

MOVING FORWARD WITH ASEAN Connectivity:

The ASEAN Power Grid

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Why we need ASEAN
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Energy Situation Overview in ASEAN





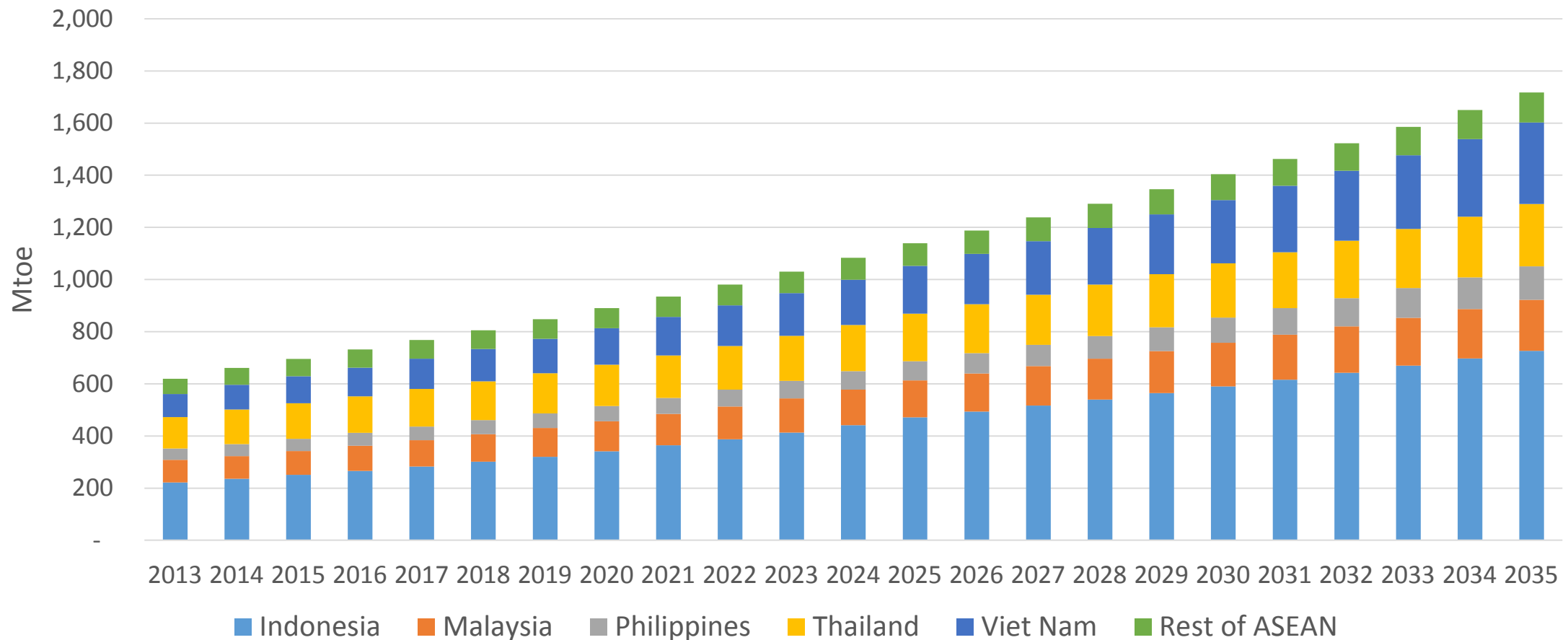
Energy Situation Overview in ASEAN



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Energy Situation in ASEAN

Total Primary Energy Supply



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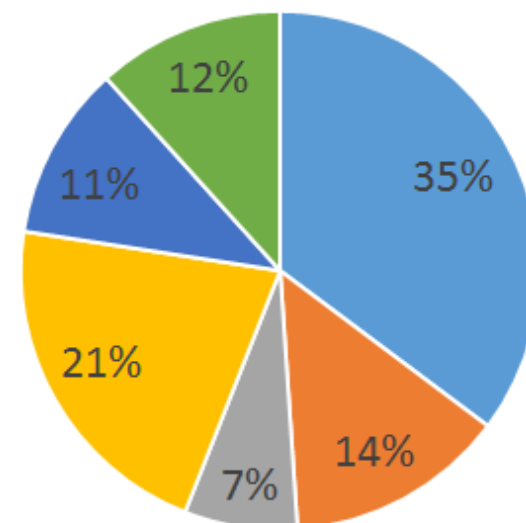
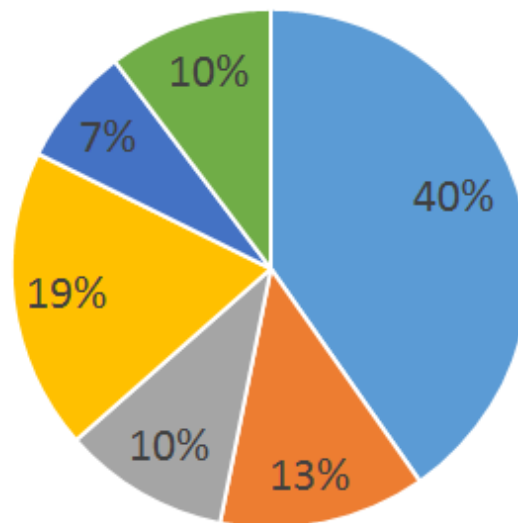
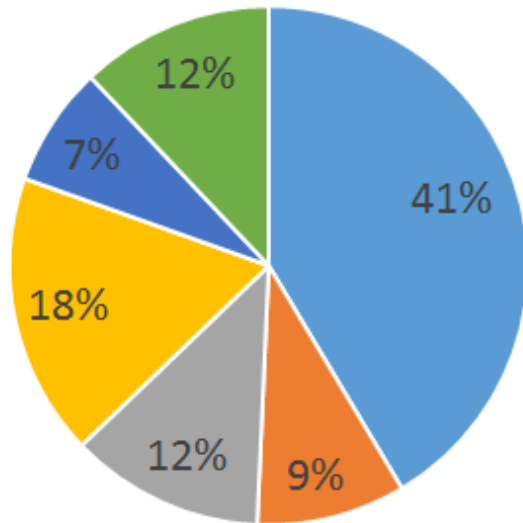
Energy Situation in ASEAN

