



Long-Duration Energy Storage Systems for a Cleaner Future

November 2024



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Company Overview

ESS Founded in 2011 with mission to develop the safest, most cost-effective and sustainable long-duration energy storage technology

Headquarters Wilsonville, Oregon

Facilities 200,000 ft² manufacturing plant
Automated production line currently scaling to 2GWh annual production

Employees ~300

Technology Iron flow battery for utility-scale and commercial applications

Publicly traded NYSE: GWH



Catalyzing a Clean Future. Every Day.

ESS Technology is Commercially Available Today



Large and fast-growing TAM



Simple, yet revolutionary technology



Compelling value proposition



Low risk expansion plan



Considerable pipeline of opportunities



ESS: An Enduring Value Proposition

ESS delivers the safe, market leading, long-duration energy storage solutions that empower our customers to make their clean energy vision a reality.

Flexible Technology

ESS' scalable solutions serve a variety of needs and will underpin the decarbonized energy system of the future.

Powered by Nature

Iron. Salt. Water.
Simple ingredients provide a natural, cost-effective, long-duration solution.

Responsible and Equitable

Domestically produced to deliver benefits to communities worldwide.





Resiliency
and reliability

are harder
with
intermittent
resources.



Significant Market Tailwinds Building Momentum

EnergyPortal.eu

The Inflation Reduction Act Boosts Energy Manufacturing in the U.S.



Battery storage sector primed for first wave of large-scale project augmentations

BARRON'S

Honeywell Invests in Battery Storage
This Start-Up's Stock Is Soaring.

BloombergNEF

Global Energy Storage Market to Grow 15-Fold by 2030



ESS Recognized as Leading American Clean Technology Exporter by U.S. Department of Commerce



Australia's Victoria to invest \$100 million in energy storage push to cut emissions



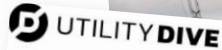
Europe smashes new record for battery storage capacity

S&P Global Market Intelligence

Battery innovators play long game to break lithium's lock on energy transition



US utility-scale battery storage industry deployed 4GW/12GWh record-breaking 2022



New York's plan to expand storage capacity to 6 GW by 2030 includes centralized procurement methods



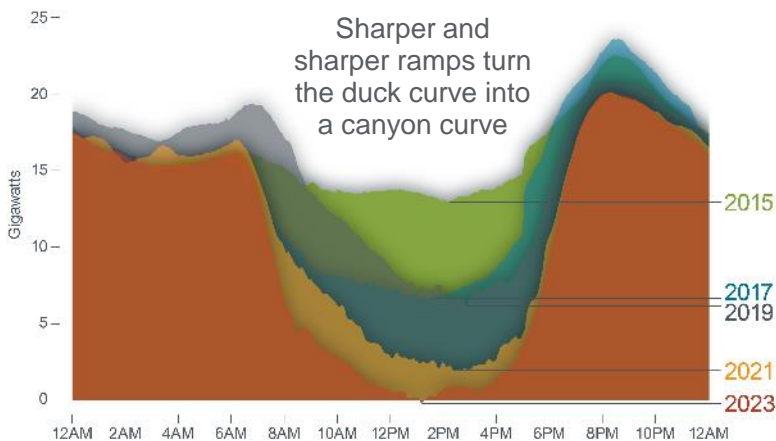
Flow battery player ESS Inc: Bringing home the idea of green baseload



