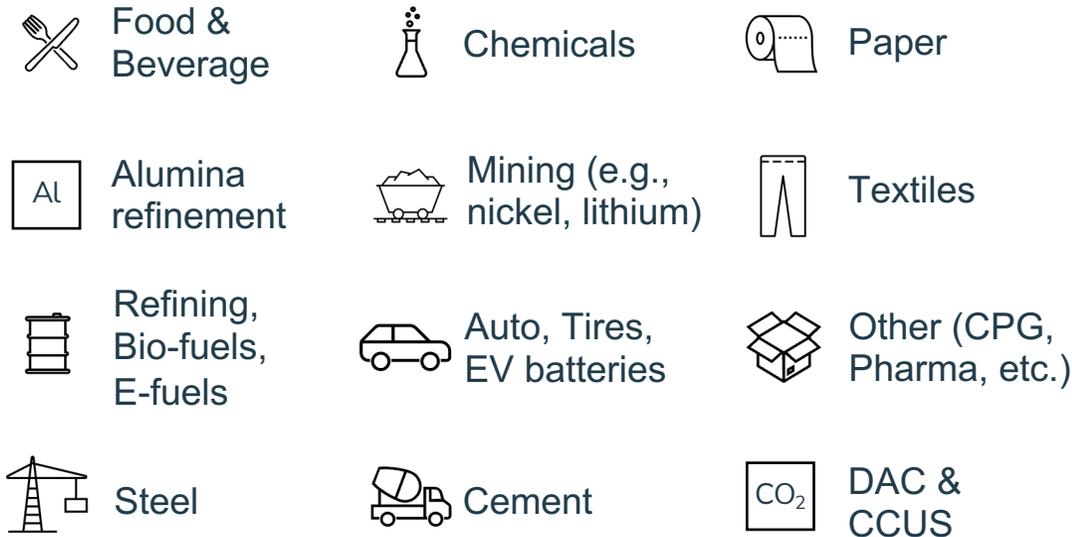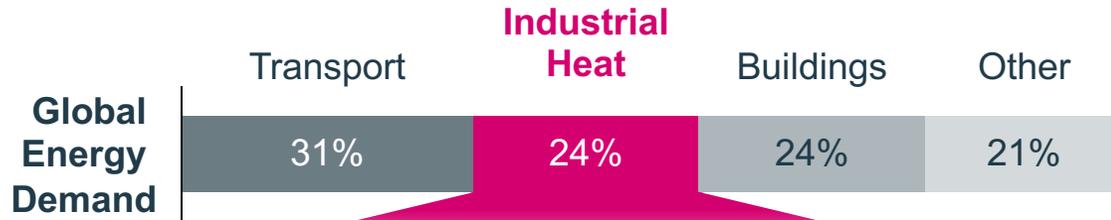
THE CHALLENGE

Fossil fuels have <u>historically</u> been the best solution

$ **Lowest cost** source of energy

∞↻ Deliver **continuous** heat, on demand

Yet there are problems with burning fossil fuels for heat

Risk of spikes in fossil fuel prices; price on carbon is expected to **increase**

Creates **25%** of global GHGs; **major scope 1 source** for industrials

*"I want to **save money** on heat and **drop the emissions!**"*

The Rondo Heat Battery is a drop-in, zero-carbon boiler replacement powered by cheap off-peak electricity

