



PowerKonnekt

# Frequency Control

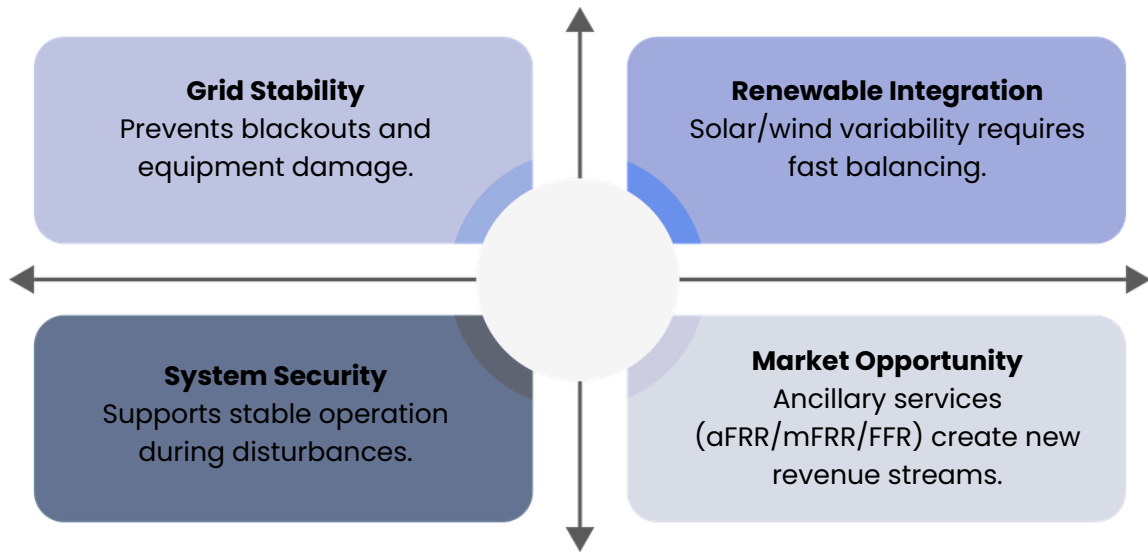


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