Modernizing renewable power plants with zenon to optimize operations

Improved oversight at DaeMyoungEnergy by EMS

DaeMyoungEnergy was founded in 2000 to address the need for renewable energy management and investment in Korea. Since then, the business has grown rapidly and was listed on KOSDAQ, the Korean stock exchange, in 2022. The company's employees operate and manage wind and solar power and energy storage systems across Korea, with the company headquartered in the Korean capital of Seoul.

THE NEED FOR CENTRAL OVERSIGHT OF DISPERSED POWER PLANTS

DaeMyoungEnergy operates several dispersed wind and solar power plants across Korea in the Taebaek, Cheongsong, Pohang, Yangsan, Geochang, Hwasun, and Yeongam regions. The company's management team wanted to improve the central oversight and management of these locations.

Rapid growth over two decades meant there had been little time to standardize. Each plant had unique configuration and data formats. This made it very difficult to share insights and knowledge between sites and across the company. The incumbent power monitoring system was slow to operate and lacked control functions. The data it displayed was simplistic and reports were inconveniently structured for field personnel to use.

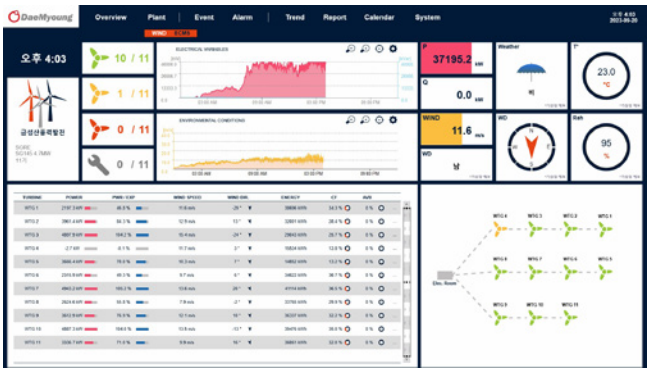
The team at headquarters was dependent on local managers preparing and sharing reports, resulting in several days' delay when investigating problems or requesting detailed performance information.

CHOOSING ZENON FOR ITS PROVEN TRACK RECORD IN ENERGY

The team at DaeMyoungEnergy began looking for a suitable overarching supervisory system in May 2022. Led by GwangCheol Roh, Managing Director at DaeMyoungEnergy, it sought a solution that was easy to operate and manage and which provided the necessary connectivity to the company's diverse hardware and software systems.

Lait System Co Ltd, a Korean systems integrator with deep expertise in the energy sector, recommended the zenon

Overview of the performance of the nine dispersed wind and solar power plants.



Detailed overview of the real-time performance metrics of a wind plant.

software platform from the Austrian industrial and energy automation specialists COPA-DATA.

"We recognized that zenon's strengths were a great match for our requirements," explains GwangCheol Roh. "zenon is user-friendly and is hardware and software agnostic. zenon simplifies the integration with our other systems and offers the customizable reporting options we need. The fact that it is recommended by companies with extensive experience in the power and renewable energy sector was a further reason for our selection of zenon."

"With zenon, COPA-DATA offers the most complete solution for the energy sector," confirms Hyeon Hui Choe, CEO at Lait System, the appointed system integrator working alongside the DaeMyoungEnergy team.

DELIVERING AN OVERARCHING VIEW WITH ZENON

One of the main reasons for selecting zenon was its unparalleled connectivity. zenon natively supports more than 300 protocols and drivers, including IEC 61850, Modbus Energy, OPC UA/DA, and Remote RT, which were essential in this project.

zenon was implemented as a gateway for nine power plants and one substation of DaeMyoungEnergy, enabling data from each plant to be presented in a standard format. The project was completed across all sites over a period of twelve months, with monitoring and control systems for two new power plants built from scratch using zenon.

Lait System was able to customize the different functions and requirements for each power plant while providing the comprehensive central oversight which the client needed.

COMPREHENSIVE CONNECTIVITY AND SIMPLIFIED CONFIGURATION

To configure zenon, engineers need only to configure parameters – no coding is required. This simplified configuration saves time and minimizes the potential for error.

zenon Process Gateway enables easy integration with other systems. Data from a variety of wind turbine generators, including Siemens Gamesa, GE, HYUNDAI ELECTRIC, Mita-Teknik and Sungrow hardware, was integrated using the OPC protocol.

