



One Community  
for Sustainable  
Energy

# Regional Energy Cooperation and Regulatory Approaches for Achieving Clean Energy Transition and Net Zero Goals in the ASEAN Region – ASEAN Power Interconnection

**Prihastya Wiratama**

Project Manager of ASEAN Power Interconnection,

Power Fossil Fuel, Alternative Energy, and Storage (PFS) Department, ASEAN Centre for Energy

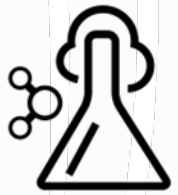
*“Enhancing Electricity Regulatory Ecosystem for Accelerating Clean Energy Transition and Achieving Net Zero Ambitions in The South Asia Region”*

18 September 2023

# Introduction to the ASEAN Centre for Energy (ACE)

Established in January 1999, ASEAN Centre for Energy (ACE) is an **intergovernmental organization within ASEAN** structure that represents the 10 ASEAN Member States' interests in the energy sector.

## What We Do



### Catalyst

Unify and strengthen ASEAN energy cooperation by providing a platform for sharing, policy advisory, best practices, and capacity building.



### Knowledge Hub

Provide a knowledge repository for ASEAN Member States (AMS) and services through data management, publication, and dissemination.

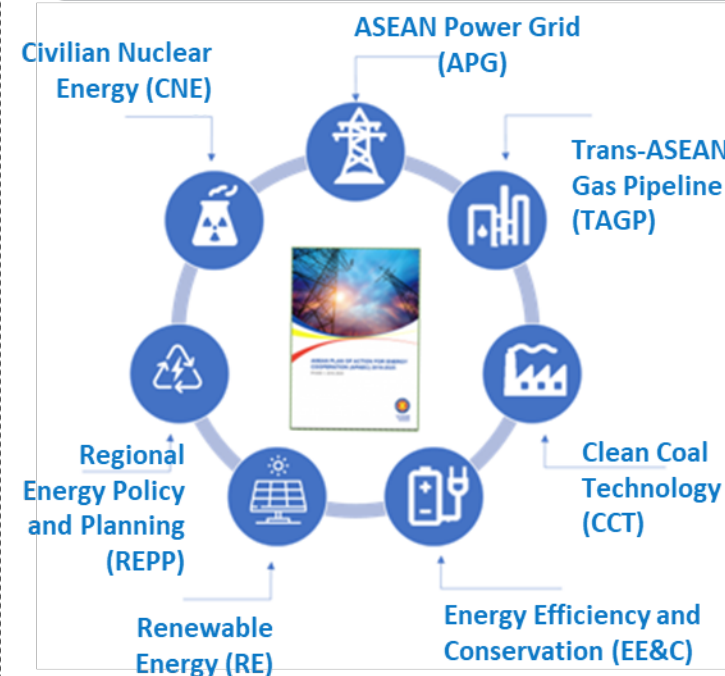


### Think Tank

Assist AMS on research and identifying practical and specific solution on policies, legal, and regulatory frameworks, technologies, and innovative solutions.

## ASEAN Plan of Action for Energy Cooperation (APAEC)

*Enhancing Energy Connectivity and Market Integration in ASEAN to Achieve Energy Security, Accessibility, Affordability and Sustainability for All*



### What is APAEC?

A series of guiding policy documents serving as the platform for deeper cooperation both within ASEAN as well as with DPs and IOs.

### What does APAEC do?

Promoting **multilateral cooperation and integration** in the energy sector.

### What is APAEC trying to achieve?

To attain the goals of **ASEAN Economic Community (AEC)** by enhancing security, accessibility, affordability, and sustainability in the energy sector.

