

**Franco-ASEAN Seminar**

**on**

**'Powering ASEAN: Technology and Policy Options'**

**Bangkok**

**6-7 September 2007**

**Country Report of MYANMAR**



# **UNION OF MYANMAR**

**MYANMAR HAS A TOTAL AREA OF 676,577 KM<sup>2</sup> SHARING BORDERS WITH:**

- ❑ BANGLADESH & INDIA ON THE NORTH-WEST**
- ❑ CHINA ON THE NORTH-EAST**
- ❑ LAOS ON THE EAST**
- ❑ THAILAND ON THE SOUTH-EAST**

**HAS A COASTAL STRIP OF 2832 KM FACING TO THE BAY OF BENGAL AND ANDAMAN SEA.**

**THE POPULATION IS 56.51 MILLION PEOPLE WITH AN AVERAGE GROWTH RATE OF 2.02% PER ANNUM.**

**THE GROSS DOMESTIC PRODUCT IN 2005-2006 IS 4675.2 BILLION KYATS AT CURRENT PRICES AND THE AVERAGE ANNUAL GROWTH RATE FOR 2005/2006 IS 13.2%.**

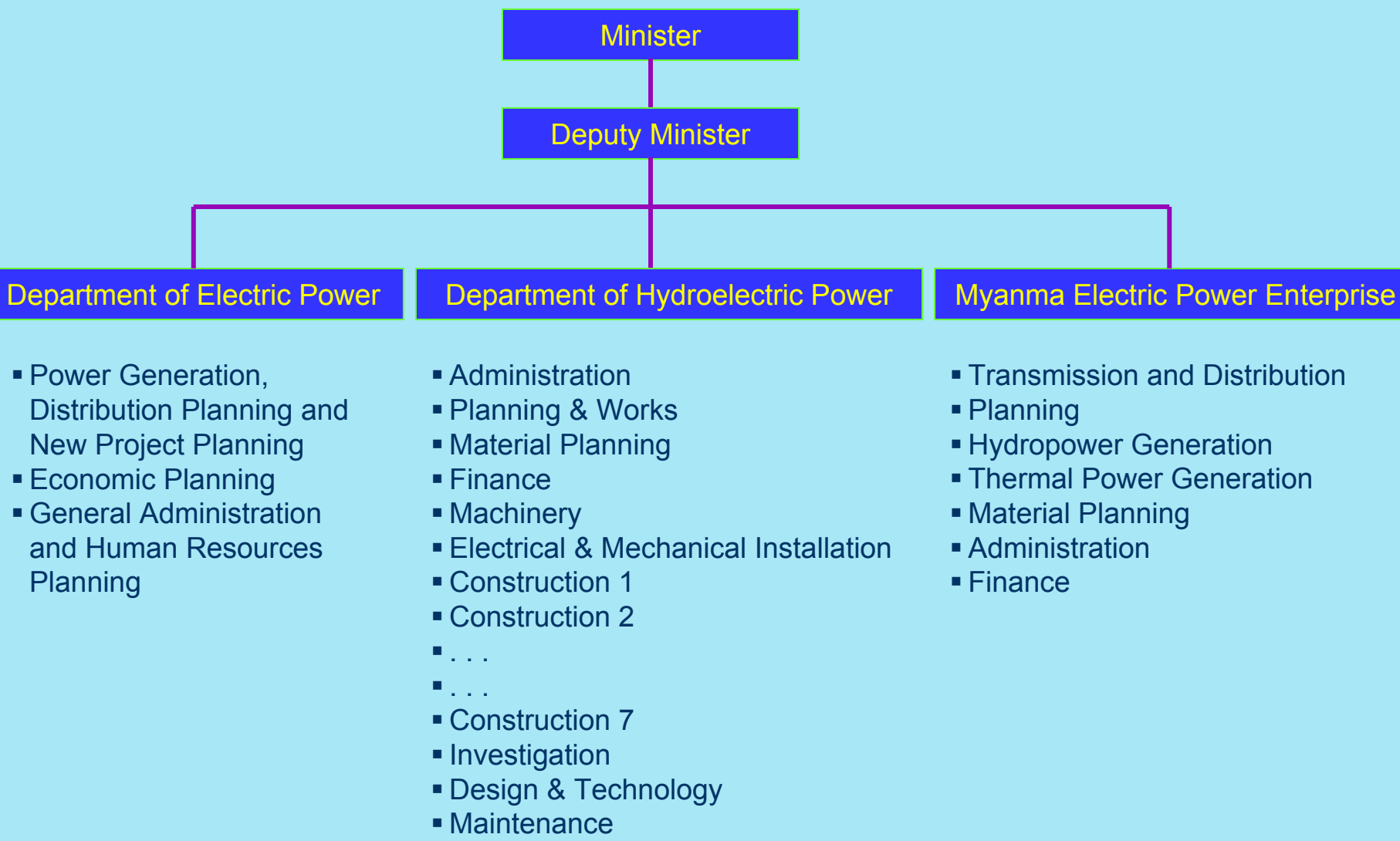
# Energy Related Organizations in Myanmar

