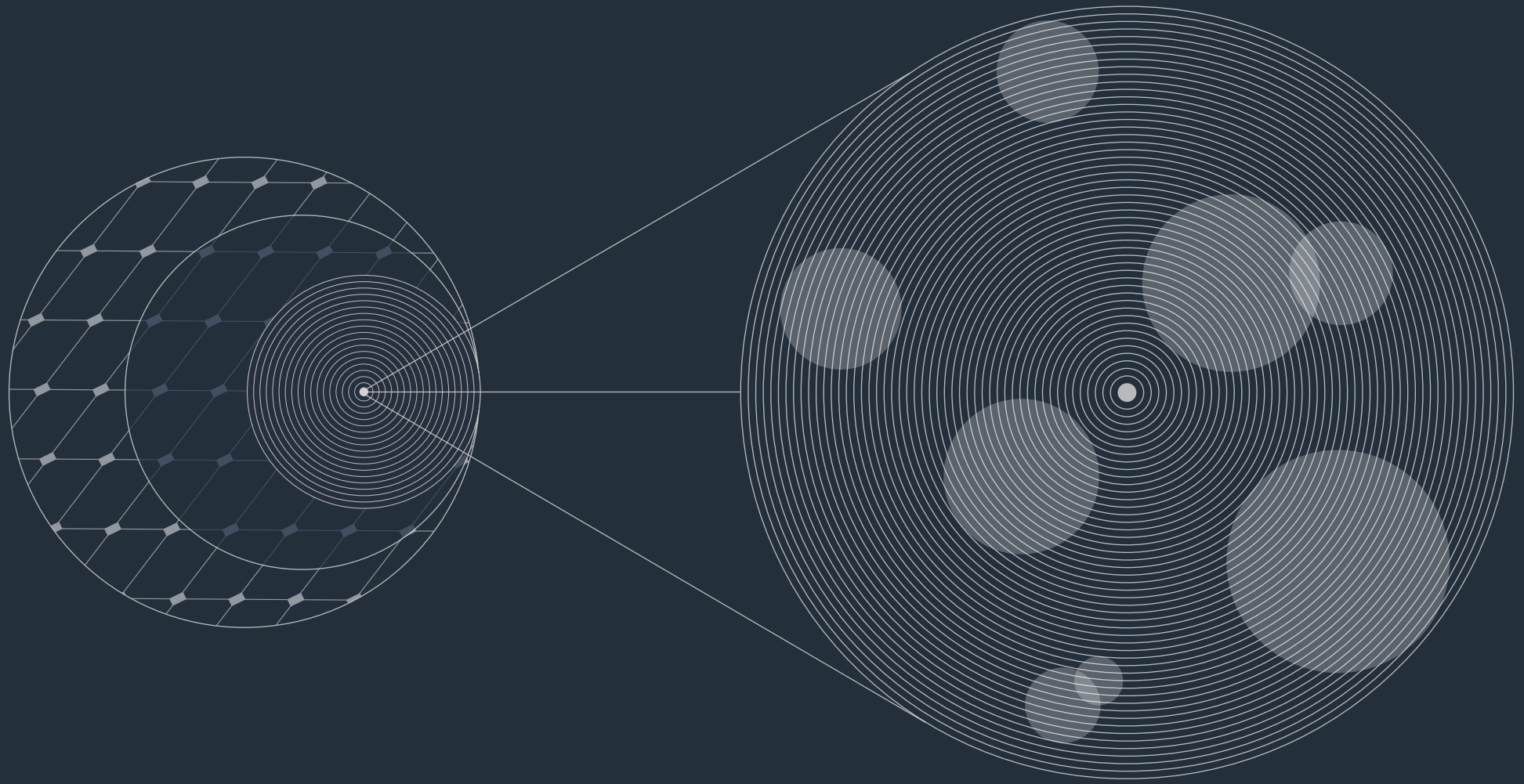
HEIS 2.0

All-in-One Energy Integration Platform



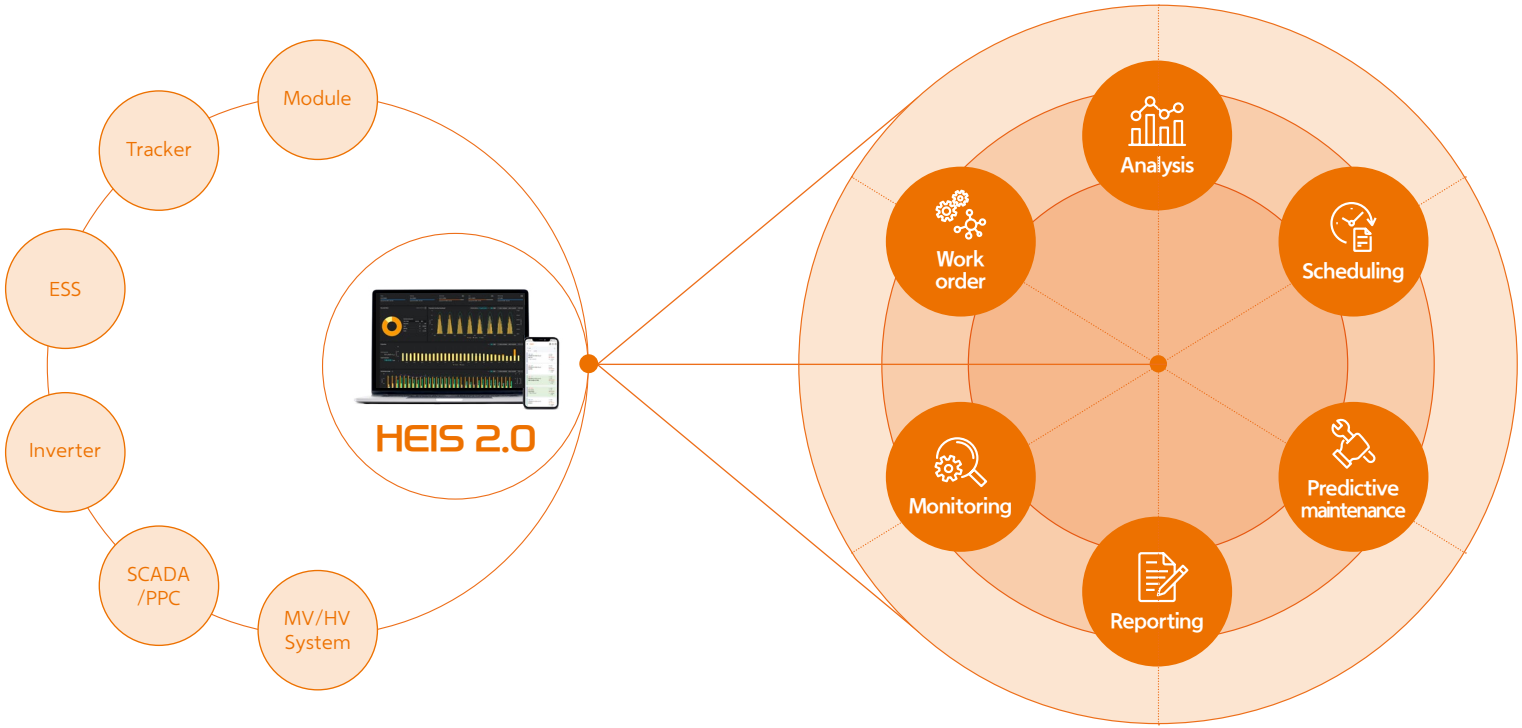
Hanwha Convergence

Empowering Energy Excellence with the Ultimate All-in-One Platform

The Integrated Energy Control Platform empowering the entire value chain from power plant monitoring to control, data collection, and O&M operations across edge to cloud

HEIS* 2.0 utilizes **Hanwha Convergence's R&D capabilities and global PV-ESS expertise** for an optimal green energy platform service

* **HEIS** : Hanwha Energy Integrated System



All-In-One Platform

Comprehensive platform services from data collection to analysis

Integration of PC-based web service, tablet and mobile app friendly functions

Service Based On In-House R&D Organization and Global Expertise

Immediate service response facilitated by internal R&D capabilities and on-site validation through actual user reviews

Global operation experience in the US, Japan, Vietnam, etc.