# Commitment of ASEAN in carbon neutrality

ASEAN Country	Emission Reduction Target		Carbon Neutrality / Net Zero Target
	Unconditional	Conditional	
<b>Brunei Darussalam</b>	<ul style="list-style-type: none"> <li>20% GHG emissions reduction by 2030 compared to Business as Usual (BAU)</li> <li>At least 10% GHG emissions reduction by 2035 through better supply and demand management of electricity consumption</li> </ul>	N/A	Net zero emission by 2050
<b>Cambodia</b>	N/A	42% GHG emissions reduction or 64.5 MtCO <sub>2</sub> eq by 2030 compared to BAU	Carbon neutrality by 2050
<b>Indonesia</b>	31.89% GHG emissions reduction by 2030 compared to BAU	43.2% GHG emissions reduction by 2030 compared to BAU	Net zero emission by 2060 or sooner
<b>Lao PDR</b>	60% GHG emissions reduction compared to Baseline scenario, or around 62 MtCO <sub>2</sub> eq in absolute terms	N/A	Net zero emission by 2050 conditionally
<b>Malaysia</b>	Economy-wide carbon intensity (against GDP) reduction of 45% in 2030 compared to the 2005 level	N/A	Carbon neutrality by 2050
<b>Myanmar</b>	244.52 MtCO <sub>2</sub> eq emissions reduction by 2030	414.75 MtCO <sub>2</sub> eq emission reduction by 2030	Carbon neutrality by 2050
<b>Philippines</b>	2.71% GHG emissions reduction by 2030 compared to BAU	72.29% GHG emissions reduction by 2030 compared to BAU	N/A
<b>Singapore</b>	Achieve peak emissions at 60 MTCO <sub>2</sub> eq around 2030	N/A	Net zero emission by 2050
<b>Thailand</b>	30% GHG emissions reduction by 2030 compared to BAU	40% GHG emissions reduction by 2030 compared to BAU	Carbon neutrality by 2050 and Net zero emission by 2065
<b>Vietnam</b>	15.8% GHG emissions reduction by 2030 compared to BAU	43.5% GHG emissions reduction by 2030 compared to BAU	Net zero emission by 2050

Source: ACE (2023) based on several national documents submitted to UNFCCC

# The APAEC Phase II: 2021 – 2025

A regional blueprint for energy cooperation in the ASEAN that builds on the success of APAEC Phase I: 2016-2020, sets out ambitious targets and initiatives to enhance energy security and sustainability and supports the UN SDG 7.

ASEAN Plan of Action for Energy Cooperation (APAEC) 2016-2025 Phase 2: 2021-2025

- **Theme:** “Enhancing Energy Connectivity and Market Integration in ASEAN to Achieve **Energy Security, Accessibility, Affordability and Sustainability** for All”.
- **Sub-theme:** “Accelerating Energy Transition and Strengthening Energy Resilience through Greater Innovation and Cooperation.”

## APAEC Program Area No.1: ASEAN Power Grid



### Key Strategies:

To expand regional multilateral electricity trading, strengthen grid resilience and modernisation, and promote clean and renewable energy integration.



### Outcome Based Strategies:



#### OBS 1

Accelerate the completion of APG Project and initiate the expansion of multilateral electricity trading



#### OBS 2

Work on Institutional framework and regulatory capacity as minimum requirement to advance multilateral electricity trading



#### OBS3

Work on harmonizing the minimum technical requirements to advance multilateral electricity trading



#### OBS 4

Explore integrating renewable energy and other digital developments into APG Grid

