

# Sodium-Ion Battery Systems

ANMD-MRS17-166 · 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

Sodium-ion battery systems are the emerging, lithium-free storage alternative — the layered-oxide, polyanionic and Prussian-blue chemistries and containerized systems that store energy using abundant, low-cost sodium instead of lithium. With supply-chain resilience and cost as headline advantages, sodium-ion is moving from labs into early commercial stationary-storage deployment. This report is a comprehensive, decision-grade study of that sodium-ion market across cathode chemistry, form factor, 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. Sodium-ion offers lithium-free, abundant-material storage with supply-resilience and potentially lower footprint. The analysis applies double materiality, maps outcomes to GRI, SASB, ISSB, TCFD, TNFD, CSRD and the EU Taxonomy, and Material sourcing and manufacturing footprint, performance-claim substantiation, and end-of-life recycling are treated as material risks — with greenwashing and SDG-washing screens applied throughout.

### Mapped Sustainable Development Goals:

<b>SDG 7</b> Affordable & Clean Energy	<b>SDG 9</b> Industry & Infrastructure	<b>SDG 11</b> Sustainable Cities	<b>SDG 12</b> Responsible Consumption	<b>SDG 13</b> Climate Action
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### Measurable sustainability outcomes assessed:

- Lithium-free storage from abundant sodium
- Supply-chain resilience and reduced critical-mineral dependence
- Safety and cold-temperature performance advantages
- Energy density and cell-manufacturing footprint 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

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

## REPORT COVERAGE

**Geographic scope:** North America, Europe, Asia Pacific, Latin America, Africa, Middle East and Rest of World — with named country intelligence. Asia Pacific (China) leads cell production and scale-up; Europe and North America drive chemistry innovation and supply resilience; other regions assessed on their own merits.

## MARKET OVERVIEW

### From early-commercial chemistry to cost-competitive, lithium-free storage.

Sodium-ion is an early-commercial, fast-emerging chemistry. Demand is driven by lithium-supply-chain resilience, low material cost, and cold-temperature and safety advantages — with energy density and cost-down central to viability. 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.

- **China leads commercialisation** — anchored by CATL, HiNa, BYD, Zhongke and Sodium Energy scaling sodium-ion production.
- **Europe drives chemistry innovation** — with Faradion (Reliance), Northvolt, Tiamat and Altris advancing cells.
- **North America adds new entrants** — with Natron Energy and Bedrock Materials targeting niche and supply-resilient applications.
- **Supply-chain resilience is the differentiator** — abundant sodium and lithium-free supply chains de-risk storage from critical-mineral constraints.

## 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
Asia Pacific	Commercialisation leader	China — CATL, HiNa, BYD, Zhongke, Sodium Energy
Europe	Chemistry-innovation hub	UK, Sweden, France — Faradion, Northvolt, Tiamat, Altris
North America	New entrants	United States — Natron Energy, Bedrock Materials
Latin America	Frontier	Brazil — early sodium-ion interest
Africa	Frontier	South Africa — supply-resilient storage interest
Middle East	Emerging	UAE — supply-diversification interest

## KEY MARKET DRIVERS & RESTRAINTS

Drivers	Restraints
<ul style="list-style-type: none"> <li>• Lithium-supply-chain resilience</li> <li>• Low, abundant material cost</li> <li>• Cold-temperature &amp; safety advantages</li> <li>• Stationary-storage cost pressure</li> <li>• Geopolitical critical-mineral de-risking</li> </ul>	<ul style="list-style-type: none"> <li>• Lower energy density vs lithium</li> <li>• Early commercial maturity &amp; scale</li> <li>• Manufacturing-ecosystem build-out</li> <li>• Cycle-life &amp; performance proof</li> <li>• Competition from cheap LFP</li> </ul>

## SEGMENTATION SNAPSHOT

<b>By Cathode Chemistry</b>	Layered-oxide · polyanionic · Prussian-blue · hybrid Na-ion · containerized Na-ion
<b>By Form Factor</b>	Cell / module · rack · containerized
<b>By Application</b>	Front-of-meter · commercial & industrial · residential
<b>By End User</b>	Utilities · IPPs · developers · C&I; · residential
<b>By Business Model</b>	Equipment sales · integration · storage-as-a-service
<b>By Maturity</b>	Pilot · early commercial · scaling

## 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 — Sodium-Ion Battery Systems
- › 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

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### Part IV — Technology, Innovation and Category-Specific Intelligence

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

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## Part IX — Annexes, Directories and Reference Material

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- › Chapter 49. Patent Directory and Patent Intelligence Annex
- › Chapter 50. Project Intelligence Annex
- › Chapter 51. Forecast Annex
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- › Chapter 53. Reference Annexes

## COMPETITIVE & INVESTMENT SNAPSHOT

The competitive field spans Chinese cell leaders and Western chemistry innovators.

### Representative players profiled in the full report:

Contemporary Amperex Technology Co., Limited · HiNa Battery Technology Co., Ltd. · Faradion Limited (Reliance Industries Limited) · Natron Energy, Inc. · BYD Company Limited · and 20+ further profiled players across Chinese cell leaders and Western chemistry innovators.

**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 sodium-ion battery systems market, and how fast will it grow to 2032?
- ? Which regions, countries and segments offer the strongest risk-adjusted opportunity?
- ? How do supply-chain resilience and material cost change value versus lithium-ion incumbents?
- ? 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 battery / PE funds, cell and pack manufacturers, OEMs and integrators, utilities and storage developers, 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](http://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](http://www.anewmarketdynamics.com). The full detailed table of contents will be sent directly to your registered company email address.