- (1) Ministry of Electric Power (1) = Hydropower and Coal-fired Thermal Power**
- (2) Ministry of Electric Power (2) = Gas-fired Thermal Power, Power Transmission & Distribution**
- (3) Ministry of Energy = Oil & Gas**
- (4) Ministry of Mines = Coal**
- (5) Ministry of Forestry = Biomass & Fuel Wood**
- (6) Ministry of Science & Technology = Renewable Energy**

## **GOVERNMENT POLICY**

- To maintain the status of Energy Independence.**
- To employ hydroelectric power as one vital source of Energy Sufficiency.**
- To generate and distribute more electricity for economic development.**
- To promote wider use of New and Renewable Sources of Energy.**
- To promote Energy Efficiency and Conservation and**
- To promote use of Alternative Fuels in household.**

# Organization Chart for former Ministry of Electric Power



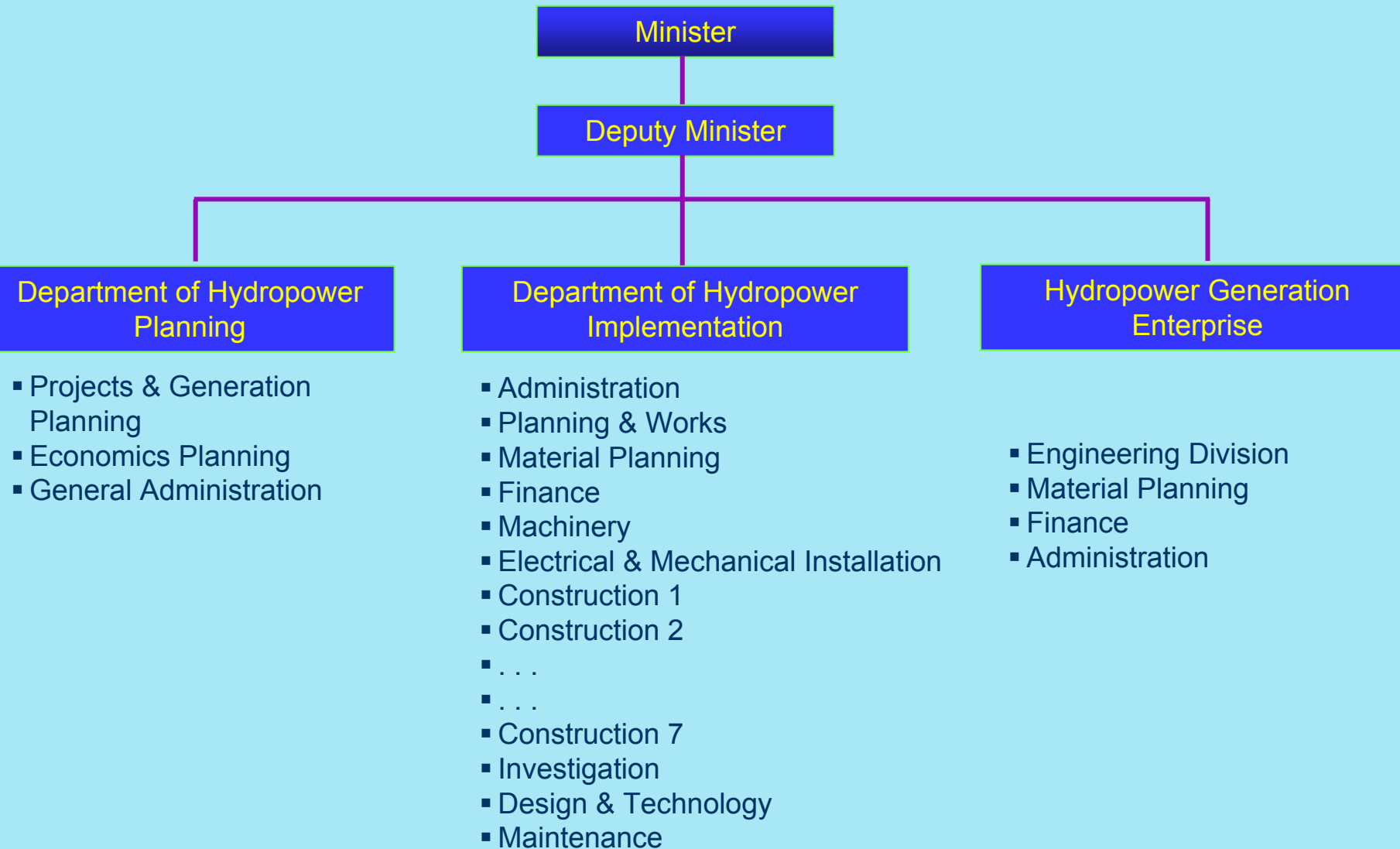
# The Objective of New Structural Changes

