



Ministry of Industry and Trade



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DEUTSCHE ZUSAMMENARBEIT

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BATTERY ENERGY STORAGE SYSTEM (BESS)

GIZ Viet Nam/ESP

by Henri Wasnick and Nancy Balbin Chavez

Image source: GettyImages/Petmal

Overview of technology and market

- BESS annual installations will quadruple by 2030.
- Market is evolving constantly with promising new technologies.

Viet Nam's context

- BESS is an upcoming topic for Viet Nam.
- Expected grid development is not aligned with energy capacity targets.

BESS as a possible solution

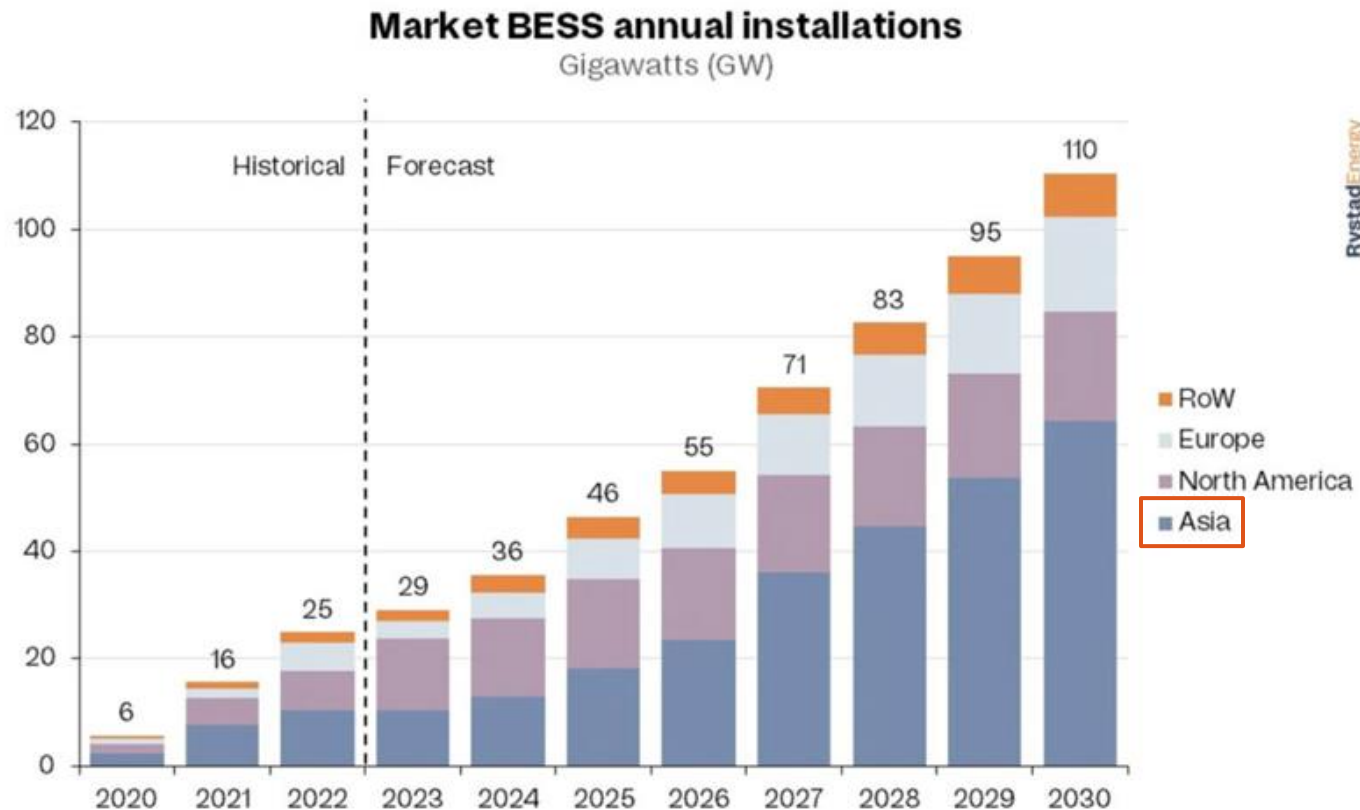
- BESS may target current issues.
- Scaling up BESS faces obstacles.

