



# **Greater Mekong Sub Region (GMS) 28<sup>th</sup> Regional Power Trade Coordination Committee (RPTCC-28).**

## **Country Presentation**

**26-27 August 2021, Vientiane, Lao PDR.**

# Contents

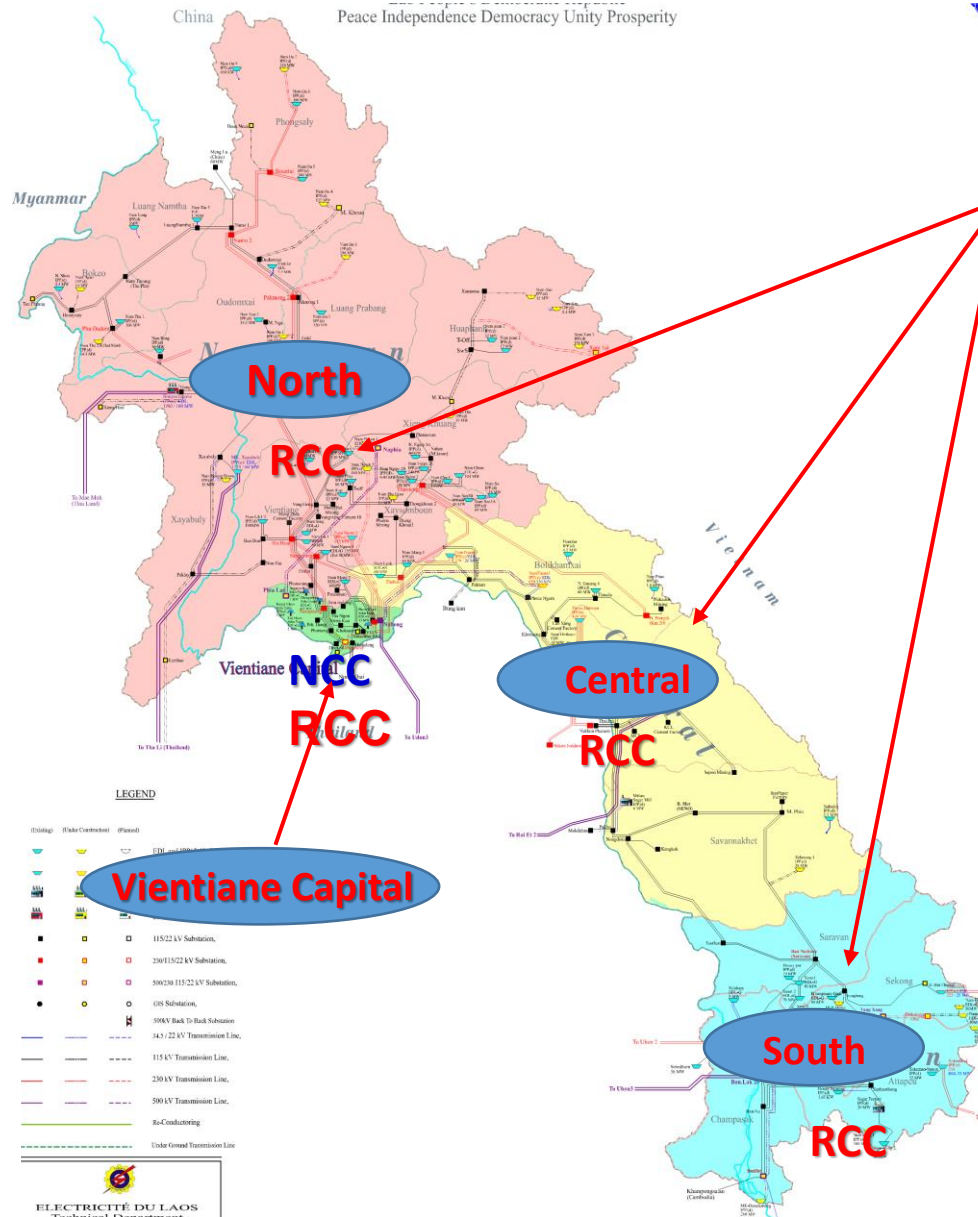
1. Present Status of Power Sector of Laos.
2. Impact of Covid-19 pandemic on power sector Power Energy Policy
3. Energy Policy of Laos
4. National Power Development Plan 2021-2030
5. Summary Projects in National Power Development Plan 2021-2030

# 1. Present Status

- Grid System and Control/Admin Area

There are Four (4) control/Admin.

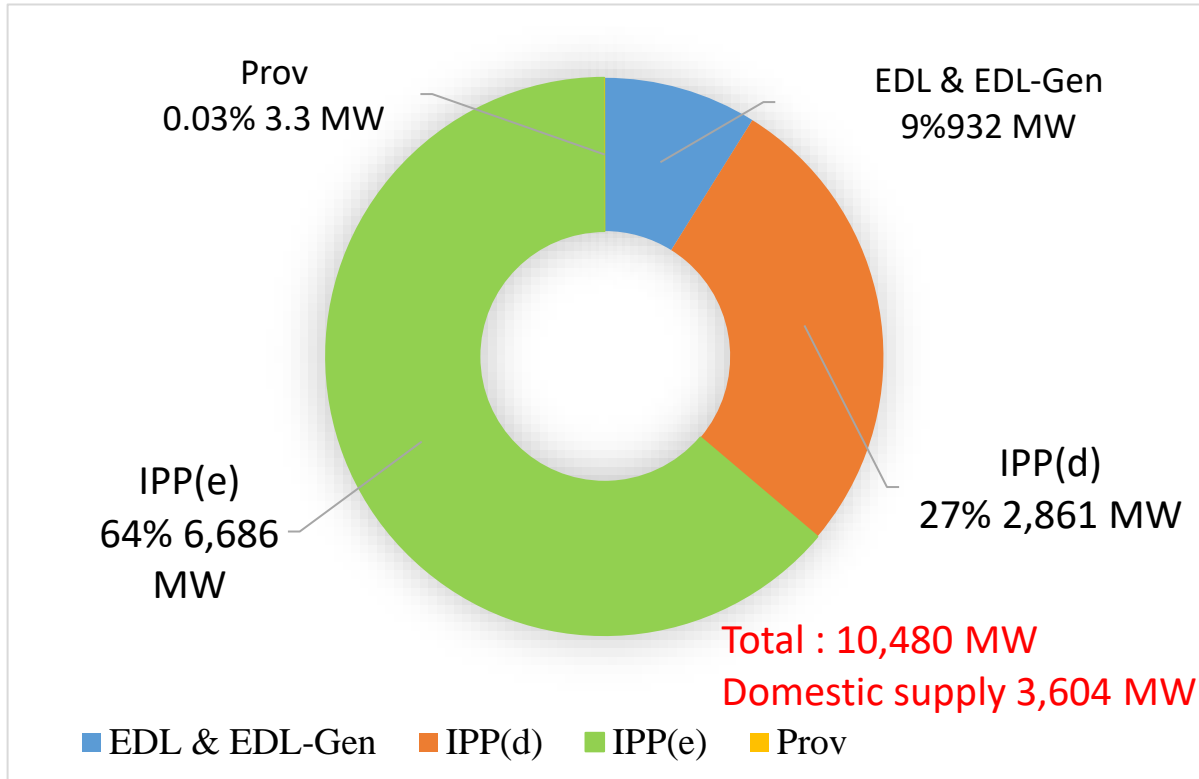
- North (N),
- Vientiane Capital (VT),
- Central (C) and
- South (S)



