



**Greater Mekong Sub Region (GMS)
25th meeting of the Regional Power Trade
Coordination Committee (RPTCC-25)**



Country Report

21-22 March 2019, Bangkok, Thailand.

**Mr. Chitpanya PHAMISITH
System Planning Office
Technical Department
Electricite Du Laos**



Contents

1. Present Status
 - Electricity Statistic
 - Existing cross border interconnection
2. Power Trade with neighboring countries
3. Power Development Plan (PDP)
 - Power Demand forecast
 - Power Development Plan
 - TL Projects under construction
 - 500 kV projects and Plan Cross border Inter-Connection

1. Present Status

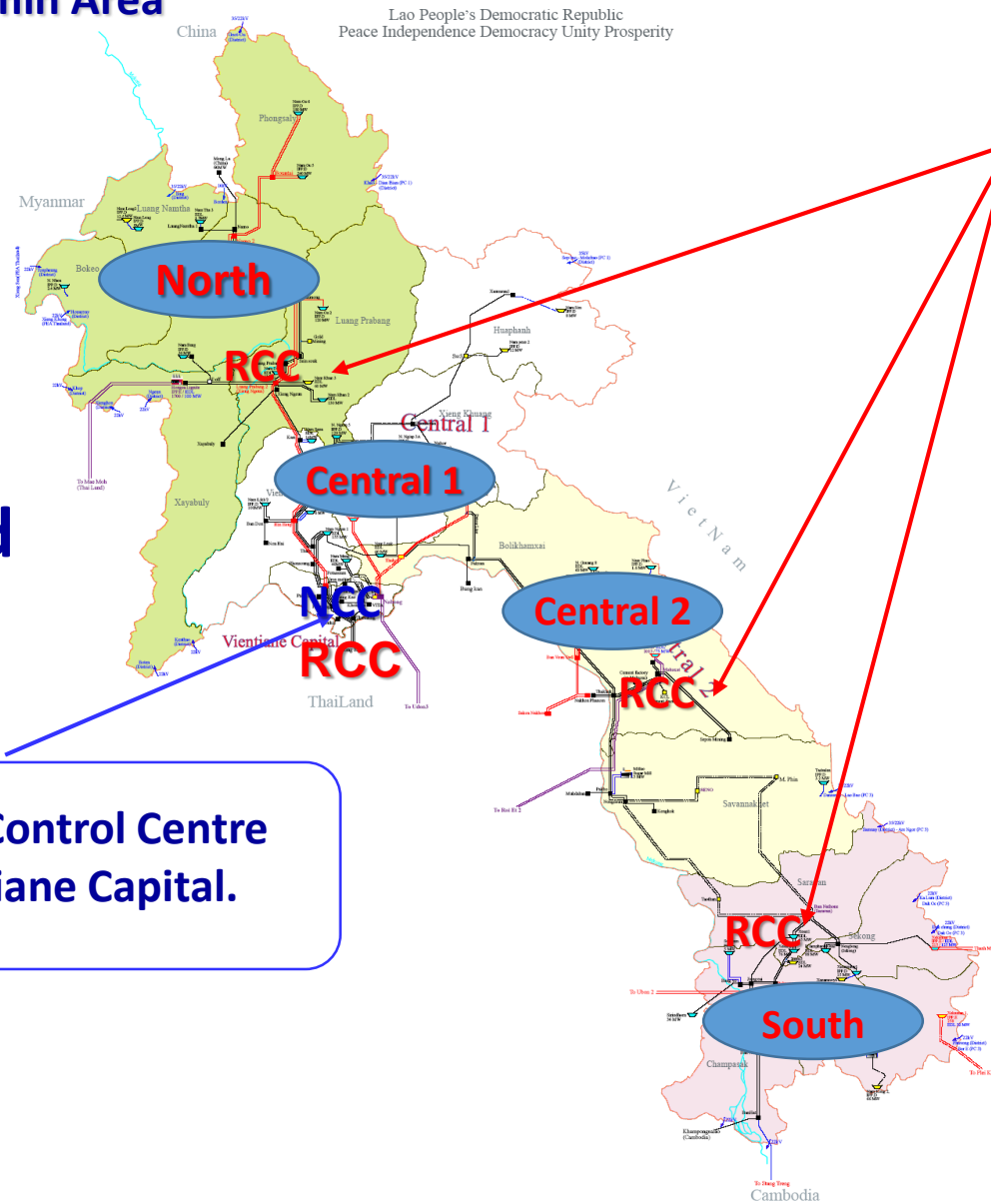
- Grid System and Control/Admin Area

There are Four (4) control/Admin.

- North (N),
- Central1 (C1),
- Central2 (C2) and
- South (S)

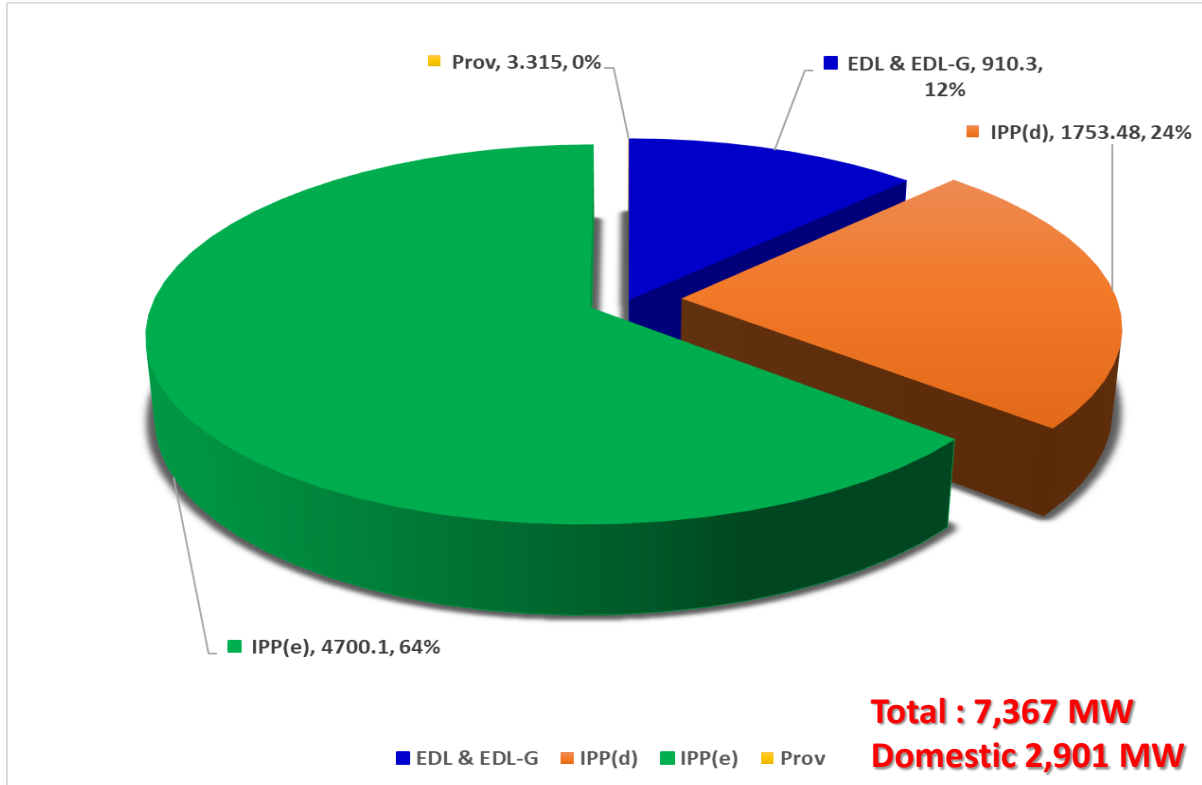
The National Control Centre (NCC) in Vientiane Capital.

