

“Evaluation of Li-ion Battery System” and “Demonstration Project of Virtual Power Plant” (tentative)

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Session 1 The value and benefits of energy storage

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Abstract

Kansai Electric Power (KANSAI) is researching several battery related R&D them. In this session, some of them are introduced as followings.

(1) Evaluation of Li-ion Battery System

KANSAI installed TOSHIBA’s Lithium Ion Battery (SCiB) in our laboratory and started its operation as one element of Energy Management System (EMS) of R&D Center in 2013. The system configuration of the battery is 100kW-300kWh.

KANSAI decided to adopt SCiB because of its long life and its safety.

Battery follows the order of EMS, in basic ‘Peak Shift Operation’. Scheduled performance test is conducted. We focused ‘available capacity’ and continuously checked it’s seasonal variation and change with time.

So far, there is not a significant deterioration in its performance.

In addition, KANSAI added the function to use this battery for Frequency Control for Grid stability. KANSASI continues to operate this Battery to evaluate in the long time operation.

(2) Demonstration Project of Virtual Power Plant (VPP)

Bundling end-use devices scattered across power grids through the IoT (Internet of Things), will create one “virtual” power plant, where demand and supply on the grid can be more effectively balanced by controlling demand. Enhancing the system for controlling demand will make it easier to accommodate renewable energy sources in the power grid.

KANSAI applied and started VPP demonstration project funded by Japanese Government in 2016.

Aggregators will become to be able to provide services to retailers, grid system operators, renewable energy generators and consumers & communities by controlling end-use devices and adjusting for increase and decrease in electricity demand remotely in the future.

The Virtual Power Plant is designed to control the resources such as Battery, Electric Vehicle (EV) and Heat Pump Heat Warmer. Under the experimental project, some of these resources are operated through IOT, as per the monitoring and controlling systems established by the participating companies. Expanding the scale and range of resources to be controlled by the Virtual Power Plant will also be considered in the following step of the project.