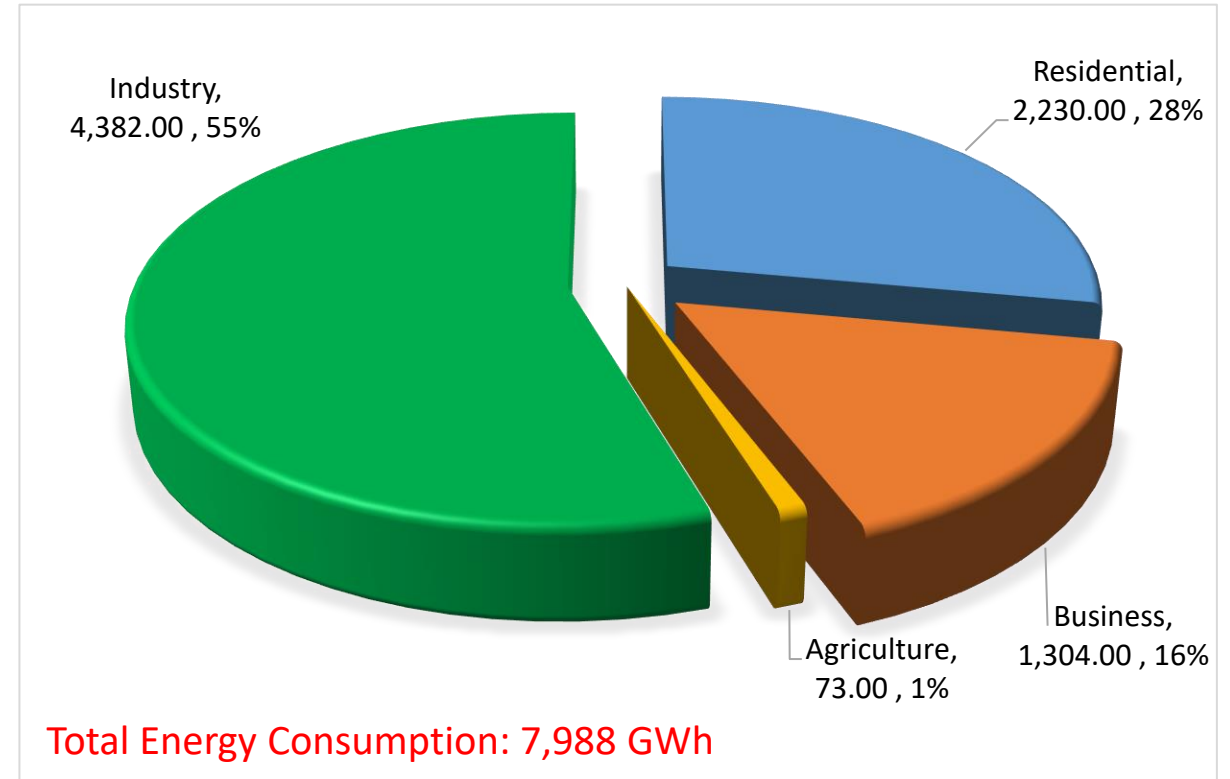
Regional Control Centre (RCC).