Regional Control Centre (RCC) projects .

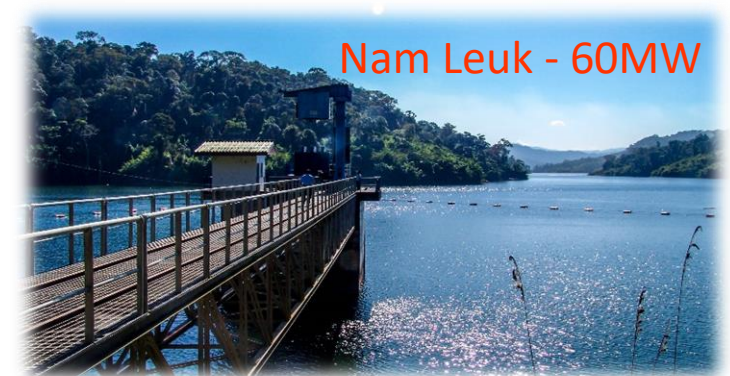
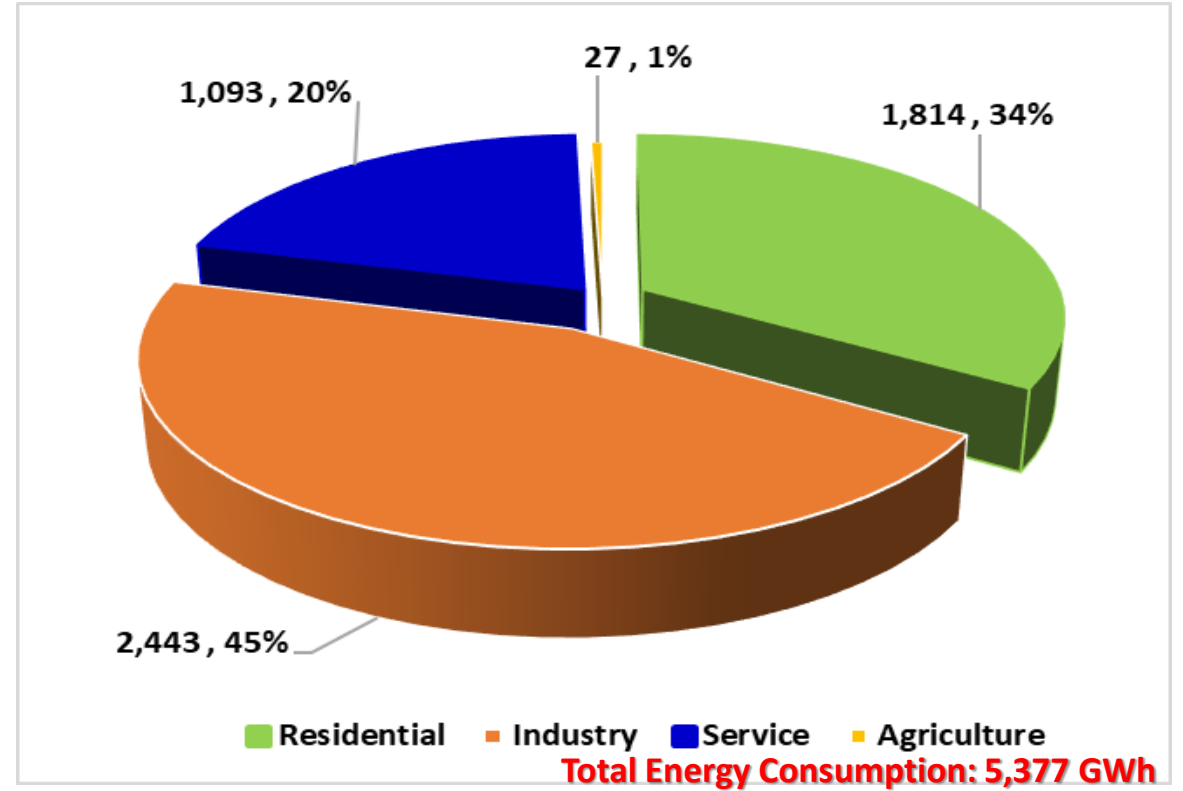


1. Present Status

■ Generation Capacity for domestic in 2018 (MW)