Unlock Efficiency, Save Costs, and Secure Power with HEIS 2.0

Benefits

O&M Efficiency

- Efficient work processes for owners and operators through seamless integration of data from core resources
- Increase in O&M efficiency through the automation of work management and power generation forecast based on AI

Cost Saving

- Transparent O&M systematic process to ensure cost savings and fosters firm trust among users (operators, managers and site owners)
- Customizable tracking of O&M activities to reduce unnecessary O&M costs

Safety and Security

- Improved alarm function for faster incident response and increased power plant stability
- Enhanced alarm log function for device–specific and time–based analysis, trengthening O&M preventive maintenance capabilities

Unlock Efficiency, Save Costs, and Secure Power with HEIS 2.0

Features

Customizable Overview Display

- Dashboard and main monitoring display customizable for all user purposes
- Features and templets customizable for each user roles (Manager, ROC, Customer, etc.)
- KPI tracking & validated data Reporting

Compact Power Plant Status & Comparison

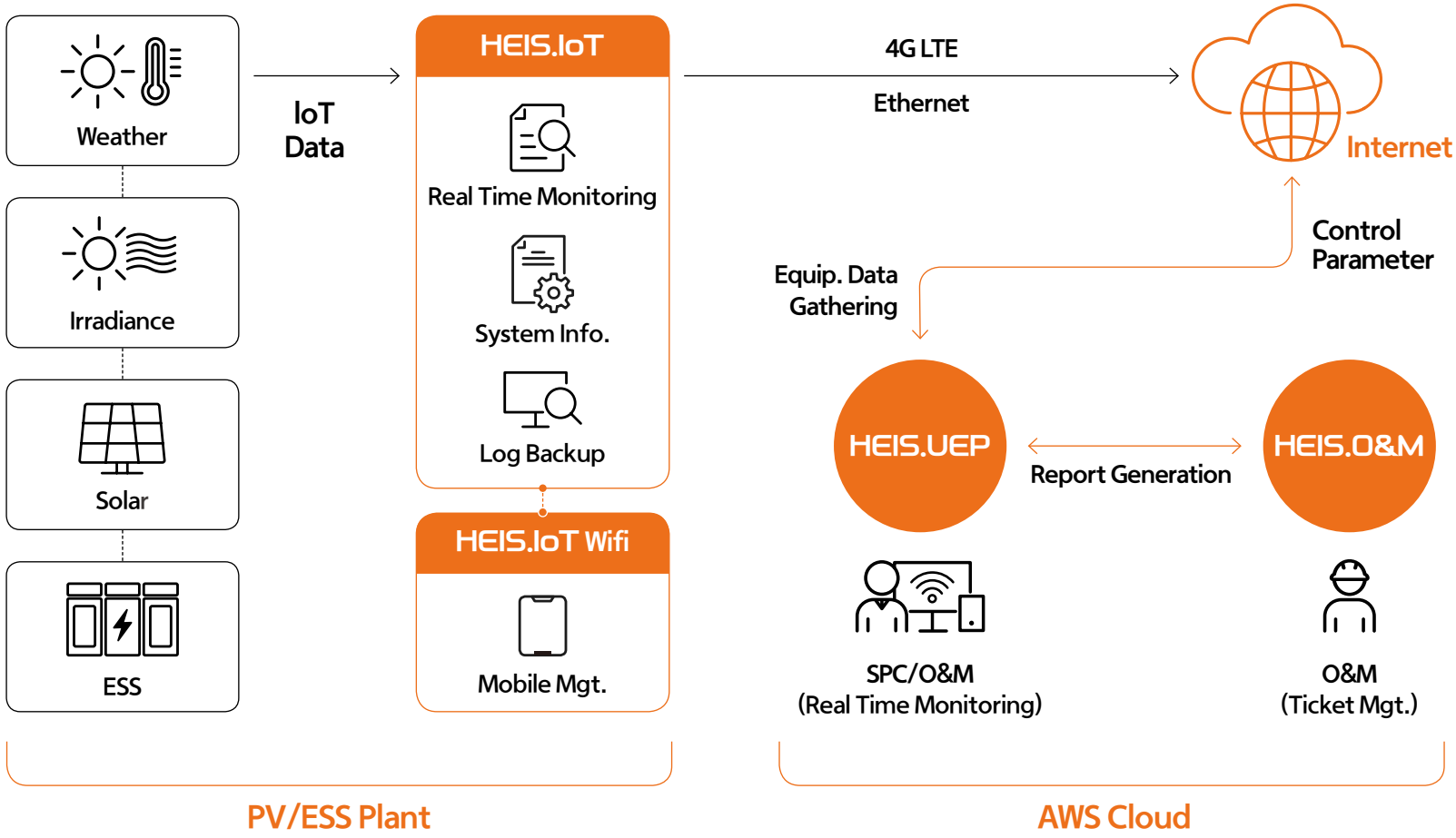
- Monthly/daily power generation information
- Enhanced plant integrated management with multi–parameter and widget functions
- Freely grouping power plants and highlighting specific data points