# 1. Present Status

## Generation Capacity in 2021 (MW)



## Annual Energy Consumption By Sector, 2021 (GWh)



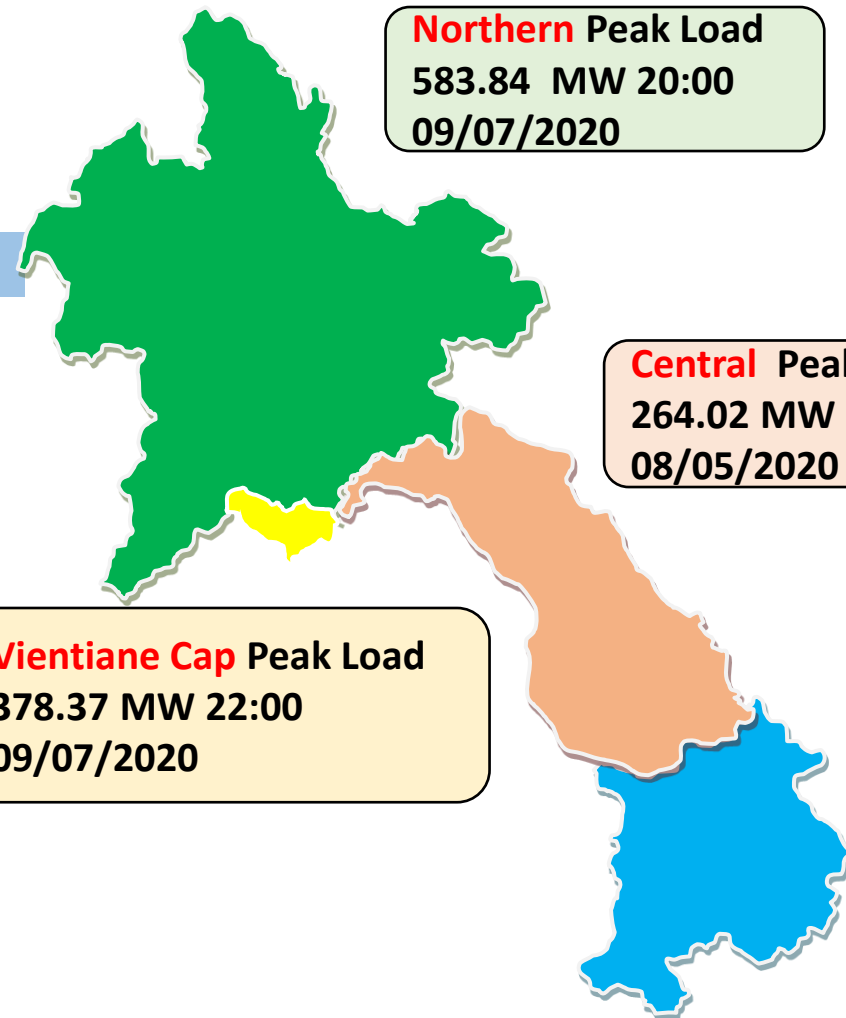
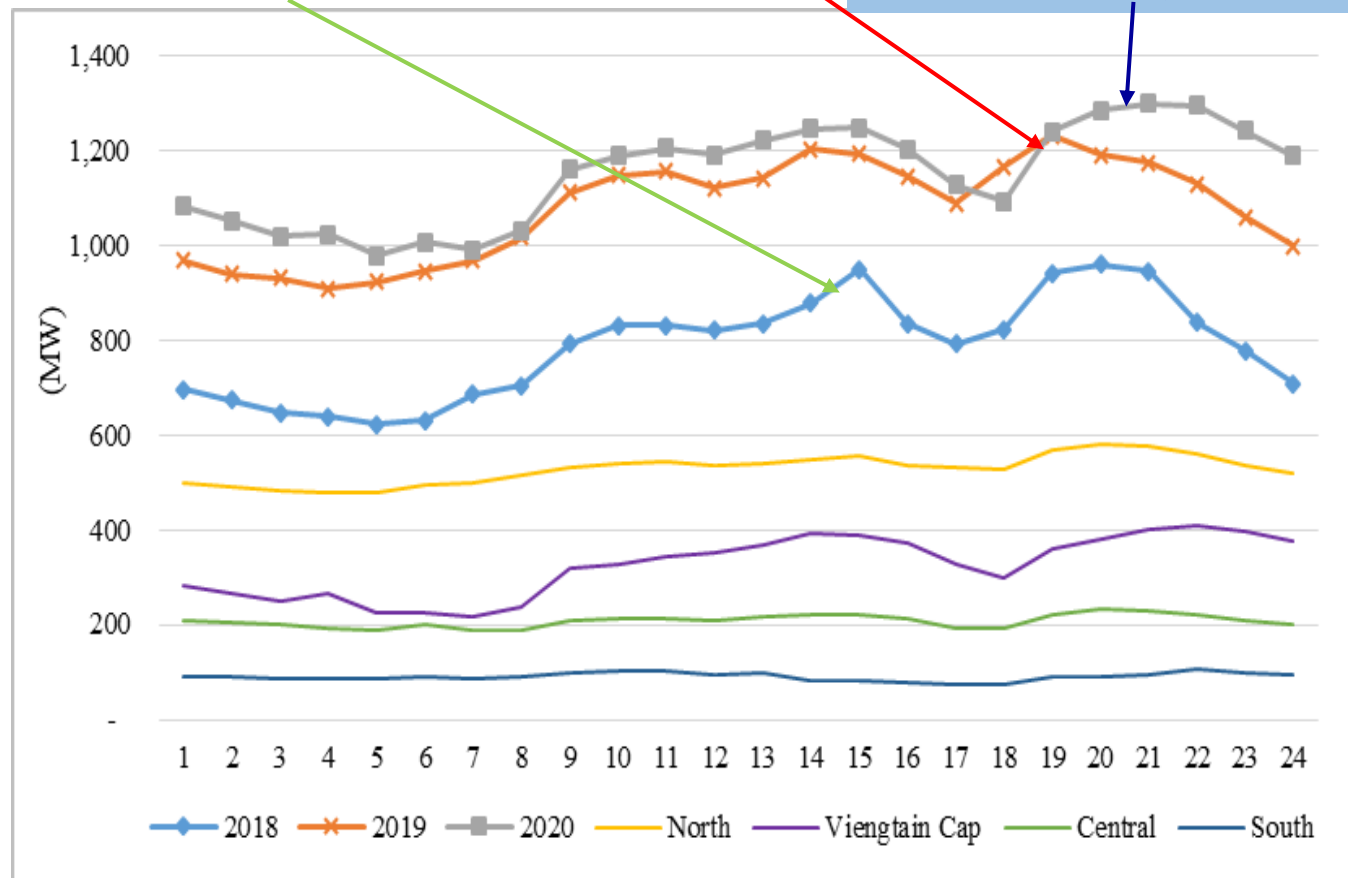
# 1. Present Status

- Daily Peak Demand in 4 Regions and Whole

2019 Peak @ 21.00 pm : 1,229 MW

2018 Peak @ 21.00pm : 959 MW

2020 Peak @ 21.00pm : 1,299 MW



**Northern Peak Load**  
583.84 MW 20:00  
09/07/2020

**Central Peak Load**  
264.02 MW 19:00  
08/05/2020

**Vientiane Cap Peak Load**  
378.37 MW 22:00  
09/07/2020

**Southern Peak Load**  
131.25 MW 19:00  
26/03/2020

**System Peak Demand in 4 Regions and Whole the country 1299 MW @ 06 May 2020**

# 1. Present Status

## ▪ Summary Existing Hydro Power Plants

No.	Region	Type of Power Plant	Install Capacity (MW)	Energy per Annual (GWh)
1	Northern	Hydro Power Plant	2,875.76	11,488.80
		Thermal Power Plant	100	830
2	Vientiane Cap	Solar	42.8	72.3
3	Central	Hydro Power Plant	338.6	1,306.30
		Solar	10	16
		Biomass	23.7	105
4	Southern	Hydro Power Plant	301.9	1,392.30
		Biomass	20	123
	Total		3,712.76	15,333.70

### Type of generation

- ❖ Hydro power plant 3,516.26 MW, 95%
- ❖ Thermal 100 MW, 3%
- ❖ Solar 52.8 MW, 1%
- ❖ Other 43.7 MW, 1%

