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The Battery Show Asia

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The Battery Show Asia 2025

Powering Asia's Energy Future: Where Innovation Meets Opportunity

The Battery Show Asia 2025 brought together the **global battery ecosystem** across materials, cell manufacturing, equipment, energy storage, and e-mobility solutions. As part of a broader innovation ensemble – including **Mobility Tech Asia, Build Asia, and Data Center Asia** – the event served as a strategic hub where **technology, policy, and investment priorities converged**.

Key insights highlighted **South and South-East Asia's emergence as a critical growth region** for **battery energy storage systems (BESS)** and **renewable energy integration**. Countries such as **Australia, Malaysia, Thailand, Singapore**, and **the Philippines** showcased robust **policy frameworks**, ambitious **net-zero goals**, and **cross-border collaboration initiatives** like the **SunCable ASEAN power project**. These initiatives are accelerating **regional value creation** and attracting **global investments**.

Technological innovation dominated discussions, from **solid-state and sodium-ion breakthroughs** to **AI-driven production optimization** and **digital detection systems** enhancing efficiency. Meanwhile, **circular economy strategies, digital product passports (DPPs)**, and **X-as-a-Service business models** emerged as **essential levers** for sustainable growth.

At **Active-Sites Consulting**, we translate these insights into **actionable strategies**, helping clients navigate **complex regulations**, implement **traceability frameworks**, and scale responsibly across evolving markets.

The future of energy storage in Asia is **digital, circular, and collaborative** – and this report captures **what matters now and what's next**.

The inaugural Battery Show Asia was held at the Hong Kong Expo from 15–17 July 2025. This event was part of a broader ensemble of events: Mobility Tech Asia, Build Asia, and Data Center Asia. Delegates could freely visit all four events, broadening their exposure across these sectors. Exhibitors from all parts of the value chain were there, material producers, cell manufacturers, equipment manufacturers, and electromobility. The international speaker line-up included experts from industry, research, institu-

tions, and finance.

The opening statements set the stage for the overall purpose of the trade show It needs "the right people and the right system, so that change becomes faster". This was the call for a good blend of human and technological capability as a foundation for advancement. Also the need was expressed for an international platform to coordinate technology and collaboration for the global battery ecosystem. With regard to energy storage, it is perceived as a means of energy security and market stability. This includes interconnections between countries globally and a facilitated energy transport by batteries. Green growth is projected to be a $ 200 bn, by 2030. The RePower EU framework[1] was positively mentioned in the discussions and acknowledged that both regulations and technology together drive the market.

Policies & Investments Powering Asia's Energy Transformation

South and South-East Asia represent dynamic and attractive regions for deploying renewable energy systems and battery energy storage solutions. Countries have solid policy frameworks in place to support investments. Australia, Malaysia, Thailand, Singapore becoming core strategic regions in this respect.

Australia is the 5^{th} most attractive region for renewable energy investment, with a solid National Battery Strategy[2] in place, and many governmental support schemes to reduce investment risks (e.g. a capacity investment scheme with 15 years of revenue floor guarantee [3]. All states and territories have own objectives, and there is an overall net-zero goal by 2050. By 2030 Australia aims to have 82 % of renewable energy production. Currently, the island nation is the 4^{th} largest utility scale storage market with 30 batteries working and 60 more under construction and 6^{th} largest PV producer (1st per capita). All coal power plants are planned to be shut down by 2040. The estimated investment to decarbonize the electricity market amounts to AUS$ 120 bn.

The huge potential of Australia's vast renewable energy potential could supply other parts of South-East Asia through the SunCable project, an ASEAN power cable connecting Australia via Indonesia to Singapore.[4]

Key Takeaways:

- Southeast Asia is rapidly becoming a global BESS and renewables hub.
- Australia, Malaysia, and Thailand are leading regional investments with strong policies and net-zero targets.
- Cross-border initiatives like SunCable are reshaping energy trade flows.

