



Addressing Saturation in the Korea Power System

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1. Background

A system management substation in Korea means a substation designated by KEPCO which has saturated access capacity. Output of power generation facilities connected to such system management substations may be controlled even if there is spare capacity in surrounding substations and transmission lines etc.

The construction of substations and transmission lines is being delayed in many areas in Korea. There are concerns that if additional power generation may create system instability not only in the relevant region, but also nationwide.

To tackle such issues, the Ministry of Trade, Industry and Energy and KEPCO have sought to (i) minimise the impact on the output of existing power plants affected by the new entrants, and (ii) induce the distribution of power generation projects to areas with affordable system capacity.

On May 30, 2024, KEPCO designated 103 substations in Gwangju and Jeonnam, 61 in Jeonbuk, 25 on the East Coast, and 16 in Jeju as system management substations.

2. Impact on power generation

A new power generation plant seeking to connect to a system management substation can only do so during a “connection accessibility period”, being at the time of completion of the relevant power grid.

On 26 July 2024, at the 300th Electricity Regulatory Commission meeting, licences for power generation were issued conditional on the relevant power plants being connected to system management substations after reinforcements to the system have been completed (scheduled for December 2031).

Accordingly, it is expected that licences for power plants to be constructed in the Honam area, where every substation is designated as a system management substation, will be issued on condition that the relevant power plant is connected to the substation from January 2032, and for those to be located in the East Coast region, where only part of the

substations are designated as a system management substation, will be issued on condition that the relevant power plant is connected to the substation from July 2026.

3. Resolving system instability

It has been confirmed that the Ministry of Trade, Industry and Energy, KEPCO, and the Korea Power Exchange are reviewing the following measures to resolve the system connection delay or system instability issue. Prospective operators and existing power generation companies that may have output controlled should pay attention to such measures. Measures being considered are as follows.

(a) Shortening the construction time of large-scale transmission lines and forming a consultative body with local governments

KEPCO is currently pursuing the construction of large-scale transmission lines, including five 345kV transmission lines, two high voltage direct current transmission lines (HVDC) on the West Coast, and 36 154kV transmission lines in various areas. KEPCO has announced a total budget of KRW 56.5 trillion (approx. USD 4 billion) to be invested in transmission and substation facilities.

The other priority of KEPCO is to reduce construction times and to set up regional power system consultative bodies to ensure the prompt approval and permits being granted by local governments.

(b) Possible termination of network use agreements and granting of conditional power generation licences

KEPCO seeks to clean up network use agreements entered into with business operators who do not actually operate a power generation business and to grant conditional power generation licences for those which are equipped with energy storage systems.

(c) Compensation for those who have output controlled

From October 2024, for a power generation business which has signed a contract with the Korea Power Exchange and has been the subject of output control will be entitled to compensation on an opportunity cost basis (expected profit-expected cost) for the reduced power generation due to output control.

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