HEIS 2.0 Suite: Harnessing the Power of Edge to Cloud Integration

HEIS 2.0 Suite combines task-oriented solutions from edge to cloud to boost system availability and scalability

HEIS Architecture

Stable data gathering of various equipment in plant



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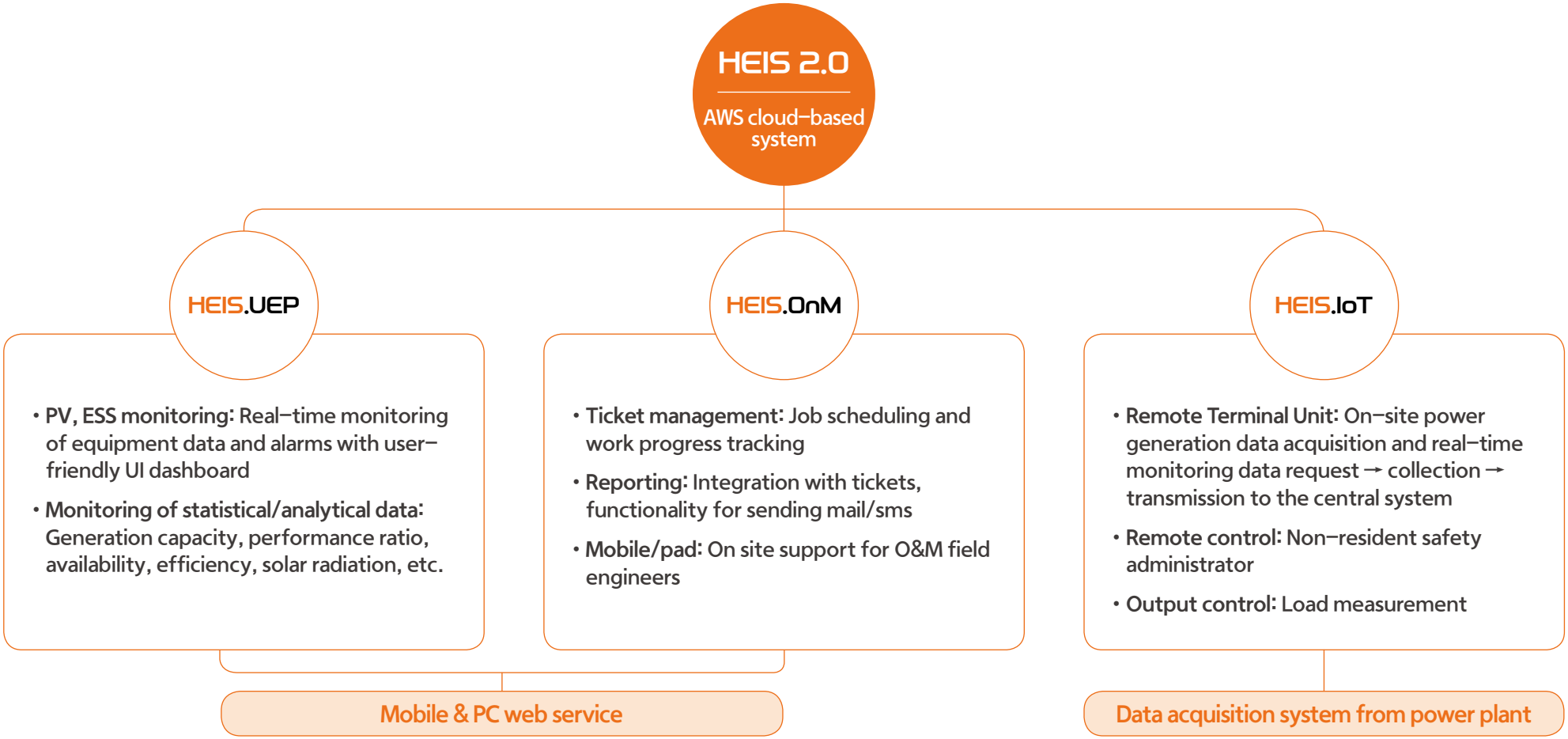


