



Battery Energy Storage Systems for Malaysia's Energy Transition

Scalable Storage Solutions for Grid Stability, Renewable Integration, and National Energy Security

100MW / 400MWh | 50MW / 200MWh | 10MW / 40MWh



Prepared for Strategic Discussion | Malaysia Energy Transition Opportunity

A Timely Opportunity for Malaysia



Malaysia Has Proven the Model

- The successful deployment of large-scale BESS demonstrates readiness for the next phase of national rollout.

The Next Need Is Scale

- Malaysia now needs replicable storage systems to support renewable energy growth and grid resilience.

Volterra Can Support Deployment

- Volterra offers scalable BESS project formats, deployment support, and a flexible partnership model.

The Strategic Outcome

- Stronger grid stability, better renewable integration, improved resilience, and local economic value creation.

Volterra proposes a scalable BESS platform aligned with Malaysia's national energy transition goals.

Malaysia's BESS Momentum Is Already Underway

Lahad Datu BESS — Sabah

100MW / 400MWh

Demonstrates the growing role of large-scale storage in strengthening regional energy infrastructure

Santong BESS — Terengganu

100MW / 400MWh

- First battery energy storage system connected to Malaysia's grid
- Supports controlled energy storage and discharge to strengthen grid stability and reliability

What This Means

Malaysia has moved from concept to execution.

The opportunity now is to **replicate, optimize, and scale** future BESS deployments.

The first projects validate the need — the next step is wider national deployment.

Why Malaysia Needs More Energy Storage



Renewable Integration

Battery systems help shift solar and renewable output into higher-value hours and improve dispatchability.



Grid Stability

BESS strengthens system reliability by storing and releasing power in a controlled way.



Regional Resilience

BESS supports East Coast, Sabah, Sarawak, and other areas where grid flexibility is especially valuable.



Industrial Growth

Malaysia's industrial expansion and large-load growth require flexible, modern power infrastructure.



Energy Security

Storage supports system resilience during outages, disturbances, and supply constraints.



Affordable & Sustainable Energy

BESS helps Malaysia balance reliability, affordability, and sustainability as the energy mix evolves.

BESS is not optional infrastructure — it is an enabler of Malaysia's long-term energy transition.

Aligned with Malaysia's Energy Priorities



NETR Pathway

Supports the transition toward higher renewable energy penetration and long-term energy system transformation.

Reliable Energy for All

Supports affordable, reliable, and sustainable energy access, including for rural and remote areas.

Renewables + Storage

Pairs naturally with solar, biomass, biogas, and future clean-energy infrastructure.

Resilient Grid Infrastructure

Improves the flexibility and responsiveness of the power system.

Economic Development

Enables local jobs, skills transfer, O&M capability, and potential local assembly or integration opportunities.

Volterra's BESS platform is designed to support the policy goals Malaysia has already set.

Volterra's BESS Platform



Battery Storage Systems



4-hour lithium battery storage for utility, industrial, and distributed applications.

Power Conversion & Balance of Plant



PCS, transformers, switchgear, protection, and interconnection-ready system architecture.

Energy Management Intelligence



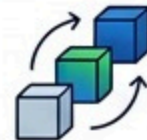
Real-time control, monitoring, optimization, and dispatch support.

Flexible Commercial Structures



Turnkey EPC, development partnership, joint venture, or build-own-operate options.

Scalable Project Formats



Standardized 10MW, 50MW, and 100MW project pathways to simplify deployment.

Volterra offers a repeatable, scalable storage solution for Malaysia's next phase of energy infrastructure.

