

EF Co., Ltd.

Advanced ESS solution supporting PCC-based grid interconnection control and upstream platform integration

EF connects on-site energy challenges with technology

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This document introduces EF Co., Ltd. and its solutions.
Product specifications, configurations, images, and applications may vary by site conditions and customer requirements.
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EF Co., Ltd. Company Profile

Integrated Power Solutions Provider

directlyDesigning control for power connected to the grid

From customized power supply to grid stabilization -
PCS control, protection & grid interconnection with our own technology



ESS
Solutions



Intelligent
PMS/EMS



Flexible &
Scalable



Expert O&M
& Support

Company Overview

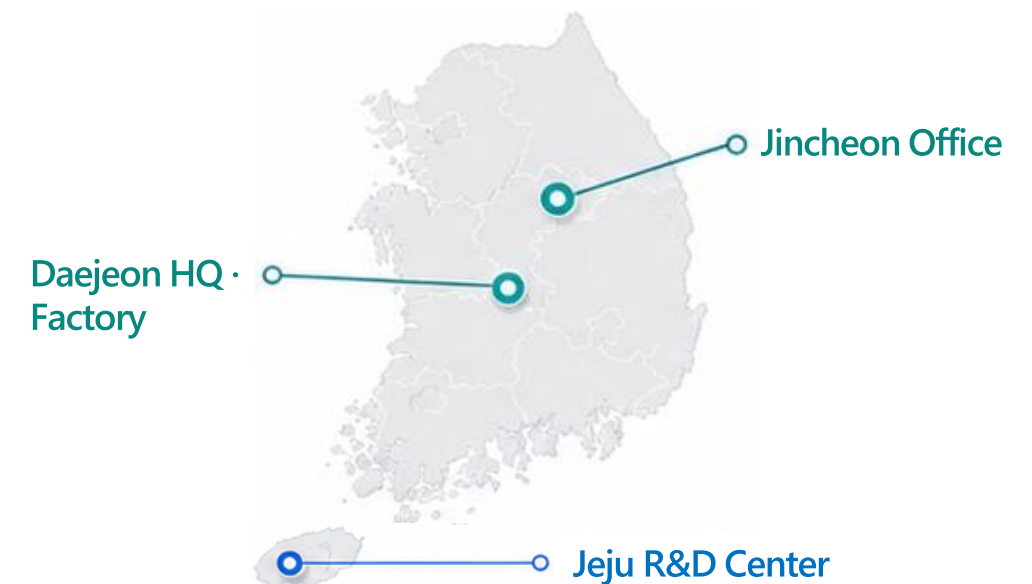
General Information

Company	EF Co., Ltd.
Co-CEOs	Hyukgil Kwon, Horyang Kim
Founded	June 17, 2019
Capital	KRW 937 million
Employees	16 (as of Jun 2026)
Core Competencies	Integrated ESS design, construction & operation Power/comm control H/W & S/W development Grid-code-based control solution development
Business Areas	Power control solution development & supply ESS-based power infrastructure engineering Infra planning, design, construction & O&M

Core Competencies

- One-Stop HW & SW Solutions**
 Turnkey delivery spanning from physical grid infrastructure (T&D, renewable energy) to control and monitoring platforms.
- In-House HW & SW Integration**
 Proprietary development and manufacturing of distribution grid-connected PCS & PMS packages, seamlessly integrating hardware and software in-house.
- All-in-One ESS Lifecycle Services**
 End-to-end services covering the entire ESS lifecycle—encompassing design, EPC, construction, monitoring & control platforms, and O&M.

Key Facilities & Locations



Daejeon HQ · Factory



Manufacturing of Industrial Power Conversion Systems & Global Sales Center

Jeju R&D Center



R&D and Technical Support for Energy Control Systems

Jincheon Office



R&D and Technical Support for Energy System Hardware



Design & Dev



Grid Testing



ESS Packaging



Operations

History & Milestones

Growth History

Starting as an ESS PMS specialist startup,
EF keeps growing into an integrated ESS solutions company.