HEIS 2.0 UEP (Utility Energy Platform): Functions

Real-time monitoring of power plant status and prompt action taken upon detection of abnormalities

Comprehensive data analysis of power plant KPIs and predictive diagnosis

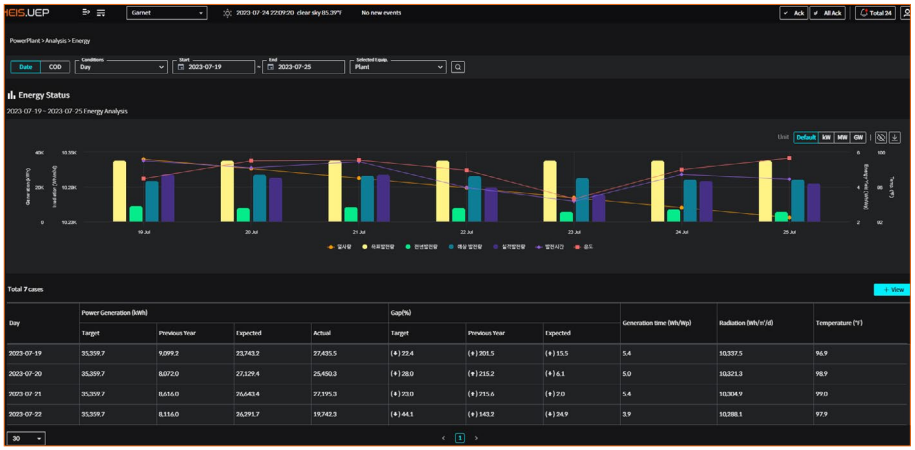
Inquiry for Power Plant Status and KPI

Monitoring & Operation

- Integrated operation control
- Power generation/operational data and inputs
- Real-time SMS/email alarm notifications
- Onsite CCTV video surveillance

Power Plant Analysis Data

Data Analysis

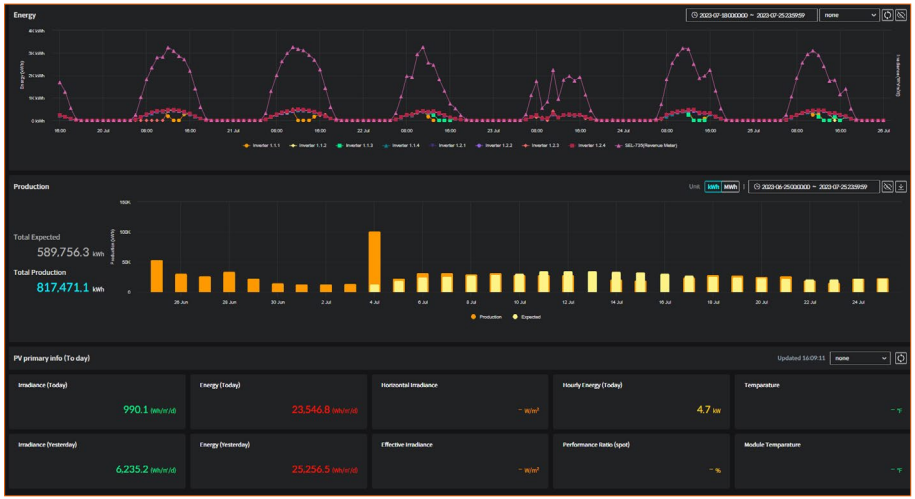


- Comprehensive analysis of power plant KPIs and events
- Estimation of power generation and efficiency for each facility
- Data-driven predictive diagnosis and daily/monthly reports
- Secure data storage and continuous data management
- Statistical analysis of generated amount, generation output, PR (Performance Ratio), operating rate, charge/discharge

