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ASEAN Power Grids Interconnection Projects for Energy Efficiency and Security of Supply

By
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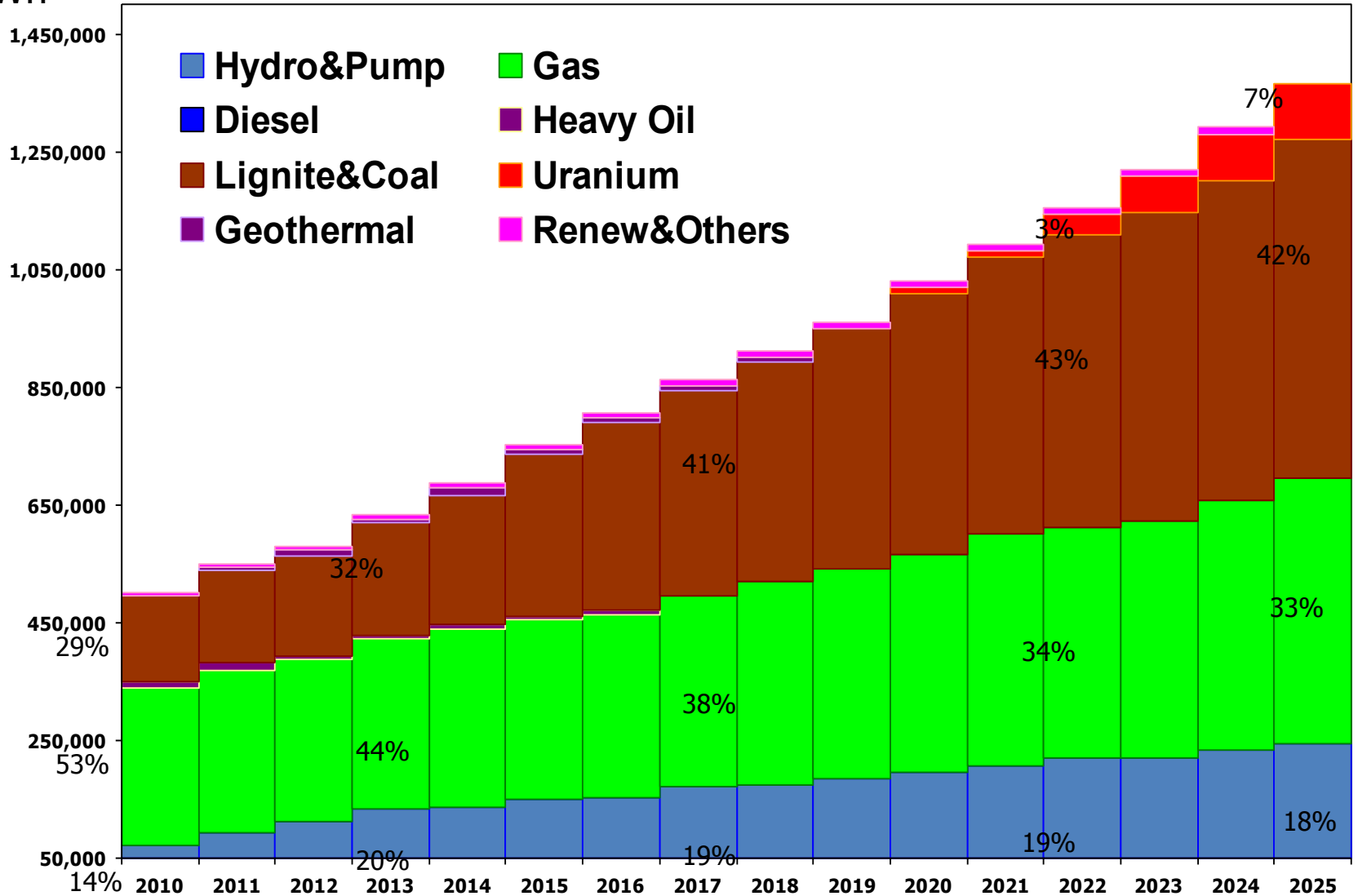
REGIONAL ENERGY TRADE WORKSHOP
ADB, MANILA 8 – 9 SEPTEMBER 2014