Malaysia is another forerunner in the region with an ambitious New Industry Master Plan 2030[5]. The country has a net-zero target of 2050 and is with a projected growth rate of 4 – 5 % an attractive investment environment. Their battery ecosystem is beginning to evolve. Some major cell manufacturing companies are looking into Malaysia, where already some upstream supply chain and a good raw material supply is present. Furthermore, Singapore and Malaysia are building up a Special Economic Zone (SEZ) at their border to further strengthen value creation in the region.

The Philippines are another region with ambitious targets to have 35 % and 50 % of renewable energy production by 2030 and 2040, respectively. This comes along with a goal of 2 GWh of BESS by 2030, which underlines their attractiveness for global investments, too.

Thailand aims to reach a 50 % renewable energy

[1] REPowerEU – Affordable, secure and sustainable energy for Europe [accessed 24 August 2025]
[2] National Battery Strategy – Leading the charge towards a competitive and diverse Australian battery industry [accessed 24 August 2025]
[3] Capacity Investment Scheme Australia [accessed 24 August 2025]
[4] Australia-Asia Power Link (AAPowerLink) [accessed 24 August 2025]
[5] New Industrial Master Plan 2030 [accessed 24 August 2030]

production by 2050 and 30 % of EVs by 2030. There is a roadmap to have a capacity of 45 GWh of energy storage (both BESS and Pump Hydro Storage (PHS)) by 2030 with further 2.4 GW of wind and 5.2 GW of photo voltaic installed. A pilot line for the production of sodium ion batteries is running, with locally sourced material. Thailand also has voluntary national standards for battery swapping, an initiative for a Battery Passport in place and a roadmap for end-of-life batteries to drive circular economy principles. The country presented itself as an attractive region for renewable energy investments.

The EU is perceived as a good partner in the field of energy storage and renewable energy. It is much appreciated that Europeans value quality and understand that this comes at a price. One can recognize the willingness of Asian players to learn and improve together with European players. Technology transfer is more perceived as a way to grow together.

We Recommend:

- ▷ Prioritize partnerships in Australia, Malaysia, and Thailand to leverage policy-driven incentives.
- ▷ Engage with cross-border energy initiatives to capture first-mover advantage.
- ▷ Position offerings around compliance, traceability, and circularity to align with evolving regulatory landscapes.

Asia's Battery Market: Scaling Up for a Sustainable Future

South-East Asia has emerged to be a key market for the expansion of Electric Vehicles (EV). In China, the total cost of ownership for an EV is already lower than that of a fossil-fuel-powered car. Main drivers for this trend are breakthroughs in technology, fast-charging capabilities, low battery costs, overseas R&D centres, local talent recruiting, and market exploration.

The region's rapid pace of adoption is driven by strong policy signals, such as Singapore or Thailand (with a roadmap for 30 % of EVs by 2030), Indonesia's huge nickel reserves (aiming to become the 3rd largest EV producer by 2030 with 600000 vehicles), and Thailand's focus on local manufacturing (regulated through reduced import and subsidised domestic production),

Globally, the Paris Agreement is a continuous common driver for growth in the EV and energy storage sector. The global annual production of battery cells crossed the 1 TWh-mark in 2024, with 207 GWh of ESS in that year (projected to raise to 348 GWh in 2025). The demand in energy storage applications is largely driven by high electricity prices and national policy frameworks.

Strong domestic demand for EVs and/or Energy Storage Systems (ESS) varies in regions across the globe. In terms of volume, South Africa mainly leads the African market. Germany, Italy, Great Britain, Spain, and Greece show highest demands in Europe, and the US and Canada lead the North-American market. China produces and deploys most in Asia, with South-East Asian countries and Australia following.

BIWO's high capacity 60140 cylindrical cell.[6]

Innovation on Overdrive: Trends Reshaping Energy Storage

Battery cell costs have fallen significantly in recent years, leaving limited room for further reductions. The focus is now more focussed on im-

[6] BIWO Battery

provements on system level rather than cell level, to further improve energy density and prolonged battery life. In addition to keeping production cost low and lower, major efforts are as well given to reduce safety issues. Companies must conduct extensive safety tests for their battery cells, with the nail-penetration test among the most challenging. All these efforts are necessary to meet regulatory compliance, however is otherwise hard to monetise and return the investments.

