



**Greater Mekong Sub Region (GMS)**  
**26<sup>th</sup> meeting of the Regional Power Trade  
Coordination Committee (RPTCC-26)**



# Country Report

**27<sup>th</sup> November 2019, Pan Pacific, Hanoi, Vietnam**

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**Electricite Du Laos**



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Vision 2030 of the power sector

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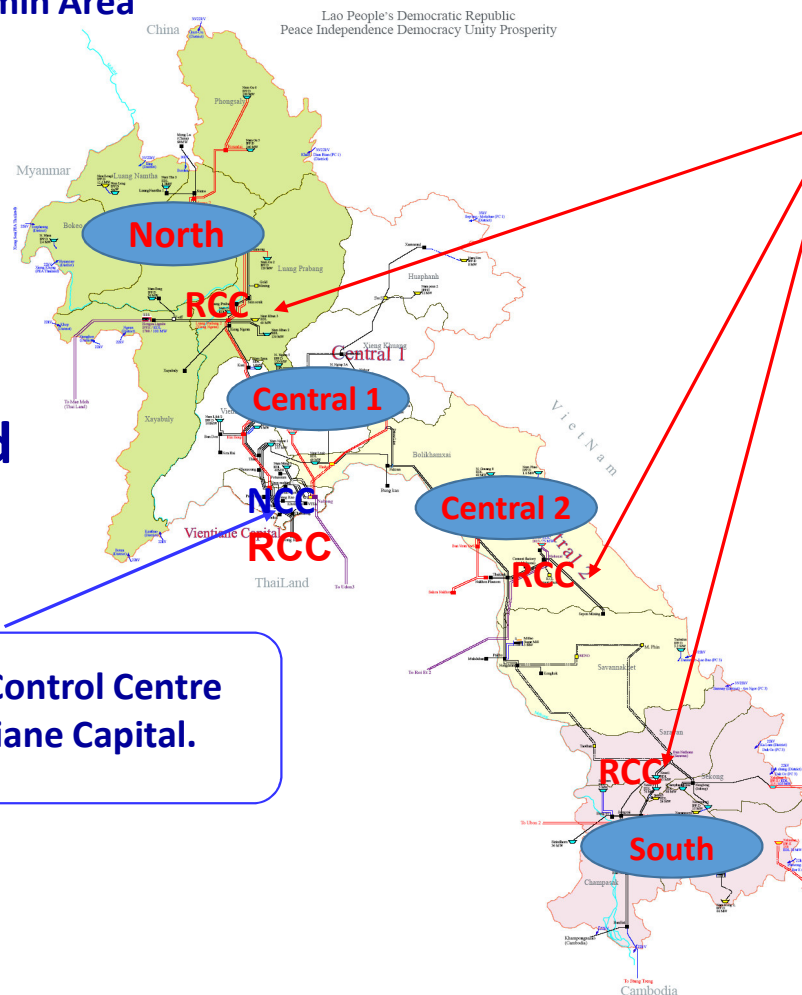
# 1. Present Status

- Grid System and Control/Admin Area

There are Four (4) control/Admin.

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

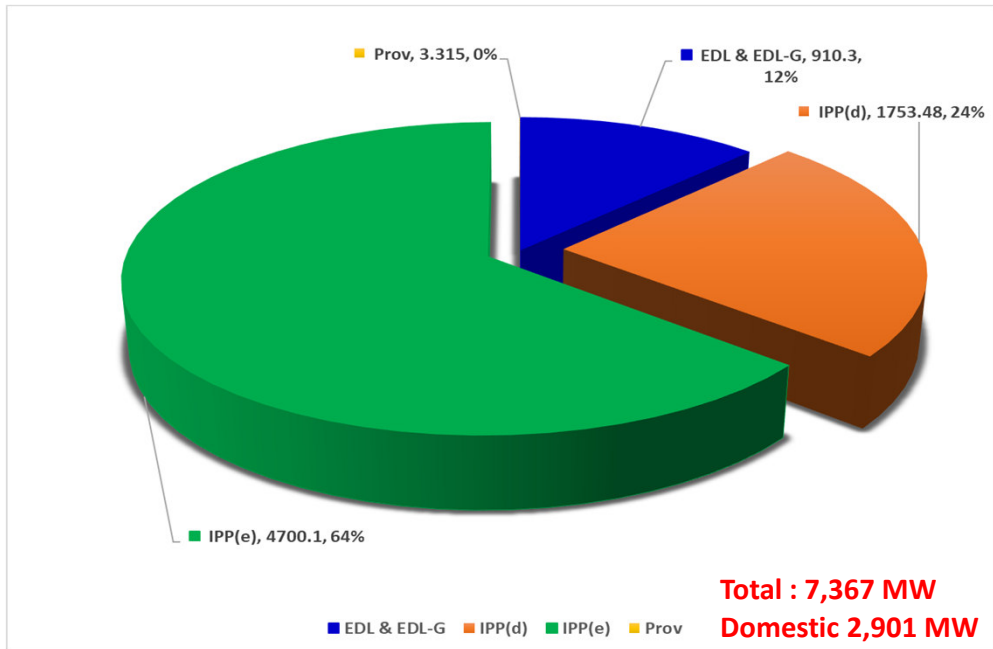
The National Control Centre (NCC) in Vientiane Capital.



