

International Conference on Smart Grids (icSmartGrids) 2018

December 4-6, 2018, Nagasaki Prefectural Art Museum, Nagasaki, Japan Keynote Speech,
Hitoshi Hayashiya (Abstract)

**Title : Improvement of Power Supply Efficiency in Railway Power Supply System by
Applying Smart Grid Technologies and Its Future Prospects**

Abstract:

Railway is well known as one of the most efficient transportation modes. In this presentation, the history of rail electrification in Japan, recent trend of electric energy consumption in railway system and our trial to improve power supply efficiency in railway power supply system by applying smart grid technologies are overviewed.

For example, more than 20 energy storage systems have been already installed in d.c. railway power supply system in Japan. The purposes of energy storage system installation are voltage drop compensation, regenerative energy utilization, emergency power supply and substitution for existing substation. We, East Japan Railway Company has already installed 4 energy storage systems for regenerative energy utilization. The effects of these systems will be shown in detail.

Some test results related to future technologies will also be shown. At Ohnuki Substation, charge and discharge of energy storage system were controlled referring to the location of trains and the possibility of total capacity reduction was evaluated. Between Musashisakai and Musasikoganei Station, some loads of railway stations were controlled and the peak power of distribution line was reduced. At Keiyo Depot, the distribution line voltage was controlled to promote reverse flow of residual solar power during the daytime.

Other practical examples related to renewable energy, energy storage and power conversion technologies will be introduced.

Date of presentation: Wednesday, December 5, 2018

Duration of presentation: 1 hour (60 minutes)