

# Special Issue on State-of-the-Art Renewable Energy in Korea

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Nowadays, renewable energy plays an important role in nationwide power systems. We previously dealt with the problem of accepting renewable energy; now we deal with utilizing it. This Special Issue addresses three major aspects of the current trend towards the use of renewable energy in South Korea.

The first aspect is a renewable-based power system, where both main and ancillary supplies are sourced from renewable energies. Ko et al. [1] proposed an incentive model for ESS (energy storage system) utilization in order to reduce the fluctuation of wind power. They applied it to Jeju island which has a very high proportion of renewable energy. Similarly, Lee and Kim [2] proposed an economic model for ESS-based frequency regulation from the electricity market price forecast in Korea. ESS has an advantage in terms of faster response to frequency variation than conventional fossil-fuel generators. Ko et al. [3] developed a demand-side management model using a demand response (DR) aggregator and showed real cases in South Korea. The paper analyzes the economic effect of the DR program.

The second aspect is a distribution network for renewable energy. Kim et al. [4] proposed an optimal operation scheduling model using an energy band in a microgrid. The model operates between a distribution network (DN) and microgrid (MG) while minimizing the cost of the DN and maximizing the profit of MG. A major issue of the DN is a scheme for coordination of the protection relays needed for fault currents. The model proposed by Wadood et al. [5] minimizes the total operating time of all relays to prevent excessive interruptions.

The final aspect is a nano grid network technology. Lee [6] and Shin and Geem [7] show examples of a house while Park and del Pobil [8] show a building. This is a meaningful and timely approach with respect to an ESG (Environment, Social, Governance) trend.

The papers compiled in this special issue do not suggest that the increase in renewable energy is simply the replacement of fossil energy. Renewable energy requires many innovations over existing power infrastructure and regulation. These articles show the changing trend in various sectors in Korea.

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