



Long Duration Energy Storage Systems for a Cleaner Future

August 2023

ESS™
Clean, Safe, & Sustainable
Energy Storage

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ESS is a Category Defining Company



Large and
fast-growing TAM



Simple, yet
revolutionary technology



Compelling
value proposition



Low risk
expansion plan



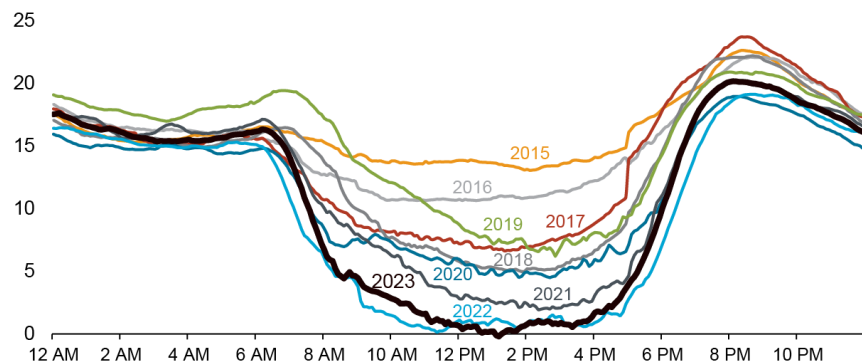
Considerable pipeline
of opportunities



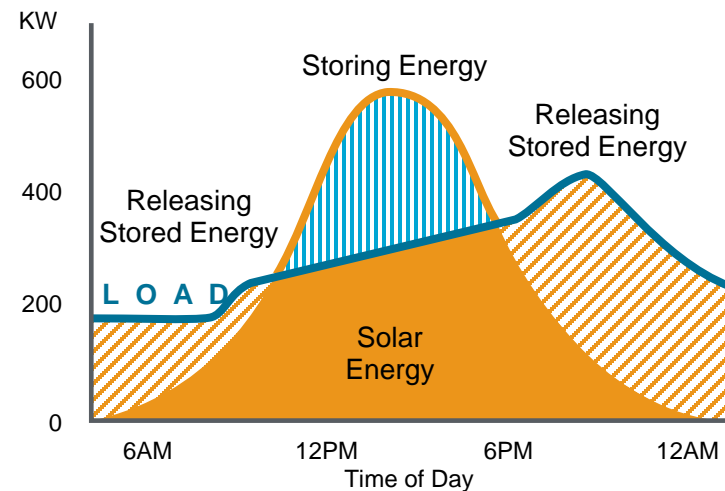
Renewable Penetration Drives Further Storage Needs