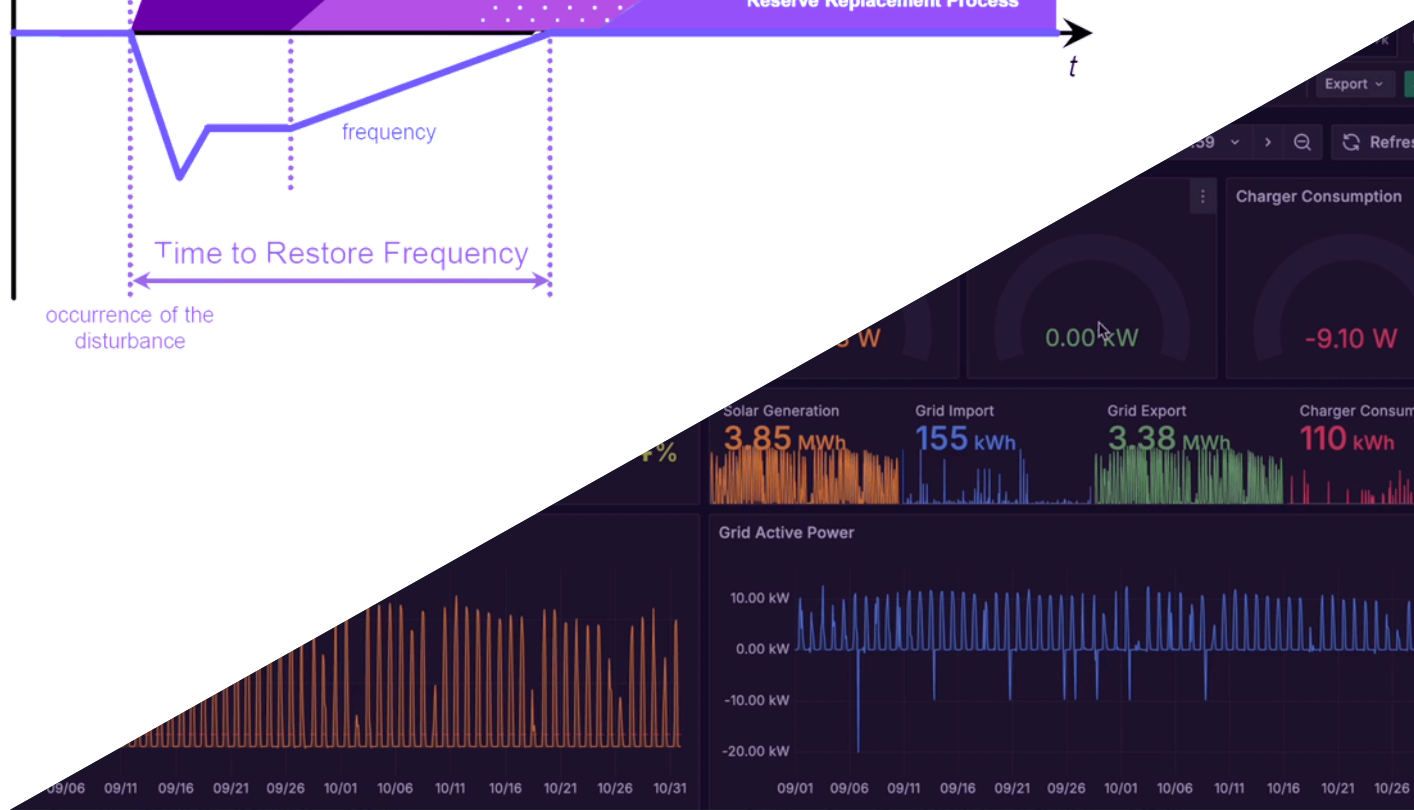
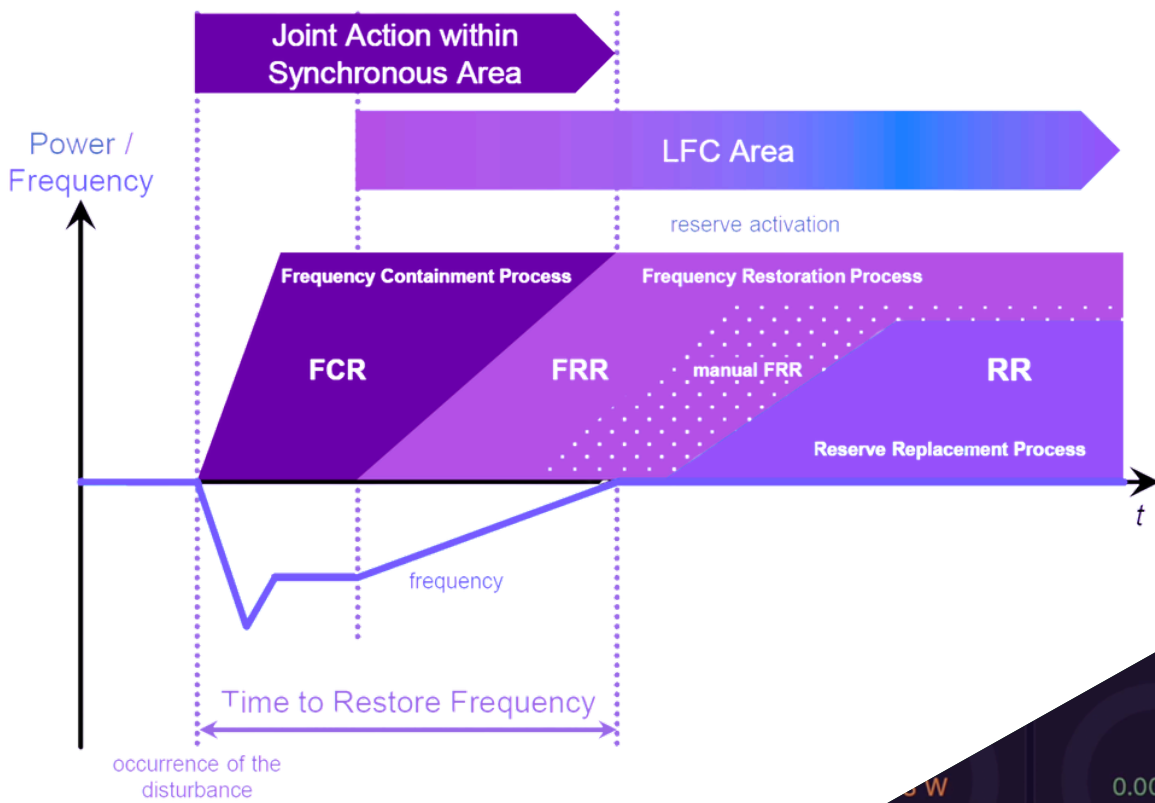
# Frequency Control