# 1. Present Status

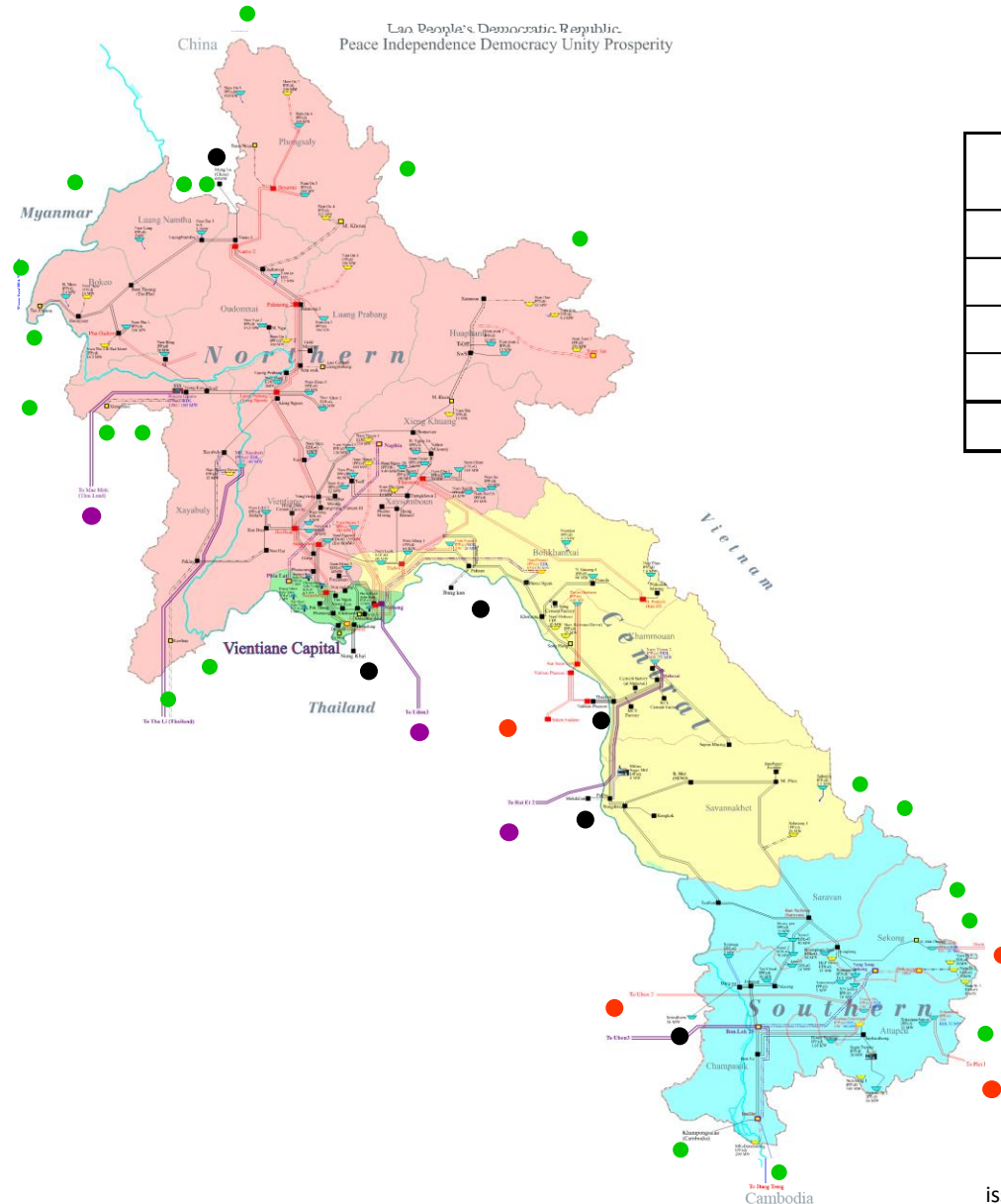
- EDL's Transmission Lines and Substation Facilities in 2020

Regional	230/115/22 kV			115/22 kV		
	Transmission Line 230 kV (cct-km)	Substations (Unit)	TR Capacity (MVA)	Transmission Line 115 kV (cct-km)	Substations (Unit)	TR Capacity (MVA)
Northern	1,549	9	2,010	4,068	36	1,253
Vientiane Cap	-	2	600	312	9	872
Central	856	2	300	2,339	12	526
Southern	56	1	190	1,348	9	375
<b>Whole Country</b>	<b>2,461</b>	<b>14</b>	<b>3,100</b>	<b>8,067</b>	<b>66</b>	<b>3,025</b>



# 1. Present Status

- Existing Grid System and cross – border interconnection






Lao People's Democratic Republic,  
Peace Independence Democracy Unity Prosperity

	Voltage Level	EDC	EVN	CSG	Myanmar	Thailand		Total
						EGAT	PEA	
●	22/35 kV	1	7	3	1		7	19
●	115 kV	1		1		6		8
●	230 kV		2			2		4
●	500 kV	1				3		4
	<b>Total</b>	<b>3</b>	<b>9</b>	<b>4</b>	<b>1</b>	<b>11</b>	<b>7</b>	<b>35</b>

