ASIA CLEAN ENERGY FORUM 2025

Empowering the Future: Clean Energy Innovations, Regional Cooperation and Integration, and Financing Solutions

2–6 June | ADB Headquarters

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2–6 June | ADB Headquarters, Manila

ADB

Innovative Decentralized Renewable Energy Monitoring System in Korea:

Supporting Sustainable Energy Transition

04 June 2023 | 4–5 p.m. (GM T+8)

In cooperation with

60Hertz

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Empowering the Future: Clean Energy Innovations,
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2–6 June | ADB Headquarters, Manila

ADB

Hyein Park

Project Manager (CEO Staff)
60Hertz Inc.

Featured Speaker

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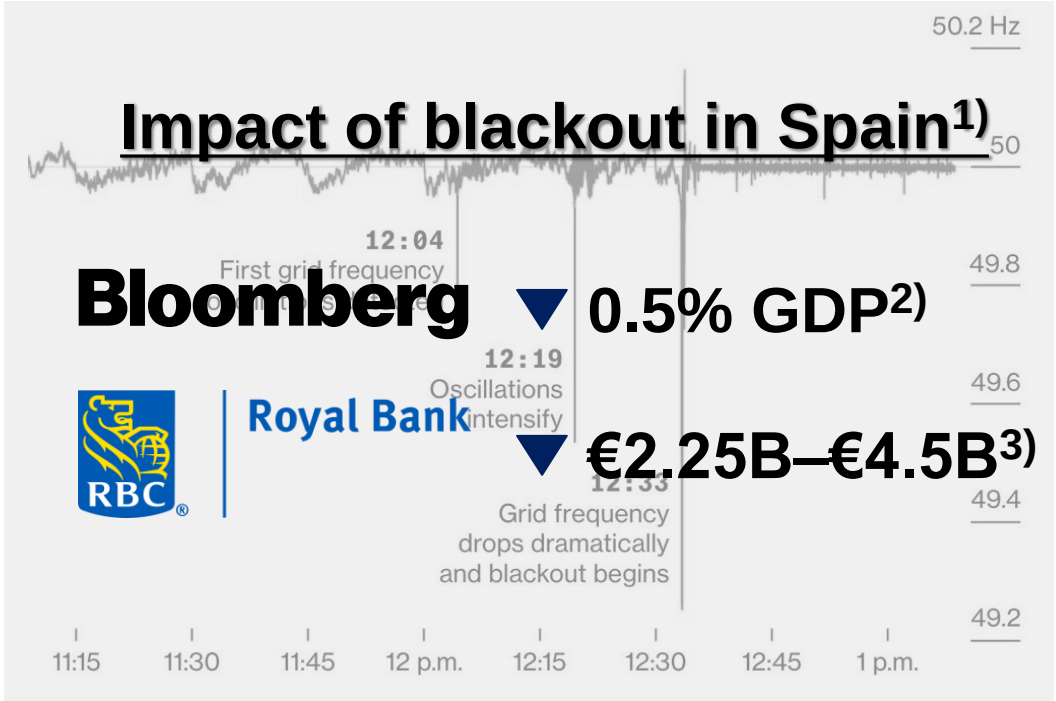
Introduction

The Critical Impact of Grid Instability: Lessons from Spain's Blackout

© Reuters, Jon Nazca



1) Gridradar, Bloomberg Graphics
2) https://www.bloomberg.com/news/articles/2025-05-06/spanish-economy-to-have-a-400-million-hit-on-blacko-caixabank-says
3) https://www.reuters.com/world/europe/spains-power-generation-nearly-back-normal-after-monday-blackout-says-grid-2025-04-29/

