



NET-ZERO INDUSTRIES

MISSION



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| Project Title | Rondo Heat Battery |
| Industry Partner | Rondo Energy |
| Industry Sector | Cement & Lime Chemicals & Refining Other energy-intensive industries (food & beverages, textiles, biofuels) |
| Technology Pathway (Primary) | Electrification of Production & Process |
| NIM Pillar | Technology Demonstration |
| Source | NIM Awards 2024 |
| Description | <p>Rondo Energy is the fastest growing storage company, working on industrial decarbonization across a variety of sectors. In June 2024, Rondo, Breakthrough Catalyst, and European Investment Bank announced 75M Euro in project financing for 3 first of a kind projects.</p> <ul style="list-style-type: none">• RHB100 for Covestro: The battery will generate ten percent of the steam needed at the Covestro site in Brunsbüttel with renewable energy• RHB100 for GreenLab: The green industrial park will replace fossil fuels tied to heat consumption for its site partners and offer CO₂-neutral heat, or “green heat”, at cost parity• European Food & Bev Project: Rondo will build a third project that charges from on-site and off-site solar, delivering deep decarbonization for a European producer in the food and beverage sector <p>High temperature heat used to power industrial processes from steel to cement to food processing is responsible for 25% of the world’s fossil fuel use. Until now, we haven’t had a decarbonization option that is proven, affordable, or scalable.</p> <p>The Rondo Heat Battery (RHB) replaces gas fired boilers with heat derived from intermittent renewables; at the same time, RHBs stimulate the production of more renewable electricity through their ability to absorb excess energy and turn it into pollution-free heat. This addresses curtailment issues on the grid, speeds access for new renewables that would otherwise be stuck in interconnection queues and unlocks the opportunity for large industrial heat loads to be a solution to grid congestion and overgeneration all at lower cost than fossil-derived heat.</p> |
| Innovations Employed | Industry accounts for 25% of carbon pollution, with 74% tied to heat. Our technology can cut 6 gigatons of global CO ₂ , equal to emissions from 1.5 billion cars. With a \$3+ trillion market potential, we’re driving new demand for renewables, improving energy security, and accelerating rapid carbon reduction within the world’s most hard-to-abate sectors. |
| Dimension of Novelty | It was new to the and International Market |
| Innovation Collaboration | In-house (US) |



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Project Title

Rondo Heat Battery

Intellectual Properties

Today, Rondo holds 28 allowed and issued US patents and 12 worldwide patent applications, covering innovations of the heat battery system and a broad range of important industrial applications.

IP Links

[Rondo](#)

Timetable & Progress

The development started in 2020

The RHB hit several milestones with its commercial deployment at the Calgren ethanol plant in California in March 2023: it is the first electric thermal energy storage system (ETES) in the U.S. & the highest temperature ETES system in commercial operation worldwide.

Financing (Public/Private)

\$75M euro from European Investment Bank; Rondo part of \$375 million grant U.S. DOE grant.

Finance Links

[EIB – Press: Greener food, fuel and chemical production in Europe boosted by EIB, European Commission and Breakthrough Energy Catalyst support for groundbreaking energy- storage project](#)

[Rondo Press: Rondo Energy announces €75M project funding with Breakthrough Energy Catalyst and the European Investment Bank](#)

Project Phase TRL

TRL 8-9

Problems to be Solved and Risks to be Managed

The Rondo Heat Battery (RHB) replaces gas fired boilers with heat derived from intermittent renewables. RHBs are made from a time-tested simple material: refractory brick. The 500-1,000 lb bricks inside the battery are superheated with the same basic process used to heat a toaster. RHBs are also the safest thermal energy storage technology on the market they have no pressurized container and thus no risk of explosion. They are also made of only brick and iron, eliminating the hazards of other energy storage technologies with risky chemical or flammable components. With no supply chain constraints for refractory materials and no need for critical minerals, the RHB does not face many of the obstacles that other burgeoning storage tech does.

Preliminary or Final Results Achieved

Rondo's first commercial unit in Pixley, CA has the lowest carbon intensity (CI) ethanol in the country. The three aforementioned new units across Europe will provide multiple sustainability benefits for their customers:

- RHB100 for Covestro: The battery will generate ten percent of the steam needed at the Covestro site in Brunsbüttel with renewable energy
- RHB100 for GreenLab: The green industrial park will replace fossil fuels tied to heat consumption for its site partners and offer CO₂-neutral heat, or "green heat", at cost parity
- European Food & Bev Project: Rondo will build a third project that charges from on-site and off-site solar, delivering deep decarbonization for a European producer in the food and beverage sector

CO₂ Emissions Reduction Potential -

Wider applications for Rondo's technology can help heat-intensive industries in the major building blocks of industry, cutting carbon emissions by 50 to 80% depending



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Implementation and Future Market

on the industry. Rondo's future customers are investing heavily in the technology, with global manufacturing giants like Rio Tinto, Microsoft, Aramco, SABIC, SCG, TITAN, joining together across industries to form Rondo's Strategic Investment Advisory Board.

RHBs unlock a massive development opportunity for additional large scale renewables on the grid, and off-grid, for utilities and industrial sites. Research shows that decarbonizing industry with heat batteries is a \$10+ trillion opportunity for ~10,000GWs of new wind and solar power to provide electricity for ~\$5 trillion of heat batteries. We have found that an average industrial solar deployment can be increased by 10x, due to a facility's heat load being unlocked as a renewable heat opportunity.

Market Positioning

Project Location

Alameda (US)

Project & Technology Links

[Video: Can a simple brick be the next great battery?](#)

[Heatmap News : The Coolest Thing in Climate Tech Just Got More Buyers](#)