Duck Curve Evolution Shows Sharp Ramp Needs and Overgeneration Risk

CAISO lowest net load day each spring (March - May, 2015 - 2023), gigawatts



Energy Shift to Evenings Using Long Duration Storage



Lack of storage caused more than 2 TWh to be wasted in 2022 in California alone



140 TWh of Long Duration Energy Storage Needed

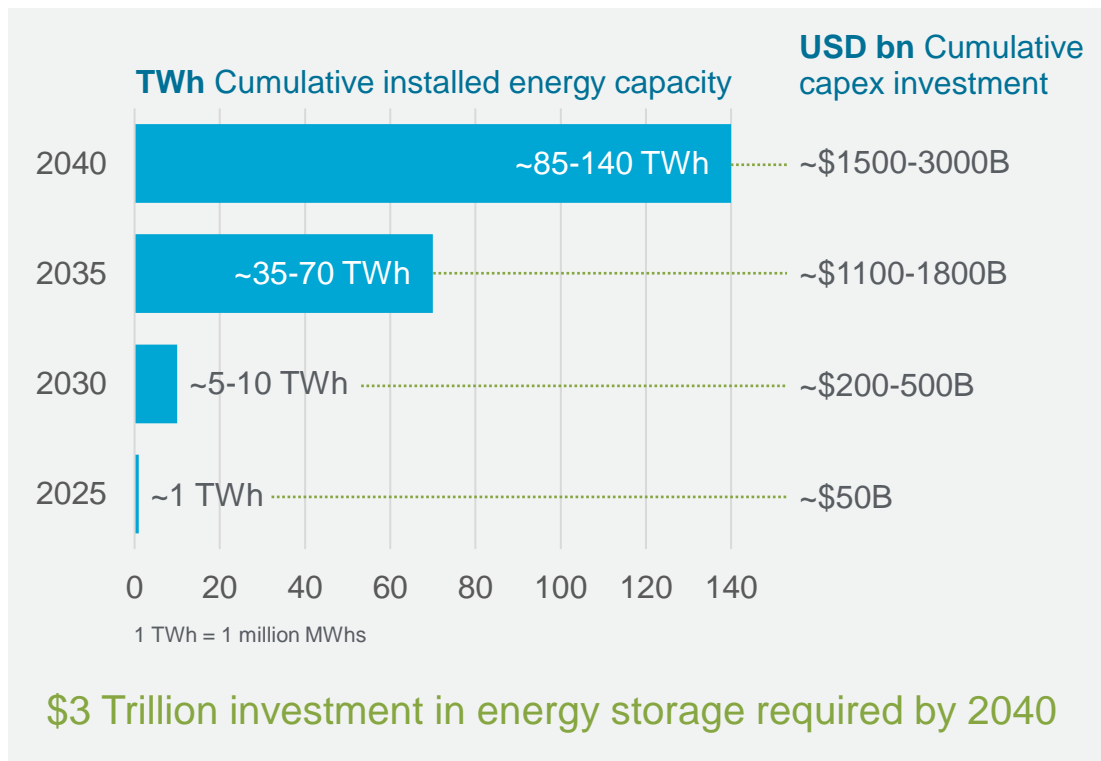
With LDES, total energy system costs can go down

Renewable power with LDES can be cost effective

COP 26:

Major global report by McKinsey declared that LDES is key to energy transition

- LDES sits between lithium batteries and hydrogen
- LDES defined as two categories: 8-24h and >24h storage
- Lithium will continue to play a role for <6h but too expensive for longer durations



Significant Market Tailwinds Building Momentum

EnergyPortal.eu

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



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

BloombergNEF

Global Energy Storage Market to Grow 15-Fold by 2030

pv magazine

Sunrise brief: Maryland now the 10th state with an energy storage procurement goal



Canada's budget includes energy storage tax credit in wave of cleantech investment