Introduction Rising Renewables Demand Smarter Grid Management

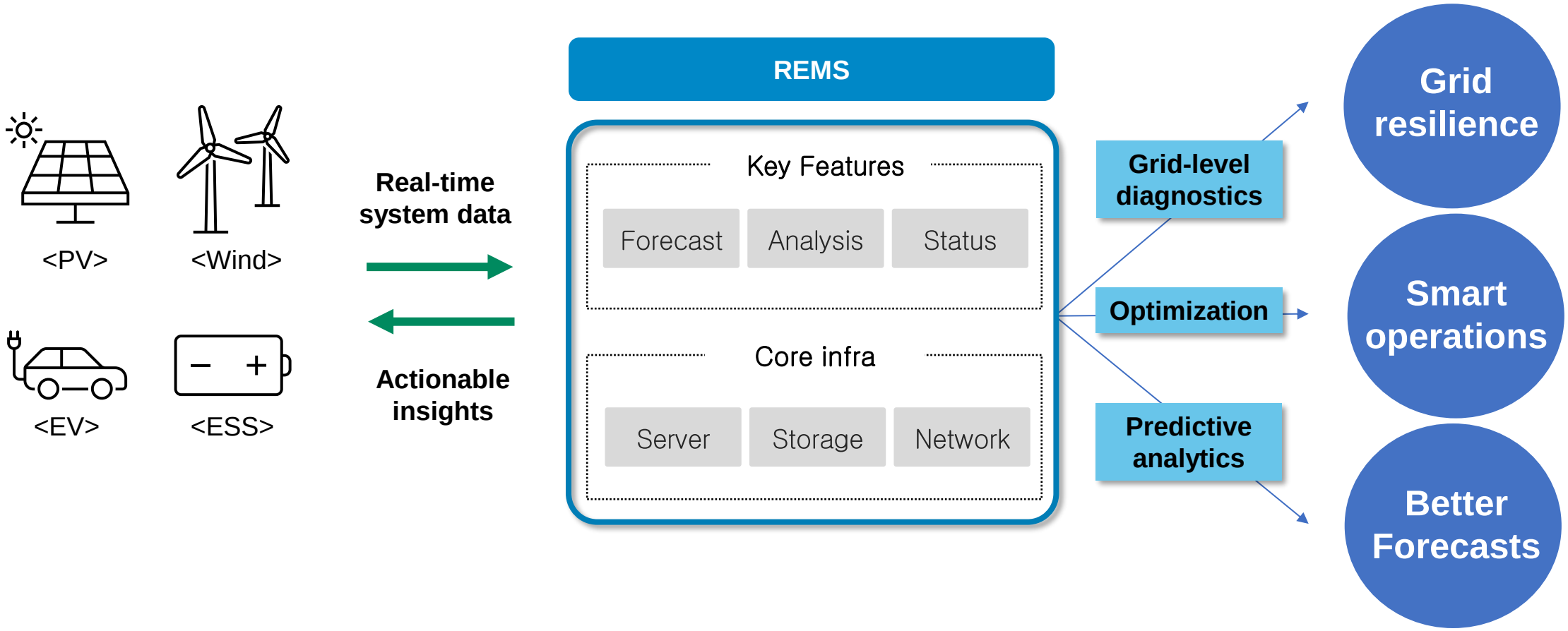
Factors Behind the Spain Blackout

1. Sudden drop in solar output
2. Low inertia in renewable-heavy grids
3. Limited real-time grid visibility

REMS

Renewable Energy Monitoring System

Introduction REMS Enables Predictive, Data-Driven Grid Management



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Solution KEA's REMS: A Nationwide Monitoring Backbone

KEA's REMS

© KEA

1. **182,500 Unit** — **Nationwide** number of power plants currently connected to REMS
2. **906.1 MW** — **Nationwide** installed electricity capacity connected to REMS
3. **7.65 TWh** — **Cumulative** electricity generation from REMS-connected plant

Solution KEA's REMS Solution in Korea (1/4)

Main Dashboard

전국 | 전체 | ※ 연동된 설비 기준

지역	태양광			지열			태양열		
	개	설비용량 (MW)	금일발전량 (MWh)	개	설비용량 (MW)	금일사용량 (kWh)	개	설비용량 (km^2)	금일사용량 (kWh)
서울	507	7.2	0.01	7	5.4	14.00	1	0.4	2.0
부산	2,304	18.5	0.00	4	3.5	0.50	27	0.2	0.3
대구	2,839	26.0	-	151	3.0	602.60	77	0.7	14.0
인천	2,957	25.7	-	29	0.5	52.60	43	2.6	27.1
광주	7,659	33.6	0.01	-	-	-	323	2.1	23.0
대전	4,968	25.1	-	83	1.5	51.60	135	1.2	13.2