1. Energy Supply Industry Structure of HAPUA Members Country

Country	Utility Serves	Note	Installed Capacity (MW)
1. Brunei Darussalam	Departement of Electrical Services (DES)	Vertical Integrated Utility (VIU)	827
2. Cambodia	Electricite Du Cambodge (EDC)	VIU	732
3. Indonesia	PT PLN (persero)	VIU	40 524
4 Lao PDR	Electricite Du Laos	VIU	2 978
5. Malaysia	Tenaga Berhad SESCO SESB	VIU Penisular Malaysia VIU Serawak State VIU Sabah	27 179
6. Myanmar	Ministry of Electric Power (MEPE) 1 MEPE (2)	Transmission and Distribution Hydro Power Generation	3 494
7. Philippines	National Power Corporation Trans Co	Power Generation Company Transmission Company	16 924
8. Singapore	SP Power Grid	Gencos, T & D	9 951
9. Thailand	EGAT MEA & PEA	Generation, SO & Transmission Distribution/Retail Supply	34 335
10. Vietnam	Electricity of Vietnam (EVN)	VIU	26 926

2. THE FOSSIL FUEL IS MAJOR SHARE

GWh



3. THE APG PROJECTS

A. THE BACKGROUND THOUGH

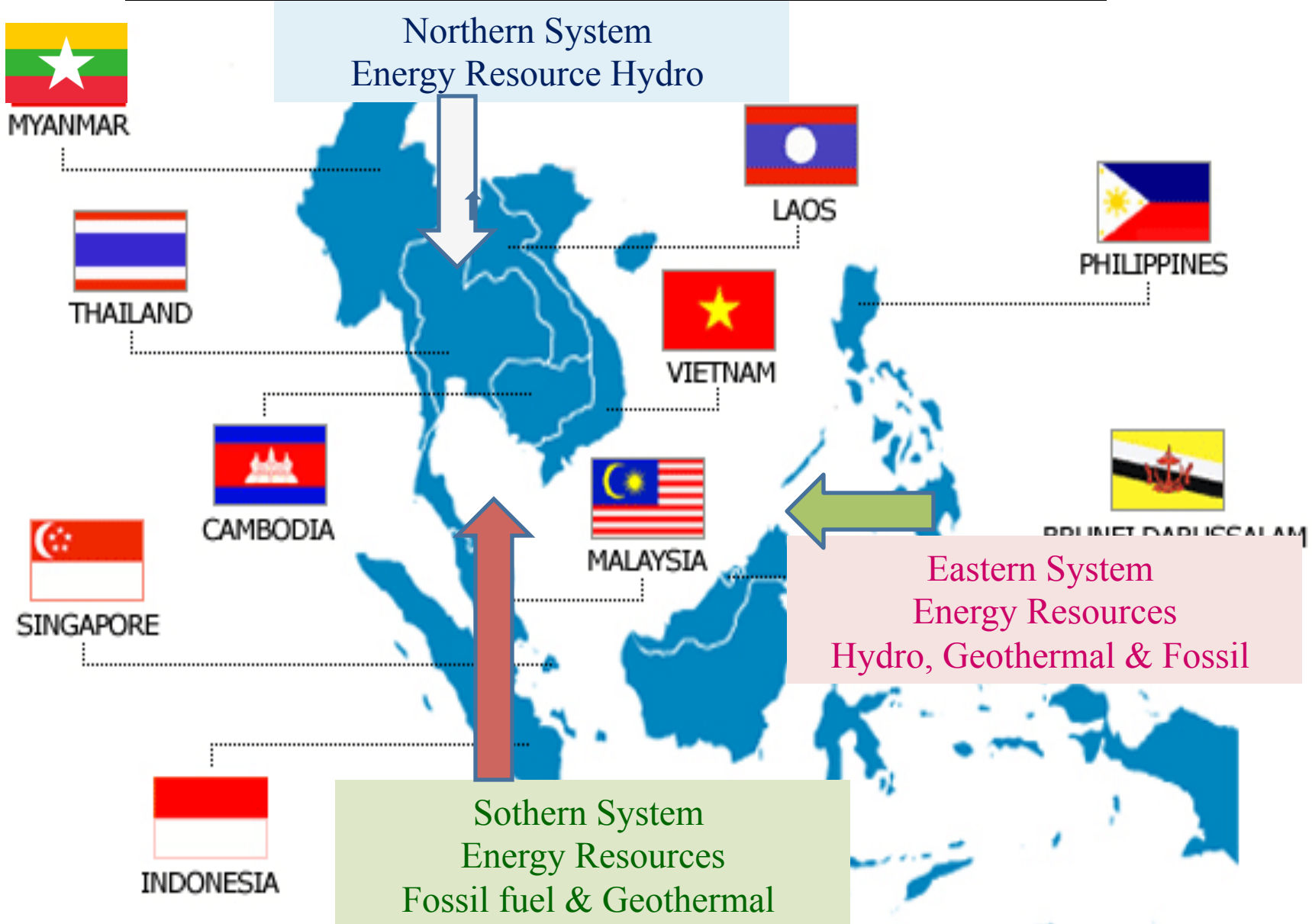
(1) The ASEAN region as a whole has abundant energy resources with great diversity. There are large hydropower potentials as well as huge oil, natural gas, and coal resources.