Europe smashes new record for battery storage capacity



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



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



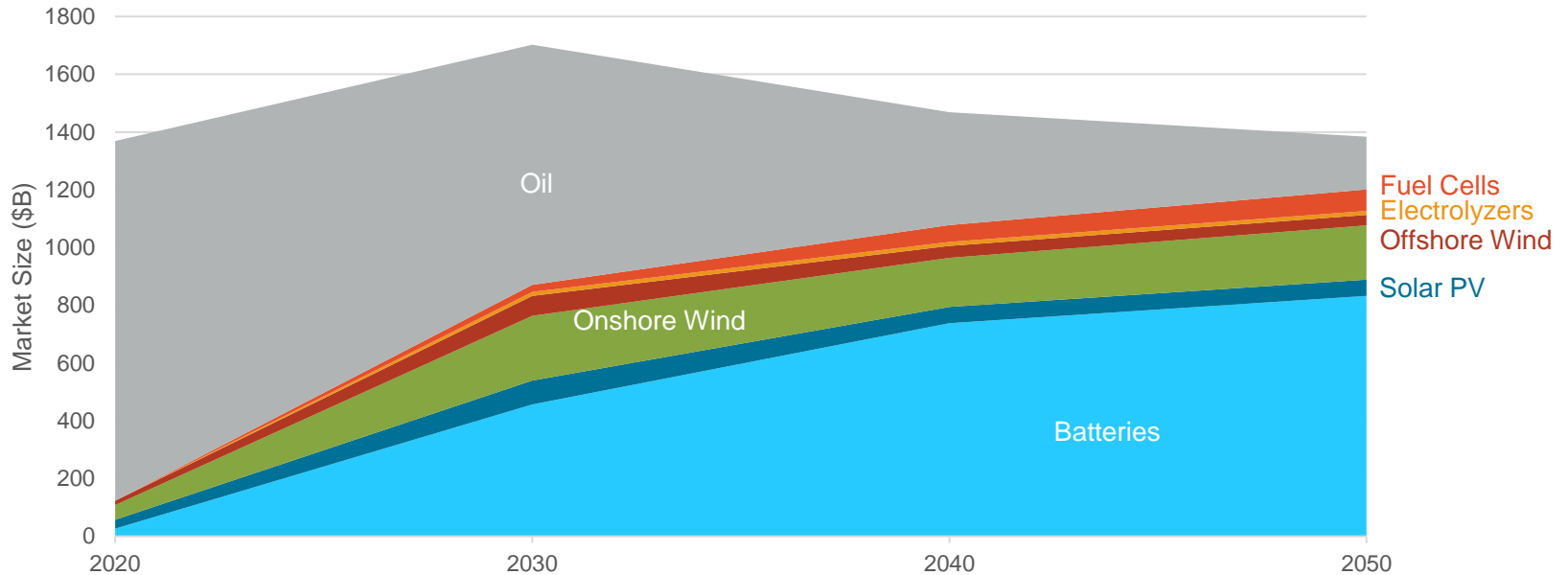
US utility-scale battery storage industry deployed 4GW/12GWh in record-breaking 2022

U.S. Annual and Cumulative Utility-Scale Clean Power Capacity Growth



Batteries are a Big Part of the Solution

Projected market size of energy technologies to reach zero emissions



Challenges Face the Grid Storage Incumbent: Li-ion

THE WALL STREET JOURNAL.