전국 전기에너지

금일발전량 72.9 kWh

금일CO_2저감량 0 tCO_2

설비용량 906.1 MW

누적발전량 3,230,190.4 MWh

전국 열에너지

금일사용량 10,075 kWh

금일CO_2저감량 4.7 tCO_2

설비용량(태양열 / 지열) 155.4 km^2 / 200.2 MW

누적사용량 3,719,211.8 MWh

전국 운영현황

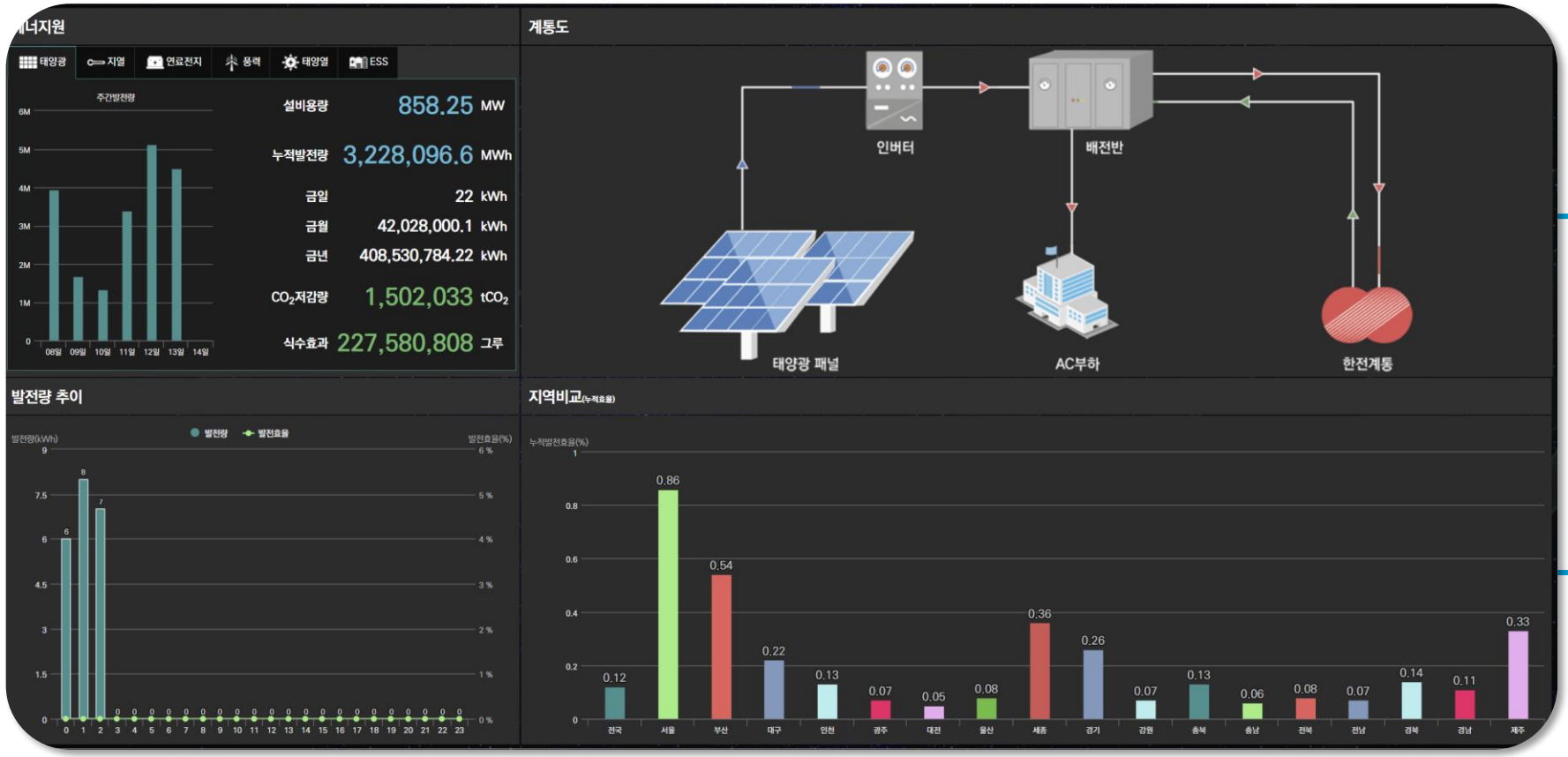
전체		태양광	
정상	176,364 개	정상	160,164 개
미작동	839 개	미작동	698 개
경고	274 개	경고	254 개
고장	5,025 개	고장	3,381 개
총계	182,502 개	총계	164,497 개

Provides status information by region and energy source

Provides operational status and key performance indicators
(e.g., cumulative generation, GHG reduction)

Solution KEA's REMS Solution in Korea (2/4)