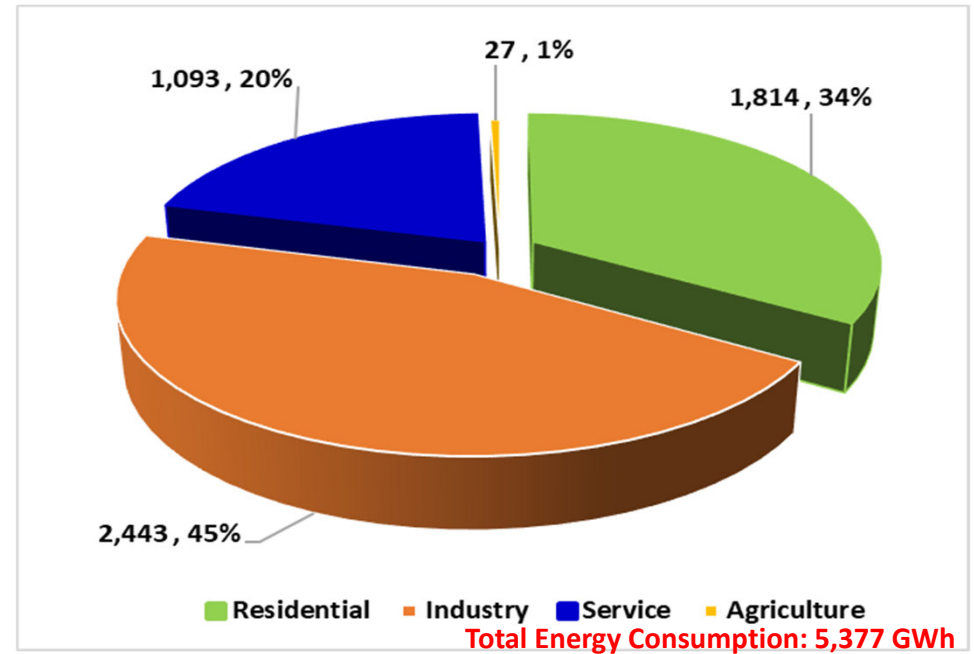
Regional Control Centre (RCC) projects .

# 1. Present Status

- Generation Capacity for domestic in 2018 (MW)

