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ASEAN Power Grid Opportunities

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**Solving Complex
Challenges Together**

Regional interest in the ASEAN Power Grid is growing, given a range of potential benefits

—A Power Grid for 700 million people in Southeast Asia

1. Powering ASEAN's Future

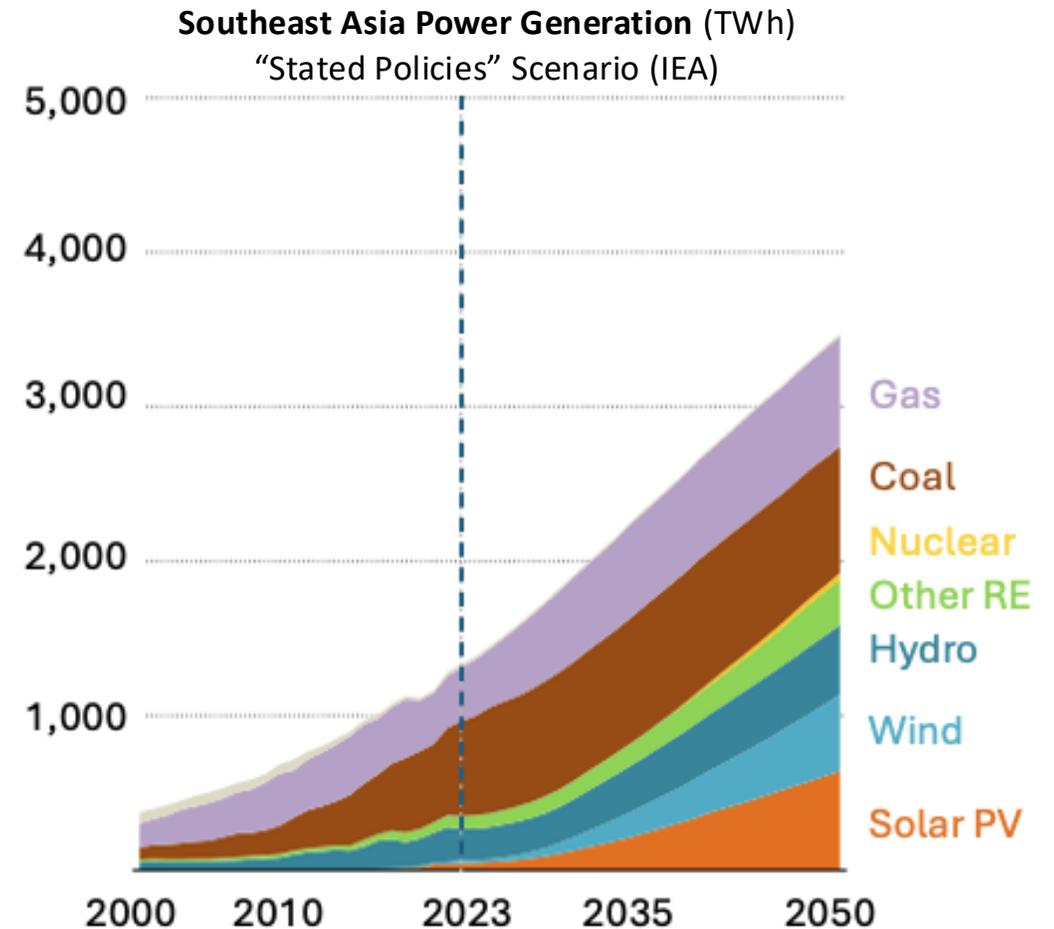
- Energy demand is rising rapidly—a stronger, smarter grid is critical.
- ASEAN Leaders' recognition → commitment to developing a fully integrated grid by 2045 for energy security.

2. Reliable and Affordable Power

- Grid interconnection lowers cost of power.
- Strengthen system resilience against demand shocks and supply risks.