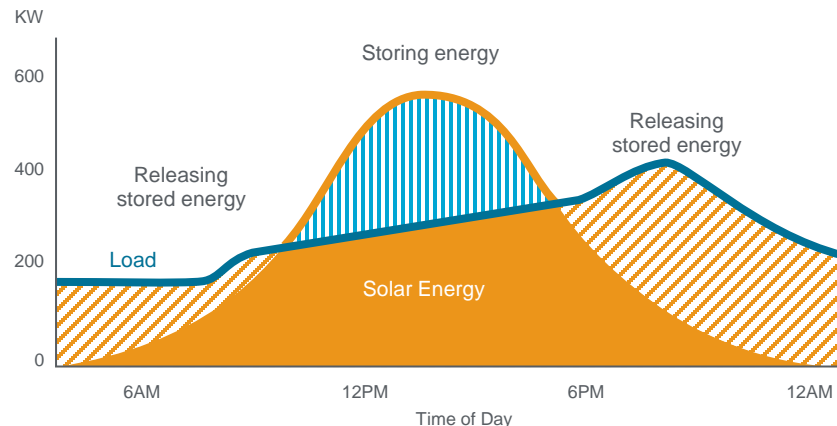
Countdown to clean: Dwindling fossil fuels in a greener European future



Renewable Penetration Drives Energy Storage Needs



Overgeneration and curtailment result



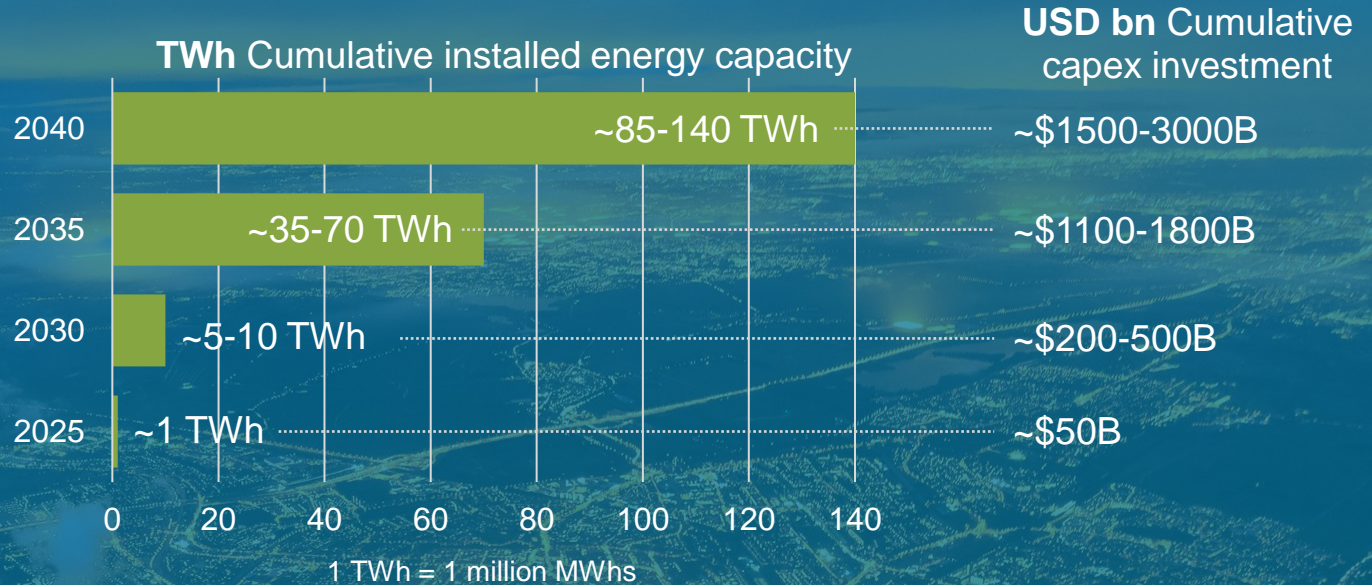
Energy shift to evenings using long-duration storage

Lack of storage caused more than **2.6 TWh to be wasted in 2023** in California alone