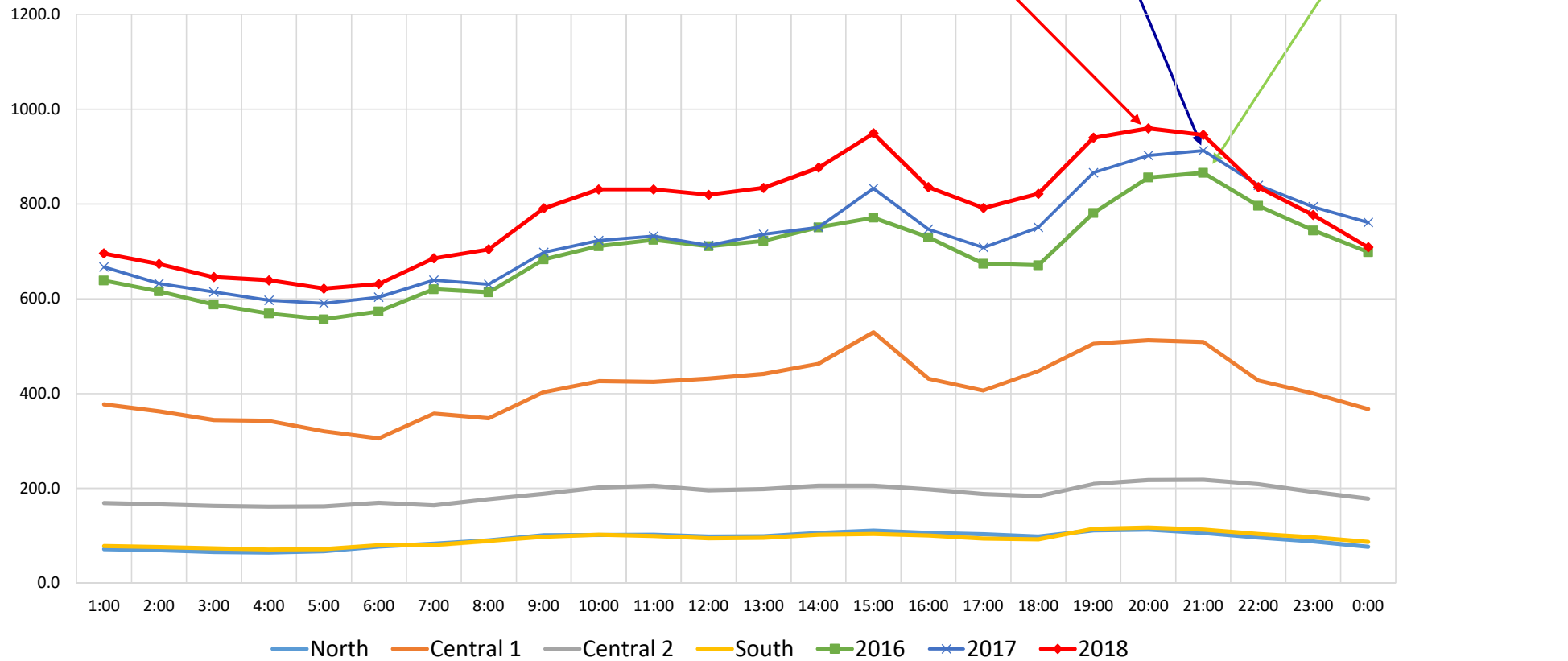


- Annual Energy Consumption By Sector, 2017 (GWh)



# 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

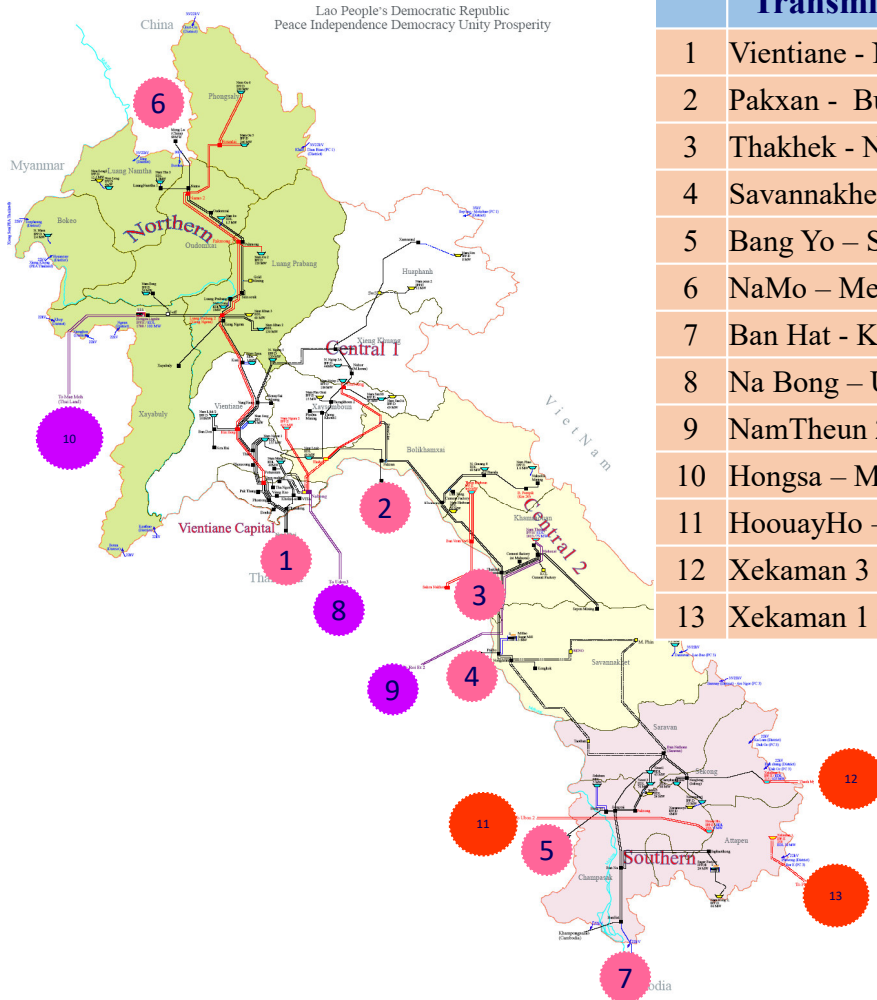
Regional	230/115/22 kV			115/22 kV		
	Transmission Line (cct-km)	Substations (Unit)	TR Capacity (MVA)	Transmission Line (cct-km)	Substations (Unit)	TR Capacity (MVA)
Northern	1,084	4	440	1,258	13	351
Central 1	169	3	800	1,594	24	937.5
Central 2	440	1	200	2,221	12	412
Southern	-	-	-	1,263	10	413
<b>Whole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





# 1. Present Status



- Power Exchange Via Existing Line 115 kV and Power export from IPP,E



No.	Projects List	Voltage	No. of Circuit	Conductor size	Owner
	Transmission Line (From - To)	(kV)		(Sq.mm)	
1	Vientiane - Nong Khai (Thai)	115	3	ACSR 240	EDL
2	Pakxan - Bueng Kan (Thai)	115	1	ACSR 240	EDL
3	Thakhek - Nakhon Phanom (Thai)	115	2	ACCC 325	EDL
4	Savannakhet - Mukdahan 2 (Thai)	115	1	ACSR 240	EDL
5	Bang Yo – Sirindhorn (Thai)	115	1	ACSR 240	EDL
6	NaMo – MengLa (China)	110	1	ACSR 185	EDL
7	Ban Hat - Khamponsalao (Cambodia)	115	1	ACSR 240	EDL
8	Na Bong – UdonThani 3 (Thai)	500	2	ACSR	IPP, E
9	NamTheun 2 – RoiEt 2 (Thai)	500	2	ACSR	IPP, E
10	Hongsa – MaeMoh (Thai)	500	2	ACSR	IPP, E
11	HoouayHo – UbonRachaThani 2 (Thai)	230	2	ACSR	IPP, E
12	Xekaman 3 – Thanmy (Vietnam)	220	2	ACSR	IPP, E
13	Xekaman 1 – Pleiku (Vietnam)	220	2	ACSR	IPP, E