Long-Life LFP Storage Platform

- High-safety lithium iron phosphate chemistry
- Engineered for stationary energy storage applications
- Strong thermal stability and safety profile
- Designed for 10,000+ cycles under optimized operating conditions
- Suitable for utility-scale, commercial, industrial, and microgrid deployments

Volterra Integration

- Volterra-branded BESS container and product platform
- System engineering and architecture design
- EMS, SCADA, and controls integration
- Grid interconnection and compliance support
- EPC coordination and deployment management
- Long-term operations, maintenance, and monitoring



Advanced Battery Intelligence

- Intelligent battery control at module and cell management level
- Improved usable energy and system optimization
- Enhanced operating efficiency and asset performance
- Smarter battery protection and performance balancing
- Scalable architecture for high-value BESS deployment

Deployment & Commercial Readiness

- Designed for 10MW, 50MW, and 100MW class deployments
- Supports utility, grid-support, industrial, and renewable integration applications
- Built for scalable rollout across national and regional energy projects
- Supports long-term asset ownership and recurring revenue models
- Flexible enough for direct sale, long-term service agreement, or Battery-as-a-Service deployment

Volterra combines long-life LFP storage, advanced battery intelligence, and system integration to deliver scalable, revenue-producing BESS infrastructure.

BUSINESS MODEL

Battery-as-a-Service and Long-Term Asset Ownership



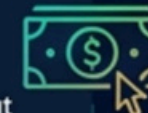
VOLTERRA OWNS AND OPERATES

- Volterra retains ownership of the BESS asset
- Volterra manages engineering, integration, and deployment
- Volterra oversees operations, maintenance, and performance monitoring
- Volterra controls long-term asset optimization and lifecycle management
- Volterra builds a portfolio of recurring-revenue energy assets



CUSTOMER PAYS FOR ACCESS AND USAGE

- Reservation or development deposit
- Monthly subscription or availability fee
- Utilization fee based on usage or energy throughput
- Optional revenue-share on market or grid-service upside
- Optional long-term buyout pathway



ILLUSTRATIVE COMMERCIAL STRUCTURE

10MW / 40MWh



Deposit: RM40.3M
Monthly Subscription:
RM806K/month
Utilization Fee:
RM202/MWh discharged
Term: 10 years

50MW / 200MWh



Deposit: RM161.2M
Monthly Subscription:
RM3.22M/month
Utilization Fee:
RM161/MWh discharged
Term: 10-15 years

100MW / 400MWh



Deposit: RM322.4M
Monthly Subscription:
RM6.04M/month
Utilization Fee:
RM161/MWh discharged
Term: 15 years

WHY THIS MODEL WORKS



Reduces or avoids major upfront customer CAPEX



Aligns payment with performance and actual utilization



Accelerates deployment through a service-based model



Allows Volterra to capture long-term recurring revenue



Supports optional buyout or revenue-sharing flexibility



Creates a bankable platform for multi-site rollout and asset ownership

BENEFITS & INCENTIVES



CUSTOMER BENEFITS

- Lower upfront cost
- Reliable energy storage access
- Performance-based payment structure
- Operational support from Volterra
- Optional future ownership pathway



VOLTERRA BENEFITS

- Recurring subscription revenue
- Usage-based upside
- Asset ownership and portfolio growth
- Long-term strategic customer relationship
- Scalable clean-energy infrastructure business

Volterra's Battery-as-a-Service model enables customers to deploy BESS without full upfront CAPEX while allowing Volterra to build a long-term, revenue-producing energy asset platform.

BATTERY-AS-A-SERVICE FINANCIAL MODEL — MALAYSIA

Volterra-Owned BESS with Government / Utility Leasing Structure

COMMERCIAL STRUCTURE



10MW / 40MWh



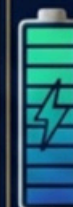
Estimated System Cost: RM76.6M
CAPEX Contribution / Security Deposit: RM40.3M
Net Volterra-Financed Balance: RM36.3M
Monthly Subscription: RM806K
Usage Fee: RM202/MWh discharged

50MW / 200MWh



Estimated System Cost: RM302.3M
CAPEX Contribution / Security Deposit: RM161.2M
Net Volterra-Financed Balance: RM141.1M
Monthly Subscription: RM3.22M
Usage Fee: RM161/MWh discharged

100MW / 400MWh



Estimated System Cost: RM564.1M
CAPEX Contribution / Security Deposit: RM322.4M
Net Volterra-Financed Balance: RM241.8M
Monthly Subscription: RM6.04M
Usage Fee: RM161/MWh discharged

Main Message: Volterra funds and retains ownership of the BESS asset while the government or utility pays a CAPEX contribution, monthly subscription, and usage-based fee.

