

Development of Degradation Diagnosis and Forecast Technology for Battery Energy Storage System

Aiming to build an optimal operation system that balances safety and economy

March 31, 2025 Osaka Gas Co., Ltd. KRI, Inc.

Osaka Gas Co., Ltd. (Representative Director and President: Masataka Fujiwara; hereinafter "Osaka Gas") and its wholly owned subsidiary KRI, Inc. (Representative Director and President: Hiroaki Shigesada; hereinafter "KRI") announced today that, using KRI's technology, they have developed deterioration diagnosis and Forecast technology for battery energy storage system(hereinafter referred to as "the Technology") for grid storage batteries¹ and other equipment.

Going forward, the companies aim to build an optimized battery operation system by combining the Technology with Osaka Gas's power trading know-how.

In recent years, with expansion of the adoption of renewable energy, the need for storage batteries that help reduce the output fluctuations of renewable energy has become increasingly important. Osaka Gas decided to enter the grid storage battery business in February 2023 and is currently working on projects at three locations² across Japan.

Meanwhile, one characteristic of storage batteries is that if charge and discharge control appropriate for the State of Health is not in place, rapid deterioration may occur, leading to a reduction in safety. In particular, there is a need to develop operation technologies for large battery energy storage system to ensure their continued safe use over the long term.

Based on the experience and expertise that KRI has accumulated in the analysis and evaluation of storage batteries, Osaka Gas and KRI have been conducting research into deterioration diagnosis and lifespan prediction for storage batteries.

The two companies have now applied these technologies to battery energy storage system, developing technology that not only diagnoses the State of Health of storage batteries from monitoring data such as in-service voltage, current, and temperature but also predicts future deterioration for each operating pattern.

By combining theoretical models based on physical phenomena with data, the Technology makes it possible to find out the optimal operating method from a wider range of operating pattern options, compared to conventional prediction methods that use only data. This will enable the battery to operate for a long period of time while suppressing deterioration.

Going forward, Osaka Gas will gradually apply the Technology to its own battery storage business and proceed with detailed design work for practical application. By combining the Technology with the power trading know-how that Osaka Gas has developed, the company aims to build a system that optimizes the operation of batteries to achieve both long battery life and safety, as well as the economic efficiency of electricity market transactions.



Years of use

Furthermore, in the storage battery business as a whole, the Daigas Group will utilize its comprehensive strengths and, in addition to the grid storage battery business in which it is already involved, will also study storage batteries installed with renewable energy facilities, with the aim of becoming one of Japan's top storage battery operating companies.

The Daigas Group, under the "Energy Transition 2050" initiative announced in February 2025, remains committed to developing technologies and services that contribute to a decarbonized society and solving social issues, including climate change, in order to become a corporate group that contributes to the "further evolution" of customers' lives and businesses.

- 1: Refers to large-scale storage batteries directly connected to the power grid.
- 2: Osaka Gas is involved the following grid storage battery businesses:
 - Senri Grid Storage Plant (rated power output 11,000 kW, rated capacity 23,000 kWh) (Announced in June 2023)

https://www.osakagas.co.jp/en/whatsnew/__icsFiles/afieldfile/2023/06/15/230607.pdf

- Takeo Grid Storage Plant (rated power output 2,000 kW, rated capacity 8,000 kWh) (Announced in July 2024)
- https://www.osakagas.co.jp/en/whatsnew/__icsFiles/afieldfile/2024/07/10/240711_1.pdf
- Kamiosatsu Grid Storage Plant (rated power output 25,000 kW, rated capacity 50,000 kWh) (Announced in March 2025)

https://www.osakagas.co.jp/en/whatsnew/__icsFiles/afieldfile/2025/04/09/250304_2.pdf