*“Batteries are crucial in the **global economy transition** with their ability to maintain a **balance** between **supply and demand** within the power system.”*

Source: <https://knowhow.distrelec.com/energy-and-power/the-importance-of-batteries-in-renewable-energy-transition/>

Overview of technology and market

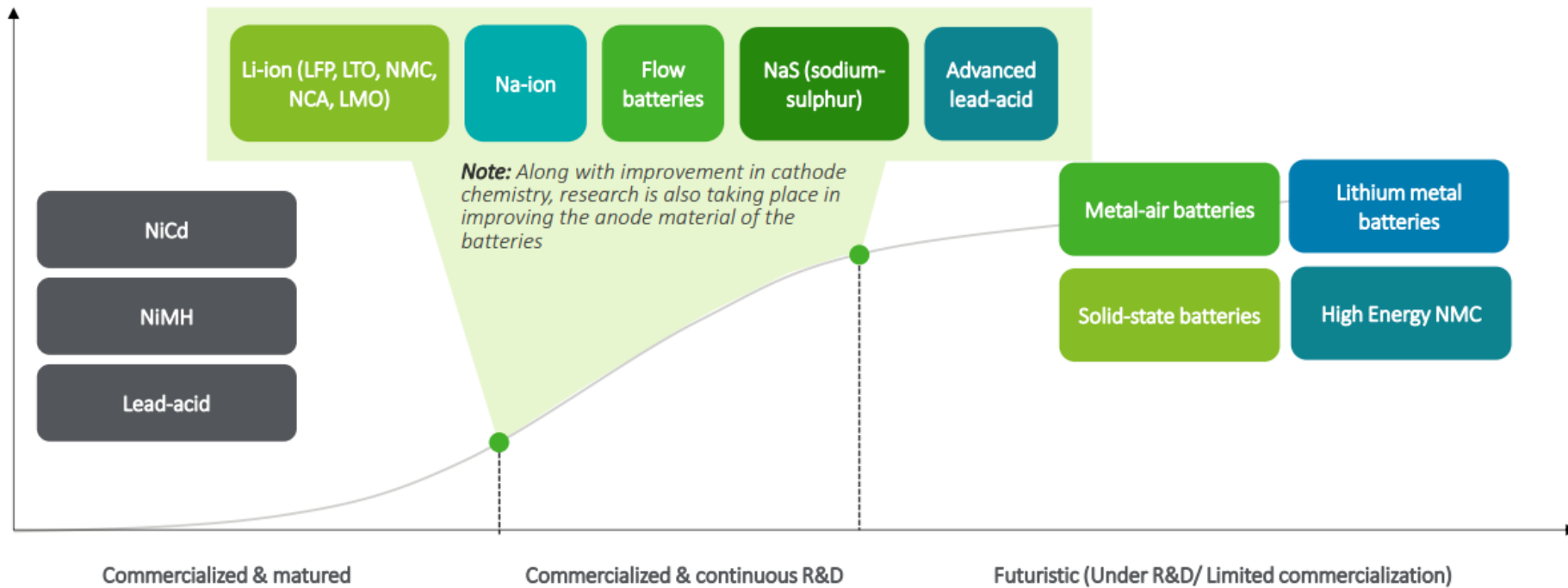
BESS annual installations will quadruple by 2030



- By 2030, Asia will reach its highest annual installation and reach **60GW of installed BESS capacity** out of the global total of 110 GW.
- Prices are decreasing for matured BESS technologies.