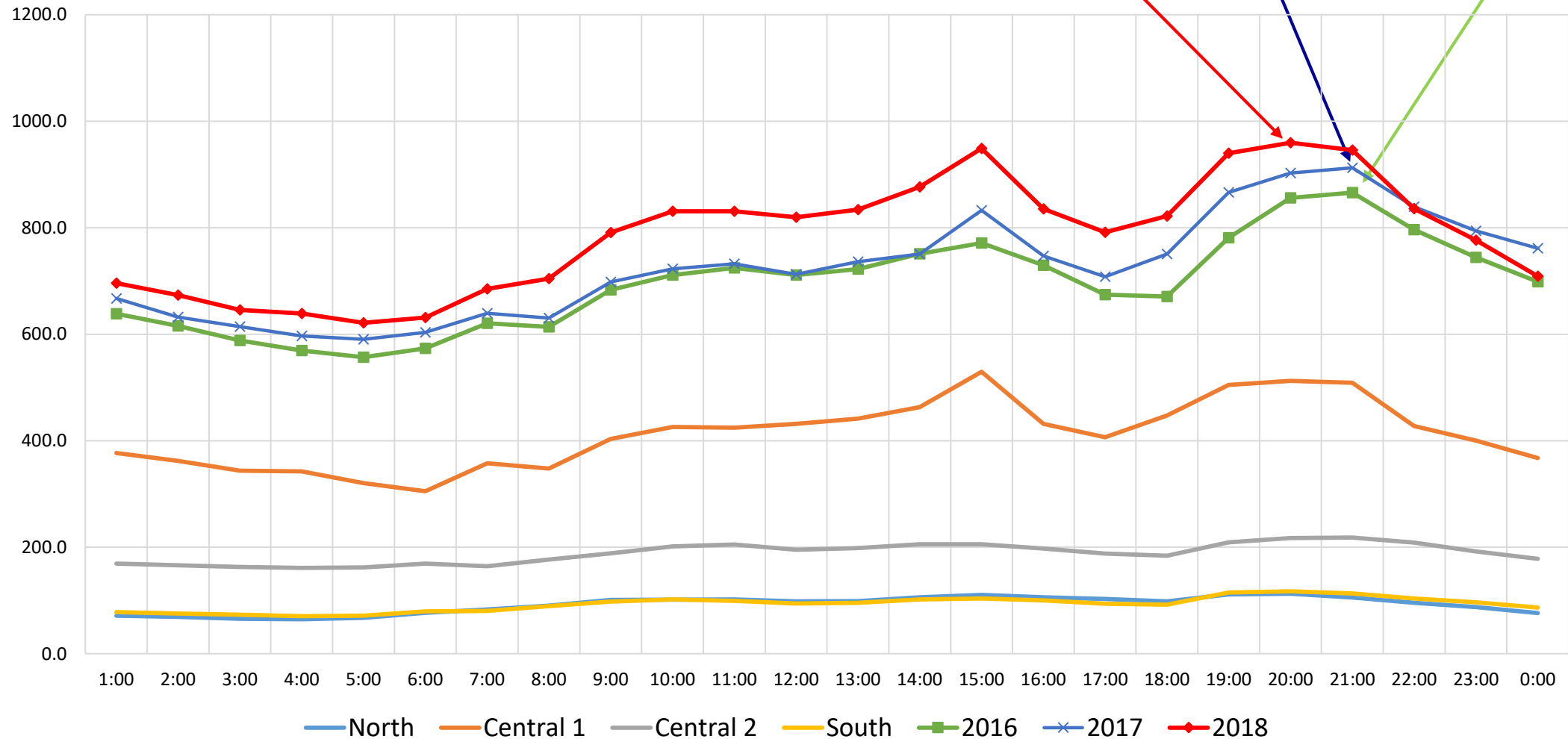


■ Annual Energy Consumption By Sector, 2017 (GWh)



1. Present Status

- Daily Peak Demand in 4 Regions and Whole



System Peak Demand in 4 Regions and Whole the country 959 MW @ 24 April 2018

1. Present Status

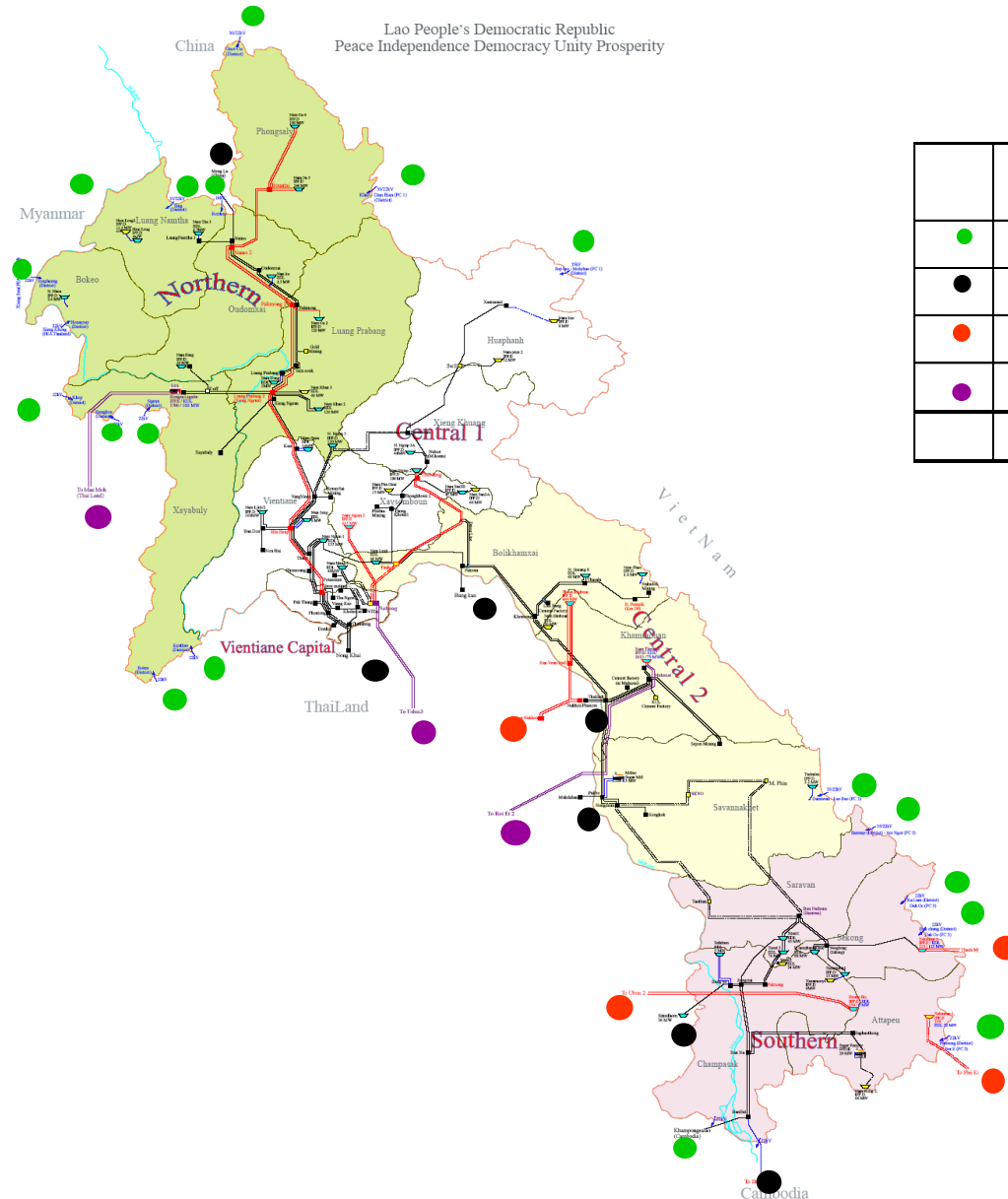
- EDL's Transmission Line and Substation Facilities in 2018

Regional	230/115/22 kV			115/22 kV		
	Transmission Line (cct-km)	Substations (Unit)	TR Capacity (MVA)	Transmission Line (cct-km)	Substations (Unit)	TR Capacity (MVA)
Northern	1,084	4	440	1,258	13	351
Central 1	169	3	800	1,594	24	937.5
Central 2	440	1	200	2,221	12	412
Southern	-	-	-	1,263	10	413
Whole Country	1,693	8	1,440	6,336	59	2,113.5



1. Present Status

- Existing Grid System and cross – border interconnection



	Voltage Level	EDC	EVN	CSG	Myanmar	Thailand		Total
						EGAT	PEA	
●	22/35 kV	1	7	3	1		6	18
●	115 kV	1		1		5		7
●	230 kV		2			2		4
●	500 kV					3		3
	Total	2	9	4	1	10	6	32

Remarks:

- 22/35kV – Import
- 115kV – Exchange
- 230kV – Purely Export
- 500kV – Purely Export

