

Battery Innovation System of Japan



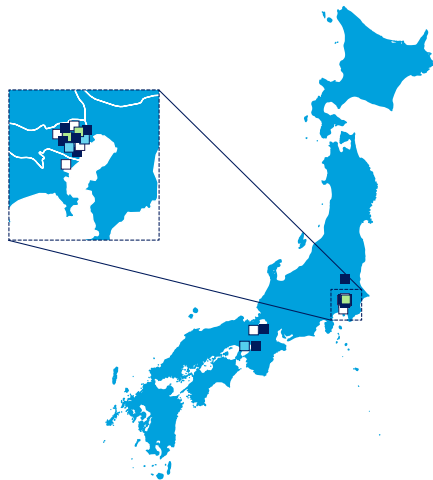
Main Players

POLITICAL ORGANISATIONS

- Ministry of Economy, Trade and Industry (METI)
- Ministry of Education, Culture, Sports, Science and Technology (MEXT)
- The New Energy and Industrial Technology Development Organization (NEDO)

RESEARCH ORGANISATIONS

- National Institute of Advanced Industrial Science and Technology (AIST)
- National Institute for Materials Sciences (NIMS)
- Kyoto University
- Waseda University
- Tokyo Institute of Technology



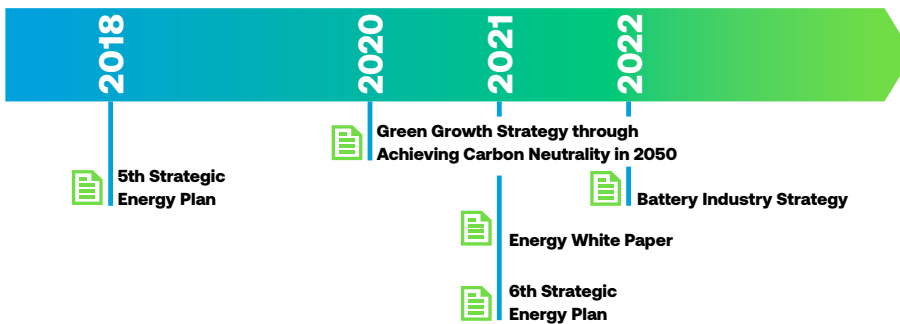
INDUSTRY ASSOCIATIONS

- Consortium for Lithium Ion Battery Technology and Evaluation Center (LIBTEC)
- The Battery Association of Japan (BAJ)
- The Battery Association for Supply Chain (BASC)

COMPANIES

- Asahi Kasei (Materials)
- GS Yuasa International Ltd (Batteries)
- Mitsubishi Chemical Corporation (Materials)
- Panasonic Energy (Batteries)
- Prime Planet Energy & Solutions (Batteries)
- Resonac (Materials)
- Sumitomo Metal Mining (Materials)

Strategic Documents



Policy Goals

- ### 2030
- Domestic production capacity** of EV and energy storage batteries at 150 GWh/year
 - Annual production** of 600 GWh (20% share of the global battery market)
 - All-solid-state batteries** full-scale commercialised
 - GHG emissions in Japan** reduced by 46% from 2013 levels
 - Recruitment:** 30,000 trained workers for battery manufacturing and supply chains
 - Prices:** In-vehicle battery pack price of max. 10,000 yen/kWh, a system price of max. 70,000 yen/kWh for household storage batteries with solar panels, and a system price of max. 60,000 yen/kWh for storage batteries installed in factories and other business sectors

- ### 2035
- Innovative battery chemistries** (such as fluoride batteries, zinc batteries and polyvalent ion batteries) commercialised
 - Electrified vehicles** (EV, FCV, PHEV, and HV): 100% of new sold passenger vehicles

- ### 2050
- Carbon neutrality**

Country Specific Information

As an early technology leader, Japan began funding lithium-ion batteries, especially the development of solid-state batteries and certain types of alternative batteries. Total battery funding by NEDO between 2009–2022 (for Solid-EV and RISING 1, 2 and 3 projects) is estimated by ca. 58 billion yen. In the Battery Industry Strategy (2022), the government revised Japan's conventional battery strategy from solid-state batteries to new-generation high-performance batteries. It aims to strengthen the domestic production base of liquid-electrolyte lithium batteries, increase production capacity, and secure the domestic and global market for lithium-ion batteries so that Japanese companies do not further lose the market competition before solid-state

batteries are commercialised. Japan imports about 90% of its primary energy requirements and is vulnerable to energy supply disruptions overseas. In recent years, new energy security factors have been studied. These include expanded use of renewable energy to respond to climate change and cyber security improvements that will enable mass deployment of renewable energy.

Research Priorities

Next-generation batteries + innovative and enhanced batteries for EVs from material design to battery system design + fluoride shuttle battery, zinc-air battery, conversion-type battery, sulphide battery + high-performance batteries, materials and production technology + reduction of the amount of critical raw materials needed + reduction of GHG during the production process + recycling technology

Funding Instruments

TIME	FUND	FOCUS	BUDGET
2018–2022	NEDO: SOLID-EV	Material evaluation technology for all-solid-state batteries	2.371 billion yen in 2021
2021–2030	NEDO: Green Innovation Fund (The development of next-generation batteries/motors)	High-performance batteries, battery materials, recycling technology	120.5 billion yen
2021–2025	NEDO: RISING-3	Next-generation batteries for EV	2.375 billion yen in 2021
2021–2022	METI programmes to expand lithium-ion battery production	<ul style="list-style-type: none"> Large-scale production/ recycling technology Clean Energy Vehicles and Infrastructure (to encourage the purchase of EVs, PHEVs and FCVs and the development of charging and hydrogen fuel infrastructure) Acceleration of introducing stationary batteries aiming to increase the ratio of renewable energy 	100 billion yen 53 billion yen 13 billion yen in 2021