

Battery Innovation System of India



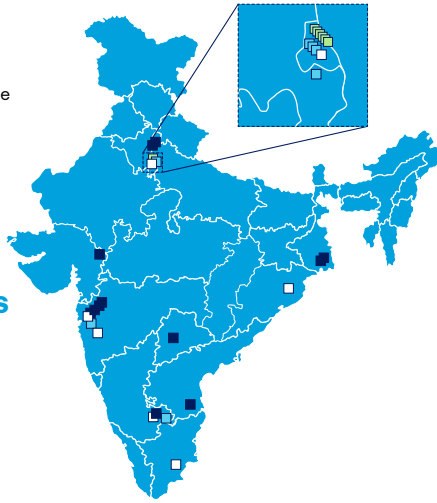
National Ecosystem

GOVERNMENT ORGANISATIONS

- The Union Ministry of Environment, Forest and Climate Change
- Ministry of Mines
- Ministry of Road Transport and Highways (MORTH)
- Ministry of Heavy Industries
- Ministry of New and Renewable Energy (MNRE)
- The National Institution for Transforming India (NITI Aayog)
- Department of Science and Technology

INDUSTRY ASSOCIATIONS & THINK TANKS

- Indian Battery Manufacturers Association
- Society Of Manufacturers Of Electric Vehicles (SMEV)
- India Energy Storage Alliance (IESA)
- RMI India Foundation
- WRI India
- CEEW



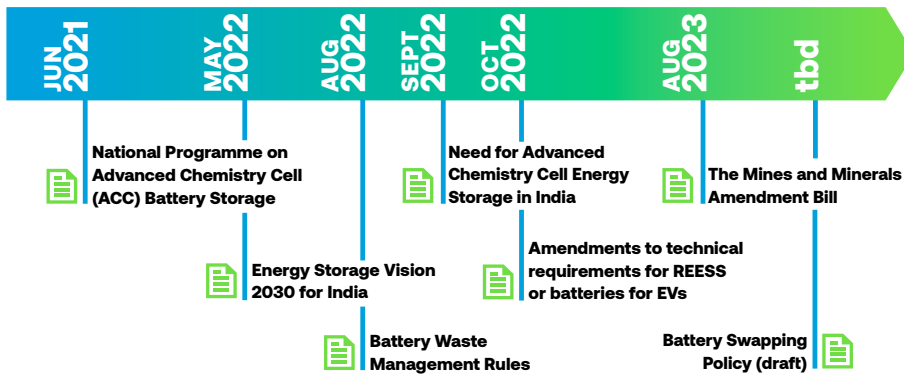
RESEARCH ORGANISATIONS

- Central Electrochemical Research Institute (CECRI)
- International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI)
- Centre for Materials for Electronics Technology (CMET)
- Institute of Minerals and Materials Technology (IMMT)
- National Chemical Laboratory (NCL)
- NonFerrous Materials Technology Development Centre (NFTDC)

COMPANIES

- Amara Raja Batteries (Batteries)
- Epsilon Advanced Materials (Anode and Cathode)
- Exide Industries (Batteries)
- Hbl Power Systems (Batteries)
- Himadri Chemicals (Anode and Cathode)
- Khanij Bidesh India (Raw Materials)
- LivGuard (Batteries)
- Luminous (Lead Acid)
- OLA (Batteries and EVs)
- Reliance Industries (Batteries)
- Tata-Agratas (Batteries)

Strategic Documents



Policy Goals

- ### 2030
- Battery production capacity:** 120 GWh
 - Supply capacity:** 500 GW of installed non-fossil fuel energy
 - EV transition:** Substitute 30% of private cars, 70% of commercial vehicles, 80% of two and three-wheelers and 100% of government vehicles to EVs; annual EV sales: 10 million;
 - Energy Storage Obligation (ESO):** 4% of total energy consumed from solar and/or wind with/through energy storage
- ### 2070
- Net-zero emissions**

Country Specific Information

India is one of the world's fastest growing economies. The goal of enhancing its global standing is being pursued through significant investments across the entire domestic battery value chain, facilitated by schemes such as the Production-Linked Incentive (PLI). The battery industry is undergoing a major transformation to reduce its heavy reliance on imports. In this respect, India is open to international collaboration, with particular interest in the United States and Europe. In June 2023, it

became a member of the Minerals Security Partnership (MSP), an initiative led by the US and comprising 12 other countries and the European Union, aimed at establishing critical energy minerals supply chains.

The shift in the Indian battery value chain includes a focused effort to strengthen domestic manufacturing capacities. The middle and downstream parts of the battery value chain are already well developed, however cell manufacturing and recycling still need to make progress. Recognising the potential of sodium-ion batteries (NiBs), India is actively moving towards its large-scale production.

Research Priorities

Next-generation batteries + sodium-ion batteries + innovative and enhanced batteries for EVs from material design to battery system design + Li-ion cells + lithium-manganese-cobalt-oxide (NMC) batteries + hydrogen energy and fuel cell technologies + optimizing energy storage (grid) + high-performance batteries, materials and production technology + reduction of GHG during the production process + recycling technology + cathode, anode and electrolyte

Funding Instruments

TIME	FUND	FOCUS	BUDGET
2023-2029	Production Linked Incentive (PLI) Scheme 'National Programme on Advanced Chemistry Cell (ACC) Battery Storage	Setting up domestic production capacities of advanced chemistry cells for at least 5 GWh and totalling up to 50 GWh battery capacity	\$ 2,5 billion
2023-2033	PM-eBus Sewa	Deploy a total of 10,000 electric buses in 169 Indian cities within ten years and to create the infrastructure, including charging technology, to operate the e-buses	\$ 6,8 billion (576 billion INR)
2019-2024	FAME India Scheme II	Second Stage of Fame India I supporting electrification of public and shared transportation as well as creation of the charging infrastructure	\$ 1,2 billion