Overview of technology and market

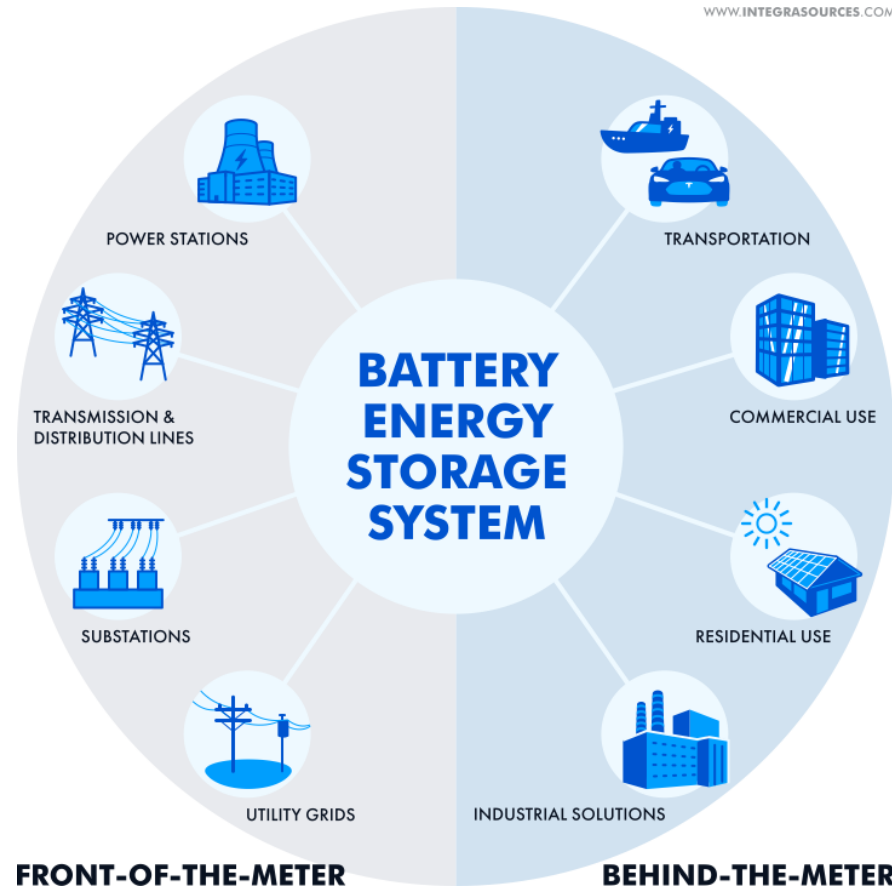
Market is evolving constantly with promising new technologies



Source: https://changing-transport.org/wp-content/uploads/GIZ_Battery-ecosystem-report.pdf

Overview of technology and market

BESS may be used for a range of applications



- Most used technologies in the energy sector are lead-acid and lithium ion batteries.
- Criteria: technical, economic and operational.

BESS is an upcoming topic for Viet Nam

PDP8

- PDP8 plans between 140-160GW (“backloaded after 2030”) of solar PV by 2050
- The PDP8 also includes a target to equip **50% of households and public office buildings with rooftop solar (RTS)** by 2030.
- BESS to be **combined with solar power** when the price is suitable.
- BESS to be **located near wind and solar power sources** or load centers.
- Capacity of BESS by **2030 at 300 MW**, by **2050 BESS around 30,650 MW – 45,550 MW** (incl. pumped hydropower storage).
- The current focus remains on pure **self-consumption** (with no exports to the grid) and new grid-connected solar PV projects are prohibited.

JETP

- JETP Proposal: **Re-activating solar PV market development** and integration of batteries (hybrid systems).

The importance of RE in VNM. The challenge: Supply and Demand

Expected grid development is not aligned with energy capacity targets

- Vietnam's installed **power production capacity** is over **80,705 GW by 2022**.
- Between 2021 and 2030, energy capacity is anticipated to reach **150,5 GW by 2030**. And at least **490,5-573GW by 2050**.
- **Electricity grid is saturated** as it was designed for conventional resources.
- Difficulties with RE integration: **excess in electricity generation** due to lack of regulation and an insufficient power purchasing plan led to excesses in electricity generation, **halting new RE projects**.
- **Challenge to maintain a stable price** while serving a high demand and ensuring financial viability for EVN.
- **Lack of funding mechanisms** for grid expansion & flexibilization and other constraints (e.g., land clearance and time).