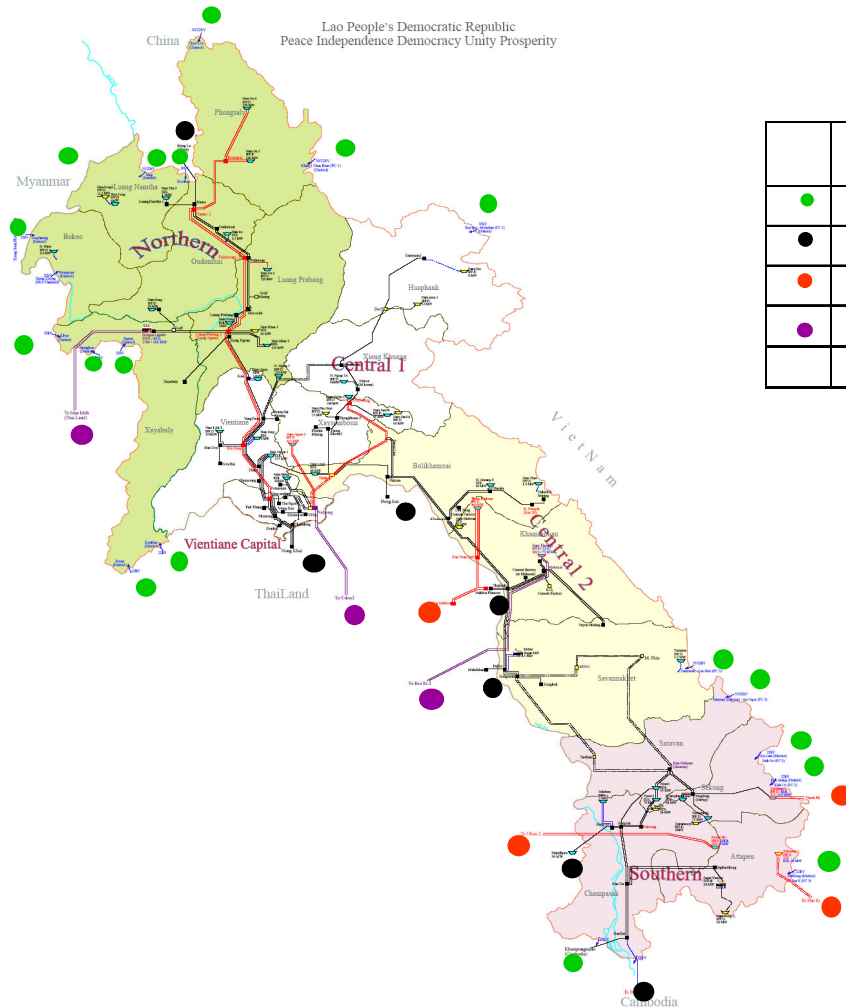
## Remarks:

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

Legend : 115 kV   
 230 kV   
 500 kV 

# 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
	<b>Total</b>	<b>2</b>	<b>9</b>	<b>4</b>	<b>1</b>	<b>10</b>	<b>6</b>	<b>32</b>