Rising Battery Prices Add Uncertainty to Electric-Vehicle Costs

Demand for lithium outstrips supply, ending yearslong price declines

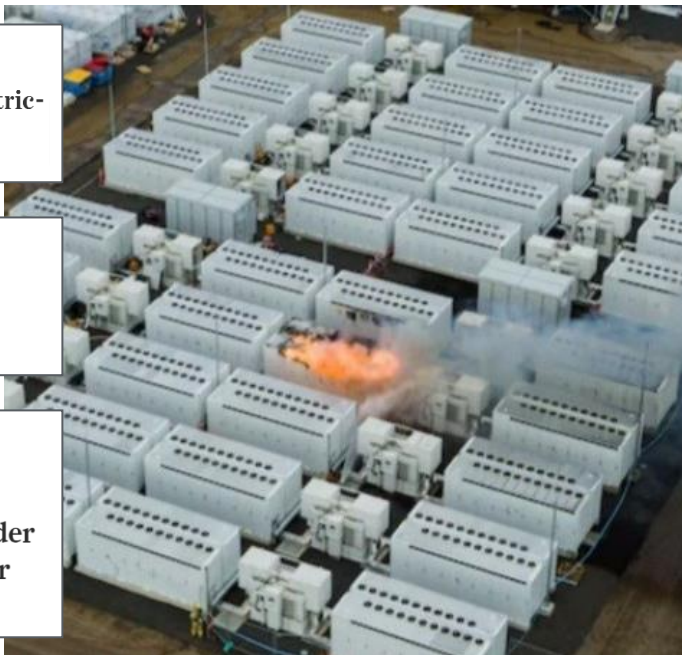
Bloomberg

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



ESS has received increased inbound opportunities due to Li-ion uncertainty



Commercial Traction: Large, Signed Supply Agreements



Customer	Background	Deal Details	Status
Sacramento Municipal Utility District	Large, CA-based utility serving 1.5 million electricity customers Aggressive decarbonization targets	Shipped first phase Developing LDES Center of Excellence Enabling 2030 Zero Carbon Plan – 2GWh of storage by 2028	Six EWs onsite Commissioning in process
Energy Storage International – Asia Pacific	ESI is our distribution and manufacturing partner in AU/NZ/Oceania	Expected to deliver 1GWh of iron flow batteries over the next 7 years	Initial delivery complete Recently announced project with Energy Queensland
LEAG	Currently operating large-scale lignite mining and coal-fired generation Implementing a vision to transform the coal-dependent region into Germany's green powerhouse	50MW / 500MWh iron flow battery system Expected to provide standardized building block for LEAG's planned 2-3GWh of LDES	Contract to be finalized in Q3 Deployments beginning in 2027



Commercial Traction: Deals with Large Upside



Customer

Background and Deal Details

Broader Opportunity

Turlock

Pairing storage with solar that will cover CA aqueducts, providing multiple benefits
Demonstration of new solar storage for grid firming and evening arbitrage

20-50MW by 2030
Excess solar to capitalize in ISO for peak shifting
Part of Project Nexus designed to prove use case of storing excess solar over state and utility aqueducts

Schiphol

Large European airport; leading the way to decarbonize ground operations as part of the TULIPS consortium

Targeting emission-free and zero-waste at the EU's 300+ airports by 2030 and climate-neutral aviation by 2050