- 2019**
- EF Co., Ltd. incorporated
 - Residential ESS & streetlights (second-life batteries)
 - Deployed PMS for renewable-linked ESS



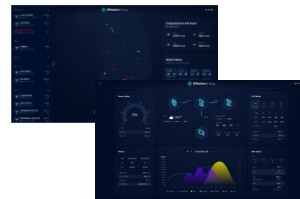
- 2021**
- Completed multi-protocol integrated gateway



- 2022**
- Established corporate R&D center
 - EV-charging ESS PMS (Children's Grand Park & Suseo)
 - ESS module & rack packaging (second-life batteries)



- 2023**
- Selected for VPP / ISO-DSO national R&D project
 - ESS CS partnership with LG Energy Solution
 - PMS/EMS for LGES Ochang test equipment
 - ESS/UPS system for KETI
 - ESS for Chungbuk Technopark
 - PMS/EMS for Jeju hybrid EV charging stations



- 2024**
- Electrical contractor license
 - Multi-grid facilities for RE100 (Sincheok Reservoir)
 - Registered Chungbuk branch



- 2025**
- Horyang Kim appointed Co-CEO
 - R&D-type venture certification
 - Patents incl. ESS control platform
 - PMS for distribution-connected ESS
 - Acquired Daejeon factory
 - MAIN-BIZ / energy-specialized designation



- 2026**
- Youth-employment strong SME
 - ISO 45001 certified
 - Relocated HQ to Daejeon



Business Area

Business Areas

With core ESS experience and technology,
EF creates value across diverse industries.



01



ESS PMS/EMS Dev & Deployment

Customized PMS/EMS for performance optimization, real-time monitoring, and data-driven operation.



02



ESS Consulting Design & Build

Full-cycle consulting from feasibility to design and construction management.



03



O&M & Safety Management

24/7 remote monitoring and preventive maintenance maximize uptime, with systematic management based on safety standards.



04



Renewable Energy Integration

Offsets renewable variability via forecasting and output control.



05



Multi-grid, VPP/DR & Distribution

Multi-grid & VPP/DR integration secures grid flexibility and maximizes market value.



06



Second-life Batteries & S/W-H/W Development

We provide safe reuse and recycling solutions for second-life batteries and continuously develop S/W and H/W for the power sector.



Track Record

Project References

Drawing on project experience across diverse industries and environments, we maximize customers' energy value and deliver stable operational results.

01 Distribution ESS

PMS development, supply & operation



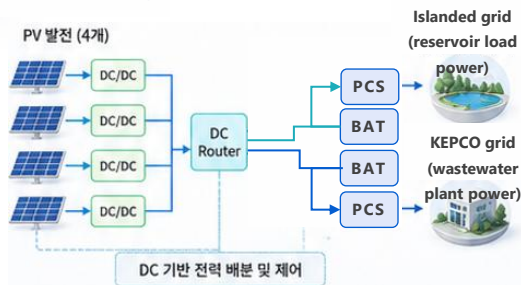
02 Grid-forming ESS

Battery system construction



03 DC-coupled multi-grid ESS

Grid design & O&M



04 Hybrid EV charging station

Integrated ESS control (PMS/EMS)



05 Battery test control system

Export battery parallel testing
(back-to-back power supply)



06 Independent power grid

for national security facilities
ESS islanded-mode power supply



Main Item

Main Products

EF-PMS | Customizable Power Management System



Peak Control

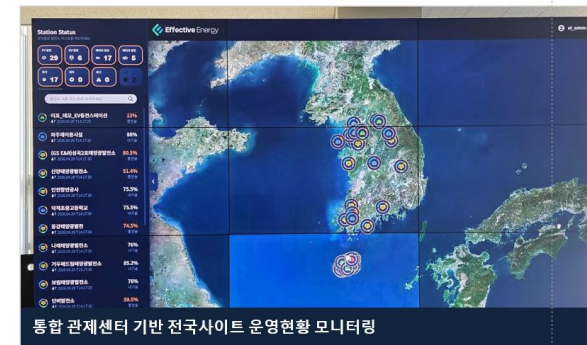
Renewables

PV EV Charging

Off-grid

Generator-linked

EF-EMS | Integrated Energy Management System



- Cloud-based Integrated Management
- 24/7 Remote Monitoring
- Real-time site monitoring & control
- Big-data site health & efficiency analysis
- Predictive maintenance minimizes downtime
- Operation reports for energy planning



EF-Gateway | Multi-protocol Integration Device



- Integrated management of metering, network, temp/humidity & more
- Unifies device protocols for remote monitoring & control
- Extensive delivery track record
- TCP/IP support (32 devices)
- RS-485 support, 2CH
- CAN support, 2CH
- 8 input / 8 output ports

Main Products

Distribution-Grid-Connected Grid-Support ESS

Advanced ESS solution supporting PCC-based grid interconnection control and upstream platform integration

With renewable growth and grid transformation, stable interconnected operation and upstream platform integration are becoming critical at the distribution level. Our distribution-grid-connected ESS delivers PCC-based control, protection/metering integration, and real-time data-driven operation for higher grid reliability and operational efficiency.