Total Primary Energy Supply, by ASEAN countries

1990 = 238 Mtoe

2000 = 386 Mtoe

2013 = 618 Mtoe



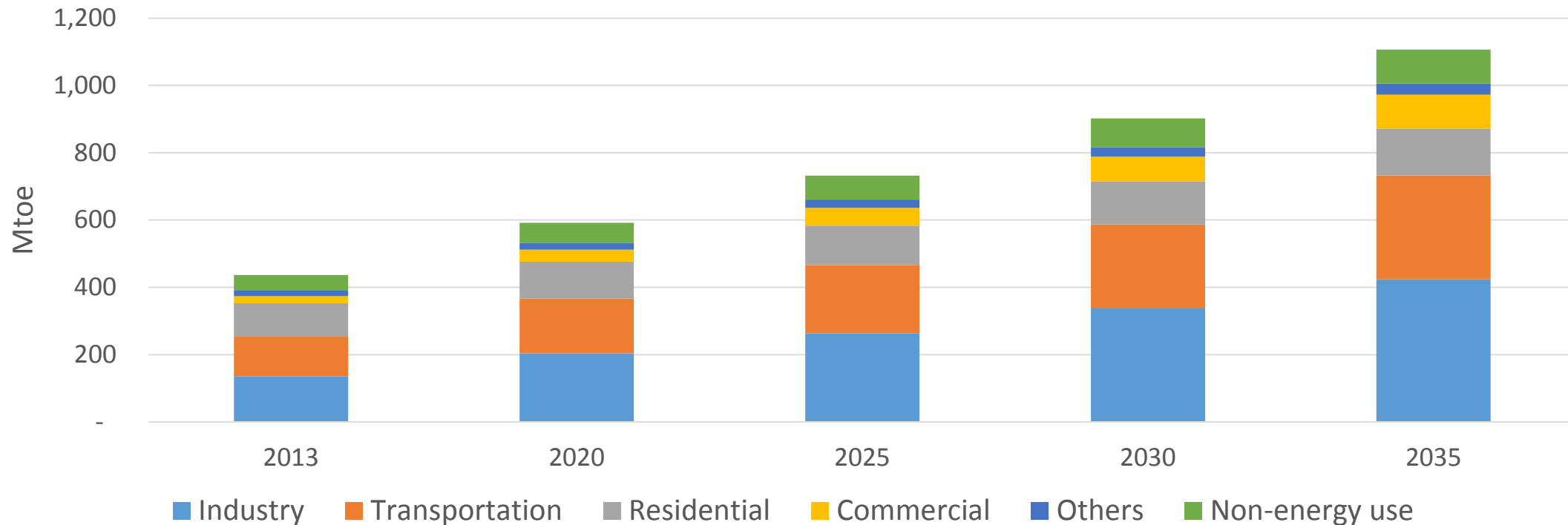
■ Indonesia ■ Malaysia ■ Philippines ■ Thailand ■ Viet Nam ■ Rest of ASEAN



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Energy Situation in ASEAN

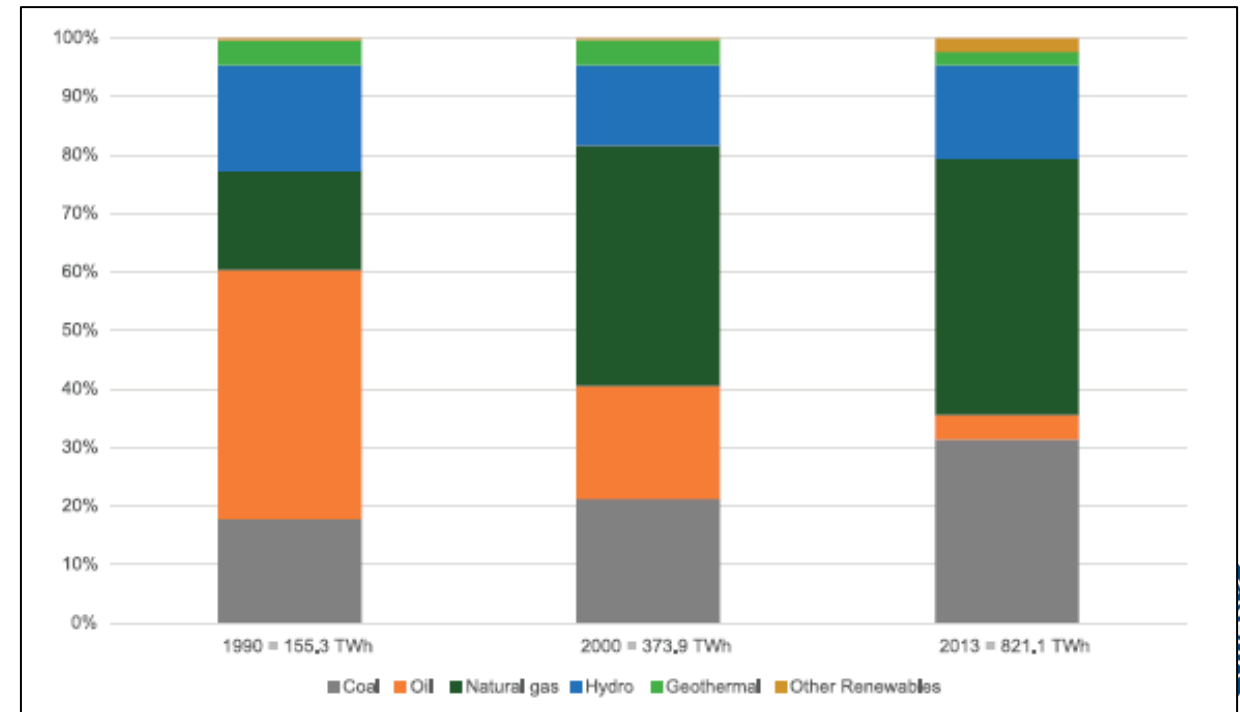
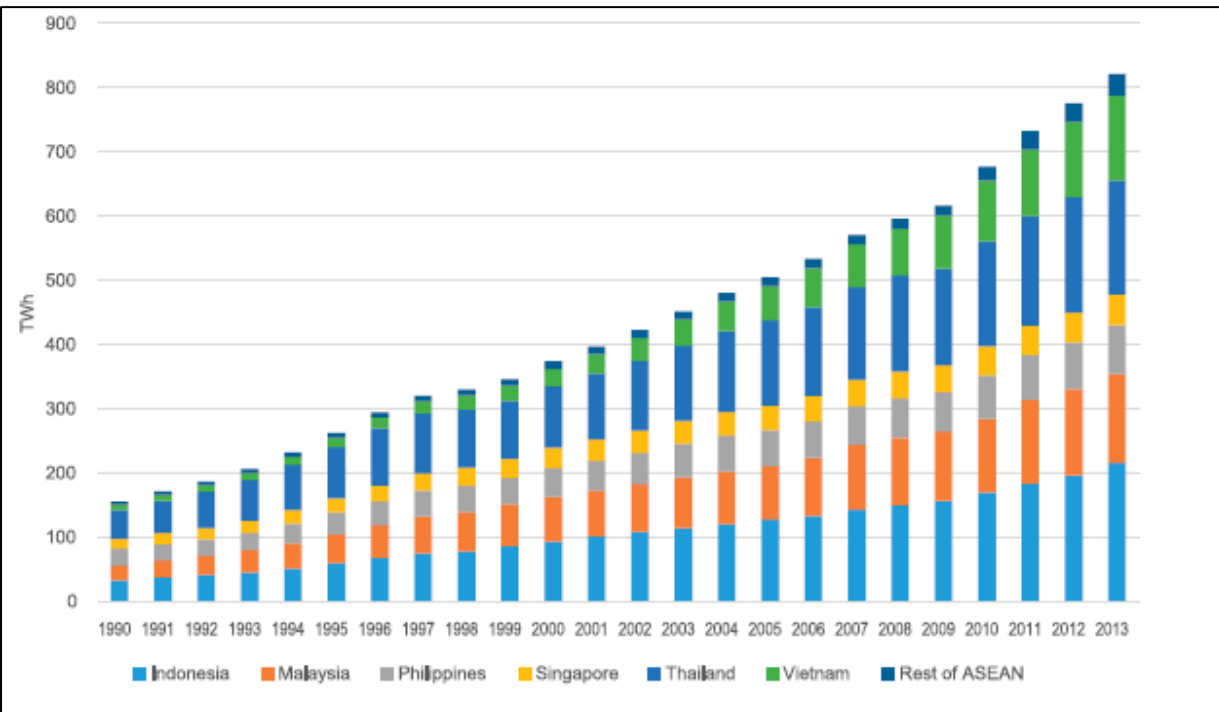
Total Final Energy Consumption