RONDO

Stand 10GO4

WIND

SOLAR

THE GRID

STEAM TO CUSTOMER

WATER IN

CIRCULATING AIR BLOWER
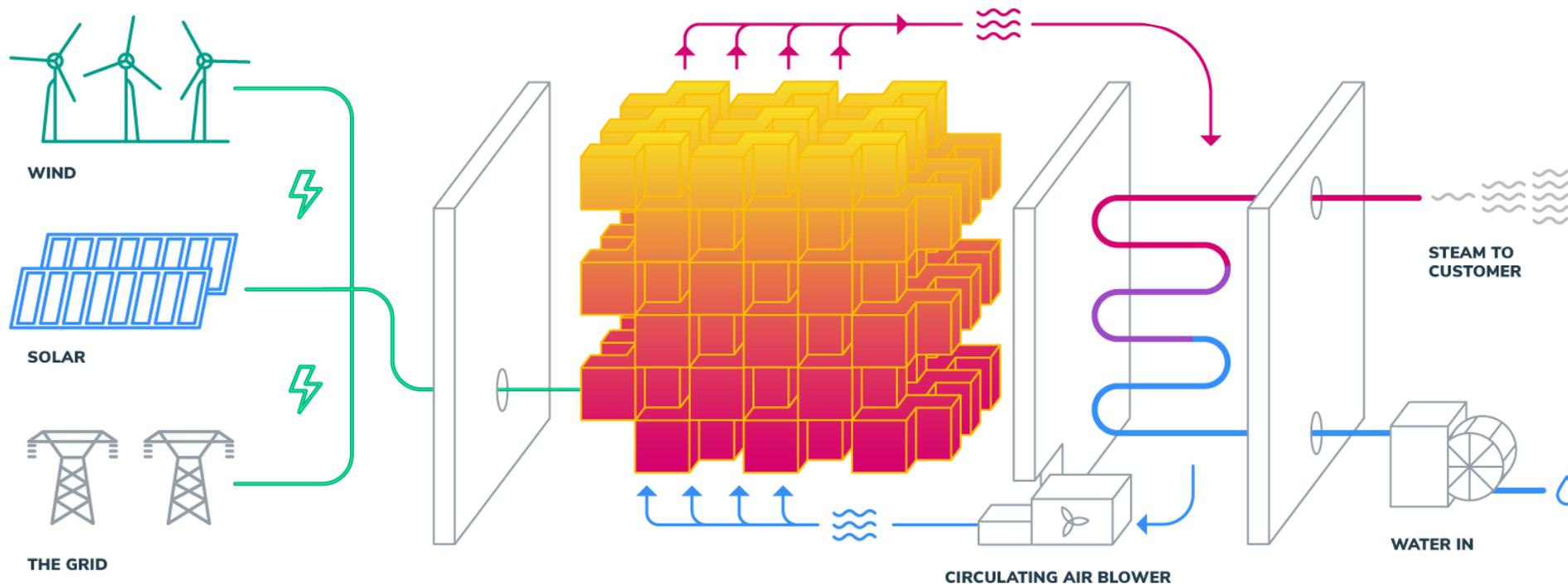
1 The Rondo Heat Battery charges with **intermittent electricity** from local wind & solar or from the grid.

2 Electricity powers radiant heaters with zero loss. Refractory brick is rapidly, uniformly heated to **1100 - 1500 °C**, and stores heat for hours or days.