Key Requirements to Address



01 Grid Flexibility

Response to output variability & power quality stabilization



02 Grid Code Compliance

PCC-based operation, protection, metering & control



03 Data Management

Monitoring, alarms, reports, fault response reports, fault response

Proven Technology & Experience



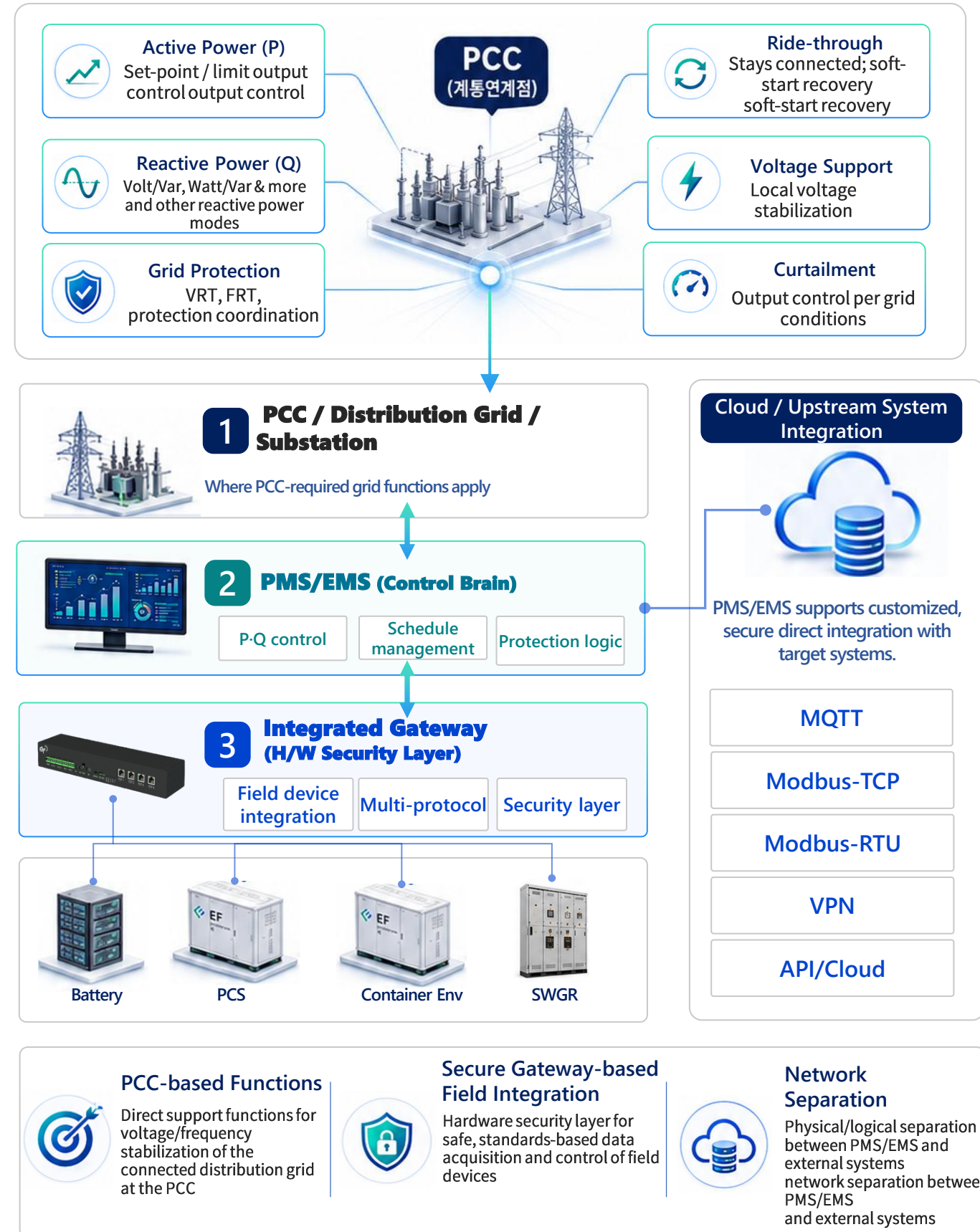
National R&D participation



Function/field test certification



Grid code standardization



Main Products

Transformer-Integrated ESS Power Block

MV Station / Skid package based on Battery · PCS · LV Switchboard · TR · MV Switchgear

MV Station / Skid-based ESS Package

Product Concept

- ✓ MV Station composed of Battery, PCS, LV Switchboard, TR & MV Switchgear
- ✓ Common-skid or external-TR configuration per site conditions
- ✓ Integrated supply of power equipment & ESS improves installation, commissioning & maintenance efficiency
- ✓ Applicable to utilities, renewables, industry, data centers, EV charging & microgrids

