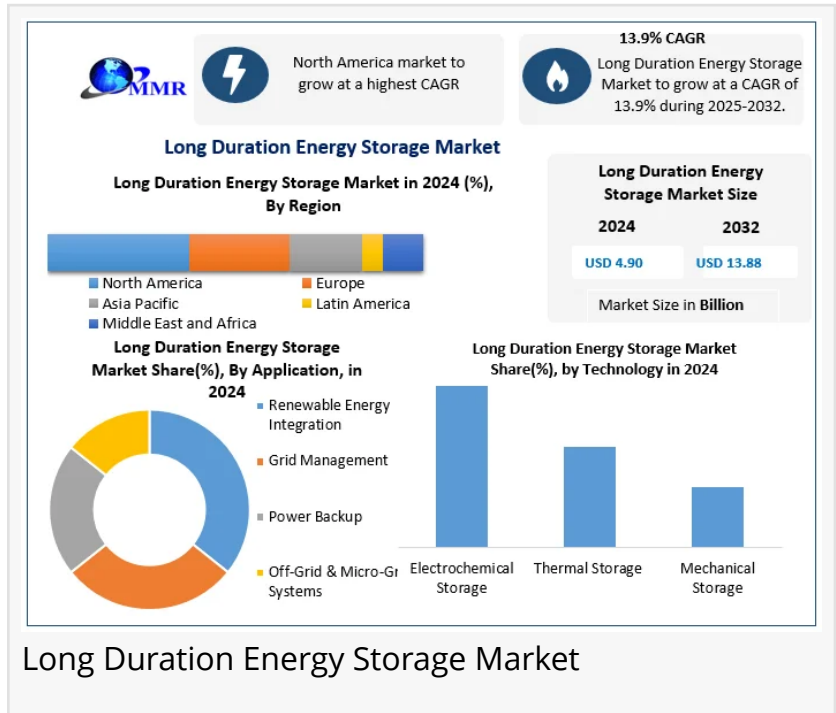


Long Duration Energy Storage Market to Reach USD 13.88 Billion by 2032 at 13.9% CAGR | Maximize Market Research

LDES Market at USD 4.90 Bn in 2024, set to reach USD 13.88 Bn by 2032 at 13.9% CAGR - driven by grid decarbonization and rising renewable energy adoption.

ROCKVILLE , MD, UNITED STATES, April 29, 2026 /EINPresswire.com/ -- Overview: Grid Decarbonization Propels a USD 13.88 Billion Storage Revolution

The [Global Long Duration Energy Storage Market](#) size was valued at USD 4.90 billion in 2024 and is projected to reach USD 13.88 billion by 2032 at a CAGR of 13.9%. Growth is driven by renewable energy integration and demand for long-duration grid stability. Technologies like iron-air batteries and liquid air storage are accelerating the shift from pilot projects to large-scale commercial deployment.



Long Duration Energy Storage Market

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"Iron-air batteries storing 100 hours of power are not tomorrow's grid solution — they are today's." — Analyst, Maximize Market Research"

Maximize Market Research

Market Dynamics: Drivers, Restraints & Opportunities

Drivers: Renewable Energy Surge and Grid Policy Incentives Accelerate Global LDES Deployment

Rapid expansion of variable solar and wind capacity is

driving structural demand for multi-hour storage systems. The U.S. Inflation Reduction Act delivers 30–50% investment tax credits for qualifying LDES projects, while China's 14th Five-Year

Plan directly subsidizes large-scale flow battery programs. Grid modernization mandates across North America and Europe are creating durable, policy-backed demand for long-duration storage infrastructure through 2032.

Restraints: High Capital Costs and Regulatory Fragmentation Impede Broad Commercialization

Emerging LDES technologies - flow batteries, molten salt, and compressed air - require heavy upfront capital without near-term revenue certainty. Inconsistent regulatory frameworks across jurisdictions create financing uncertainty for developers and utilities. Without standardized market mechanisms to value long-duration storage alongside gas peakers, project sanctioning remains constrained and commercial deployment velocity is suppressed globally.

Opportunities: AI Energy Demand, Data Center Growth and Wind Curtailment Create Structural LDES Pull

U.S. data centers consumed 176 TWh in 2023 - a figure projected to triple by 2028. AI infrastructure and EV charging networks require consistent, baseload-quality power, positioning LDES as the critical enabling technology. Solar and wind curtailment losses create direct economic incentives for utilities to deploy long-duration storage at commercial grid scale globally.

Key Market Trends & Insights: Iron-Air, Liquid Air, and Policy Drive the 2025–2032 LDES Trajectory

Iron-Air Battery Achieves Commercial Breakthrough, Disrupting Gas Peaker Economics

In 2024, Form Energy deployed the first grid-connected iron-air battery in Minnesota with 100-hour discharge capability at costs below USD 20/kWh. This breakthrough challenges gas peaker economics and is reshaping utility investment decisions globally.

Liquid Air Energy Storage Attracts £300 Million in Institutional Capital

In 2024, Highview Power secured £300 million to build a 50 MW / 300 MWh liquid air energy storage plant in Manchester. LAES technology stores energy as cryogenic liquid and delivers scalable, mineral-free grid resilience.

China's Dalian 200 MW Vanadium Flow Battery Signals Asia Pacific's LDES Ambition

China's 200 MW / 800 MWh vanadium flow battery in Dalian, the world's largest, highlights large-scale LDES deployment backed by government subsidies. This strategy is strengthening China's position in global manufacturing and increasing competitive pressure on Western markets.