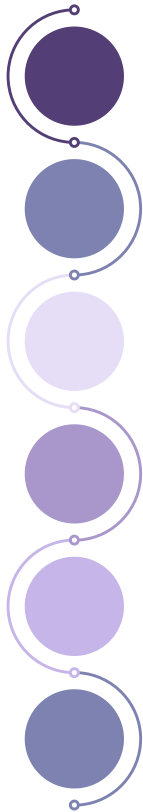


Frequency control ensures that grid frequency is kept within safe limits by rapidly balancing supply and demand.



## Frequency Control Reserve Architecture





**Instant Fleet Response:** Distributed assets react together to any frequency drift within seconds.

**Adaptive Power Adjustment:** Output is continuously reshaped based on system needs and asset limits.

**Centralized Frequency Intelligence:** One platform analyzes deviations and orchestrates the entire fleet's behavior.

**Continuous Stability Support:** Assets provide sustained regulation until frequency returns to nominal.

**Safe Operating Control:** Every activation respects battery health, temperature, and lifecycle boundaries.

**Event-Aware Automation:** The system detects disturbances and activates predefined response strategies automatically.

## CASE STUDY

**Project:** FCR-N with C&I Scale BESS

**Size:** 200kW/430kWh

**Location:** Finland

### Key Capabilities Demonstrated

- Zero-Injection Enforcement
- Grid Code-Compliant Frequency Response
- Arbitrage based on dynamic market prices
- Multi location application enabling operation as one system as well as individually



### Outcome

- Protect the grid while stabilizing customer operations
- Deliver grid-code-compliant frequency response for lucrative ancillary services income
- Lowering energy costs by time-of-use optimization and self consumption
- Avoid penalties by upholding strict zero-export requirements
- Transparent, auditable system behavior



## CASE STUDY

**Project:** Ege RES

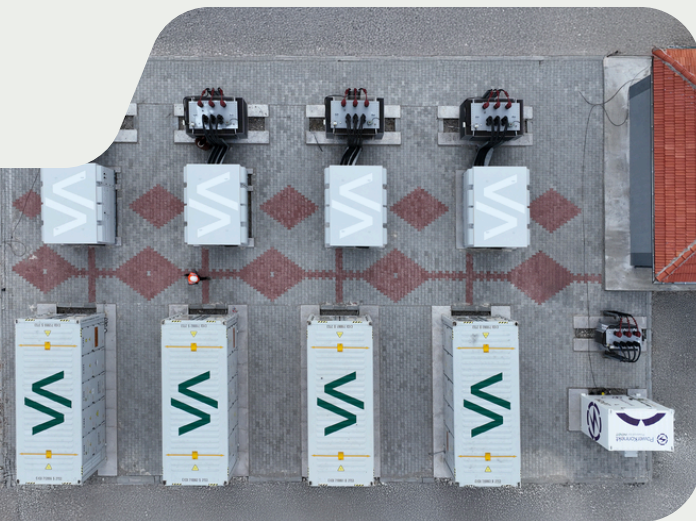
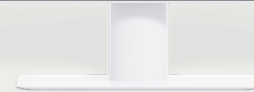
**Size:** Total 28,16 MWh