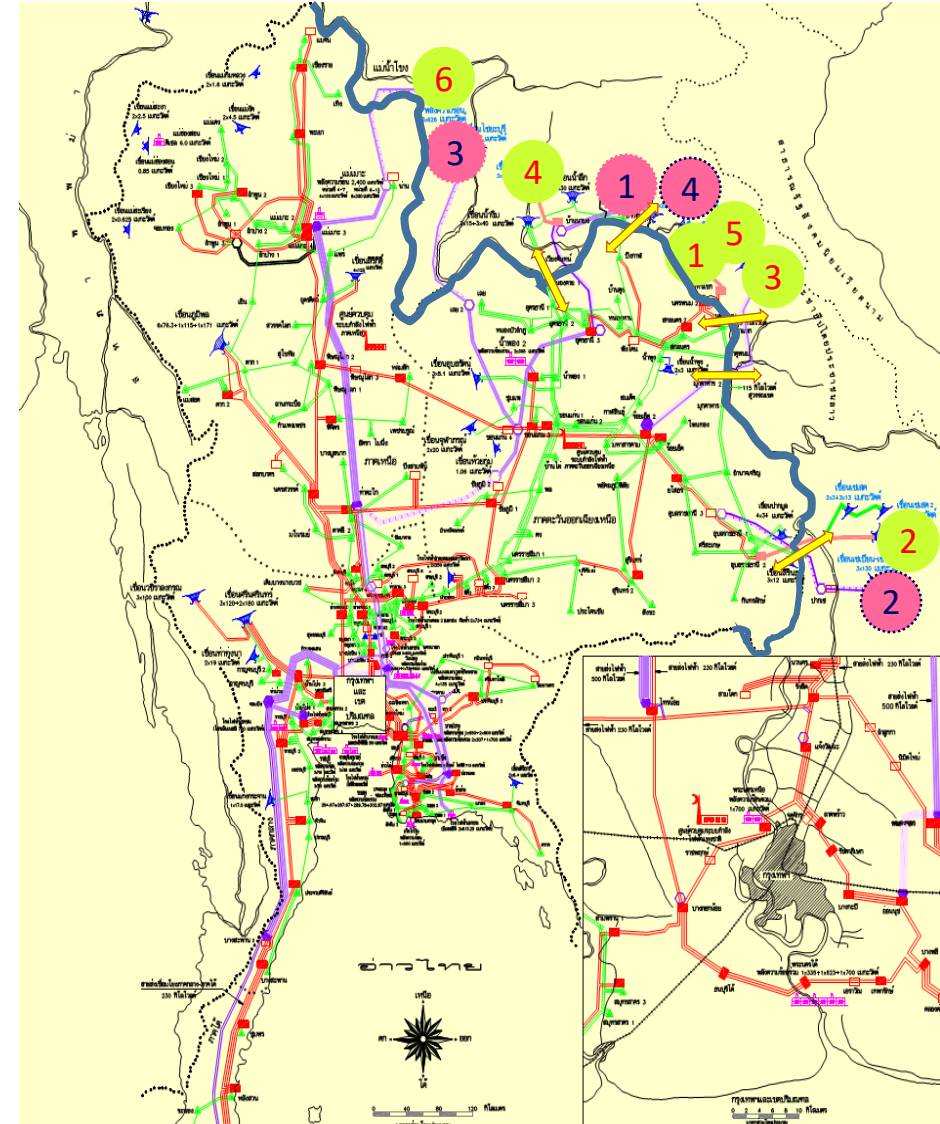
Legend :

115 kV	
230 kV	
500 kV	

2. Power Trade with Neighboring Countries

1. Power Trade with Thailand

- **MOUs signed with Thailand**
 - ✓ 1st MOU signed in Y1993 agreed to Export 3,000 MW
 - ✓ 2nd MOU signed in Y1996 agreed to export 7,000 MW
 - ✓ 3rd MOU signed in September, Y2016 agreed to export 9,000 MW.
- **Existing 3,983 MW (Export 3,584MW)**
 1. Theun Hinboun (220 MW), Export 220 MW – COD Y1998
 2. Houay Ho (149 MW), Export 126 MW – COD Y1999
 3. Nam Thuen 2 (1,000 MW), Export 948 MW – COD Y2011
 4. Nam Ngum 2 (615 MW), Export – 597 MW – COD Y2011
 5. Theun Hinbouon (220 MW Expansion), Export 220MW – COD Y2012
 6. Hongsa (Lignite) (1,778 MW), Export 1473MW- COD Y2015-16
- **Under Construction and PPA negotiation Projects 2,8432MW**
 1. Nam Ngeip 1 (272MW), Export – 269 MW - COD Y2019
 2. Xepien-Xenamnoy (390 MW), Export 354 MW - COD Y2020
 3. Mekong Sayabury (1,260 MW), Export 1220 MW - COD Y2019
 4. Nam Thuen 1 (600 MW), Export 520 MW – COD Y2023
 5. Nam Ngum 3 (480 MW), Export 480 - COD Y2023



2. Power Trade with Neighboring Countries

2. Power Trade with Vietnam

MOUs signed with Vietnam

- ✓ 1st MOU signed in Y1998 agreed to export 3,000MW
- ✓ 2nd MOU signed in Y2006 agreed to export 5,000MW.

The two governments has MOU signed and agreed to continuous upgrade the cooperation on hydropower projects development in Vientiane on 5 October 2016

- ✓ Short Term in Y2020 agreed to export 1,000 MW
- ✓ Medium Term Y2021 - 2025 agreed to reach 3,000 MW
- ✓ Long Term Y2026 - 2030 agreed to reach 5,000 MW.

Existing 572 MW

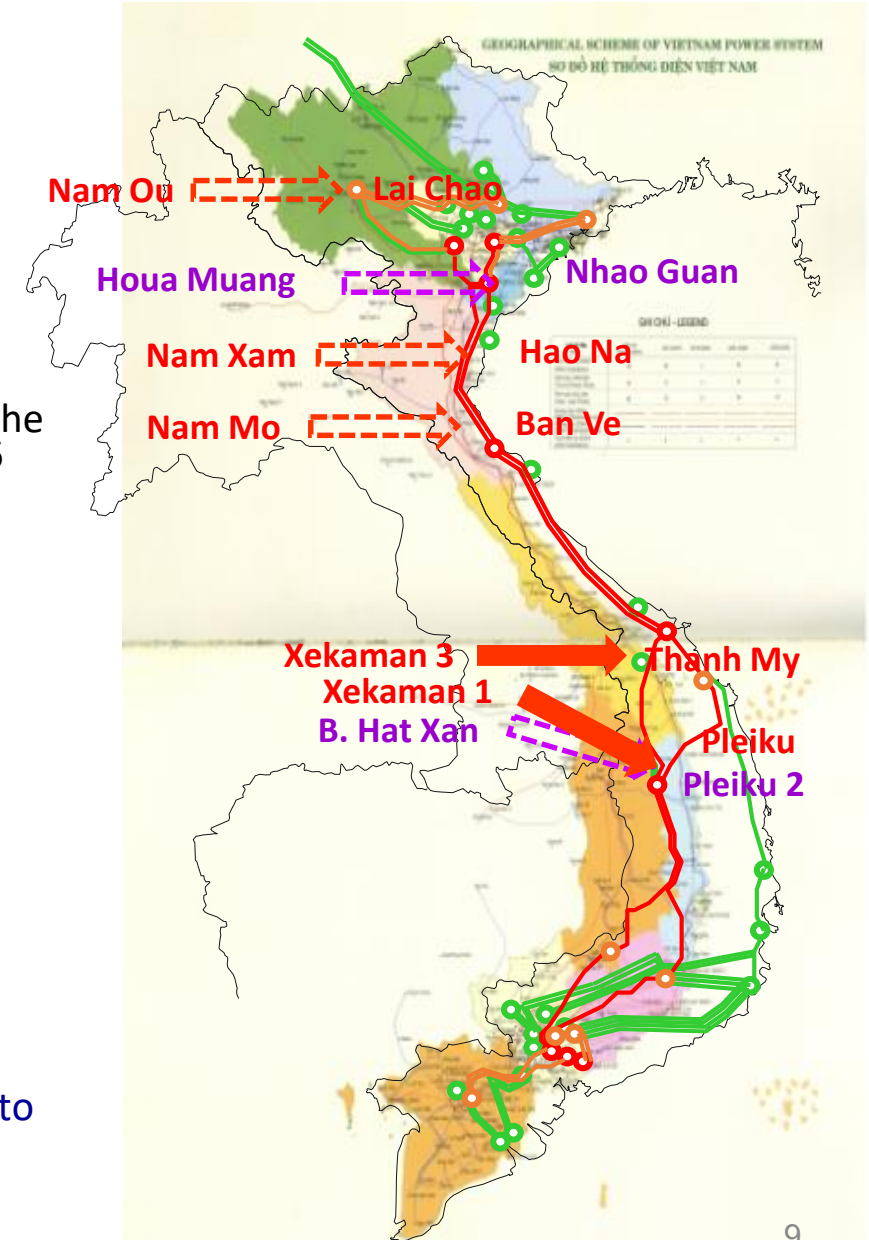
1. Xekaman 3 (250 MW), Export 225 MW – COD Y2013
2. Xekaman 1 (290 MW), Export 290 MW – COD Y2017
3. Xekaman-Sanxai (32MW) – COD Y2019