- The State Peace and Development Council established the Ministry of Electric Power on 15 November 1997 for promotion and effective operation of the Power Sector.
- In order to effectively carry out to fulfill the electricity requirement for the economic development, nation-building and multi-sector development tasks, the Ministry of Electric Power has been reorganized as two Ministries viz Ministry of Electric Power (1) and Ministry of Electric Power (2) on 15 May, 2006.

## Organization and their Position

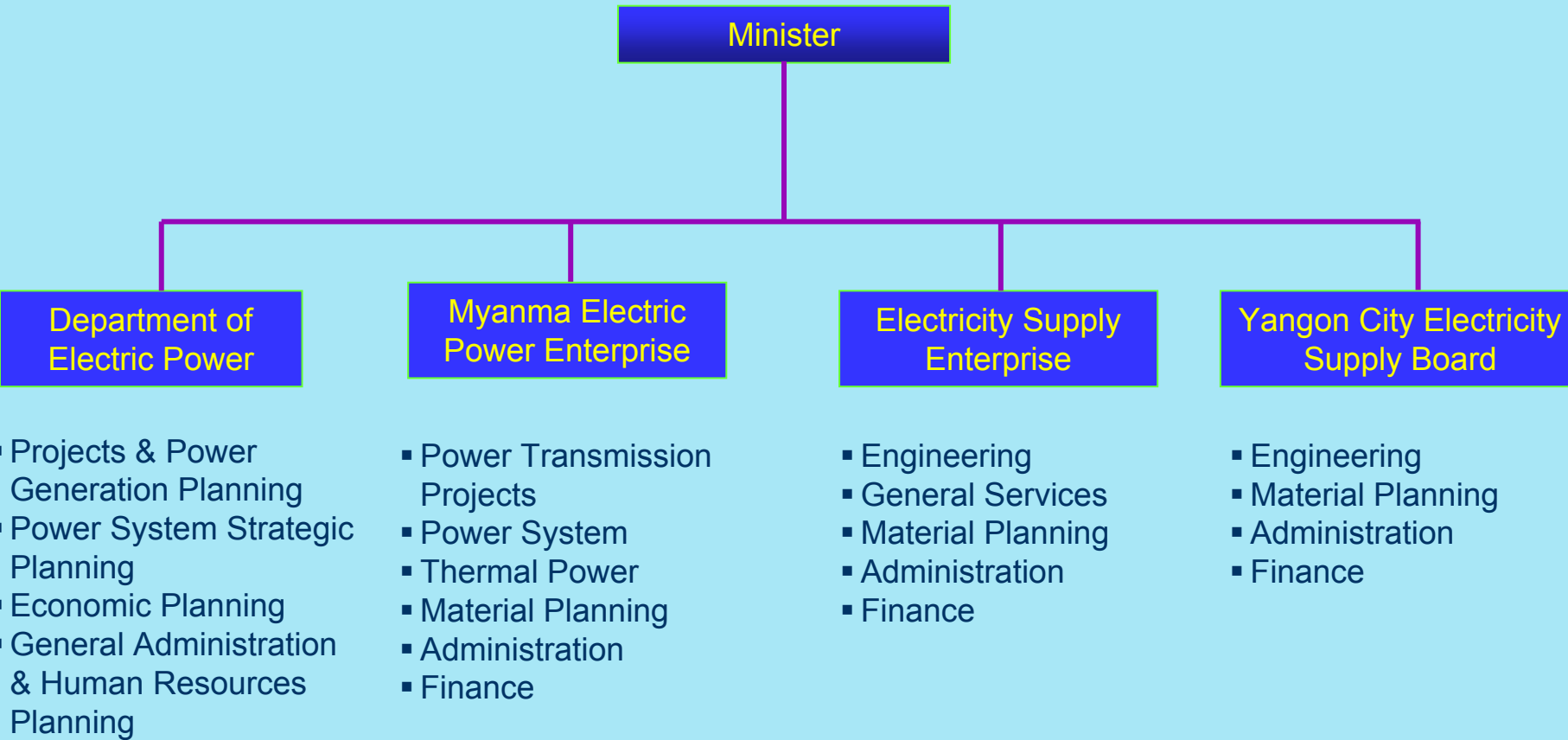
- The Ministry of Electric Power (1) is responsible for generation of electricity and Hydroelectric power implementation.
- The Ministry of Electric Power (2) is responsible mainly for transmission and distribution of electricity throughout the country.