## Remarks:

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

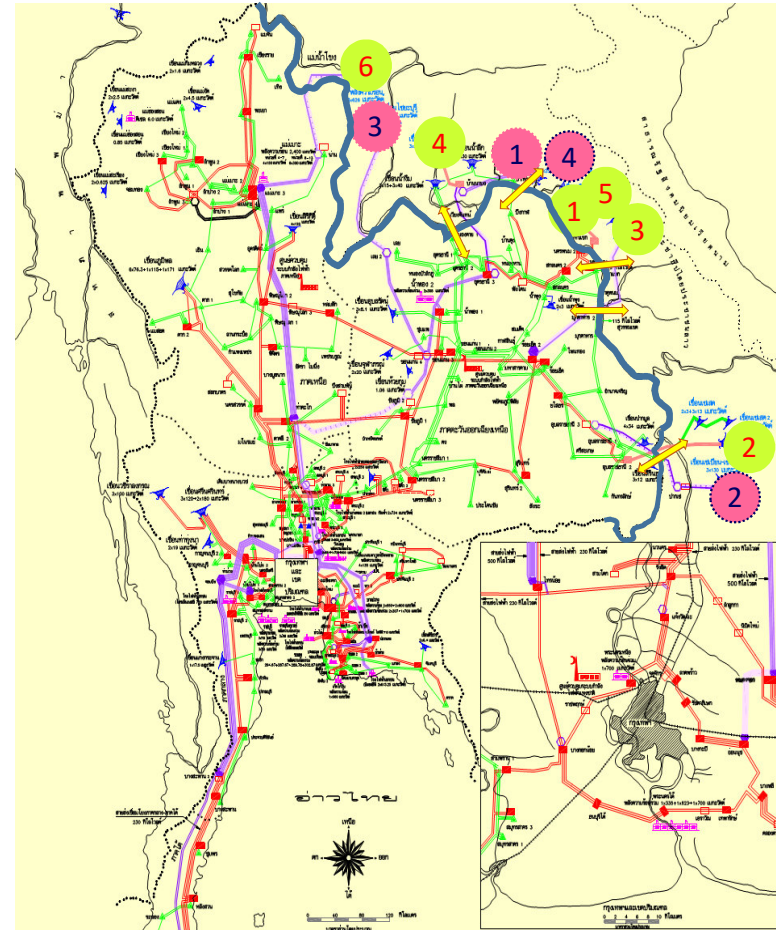
Legend : 115 kV   
 230 kV   
 500 kV 



# 2. Power Trade with Neighboring Countries

## 1. Power Trade with Thailand

- **MOUs signed with Thailand**
  - ✓ 1<sup>st</sup> MOU signed in Y1993 agreed to Export 3,000 MW
  - ✓ 2<sup>nd</sup> MOU signed in Y1996 agreed to export 7,000 MW
  - ✓ 3<sup>rd</sup> 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

- ✓ 1<sup>st</sup> MOU signed in Y1998 agreed to export 3,000MW
- ✓ 2<sup>nd</sup> 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

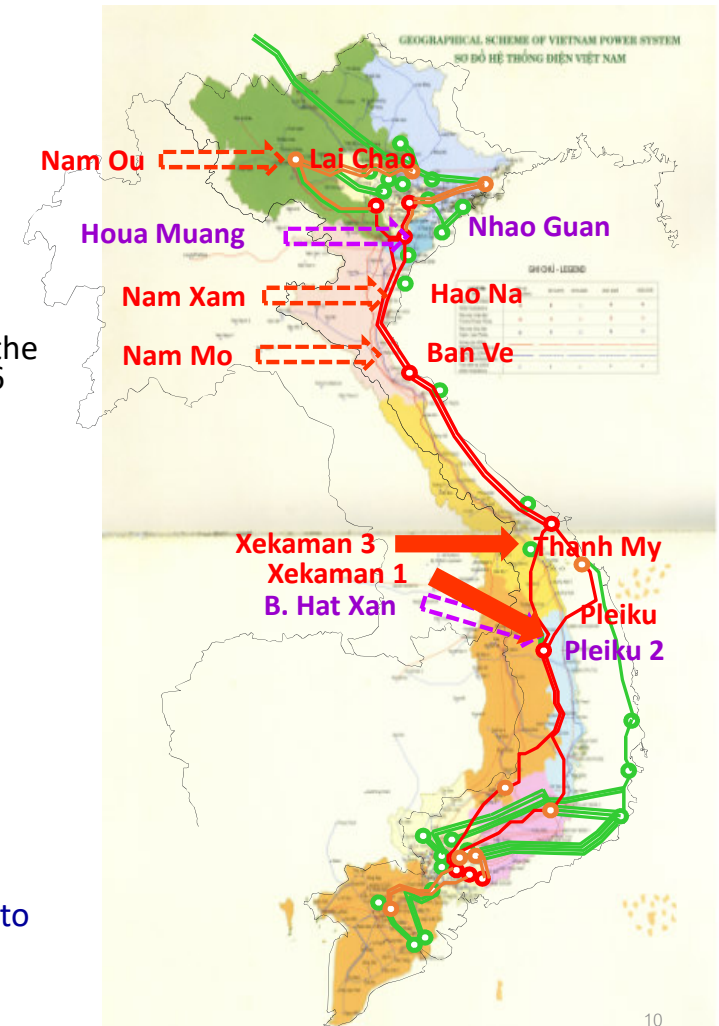
1. Xekaman 3 (250 MW), Export 225 MW – COD Y2013
2. Xekaman 1 (290 MW), Export 290 MW – COD Y2017
3. Xekaman-Sanxai (32MW) – COD Y2019

### Projects under 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 Vietnam Government**
  - ✓ 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 to 70 and 120 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. And More 100+ MW.
- **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 1 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 by 66 kV from Ban Ton Pheung to Thachilek of Myanmar.
    - ✓ Long term, Laos to export power up to 300 MW, via 230 kV or 500 kV TL (Proposed study by ADB).