Projects Prepare Construction

1. Xekaman 4 (80MW) – COD Y2023

Projects planned

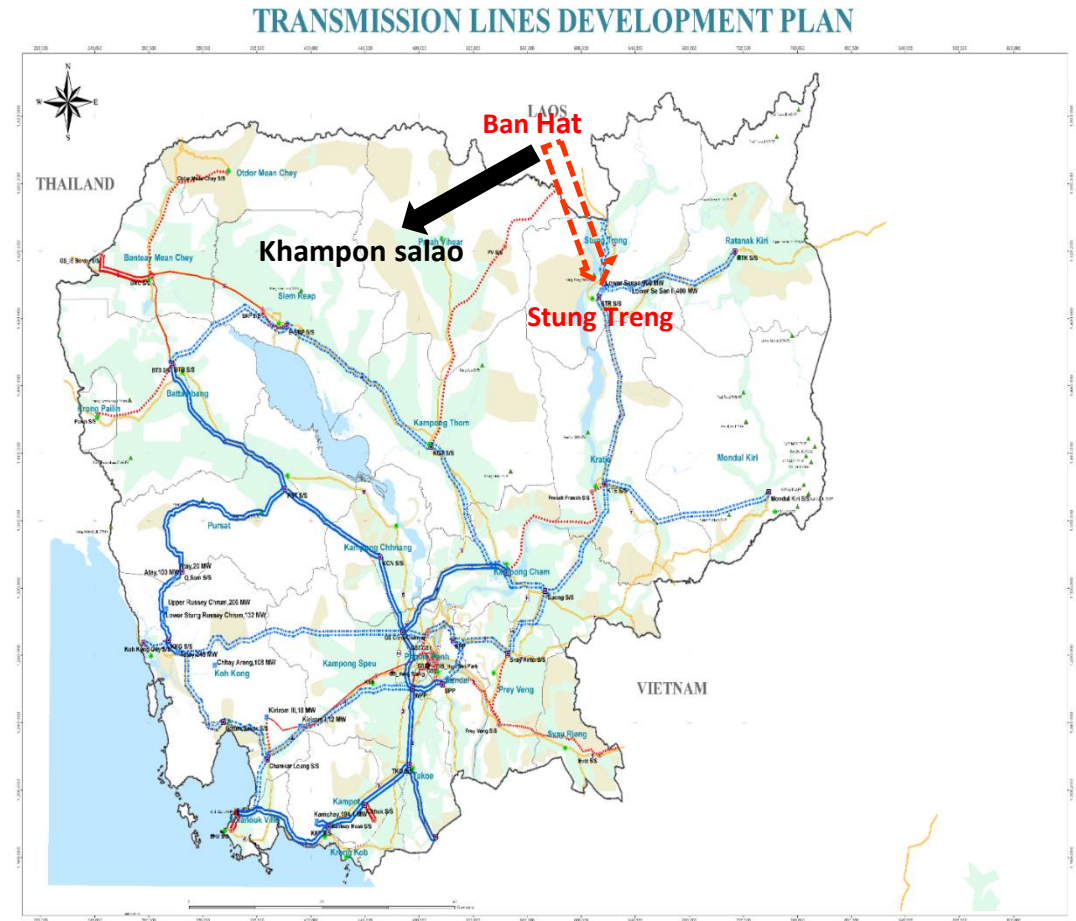
1. Planned up to 5,000 MW, Back-to-Back substation in the south of Lao PDR to export to Southern of Vietnam.



2. Power Trade with Neighboring Countries

3. Power Trade with Cambodia

- **MOUs signed with Cambodia**
 - ✓ Y1999 agreement on cooperation power sector was signed MOU with Cambodia, Laos to export up to 300 MW.
- **Existing**
 1. 22 kV Existing with exporting 5 MW .
 2. 115 kV Existing with exporting 20 MW and the end of this year will be increased up to 70 MW.
 - ✓ EDL have sign PPA to export power to EDC in Y2021 with 195 MW, energy 1,521 GWh/year, Built TL 500 kV structure the first stage energize by 230 kV.
- **Projects planned**
 - ✓ Planned to export power 300 - 500 MW or more



2. Power Trade with Neighboring Countries

4. Power Trade with Myanmar

- **Existing**
 - ✓ 22 kV from M. Long, Laos – Kenlat, export 3 MW
- **Progress of the cooperation**
 - ✓ Prepare MOUs signed with MOEE to export power to Myanmar 300-500 MW.
 - ✓ Bilateral meeting Laos and Myanmar during 15-16 February Y2019 to discussed on energy cooperation and power trade in future
 - ✓ Study, Laos to export power up to 100 MW
 - ✓ Long term, Laos to export power up to 300 MW, via 230 kV or 500 kV TL (Proposed study by ADB).