Dashboard by energy source

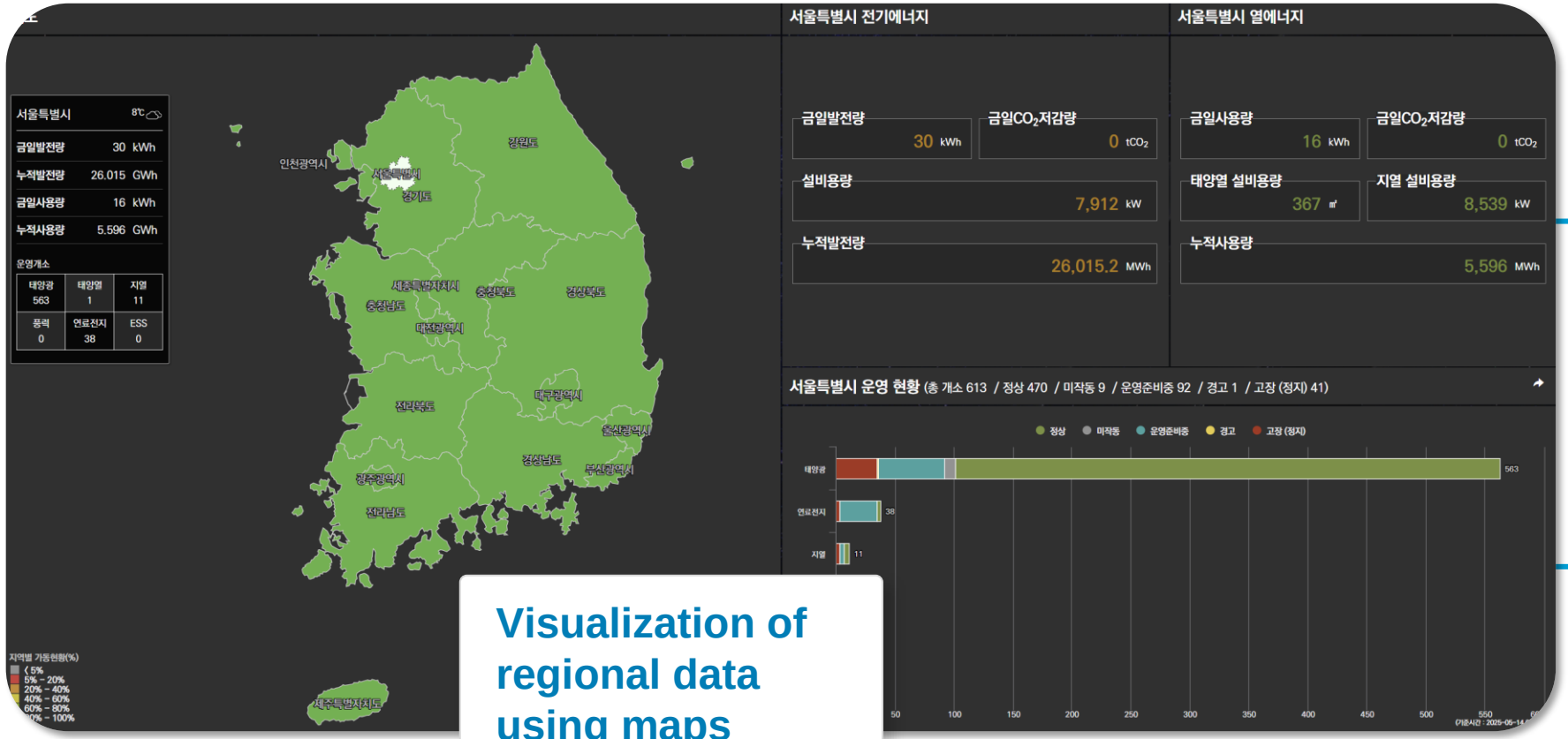


Generation, capacity, and grid information

Power generation trends by time and region

Solution KEA's REMS Solution in Korea (3/4)

Dashboard by region



Visualization of regional data using maps

Information on key indicators (e.g., cumulative generation, GHG reduction)

Information on the operational status of each energy source

Solution KEA's REMS Solution in Korea (4/4)

Analysis

Generation Comparison by Producer within Same Source and Region

Offers manufacturer data and diverse performance insights

Solution Systematic Monitoring for Sustainable Energy Goals

Maximizing efficiency
through integrated monitoring of renewable energy power plants

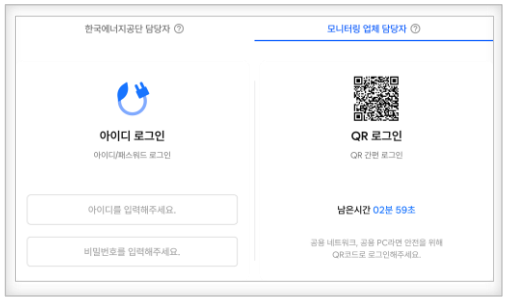
Management innovation
through real-time data analysis

Enhancing renewable energy transparency
for environmental goals

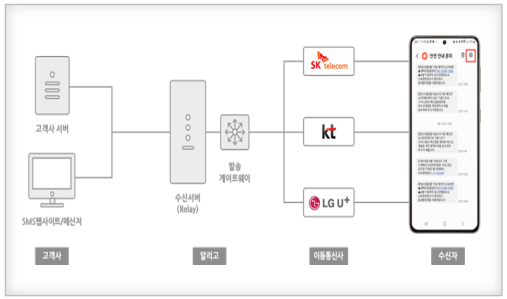
Expanding the adoption of renewable energy and achieving environmental goals through systematic data management utilizing the system