This provides vast opportunities to exploit these energy resources collectively within ASEAN thereby reducing the need and independency on imported fuel from other regions.

(2) It is expected that interconnection will give rise to the following benefits;

- Greater economic generation and transmission of electricity
- Greater reliability and security of electricity supply in member countries
- Provision of a platform for future energy trade

4. The Fuel Input for Generation



5. STRATEGIC GOALS OF APG

- To achieve a long-term security, availability and reliability of energy supply, particularly in electricity through regional energy cooperation in Trans-ASEAN Energy Network
- To optimize the region's energy resources towards an integrated ASEAN Power Grid system, and
- To further harmonize all aspect of technical standard and operating procedure as well as regulatory frame works among member country.
- By 2025, there will be up to **19,576 MW** of cross-border power purchase and **3,000 MW** of energy exchange through the cross border interconnections
- The integration of ASEAN Network resulted in a net saving of **788 MUSD** and a reduction in installed capacity **by 2,013 MW**

6. ASEAN Interconnection Projects

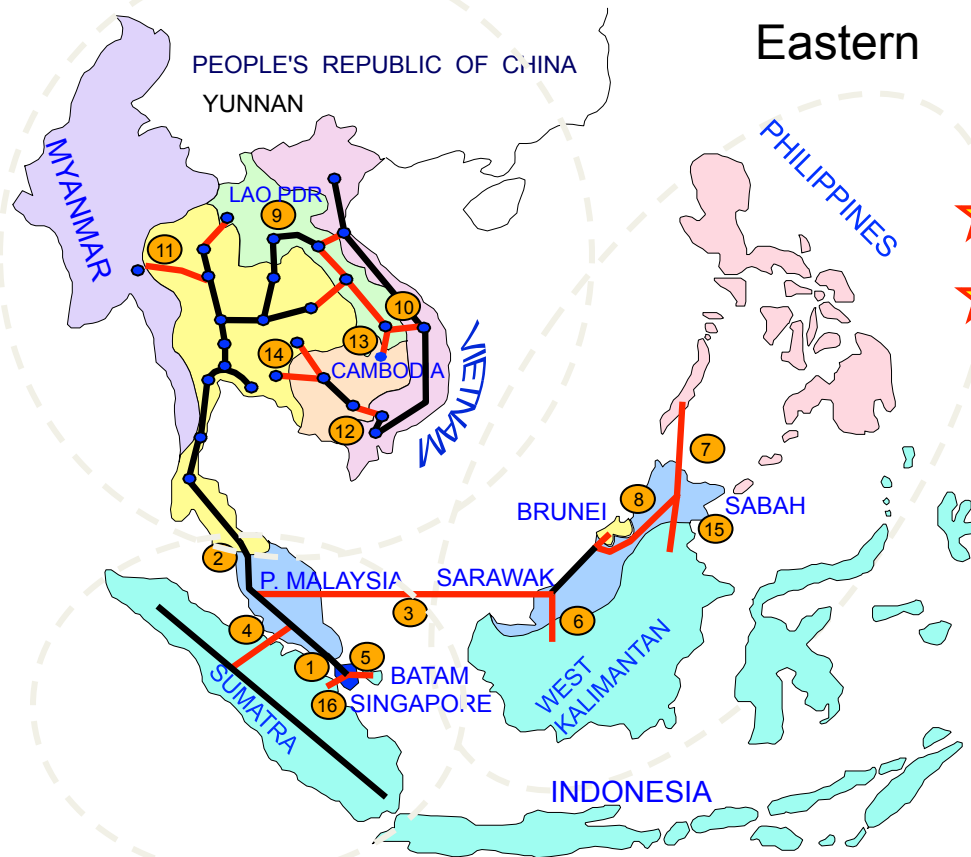
(Updated in May 2014)

