

News Release

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Demonstration Project Starts in Indonesia on the Use of Anomaly Predictive Diagnostics for Geothermal Power Plants *— To reduce the rate of problem occurrences at power plants by 20% with IoT and AI Technologies —*

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New Energy and Industrial Technology Development Organization (NEDO)

Toshiba Energy Systems & Solutions Corporation

New Energy and Industrial Technology Development Organization (NEDO) and Toshiba Energy Systems & Solutions Corporation (Toshiba ESS), a leading supplier of integrated energy solutions, today announced that Toshiba ESS has started a demonstration project of anomaly predictive diagnosis to improve geothermal power plant utilization factor using Internet of Things (IoT) and artificial intelligence (AI) technologies. Funded by NEDO with the aim to expand the advanced use of geothermal power generation, this demonstration is scheduled from October 2019 to February 2021 and held in Patuha Geothermal Power Plant*¹ in West Java, Indonesia owned by PT Geo Dipa Energi (Persero) (GDE), Indonesia's state-owned geothermal energy company.

In this demonstration, Toshiba ESS will implement an anomaly predictive diagnostics technology using big data analysis which Toshiba ESS has developed since 2018 under NEDO's grant, on an actual power generation equipment in Indonesia in order to review the technology's ability to predict anomalies ahead of time, while validating the effectiveness of this technology. Indonesia is a country that is actively utilizing geothermal resources for power generation.

Through this demonstration, Toshiba ESS aims to lower the rate of problem occurrences at geothermal power plants by 20% and reduce unplanned outage period in power stations. Increasing utilization factor leads to an increase of power generation amount and a reduction of the generation cost. It can be expected that the project will contribute to higher adoption of geothermal energy.



Image 1 Patuha Geothermal Power Plant

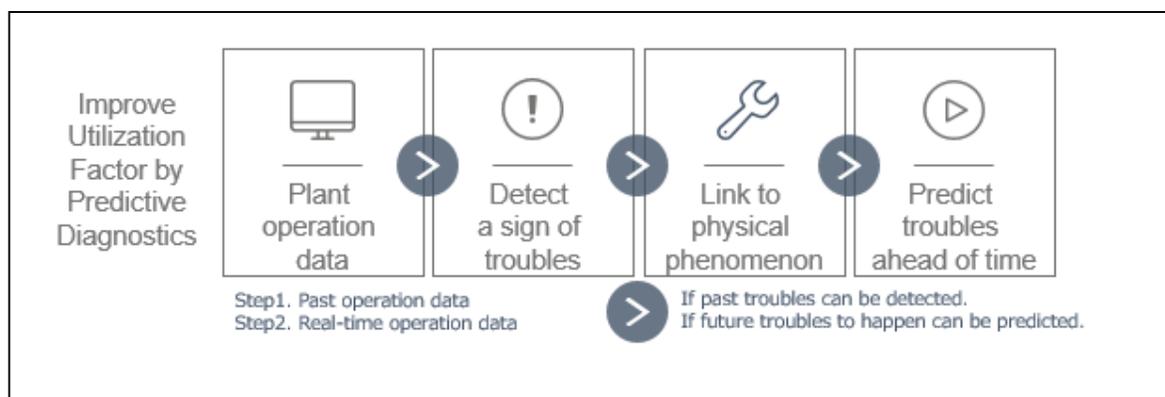


Image 2 Predictive diagnostics technology's outline

1. Background

The 5th Strategic Energy Plan, approved by the Japanese Cabinet in July 2018, presents the basic direction of Japan's energy policy towards 2030, and further towards 2050 including the path to decarbonization. The plan emphasizes the strengthening of efforts to achieve an optimal energy mix and a low cost renewable energy that is identified to be the primary energy source towards 2030. Japan, as a country with the third largest geothermal resource potential in the world, is expecting geothermal power generation to function as base load energy source*² since this renewable resource can provide stable power output. The installed capacity of geothermal power generation in Japan is targeted to reach 1,550 MW by 2030.

This energy transition plan is promoting new geothermal power plant construction projects in Japan. However, the utilization factor*³ of the existing geothermal power stations is low at about 60% which is due to the unplanned outages caused by problems with deterioration in equipment and the planned outages for maintenance work needed. For example, scales formed in turbines need to be cleared to remove any deposits from geothermal steam. Thus, increasing the utilization factor is a pressing issue to improve the economics of geothermal power generation. To address the challenge, Toshiba Energy Systems & Solutions Corporation (Toshiba ESS), has started a technology development that applies IoT and AI technologies to actual power plants to improve the utilization factor of geothermal power plants since 2018. This initiative is funded by New Energy and Industrial Technology Development Organization (NEDO)'s geothermal power generation research and development project.

2. Predictive Diagnostics Technology and Project Outline

Toshiba ESS will install an anomaly predictive diagnostics system using big data analysis in PT Geo Dipa Energi (Persero) (GDE)'s Patuha Geothermal Power Plant and examine the plant operation data on a real-time basis. This predictive diagnostics technology analyzes the power plant's past and daily operating data through various sensors with big data analytics and predicts anomalies for the equipment ahead of time, detecting potential problems during normal operations. The results of the analysis are consequently shared with GDE's Headquarters and Toshiba ESS engineering sites through information and communication technology (ICT) for review, which allows Toshiba ESS to verify the technology as a whole system.



Image 3 Anomaly predictive diagnostics system installed at Patuha Geothermal Power Plant



Image 4 A reference image of monitoring power plant data remotely

Notes

- *1 Patuha Geothermal Power Plant is owned by GDE, an Indonesian electric power company. It started commercial operation in 2014 and has rated power generation capacity of 60MW.
- *2 Source of energy that is low cost and stable, and it can operate continuously day and night.
- *3 The ratio of the actual amount of electric power generation to the ideal amount of electrical power generation if the power plant operates with its 100% power output for a certain period.

3. For more information, please contact:

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