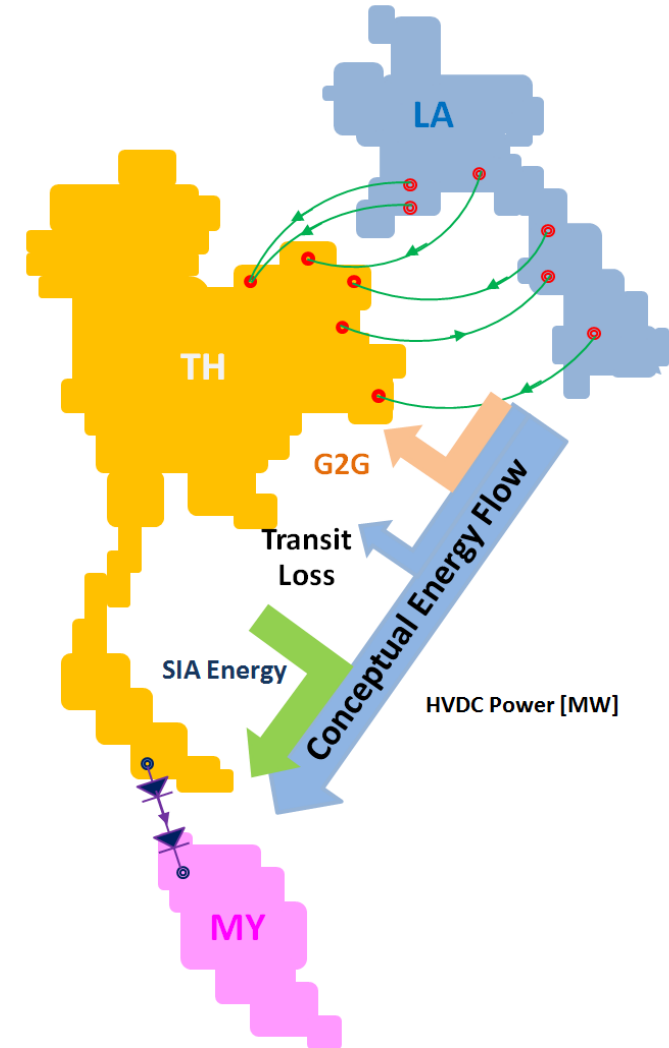
5. Power Trade with China.

- ✓ Existing 115 kV, import from China max. 60 MW
- ✓ Planned 1,000-3,000 MW (HVDC) Power from China Export to Thailand.

2. Power Trade with Neighboring Countries

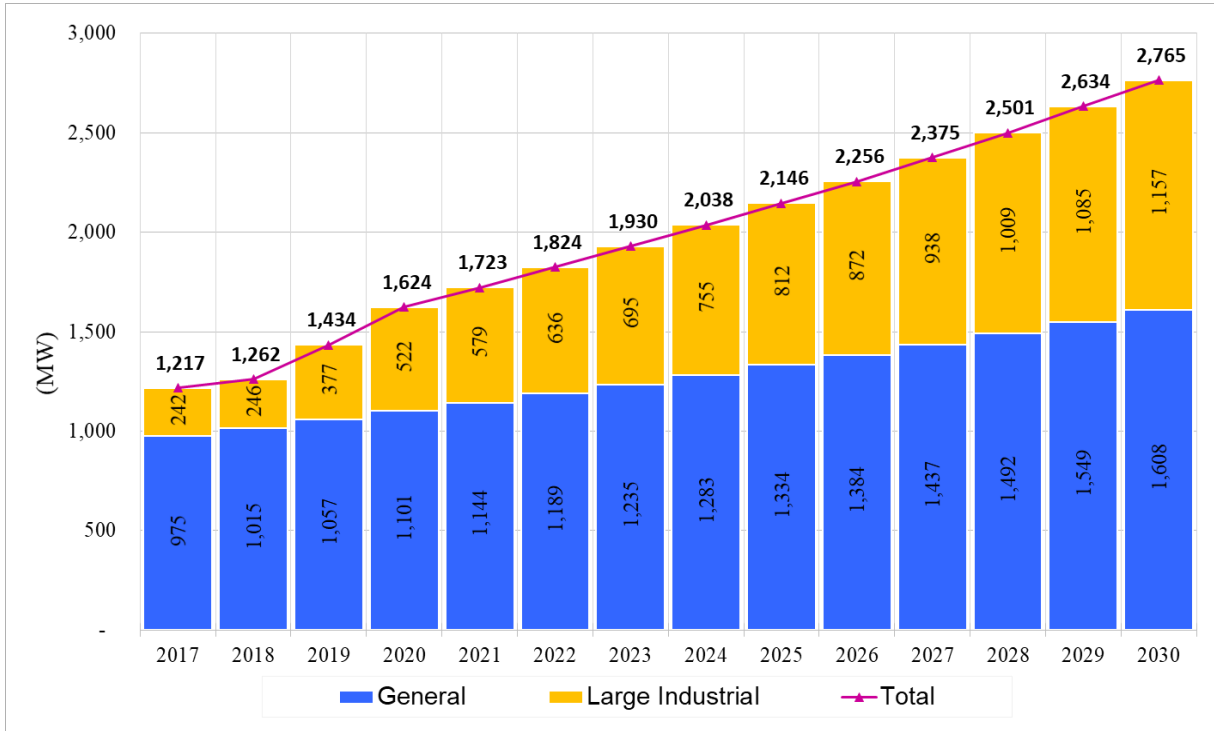
6. Multilateral Power Trade LTM-PIP Project

- Malaysia , Thailand and Laos signed MOU at AMEM, Myanmar, 21 September 2016. The MOU will facilitate multilateral cross-border power trade up to 100 MW through Thailand.
- Phase I: Project have been started on January 2018 with total energy 17 Gwh to Malaysia.
- Phase II: The consultative meeting on March 12 2019 in Vientiane to extend or amend the Lao PDR-Thailand-Malaysia Firm energy 100 GWh/year and capacity up to 300 MW.

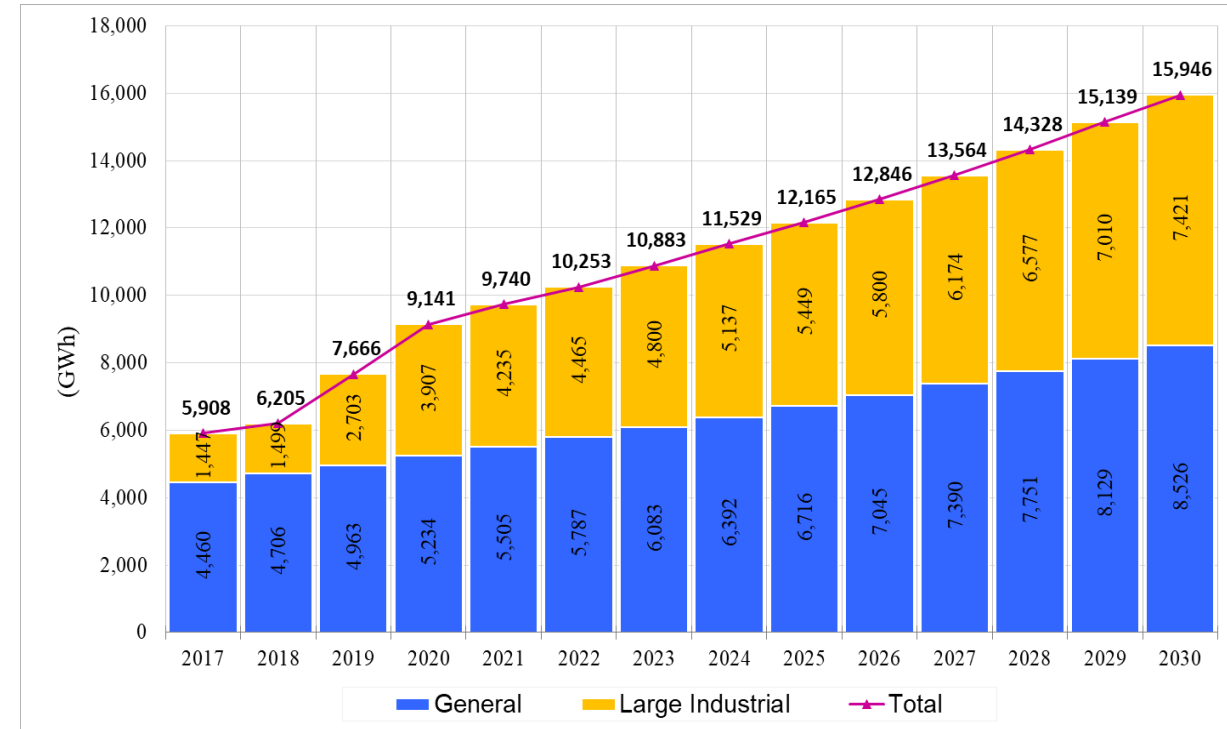


3. Long-term Power Development Plan

- Power Demand forecast for Whole Country (MW)