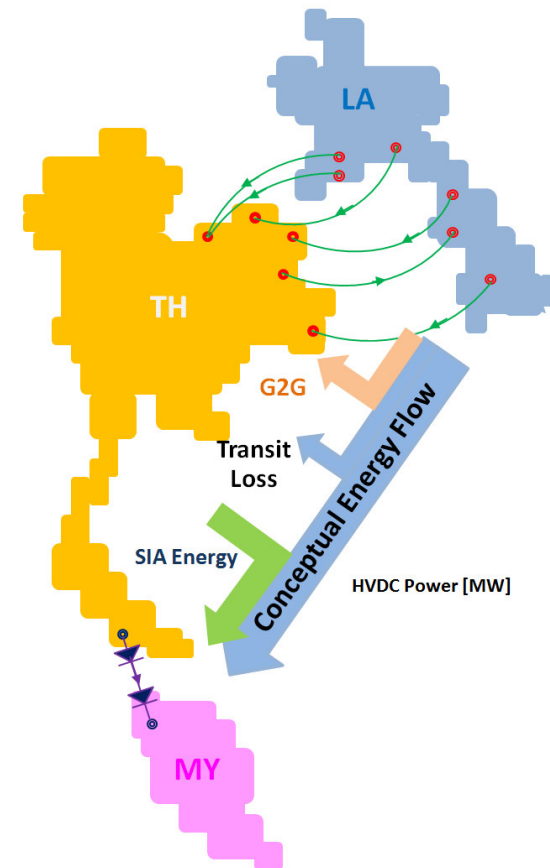
### 5. Power Trade with China.

- ✓ Existing 115 kV, import from China max. 60 MW
- ✓ Study on more power import from China

## 2. Power Trade with Neighboring Countries

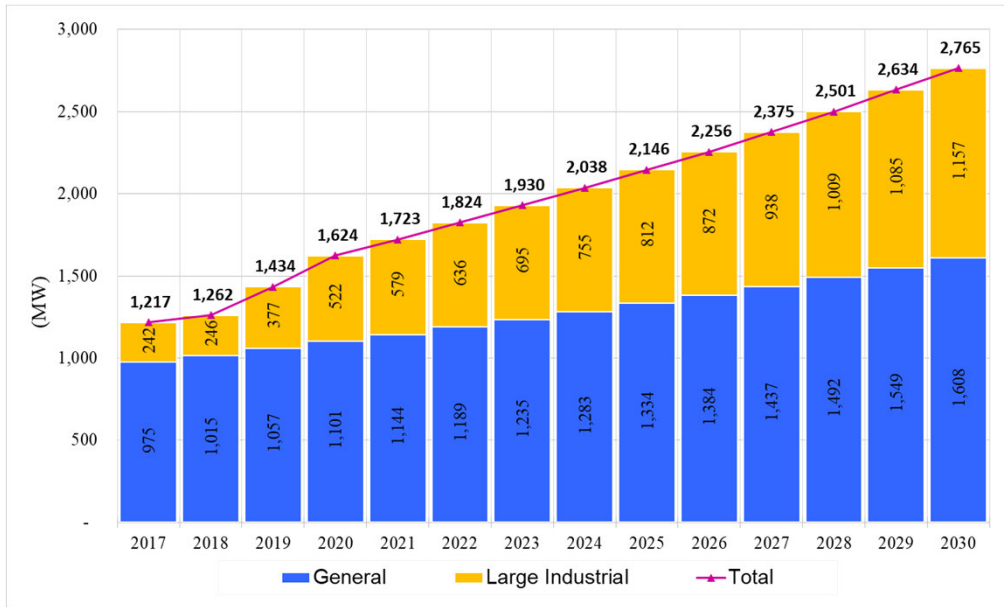
### 6. Multilateral Power Trade LTM-PIP Project

- 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 up to 100 GWh/year and capacity up to 300 MW.