# Why Southeast Region Need APG?



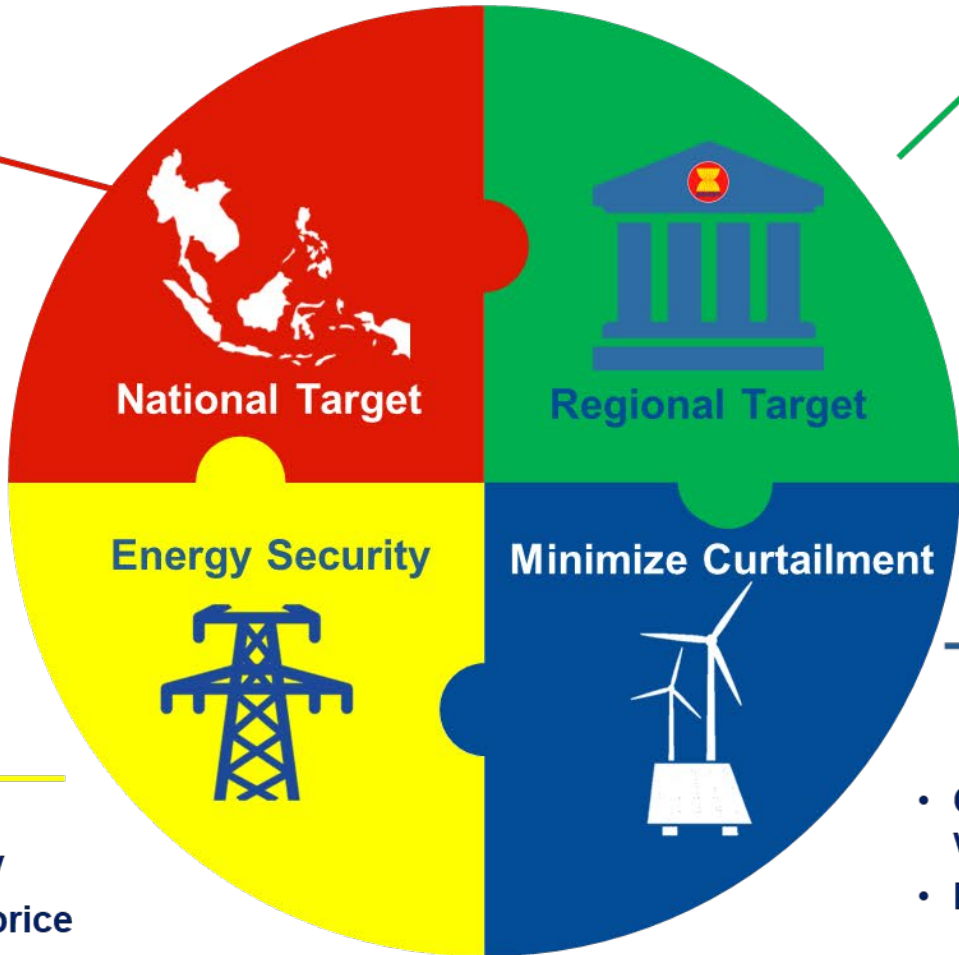
## Realize National Target

Addressing different condition of AMS, pursuing higher interconnection can unlock higher share of RE utilization

- To Achieve Regional Target, needs 44% share of RE installed capacity. Updated national PDP, predicted 39% of RE share in 2025
- Interconnection can help country like Singapore achieve its national target despite land and resource scarcity

## Energy Security

- Enhance regional energy security
- Minimize damage due to price volatility in global market



## Pursuit of Regional Target

ASEAN need to Achieve 23% share of RE in energy mix and 35% share of RE in installed Capacity by 2025

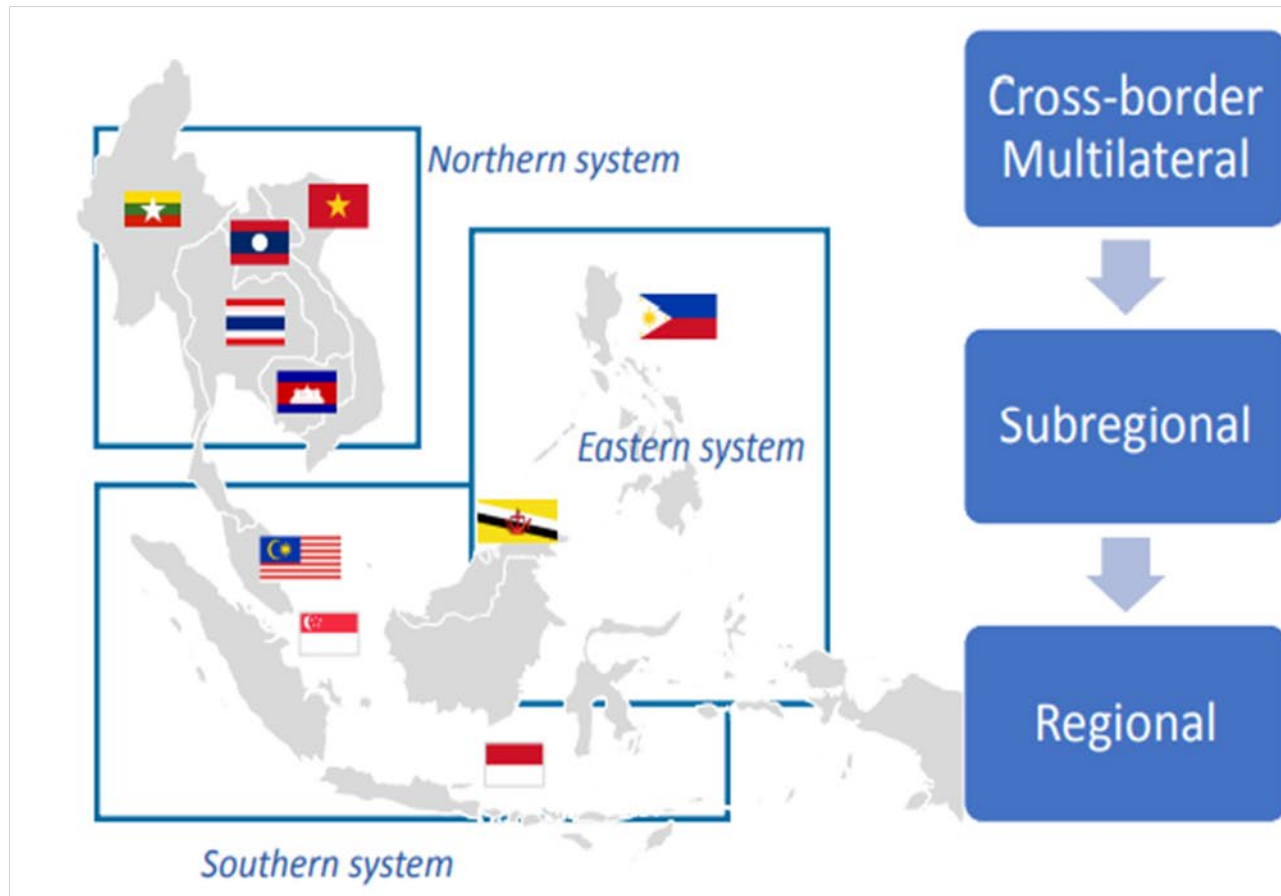
- Based on ASEAN Energy Outlook VII, it is predicted 60% of new installed capacity (2021-2025) will be RE
- Need 155 GW RE Capacity installed by 2025