Consumers Energy

Microgrid powering the White Pigeon Gas Compression Facility

Potential for 7MW of IFB deployments across all seven gas compression plants












Burbank Power & Light

Renewable energy integration

5MW by 2028 as part of decarbonization efforts
Model for public power market

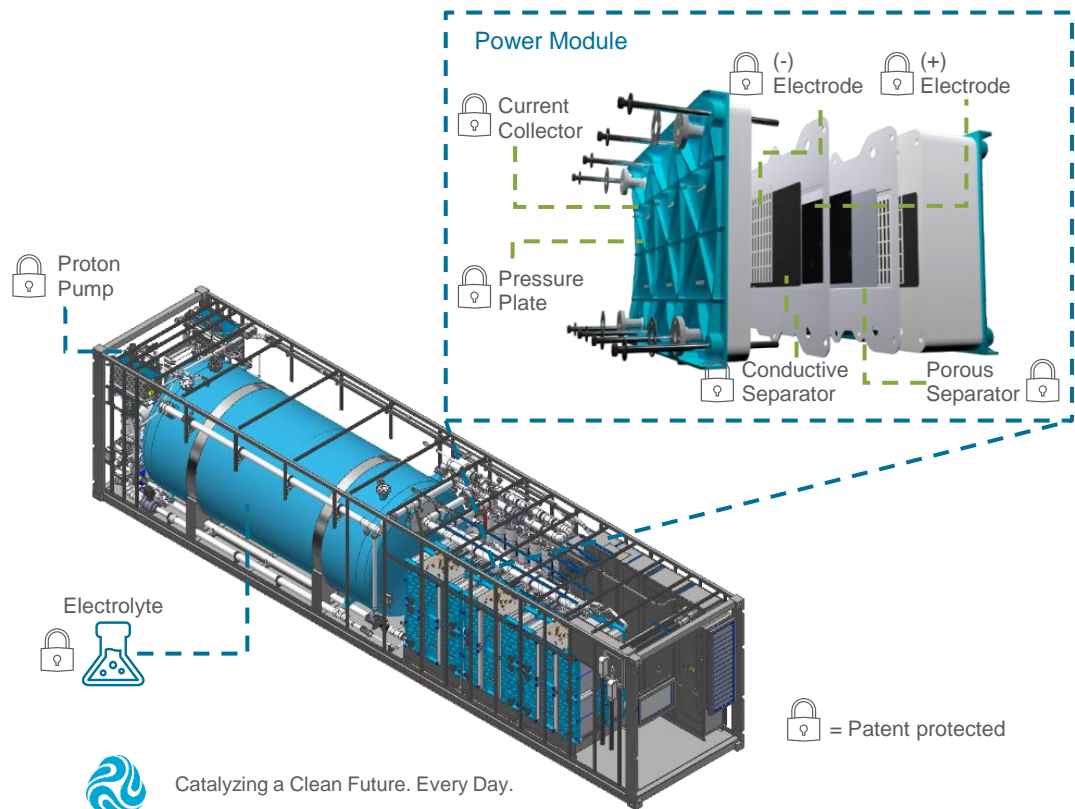


ESS Transforms the Value Proposition for Long Duration Storage

What Customers Demand		How ESS Transforms the Grid
 <p>Longer duration</p>	<p>Up to 10 hours No capacity fade No power fade</p>	 <p>Can replace coal and gas with solar and wind Designed for utility-scale applications</p>
 <p>Low cost</p>	<p>Lower LCOS than other technologies No augmentation required</p>	 <p>The first truly low-cost flow battery In commercial production today</p>
 <p>Power on demand</p>	<p>>20,000 cycle life – \$0 marginal cost per cycle Flexibility allows multiple revenue streams</p>	 <p>Improved grid resiliency and flexibility Enables multiple use cases</p>
 <p>Safety, reliability, and bankability</p>	<p>Conforms to UL 9540* Wide operating temperature range Munich Re insures technology risk</p>	 <p>Can deploy in a wide range of geographies No HVAC needed – cuts CAPEX and OPEX</p>
 <p>Sustainability</p>	<p>Safe and sustainable Easily sourced materials; recyclable components “Plug and play” with 25-year design life</p>	 <p>Environmentally sustainable Accelerates clean energy transition</p>



Differentiated Iron Flow Design and IP Protected



ESS IP portfolio

- 235 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™ Overview



First customer deployment in 2015

Generation II launched in 2020

Containerized fully-integrated design

Fast to deploy and commission

Specifications

Nominal Power	75kWdc
Peak Energy Capacity	500kWh
Rated Energy Capacity	400kWh
Module Cycle Life	>20,000 cycles
Ambient Temperature	0°C to +40°C
Expected Life	25-year design life
Warranty	1-year comprehensive defect warranty Optional 10-year extended warranty on core components



Energy Center Overview



Front-of-the-meter solution

Production begins Q4 2023

Modular design for utility-scale applications

Specifications

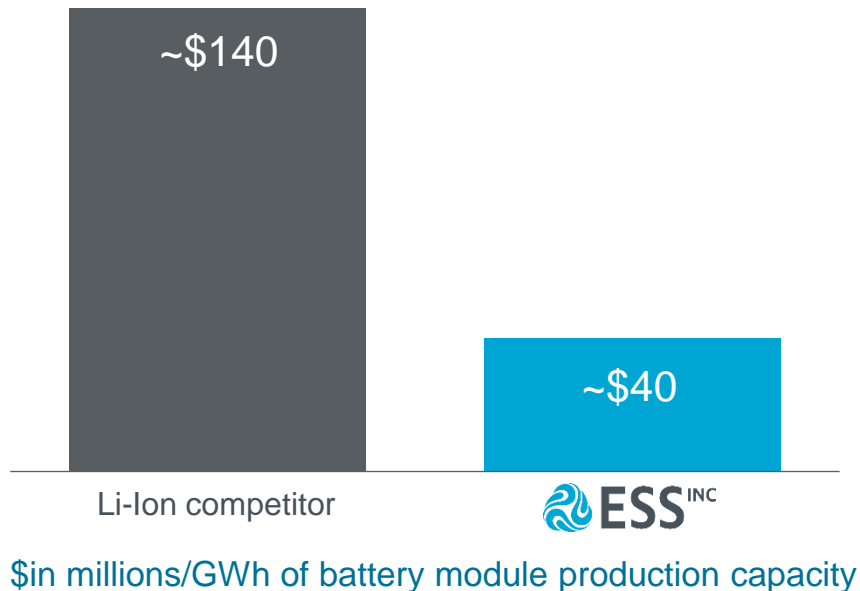
Configurable Range	Customizable up to GW scale; 145kW DC increments
Rated Capacity	8MWh per MW installed
Total Capacity	10MWh per MW installed
Ambient Temperature	0°C to +40°C standard; -15°C to +40°C variant; both 15% derate to +45°C *
Expected Life	25- year design life
Secondary Containment	Integrated into tank container to volume of largest tank
Warranty	1-year comprehensive defect warranty 10-year extended warranty on core components



