

Behind-the-Meter Storage Units

ANMD-MRS17-170 · 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

Behind-the-meter storage units bring energy storage to homes and businesses — the residential and C&I; systems, solar-plus-storage, backup/resilience units and VPP-enabled batteries that store energy on the customer side for self-consumption, backup and grid services. As electricity prices, outages and rooftop solar rise, behind-the-meter storage is becoming a mainstream consumer and commercial asset, increasingly aggregated into virtual power plants. This report is a comprehensive, decision-grade study of that behind-the-meter market across system type, use case, application, end user and business model, spanning history 2020–2024, a 2025 base year, a 2025–2032 forecast and long-term outlooks to 2035, 2040 and 2050. This decision-grade study sizes the global market three ways — value, capacity (MWh) and shipped units — across segmentation, seven regions and four scenarios to 2032, with outlooks to 2050.

SUSTAINABILITY & SDG IMPACT — THE ANMD LENS

The sustainability case is the report's backbone. Behind-the-meter storage advances distributed clean energy, resilience and grid flexibility, democratising the energy transition for consumers. The analysis applies double materiality, maps outcomes to GRI, SASB, ISSB, TCFD, TNFD, CSRD and the EU Taxonomy, and Critical-mineral sourcing, manufacturing and e-waste footprint, and equitable access across income levels are treated as material risks — with greenwashing and SDG-washing screens applied throughout.

Mapped Sustainable Development Goals:

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

Measurable sustainability outcomes assessed:

- Distributed clean energy and self-consumption
- Backup, resilience and grid-services revenue
- VPP-enabled flexibility democratising the transition
- Installed cost and software/VPP integration 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	9	7	40+
Chapters	Report Parts	Regions Covered	Country Markets
2025–32	4	25+	5
Forecast Horizon	Forward Scenarios	Companies Profiled	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, Europe and Asia Pacific lead residential and C&I; storage; Australia leads VPP adoption; other regions assessed on their own merits.

MARKET OVERVIEW

From niche backup to integrated, VPP-enabled distributed storage.

Behind-the-meter storage is scaling toward the mainstream. Demand is driven by self-consumption economics, backup and resilience, rooftop-solar pairing, and VPP grid-services revenue — with installed cost and software/VPP capability central to value. The market is read three ways — value, capacity (MWh) and shipped units — and forecast under four scenarios (conservative, base, accelerated and disruption), each region reported separately.

- **North America leads residential and VPP** — anchored by Tesla Powerwall, Enphase, Generac and FranklinWH across home storage and aggregation.
- **Europe drives self-consumption and VPP** — with sonnen (Shell) and strong solar-plus-storage and grid-services markets.
- **Asia Pacific scales supply and residential** — with BYD, Sungrow, Panasonic and Pylontech across home and C&I; storage.
- **VPP and software are the differentiator** — aggregating distributed batteries into virtual power plants unlocks grid-services revenue and stickiness.

REGIONAL OUTLOOK

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

Region	Stage	Lead Markets & Drivers
North America	Residential & VPP leader	United States — Tesla Powerwall, Enphase, Generac, FranklinWH
Europe	Self-consumption & VPP	Germany — sonnen (Shell), solar+storage markets
Asia Pacific	Supply & residential	China, Japan, South Korea — BYD, Sungrow, Panasonic, Pylontech
Latin America	Emerging	Brazil, Mexico — residential solar+storage
Africa	Frontier	South Africa — backup & resilience storage
Middle East	Emerging	UAE, Israel — SolarEdge, residential storage

KEY MARKET DRIVERS & RESTRAINTS

Drivers	Restraints
• Self-consumption & time-of-use savings • Backup & resilience demand • Rooftop-solar pairing growth • VPP & grid-services revenue • Falling installed costs & incentives	• Installed-cost & payback sensitivity • Incentive & policy dependence • Interconnection & permitting friction • Installer & channel constraints • VPP market-access complexity

SEGMENTATION SNAPSHOT

By System Type	Residential storage · C&I; storage · solar+storage · backup / resilience · VPP-enabled
By Use Case	Self-consumption · backup / resilience · VPP / grid-services
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 Channel	Installer · direct · utility-program

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 — Behind-the-Meter 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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Part IV — Technology, Innovation and Category-Specific Intelligence

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- › 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

- › Chapter 23. Competitive Landscape
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- › Chapter 25. Mergers, Acquisitions, Partnerships and Ecosystem Intelligence
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- › Chapter 28. Sustainability Intelligence Suite
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- › Chapter 30. ESG and Sustainability Framework Alignment
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Part VII — Supply Chain, Policy, Legal, Economics and Finance

- › Chapter 37. Value Chain, Supply Chain and Geopolitical Intelligence
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- › Chapter 40. Unit Economics, CAPEX, OPEX and Return Analysis
- › Chapter 41. Investment, Sustainable Finance and Bankability Intelligence

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

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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

- › Chapter 47. Methodology Annex
- › 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 home-storage leaders, inverter players and aggregation specialists.

Representative players profiled in the full report:

Tesla, Inc. · Enphase Energy, Inc. · LG Energy Solution, Ltd. · BYD Company Limited · sonnen GmbH (Shell plc) · and 20+ further profiled players across home-storage leaders, inverter players and aggregation specialists.

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

KEY QUESTIONS THIS REPORT ANSWERS

- ? How large is the global behind-the-meter storage units market, and how fast will it grow to 2032?
- ? Which regions, countries and segments offer the strongest risk-adjusted opportunity?
- ? How does VPP enablement change behind-the-meter value versus self-consumption alone?
- ? 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, circular-economy and resource-security and disclosure regulation?

WHY ANMD — THE DIFFERENCE

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

- **Triangulated sizing** — every market read three ways (value, capacity (MWh) and shipped units) so value-led and volume-led 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, decision-ready investment verdict.

WHO SHOULD BUY THIS REPORT

Investors and infrastructure / PE funds, utilities and aggregators, storage and inverter OEMs, installers and energy retailers, policymakers and lenders, and corporate strategy and ESG teams.

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.