3. Driving Competitiveness & Climate Goals

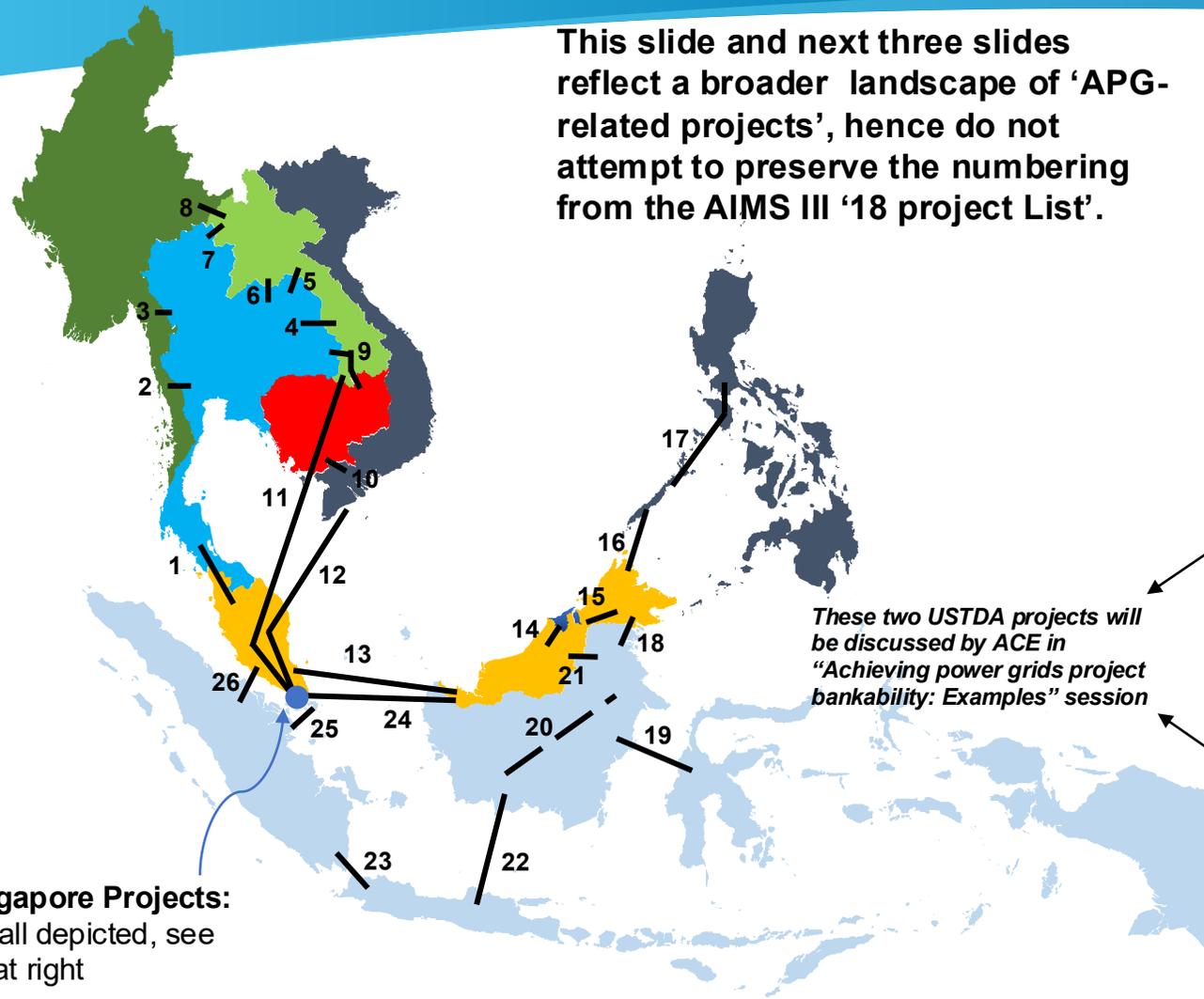
- Position ASEAN as a clean energy hub for industry and digital growth, fueled by clean energy.
- Enhance competitiveness → lower cost for exports, FDI to increase jobs and sustain growth.
- Deliver net-zero commitments by decarbonizing the region's energy system.