- Energy Demand Forecast for Whole Country (GWh)



Year	2017	2018	2020	2025	2030
Demand forecast (MW)	1,217	1,262	1,624	2,146	2,765

3. Long-term Power Development Plan

- Summary power demand from 2017-2030

No.	ລາຍລະອຽດ (Descriptions)	Units	ປະຈຸບັນ (Actual)		ຄາດຄະເນ (Forecast)				Growth Rate (%)		
			2017	2018	2019	2020	2025	2030	2017-2020	2017-2025	2017-2030
			1	ຄວາມຕ້ອງການ ພະລັງງານໄຟຟ້າ (ບໍ່ລວມຕົກເຮ່ຍໃນລະບົບ) Energy Demand (Excluding system losses)	(GWh)	5,360	5,633	7,030	8,440	11,294	14,876
2	ພະລັງງານຕົກເຮ່ຍໃນລະບົບ System Losses	(GWh) (%)	548 9.3%	572 9.2%	636 8.3%	700 7.7%	871 7.2%	1,070 6.7%			
3	ຄວາມຕ້ອງການ ພະລັງງານໄຟຟ້າ (ລວມຕົກເຮ່ຍໃນລະບົບ) Energy Demand (Including system losses)	(GWh)	5,908	6,205	7,666	9,141	12,165	15,946	15.7%	9.4%	5.7%
4	ຄວາມຕ້ອງການ ກຳລັງໄຟຟ້າສູງສຸດ Peak Load	(MW)	1,217	1,262	1,434	1,624	2,146	2,765	10.1%	7.3%	6.5%
5	Load Factor	(%)	55.4%	56.1%	61.0%	64.3%	64.7%	65.8%			
* ສະເລ່ຍເພີ່ມຂຶ້ນ ຕໍ່ປີ (Average Growth per Annum)									2017-2020	2017-2025	2017-2030
* ຄວາມຕ້ອງການ ພະລັງງານໄຟຟ້າ ບໍ່ລວມຕົກເຮ່ຍໃນລະບົບ (Energy Demand Excluding System Losses), GWh									1,027	742	732
* ຄວາມຕ້ອງການ ພະລັງງານໄຟຟ້າ ລວມຕົກເຮ່ຍໃນລະບົບ (Energy Demand Including System Losses), GWh									1,078	782	772
* ຄວາມຕ້ອງການ ກຳລັງໄຟຟ້າສູງສຸດ (Peak Load), MW									136	116	119

3. Long-term Power Development Plan

- Hydro Power Plants Project PPA and Under Construction

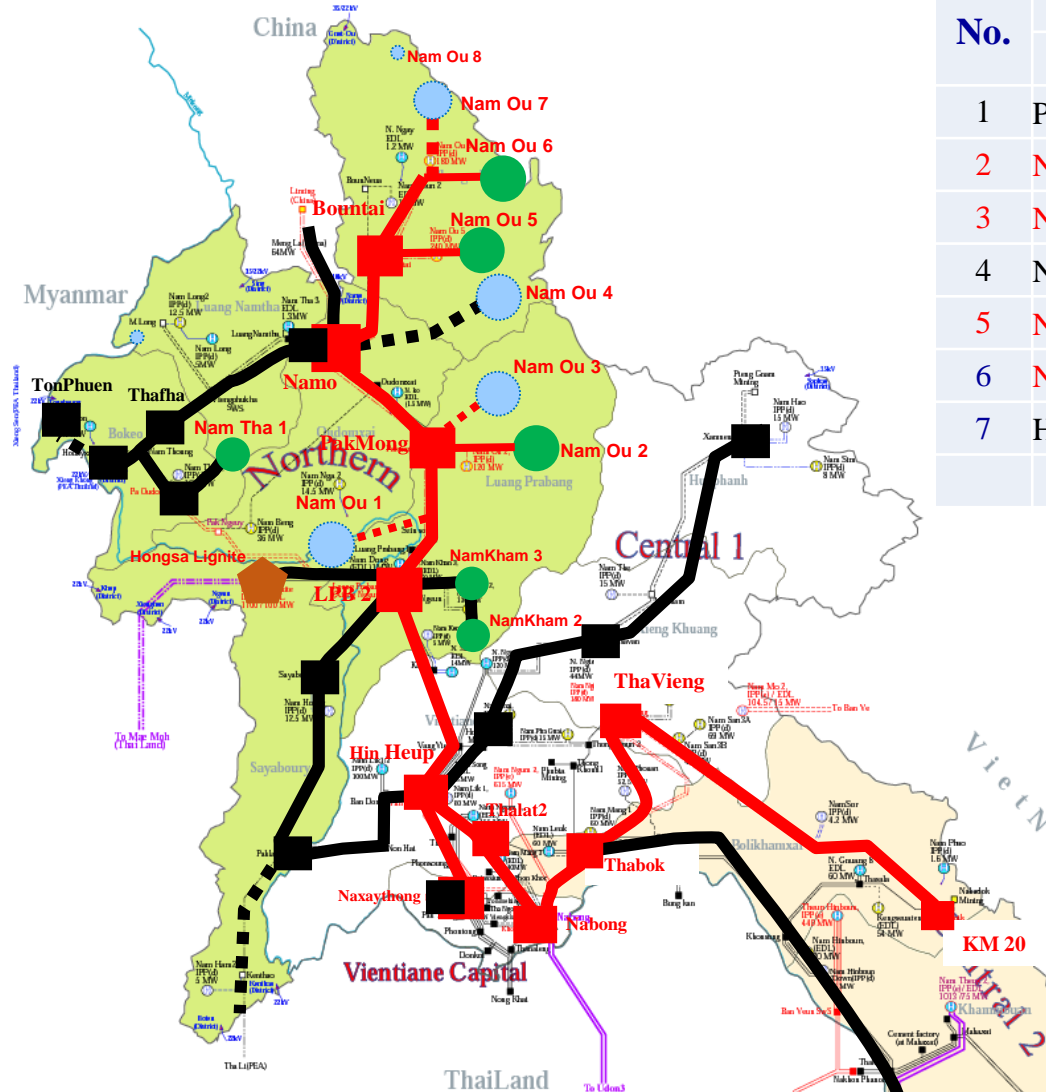
Regional	Install Capacities (MW)	Projects (Unit)
Northern	839	8
Central 1	670	13
Central 2	269	6
Southern	576	7
Whole Country	2,354	21

