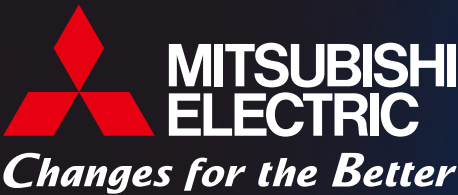


ICT Power Systems Solution Package *BLEnDer*® Series

Description of BLEnDer®

Category	Package name	Function	Detailed description
Supply and Demand Management Customer Management	LF (Load Forecast)	Load Forecast	Predicts power demand and renewable energy output from weather forecast and various kinds of actual data.
	PM (Portfolio Manager)	Supply and Demand Planning	Formulates generation plans for maximum profits considering limiting conditions and power trading.
	BP (Business Protocol)	Planning Submission	Submits generation and sales plans to "Organization for Cross-regional Coordination of Transmission Operators" in accordance with business protocol.
	BM (Balance Manager)	Balancing Monitoring	Collects demand/generation actual results and monitors the balancing of the retail and generation BG.
	DM (Data Manager)	Record Statistics	Saves various actual results,planned data and processes various record statistics.
	CM (Contract Manager)	Master Management	Manages various kinds of contract information,generators rating data necessary for supply and demand operation.
Power Trading	Trader, Trader for MMS	Power Trading Support	Transacts in the wholesale power market, supply-demand balancing market in real time. <small>*Product lineup to be expanded in accordance with changes in the market rules.</small>
	Exchange	Electric Power Exchange	Realizes power exchange in spot market ,one hour ahead market and forward market.
Distributed Power	RE (Renewable Energy)	Renewable Energy Management	Monitors and controls renewable energy and storage battery system.
	DR (Demand Response)	Demand Response	Performs DR commands,monitoring and settlement for Consumers in accordance with the standard of Open ADR.
	AC (Aggregation Coordination)	Aggregation Coordination	Controls, monitors and manages power sources in accordance with upper command.
Consignment	TS (Transmission Service)	Consignment Fees Settlement	Calculates the consignment fees for use of transmission and distribution network.
	BP (Business Protocol)	Information Disclosure	Realizes the disclosure of consignment information and acceptance of consignment application in accordance with business protocol.
	RS (Balancing Reserves Settlement)	Balancing Reserves Settlement	Enhances processing precision and achieves labor savings for balancing reserves settlement operation.
Smart Meter	MD (Meter Data)	Meter data Management	Realizes the meter data collection management,automated meter reading work and distribution network operation.
	HE (Head End)	Communication Management	Manages and controls smart meters in accordance with various communication methods.
	MESH	Wireless mesh communication	Utilizes wireless multihop communication to realize a wide range of smart meter communication with low cost.
	ICE (Intelligent Communication Edge)	Wireless communication devices for sensor network	Realizes the remote monitoring and control of various sensors and automated co-meter reading for water and gas.
Others	CIS (Customer Information System)	Customer Management	Manages customer information necessary for supply and demand operation/billing work.
	GD (Gathering Dispatcher)	Data collection/distribution	Provides the platform to collect the actual power consumption data disclosed by utilities and openly distribute it to specified recipients.
	PI (Performance Indicator)	Income and expenditures management	Calculates the daily and monthly income and expenditures status approximately based on the demand-supply plan, power generation results and demand results.

POWER INFORMATION AND COMMUNICATIONS TECHNOLOGY CENTER
ENERGY SYSTEMS CENTER
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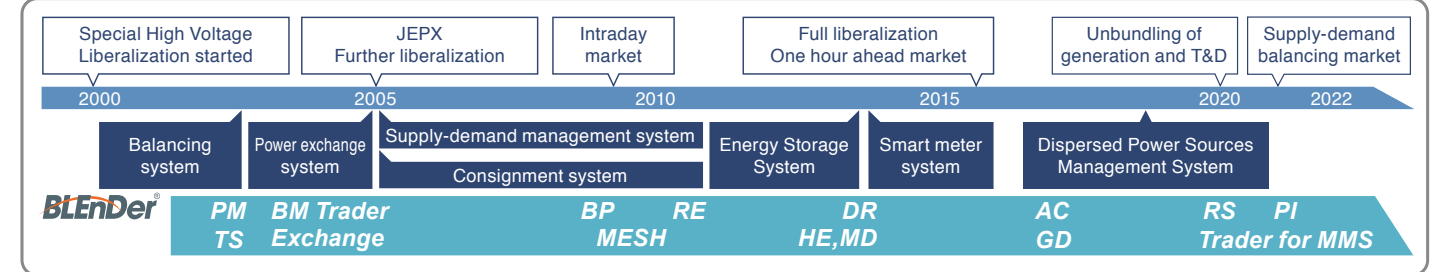
ICT Power Systems Solution Package *BLEnDer*® Series

