सत्यमेव जयते

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ITUWTSA
NEW DELHI 2024

संयुक्त सचिव
भारत सरकार
नवीन और नवीकरणीय ऊर्जा मंत्रालय
JOINT SECRETARY
GOVERNMENT OF INDIA
MINISTRY OF NEW AND RENEWABLE ENERGY

Foreword

India's energy landscape is undergoing a significant transformation, driven by the growing demand for electricity, the increasing share of renewable energy and need for greater energy security. Government of India has set a target to reach 500 GW of installed electricity capacity from non-fossil fuel sources by 2030. Most of this capacity will be catered by Renewable Energy (RE) sources like solar and wind, which are intermittent in nature. Energy storage has emerged as a key enabler of this transformation, offering a range of benefits including improved grid stability, enhanced renewable energy integration, and increased energy access.

Various types of energy storage, including battery storage, pumped storage, thermal energy storage, hydrogen storage among others are expected to play a role during this transition. While each type has its unique advantages, battery energy storage is particularly significant due to its quick commissioning time and falling costs.

Currently India has already installed around 211 GW of non-fossil installed electric capacity, however, the installed capacity of grid scale Battery Energy Storage System (BESS) in the country is around 220 MWh only. In addition, tenders for over 16 GWh of grid scale BESS are currently active or awarded. To meet the emerging demand of round the clock, Firm and Dispatchable RE a significant increase in grid scale BESS is expected. According to the Central Electricity Authority (CEA), anticipated requirement of energy storage through BESS will increase to 35 GWh by the year 2026-27 and 208 GWh by the year 2029-30.

The Government of India has launched various schemes and guidelines to promote the development of BESS in the country. These include setting targets for energy storage called Energy Storage Obligations(ESOs), waiving interstate transmission system (ISTS) charges for BESS projects, offering incentives for manufacturing advanced batteries under ACC-PLI scheme, and providing financial support under viability gap funding scheme for BESS projects.

Considering the BESS targets of the country, in addition to established technologies such as lithium-ion batteries, there is a space for other emerging technologies like sodium-ion batteries, flow batteries etc. There is also a need to promote research & development, testing & certification and skill development for these new technologies besides securing the supply chains. There is also a focus on developing a coherent regulatory framework to incentivize stakeholders to participate in the battery recycling process.

This report on 'Assessment of the Global Landscape for Sodium-Ion Batteries and Their Potential in India,' aims to provides an overview of sodium-ion batteries as an innovative technology with significant potential in India. The report contains the analysis of the sodium-ion battery technology, including its current global landscape, potential market & applications in India, supply-side considerations, and the existing policy ecosystem. The report also identifies areas to address for the deployment and promotion of Sodium-ion batteries in India and provides recommendations for the same.

I am confident that developing a strong ecosystem for adopting emerging battery technologies, such as sodium-ion batteries, will enable the smooth integration of renewable energy into the grid. This will help meet the ambitious targets set for 2030 and contribute to achieving the goal of net zero emissions by 2070.

(Ajay Yadav)

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Acknowledgement

This report was developed under the guidance of the Energy Storage Department of the Ministry of New and Renewable Energy (MNRE), Government of India, with inputs and support provided by Dr. Kuldeep Rana (Scientist E), Mr. Chalapathi Rao (Scientist D), and Mr. Saransh Gupta (Young Professional).

This report was developed as part of the Accelerating Smart Power and Renewable Energy in India (ASPIRE) Programme of the Foreign, Commonwealth & Development Office (FCDO), Government of the United Kingdom. Guidance and inputs were provided by the technical assistance team at FCDO, including Ms. Archana Chauhan (Head- Energy Sector Reforms), Mr. Nishant Singh (Senior Advisor, Energy Security and Lead for Renewable Energy), and Mr. Yash Khandelwal (Policy Advisor- Low Carbon Growth).

We would like to thank KPMG in India for providing support and detailed analysis for the preparation of this report.