## Minimize Curtailment

- Connect high-cater demand area with big potential RE Sites
- Minimize Curtailment Issue
  - Solar Power in Vietnam faces high curtailment due to high supply yet small domestic demand

# APG Concept: Pathway to establishing regional (multilateral) power trading

- The pathway to regional (multilateral) power trading in ASEAN has three different steps, where most progress has been made in bilateral cross-border trading.



Existing : 7,720 MW  
Ongoing : 555-625 MW  
Future : 18,369 – 21,769 MW

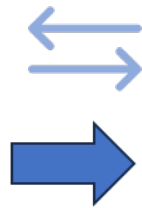
North system : Cambodia, Lao PDR,  
Myanmar,  
Thailand and Viet Nam  
South system : Indonesia, Malaysia and  
Singapore  
East system : Brunei Darussalam,  
Indonesia,  
Malaysia and Philippines

# ASEAN Interconnection Master Plan Study (AIMS) in a nutshell



## AIMS I (2003)

- Proposed regional electrical power transmission network: ASEAN Power Grid (APG).
- Identified potential saving in new investment and operating costs on interconnection.



## AIMS II (2010)

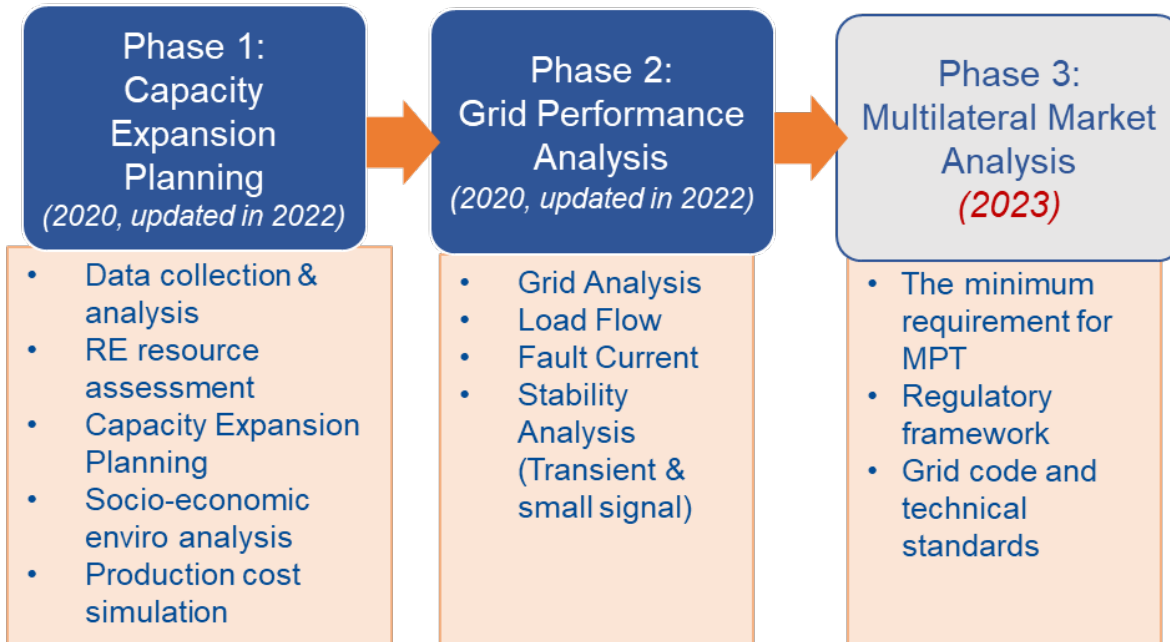
- Updated APG: changes in economic situation, electricity demand, energy requirement.
- Primarily made to plan APG through interconnection and to promote efficient, economical, and secure power system.



