

BARRIERS AND OPPORTUNITIES FOR ELECTRICITY INTERCONNECTION  
THE SOUTHEAST ASIAN EXPERIENCE

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APERC Conference, Tokyo 27 March 2014

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# I. THE APG HISTORY

- The ASEAN Power Grid (APG) is a flagship programme mandated in 1997 by the ASEAN Heads of States/Governments under the ASEAN Vision 2020.
- The 17th AMEM in Bangkok July 1999 has adopted The APAEC 1999- 2004 tasked to implement the ASEAN Power Grid (APG) program.
- HAPUA was also tasked to conduct the ASEAN Interconnection Master Plan Study (AIMS), the study has been completed in March 2003 for AIMS I and AIMS II in 2012.
- The MOU of APG signed by Energy Minister in July 2007 with objective to strengthen and promote a broad framework for the Member Countries to cooperate towards the development of a common ASEAN policy on power interconnection and trade, and ultimately towards the realization of the ASEAN Power Grid to help ensure greater regional energy security and sustainability on the basis of mutual benefit

## I. 1. THE AIMS OF APG

Recognising the critical role of an efficient, reliable and resilient electricity infrastructure for stimulating regional economic growth and development, the APG is aimed for :

1. Ensuring regional energy security while promoting the efficient utilisation and sharing of resources for mutual benefit.
2. Enhancing electricity trade across borders, through the integration of national power grids, to meet the rising of electricity demand and improve access to energy services.
3. Sharing of surplus reserve generation capacity between ASEAN member states to enhance overall system security and reduce system costs.

## I.2 THE BENEFIT OF APG PROJECTS

- (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

## I.3 THE FINDINGS FROM AIMS II STUDY

- “ The study confirmed that the power interconnection is economically and technically feasible within the region.
- “ AIMS-II identified at least 14 generic interconnection projects which are feasible for the purpose of economic energy exchange and power import/export.
- “ The results of AIMS-II also identified significant saving in investment of new power projects and operating costs within member countries.
  - 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**

## I. 4 APG STRATEGIC CONCERNS

### **THE APG MOU CONCERNS ON CROSS BORDER ISSUES:**

- Harmonization of legal and regulatory framework for bilateral and cross - border power interconnection and trade
- Harmonization of common 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)
- Identification and recommendation on Financing Modalities for realizing the APG

## I.5 THE ASEAN PLAN OF ACTIONS ON ENERGY COOPERATION (APAEC) 2010 -2015 PROGRAM NO 1 : APG PROJECTS

“ Objective:

“ To facilitate and expedite the realisation of the ASEAN Power Interconnection and to further harmonize technical standards and operating procedures as well as regulatory and policy frameworks among the ASEAN Member States (AMS).

“ Key Strategies:

“ Accelerate the development of the ASEAN Power Grid Interconnection projects

“ Optimise the generation sector vis-à-vis the available indigenous energy resources in the region

“ Encourage and optimise the utilisation of ASEAN resources, such as funding, expertise and products to develop the generation, transmission, and distribution sectors in the region.

## II. THE APG PROJECTS STATISTICS

No.	Interconnected Systems	CAPACITY	
		2010	2013
1	Thailand - P.Malaysia	380	380
2.	Thailand - Lao PDR	1853	2111
3.	Singapore - P Malaysia	400	450
4.	Cambodia - Vietnam	120	200
5.	Thailand - Cambodia	-	100
	<b>Total Bilateral PP/EE</b>	<b>2753</b>	<b>3489</b>