BASE CASE MONTHLY REVENUE ASSUMPTION

1 full cycle per day, 30 days per month

System Size	Monthly Subscription	Usage Revenue (1 Cycle/Day)	Total Monthly Revenue	Est. Monthly Operating Profit
10MW / 40MWh	RM806K	RM242K	RM1.05M	RM838K
50MW / 200MWh	RM3.22M	RM967K	RM4.19M	RM3.35M
100MW / 400MWh	RM6.04M	RM1.93M	RM7.98M	RM6.37M

100MW / 400MWh MONTH-BY-MONTH REVENUE SNAPSHOT

Month 0	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
RM322.4M Deposit	RM7.98M Revenue	RM7.98M Revenue	RM7.98M Revenue	RM7.98M Revenue	RM7.98M Revenue	RM7.98M Revenue	RM7.98M Revenue	RM7.98M Revenue	RM7.98M Revenue	RM7.98M Revenue	RM7.98M Revenue	RM7.98M Revenue

This structure

Year 1 Total Cash Inflow

RM418.1M

Annual Recurring Revenue

RM95.75M

Estimated Annual Operating Profit

RM76.6M

Net Volterra-Financed Balance

RM241.8M

set platform.

Budgetary Pricing Framework — Malaysia BESS Deployment

Main Message: Volterra recommends presenting Malaysia BESS pricing as a bankable project range, not as a direct scale-up of the 540kWh cabinet quote.