Catalyzing a Clean Future. Every Day.

70%+ Less Capital Required – Ready to Scale Globally

Simple, low-cost production in the USA



VS



Our 2023 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

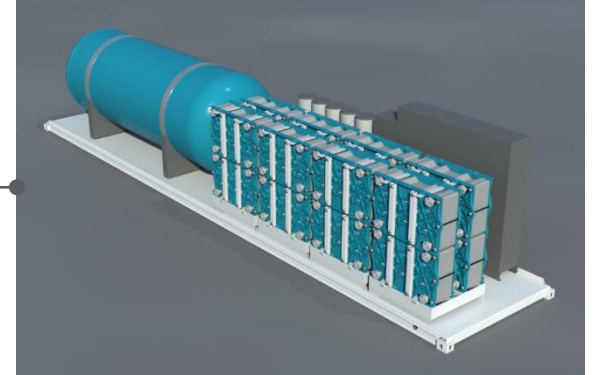


04

Reducing time to commission solutions at client sites



Four Major Technologies of the EW



**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



Energy Warehouse Product Improvements Rev 1 ► Rev 2

Plumbing improvements

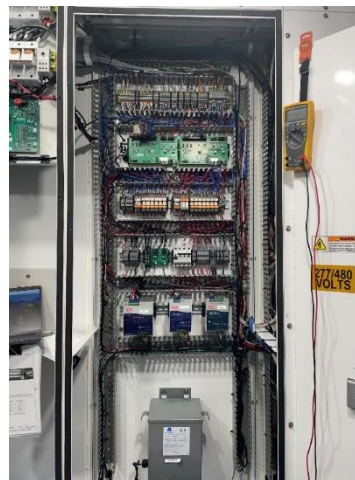


Piping / fitting / union / flange reduction



Electrical wiring and component reduction

Electrical improvements



Reduced fail points for improved quality

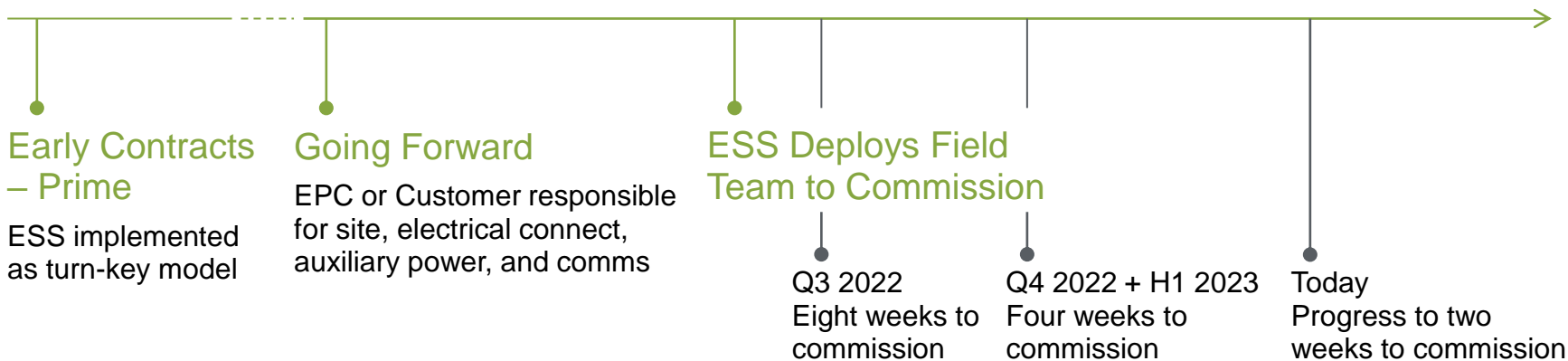


Cost reduction (material and labor hours)

