Grid-Scale Storage Units

ANMD-MRS17-162 · Energy Storage & Grid Flexibility Technologies

A Global Sustainability Due Diligence & Market Research Study

History 2020–2024 · Base Year 2025 · Forecast 2025–2032 · Outlooks 2035 / 2040 / 2050 · Currency US$

WHY THIS REPORT

Grid-scale storage units are the utility-level assets reshaping power markets — the utility BESS installations, co-located solar-plus-storage, standalone and transmission-connected storage and grid-forming systems that provide arbitrage, capacity and ancillary services at MW-to-GW scale. As renewables displace dispatchable generation, grid-scale storage is becoming the flexibility and reliability backbone of the modern grid. This decision-grade study sizes the global market three ways — value, capacity (MWh) and power (MW) — across installation type, service, application and end-user, across seven regions and four scenarios to 2032, with outlooks to 2050.

SUSTAINABILITY & SDG IMPACT — THE ANMD LENS

Sustainability is this report's backbone. Grid-scale storage is foundational to renewable integration, grid reliability and decarbonisation of power systems, with footprint shaped by mineral sourcing, siting and recycling that the analysis screens throughout.

Mapped Sustainable Development Goals:

SDG 7	SDG 9	SDG 11	SDG 12	SDG 13
Affordable Clean Energy	Industry & Innovation	Sustainable Cities	Responsible Consumption	Climate Action

Measurable sustainability outcomes assessed:

- Renewable integration and curtailment relief
- Capacity, ancillary and grid-forming services
- Reliability for inverter-dominated grids
- Critical-mineral sourcing, fire safety and end-of-life recycling as material risks

Framework alignment: Double materiality mapped to GRI, SASB, ISSB, TCFD, TNFD, CSRD and the EU Taxonomy, with greenwashing and SDG-washing screens applied throughout.

WHAT'S INSIDE AT A GLANCE

53 Chapters	**9** Report Parts	**7** Regions Covered	**40+** Country Markets
2025–32 Forecast Horizon	**4** Forward Scenarios	**25+** Companies Profiled	**5** SDGs Mapped

REPORT COVERAGE

Geographic scope: North America, Europe, Asia Pacific, Latin America, Africa, Middle East and Rest of World — with named country intelligence. North America leads project deployment (United States) on system integrators; Asia Pacific drives supply and scale (China, South Korea); Europe adds balancing and grid-forming depth (Finland, France); other regions assessed on their own merits.

MARKET OVERVIEW

From peaking asset to the flexibility backbone of the modern grid.

Grid-scale storage is in a deployment boom. Demand is driven by renewable integration, capacity-market participation and the shift toward grid-forming services that stabilise inverter-dominated grids, against interconnection delays, market-design risk and supply-chain constraints. The market is read three ways — value, capacity (MWh) and power (MW) — and forecast under four scenarios, each region reported separately.

- **North America leads project deployment** — anchored by Fluence, Tesla Megapack, Powin and FlexGen across utility and merchant markets
- **Asia Pacific drives supply and scale** — Sungrow, BYD and CATL combining cells, PCS and project scale
- **Europe and balancing markets add depth** — Wärtsilä, Saft and Nidec across grid-services and grid-forming applications
- **Grid-forming capability is the differentiator** — providing inertia and stability to inverter-dominated grids is the emerging high-value frontier

REGIONAL OUTLOOK

Across seven reporting regions, the report separates deployment leaders from high-growth and emerging markets — each profiled in full rather than aggregated into Rest of World.

Region	Stage	Lead Country Markets & Drivers
North America	Deployment leader	United States — Fluence, Tesla Megapack, Powin, FlexGen
Asia Pacific	Supply & scale	China, South Korea — Sungrow, BYD, CATL
Europe	Balancing & grid-forming	Finland, France — Wärtsilä, Saft, Nidec
Latin America	Emerging	Chile, Brazil — utility storage growth
Africa	Frontier	South Africa — grid-stability storage
Middle East	Emerging	Saudi Arabia, UAE — giga-scale solar + storage

KEY MARKET DRIVERS & RESTRAINTS

Drivers	Restraints
• Renewable integration & curtailment relief • Capacity-market & ancillary revenue • Grid-forming & stability needs • Standalone-storage economics • Co-location with solar & wind	• Interconnection & permitting delays • Revenue-stacking & market-design risk • Supply-chain & cell availability • Fire-safety & siting concerns • Merchant-revenue volatility

SEGMENTATION SNAPSHOT

By Installation Type	Utility BESS · co-located solar + storage · standalone grid storage · transmission-connected · grid-forming storage
By Service	Energy arbitrage · capacity · ancillary / grid-forming
By Application	Front-of-meter · commercial & industrial · residential
By End User	Utilities · IPPs · developers · C&I · residential
By Business Model	Equipment sales · integration · storage-as-a-service
By Duration	≤2 h · 2–4 h · 4 h+

TABLE OF CONTENTS — PARTS & CHAPTERS

The full report is organised into nine parts across 53 chapters, listed below. Detailed sub-headings, country tables and directories are provided in the full report.