Source: International Energy Agency. Southeast Asia Energy Outlook 2024

Landscape of planned / under development / under construction projects*

This slide and next three slides reflect a broader landscape of 'APG-related projects', hence do not attempt to preserve the numbering from the AIMS III '18 project List'.



Singapore Projects: not all depicted, see list at right

These two USTDA projects will be discussed by ACE in "Achieving power grids project bankability: Examples" session

No.	Project Name	From	To
1	Thailand - P. Malaysia	THA	MYS (Peninsular)
2	Thailand - Tanintharyi	THA	MMR (Tanintharyi)
3	Mae Sot - Myawaddy	THA	Myanmar
4	Pakbo - Mukdahan 2	THA	LAO
5	Pakxan - Bungkhan	THA	LAO
6	Dongphosy - Nongkhai	THA	LAO
7	Ton Phueng - Mae Chan	THA	LAO
8	M. Long - Keng Tung	LAO	MMR (Shan)
9	Laos - Thailand - Cambodia	THA	LAO / KMR
10	Cambodia - Vietnam	KMR	VNM
11	Laos, Cambodia, Singapore	(LAO) / KMR	MYS (Peninsular) / SGP
12	Project RISE	VNM	MYS / SGP
13	Sarawak - Semenanjung**	MYS (Sarawak)	MYS (Peninsular)
14	Sarawak - Brunei	MYS (Sarawak)	BRN
15	Sarawak - Sabah	MYS (Sarawak)	MYS (Sabah)
16	Sabah - Palawan	MYS (Sabah)	PHL (Palawan)
17	Palawan - Mindoro - Luzon	PHL (Palawan)	PHL (Mindoro - Luzon)
18	Sabah - Kalimantan	MYS (Sabah)	IDN (Kalimantan)
19	Kalimantan - Sulawesi	IDN (Kalimantan)	IDN (Sulawesi)
20	Kalimantan Internal Grid	IDN (Kalimantan)	IDN (Kalimantan)
21	Sarawak - N. Kalimantan	MYS (Sarawak)	IDN (Kalimantan)
22	Kalimantan - Java	IDN (Kalimantan)	IDN (Java)
23	Java - Sumatra	IDN (Java)	IDN (Sumatra)
24	Sarawak - Singapore	MYS (Sarawak)	MYS (Peninsular)
25	Sumatra - Batam	IDN (Sumatra)	IDN (Batam)
26	Sumatra - Peninsular Malaysia	IDN (Sumatra)	MYS (Peninsular)
27	Pacific Medco Solar Energy	IDN (Batan - Bulan)	SGP
28	Alamtri Resources	IDN (Batan)	SGP
29	Equator Renewables Asia	IDN (Combol - Citlim)	SGP
30	Vanda RE	IDN (Galang)	SGP
31	Keppel Energy	IDN (Durian, Kombol...)	SGP
32	Singa Renewables	IDN (Rangsang)	SGP
33	Shell Eastern Trading	IDN (Rangsang)	SGP
34	P. Malaysia - Singapore	MYS (Peninsular)	SGP
35	Sun Cable	AUS	SGP

* Various IPP-to-foreign grid projects in GMS are not included, among others. ** Not showing a version of this project extending from P. Malaysia to Singapore. Projects in red colour are also covered by the list of 18 projects catalogued in AIMS III.