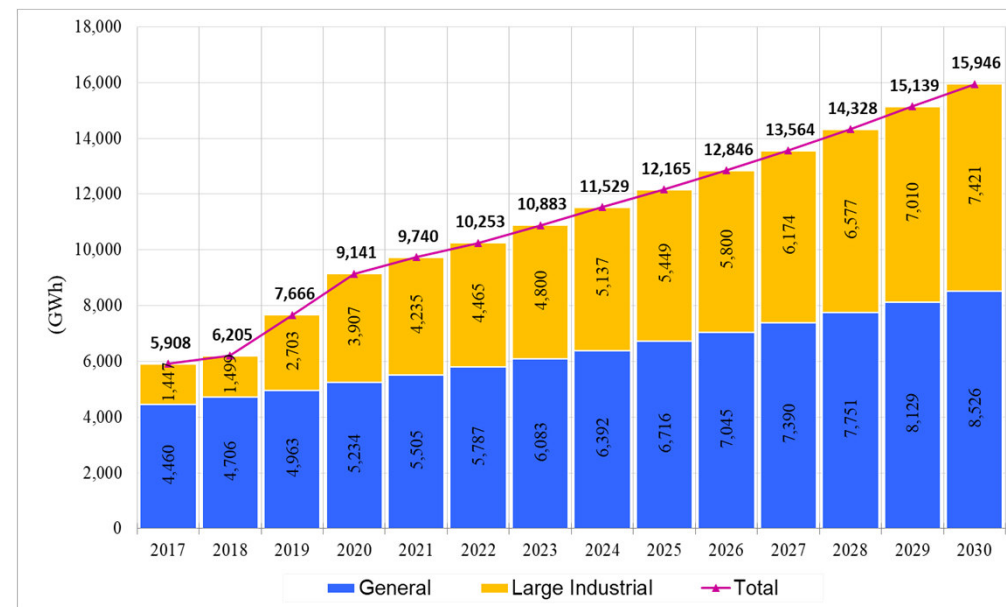


# 3. Long-term Power Development Plan

- 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 (ບໍ່ລວມຕົກເສຍໃນລະບົບ) Energy Demand (Excluding system losses)	(GWh)	5,360	5,633	7,030	8,440	11,294	14,876
2	ພະລັງງານຕົກເສຍໃນລະບົບ 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 (ລວມຕົກເສຍໃນລະບົບ) 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)									<b>2017-2020</b>	<b>2017-2025</b>	<b>2017-2030</b>
* ຄວາມຕ້ອງການ ພະລັງງານໄຟຟ້າ ບໍ່ລວມຕົກເສຍໃນລະບົບ (Energy Demand Excluding System Losses), GWh)									1,027	742	732
* ຄວາມຕ້ອງການ ພະລັງງານໄຟຟ້າ ລວມຕົກເສຍໃນລະບົບ (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
<b>Whole Country</b>	<b>2,354</b>	<b>21</b>

- 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

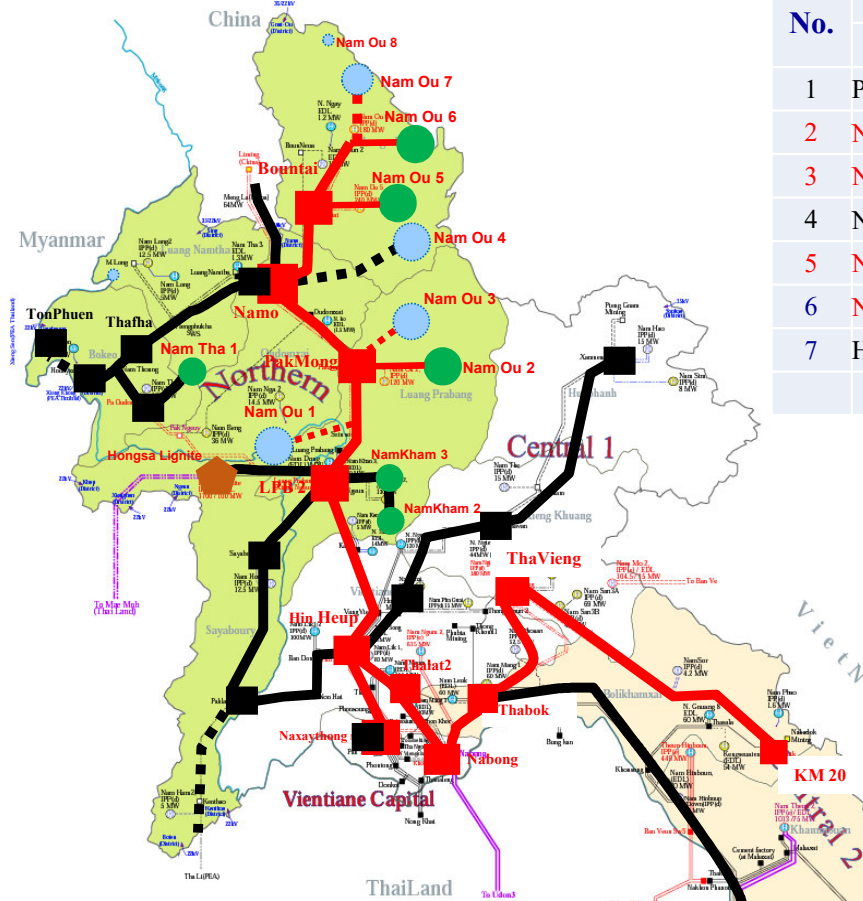
# 3. Long-term Power Development Plan

- Substation Project Under Construction

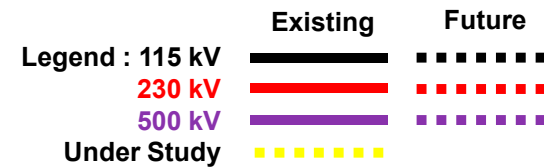
No.	Projects List	Capacity (MVA)		Province	Connection point
		230/115 kV	115/22 kV		
1	115/22 kV Boun Neua S/S		30	Phongsaly	115/22 kV Bountai S/S
2	115/22 kV M. Khoua S/S		30	Phongsaly	115/22 kV Oudomxai S/S
3	115/22 kV Ton Pheung S/S		50	Bokeo	115/22 kV Houayxai S/S
4	115/22 kV Kenthao S/S		30	Sayabuly	115/22 kV Paklay S/S
5	115/22 kV Nahai S/S		50	VT Cap	
6	500/230/22 kV Naphai S/S	200	50	XiengKhuang	500/230/22 kV PhailatS/S
7	230/115/22 kV Xantai S/S	200	50	Phongsaly	
8	230/115/22 kV Donphousi S/S	200	50	VT Cap	
9	500/230/22 kV Ban Lak 25 S/S	200	50	Champasack	
10	230/22 kV Ban Hat S/S	200	50	Champasack	
Total		1000	410		

