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Next-Generation Energy Storage Innovation to Tackle Renewable Energy Flexibility Challenges

- MCEE Minister discusses next-generation technology trends and development strategies with energy storage system (ESS) industry experts, including three major battery companies
- Government to pursue systematic policies positioning next-generation energy storage systems as a key national strategy

The Ministry of Climate, Energy and Environment (MCEE, Minister Kim Sungwhan) announced that it will hold the "Next-Generation Energy Storage System (ESS) Technology Development Innovation Roundtable" on the afternoon of May 19 at the Korea Chamber of Commerce and Industry (located in Jung-gu, Seoul), with participation from the ESS industry as well as academia and research institutions.

Based on the "Energy Grand Transition Plan of the People's Sovereign Government*" reported at the Cabinet meeting on April 6, the MCEE is promoting the development of energy storage systems as a key national strategy to expand renewable energy as a primary power source and secure power grid flexibility.

* A plan to fundamentally transform the energy system by reducing dependence on fossil fuels and advancing electrification centered on renewable energy (aiming to achieve a 20% share of power generation by 2030).

To this end, the government plans to pursue key policy measures in parallel, including: early-stage demonstration projects, market creation, and the accumulation of operational data (track records); linkages with public procurement; and the establishment of safety, standards, and certification

systems. In particular, it will systematically build a national strategic investment portfolio based on “short-duration lithium iron phosphate (LFP) + medium- to long-duration non-lithium systems + ultra-long-duration thermal and mechanical storage.”

This roundtable was organized following Minister Kim Sungwhan’s consecutive visits to four next-generation energy storage system sites in the Gyeryong, Daejeon, and Wanju areas around mid-month, where he inspected production processes and the status of technology development. The meeting was intended to discuss the technological direction and industrial strategy Korea should pursue to usher in an era of renewable energy as a primary power source.

* May 13 (Wed) – Vanadium flow battery (Gyeryong-si, Chungcheongnam-do), vanadium ion battery (Daedeok-gu, Daejeon), liquid air energy storage (Yuseong-gu, Daejeon) / May 18 (Mon) – Sodium-ion battery (Wanju-gun, Jeollabuk-do)

The global ESS market* is currently entering the large-scale demonstration and operational phase, with projects ranging from hundreds of megawatts to gigawatts rapidly expanding, particularly in the United States, China, and Europe.

* (BNEF) Global ESS installed capacity is projected to reach 748 gigawatts by 2030 (approximately 2.5 times higher than in 2024); (IEA) 1,200 gigawatts of battery energy storage systems (BESS) will be needed by 2030, with investment expected to exceed USD 262 billion.

However, the domestic industry remains relatively small in scale, with most projects ranging from several megawatts to several tens of megawatts, lagging behind overseas markets. Gaps also exist in terms of large-scale operational data, grid integration, and system integration experience. In the short term, Korea urgently needs to secure competitiveness in energy storage systems based on lithium iron phosphate (LFP), while in the medium to long term, it must strengthen competitiveness and secure an early market position in non-lithium long-duration energy storage systems.

Minister Kim Sungwhan of the MCEE stated, “Energy storage systems are a

key national strategic asset that supports both the expansion of renewable energy and the power grid in the age of artificial intelligence. For renewable energy to become a primary power source going forward, energy storage systems — an essential balancing resource responsible for grid stability and power supply-demand equilibrium — must play a central role.”

He added, “We will directly listen to the field experience and technical insights of the experts participating in this roundtable and actively reflect them in policy design, with the goal of diversifying technologies and accelerating commercialization, including identifying the direction of next-generation energy storage system technologies that will help advance carbon neutrality.”