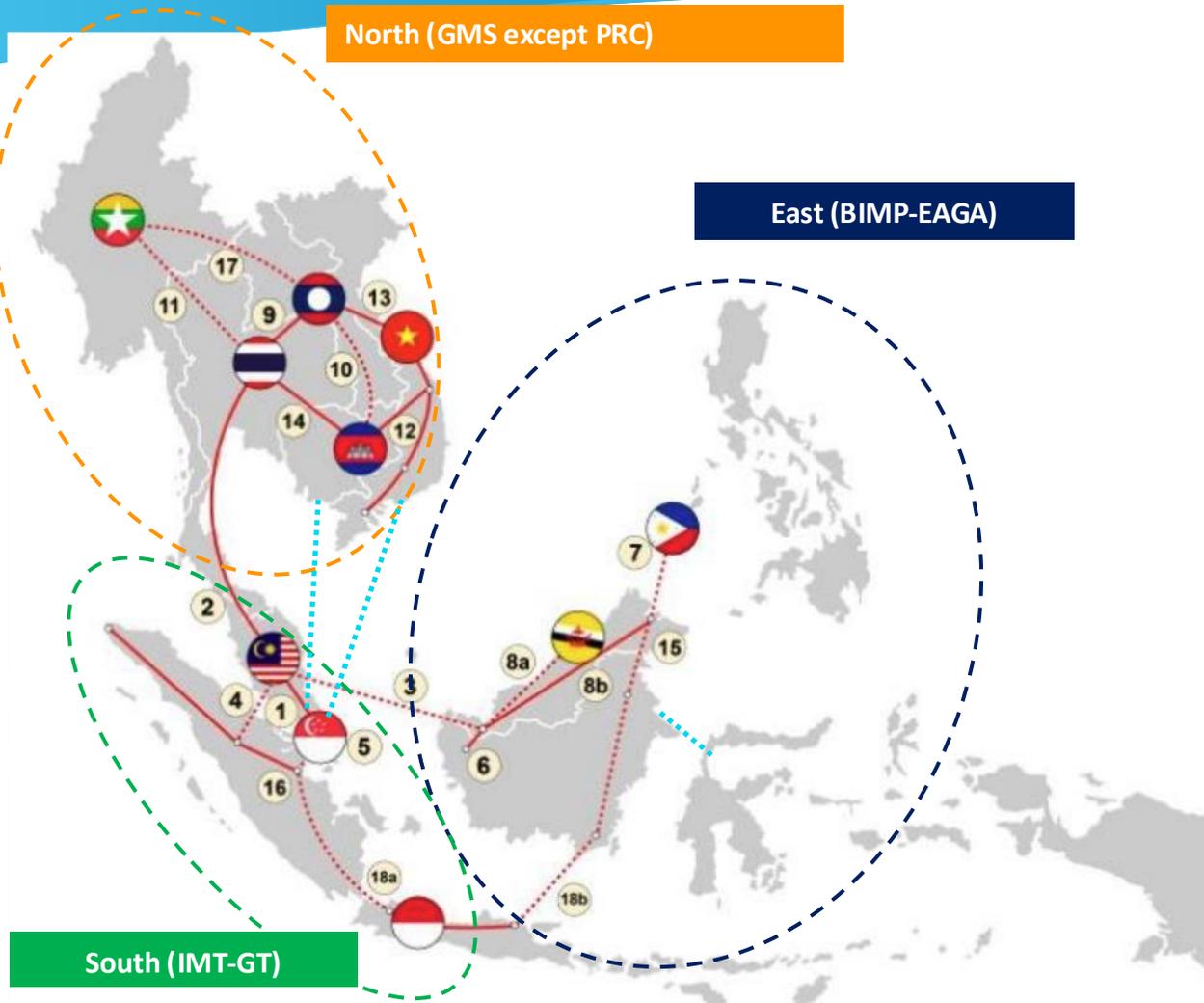
Power Trade Landscape in Southeast Asia within subregions and ASEAN



North (GMS except PRC)

East (BIMP-EAGA)

South (IMT-GT)



• ASEAN Power Grid (APG)

- Integrated grid operations by 2045
- 18+ cross border projects, subsea cable projects, and national grid upgrades
- \$100+ billion investment required

• GMS power trade outlook

- **14.5GW** from Lao PDR over 5-10 years to Cambodia (3GW), Thailand (3.5GW), and Viet Nam (8GW), which also meeting domestic power demand
- **3GW** between PRC and Viet Nam

• BIMP-EAGA

- Large untapped renewable energy potential (22GW+)
- Emerging industrial/mining growth and Indonesia new capital development
- BIMP-EAGA master plan is under consideration.