**Remarks:**

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

**Legend :** 115 kV   
 230 kV   
 500 kV 



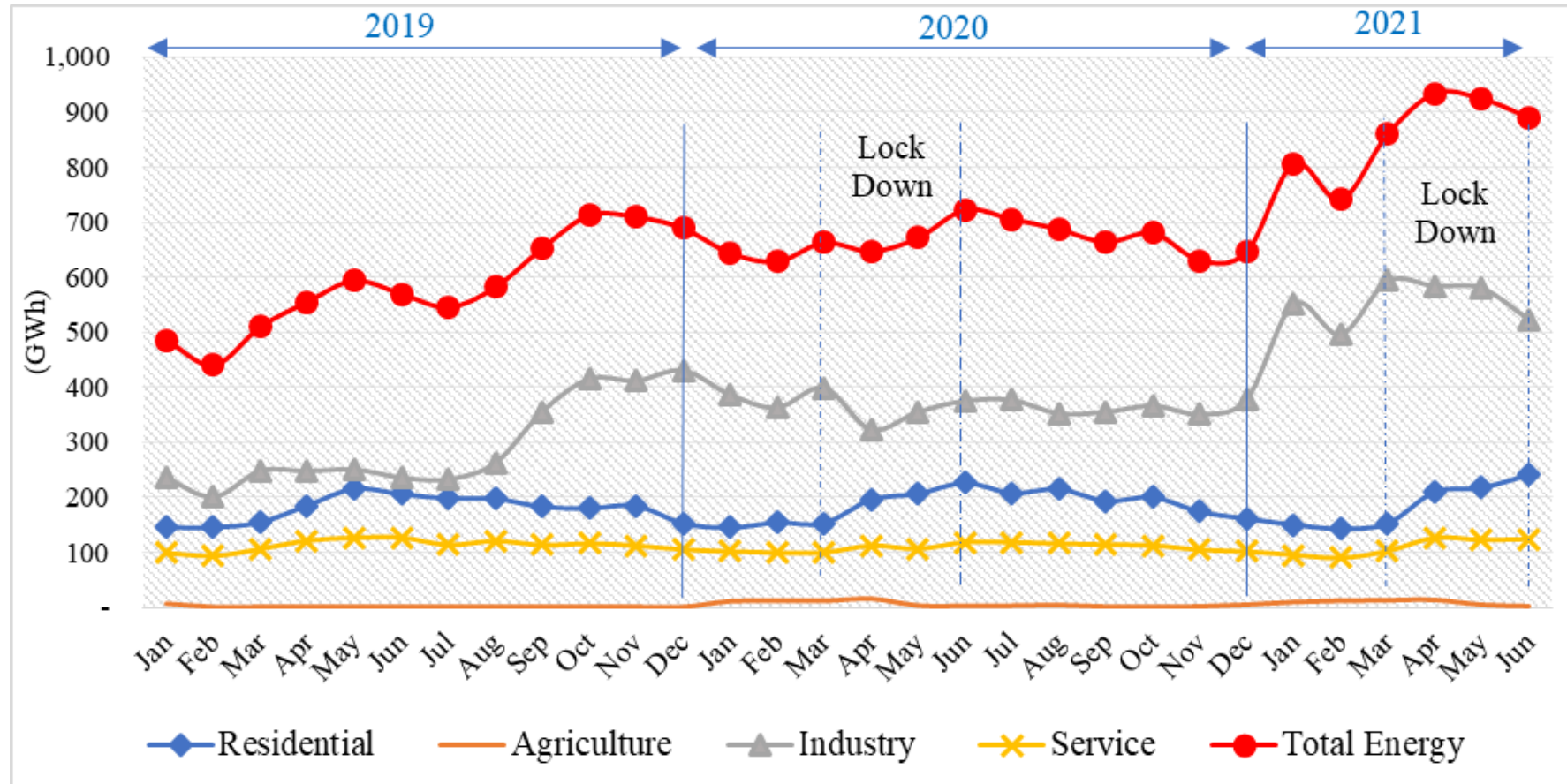
# 1. Present Status

- Electricity Tariff Structure

No.	Categories	No.	Categories
<b>I</b>	<b>Residential Sector</b>	<b>II, III</b>	<b>Non Residential Sector</b>
1	The 1 <sup>st</sup> from 0 - 150 KWh		<b>Low Voltage 0.4 kV and Medium Voltage 22 kV</b>
2	The 2 <sup>nd</sup> from 26 - 150 KWh	1	International Organization
3	The 3 <sup>rd</sup> from 151 - 300 KWh	2	General Business, temporally Meter
4	The 4 <sup>th</sup> from 301 - 400 KWh	3	Education and Sports
5	The 5 <sup>th</sup> from 401 - 500 KWh	4	Entertainment
6	More than 500 KWh	5	Government Office
		6	Agriculture (Irrigation and Pumping)
		7	Industries
		<b>IV</b>	<b>High Voltage (&gt;115 kV)</b>
		1	High voltage(115 kV Above)

# 2. Impact of Covid-19 pandemic on power sector

- Energy consumption comparison during government lockdown from 2019-2021



# 3. Energy Policy of Laos

1. *“Create mechanisms to reduce oil and gas imports”*, by reducing consumption and promoting the increased use of electrically-powered vehicles in the transportation sector. EV target in 2025 cover 15% of the total vehicle in country and up to 2030 will be increased to 30%
2. *“Promote the use of biogas in households and rural areas”* by promoting research and development in collaboration with all relevant stakeholder.
3. The use of coal from domestic sources must *“be selective for its use to bring optimum benefit”* and ensure support for the economy and the import of coal from overseas must be of high quality.
  - *“Coal with a calorific value of over 5,000 kcal/kg must be reserved for use in industrial factories”*.
  - *“Coal with a calorific value of under 5,000 kcal/kg must be used for mine mouth power generation”*.
  - All production processes and technologies of *“the use of thermal power from coal must be clean production processes”* (clean coal technology).
4. **Electricity Production Energy Mix** such as hydropower, coal-based thermal energy, solar energy, wind energy, and so forth, based on the necessary investment being low. “The domestic supply of electrical energy must be allocated according to proportions” 65% being sourced from hydropower, 30% from coal thermal energy, and 5% from other renewable energy sources.
5. “Develop domestic hidden potential to ensure renewable energy accounts for 30% of total energy consumption in 2025”.

### 3. Energy Policy of Laos (Cont.)

6. *“Develop hydropower with reservoirs”* in order to ensure the production of electricity, deal with droughts and flooding, and provide water for use by other sectors effectively. the goal set by the government for 2020 to develop hydropower sources to produce and installation capacity in excess of 10,000 MW, 12,000 MW by 2025, and 20,000 MW by 2030,

7. Transmission Line System Development: *“Link up the transmission line system to achieve nationwide coverage”* and integrate export systems with domestic consumption systems into a single system to advance towards a subregional connection hub. In future using bids for tenders for engineering procurement construction (EPC) contracts and Power interconnection system will change to build-operate-transfer (BOT).

8. Electricity Distribution System Development. The government has set targets of 95% for 2020, 98% for 2025, and 100% for 2030.

9. Promote electricity exportation across GMS countries to achieve under MOU that was signed and the ASEAN especially Lao-Thai-Malaysia-Singapore (LTMS) project.