Long Duration Energy Storage Market Segmentation: Electrochemical Dominance and U.S. Commercial Leadership

Electrochemical storage leads the long duration energy storage market size with 50–60% share,

driven by scalable flow batteries and lithium-ion systems. Utilities dominate demand for renewable integration. The U.S. leads globally, hosting 60% of startups and major projects like Moss Landing, supported by IRA tax credits and favorable regulatory frameworks.

By Technology Outlook

Mechanical Storage

Thermal Storage

Electrochemical Storage

By Duration Outlook

8 to 24

>24 to 36

>36

By Application

Grid Management

Power Backup

Renewable Energy Integration

Off-Grid & Micro-Grid System

By End-Use

Residential & Commercial

Transportation & Mobility

Utilities

Others

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Regional Insights: North America Dominates While Europe Builds the World's Fastest-Growing LDES Pipeline

North America: Policy Architecture, Commercial Scale, and 60% of Global LDES Startups

North America leads the long duration energy storage market, driven by U.S. IRA tax credits of 30–50% and supportive FERC regulations. The region hosts 60% of global startups and major projects like Moss Landing and Form Energy's iron-air system. Strong renewable mandates and innovation ecosystems position North America as the global hub for LDES growth through 2032.

Europe: Carbon Policy, Offshore Wind Buildout, and Industrial Decarbonization Fuel Fastest-Growing LDES Region

Europe ranks second in the long duration energy storage market, driven by EU Fit for 55 targets and net-zero mandates. Projects like Highview Power's LAES and Invinity's flow battery highlight growing deployment, while Siemens Gamesa's thermal storage expands industrial use. Strong carbon policies and offshore wind growth position Europe as the fastest-growing LDES region through 2032.

Key Recent Developments: Global LDES Market Leaders (2021–2025)

Form Energy (2024): Form Energy commissioned the world's first commercial iron-air battery grid installation - 1 MW / 150 MWh - in Minnesota with Great Plains Energy Cooperative, proving 100-hour storage viability at utility-commercial scale for the first time.

Highview Power (2024): Highview Power secured £300 million to develop a 50 MW / 300 MWh liquid air energy storage plant in Manchester - the largest LAES project in European history, targeting 2026 commissioning as a flagship grid resilience asset.

Invinity Energy Systems (2023): Invinity deployed a 41 MWh vanadium flow battery system in Scotland - one of the UK's largest flow battery installations, supporting grid stability and utility-scale renewable integration under a national energy security program.

Siemens Gamesa (2023): Siemens Gamesa launched its 130 MWh Electric Thermal Energy Storage pilot in Germany, converting surplus renewable electricity into redeployable industrial heat, a landmark milestone for commercial thermal LDES viability across European industry.

ESS Inc. (2022): ESS Inc. expanded iron-flow battery deployments across North American utility sites under U.S. DOE grants, advancing all-iron flow chemistry as a critical-mineral-free, sustainability-first alternative to conventional lithium-ion long-duration storage systems.

Key Players:

Form Energy

Fluence Energy

ESS Inc.

Ambri

Malta Inc.

Hydrostor

Highview Power

CMBlu Energy

EnergyNest

NGK Insulators

Sumitomo Electric Industries

Redflow

VRB Energy

Azelio

SaltX Technology

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Competitive Landscape of the Long Duration Energy Storage Market

The LDES market is defined by technology-level competition rather than scale concentration. Form Energy and ESS Inc. anchor North American electrochemical innovation, while Highview Power and Invinity Energy Systems lead European deployments. China's NGK Insulators and Shanghai Electric are scaling rapidly under state-backed programs. Utility partnerships, government backing, and technology differentiation — not incumbent market share — will determine competitive positioning through 2032.

Analyst Perspective: LDES Is the Missing Infrastructure Layer of the Energy Transition

Long Duration Energy Storage is not a niche clean-tech play — it is the critical missing layer of the global energy transition. Grid operators can no longer manage multi-day renewable variability with 4-hour lithium-ion systems. As iron-air, flow, and liquid air technologies cross commercial cost thresholds and policy frameworks mature, LDES transitions from an experimental asset class into mandatory grid infrastructure. The next eight years will define a multi-trillion-dollar energy infrastructure category. — Maximize Market Research

Frequently Asked Questions (FAQs)

What is the global Long Duration Energy Storage Market size and forecast?

The LDES Market was valued at USD 4.90 billion in 2024 and is projected to reach USD 13.88 billion by 2032 at a 13.9% CAGR, driven by renewable energy integration demand, U.S. IRA incentives, and rapid commercialization of iron-air and flow battery technologies worldwide.

Which technology segment dominates the LDES market?

Electrochemical storage leads with 50–60% market share, driven by flow battery scalability and declining lithium-ion costs. U.S. IRA tax credits and China's Five-Year Plan subsidies, combined with rapid utility-scale deployment across renewable integration projects, solidify electrochemical storage's dominant position through 2032.

What are the key LDES technologies driving market growth?

Key technologies include electrochemical systems such as flow batteries and iron-air, mechanical storage including compressed air and gravity, and thermal systems including molten salt and liquid air. Form Energy's iron-air battery with 100-hour discharge capability represents the most commercially disruptive emerging technology through 2032.

What is driving institutional investment into the LDES sector?

The U.S. IRA's investment tax credits, AI-driven data center energy demand growth, offshore wind integration requirements, and the DOE's Long Duration Storage Shot - targeting 90% cost reduction by 2030 - are converging to drive unprecedented institutional capital into the global LDES market.

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Maximize Market Research is a rapidly expanding market research and business consulting firm delivering high-impact, growth-focused insights across global industries. Our expertise in the energy storage and clean energy sectors supports clients with in-depth industry analysis, competitive intelligence, and future-ready strategies aligned with evolving grid infrastructure and decarbonization mandates.

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