BLEnDer® Solution to Support the Digitalization of Power System and Energy Business

For the start of electricity liberalization and establishment of power exchange market, Mitsubishi Electric developed a packaged software called “BLEnDer (Bid Liaison and Energy Dispatcher)” series which can integrally manage “power trading” and “supply and demand control”, and we have supplied this system to JEPX (Japan Electric Power Exchange) and many power producers and retailers.

As the energy market is drastically changing, such as establishment of new rules/markets and increase in renewable energy, “BLEnDer” integrates new developments across multiple fields, including power systems, smart meter systems and energy storage systems.

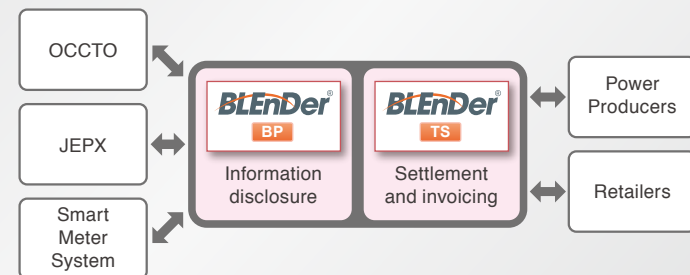
“BLEnDer” supports the smart operation of yours power transmission/distribution network and expansion of power business by better reflecting market and energy trends.



BLEnDer® TS BP RS

Consignment System

Improves the efficiency of transmission work for transparency and fairness in transmission and distribution business.



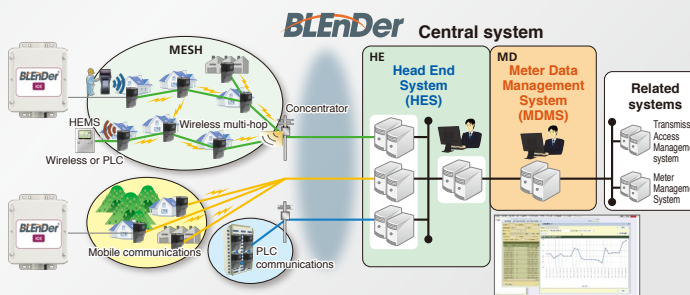
- ✓ Compatible with standard business.
- ✓ Improves work efficiency by dividing calculation period of billing, aggregated billing.

BLEnDer® HE MD MESH ICE

Smart Meter System

Realizes the centralized management of tens of millions of meter data with a communication infrastructure collecting power consumption data every 30 minutes.

- ✓ Utilizes wireless multi-hop communication, mobile communication (LTE), PLC communication for different environments.
- ✓ Collection rate over 99%.
- ✓ Meter data(collected every 30minutes) can be processed at high speed within 30 minutes.
- ✓ Realizes the remote monitoring and control of various sensors and automated co-meter reading for water and gas.