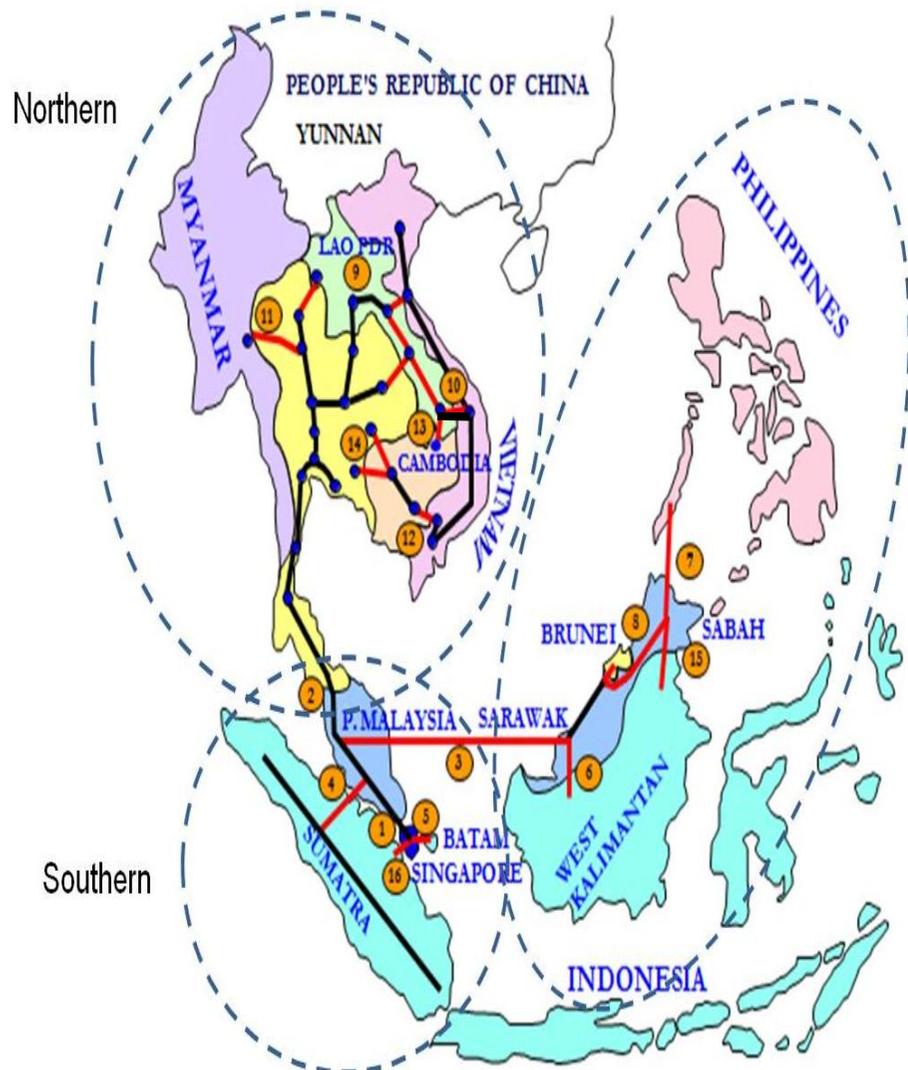


ASEAN POWER GRID  
CONSULTATIVE COMMITTEE

PEACE  
STABILITY  
COURAGE  
DYNAMISM

# II.1 APG INTERCONNECTION STATUS (Revised by AUGUST 2013)

## ASEAN Interconnection Projects



Project Number	Project Name	Earliest COD
1)	P. Malaysia - Singapore (New)	2018
2)	Thailand - P. Malaysia	
	• Sadao - Bukit Keteri	Existing
	• Khlong Ngae - Gurun	Existing
	• Su Ngai Kolok - Rantau Panjang	2015
	• Khlong Ngae - Gurun (2 <sup>nd</sup> Phase, 300MW)	2016
3)	Sarawak - P. Malaysia	2015-2021
4)	P. Malaysia - Sumatra	2017
5)	Batam - Singapore	2015-2017
6)	Sarawak - West Kalimantan	2015
7)	Philippines - Sabah	2020
8)	Sarawak - Sabah - Brunei	
	• Sarawak - Sabah	2020
	• Sabah - Brunei	Not Selected
	• Sarawak - Brunei	2012, 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)	2018
	• 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	2011-2016
11)	Thailand - Myanmar	2016-2025
12)	Vietnam - Cambodia (New)	2017
13)	Lao PDR - Cambodia	2016
14)	Thailand - Cambodia (New)	2015-2020
15)	East Sabah - East Kalimantan	2020
16)	Singapore - Sumatra	2020

**II.2 STATUS OF ASEAN INTERCONNECTION PROJECT  
AUGUST 2013 DATA**

				(MW)
SYSTEM REGION	EXISTING	ON-GOING	FUTURE	TOTAL
<b>NORTHERN REGION</b>	2,659	6,062	16,374	25,095
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	11,709
12. Vietnam-Cambodia	200			200
13. Lao PDR - Cambodia		300		300
14. Thailand - Cambodia	100		2,200	2,300
<b>SOUTHERN SYSTEM</b>	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
<b>EASTERN SYSTEM</b>		400	800	1,200
6. Sarawak - W. Kalimantan		200		200
7. Philliines - Sabah			500	500
8. Sarawak - Sabah - Brunei		200	100	300
15. E.Sabah - E. Kalimantan			200	200
<b>NORTHERN - SOUTHERN SYSTEM</b>	380	100	300	780
2. Thailand - P.Malaysia	380	100	300	780
<b>SOUTHERN - EASTERN SYSTEM</b>			3,200	3,200
3. Sarawak - P. Malaysia			3,200	3,200
<b>GRAND TOTAL</b>	3,489	7,162	22,474	33,125