Battery	PCS	LV SWBD	TR	MV SWGR
				
High energy density battery rack/container	Bi-directional power conversion	LV distribution & protection/metering	Step-up Transformer (LV/MV)	MV protection, metering & interconnection

(Specification)

Model	PCS Rating	Battery Capacity	Grid Voltage	Configuration
EF-PB-1000	1MW	4MW	22.9kV/33kV (TBD)	Battery+PCS+LV/TR/MV
EF-PB-2000	2MW	8MW	22.9kV/33kV (TBD)	Battery+PCS+LV/TR/MV
EF-PB-3000	3MW	12MW	22.9kV/33kV (TBD)	Battery+PCS+LV/TR/MV
EF-PB-5000	5MW	20MW	22.9kV/33kV (TBD)	Battery+PCS+LV/TR/MV

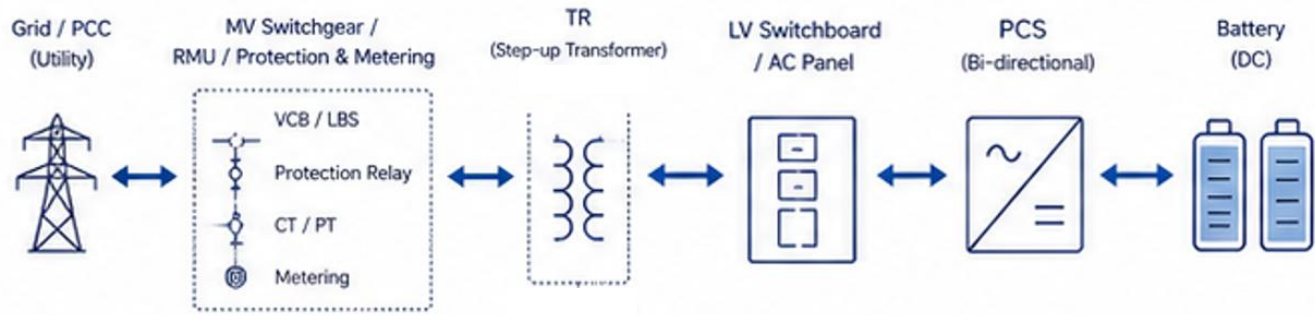
Customization Notice



Configuration, voltage level, protection scheme, grounding, fire safety, and enclosure type are customized to the target country's grid code, utility interconnection standards, and applicable safety codes (e.g., IEC / IEEE / UL / NFPA / local regulations).



System Configuration (Single Line Diagram)



Power flow: Battery (DC) ↔ PCS ↔ LV Switchboard / AC Panel ↔ TR (Step-up/down Transformer) ↔ MV Switchgear / RMU / Protection & Metering ↔ PCC / Utility Grid

Option A. Common-skid MV Station

All power equipment integrated on a common skid



Option B. External TR configuration

External TR or separate MV kiosk per project conditions



Flexible configuration for site layout, transport, maintenance, noise, insurance & regulatory requirements

Utility Interconnection
PCC-based MV interconnection with protection & metering

Package Flexibility
Selectable common-skid or external TR configuration

Maintainability
Separated equipment layout improves access & serviceability

Country Code Compliance
Customized to target-country standards & safety codes

PROJECT TRACK RECORD

Proven Track Record

With proprietary PMS/EMS-based integrated control technology and extensive device integration experience, EF delivers stable, intelligent energy operation solutions.



57

ESS / PMS sites deployed
Cumulative, 2019-2026

29.5 MW

Cumulative PCS capacity
As of Apr 2026

95.8 MWh

Cumulative battery capacity
As of Apr 2026

KPX Renewable Energy Data-Collection Modem Installation at 246 sites

As of Apr 2026

EV Second-life Battery BMS Supply & Product Development Support

Streetlight systems, tethered drone systems, and ESS module/rack

5 National R&D Projects

Completed and ongoing over the past three years(As of Jun 2026)

Trust & Contact

Trusted Foundation & Future Vision

Grounded in technology and trust, EF leads the way in building a sustainable energy ecosystem, creating a better future together with our customers.

With field-proven technology and flexible responsiveness, we will be your trusted partner for ESS deployment and operation.

Certifications & Credentials



Corporate R&D center



Electrical contractor license



Cerinea venture company



ESS / security / safety IP portfolio

MAIN Biz

MAIN-BIZ designation



Energy-specialized company



ISO 45001 certified



Youth-employment strong SME

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