ASIA CLEAN ENERGY FORUM 2026

Beyond Transition: Building Secure, Resilient, Inclusive, and Intelligent Energy Systems

8–11 June | ADB Headquarters, Metro Manila, Philippines

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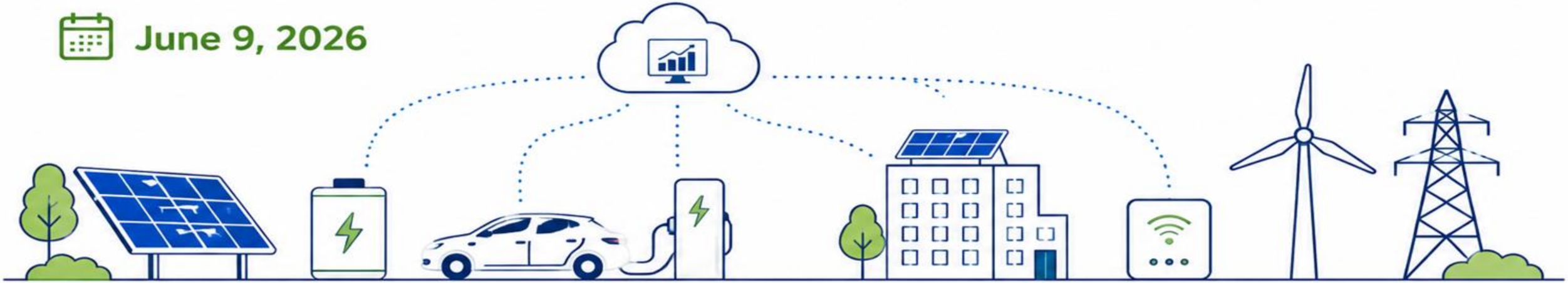
Exploring ASEAN Readiness for Virtual Power Plants

June 9, 2026



Soe Thiri Thandar
5 Lakes Energy

Outline

01 VPP Overview and Framework

02 Key Dimensions of VPP Readiness

What are virtual power plants(VPP) and how do they work?

A VPP is a system of distributed energy resources (DERs) —like rooftop solar panels, EV chargers, and smart heaters that work together to balance energy supply and demand on a large scale. They are usually run by local utility companies who oversee this balancing act. A VPP is a way of "stitching together" a portfolio of resources.

MIT Technology Review

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VIRTUAL POWER PLANT (VPP)

Aggregating Distributed Energy Resources (DER) through a digital platform to deliver value for the grid, markets, and customers.

DISTRIBUTED ENERGY RESOURCES (DER)

Solar PV
Rooftop / Ground-mount

Battery Storage
Behind-the-meter / Front-of-meter

EVs & Chargers
Vehicle-to-Grid (V2G) capable

Flexible Demand
Buildings, Industrial loads, HVAC, Pumps

VPP PLATFORM

Forecast
Load & Generation Forecasting

Aggregate
DER Portfolio Aggregation

Optimize
Economic & Grid Optimization

Dispatch
Real-time Control & Dispatch

Secure & Reliable Platform
Data Management • Communications • Cybersecurity

PRACTICAL VPP SERVICES

Frequency Response
Fast response to maintain frequency stability

Peak Shaving
Reduce peak demand and defer infrastructure

Load Flexibility
Shift or modulate loads to balance the grid

Backup Power
Provide reliable backup during outages

Enablers

1. Policy & Regulation
2. Market & Tariffs
3. Standards & Interoperability
4. Data Access & Privacy
5. Capacity Building

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Opportunity for VPPs in ASEAN

1. ECONOMIC & ENERGY GROWTH

25%

of global energy demand growth through 2035

Source: International Energy Agency. (2024). *Southeast Asia Energy Outlook 2024.*

2. RISING ELECTRICITY DEMAND

>2,000 TWh

electricity demand by 2035

Source: International Energy Agency. (2024). *Southeast Asia Energy Outlook 2024.*

3. RENEWABLE ENERGY EXPANSION

Fastest Growing Source of New Power Generation

Renewables provide an increasing share of electricity demand growth and become a major driver of power sector expansion.

Source: International Energy Agency. (2024). *Southeast Asia Energy Outlook 2024.*

4. REGIONAL GRID INTEGRATION

7.7 GW → 17.6 GW

ASEAN Power Grid target interconnection capacity by 2040

Source: Asian Development Bank & ASEAN Centre for Energy. (2023). *ASEAN Power Grid: Roadmap and Implementation Plan.*

5. GRID INVESTMENT NEED

~US$30 Billion / Year

annual grid investment required by 2035

Source: International Energy Agency. (2024). *Southeast Asia Energy Outlook 2024.*

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VPP Readiness Assessment Framework

Advanced Metering Infrastructure (AMI)

Smart meter data and two-way communication enabling visibility and customer engagement.

SCADA / ADMS Integration

Distribution network visibility and operational control for reliable and efficient grid operations.

DERMS Platform

Aggregation, monitoring, optimization, and dispatch of distributed energy resources for grid and market services.

Electricity Market Design

Market mechanisms that value flexibility services and provide appropriate compensation for VPP operations.

DER Density & Grid Codes

Sufficient DER adoption and enabling interconnection standards to support VPP deployment.

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ASEAN READINESS LANDSCAPE

ADVANCED READINESS (18–25)

- Singapore

DEVELOPING READINESS (10–17)

- Thailand
- Malaysia
- Vietnam

EARLY-STAGE READINESS (0–9)

- Philippines
- Indonesia
- Cambodia
- Brunei Darussalam
- Lao PDR
- Myanmar

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Case Studies

Veridian at County Farm

Ann Arbor, United States

Designed as a community-scale VPP (~1.3 MW) DERMS / coordination platform exists

- 4+ years in discussion with utility
- Not yet fully dispatchable as a grid resource

Singapore

- National VPP regulatory sandbox (EMA-led)
- ~15 MW pilot VPP
- Market participation is included in pilot design

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SCALE

Expand and enhance advanced VPP operations

Scale market participation

Increase DER and consumer participation in markets

Optimize flexibility and value

Maximize value from batteries, EVs and demand flexibility

Deliver grid and system services

Provide reliability, balancing and ancillary services at scale

Drive innovation and efficiency

Leverage data and AI for continuous optimization

SINGAPORE

COMMERCIALIZE

Move from pilots to commercial scale

Strengthen enabling frameworks

Finalize regulations for aggregators, DER participation and data access

Launch commercial VPP programs

Scale utility and market-led VPP deployments

Develop viable business models

Ensure bankability, fair competition and cost recovery

Integrate with utility systems

Embed VPPs in planning, operations and market processes

MALAYSIA THAILAND VIETNAM

PREPARE

Establish the foundations for VPP readiness

Build digital and data foundations

Deploy smart meters, data systems and grid visibility

Expand distributed resources

Grow DER and storage with supportive programs and incentives

Establish enabling frameworks

Develop regulations and policies to enable VPPs

Build capacity and partnerships

Strengthen utility capabilities and stakeholder collaboration

PHILIPPINES INDONESIA CAMBODIA BRUNEI LAO PDR MYANMAR

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SCAN FOR PROFILE

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