### III. APAEC PROGRAM NO 1 APG Projects MID TERM REVIEW 2014 BY REPP SSN

- “ Strategy 1: Accelerate the development of the ASEAN Power Grid Interconnection projects
- “ The MTR score of 3.08/5 reflects the overall steady progress that HAPUA has made towards achieving its key deliverables. Nonetheless, more work needs to be done on the promotion of multilateral interconnections for the APG.
- “ The slow pace of progress is mainly due to the lack of commercial interest in implementing some of the projects
- “ Strategy 2: Optimise the generation sector vis-à-vis the available indigenous energy resources in the region
- “ HAPUA has begun initial discussions on the two initiatives to “Conduct further optimisation studies on the most economic operation and possible reserve sharing scheme within the region” and to “Promote the optimal development of generation resources within the ASEAN region in line with the ASEAN Fuel Policy for power generation to be formulated by REPP-SSN”.

### III. 1 MIDTERM REVIEW 2013 BY REPP SSN

- “ Strategy 3: Encourage and optimise the utilisation of ASEAN resources, such as funding, expertise and products to develop the generation, transmission, and distribution sectors
  
- “ There has been little progress under this strategy given that the interconnections for the APG are still mostly bilateral. Under the initiative to “Encourage the private sector to jointly develop power projects within ASEAN Region, notwithstanding the importance of the interconnection projects”.
  
- “ HAPUA is currently working on a write-up on the importance of the interconnection projects which can be shared with the private sector.

## IV. THE HAPUA WAY FORWARD

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### 1. Related to the progress of APG Project :

5 APG projects has already operation, which amount of Power Purchase or exchange is 3,489 MW. 7 APG projects (including priority projects) under construction earliest COD 2015 and 12 APG projects has plan and committed beyond 2015.

### 2. Related to Strategy no 1 for Alleviate the Cross Border Issues

In regards to the border issues “The Harmonization of the Legal and Regulatory practices and to identify possible financing modality for realising the APG”, HAPUA Working Committee has already appointed to HWG 4 for the study projects on 2014 – 2015:

- a. Taxation on the Cross Border Power Transaction Within ASEAN Region.
- b. Public Private Partnership (PPP) to be applied to the APG Projects.

The preliminary result of these studies was expected to be reported at next HAPUA Council Meeting, at Manado next June 2014.

## IV.THE HAPUA WAY FORWARD

3. To step further actions as the follow up to the recommendation of the study on “Harmonisation of Technical Standard Codes and Guidelines in the Area of Planning and Design, System Operation and Maintenance for APG”.

The HAPUA recommended the APG Action Plan for the formation of:

- a. Group of APG Transmission System Operators (ATSO),
- b. Group of APG Grid Planners,
- c. Group of APG Regulators,

4. The collaboration with the IO's

The 18th meeting of HWC also has endorsed, the Collaboration of HWG 2 & HWG 4 with IOs, such as EU Ready and IEA, to conduct study to support Harmonize Legal and Regulatory and US to support the study on technical matters.

5. Related to The Strategy 2, Optimization of indigenous Energy

The effort on Optimization of indigenous energy resources in the region, will be the main agenda for discuss and share on the APG Generation and Transmission System Planning Group, as the program of the HAPUA WG 2

## IV. THE HAPUA WAYFORWARD

### 6. The ASEAN Fuel Mixed Policy

The fuel mixed policy of ASEAN members country should be formalized on Government level for reference of PDP of HAPUA members country.

### 7. The Strategy no 3, Related to the Private Partnership

The HAPUA WG 4 has already finalized the TORs of “The Study on Public Private Partnership among ASEAN Power Utilities/Authorities” and “The Study on Regulation of Taxation for Cross Border Power Transaction”; the initial report will be presented on next HAPUA meeting June 2014 at Manado, Indonesia . The study is expected to be completed by end of 2015.



**THANK YOU**  
**TERIMA KASIH**



**THANKS TO : HAPUA WG**



HAPUA 2013