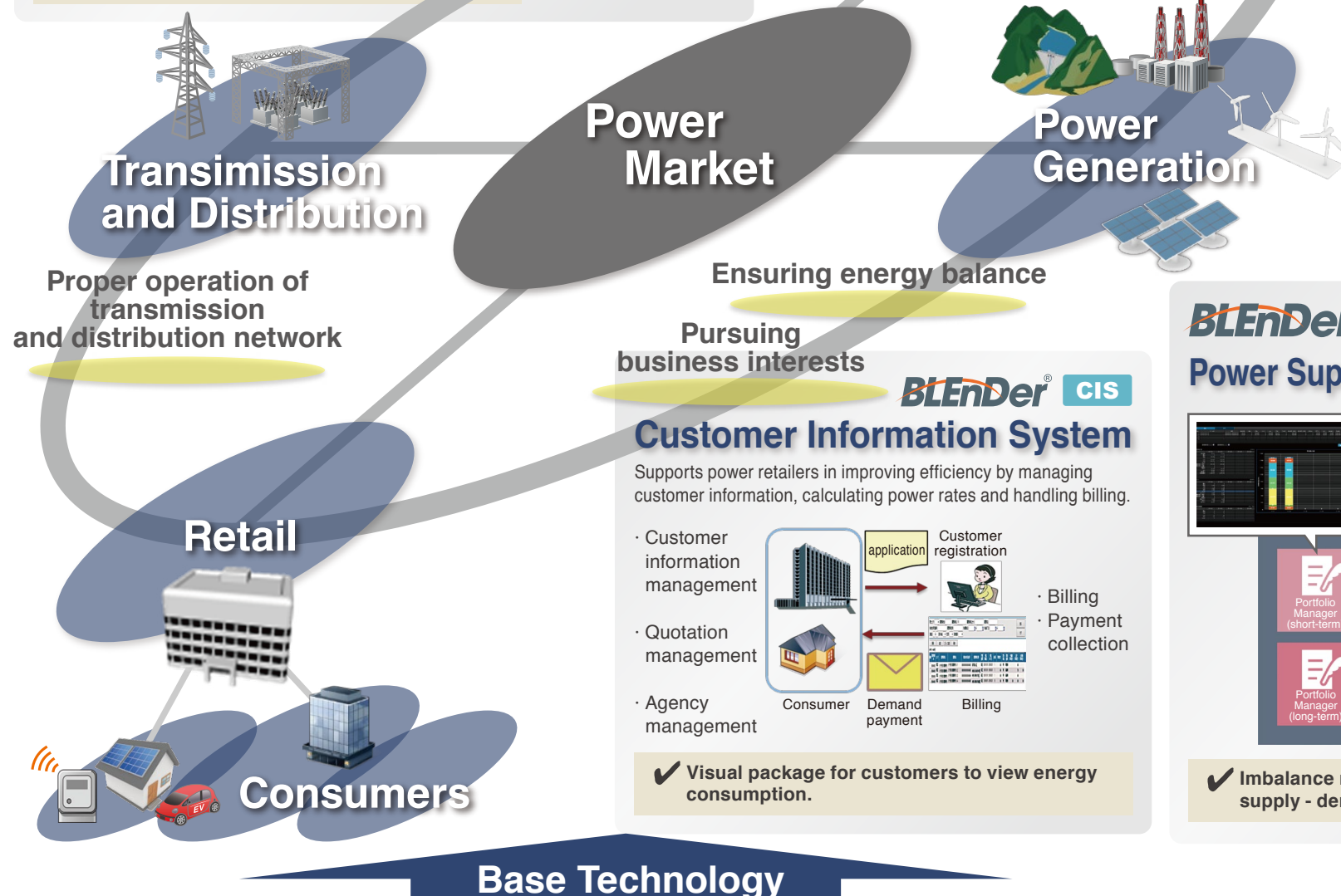
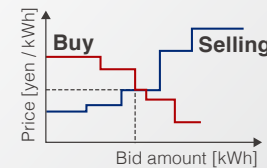
BLEnDer® Exchange

Power Exchange System

Operates the spot market, one hour ahead market and forward market for Japan Electric Power Exchange.

- Bid accept · Contract · Settlement
- Disclose information

✓ Since we started operation in 2005, our product has contributed to stable market operation in concert with rule changes.



BLEnDer® RE DR AC

Dispersed Power Sources Management System

Enables management of increase of renewable energy utilization and stabilization of system operation.

- Frequency & voltage control
- Battery optimal operation
- Regional microgrid control

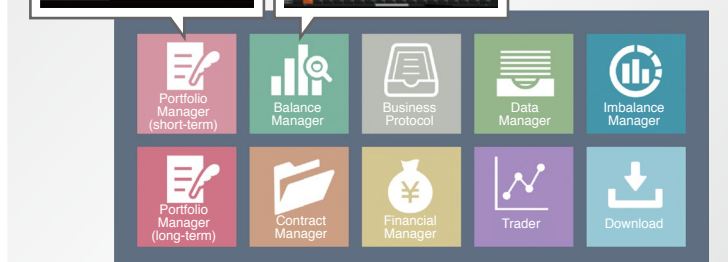
- Supply-demand balancing market
- Optimal control for each DER
- DER management and visualization

✓ Total solution including consultation on DER introduction, management, control and operation.

BLEnDer® BM LF PM BP CM Trader

Power Supply-Demand Management System

Supports power producers and retailers in supply and demand balancing operation.



✓ Imbalance minimization and profit maximization through supply - demand optimization and utilization of power trading.

Information Technology

Mathematical programming methods such as optimization technology, and computer related database, OS/MW, server security technology, etc.

Power Energy Technology

Power system operation technology, various simulation methods for economic efficiency and stability, main circuit control technology, generator control technology, etc.

Communication Technology

Wide area network technology, sensor network technology, access network technology (wireless/wired communication).