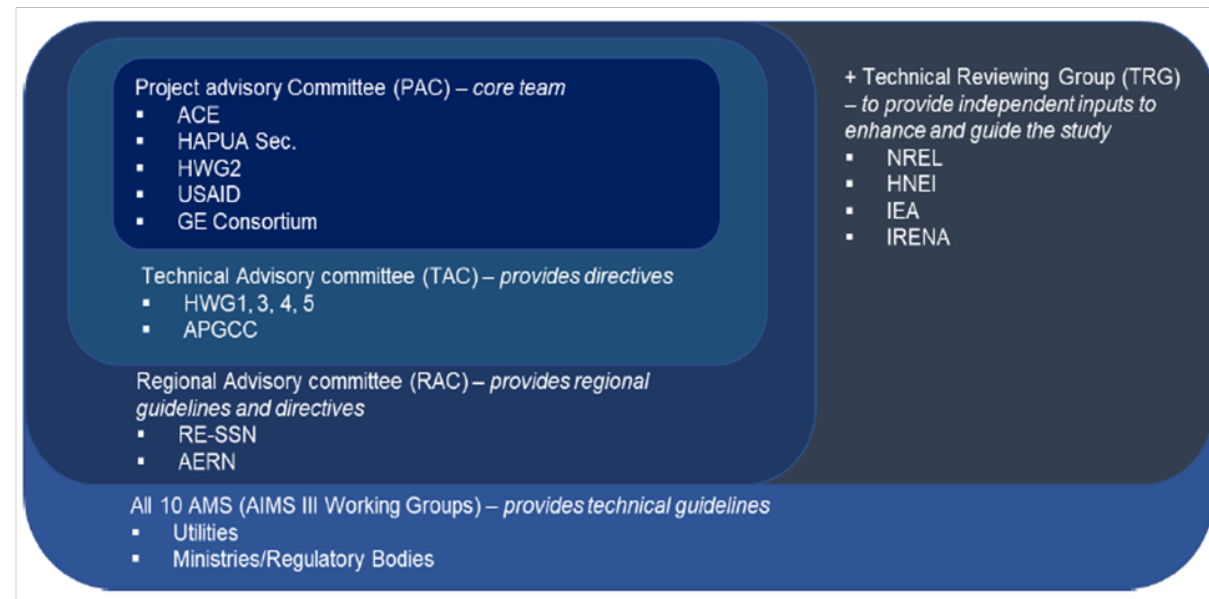
## AIMS III (2020) & Update (2022)

- Update APG plan under AIMS II
- Focus on increasing RE integration (as part of the ASEAN's target for having 23% share of RE in ASEAN's energy mix by 2025) through greater interconnections
- Time horizon up to 2040.

