About Microgrids

Microgrid is a system in which small-scale power generation facilities are built in a certain area, and energy is produced and consumed locally without relying on large-scale power plants and grids (known as macro-grids). It efficiently uses renewable energy, and in emergencies, it supplies electricity generated within the area independently of the traditional large-scale power transmission and distribution network.

Pros & cons of microgrid

Pros

- ✓ Environmental benefits
- ✓ Enhanced reliability
- ✓ Greater resilience
- ✓ Local economic development

Cons

- ✓ Technical complications
- ✓ High initial capital costs
- ✓ Regulatory issues

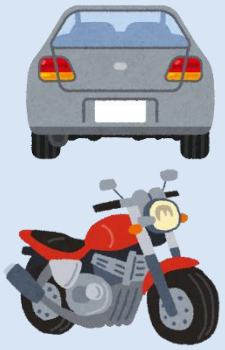
Furukawa Battery, Battery Manufacturer

FURUKAWA BATTERY

Corporate Information

- Established in 1950
- Capital JPY 1.64 Billion
- Annual Sales JPY 75.4 Billion (2023)
- Employees 2,404
(including consolidated subsidiary)

Car & Motorcycle Battery



Industrial Battery

Overseas Subsidiaries

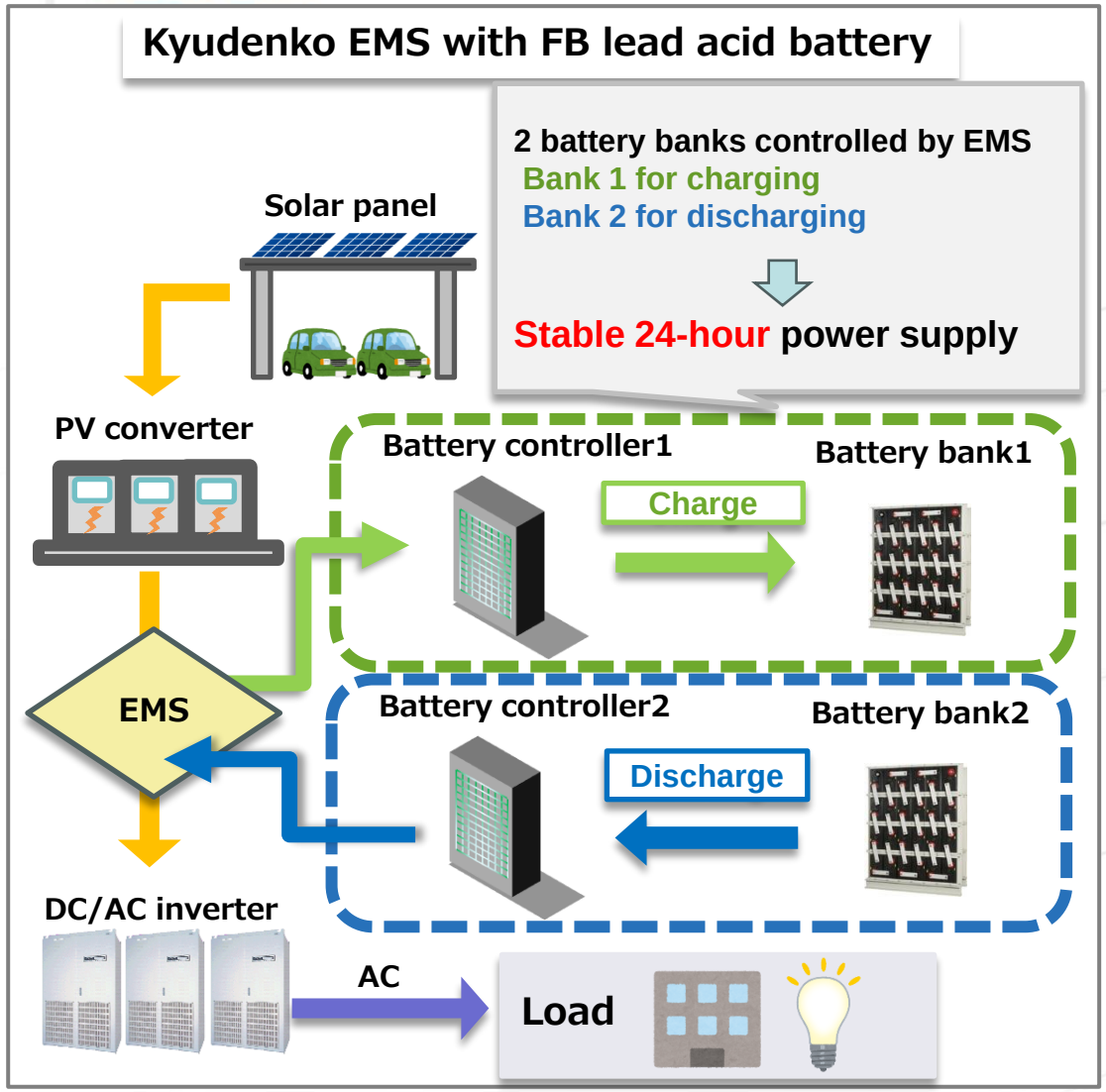
"FB Battery" in Thailand

"FB Battery" in Indonesia

THE FURUKAWA BATTERY CO., LTD.