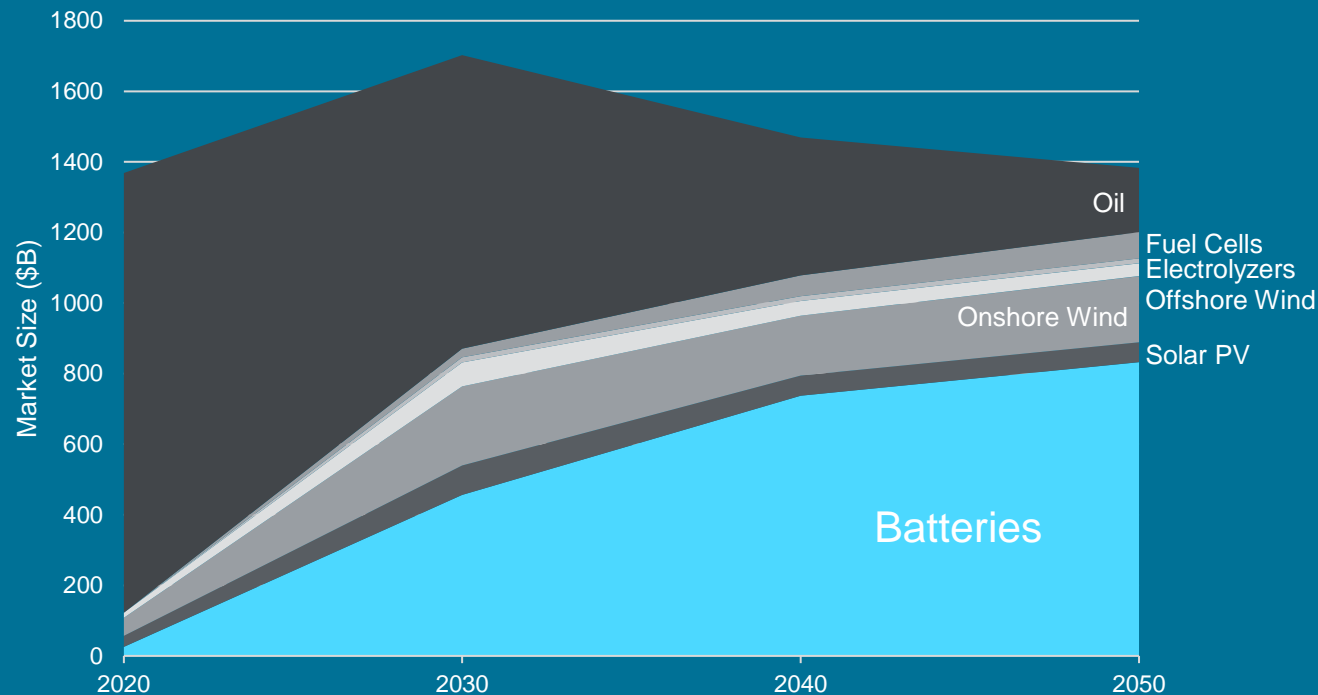


Transition to Renewable Energy Will Require 140 TWh of Long-Duration Energy Storage