**Location:** İzmir, Türkiye



### Key Capabilities Demonstrated

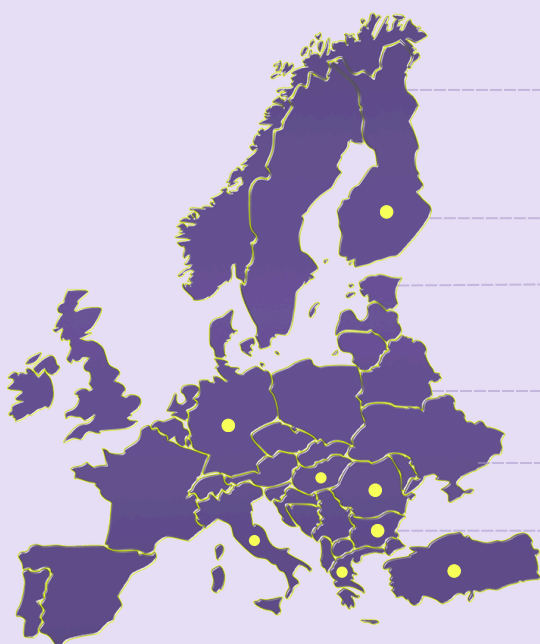
- **Real-time frequency deviation detection** and response
- Fast **active power injection/absorption** for grid stabilization
- **High-speed EMS-PCS-battery coordination** for frequency control
- **Compliance-validated performance** under live grid conditions



### Outcome

PowerKonnekt enables:

- Rapid **frequency containment and grid stability** support
- Accurate response to frequency deviations with high control precision
- Improved grid reliability through **utility-scale battery dispatch**
- Reduced stress on generation assets during frequency events
- Scalable frequency control architecture ready for **ancillary service markets**





## CASE STUDY

**Project:** Göktepe BESS

**Size:** Total 132 MWh

**Location:** Yalova, Türkiye

### Key Capabilities Demonstrated

- Seamless EMS integration with **PPC, BESS, and renewable assets**
- Support for **black start, FCR, and standard plant control functions**
- Real-time monitoring, command execution, and plant-level coordination
- **Commissioning-ready** EMS logic tailored to site and **grid requirements**



### Outcome

PowerKonnekt enables:

- **Stable coordination** between storage and renewable generation
- **Fast-response support** for **grid and frequency** services
- Improved visibility and centralized operational control
- **Stronger plant resilience** through advanced EMS functions
- **Scalable system architecture** for future expansion



## CASE STUDY

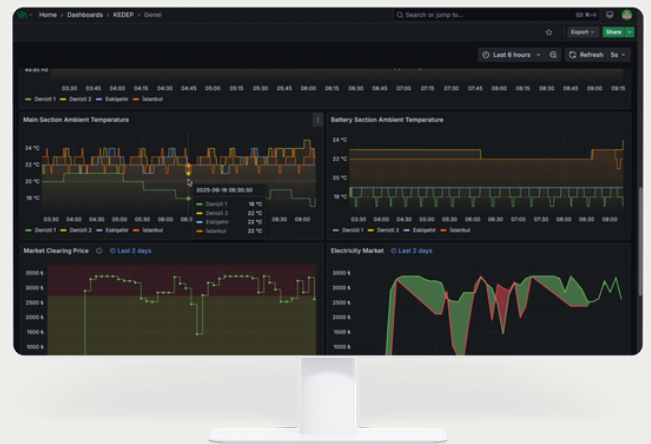
**Project:** Büyükkışla BESS

**Size:** Total 121 MWh

**Location:** Ankara, Türkiye

### Key Capabilities Demonstrated

- Advanced coordination between **CATL BESS and Power Electronics PCS**
- Support for **market-linked control functions** including **trading platform connectivity**
- Site-specific EMS logic for **PPC interaction, black start, and FCR readiness**
- **End-to-end visibility** from asset behavior to dispatch execution



### Outcome

PowerKonnekt enables:

- Smarter energy dispatch aligned with **market and grid signals**
- Stronger monetization potential through **trading platform integration**
- **Reliable system response** across core grid-support functions
- A flexible EMS backbone for **higher-value and more dynamic use cases**





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