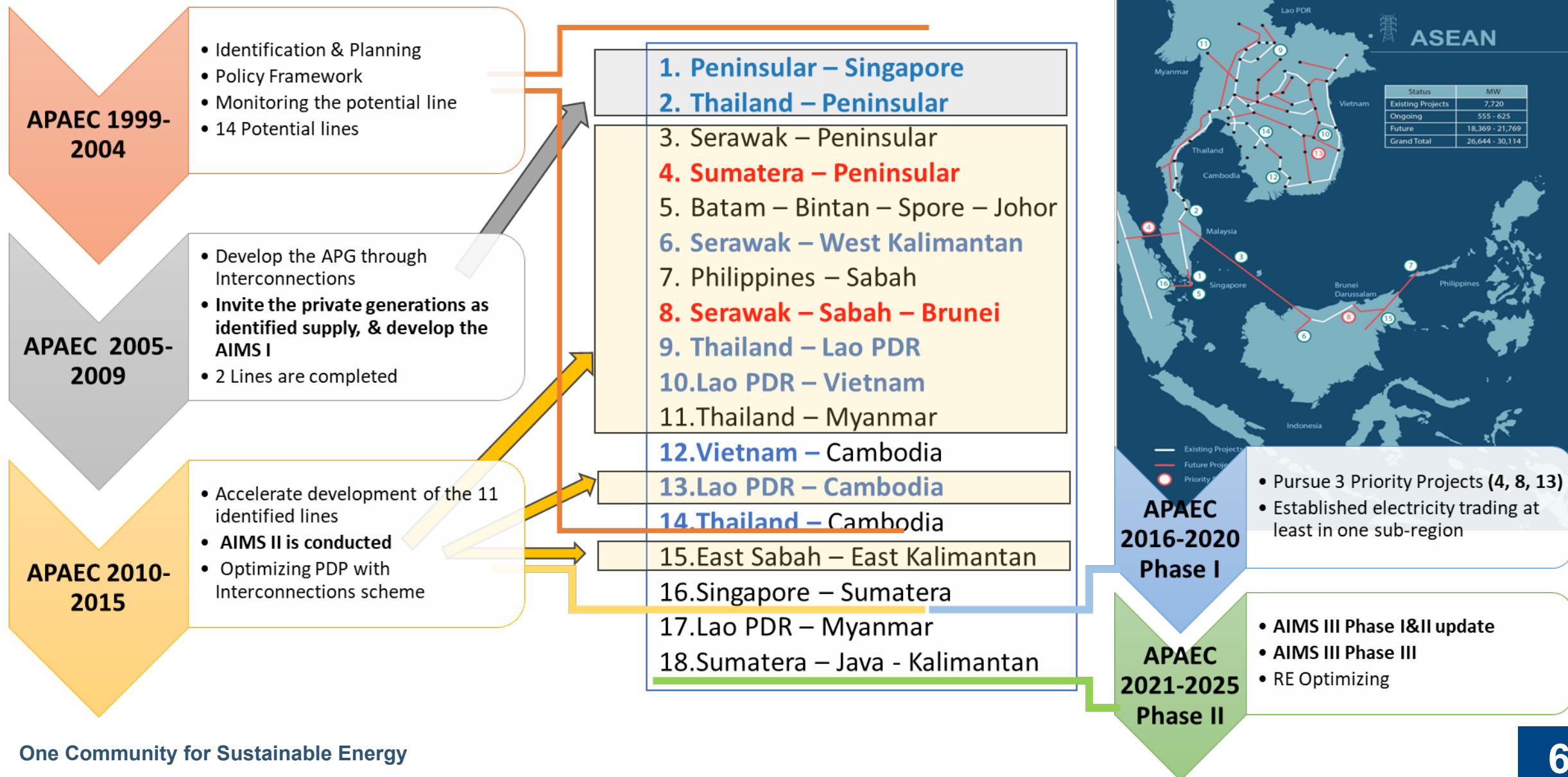
## What are the scope of AIMS III?