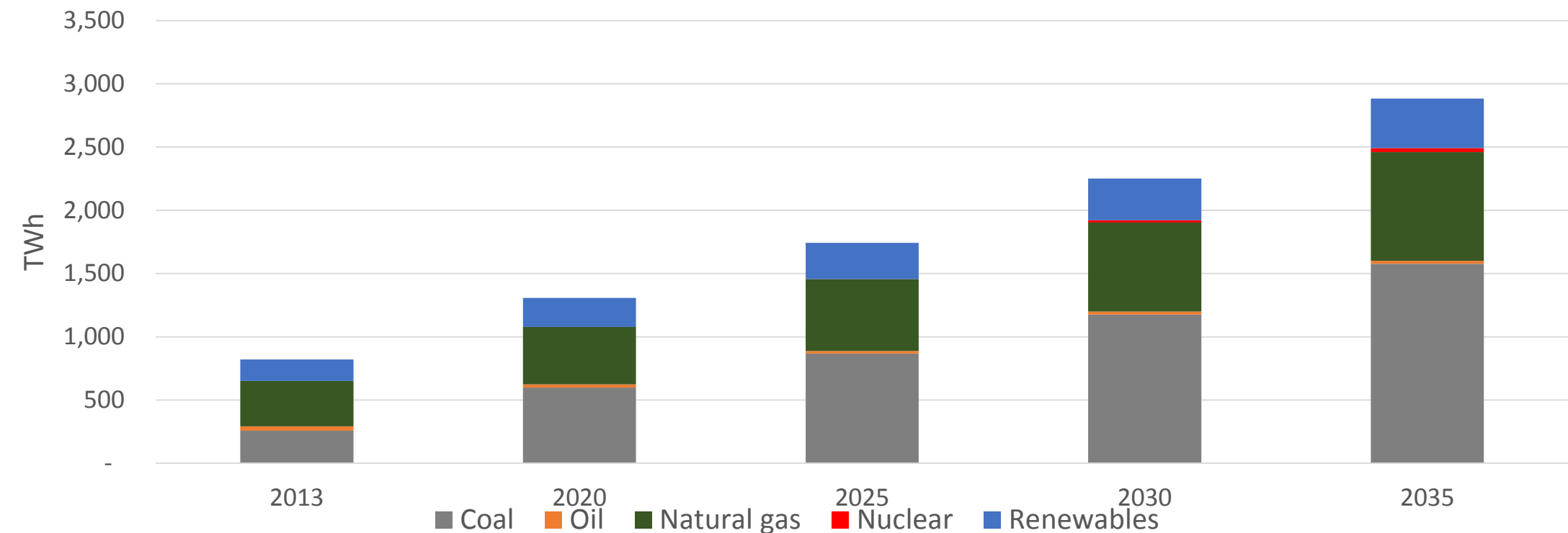
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Energy Situation in ASEAN

Electricity Generation



Electricity Generation



Power capacity in ASEAN increases rapidly. The overall capacity increases from 184 GW in 2013, to 374 GW in 2025 and is predicted to reach 607 GW in 2035, at an average growth of 5.6%.



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“Why we need ASEAN Connectivity”

Country	PPP GDP (million 2005 USD) ¹	Population (‘1,000) ²	PPP GDP/capita (2005 USD/capita) ¹	Urbanisation rate (%) ¹	Area (‘1,000 km ²) ³
Brunei Darussalam	25,873	418	61,929	77	5.8
Cambodia	39,732	15,135	2,625	20	181.0
Indonesia	2,061,232	249,866	8,249	52	1,860.4
Lao PDR	28,114	6,770	4,153	36	236.8
Malaysia	597,494	29,717	20,106	73	330.3
Myanmar	164,260	53,259	3,084	33	676.6
Philippines	554,714	98,394	5,638	45	300.0
Singapore	366,915	5,399	67,957	100	0.7
Thailand	832,188	67,011	12,419	48	513.1
Viet Nam	409,798	89,709	4,568	32	331.0
ASEAN	5,080,319	615,676	8,252	46	4,435.6