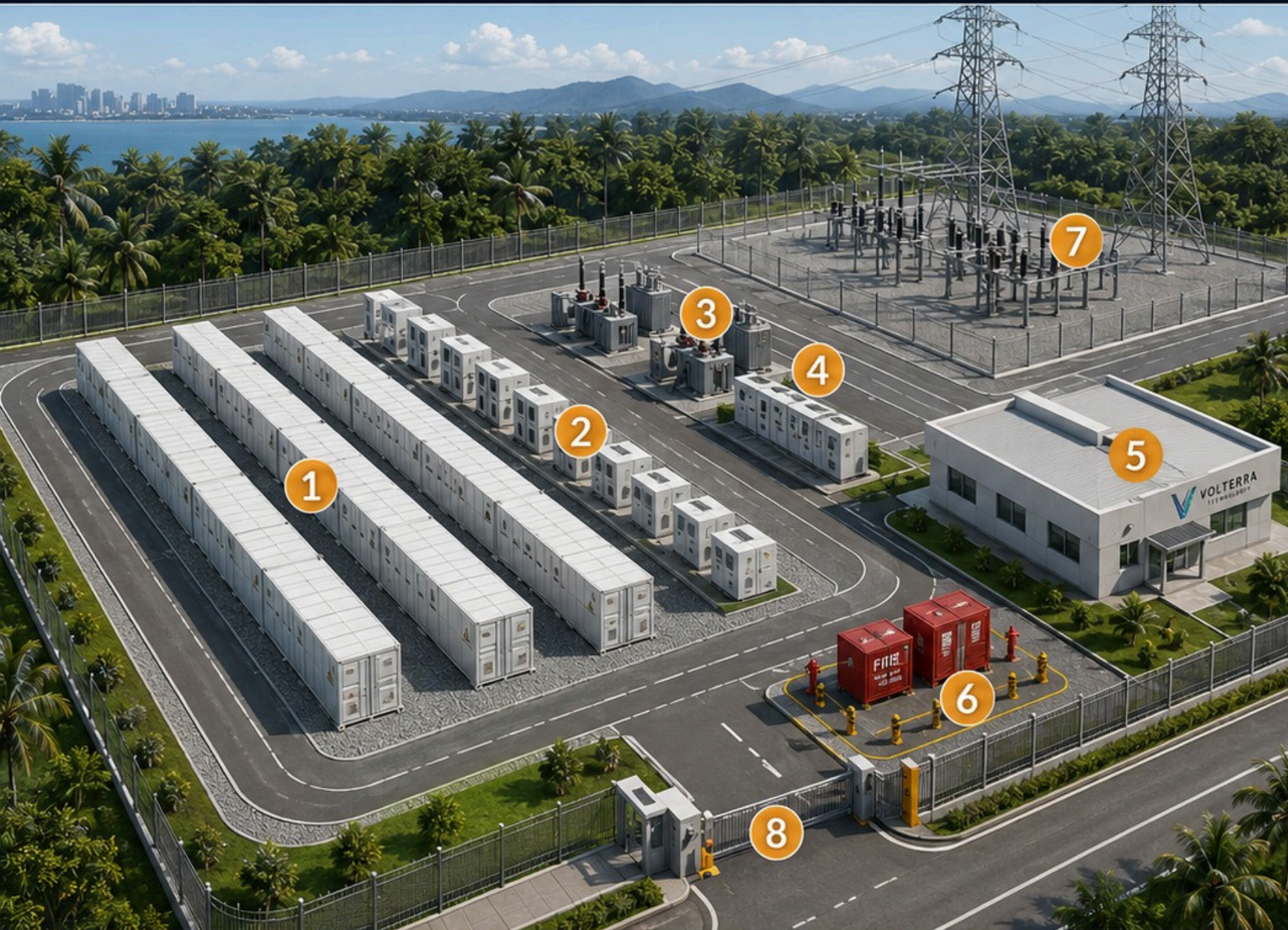
Pricing Table

BESS Capacity	Budgetary Range (RM)	Planning Midpoint (RM)
10MW / 40MWh	RM64.5M-RM88.7M	RM76.6M
50MW / 200MWh	RM262.0M-RM342.6M	RM302.3M
100MW / 400MWh	RM503.8M-RM644.8M	RM564.1M

100MW / 400MWh Cost Stack

Battery containers / DC blocks	RM221.7M-RM302.3M
PCS / inverters	RM48.4M-RM80.6M
Transformers / MV switchgear / protection	RM40.3M-RM72.5M
EMS / SCADA / controls	RM16.1M-RM32.2M
Fire safety / HVAC / monitoring	RM24.2M-RM40.3M
Civil / electrical installation / site integration	RM72.5M-RM112.8M
Engineering / commissioning / testing	RM20.2M-RM40.3M
Project management / contingency	RM40.3M-RM64.5M

100MW / 400MWh Utility-Scale BESS – Malaysia Site Layout



- 1 Battery Energy Storage Containers
- 2 PCS / Inverter Stations
- 3 Medium-Voltage Transformers
- 4 MV Switchgear / Protection Panels
- 5 EMS / SCADA Control Building
- 6 Fire Safety / Emergency Response Zone
- 7 Grid Substation / Interconnection Yard
- 8 Site Access / Security / O&M Gate



A FLAGSHIP SYSTEM FORMAT SUITED TO MALAYSIA'S NEXT GENERATION OF GRID-SCALE PROJECTS.



VOLTERRA
TECHNOLOGY



50MW / 200MWh Regional Storage Platform



Best Fit Applications

- Regional substations
- Industrial corridors
- Renewable firming
- Community-scale resilience
- Grid congestion management

Why It Matters for Malaysia

A flexible format for faster deployment where a full 100MW / 400MWh site is not yet required.

Commercial Position

A strong option for phased deployment and portfolio rollout across multiple sites.

Ideal for scaling BESS deployment beyond flagship projects into wider national use.

10MW / 40MWh Distributed & C&I Storage Platform



Best Fit Applications

- Commercial and industrial peak shaving
- Backup power
- Power quality support
- Remote or weak-grid support
- EV charging infrastructure

Malaysia Relevance

- Supports industrial customers
- Edge-of-grid applications
- Resilience for strategic smaller loads

Deployment Advantage

- Faster deployment
- Smaller footprint
- Easier replication across multiple customer sites

A practical entry-point system for distributed storage growth across Malaysia.