## Who are involved?

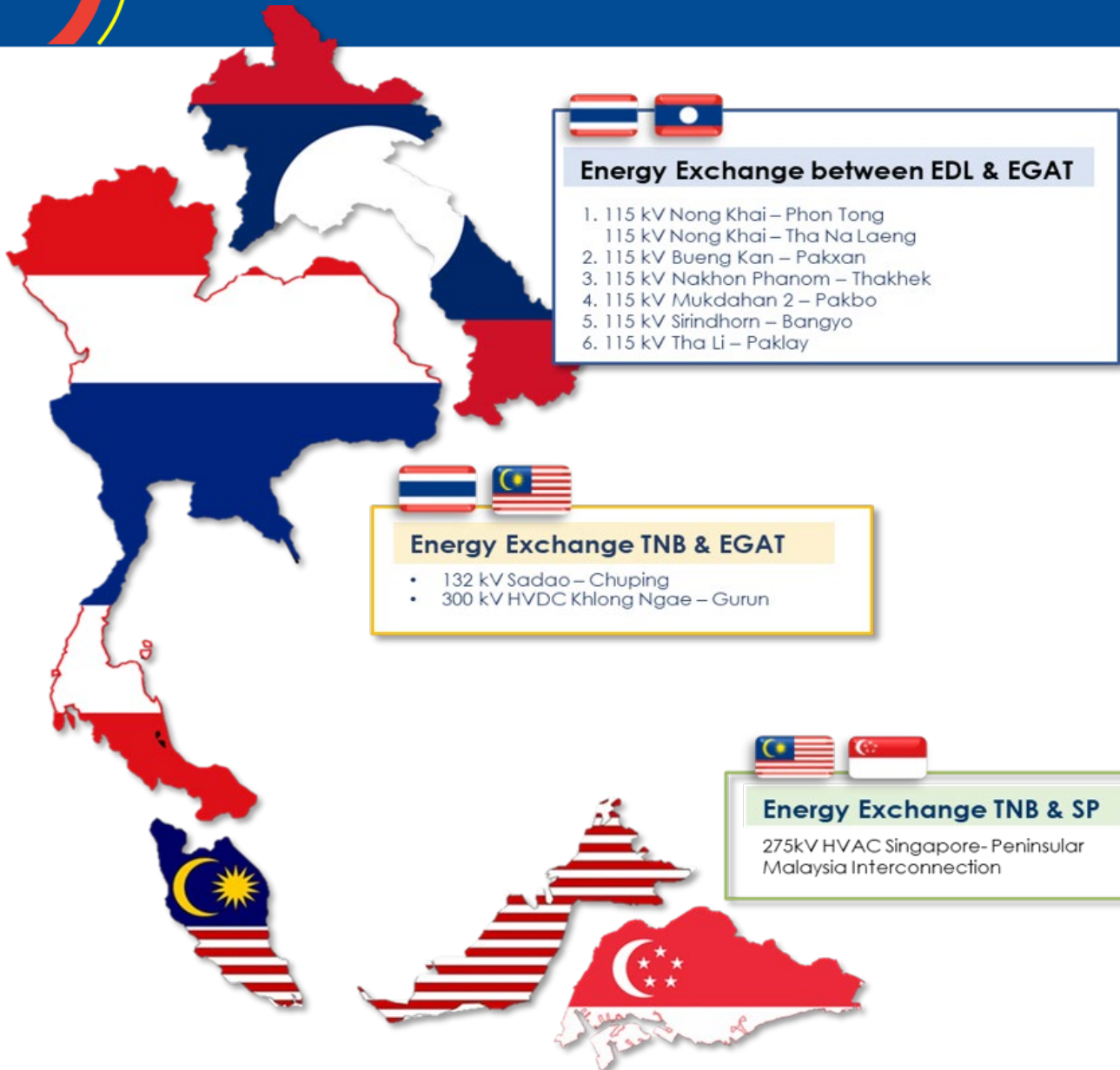


# Historical Brief of ASEAN Power Grid Based on AIMS





# Pathfinder for MPT: LTMS Power Interconnection Project



## LTM- PIP: Phase 1

**COMPLETED**

- Power purchase amount was up to 100 MW,
- **Total electricity delivered of 30.2 GWh**

## LTM- PIP: Phase 2

**COMPLETED**

- Power purchase amount has been **expanded up to 300 MW**
- LTM PIP Phase 2 into operation on December 27, 2019
- Operational period is from January 2020 – December 2021
- **A total of 2.6 GWh**, of electricity has been traded as of Dec 2021

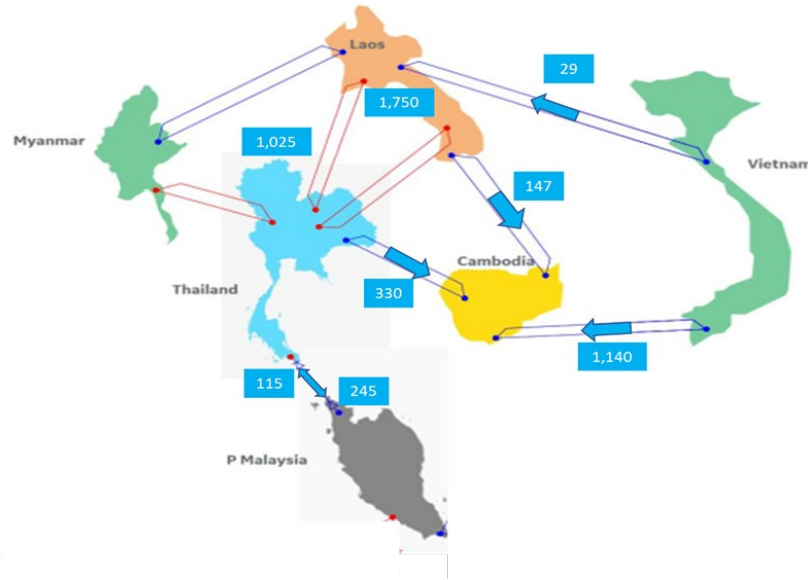
## LTMS- PIP

**IN PROGRESS**

- Power purchase amount is up to 100 MW,
- Contract Period: 2 years (2022- 2024)
- Effective Date: 22<sup>nd</sup> June 2022
- 1<sup>st</sup> Power Flow date : 23<sup>rd</sup> June 2022
- **Total of 265.73 GWh** of electricity has been traded (as of 30 April 2023)
- Proposed for the next phase power purchase capacity up to 300 MW with a 5-year contract

# Building Block of Harmonized Regulatory Framework for MPT

Illustration of Grid-to-Grid Imports and Exports (Power Trade) in the ASEAN Region