HEIS 2.0 UEP
Key Features

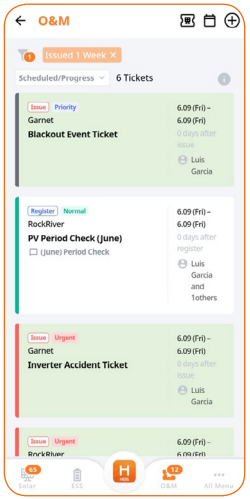
User–friendly dashboard and mobile app services that incorporate customizable widgets and intuitive user interface (UI)

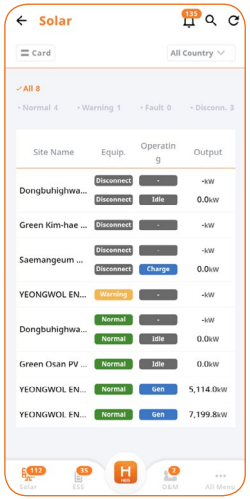
User–friendly UI

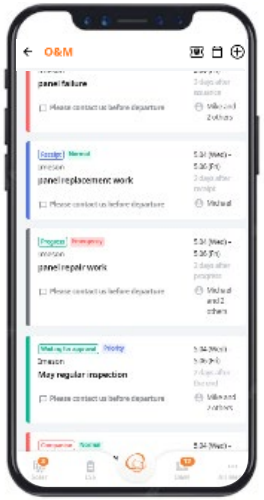


- Customizable dashboard with templates for key management items
- Remote control of power plant facilities such as inverters and switchgear
- Power plant monitoring, O&M status, and VPP management accessible by service authorities

My HEIS (Mobile–based App)