ENERGY MANAGEMENT INTELLIGENCE



REAL-TIME MONITORING

System Health



State of Charge



Performance Visibility



Alarms

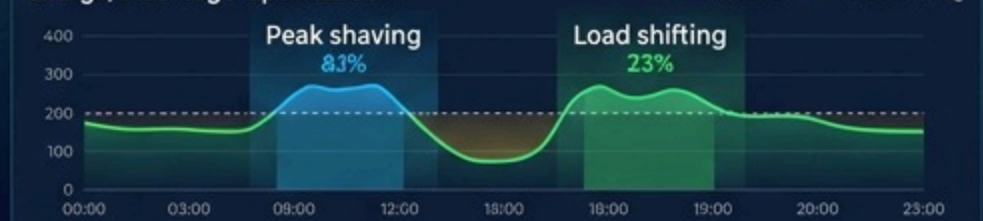
- ▲ Alarms not monitored 2 hours ago
- ▲ Alarms not monitored 7 hours ago

Temperature



AUTOMATED DISPATCH

Charge/Discharge Optimization



MULTI-ASSET CONTROL



Battery Systems

Status



Solar

Status



EV Charging

Status



Other Energy Assets



REPORTING & ANALYTICS

Operational Reports



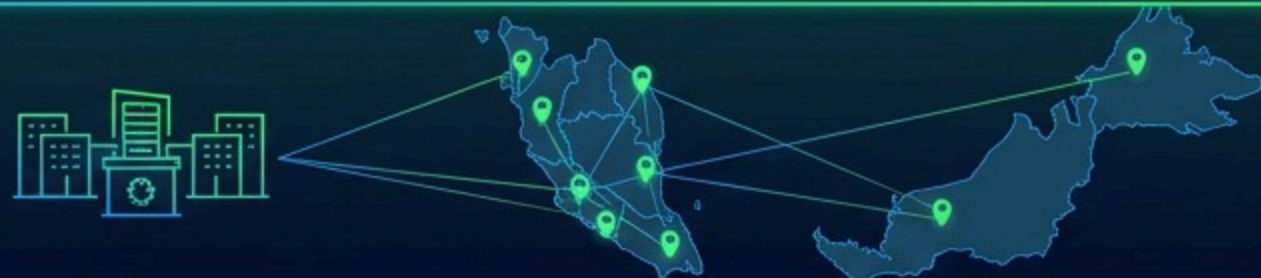
Performance Transparency



Uptime Management



SCALABLE CONTROL LAYER



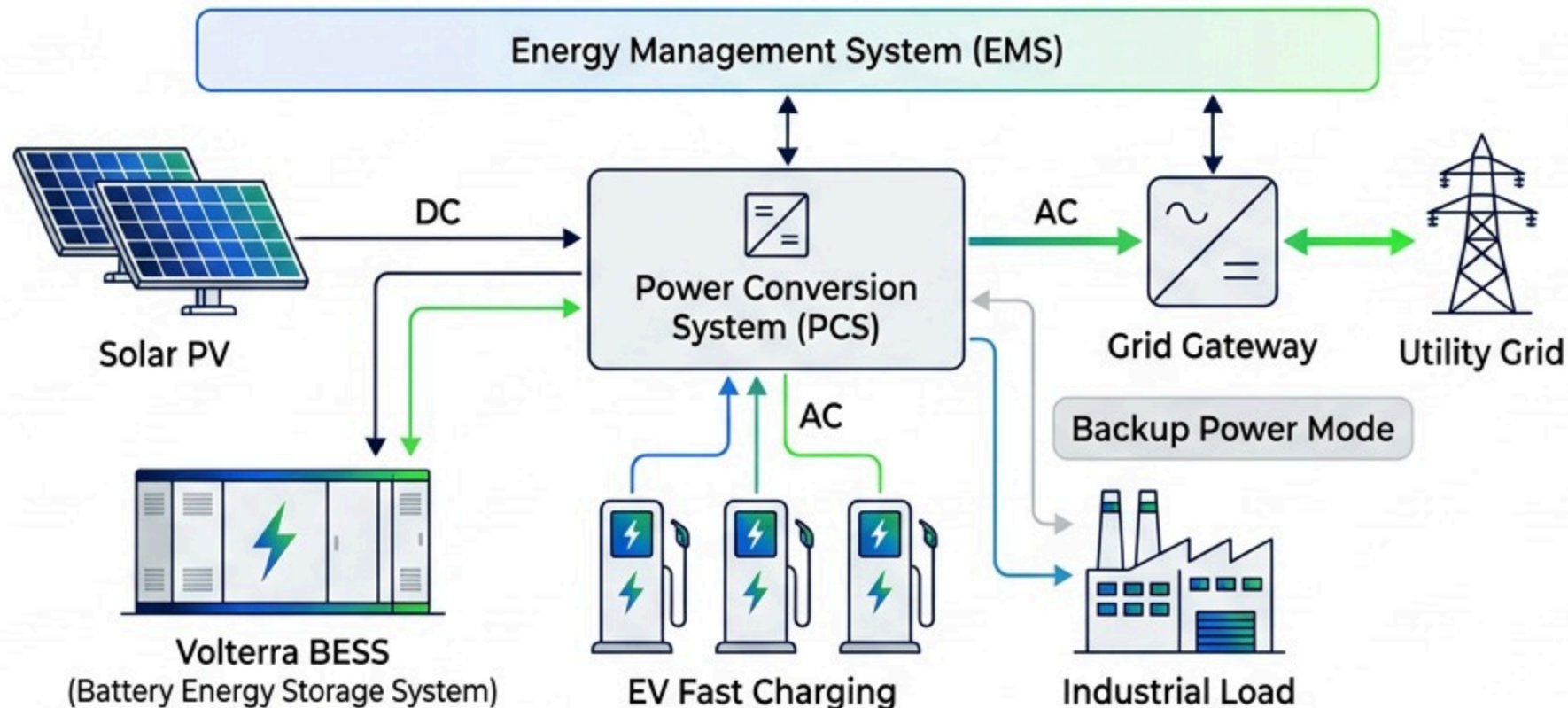
The intelligence layer is what turns a battery into a high-value operating asset.

Energy Management Intelligence

BESS + Solar + EV Charging + Microgrid



Integrated BESS Applications for Malaysia



Higher System Flexibility

Battery storage helps connect and stabilize multi-asset energy systems.

Faster Electrification Support

Supports EV charging and other new electrical loads without excessive grid strain.

Broader Application Range

Useful for industrial parks, charging hubs, campuses, community energy, and remote support.

Volterra can support storage-only, storage-plus-solar, and integrated microgrid applications.

Solar + BESS Project Integration Experience



**Commercial Retail
Energy Sites**



**Municipal &
Community Facilities**



**Utility Grid
Integration**



**Solar + BESS + EV
Charging Readiness**

Volterra's project inclusion demonstrates a scalable pathway to deliver solar-integrated BESS systems for commercial, municipal, utility, and community energy customers.

Priority BESS Opportunity Areas in Malaysia



Volterra can support a phased rollout across strategic national and regional priority sites.

Creating Local Value in Malaysia



Local EPC Partnerships

Work alongside Malaysian engineering and construction partners.



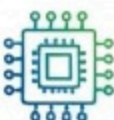
Skills Transfer

Training for operations, maintenance, controls, and project delivery.



Operations & Maintenance Capability

Develop local long-term system support.



Potential Local Integration / Assembly

Explore opportunities for local system integration and supply chain participation.



Job Creation

Support technical, engineering, and operational employment.