Design & process improvements reduced labor by 29% & direct cost by 30% in Q2 alone



ESS Deployment Scope and Commissioning



Result: Lowered time to commission by 70% in the last year
Target: Reduce EW Commissioning to <2 weeks by end of 2023



Energy Warehouse Revenue Recognition

Early Contracts

- Contracts for early shipments included deliverables at the project level
- No history of commercial shipment / acceptance
- Shifting requirements on site (grid connection, site prep, etc.)
- Early stages of building a customer success team

Outcome

Complex and lagging revenue recognition

New Contracts

- Demonstrated history of shipment / acceptance
- Simpler contracting with standard provisions
- Delivery of a completed, tested unit
- No site or project-level responsibility

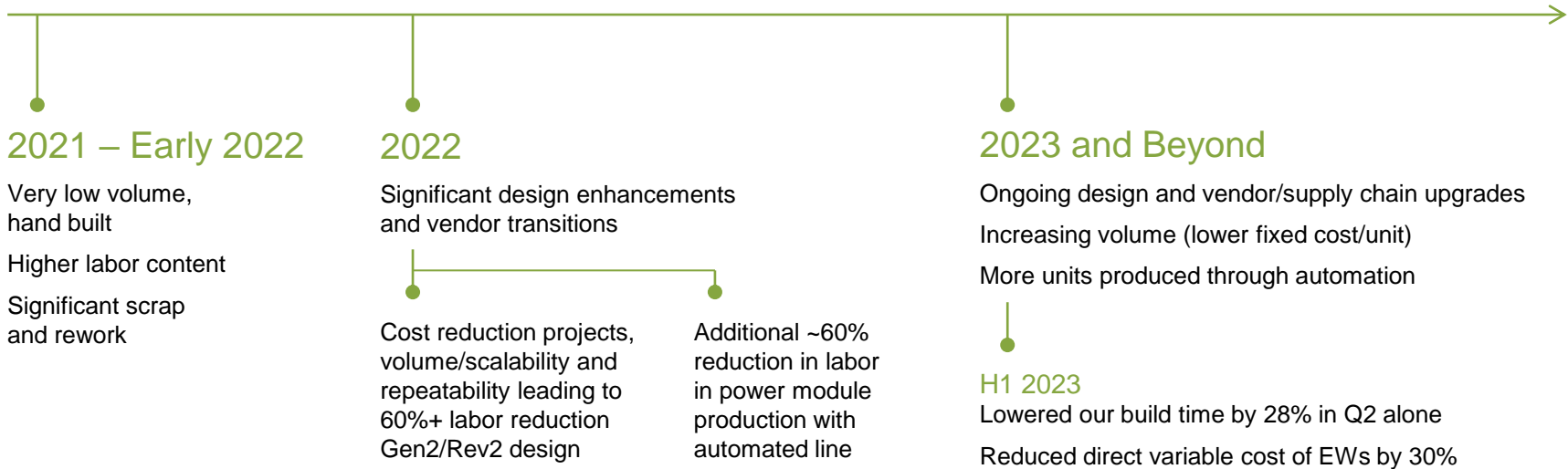
Result

Revenue recognition when EW transferred to customer via their shipment method or delivered at their site

100% of H2'23 shipments expected under new contracts



Path to Profitability



Target: Non-GAAP gross margin profitable by H2'24 for EWs



Q2 Results

Revenue

\$2.8 million

Non-GAAP Operating Expenses

\$24.3 million

Adjusted EBITDA

Loss of \$20.5 million

Cash and short-term investments

\$99.5 million





Thank You