• Within ASEAN

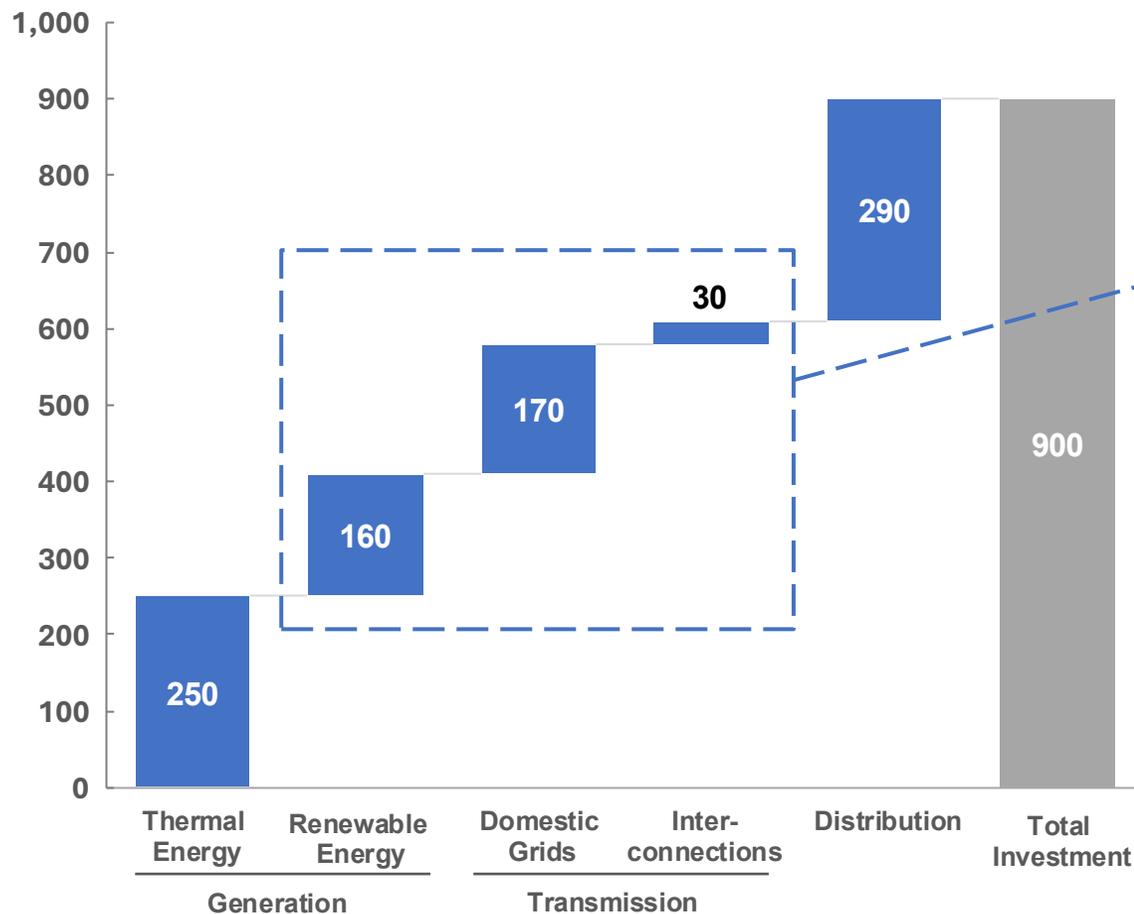
- Singapore **6GW** by 2035, potentially from Indonesia, Malaysia, Viet Nam through subsea cables
- **LTMS** pilot multilateral power trade (100MW) phase II
- Expanding **grid-to-grid** interconnections (Thailand-Malaysia, Indonesia-Malaysia)

- All countries strengthening **national grid integration including Indonesia's super grid and Viet Nam's HVDC development.**

Realizing the APG will require >\$100 billion of investments over the next 20 years...