Contents

Next Next-Gen REMS: Smarter, Faster, Stronger

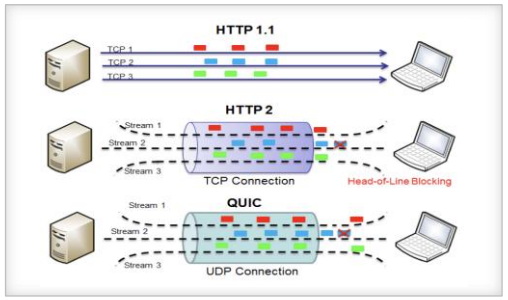


Enhanced convenience

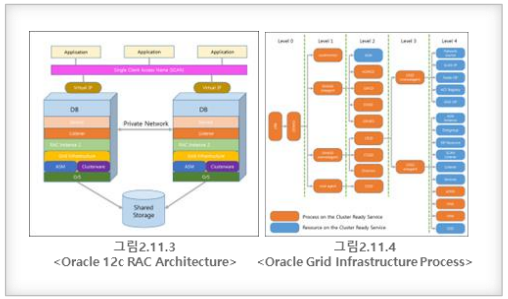


External data integration and system advancement

Next-Generation REMS



Strengthened asset management



Improved system stability

Next AI-Powered Anomaly Detection

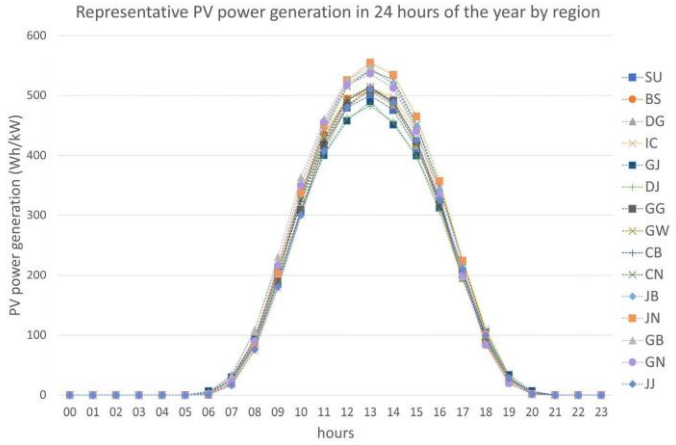
AI weather prediction

Real-time anomaly detection using weather-based prediction

Power plant clustering

Identifying abnormal facilities through location-based pattern analysis

Historical patterns



Anomaly detection based on short/long-term historical patterns

Next

From Satellite to Forecast: AI Weather Integration

AI weather prediction

Weather Data Integration

Collects weather data from satellites and public sources

Weather Forecast Calculation

Extracts key weather variables influencing power generation (e.g., solar irradiance)

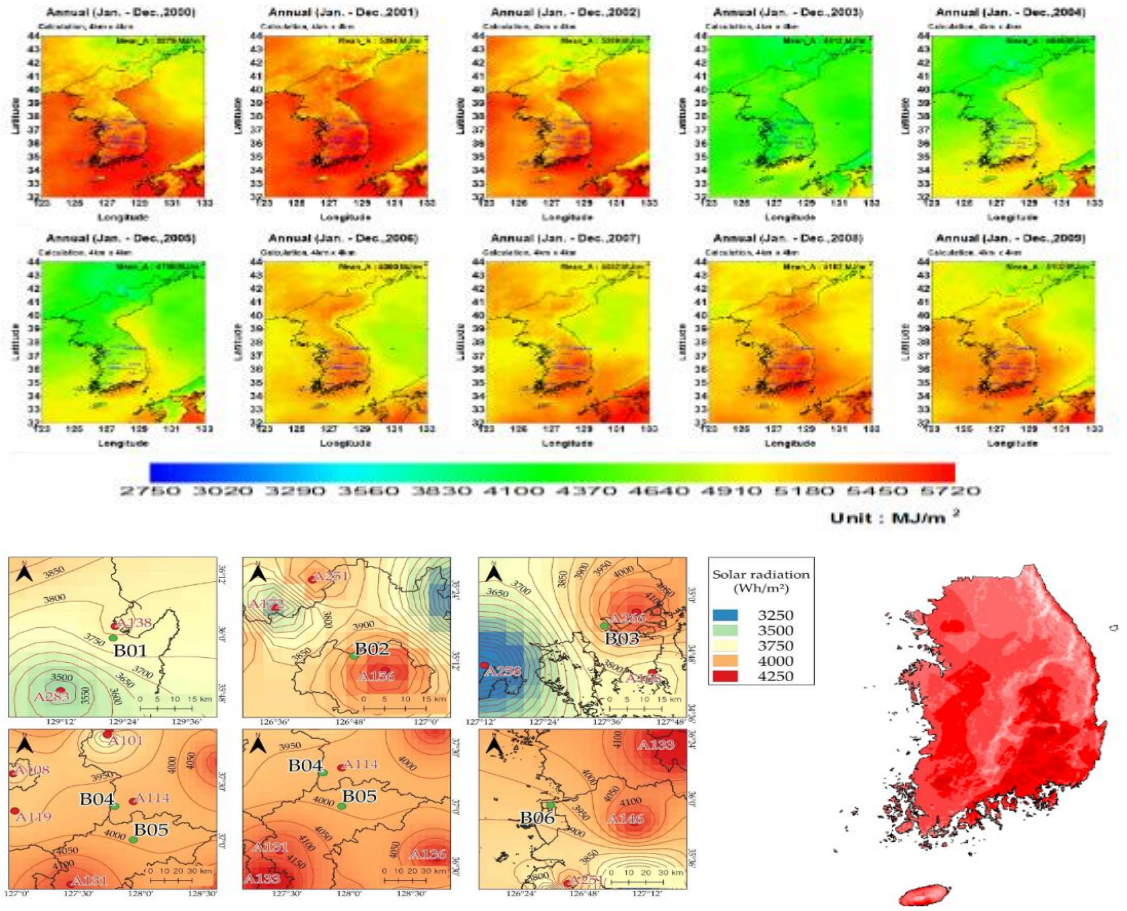
Power Generation Prediction

AI forecasts irradiance and predicts power generation for each plant

Anomaly Detection

Detects anomalies by comparing predicted vs. actual power generation

< Weather Data-Based Solar Irradiance Prediction >



Next Clustering Plants for Pattern-Based Monitoring

Power plant clustering

Identifying Normal Data

Samples normal facilities and cleans data by removing noise

Clustering

Clusters power plants with similar generation patterns (e.g., using K-Means)