**“Connectivity
creates Stronger,
Safer, Better
Economics”**

**“Stronger
Economics,
stronger ASEAN,
stronger Member
States”**



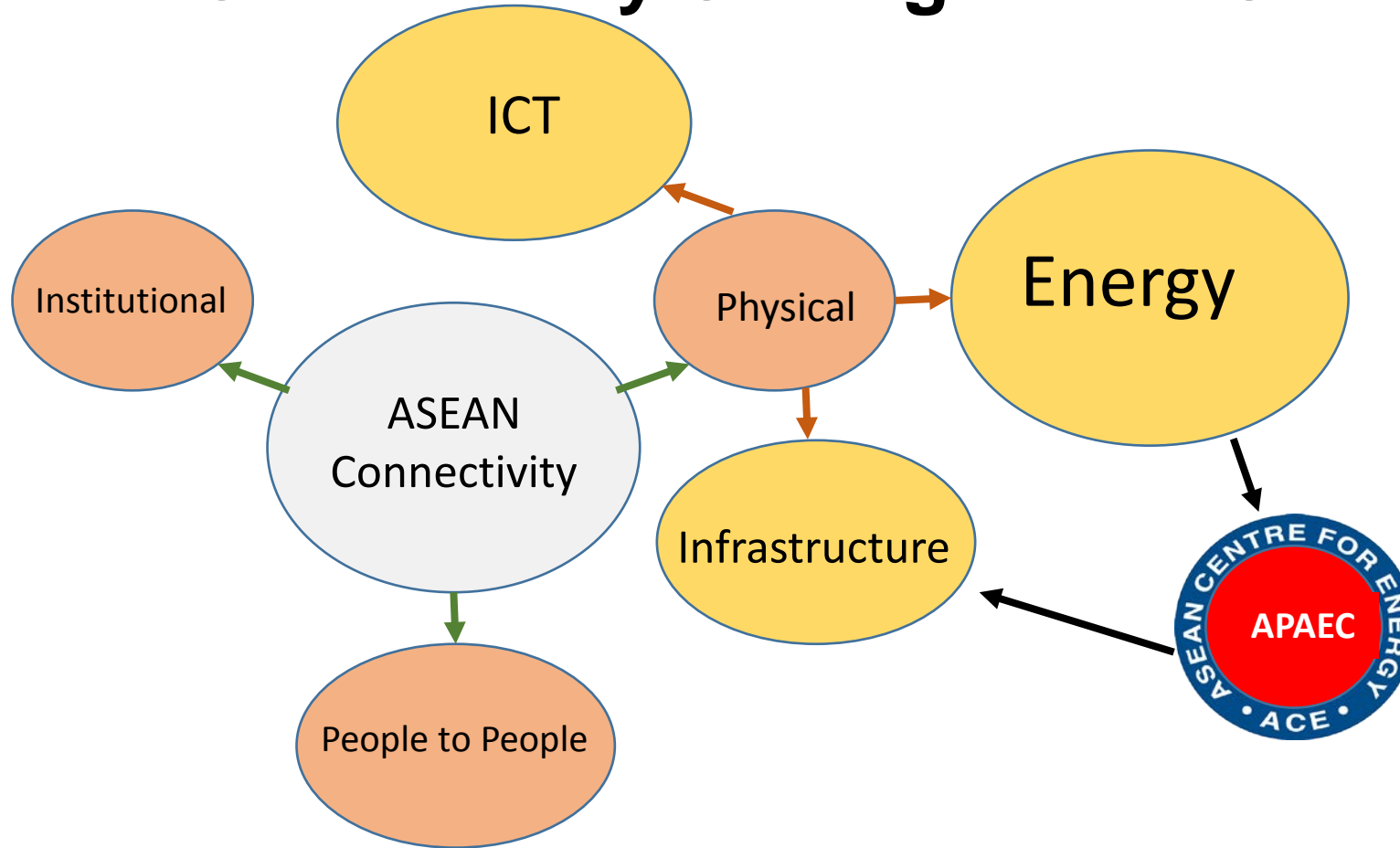
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Goals of Enhanced ASEAN Connectivity

- (i) To enhance integration and cooperation of ASEAN;
- (ii) To enhance global competitiveness of ASEAN through stronger production networks;
- (iii) To enhance the well-being and livelihood of ASEAN peoples;
- (iv) To enhance rules and good governance for ASEAN;
- (v) To enhance connections to economic centres both within the ASEAN region and within individual Member States and narrow the development gaps; MASTER PLAN ON ASEAN CONNECTIVITY 6
- (vi) To enhance local economic and social development;
- (vii) To enhance efforts to tackle climate change as well as promote sustainable development; and
- (viii) To address the negative impacts of Connectivity

Connectivity Strategies in ASEAN

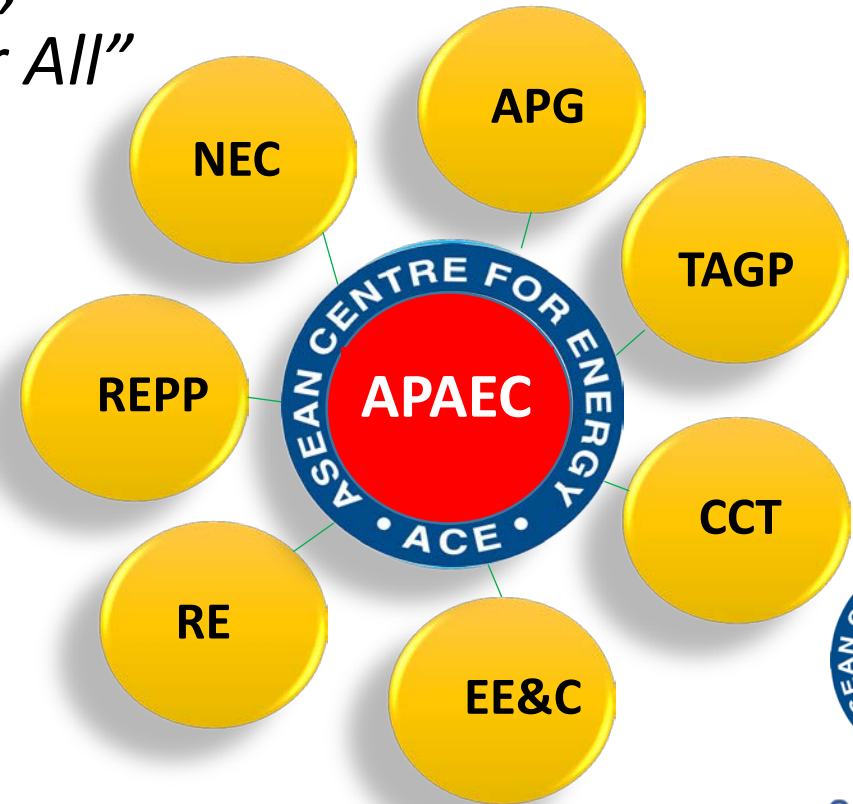
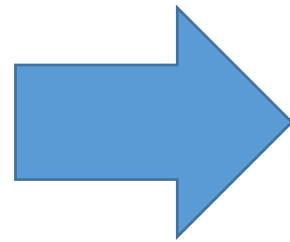


“Connectivity in ASEAN encompasses the physical (e.g., transport, ICT, and energy), institutional (e.g., trade, investment, and services liberalisation), and people-to-people linkages (e.g., education, culture, and tourism).”