# 3. Long-term Power Development Plan

## TL under construction Projects in Northern Area

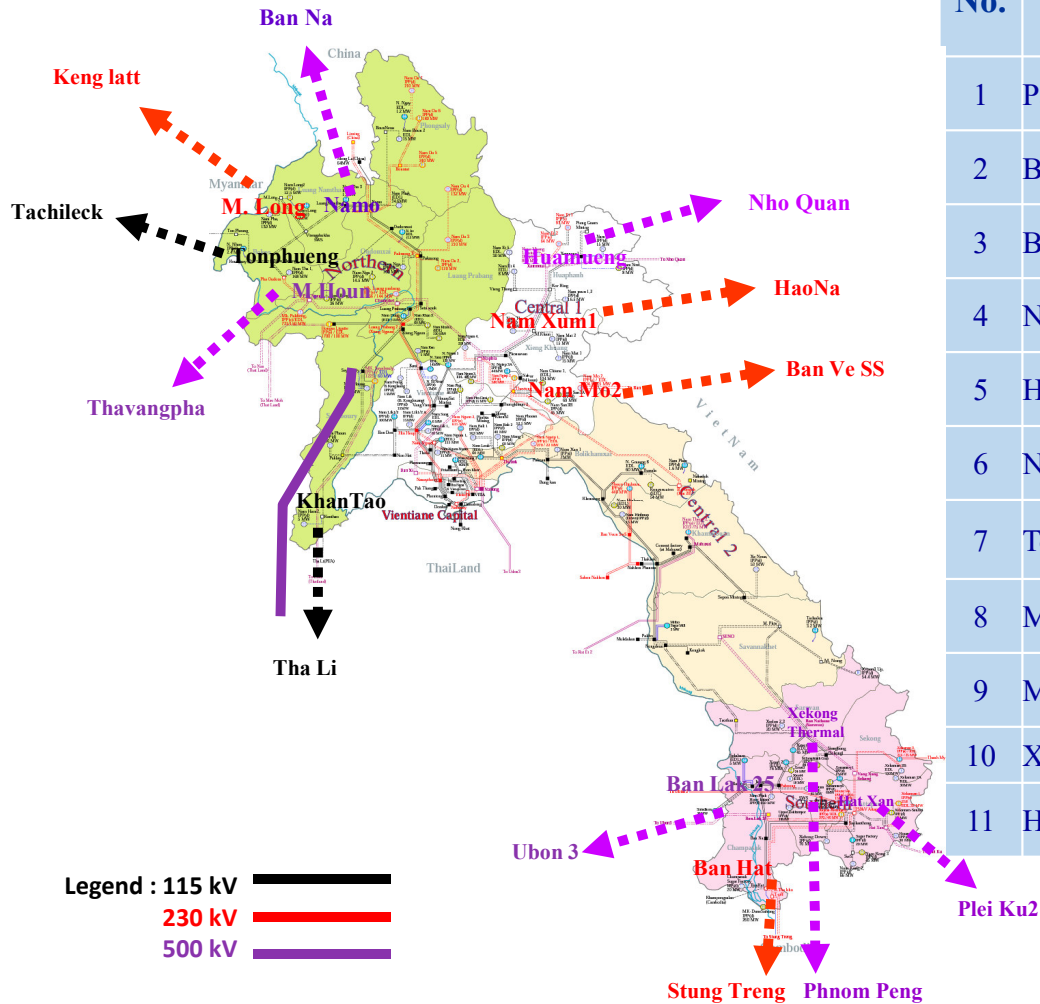


No.	Projects		Voltage (kV)	Length (km)	COD
	From	To			
1	Paklay	Ken Thao (Boder)	115	67	2019
2	Nam Ou 7	Nam Ou 6	230	45	2020
3	Nam Ou 7	Bountai	230	100	2020
4	Nam Ou 4	Oudomxai	115	100	2020
5	NamOu 3	PakMong	230	70	2020
6	NamOu 1	Pakmong2-Luangprang2	230	2	2020
7	Houayxai	Tonpheung	115	51	2019



# 4. 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	Ban Hat	Stung Treng (Cambodia)	230	South	Under Construction	EDL
3	Ban Lak 25	Ubon 3 (Thailand)	500	South	Under Construction	IPP(e)
4	Na Mo	Ban Na, (China)	500	North	Planed	EDL
5	Hat Xan	Plei ku (Vietnam)	500	South	Planed	EDL
6	NamMo2	Ban Ve (Vietnam)	230	Central 1	Planed	IPP(e)
7	Ton Pheung	Tachileck (Myanmar)	66	North	Study	EDL
8	Muang Houn	Nan 2 (Thailand)	500	North	Planed	EDL
9	M. Long	Kenglatt (Myanmar)	230	North	Study (by ADB)	EDL
10	Xekong	Phanompeng	500	South	FS	IPP(e)
11	Huamueng	Nho Guan or Thang Hoa	500	North	Planed	EDL

**Thank you**  
**ຂອບໃຈ**