- Transmission Line Project Under Construction and will be Operate in 2020

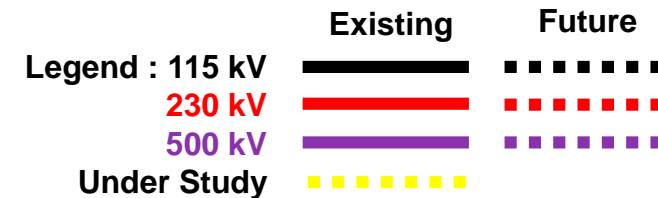
No.	Projects List	Voltage	No. of Circuit	Transmission Line Lenth	Conductor size	Province
	Transmission Line (From - To)	(kV)		(cct-km)	(Sq.mm)	
1	Nam Ou1 HP – 230 kV Pakmong2-Luangprabang2	230	2	2	ACSR 240	Luangprabang
2	Nam Ou 3 HP - 230/115/22 kV Pakmong2 S/S	115	2	65	ACSR 240	Luangprabang
3	Nam Ou 4 HP - 115/22 kV Oudomxai S/S	115	2	100	ACSR 240	Phongsaly
4	Nam Ou 7 HP- 230/115/22 kV Bountai S/S	230	2	55	ACSR 240	Phongsaly
5	Houayxay S/S - Tonpheung S/S	115	1	48	ACSR 240	Bokeo
6	Paklai S/S - Khentao S/S	115	1	67	ACSR 240	Sayabuly

3. Long-term Power Development Plan

TL under construction Projects in Northern Area

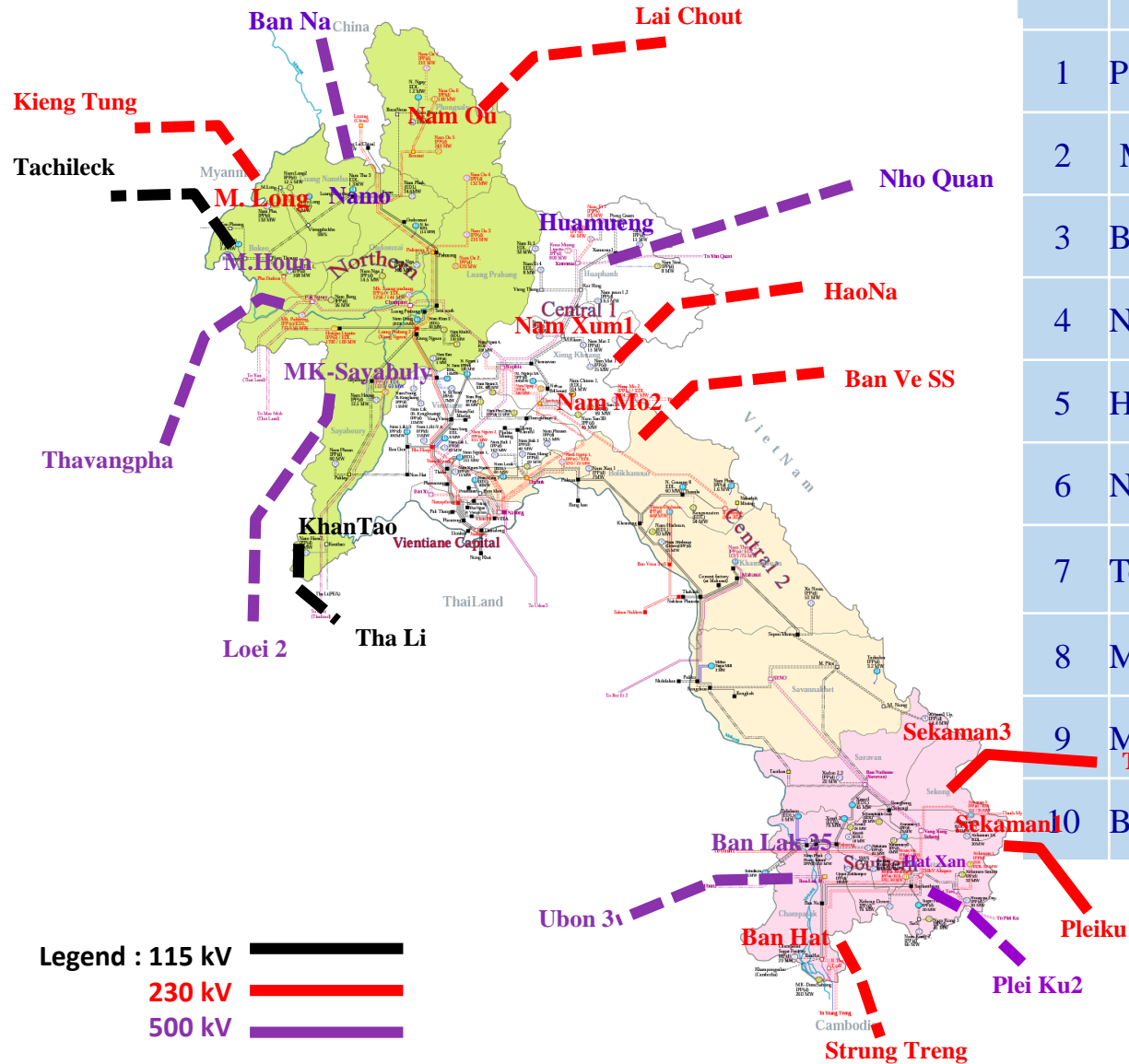


No.	Projects		Voltage (kV)	Length (km)	COD
	From	To			
1	Paklay	Ken Thao (Boder)	115	67	2019
2	Nam Ou 7	Nam Ou 6	230	45	2020
3	Nam Ou 7	Bountai	230	100	2020
4	Nam Ou 4	Oudomxai	115	100	2020
5	Nam Ou 3	PakMong	230	70	2020
6	Nam Ou 1	Pakmong2-Luangprang2	230	2	2020
7	Houayxai	Tonpheung	115	51	2019






3. Transmission Interconnection Plan

Plan cross – border interconnection



No.	Projects		Voltage (kV)	Region	Progress	Owner
	From	To				
1	Paklay	Tha li (Thailand)	115	North	Under Construction	EDL
2	MK_Xayabuly	Loei 2 (Thailand)	500	North	Under Construction	IPP(e)
3	Ban Lak 25	Ubon 3 (Thailand)	500	South	Under Construction	IPP(e)
4	Na Mo	Ban Na, (China)	500	North	Planned	EDL
5	Hat Xan	Plei ku (Vietnam)	500	South	Planned	EDL
6	NamMo2	Ban Ve (Vietnam)	230	Central 1	Planned	EDL
7	Ton Pheung	Tachileck (Myanmar)	115	North	Study	EDL
8	Muang Houn	Nan 2 (Thailand)	500	North	Planned	EDL
9	M. Long ThanhMy	KiengTung (Myanmar)	230	North	Study	EDL
10	Ban Hat	Stung Treng (Cambodia)	230	South	Study	EDL

Legend : 115 kV 
 230 kV 
 500 kV 

Thank you for your attention
ຂອບໃຈ