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## Abstract Format

Technologies reshaping the electricity supply industry  
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### **Applications of secondary battery technologies for realizing a low-carbon society**

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#### **Abstract**

Secondary battery technologies are a key to realizing a low-carbon society. The carbon dioxide (CO<sub>2</sub>) emissions resulting from power supply systems and energy demand need to be reduced. Low-carbon electric power generation systems have been developed for renewable energy sources, which often generate power unstably. However, stable electric power supply is necessary for maintaining economic and domestic activities. Connecting electric energy storage systems to power grids enables energy management, backup power, load leveling, frequency regulation, voltage support, and grid stabilization. Secondary battery technologies are expected to be used for electricity storage. In particular, stationary secondary batteries are the type of electric energy storage system that is most suitable for power grid frequency stabilization. Electric energy storage is essential for a resilient, efficient power grid. As the installed capacity of renewable energy generation has increased, several secondary battery energy storage systems have been installed in Japan. Moreover, the aggressive combined use of high-efficiency equipment and low-carbon electric power generation can be expected to substantially reduce the amount of CO<sub>2</sub> emissions. The reduction of CO<sub>2</sub> emissions in the transportation sector has been greatly accelerated by the commercialization of electric vehicles (EVs) equipped with secondary battery systems that are charged by low-carbon electric power generation. More than 5000 quick-charging stations normal charge systems have been installed for charging EV batteries across Japan. Now, EVs are also anticipated to be used for stabilizing the power grid system through the control of EV charging and the applications of EVs for energy storage systems. Secondary batteries are expected to improve in performance and become low cost and non-flammable.

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