Track Record of Microgrid
Kyudenko Energy Management System × FB Battery

Kyudenko EMS with FB lead acid battery



Kyudenko EMS

- ✓ Realtime synchronizing "Demand vs. Transmission" !
- ✓ Remote control / monitoring by VPN network
- ✓ Combine the several power sources (PV, Biomass, Wind, Hydro etc…)

×

FB Lead-acid Battery

- ✓ Long time discharge available
- ✓ Dedicated long-life battery for renewable energy
- ✓ Easier maintenance
- ✓ Robust material & design

- ✓ Suitable for remote area (island, rural electrification, military bases…etc)
- ✓ 24 hours continuous output with stable wave!
  (2 grids stable operation for 24 hours by EMS)

We propose an optimal microgrid system that combines Kyudenko EMS with FB's high-performance lead-acid batteries

20 Year-Life Lead-Acid Battery for Microgrid

20 Year-Life

	FCP-S Series	
Type	FCP-500S	FCP-1000S
Capacity / Voltage	500 Ah / 2 V	1000 Ah / 2 V
Number of cycles (DOD 70%)	**6,000 cycles** Discharge current: 0.23 $C_{10}A$	
Maximum operating life	Approx. **20 years***	
Maximum charge current during operation	100 A(0.2 $C_{10}A$)	200 A(0.2 $C_{10}A$)
Maximum discharge current during operation	200 A(0.4 $C_{10}A$)	400 A(0.4 $C_{10}A$)

*When used 300 times per year (25°C)

FCP-1000S-24 unit

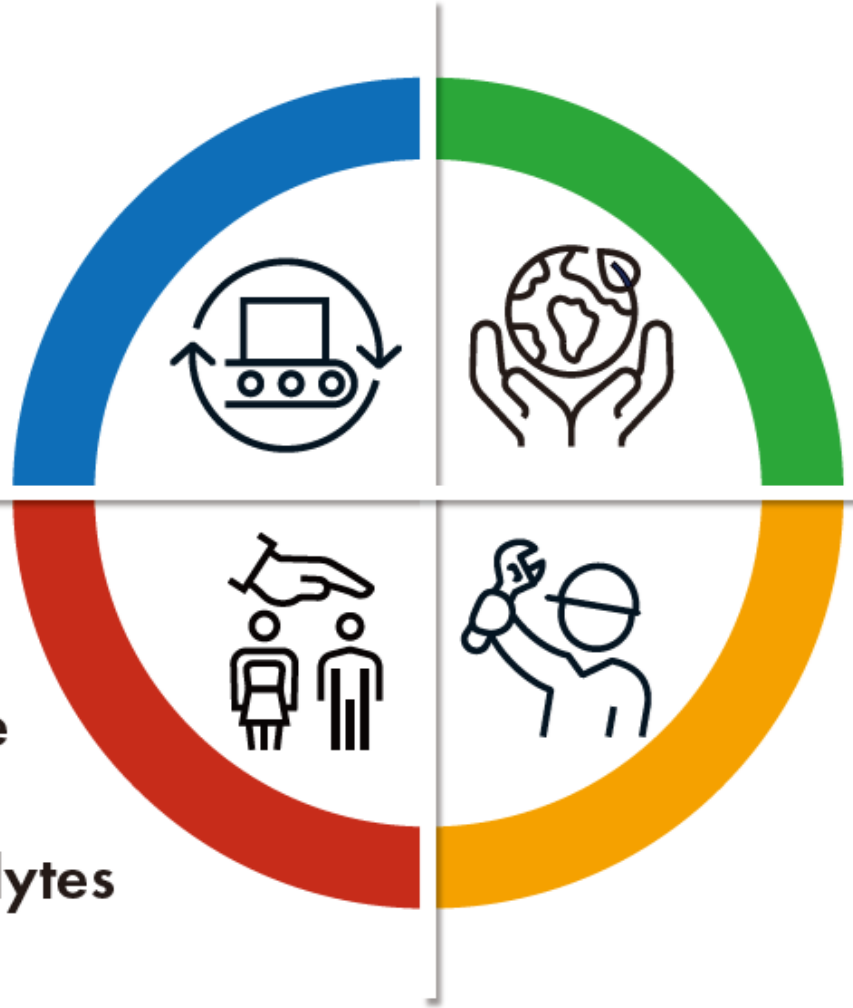
Why Lead-Acid ?

Stable supply

- No rare metals

Easy recycled product

- 99 % recyclable



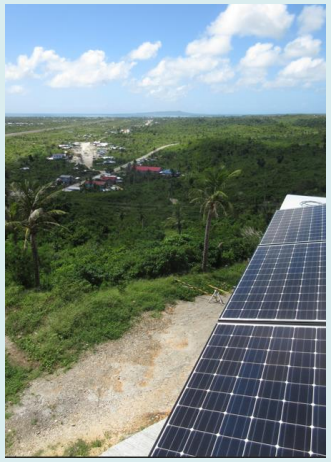
Safety

- Superior heat resistance high temperatures
- Non-flammable electrolytes

Easy maintenance

- No need to refill electrolytes
- Constant monitoring is not required

FB's Introduction Records in ASEAN



Philippines
Weather
Rader Station

Sumba Island, Indonesia
Energy management system

Thailand
ESS for Wind turbines

Singapore
ESS for vessel

CEFIA Flagship Project

- The flagship project of microgrids contribute to accumulating experiences and knowledge in introducing the microgrid technologies and to making recommendations on policy-making of microgrids from the economic and environmental perspective.

- The CEFIA flagship project will continuously promote horizontal expansion of similar projects through the active sharing of good practices.

Bangkok in July, 2024

Manila in January, 2025