3 The battery delivers **continuous thermal output** for use as process heat, steam, or electric power at over **97%** total efficiency.
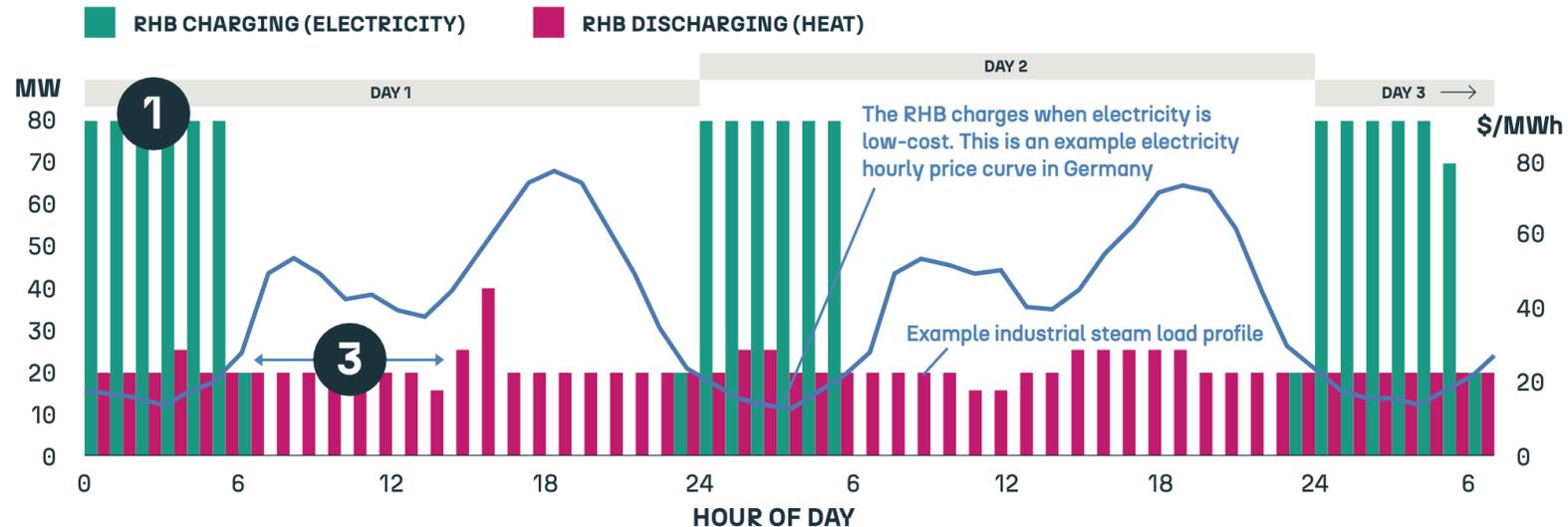
The Rondo Heat Battery is a drop-in, zero-carbon boiler replacement powered by cheap off-peak electricity

6-8 hours of cheap electricity turned into **baseload heat**
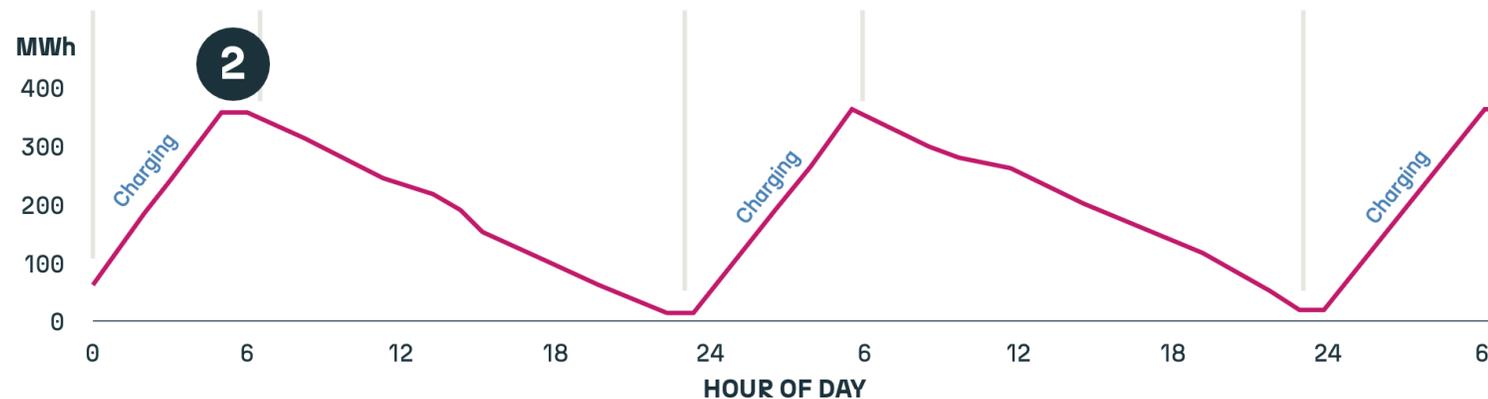

RHB CHARGE & DISCHARGE

Example pattern for RHB with:

- Discharge up to 40MW
- Charge at up to 80MW
- Storage of 360 MWh

Legend: RHB CHARGING (ELECTRICITY) — RHB DISCHARGING (HEAT)