Next-Gen Chemistries and Formats: Redefining Battery Performance

With the first break-out of the common 18650 and 21700 cylindrical cell formats by Tesla into the 46-series, it seems now to become a company "brand" to establish and distinguish themselves through their own formats. Cylindrical cells come now in addition in formats of 60140, 32140, 40160, 34145, and more.

A number of cell chemistries are entering the market step by step. Sodium ion Batteries are already in production at GWh-scale and increasing, with the major issue being the raw material price on the cathode site. Otherwise sodium ion batteries are already at par with Lithium Iron Phosphate (LFP) battery cells when it comes to energy density[7] with superior low temperature performance[8].

The incorporation of silicon into anode active material and lithium metal anodes already boosts the energy density of current lithium ion batteries, which reach up to 320 Wh/kg. Based on that the supply chain is projected to reshuffle. Other promissing technologies are Lithium-air technologies, which perform on a superior safety level.

Solid-State Batteries: From Hype to Reality

Solid state batteries are coming! So the statement, with a projected market entry by the end of the year. When talking about solid state batteries, also those with some content of liquid will fall into this category. There is a lot of "defimissm" in this respect, to define "real" and "non-real", which certainly gives experts in the field content for continued discussion $\rightarrow$ eventually, the customer does not care.

The biggest challenge for manufacturing solid state batteries is the production of the thin solid state electrolyte film. The only commercialised technology is incorporating polymer electrolytes, which require higher operating temperatures (60 – 80 ^{o}C) and come with a lower mechanical strength. Oxide electrolytes have, on the other hand, a good mechanical strength and are, however brittle and have currently a low production yield. Sulphide electrolytes perform with a high conductivity, but are forming H_2S as a by-product.

Innovation of Hype? Solid state batteries have no liquid electrolyte, which eliminates the flammability of the cell. On the other hand, the energy density is increased, which poses risks from this perspective. There is also a higher temperature required during manufacturing, which increases the cost. Thus, there is still some innovation required to increase the (cost) attractiveness of this type of battery.

All in all, the readiness level solid state batteries are now at call for application and innovations on a system level.

Flow batteries cover the field of long-duration energy storage. These type of batteries, thus, serve completely different use cases from the batteries discussed above. (Basically) Infinite scalability and long-time energy storage are key performance parameters of flow batteries. The system costs for the latest sulphur based systems are even lower than the known vanadium redox flow batteries and, indeed, lithium ion batteries.

Beyond the Highlights: What's Next

Innovation is a constant driver in the battery ecosystem. A novel binder material was presented that is completely soluble in water, thus

[7] How do sodium ion batteries compare to LFP? [accessed 24 August 2025]

[8] Naxtra Battery Breakthrough & Dual-Power Architecture: CATL Pioneers the Multi-Power Era [accessed 24 August 2025]

easily delaminates current collector foils and active material, allowing for an impressive material recovery rate of > 99 %.[9] This is already in production with a capacity of 500 MWh.

Key Takeaways:

- Solid-state, sodium-ion, and silicon-anode chemistries are shaping next-gen storage.
- AI-driven manufacturing is halving production times and reducing scrap rates.
- Detection and digital process optimization are becoming core differentiators.

A full session was dedicated to detection during production, which remains a significant challenge due to the lack of standardized protocols. Detection is a paramount topic to collect as much data as possible (overhang, particles, ...) before the jelly-role or stack is inside the housing. This underlines the complexity of battery cell manufacturing and the great efforts of many companies to create and implement innovative solutions in that field.

Digital production control merges detection results with machine actuation and optimizes production processes. This greatly enhances manufacturing performance and can decrease the production time by 50 % and reduce scrap by 10 %. Data usage is key in today's manufacturing, where failures are found in a combination of data and knowledge. In this respect, also the design for manufacturing becomes more prevalent in enhancing production efficiency.