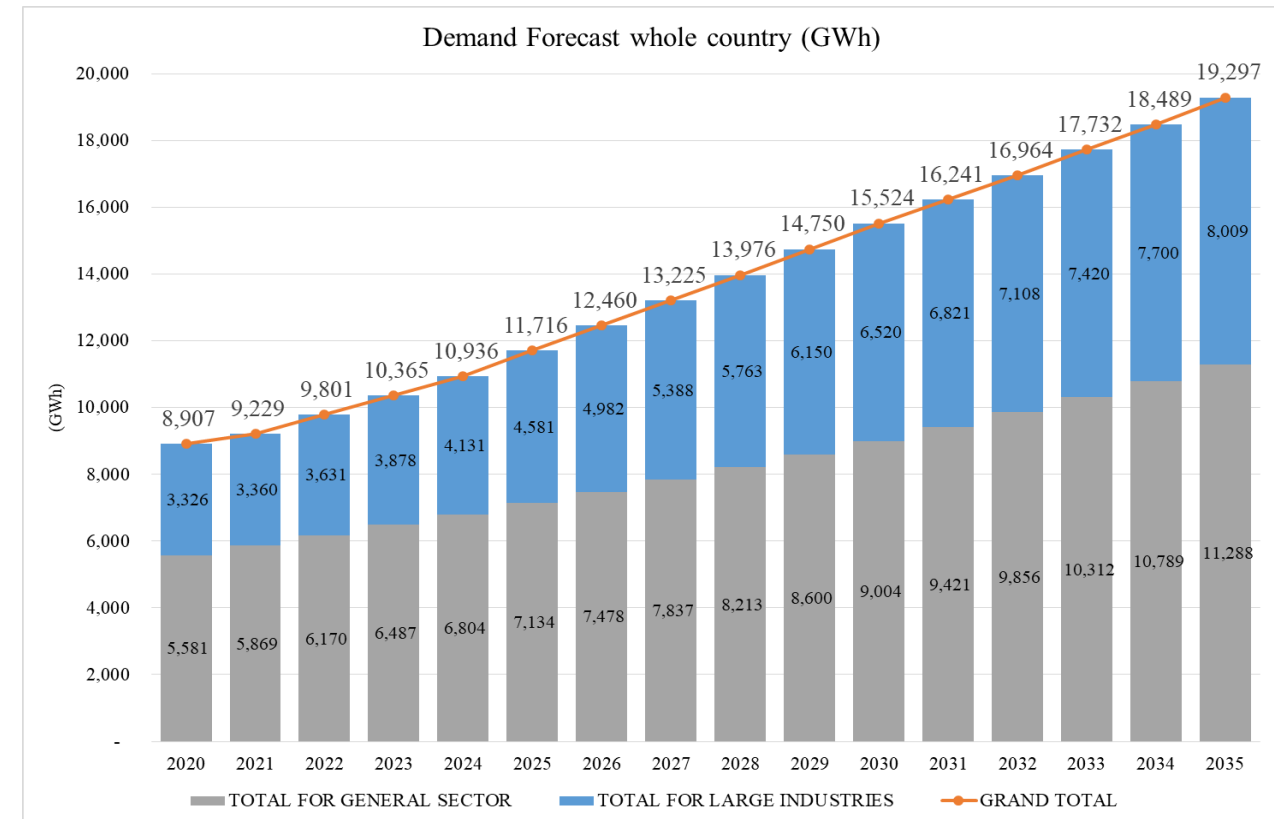
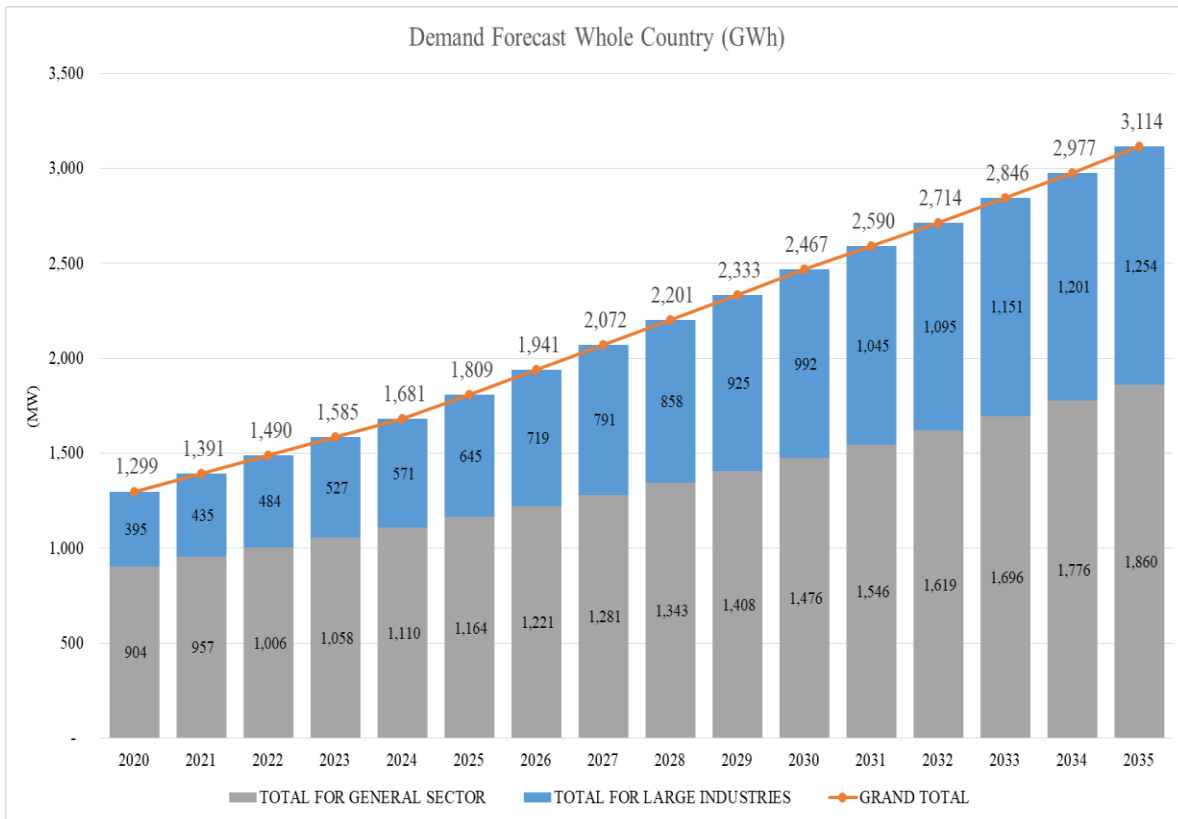
10. Promote using energy efficiency via Demand Side Management Project to decrease Peak demand in dry season.

# 4. National Power Development Plan (NPDP) 2021-2030

- Base case on Long term Demand forecast

- Power Demand forecast for Whole Country (MW)