BESS as a possible solution

BESS may target current issues

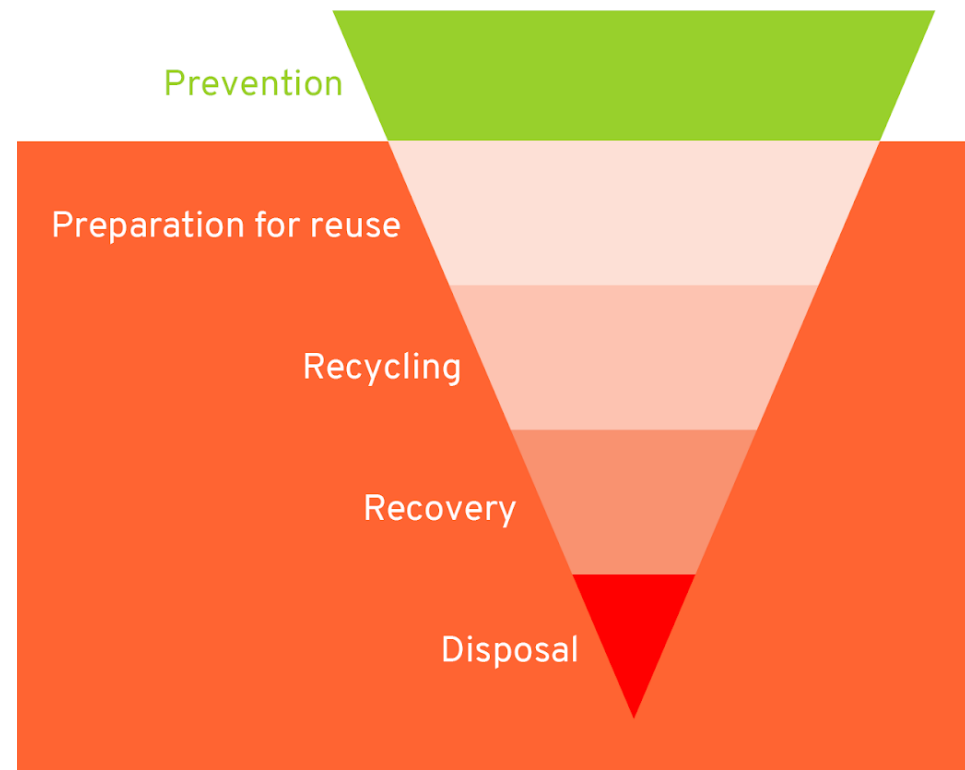
- **Construction** of grid can take **from 7 to 10 years**; In some cases, BESS may be a **cheaper option** than grid expansion.
- BESS may **reduce renewable curtailment** and **absorb excess energy** from solar and wind.
- BESS can support **ramping requirement** (sudden high demand of energy) and **peak shifting** (high demand but low offer, therefore prices of energy are high for TSO, and use of stored energy is cheaper).
- Combining BESS with solar energy could promote **electricity autonomy** for private households and commercial buildings. It can be used to reduce the **impact of intermittency and variability** in the solar power system which also provides a solution in supplying the power grid using solar power, saving on cost for energy production and Zero-Emission.

BESS as a possible solution

Scaling up BESS faces obstacles

- Political reforms needed, such as:
- Regulatory framework, tender process for utility scale solar + storage projects.
- Surplus power tariff needed, (especially surplus incentives for companies under 5 days per week needed).
- Power grid modernization vs. current stand still situation.
- Adjustment of procurement framework for battery (also in combination with solar), to support large scale of integration.
- Auction design, unclear period after lifetime.

End of life management of BESS



Source: <https://www.reneos.eu/case/the-waste-management-hierarchy-how-to-deal-with-end-of-life-ev-batteries-1>

End of presentation

Cảm ơn, Thank you, Danke!!