Data & Information Sharing  
Interconnector Capacity calculations

Harmonizing  
the  
Transparency

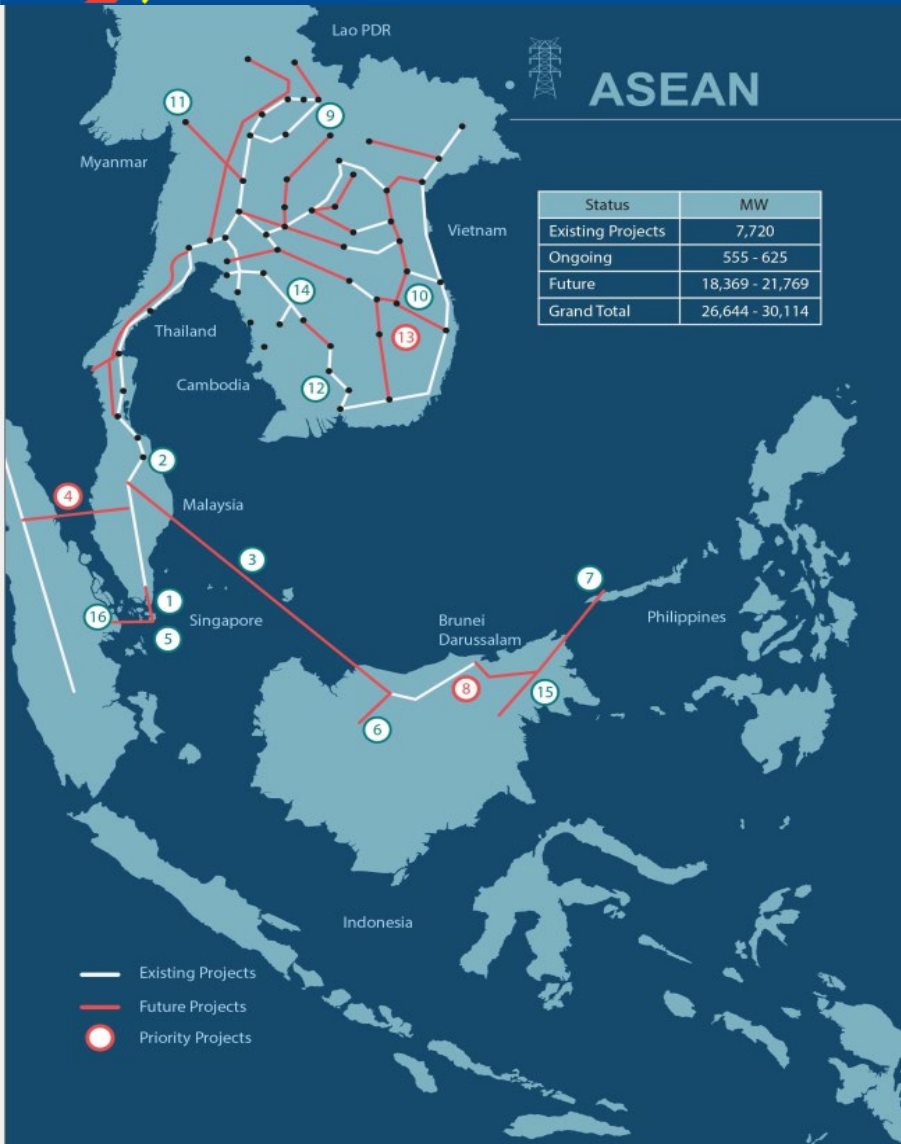
Oversight &  
Governance

Harmonized  
Grid Codes  
& Standards

Harmonized Grid Codes  
Harmonized Wheeling Charge Methodology  
Third-party access

Intergovernmental Agreements  
Institutional arrangements  
Settlement and payment mechanism  
Dispute resolution mechanism

# ASEAN Region Interconnection (ASEAN Power Grid)



The Region is requiring a balance in energy trilemma:

- security,
- affordability,
- and environmental sustainability.

APG initiative to fuelling the increasing regional energy demand and Energy Trilemma.

**Today's Quote** "There will be no energy transition without transmission"



**ASEAN Centre for Energy**

Soemantri Brodjonegoro II Building  
Jl. H.R. Rasuna Said Block X-02, Kav. 07-08,  
RT.10/RW.4, Kuningan Timur, Kecamatan Setiabudi,  
Daerah Khusus Ibukota Jakarta 12950  
T: (+62 21) 527 9332



<https://www.aseanenergy.org>