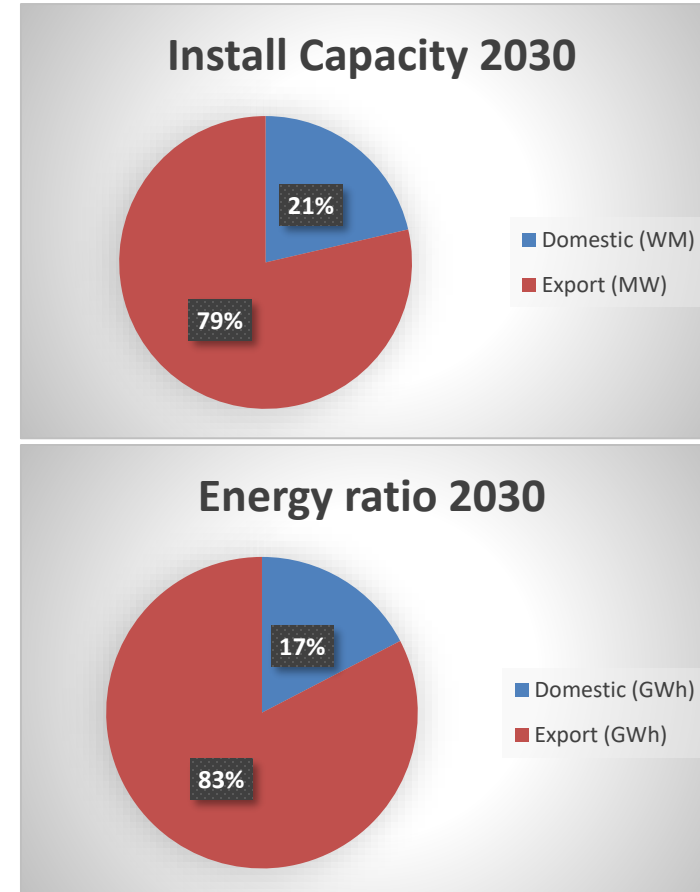
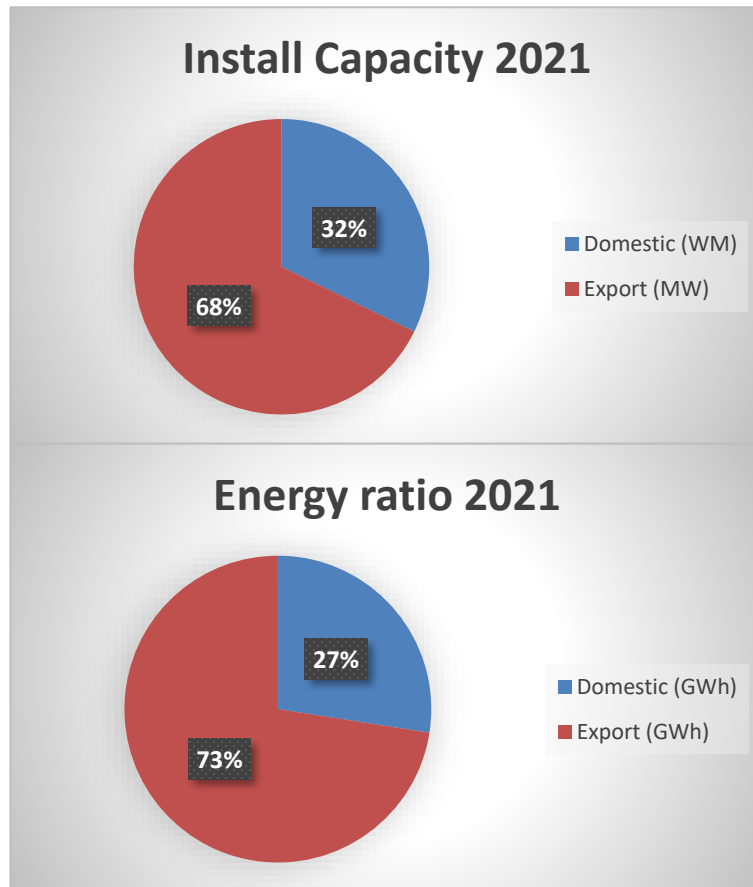
- Energy Demand Forecast for Whole Country (GWh)



Year	2020	2021	2025	2030	2035
Demand forecast (MW)	1,299	1,391	1,809	2,467	3,114

# 4. National Power Development Plan (NPDP) 2021-2030 (Cont.)

## Power Generation Plan 2021-2030

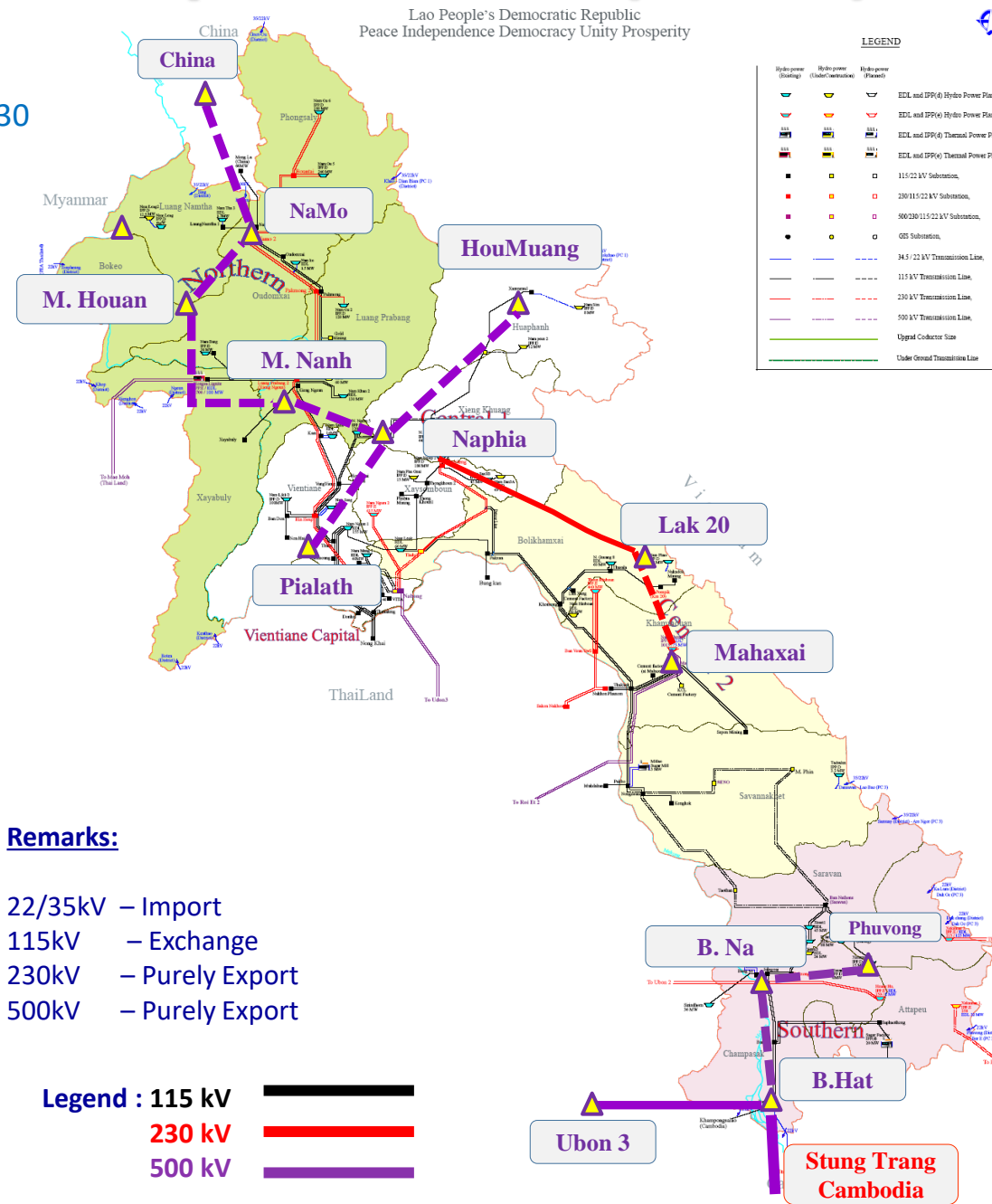


	Domestic (WM)	Export (MW)	Domestic (GWh)	Export (GWh)
2020	3,712.76	6,632.00	15,333.70	38,737.00
2030	5,793.00	21,298.00	26,178.00	124,399.97
<b>Increase</b>	<b>2,080</b>	<b>14,666</b>	<b>10,844</b>	<b>85,663</b>