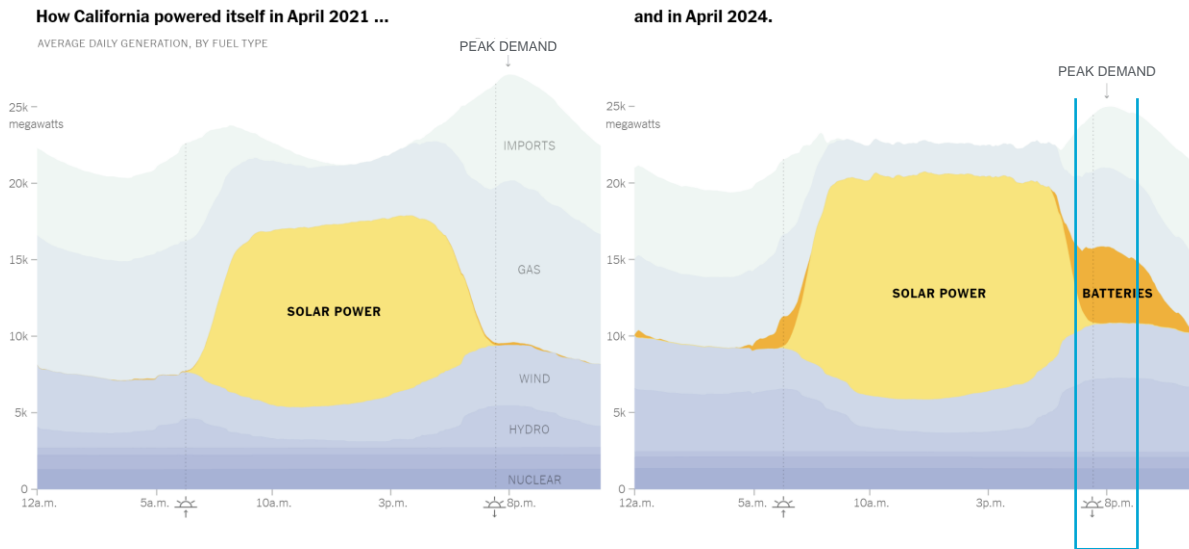
Equaling
\$3 Trillion in
Investment



Batteries are a BIG Part of the Solution



Renewable Penetration Drives Energy Storage Needs



Demand outlasts short-duration lithium-ion batteries.
Long-duration energy storage is needed more than ever.

The New York Times

Giant Batteries Are Transforming the Way the U.S. Uses Electricity

"The future is bright for energy storage," said Andrés Gluski, chief executive of AES Corporation, one of the world's largest power companies. "If you want more renewables on the grid, you need more batteries. It's not going to work otherwise."

*"Today's lithium-ion batteries typically only deliver power for two to four hours before needing to recharge...
... a start-up called **ESS** is building "flow" batteries that store energy in liquid electrolytes and can last 12 hours or longer."*



Li-ion Presents Roadblocks to Energy Transition

Short-term
energy capacity

Critical
mineral mining

Expensive
long-term

Energy
security



THE WALL STREET JOURNAL

Rising Battery Prices Add Uncertainty to Electric-Vehicle Costs

Demand for lithium outstrips supply, ending yearslong price declines

Bloomberg

California's Largest Battery Storage Shut Down by Smoke, Again

- Vistra closes 100-megawatt facility after system malfunction
- Incident comes less than six months after previous shutdown

silive.com

As 2 lithium-ion battery site fires smolder in Warwick, more questions raised over Staten Island facilities



Global Collaboration to Advance Iron Flow Battery Market Adoption

Honeywell

Go-To-Market

Honeywell to integrate ESS technology into global go-to-market offering

\$300M targeted purchases in first phase of agreement

Global reach to Honeywell's customers

Intellectual Property

ESS to license Honeywell's flow battery intellectual property

Joint Innovation

Companies invest in joint development for continual technology advancement, cost reduction and packaging of IFB systems

“The demand for long-duration energy storage represents a compelling market opportunity within the energy transition and the combination of Honeywell and ESS technology can accelerate decarbonization for the commercial, industrial and utility sectors.”

Bryan Glover
Chief Growth Officer
Honeywell Performance Materials
and Technology (PMT) group



Representative ESS Projects

Distributed Generation



Airside Operations



Utility-Scale DER



Utility-Scale DER



Green Baseload Energy



Commercial Traction: Significant, Signed Agreements



Customer	Background	Deal Details	Status
Sacramento Municipal Utility District	<p>Large, CA-based utility serving 1.5 million electricity customers</p> <p>Aggressive decarbonization targets</p>	<p>Shipped first phase</p> <p>Developing LDES Center of Excellence</p> <p>Enabling 2030 Zero Carbon Plan – 2GWh of storage by 2028</p>	<p>Phase 1 commissioning completed</p> <p>Units cycling at customer site</p>
Energy Storage International – Asia Pacific	<p>ESI is our distribution and manufacturing partner in AU/NZ/Oceania</p>	<p>Expected to deliver 1GWh of iron flow batteries over the next 7 years</p>	<p>Initial delivery complete</p> <p>Recently announced contract with Energy Queensland</p>
LEAG	<p>Currently operating large-scale lignite mining and coal-fired generation</p> <p>Implementing a vision to transform the coal-dependent region into Germany's green powerhouse</p>	<p>50MW / 500MWh iron flow battery system</p> <p>Expected to provide standardized building block for LEAG's planned 2-3GWh of LDES</p>	<p>Completed initial engineering contract</p> <p>Moving to detailed engineering phase</p> <p>Target COD 2026</p>