APAEC IN ASEAN CONNECTIVITY

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

- Development of the APAEC
- Global Energy Landscape
- ASEAN Energy Development



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APAEC IN ASEAN CONNECTIVITY

-Development of the APAEC

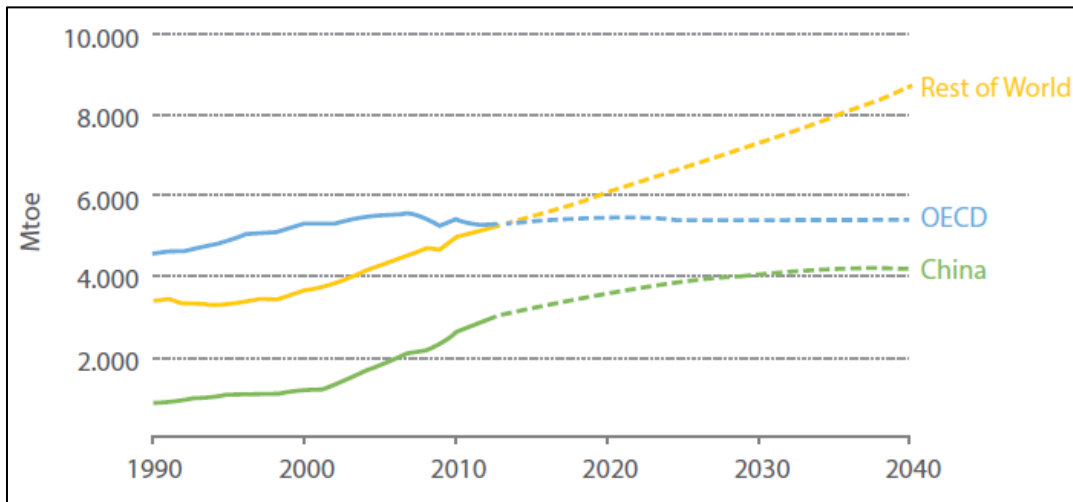
1. 1999-2004

2. 2004-2009

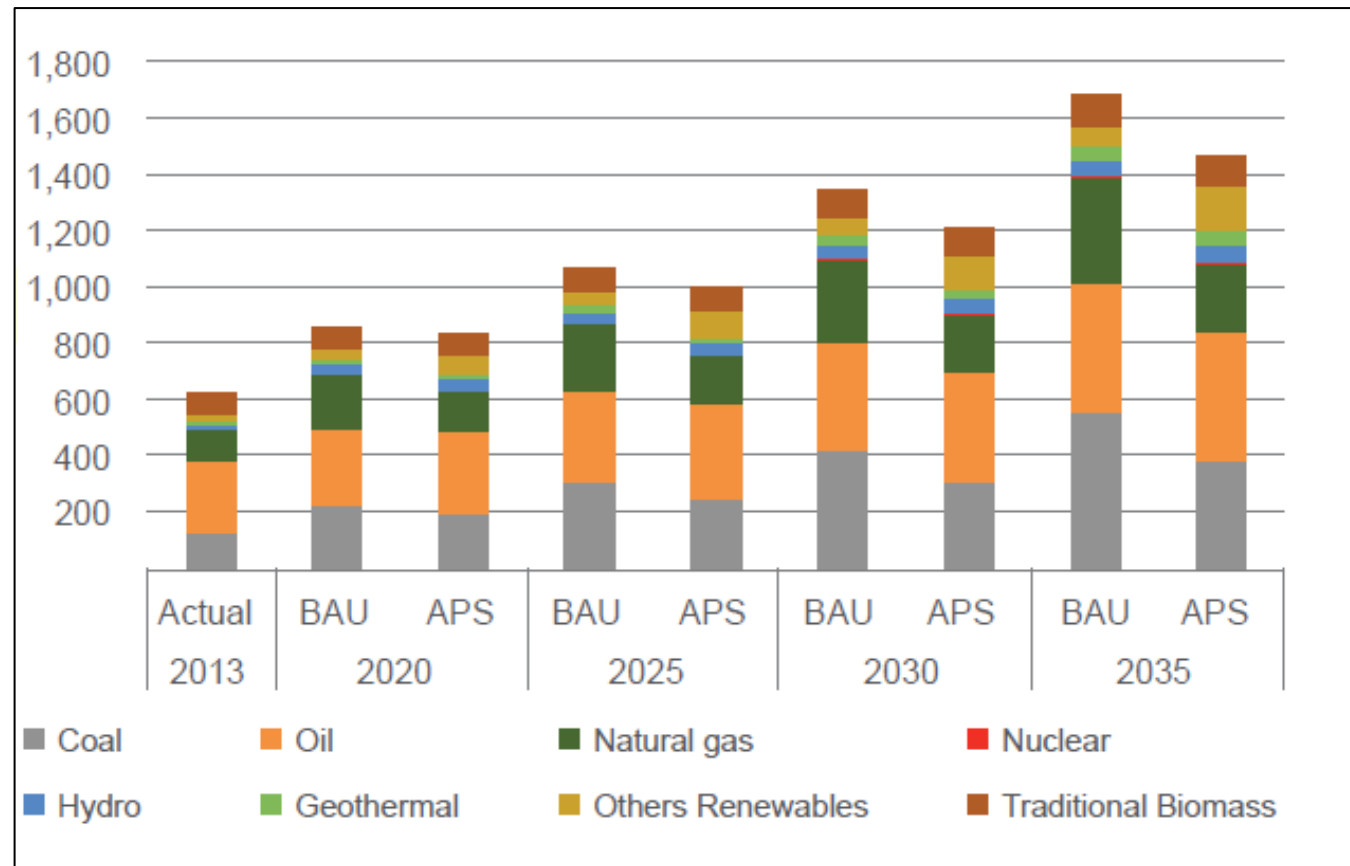
3. 2010-2015

4. APAEC
2016-2025

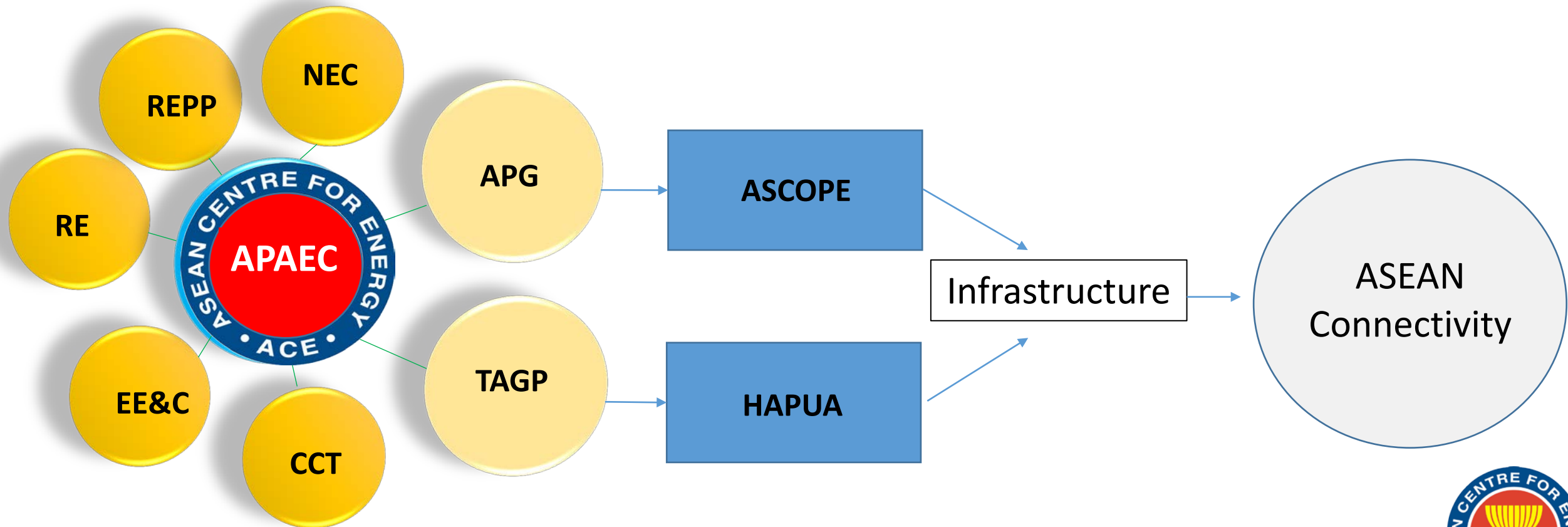
-Global Energy Landscape



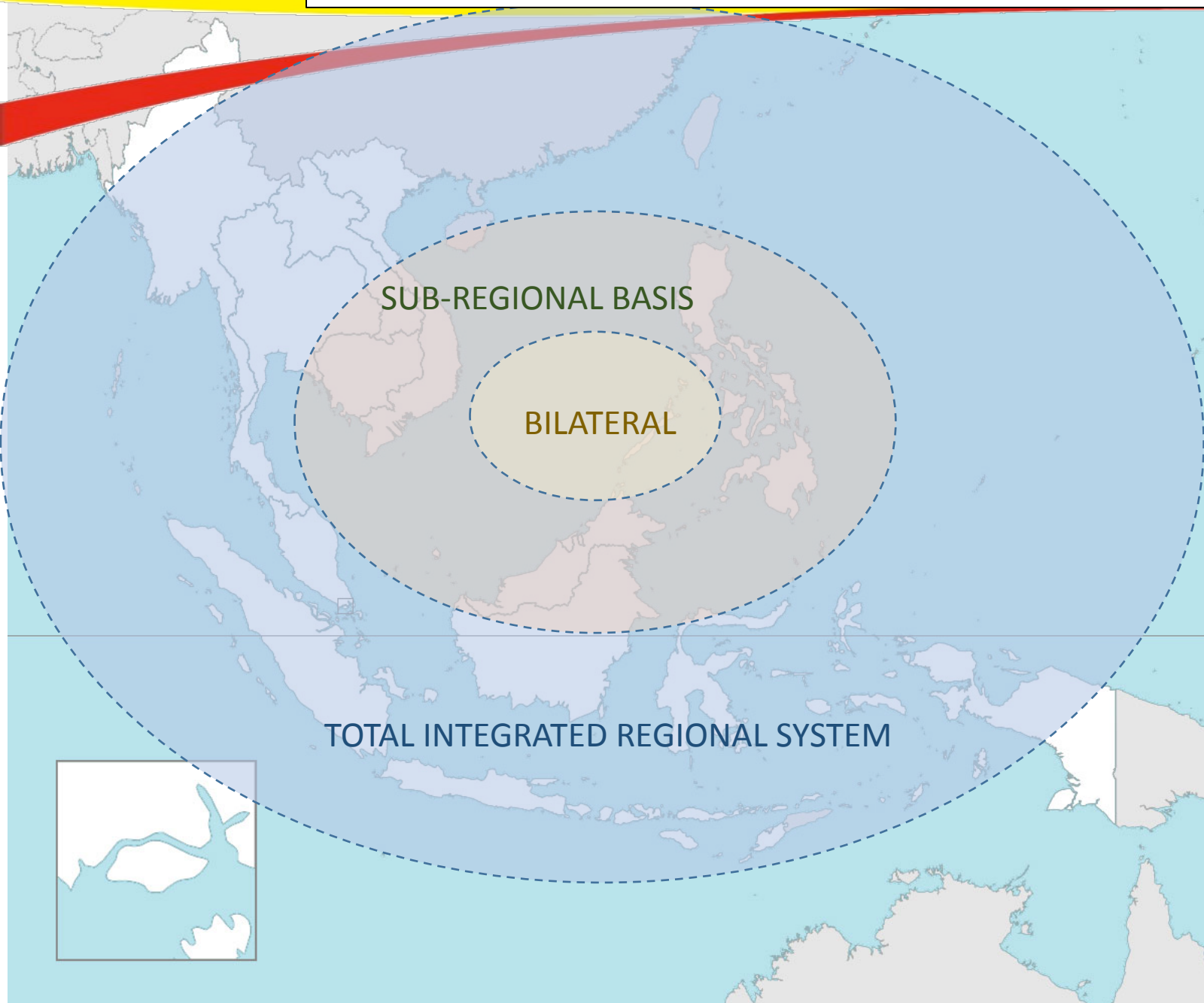
-ASEAN Energy Development



APAEC in ASEAN Connectivity



APAEC Programme Area No. 1: ASEAN Power Grid



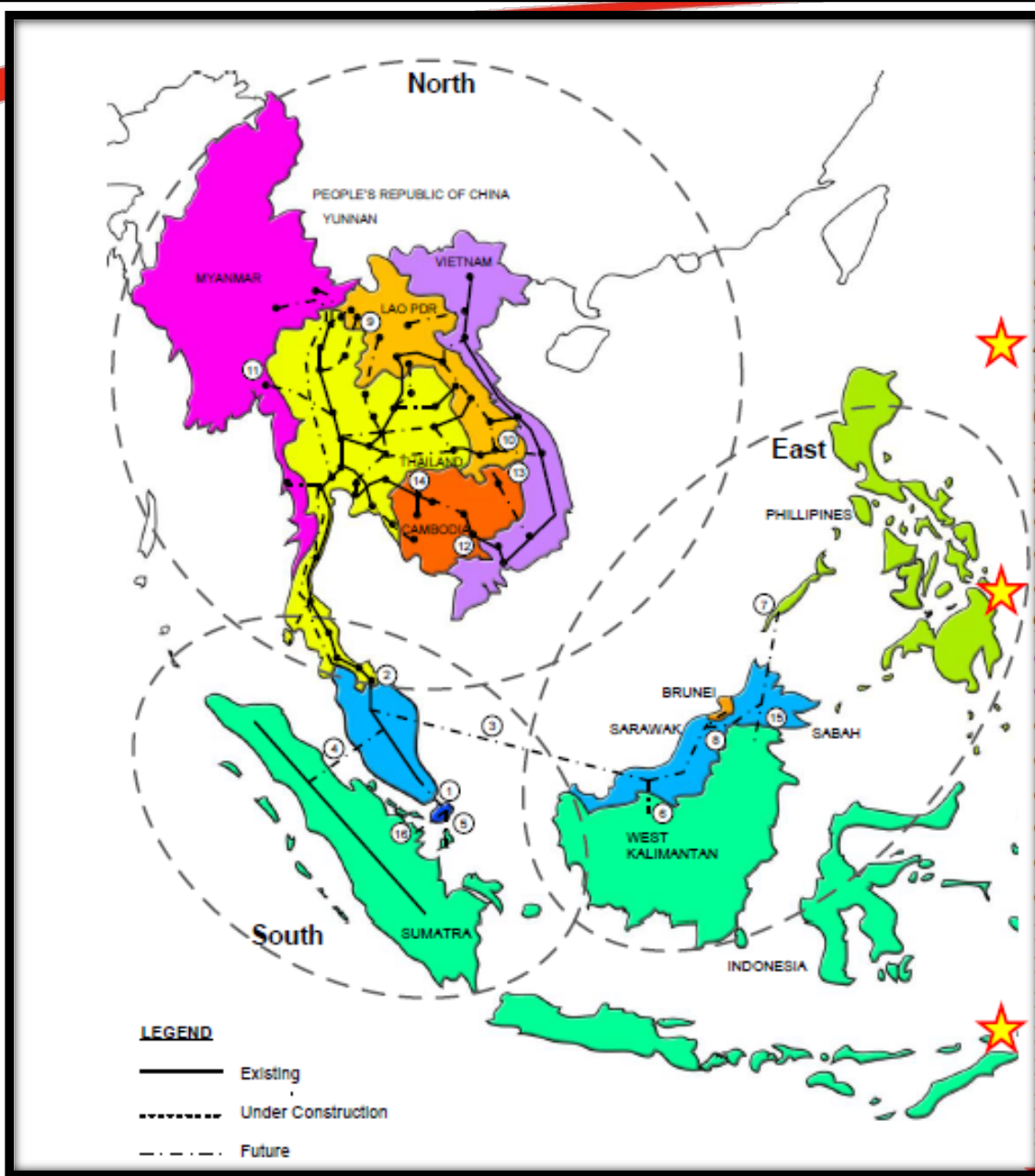
BACKGROUND

- **Efficient, reliable and resilient electricity infrastructure** in stimulating regional economic growth and development.
- **Establishment of integrated systems.**
- **Promoting the efficient utilisation and sharing of resources.**
- Enhance electricity trade across borders which would provide benefits to meet the rising electricity demand and improve access to energy services in the region”.