Artificial Intelligence (AI) is increasingly transforming R&D in battery cell manufacturing. The development times therefore reduce drastically. What took many years or even up to decades before, can now be achieved within less than an hour. The problem-solving, feedback-giving, and question-asking capabilities of AI are tremendously helpful in that respect.

We Recommend:

- ▷ Begin pilot collaborations with AI-driven production and detection tech providers.
- ▷ Focus on next-gen chemistry suppliers to future-proof your value chain.
- ▷ Build internal readiness frameworks for rapid adaptation to emerging tech.

Circularity at Scale: Building the Future of Sustainable Energy

The circular economy represents a trillion-dollar opportunity, influencing 45% of global GHG emissions and 90 % of biodiversity. Therefore such circular economy targets become more and more state-of-the art, 51 % of businesses and 35 % of countries have them already in place.

Given the projected energy storage demand, the IEA estimates a need for 10× more lithium, 5× more graphite, 3× more cobalt, and 2× more nickel by 2040.[10] The only way to come by this material demand is to rethink sourcing and mining. A huge number of batteries will reach their end of first life from the first wave of deployment. Already 25 % of materials could be sourced from there. Recycling is coming up to be a new large scale industry. Given the low price of new batteries, improved performance parameters, and uncertainty in State-of-Health (SoH) estimation, 2^{nd} live applications might become less attractive.

Circular economy provides a lot of opportunities in the value chain. It connects industries, fosters collaboration and collective problem solving. Simultaneously it eliminates negative effects on the environment. Design products for circularity keeps materials in use (creating circular clusters). Track&trace data, such as in Digital Product Passports (DPPs) and the development of X-as-a-Service (XaaS) business models help drive circularity that needs to be backed by readiness

[9] RSC Sustainability, 2024, 2, 2125-2149
[10] IEA – Global Critical Minerals Outlook 2024 [accessed 24 August 2025]

for cooperation, capital, and policy frameworks.

Solutions have to be adapted to the respective market – no one size fits all. The bigger picture is to keep the material (molecule, atom) in use, as long as possible, which reduces the demand to source virgin material.

The EU has most probably the toughest regulations with respect to circular economy. Some companies have them already fully implemented and in part exceed them. Collaboration with other companies and their technologies was the key success factor to reach these targets.

We Recommend:

- ▷ Integrate Circularity into Core Strategy → Treat recycling, reuse, and material recovery as strategic enablers, not compliance burdens, to drive long-term competitiveness.
- ▷ Leverage Digital Product Passports (DPPs) → Adopt DPP frameworks early to ensure traceability, transparency, and regulatory alignment across markets.
- ▷ Explore X-as-a-Service Models → Embrace Battery-as-a-Service and Energy-as-a-Service models to unlock recurring revenue streams and maximize lifecycle value.
- ▷ Form Strategic Alliances → Collaborate with recyclers, technology providers, and policymakers to build robust, cross-border circular ecosystems.
- ▷ Invest in Data-Driven Insights → Use real-time analytics and ESG reporting tools to monitor material flows, reduce waste, and achieve measurable sustainability outcomes.

Accelerate. Collaborate. Lead: Together Towards a Digital and Circular Energy Ecosystem

The Battery Show Asia 2025 highlighted how **Asia is rapidly shaping the global energy storage future**. With **ambitious policy frameworks, regional integration projects**, and **emerging innovation hubs**, the event reinforced the region's potential to become the **epicentre of next-generation energy solutions**. From **solid-state breakthroughs** to **digital traceability models**, the show offered a clear signal: **the future is accelerating, and collaboration is key**.

At **Active-Sites Consulting**, we transform **market insights into actionable strategies**. We enable stakeholders to **navigate complex regulatory landscapes, leverage digital product passports (DPPs)**, and **implement circular business models** that ensure **scalability with sustainability**. Our expertise bridges **technology, compliance, and execution**, positioning your business to thrive in **Asia's fast-evolving energy ecosystem**.

→ **The opportunity is now**. Let's **collaborate to unlock transparency, resilience, and long-term value** – together shaping a **digital, circular, and sustainable energy future**.

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