Challenges and Opportunities in Advancing Energy Storage Technologies in Indonesia

E. Djubaedah [(1*], A. Nurrohim [(1], J. Santosa [(1], T. Sutardi [(1

[(1] The National Research and Innovation Agency (BRIN) - Indonesia
*corresponding author : euis005@brin.go.id

Indonesia's energy transition agenda highlights the urgent need to accelerate the development and use of energy storage technologies. The goal is to improve grid reliability, support renewable energy integration, and meet national decarbonization targets.

This study examines the strategic challenges and opportunities in scaling energy storage systems across the archipelago. Key barriers include limited domestic manufacturing capacity, regulations, high capital investment requirements, and a fragmented research and innovation ecosystem. Nevertheless, Indonesia holds strong potential through its abundant mineral resources, growing domestic demand for battery-based applications, and strategic position in global supply chains.

An analysis of projected electricity supply and demand through 2060 under both BAU and NZE scenarios involving various renewable energy sources can help anticipate the energy storage requirements needed for integration with the national grid.

To support broader renewable energy adoption, the study recommends integrated approaches such as hybrid power systems, advanced grid management, and optimized storage configurations. By aligning energy storage development with national resilience and sustainability goals, Indonesia can emerge as a competitive and forward-looking player in the global energy landscape.

Keyword : decarbonization, Energy Storage, Energy Transition, Renewable Energy