SE Asia Investment Needs for Electric Power, 2025-2045

(\$ billion)



>18
cross-border projects

>24.5 GW
interconnecting capacity

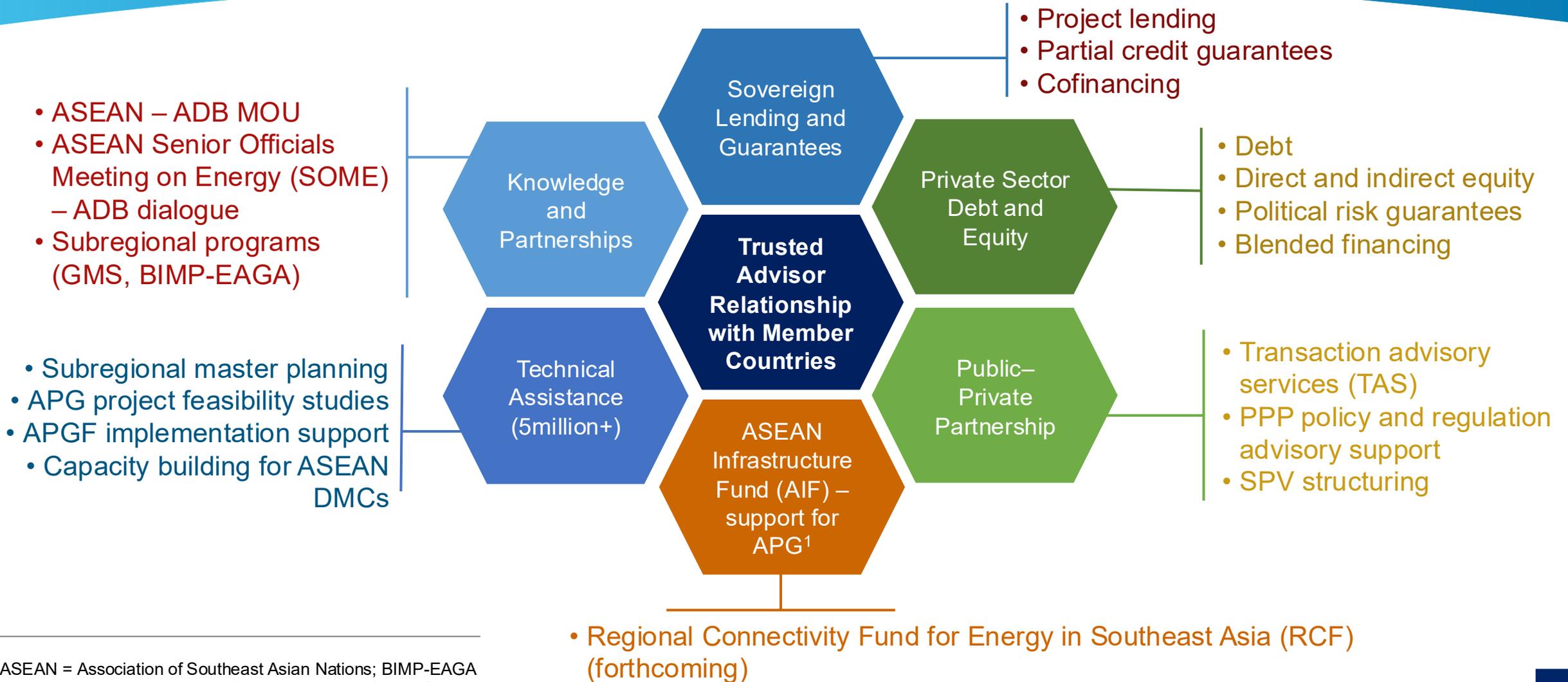
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future subsea interconnections**

- The “**APG space**” consists of grid interconnections and a portion of each of RE generation and domestic grids, together >\$100B during 2025-2045.
- The timing of APG projects depends on a range of factors, including planning decisions, policy evolution, energy market dynamics, and availability of financing.
- ADB is engaging across these areas with lending, advisory, and TA support.
- ADB’s \$10B APG ambition includes the full range of projects in the “APG space”, as well as policy advice (PBLs).