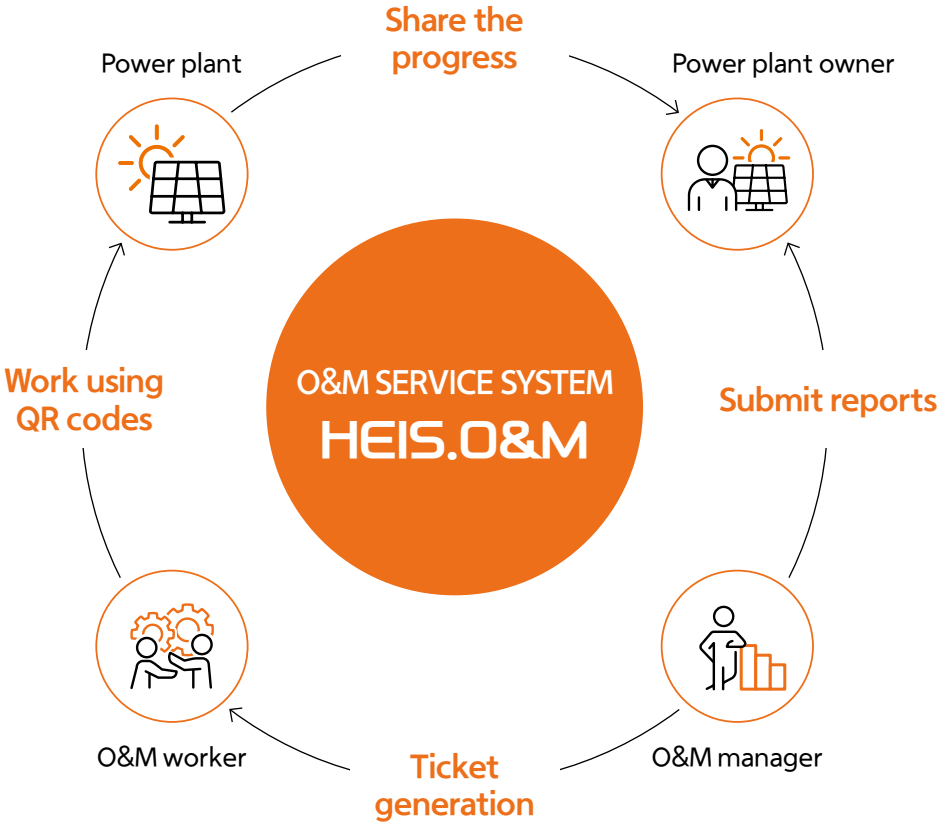


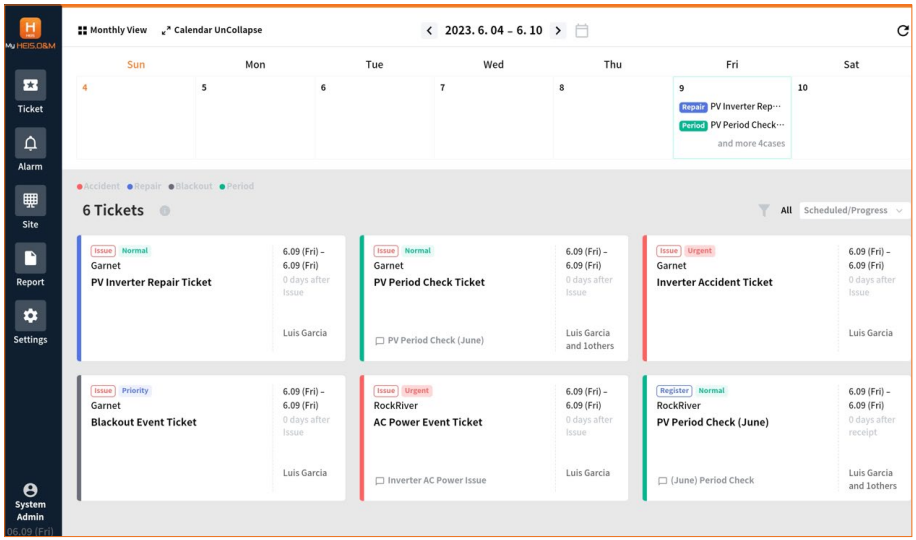
- Comprehensive overview of power plant status, including failurealarms and various power plant facility data
- Tracking power plant revenue by period, including sales, generation forecasts, and incentives
- Access to onsite work status and history for power plant O&M (applicable to HEIS 2.0 O&M)

HEIS 2.0 O&M Functions

An efficient service system that streamlines onsite O&M work processes

Sharing work status through ticketing at each stage, enhancing work efficiency and reliability





- Transparent communication and management between managers and operators through ticket–based onsite work system
- Tracking inspection items and history using QR codes
- Utilizing work checklists to ensure task completion
- Automating the scheduling of regular tasks for improved efficiency

HEIS 2.0 O&M
Key Features

Stable and transparent O&M service based on an integrated platform, improving work efficiency and service quality

Systematization Of Onsite Response

- Swift identification and ticket creation for critical alarms that occur onsite
- Ability to check the system even in areas with limited internet service
- Digitization of O&M processing history to preserve and leverage valuable know-how

Automatic Generation Of Periodic Inspection Reports

- Streamlining the process by automatically generating inspection reports using the onsite inspection app
- Utilizing report templates for different types of inspections to ensure consistency and efficiency
- Tracking inspection items and history using QR codes