Northern

Eastern

Southern

★ Priority Projects



Project ID	Project Name	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	2016
•	Khlong Ngae - Gurun (2 nd Phase, 300MW)	2016
3)	Sarawak - P. Malaysia	2025
★ 4)	P.Malaysia - Sumatra	2019
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	2016
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	2018
•	Khon Kaen 4 - Loei 2 - Xayaburi	2019
•	Thailand - Lao PDR (New)	2015-2023
10)	Lao PDR - Vietnam	2016-2020
11)	Thailand - Myanmar	2018-2026
12)	Vietnam - Cambodia (New)	2020
13)	Lao PDR - Cambodia	2016
14)	Thailand - Cambodia (New)	Post 2020
15)	East Sabah - East Kalimantan	Post 2020
16)	Singapore - Sumatra	Post 2020

7. STATUS OF ASEAN INTERCONNECTION PROJECT UPDATED IN MAY 2014

				(MW)
SYSTEM REGION	EXISTING	ON-GOING	FUTURE	TOTAL
NORTHERN REGION	2,659	6,062	16,374 - 19,524	25,095 - 28,215
9. Thailand - Lao PDR	2,111	3,352	2,465	7,928
10. Lao PDR-Vietnam	248	2,410		2,658
11. Thailand- Myanmar			11,709 - 14,859	11,709 - 14,860
12. Vietnam-Cambodia	170			170
13. Lao PDR - Cambodia		300		300
14. Thailand - Cambodia	100		2,200	2,300
SOUTHERN SYSTEM	450	600	1,800	2,850
1. P. Malaysia - Singapore	450		600	1,050
4. P Malaysia - Sumatra		600		600
5. Batam - Singapore			600	600
16. Singapore - Sumatra			600	600
EASTERN SYSTEM		430	600	1,030
6. Sarawak - W. Kalimantan		230		230
7. Philliines - Sabah			500	500
8. Sarawak - Sabah - Brunei		200	100	300
15. E.Sabah - E. Kalimantan				
NORTHERN - SOUTHERN SYSTEM	380	100	300	780
2. Thailand - P.Malaysia	380	100	300	780
SOUTHERN - EASTERN SYSTEM			3,200	3,200
3. Sarawak - P. Malaysia			3,200	3,200
GRAND TOTAL	3,489	7,192	22,474 – 25,424	32,925 – 36,075

8. THE APG BARRIERS ON CROSS BORDER ISSUES

- legal and regulatory framework for bilateral and cross - border power interconnection and trade
- Technical standards codes or guidelines in the areas of Planning and Design, System Operation and Maintenance
- Formulation of institutional and contractual arrangements for cross-border electricity trade to include Taxation, Tariff and Third Party Access (Wheeling Charge)
- Financing Modalities for realizing the APG

9. THE APG GOALS ON APAEC 2016-2020

Theme for APAEC 2016-2020

“ Enhancing Energy Connectivity and Market Integration in ASEAN to Achieve energy security, accessibility, affordability and Sustainable Energy for all”

OUTCOME STATEMENTS FOR APG

1. APG PRIORITY PROJECTS COD:
 - Peninsular Malaysia - Sumatera in 2019
 - Serawak – Brunei in 2018
 - Lao PDR – Cambodia in 2018
2. TO INITIATE MULTILATERAL ELECTRICITY TRADING BY 2018
3. TO COMPLETE THREE APG PROJECTS BY 2020, NAMELY ;
 - a) THAILAND-PENINSULA MALAYSIA, b) THAILAND-LAO PDR, and c) LAO PDR-VIETNAM

HAPUA OUTPUT FOR SUCCESS OF APG PROJECT

1. MINISTERIAL MOU FOR ALLEVIATE THE CROSS BORDER ISSUES ON REGULATION AND TAXATION
2. ENCOURAGE PUBLIC PRIVATE PARTNERSHIP ON APG PROJECTS
3. FINANCING MODALITY MECHANISM FOR APG



THANK YOU
TERIMA KASIH



THANKS TO : HAPUA WG 2



HAPUA 2013