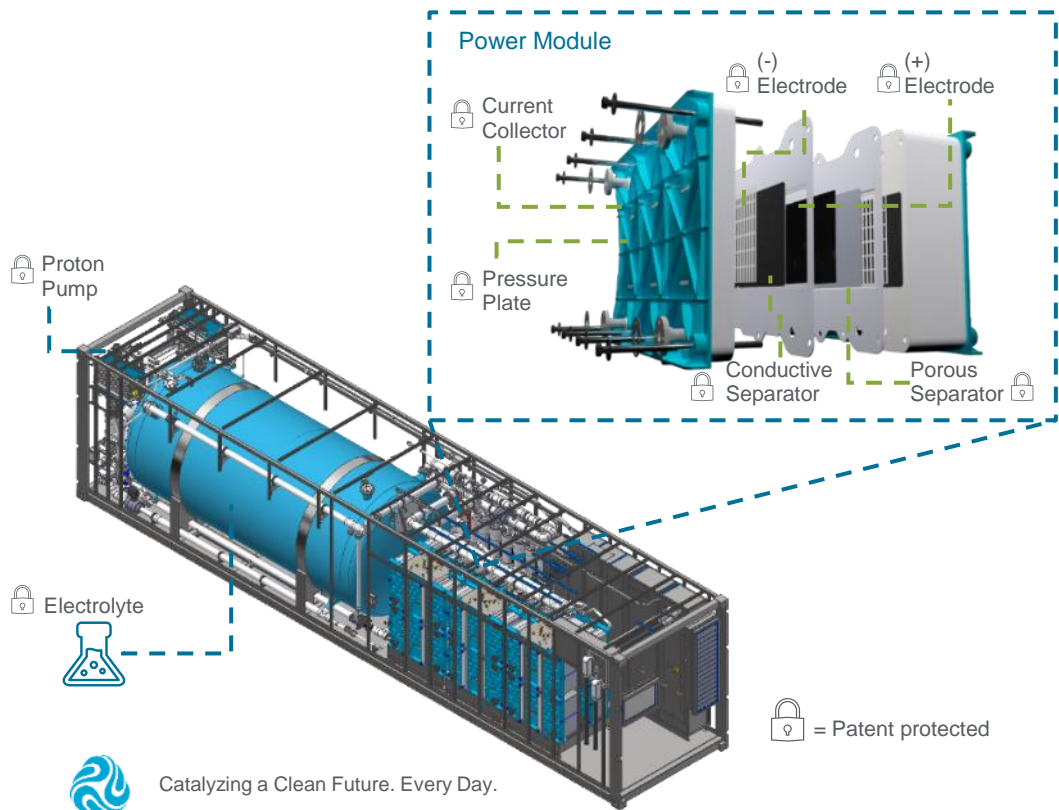
Commercial Traction: Deals with Large Upside



Customer	Background and Deal Details	Broader Opportunity
Turlock	<p>Pairing storage with solar that will cover CA aqueducts, providing multiple benefits</p> <p>Demonstration of new solar storage for grid firming and evening arbitrage</p>	<p>20-50MW by 2030</p> <p>Excess solar to capitalize in ISO for peak shifting</p> <p>Part of Project Nexus designed to prove use case of storing excess solar over state and utility aqueducts</p>
Schiphol	<p>Large European airport; leading the way to decarbonize ground operations as part of the TULIPS consortium</p>	<p>Targeting emission-free and zero-waste at the EU's 300+ airports by 2030 and climate-neutral aviation by 2050</p>
Consumers Energy	<p>Microgrid powering the White Pigeon Gas Compression Facility</p>	<p>Potential for 7MW of IFB deployments across all seven gas compression plants</p>
Burbank Water & Power	<p>Renewable energy integration</p>	<p>Potential for 5MW by 2028 as part of decarbonization efforts</p> <p>Model for public power market</p>