"zenon's ease of use – not only for operators but for system developers – was fundamental to our decision to standardize on zenon," explains GwangCheol Roh. "The integrated IEC 61131-3 programming environment and soft PLC functionality made our job especially easy."

INTEGRATED LOGIC ADDS TO ZENON'S APPEAL

zenon Logic is an IEC 61131-3 programming environment that is designed as a soft PLC for PC and CE platforms. It supports all five defined programming languages of IEC 61131-3, an essential standard in the energy industry, and enables complex logarithmic calculations to be implemented easily.

Power calculation coding was implemented in zenon Logic Studio to calculate the electricity usage and the electricity production tariff for each hour and generator. This made it possible to compensate for the errors in the cumulative generation statistics issued by the metering equipment.

Following the deployment of zenon, the difficulties reported by each power plant regarding the operation of the power grid have been eliminated.

> *With zenon, we are able to run our facilities more efficiently, which in turn improves our performance and allows us to attract more funds to invest in additional renewable energy projects. In this way, zenon is directly and indirectly contributing to the growth of our business and the creation of a sustainable energy infrastructure in the country.*

GWANGCHEOL ROH,
MANAGING DIRECTOR AT DAEMYOUNGENERGY

EASIER AND FASTER WORKFLOWS FOR OPERATORS

As well as making life easier for engineers, the implementation has also created a better working environment for staff in the field. zenon's user-friendly graphical screens make navigation easier.

With local screens now visible at headquarters, field personnel and HQ staff can now view the same control and power measurement status information.

An alarm system based on SMS messaging has also been introduced. This text messaging service is grouped by plant and facility, so that each plant representative receives information about their facility. The person at headquarters, who is responsible for all plants, receives information about every plant. This has greatly reduced the response time for restoration when a problem occurs.

ENHANCED REPORTING CREATES REAL TIME SAVINGS

Having standardized the data from each of the power plants, so that it is displayed in real time in zenon, the next step was to standardize and enhance the associated reporting. Hourly power production reports were created in zenon Historian. Reports are available for each plant site and at headquarters.

"Because we share the same report, we have eliminated the delays when gathering separate reports from each plant," states GwangCheol Roh. "Furthermore, if the headquarters team wishes to investigate or respond to errors, alarms or unexpected readings, it can do so immediately without waiting on local managers to provide detailed information."

This has freed headquarters operations staff to redirect their time to more proactive work. They now spend an average of four days per month more time on the ground.

"The seamless sharing of operational screens and data between headquarters and individual power plants has reduced unnecessary emails, reporting tasks and business travel – creating significant efficiencies for us," reports GwangCheol Roh. "Time spent on paperwork at each power plant has been reduced by an average of two days per month. In addition, we estimate that travel time for headquarters management and operations personnel has been reduced by around two days per month."

A MODEL FOR FUTURE RENEWABLE ENERGY SYSTEMS

Hyeon Hui Choe confirms, "Through zenon Logic and zenon Process Gateway, zenon's stable archive and easily connectible

report builder, we were able to satisfy all of the customer's requirements."

DaeMyoungEnergy is delighted by the results of its standardization on zenon as its renewable energy control, monitoring and reporting solution. The efficiencies and performance improvements it has achieved by deploying zenon are helping it to attract and secure new investment for its ambitious renewable energy projects.

Lait System plans to leverage zenon to expand its power management system and energy management system business in the growing energy storage and offshore wind markets.

"The project serves as a valuable reference for expanding into large-scale, integrated offshore wind power systems," advises GwangCheol Roh. "With zenon, we are able to run our facilities more efficiently, which in turn improves our performance and allows us to attract more funds to invest in additional renewable energy projects. In this way, zenon is directly and indirectly contributing to the growth of our business and the creation of a sustainable energy infrastructure in the country."

HIGHLIGHTS:

Standardized control systems to enable a centralized dynamic performance overview:

- zenon Logic soft PLC
- Integrated IEC 61131-3 programming environment
- Support for 300+ communication protocols and drivers, including OPC UA
- zenon Process Gateway
- Flexible reporting with alerts to SMS
- zenon Historian for hourly power production reports