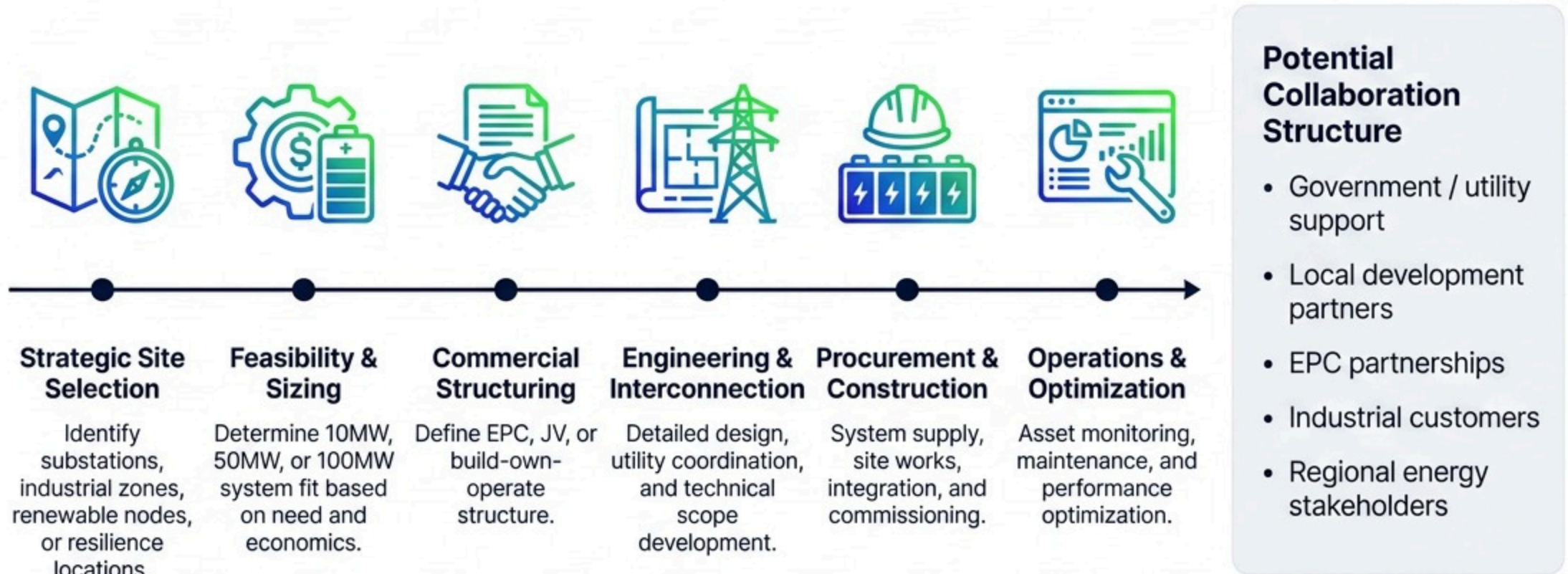
Platform for Future Clean-Tech Growth

Build a wider ecosystem that can support BESS, EV infrastructure, and future hydrogen-related applications

Volterra's objective is not only to deploy systems — but to help create long-term value in Malaysia.

Partnership & Delivery Model

Deployment Pathway for Malaysia



Voltterra offers a practical and scalable path from concept to operational BESS asset.

A Strategic BESS Partnership Opportunity for Malaysia

What Volterra Proposes

- A scalable BESS partnership platform for Malaysia using 10MW, 50MW, and 100MW deployment pathways.

What Malaysia Gains

- Grid resilience
- Renewable integration
- Improved energy security
- Local value creation
- Long-term clean infrastructure capability

Recommended Next Step

- Identify priority sites, review deployment needs, and establish a technical-commercial pathway for pilot and scale-up projects.

Volterra Technology is ready to support Malaysia's next phase of battery energy storage deployment.



South East Asia Distributor



No. 11, Jalan Kota Raja H/27H, Hicom Town Centre Seksyen 27, 40400 Shah Alam, Selangor Darul Ehsan
Tel : +603 - 5191 4505 Fax : +603 - 5191 4508
www.jtr.my / enquiry@jtr.my