Differentiated Iron Flow Design and IP Protected



ESS IP portfolio

- 250+ patents granted and in pipeline pending applications
- Undisclosed number of trade secrets and identified patents
- World-leading iron flow expertise and roadmap to additional breakthroughs and advantages
- ~44% employees have an engineering background

Scalable by simply adding more electrolyte

- Same system + more electrolyte = longer duration



Energy Warehouse™ System Overview

First commercial deployment in 2015

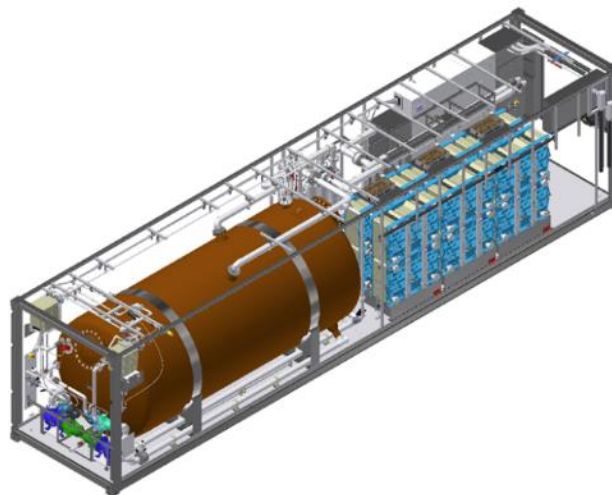
Fully integrated containerized design

EW-500 shipping in 2024

Fast and easy to deploy and commission

Specifications

Rated Discharge Power	75 kW at POC
Rated Charge Power	90 kW at POC
Rated Capacity	420 kWh
Discharge Capacity	Up to 500 kWh
Ambient Temperature	-15°C to +50°C (5°F to 122°F) Operating Range
Expected Life	25-year design life with no degradation
Warranty	1-year comprehensive defect warranty Extended warranty available
Certifications	Conforms to UL 1973, UL 9540, UL9540A, NFPA 855



Energy Center™ System Overview

Front-of-the-meter solution

Modular design for utility-scale applications

Currently in production, scaling in H2 2024

Specifications

Configurable Range	Customizable up to GW scale
Rated Capacity	145 kW DC / 1.16 MWh DC
Ambient Temperature	-15°C to +50°C (5°F to 122°F) Operating Range
Expected Life	25-year design life
Secondary Containment	Integrated into tank container to volume of largest tank
Warranty	1-year comprehensive defect warranty Extended warranty available
Certifications	Conforms to UL 1973, UL 9540*, UL9540A*

*pending



Energy Center™ System Deployed for Portland General Electric

Second EC completed in Q3



Both ECs currently testing
Full hand off to PGE expected in Q4



ESS Benefits



Made in USA

What Customers Demand



How ESS Transforms the Grid



Longer duration

- Up to 12 hours
- No capacity fade
- No power fade



- Can replace coal and gas with solar and wind
- Designed for utility-scale applications



Low cost

- Lower LCOS than other technologies
- No augmentation required



- The first truly low-cost flow battery
- In commercial production today



Power on demand

- 25-year lifetime with no daily cycling limit
- No degradation
- Flexibility allows multiple revenue streams



- Improved grid resiliency and flexibility
- Enables multiple use cases



Safety, reliability, and bankability

- Conforms to UL 1973, UL 9540*, UL9540A, NFPA 855 (Energy Warehouse)
- Wide operating temperature range



- Can deploy in a wide range of geographies
- No HVAC needed – cuts CAPEX and OPEX



Sustainability

- Safe and sustainable
- Easily sourced materials; recyclable components
- “Plug and play” with 25-year design life