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APAEC Program Area No. 1. ASEAN Power Grid



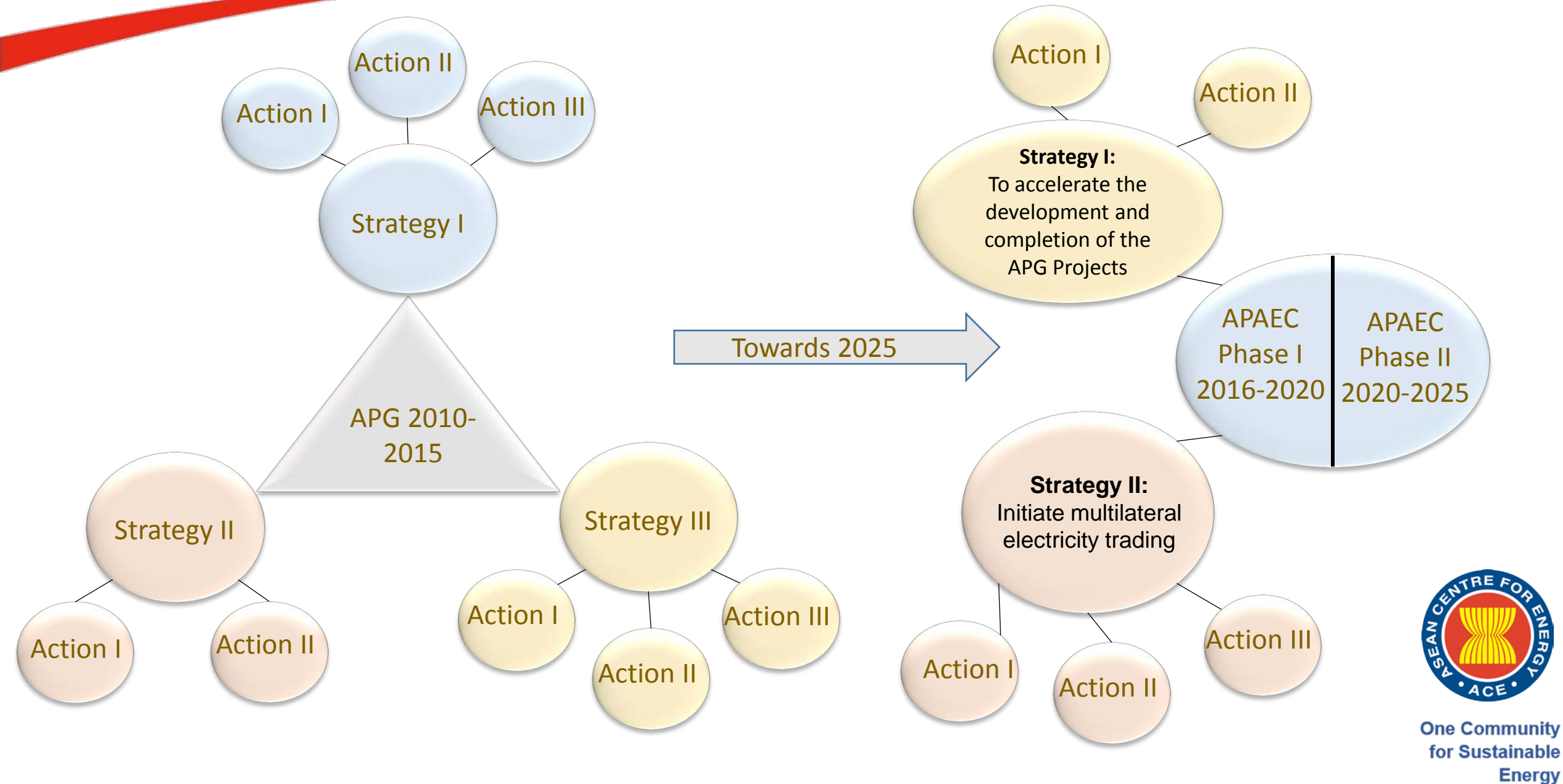
	Earliest COD
1) P.Malaysia - Singapore (New)	post 2020
2) Thailand - P.Malaysia	
• Sadao - Bukit Keteri	Existing
• Khlong Ngae - Gurun	Existing
• Su Ngai Kolok - Rantau Panjang	TBC
• Khlong Ngae - Gurun (2 nd Phase, 300MW)	TBC
3) Sarawak - P. Malaysia	2025
4) P.Malaysia - Sumatra	2020
5) Batam - Singapore	2020
6) Sarawak - West Kalimantan	2015
7) Philippines - Sabah	2020
8) Sarawak - Sabah - Brunei	
• Sarawak - Sabah	2020
• Sabah - Brunei	Not Selected
• Sarawak - Brunei	2018
9) Thailand - Lao PDR	
• Roi Et 2 - Nam Theun 2	Existing
• Sakon Nakhon 2 - Thakhek - Then Hinboun (Exp.)	Existing
• Mae Moh 3 - Nan - Hong Sa	2015
• Udon Thani 3 - Nabong (converted to 500KV)	2019
• Ubon Ratchathani 3 - Pakse - Xe Pian Xe Namnoy	2019
• Khon Kaen 4 - Loei 2 - Xayaburi	2019
• Nakhon Phanom - Thakhek	2015
• Thailand - Lao PDR (New)	2019-2023
10) Lao PDR - Vietnam	2016-TBC
11) Thailand - Myanmar	2018-2026
12) Vietnam - Cambodia (New)	TBC
13) Lao PDR - Cambodia	2017
14) Thailand - Cambodia (New)	post 2020
15) East Sabah - East Kalimantan	post 2020
16) Singapore - Sumatra	post 2020

★ Priority Projects



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APAEC Programme Area No. 1. ASEAN Power Grid



Programme Area No.1 – ASEAN Power Grid

Outcome-based Strategy 1: To accelerate the development and completion of the following APG Projects identified under AIMS II by 2020.	Action Plans
<ol style="list-style-type: none">1. APG Priority Projects: Project 13 (2017), Project 8 (2018) and Project 4 (2020).2. APG On-going Projects: Project 2, Project 9 (2019) and Project 10 (2016).	<ol style="list-style-type: none">a. Conduct a study and identify areas where indigenous resources can be fully utilised to benefit the region.b. Conduct a study on the ASEAN Primary Energy Resources for Power Generation.