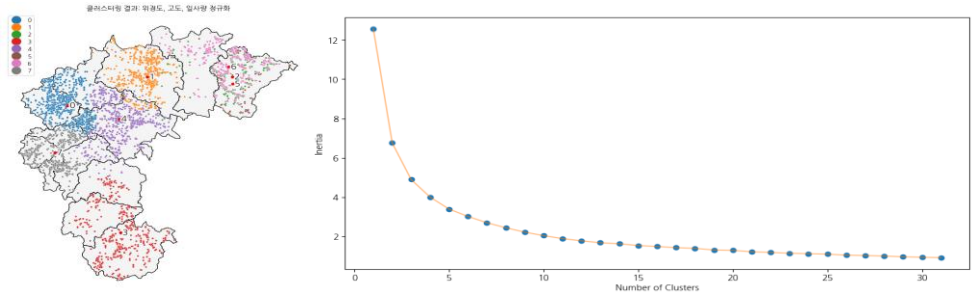
Deriving Patterns

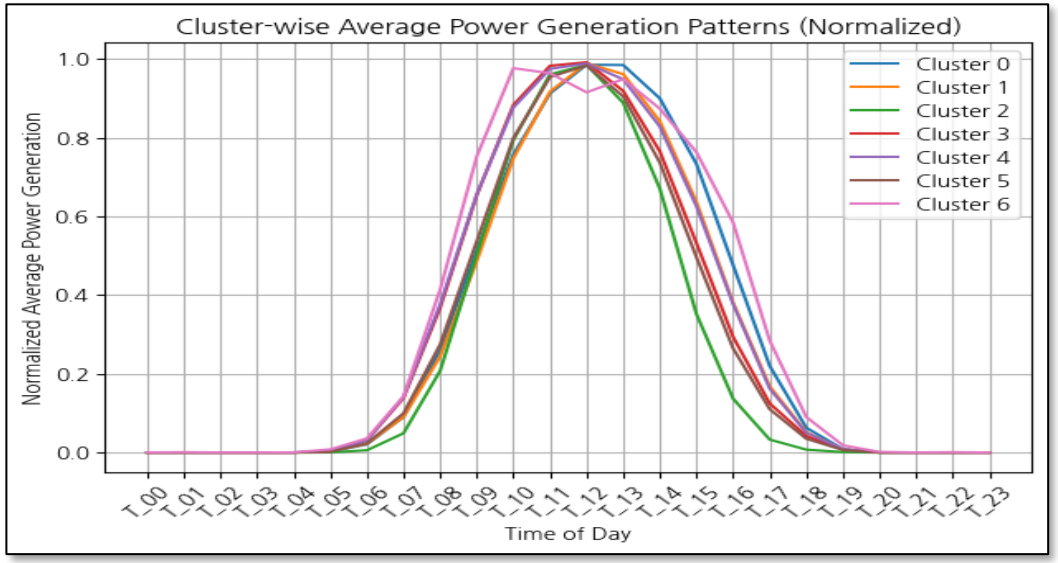
Extracts representative generation curves for each cluster

Anomaly Detection

Compares actual generation to the cluster's typical curve

< Regional Clustering of Power Plants >





Next Historical Patterns Inform Today's Operations

Historical patterns

Time-Specific Data Collection
Extracts recent data from the target facility within a specific timeframe

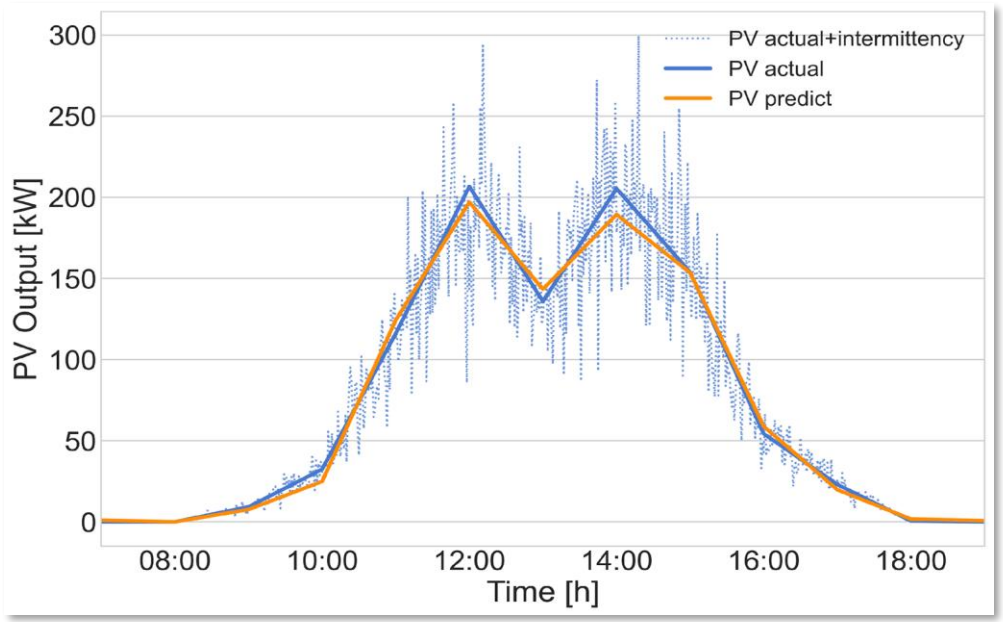
Year-Specific Seasonal Data
Extracts historical seasonal or annual generation data for comparison