Part I — Report Foundation, Discovery and Strategic Intelligence

› Chapter 1. Scope, Methodology and Report Architecture
› Chapter 2. Industry Discovery Summary — Grid-Scale Storage Units
› Chapter 3. Executive Intelligence and Decision Dashboard
› Chapter 4. Strategic Findings, Materiality and Investment Verdict Preview

Part II — Market Intelligence, Sizing, Forecasting and Segmentation

› Chapter 5. Industry Overview and Market Evolution
› Chapter 6. Market Dynamics
› Chapter 7. Global Market Size and Forecast, 2020–2032
› Chapter 8. Market Segmentation Analysis
› Chapter 9. End-User and Demand-Side Intelligence
› Chapter 10. Pricing, Cost and Commercial Model Intelligence

Part III — Regional and Country Intelligence

› Chapter 11. Global Regional Intelligence Framework
› Chapter 12. North America Market Intelligence
› Chapter 13. Europe Market Intelligence
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› Chapter 15. Latin America Market Intelligence
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› Chapter 19. Technology Landscape and Architecture
› Chapter 20. Emerging and Next-Generation Technology Intelligence
› Chapter 21. Category-Specific Intelligence Module
› Chapter 22. Research, Innovation and Funding Landscape

Part V — Company, Competition, Patent and Project Intelligence

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› Chapter 24. Company Profiles
› Chapter 25. Mergers, Acquisitions, Partnerships and Ecosystem Intelligence
› Chapter 26. Patent Landscape and Intellectual Property Intelligence
› Chapter 27. Project, Deployment and Case-Study Intelligence

Part VI — Sustainability, ESG, SDG, Climate and Natural-Capital Intelligence

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› Chapter 29. ESG Intelligence and Double Materiality
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Part VII — Supply Chain, Policy, Legal, Economics and Finance

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Part VIII — Scenario, Future Intelligence and Final Due Diligence Verdict

› Chapter 42. Scenario Analysis and Future Intelligence
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› Chapter 44. Risk Register, RAG Rating and Anti-Greenwashing Screen
› Chapter 45. Bottom-Line Verdict and Strategic Recommendations
› Chapter 46. Implementation Roadmap and Stakeholder Playbooks

Part IX — Annexes, Directories and Reference Material

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› Chapter 48. Corporate Directory and Company Intelligence Annex
› Chapter 49. Patent Directory and Patent Intelligence Annex
› Chapter 50. Project Intelligence Annex
› Chapter 51. Forecast Annex
› Chapter 52. Sustainability KPI Annex
› Chapter 53. Reference Annexes

COMPETITIVE & INVESTMENT SNAPSHOT

The competitive field spans system integrators, cell suppliers and balancing-market players. Deal activity — M&A, technology acquisition and platform expansion — signals a market consolidating around scalable, bankable, deployment-ready solutions.

Representative players profiled in the full report:

Fluence Energy, Inc. · Tesla, Inc. (Megapack) · Sungrow Power Supply Co., Ltd. · BYD Company Limited · Wärtsilä Corporation · Powin, LLC · Contemporary Amperex Technology Co., Limited (CATL) · and further profiled integration and cell players

Investment intelligence: venture, infrastructure, development, climate and blended finance, green bonds and sustainability-linked loans — culminating in a bankability assessment and a clear investment verdict.

KEY QUESTIONS THIS REPORT ANSWERS

- ? How large is the global grid-scale storage market, and how fast will it grow to 2032?
- ? Which regions, installation types and services offer the strongest risk-adjusted opportunity?
- ? How do grid-forming capability and longer durations change revenue stacks?
- ? Who leads, and where is the competitive and patent white space?
- ? Is the investment case bankable — and under what conditions?
- ? How does the category align with the SDGs, market-design and fire-safety regulation?

WHY ANMD — THE DIFFERENCE

Most market studies stop at tonnes and revenue. This report is built as a sustainability due diligence instrument — fusing market sizing with ESG, SDG, climate, carbon-integrity and natural-capital intelligence and a decision-ready bankability verdict in a single architecture.

- **Triangulated sizing** — every market read three ways (value (US$), capacity (MWh) and power (MW)) so value, capacity and volume views reconcile rather than conflict.
- **Region-honest forecasting** — Latin America, Africa and the Middle East reported in full, never hidden inside Rest of World, every forecast resolved to the 2025 base year.
- **Integrated evidence base** — company, patent and project databases linked to the analysis, with published-filing patents and FTO treated as an indicator, not a legal conclusion.
- **No-fabrication discipline** — every estimate carries a data-confidence rating and disclosed sources; gaps are flagged for further diligence, never filled with invented numbers.
- **Anti-greenwashing rigour** — SDG-washing and greenwashing screens plus claim-substantiation checks built into the ESG and project analysis.
- **Decision-first structure** — 9 Parts and 53 Chapters culminating in stakeholder playbooks and a clear, conditions-based investment verdict.

WHO SHOULD BUY THIS REPORT

Investors and infrastructure / PE funds, utilities and IPPs, storage developers and integrators, system operators, cell and PCS makers, policymakers, lenders and ESG teams, plus strategic corporate planners and decision-makers.

Access the Full Report

The complete report delivers all 53 chapters in full, with every sub-heading, country table, company and patent directory, forecast model and due diligence checklist.

Purchase at **www.anewmarketdynamics.com** · Standard & Premium licences · Single-Site (SSL) and Global-Site (GSL) options at checkout.

Want the Complete Detailed Table of Contents?

This prospectus lists the nine parts and 53 chapters. The complete detailed table of contents — every sub-heading, country table, exhibit, company and patent directory and annex — is available on request to registered users. To receive it, register with your official company email at **www.anewmarketdynamics.com**. The full detailed table of contents will be sent directly to your registered company email address.