① The RHB charges when electricity is low-cost. This is an example electricity hourly price curve in Germany

③ Example industrial steam load profile

RHB STORAGE

Energy stored in RHB

② Charging

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The Rondo Heat Battery is a drop-in, zero-carbon boiler replacement powered by cheap off-peak electricity

SPECTRUM OF SIZES

2 MW_th
3 tph

>100 MW_th
>150 tph

	Full range across sizes	Example 1	Example 2	Example 3	Example 4
Rated Heat Output MW_th	2 – 100+	3 MW_th	12 MW_th	25 MW_th	over 100 MW_th
Typical daily output MWh	48 – 2,400	72 MWh	288 MWh	600 MWh	2,400
Peak Elec. Input MW_e (AC)	8 – 240+	8 – 15 MW_e case dependent*	24 – 40 MW_e case dependent*	50 – 80 MW_e case dependent*	over 240 MW_e
Heat Storage MWh	30 – 1,000+	30 – 60 MW_e case dependent*	100 – 180 MWh case dependent*	240 – 360 MWh case dependent*	over 1,000 MWh
Round Trip Efficiency (%)	>97%	>97%	>97%	>97%	>97%
Example industrials	All heat users	Food & beverage plants, textiles, pharmaceuticals, etc.	Larger food & beverage, smaller chemicals plants, etc.	Mid-sized chemical sites, biofuels, very large F&B, etc.	Alumina refineries, petrochemical facilities, etc.

* Rondo units can serve a targeted heat output from a range of storage capacities and electricity charge rate. The best solution depends on the specifics of each application. The Rondo team works with customers to configure our Heat Battery for maximum project value.

The Rondo Heat Battery is a drop-in, zero-carbon boiler replacement powered by cheap off-peak electricity

SOLUTIONS

6-8 hours electricity → ⭘ RONDO → 24 hours heat

Heat Only

- **Steam:** RHBs can deliver dispatchable steam that matches existing infrastructure for drop-in installation.

- **Thermal oil:** RHBs can also be configured to heat up thermal oil or other fluids.

- **Air:** RHBs can heat air, or a variety of other gas streams, to replace fossil fuels.

6-8 hours electricity → ⭘ RONDO → 24 hours heat... → ...and electricity →
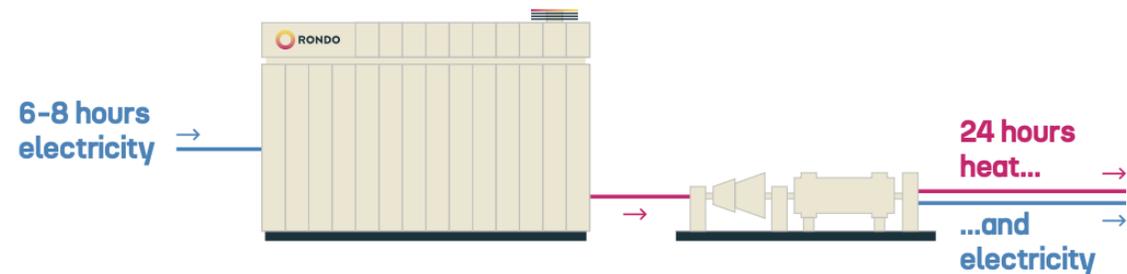
Combined Heat & Power

- **Steam turbine integration:** For customers needing lower-pressure process steam (e.g., <20 bar), RHBs can be configured to produce high-pressure steam (e.g., 100 bar) and drive a non-condensing steam turbine, delivering exhaust steam precisely at industrial specifications (e.g., 20 bar). This enables high-efficiency on-site power generation while delivering heat at spec.

- **Clean CoGen with high efficiency:** The combined RHB + steam turbine system turns low-cost intermittent electricity into baseload combined heat and electricity, at 95% energy efficiency, with c. 4:1 ratio of heat:electricity delivery, case dependent.

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Cleantech
for Iberia

The opportunity to speed up Iberia's cleantech revolution

Thank you!

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