*Shows midpoints of scenario ranges based on renewable energy penetration rates.
Source: ADB estimate, consultant analysis

Source: ASEAN Centre for Energy; Projects from ASEAN Interconnection Masterplan Study (AIMS) III Report. 2024; **Subsea project initiatives

ADB's solutions toolkit offers comprehensive, end-to-end support including USD 10 billion in financing to help crowd in private capital and accelerate delivery



ASEAN = Association of Southeast Asian Nations; BIMP-EAGA = Brunei-Indonesia-Malaysia-Philippines East ASEAN Growth Area; GMS = Greater Mekong Subregion

ADB's Experience in Cross-Border Power Projects in Southeast Asia

DMC	Project	ADB Loan (\$M)	Year (Approval)	APG Linkage				Note	ADB engagement
				Renewables Supply	Domestic Grid Strengthening	Grid Interconnects	Policy Support		
LAO-VIE	Monsoon Wind Power Project	100 ¹	2022	●		●		ADB-led financing; operating Aug 2025	✓ PSOD
LAO-THA	Nam Ngiep 1 Hydropower project	144	2014	●				290 MW hydropower for export to Thailand	✓ PSOD
INO-MAL	West Kalimantan Power Grid Strengthening Project	49.5	2013		●	●		83 km 275 kV transmission to import from Sarawak	✓ ENE
LAO-THA	GMS Northern Power Transmission Project	20 ²	2010		●	●		312 km, 115 kV transmission line for trade with Thailand	✓ ENE
LAO-THA	GMS Nam Theun 2 Hydroelectric Project	70 ³	2005	●		●		270 MW hydropower for export to Thailand	✓ ENE/PSOD
CAM-VIE	GMS Transmission Project	44.3	2003		●	●		109 km, 230 kV transmission line and associated grid strengthening to import up to 200 MW of power from Viet Nam	✓ ENE
LAO-THA	Nam Leuk Hydropower Project	52	1996	●				60 MW developed for export to Thailand and reoriented for domestic consumption since 2007	✓ ENE
LAO-THA	Theun-Hinboun Hydropower Project	60	1994	●				210 MW hydropower plant, related transmission line to export to Thailand	✓ ENE
LAO-THA	Nam Song Hydropower Development Project	31.5	1993	●				Expands existing Nam Ngum hydropower plant to export additional 137 GWh to Thailand	✓ ENE
LAO-THA	Xeset Hydropower Project	15.5	1988	●				45 MW, run-of-river dam, 40% export to Thailand and 60% for domestic consumption	✓ ENE

¹ ADB nonsovereign financing: \$100m OCR, \$150m B-loan, \$60m grant/concessional loans

² ADB sovereign financing: \$20m grant through Asian Development Fund

³ ADB sovereign financing: \$20 million; ADB nonsovereign financing: \$50 million; ADB political risk guarantee: \$50 million

⁴ ADB sovereign financing: \$115.1 million; ADB nonsovereign financing: \$350 million

