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## **Impacts of CCS and Electro-hydrogen on Decarbonization Path of Power System**

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### **Abstract**

CCS (Carbon Capture and Storage) and Electro-Hydrogen are both key technologies for the realization of power system neutrality, and they will support the different decarbonization paths of power system respectively. In this paper, the orientation and basic features of CCS and electro-hydrogen are analyzed firstly, and then the impacts of CCS and electro-hydrogen on decarbonization path are analyzed from the aspects of energy & power balance and system security support capabilities of power system. For energy and power balance, CCS is very helpful to maintain the energy and power support capability of power system by reserving more thermal plants, however, it also should be pointed out that additional energy consumption of CCS have to be accounted.

Electro-hydrogen is mainly to tackle the long-period energy and power balance problem resulted from insufficient wind and solar weather condition in several days, and it is also helpful to relieve the pressure of integration, transmission and consumption of renewable energy in power systems, and therefore to improve the capability of integration and consumption for renewable energy in comprehensive energy systems. For system security support capability, CCS is very helpful to maintain the frequency and voltage support capability of power system by reserving more thermal synchronous generators, which has natural synchronous inertia, synchronous internal voltage, governor for frequency response, and excitation system for voltage regulation.

**note:** This document will be opened to the participants on IERE website before the Forum and opened to the public afterward.