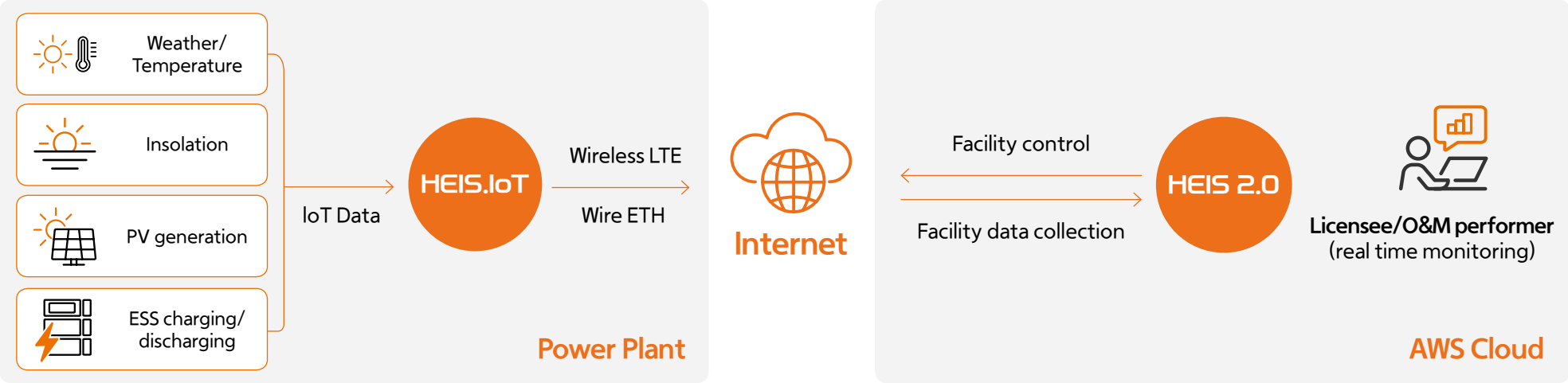
Approval Process For Major/Minor Repairs

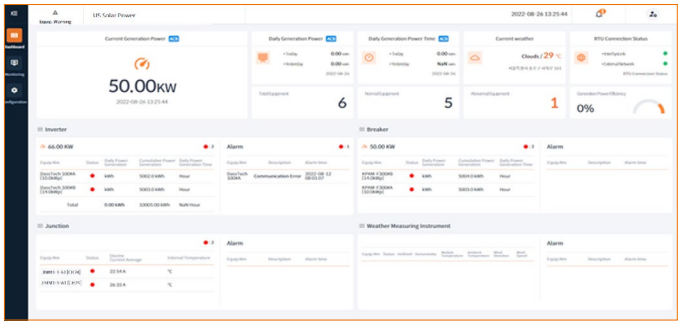
- Transparent asset management facilitated by a customer approval process for upper- and lower-line items generated during O&M activities
- Ability to search and review the item and approval history of major and minor line items by period and type for tracking and analysis

HEIS 2.0 IoT
Functions

A plant facility data management including data acquisition, data sending to the cloud-based system, and on-site monitoring

Compatible with various power generation facilities at home and abroad





- Data collection on major facilities of solar power plants
- Remote installation
- Web monitoring functionality to check onsite data
- Inverter switchgear control in addition to monitoring
- Equipped with four independent RS-485 ports for versatile connectivity
- Wireless communication options(Wi-Fi and LTE) available
- Backup/retransmission of collected data in the event of communication failure
- CC-certified VPN connection ensures secure communication with the monitoring server

HEIS 2.0 IoT
Key Features

Remote communication supporter for seamless data control and maintenance, contributing to O&M service reliability & quality

Interlocking Data from All Major Solar Power Facilities

- Communication support for dozens of major equipment models used in power plants
- Real-time monitoring in HEIS.UEP leveraging the data collected through HEIS.IoT system.

Support For Data Backup/ Restoration

- Monthly backup and data restoration support for critical power generation data, including inverter and power distribution information
- Quick replacement support facilitated through using memory cards in the event of equipment damage

Easy Equipment Maintenance

- Web management screen
- Remote support for equipment setup (for new installations or replacements)
- Access to equipment data on the web monitoring screen

Remote Control Support

- Remote control of inverters and switchboards for power plants below 3M capacity
- Integration with HEIS.UEP's control function
- Secure communication with CC certification, utilizing VPN technology

HEIS 2.0:
Unleashing Support Around the Clock

Integrated solution with quick availability, unmatched convenience, and expert assistance for elevated efficiency

Enhanced customer convenience through HEIS 2.0 desktop, tablet, and mobile functionality

Offering HEIS 2.0 manuals (documents, videos), and providing remote training as required

Business day–based response for any issues during usage

Dedicated support teams and operation of customer support hotline in the U.S.

Providing a monitoring system for trackers (available in ’24)

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