Pattern Extraction
Analyzes recent and historical data for time-based generation patterns

Anomaly Detection
Flags significant deviations of actual generation from the identified pattern as anomalies

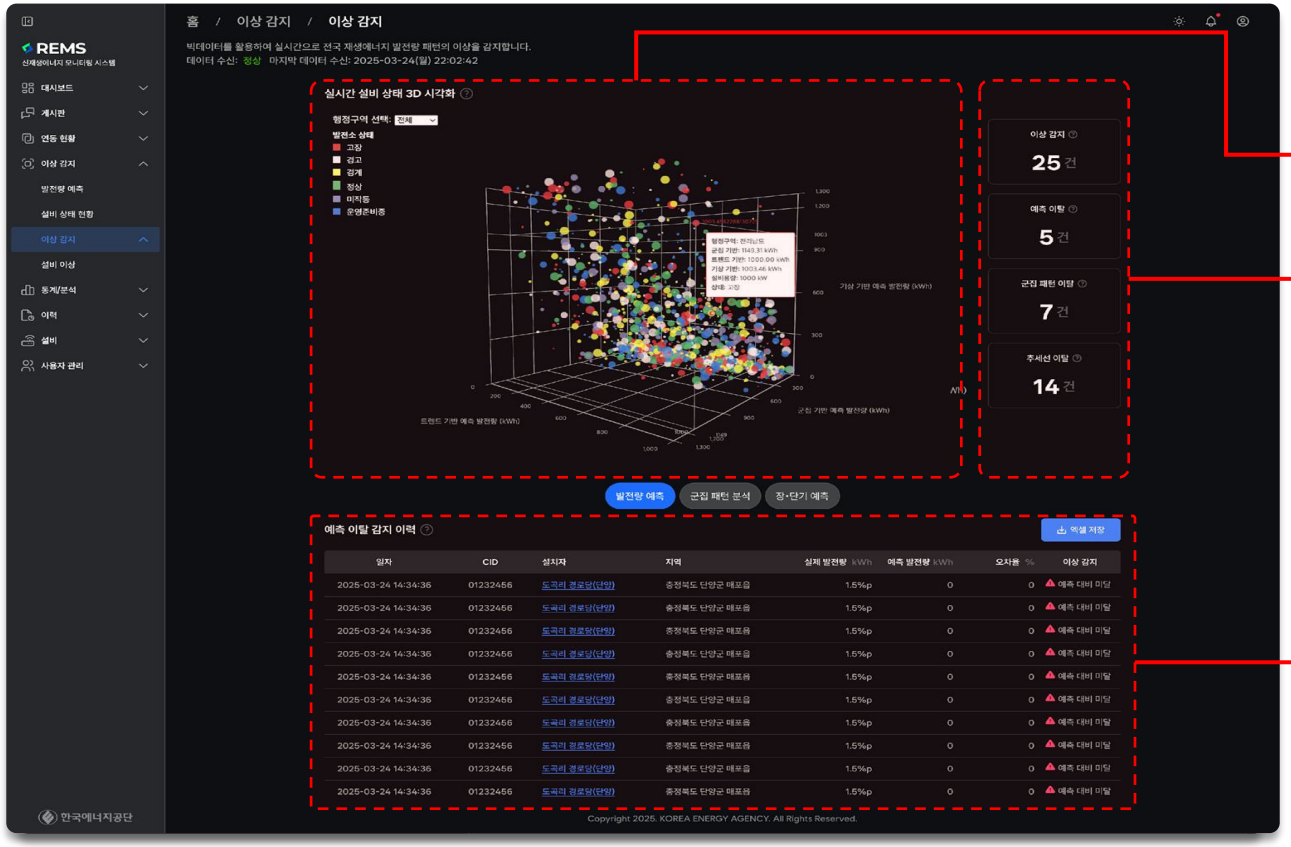
< Time-Specific Generation Analysis >

Time-Specific Data (ex. ±1 ~ 2h) + **Year-Specific Seasonal Data**



Next Live Anomaly Detection for Every Facility

Anomaly Detection



Real-Time Monitoring

Track individual facility data in real time

Summary

Displays current anomaly detection outcomes

Records

Real-time updates of recent anomalies and provide direct link to detailed views

Next Scaling with Intelligence

Monitoring and anomaly detection for power facilities across Korea

GPU-Based System

- Enhances AI model performance and accelerates statistical/deep learning algorithms using GPU.

Maintenance Enhancement

- Links anomaly detection with maintenance systems and strengthens individual facility management.

AI-Based Site Recommendation

- Suggests new facility locations based on generation data analysis and improves renewable energy economic feasibility/planning.