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Outcome-based Strategy 2: Initiate multilateral electricity trading.

Action Plans

2.1 LTMS Power Integration Project (PIP).

2.2 Establish electricity trading in at least one sub-region by 2018 namely: the Northern Sub system (Cambodia, Lao PDR, Myanmar, Thailand and Vietnam), Southern Sub System (Indonesia, Malaysia, and Singapore) and eastern Sub System (Brunei Darussalam, Indonesia, Malaysia and Philippines).

- a. Conduct a study to address barriers to interconnections, cross-border trade and investments by the five (5) HAPUA Working Groups, including:
- Harmonisation of legal and regulatory framework for bilateral & cross-border power interconnections and trade.
 - Formulation of institutional and contractual arrangements for cross-border trade to include taxation, tariff and Third Party Access (Wheeling charges).
 - Development of Public Private Partnership, including the incentive scheme.



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Outcome-based Strategy 2: Initiate multilateral electricity trading.

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- b. Review recommendation to support establishing new APG Institutions by 2018, namely:
 - APG Transmission System Operator Institution (ATSO)
 - APG Generation and Transmission System Planning Institution (AGTP)
- c. Provide inputs on framework and schemes to facilitate multilateral electricity trade in the region.





“THE BARRIERS TO IMPLEMENTATION”



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Financing barriers

1. Return on investment.
2. Fiscal capacity (of ASEAN Member States).
3. Capital availability (from alternative sources).

Decision-making barriers

1. Prioritisation issues.
2. Agency issues.
3. Information failures.

Implementation barriers

1. Capacity.
2. Coordination.
3. Regulatory structures.

“the implementation of other energy interconnection projects under the APG and the Trans-ASEAN Gas Pipelines encounter **barriers** due to **resource constraints, bankability, technical and regulatory issues**”



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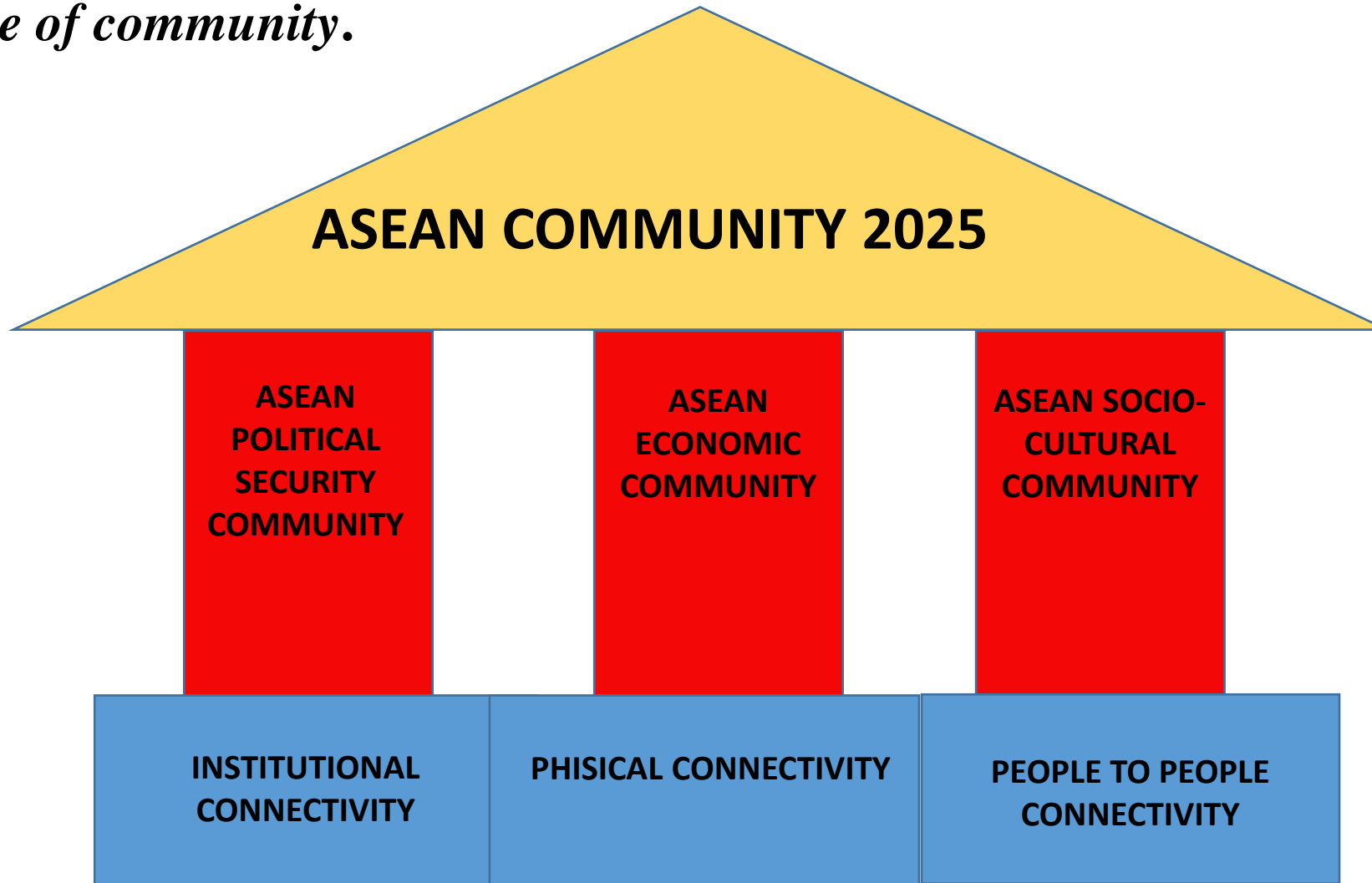
Overcoming the BARRIERS (The implementation Strategies)

- ☐ Prioritize, focus and agree on targets.
- ☐ Governance and strong stakeholders involvement
- ☐ Build human capacity, strong regulations, finance
- ☐ Performance feedbacks, monitoring, evaluation



Conclusion

Achieve a seamlessly and comprehensively connected and integrated Southeast Asia that will promote competitiveness, inclusiveness, and a greater sense of community.



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Thank You

About ACE

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