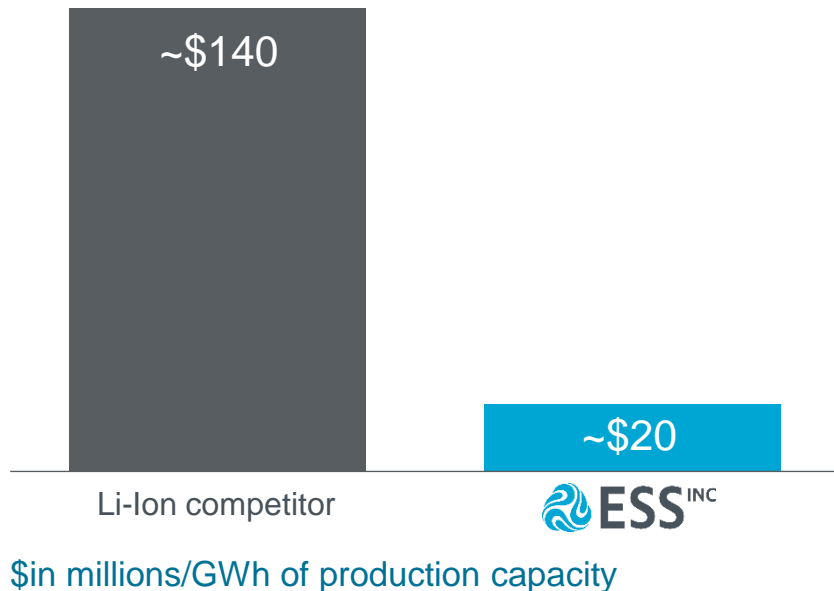


- Environmentally sustainable
- Accelerates clean energy transition



85%+ Less Capital Required – Ready to Scale Globally

Simple, low-cost production in the USA



VS



EXIM Partnership Provides Long-Term, Low-Cost Financing to Support Growth

Up to \$50 million in total funding

Long-Term

Interest-only
payments until 2026

Funds for increasing manufacturing capacity

Low Interest

Extended repayment
terms



Our 2024 Operational Focus

01

Scaling manufacturing capacity, including automation and injection molding processes



02

Improving supply chain quality and outsourcing non-core components



03

Optimizing product designs through simplification of electrical and plumbing installations

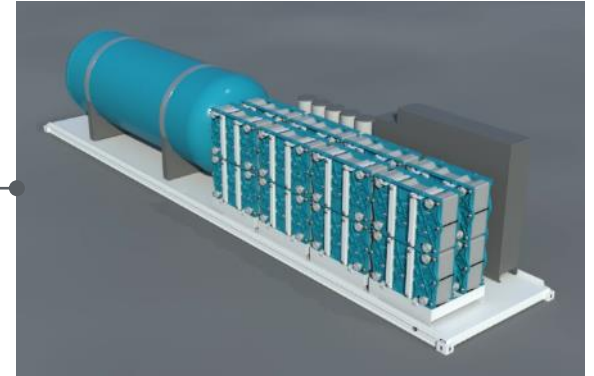


04

Reducing time to commission solutions at client sites



Four Major Technologies of the Iron Flow Battery



**Battery Modules
(Stacks)**
Intellectual property that
differentiates ESS
Generates the electricity
More complex build processes

Proton Pumps
Intellectual property that
differentiates ESS
Keeps the iron flow battery
electrically balanced
Moderate build complexity

Electrolyte
High-grade iron,
salt, and water
Mixture simple
to combine

Balance of System (BoS)
Necessary componentry to make the
other three work together
Low build complexity, many parts –
like a giant washing machine
Great benefits in streamlining assembly

Orchestrating these four technologies into a single system



Q3 2024 Results

Revenue

\$359 thousand

Adjusted EBITDA

Loss of \$18.9 million

Non-GAAP operating expenses

\$9.2 million

Cash and short-term investments

\$55.1 million





Thank You