Launch in August 2025, Upgrade in July 2026

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Next Expanding Korean Case Applications

Collaboration with Mongolia's NDC

PRESS

60Hertz and Mongolia's National Dispatching Center Collaborate on "Energy Highway" MOU Signed for AI-Powered Virtual Power Plant Development

April 25, 2025

- Development of AI-based power generation forecasting and control technologies
- Establishment of customized renewable energy monitoring systems
- Technical training and knowledge-sharing programs

Enhance the grid's renewable energy hosting capacity and operational stability

60Hertz Our Vision, Our Impact: Driving the Carbon-Neutral Future

Jongkyu Kim (CEO)

- Presidential Commission on Carbon Neutrality and Green Growth Committee
- Samsung Electronics, Researcher

54% R&BD staff

22% Staff with higher degrees

46% R&D staff

<Backgrounds>

SAMSUNG ELECTRONICS, BCG, NPS Korea's Institution for National Pension, LG Electronics, KPMG, pwc

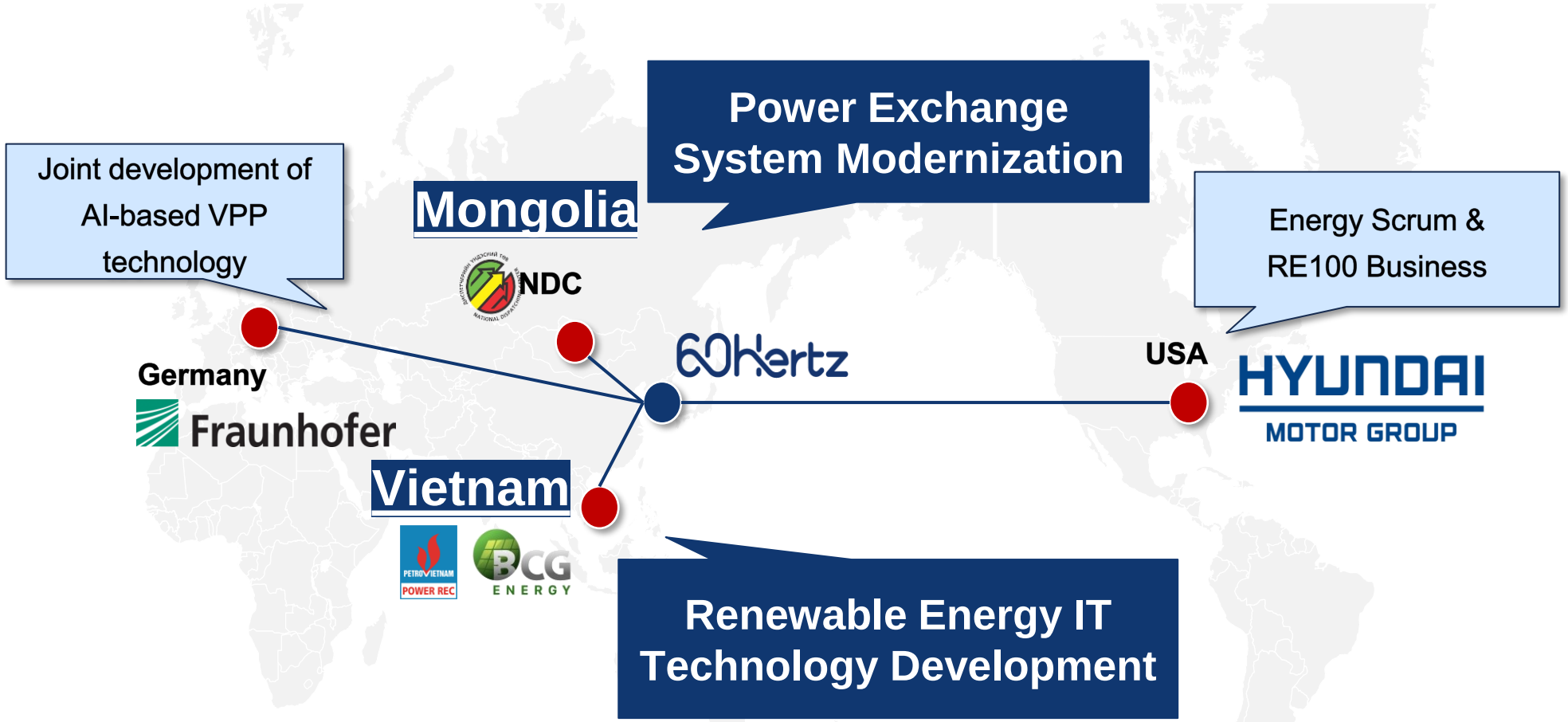
<International Award & Recognition>

- 2024.06 **Top 100 Climate Tech Startups in the Indo-Pacific by IPEF**
- 2023.01 **CES 2023 Innovation Award**

<Domestic Awards>

- 2023.03 Meteorological Industry Technology (**Minister of Environment Award**)
  2021.11 Grand Prize at the Public Data Utilization Competition **(President's Award)**
- 2021.10 Grand Prize at the Social Venture Competition **(Prime Minister's Award)**
- 2021.08 Grand Prize at the Public Data Utilization BI Competition **(Minister of Trade, Industry and Energy Award)**
- 2021.07 Grand Prize in Social Venture IR at the Social Economy Expo **(Minister of SMEs and Startups Award)**

60Hertz Global Partnerships for Global Solutions



Global Expansion to Strengthen 60Hertz's International Presence

Thank You

Contact Info : hello@60hz.io