# 4. National Power Development Plan (NPDP) 2021-2030 (Cont.)




## Power Transmission line Domestic Plan 2021-2030

	Project	Voltage kV	Transformer Capacity MVA	Circuit	Length km	Cross Section mm <sup>2</sup>	COD
	<b>Domestic Project</b>						
1	230kV Nabong 2 Dongphosy	230		2	28	2x630	2023
2	230kV Phia Lath-Naxaythong	230		2	50	2x630	2024
3	500kV Naphia-Luangprabang 2	Energize 230		2	120	4x400	2024
4	230kV Phia Lath-Dongphosy	230		2	81	2x630	2025
5	230kV MahaxaiSS project	230	2x180	2	106	2x630	2026-2030
	Total (2021-2025)						
	Total (2025-2030)						
	<b>Interconnection Project</b>						
7	China-Laos Networking Project		1x750	2	40.5	6x300	2023
	Total (2021-2030)						



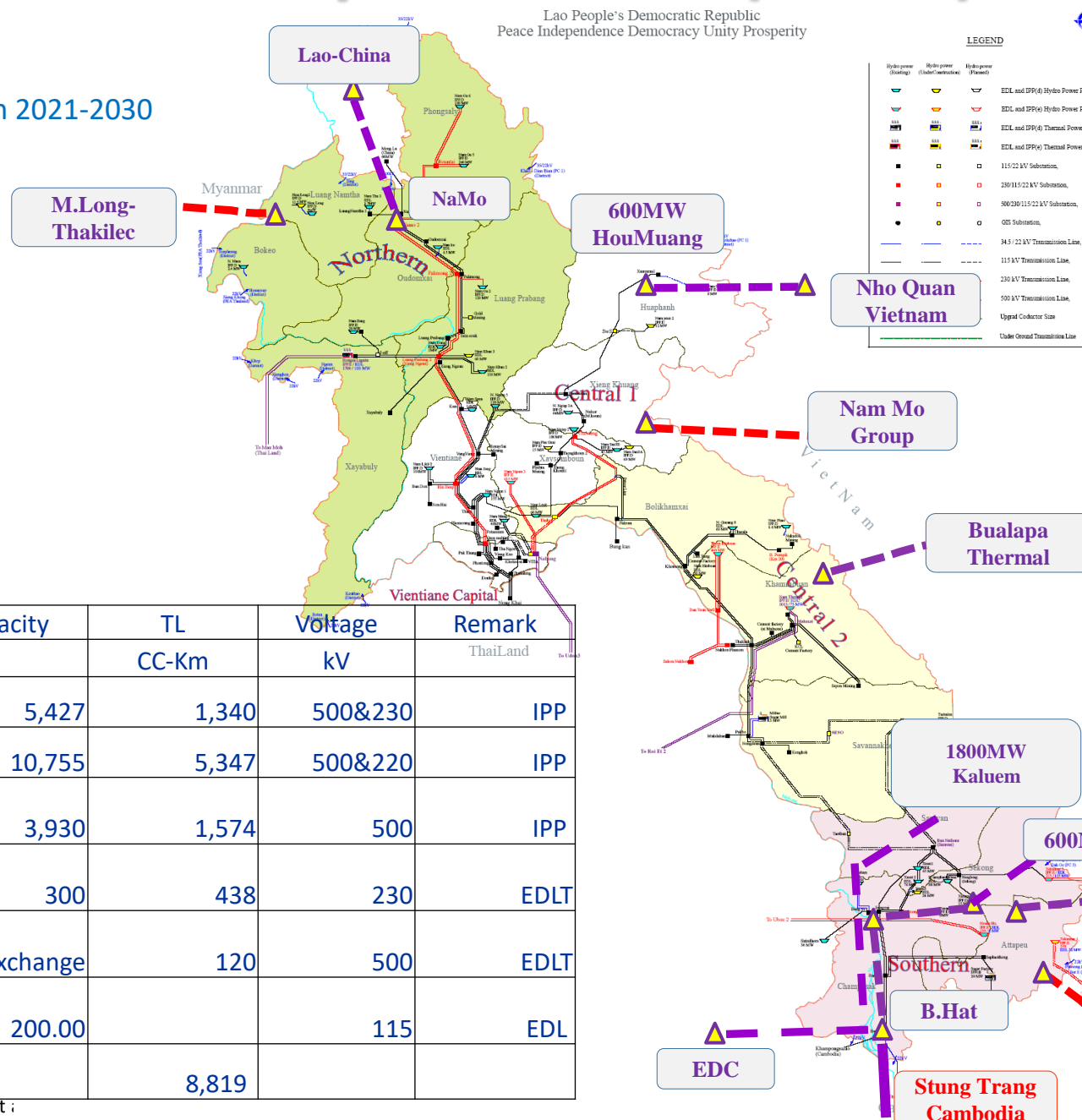
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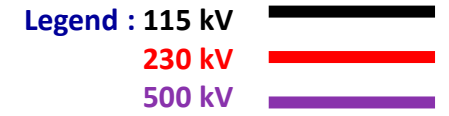
# 4. National Power Development Plan (NPDP) 2021-2030 (Cont.)

## Power Transmission line Export Plan 2021-2030



### Remarks:

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



	Quantities of Projects	Install Capacity	TL	Voltage	Remark
		MW	CC-Km	kV	
Thailand	7.00	5,427	1,340	500&230	IPP
Vietnam	101.00	10,755	5,347	500&220	IPP
Cambodia	12.00	3,930	1,574	500	IPP
Myanmar	EDL Grid	300	438	230	EDLT
China	EDL Grid	Power Exchange	120	500	EDLT
LTMS	EDL Grid	200.00		115	EDL
<b>Total</b>			<b>8,819</b>		

INTERNAL. This information is accessible to ADB Management :



# 5. Summary National Power Development Plan 2021-2030

	Transmission line	Length	
		(km)	cct-Km
500 kV	7.00	957.00	1,914.00
230 kV	16.00	921.00	1,864.00
115 kV	45.00	1,325.70	1,860.10
22 kV	5.00	136.00	136.00
<b>Total</b>	<b>73.00</b>	<b>3,339.70</b>	<b>5,774.10</b>

New construct 4 Substations 500/230/115 kV with the Capacity of 4.000 MVA, New construct 9 Substations 230/115/22 kV the Capacity of 1.800 MVA and New construct 7 Substations 115/22 kV the Capacity of 540 MVA.

**Grand total new Substations of 51 places and the total install Capacity of 6.340 MVA**

**Thank you for your attention**  
**ຂອບໃຈ**