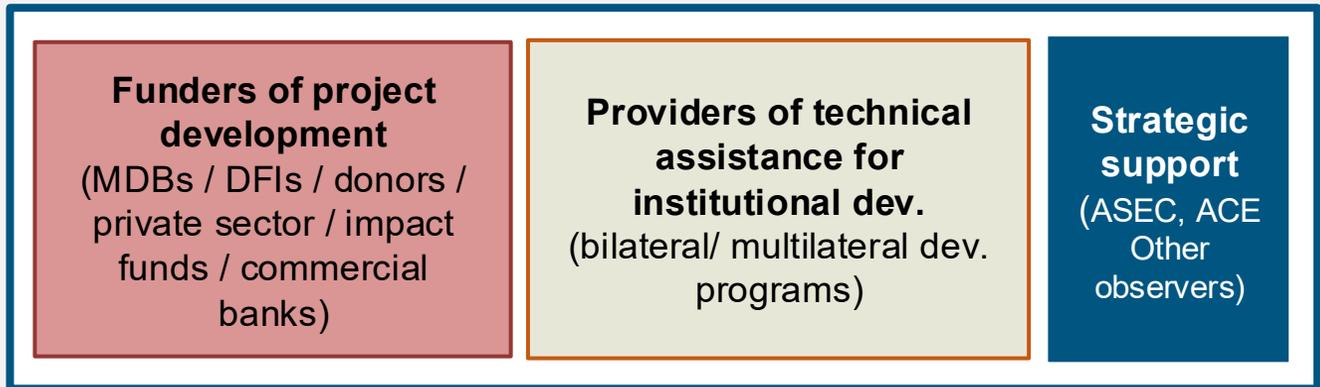
To help mobilize capital for the APG, ASEAN, ADB, and the World Bank have launched the ASEAN Power Grid Financing Initiative (APGF)

1 APGF Working Group



- **Align energy, economic, and financial cooperation under respective ASEAN tracks.**
- **Analytical support to facilitate project identification and scoping of support.**
- **Market soundings and capacity building.**
- **Report to ASEAN on progress of APGF.**

2 Partnership for ASEAN Connectivity on Energy (PACE)



- **Coordination and alignment** across fragmented development / commercial financing support landscape.
- **Discuss support requests** from utilities/sponsors.
- **Enhance visibility of development and commercial funding offers.**
- **Encourage new financing partners** to engage on the APG agenda.
- **Identify common preparation and bankability challenges** for projects.

- ## 3 Identification and **mobilization of financing** across the project cycle—from feasibility to capex stage—using the range of tools from the PACE community.

Future business opportunities (consulting services)

Opportunities	Status
ASEAN/GMS Power Trade Simulation Platform Simulation-based “dry run” of regional power trading with no physical or financial settlement, used to demonstrate market benefits, congestion impacts, and price signals	Market sounding completed in Nov 2025; Full RFP under preparation
Sarawak Studies Viability of establishing subsea interconnections between Sarawak and Peninsular Malaysia, Indonesia, and Singapore to enable cross-border trade of clean energy	For advertisement
Lao PDR–Viet Nam Power Interconnection Study A pre-feasibility study that supports large-scale renewable energy trade between the two countries including the modality of the special purpose vehicle (SPV) structure	TOR under development
BIMP-EAGA Master Plan Subregional master plan to prioritize interconnections and sequencing across East ASEAN, beginning with internal integration of the Borneo power system and positioning it as a clean energy hub for ASEAN.	TOR developed, for endorsement of BIMP officials
APG Climate Resilience Modelling Regional modelling to stress-test APG corridors against climate, hydrology, and extreme weather risks	TOR under development

Future business opportunities (investments)



Opportunities

Cross-border transmission and HVDC infrastructure

Terrestrial and subsea cables, HVDC converters, transformers, cables, and system integration, EPC, EPC-M

Grid modernization, digitalization and smart grids

HVAC, BESS, high-spec, low-loss transmission, digital substations, SCADA, EMS, and advanced protection

Renewable energy and transmission bundling

Source-to-grid IPP projects, Offshore wind, transmission backbones

Project finance, PPPs and risk mitigation

Derisking facility, blended finance and political risk coverage

Japan connections

AZEC collaboration, JBIC/JICA partnership and cofinancing

Thank you !

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