# Organization Chart for Ministry of Electric Power (1)

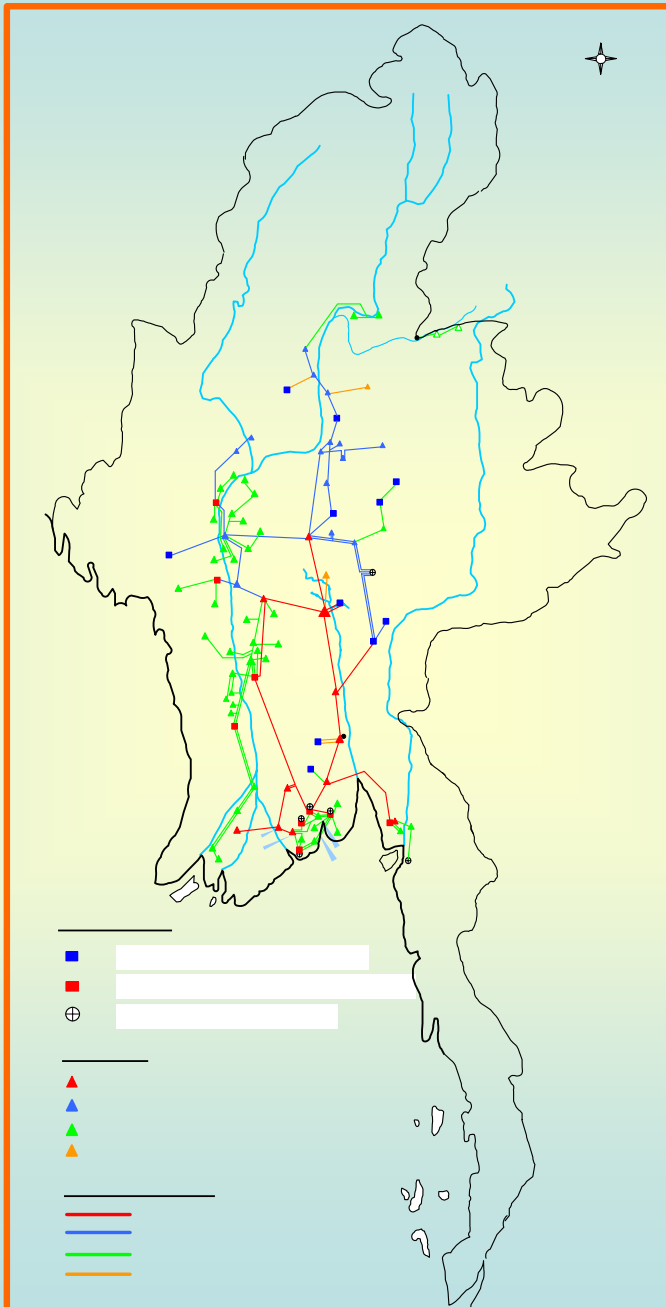




# Organization Chart for Ministry of Electric Power (2)



MYANMA ELECTRIC POWER ENTERPRISE  
NATIONAL GRID SYSTEM



# Existing Power Stations Under Operation

## Hydro Power Stations

1. BHP(2)	168 MW
2. BHP(1)	28 MW
3. Kinda	56 MW
4. Sedawgyi	25 MW
5. Zawgyi(1)	18 MW
6. Zawgyi(2)	12 MW
7. Zaungtu	20 MW
8. Thaphanseik	30 MW
9. Paunglaung	280 MW
10. Mone	75 MW
11. Ye`nwe	25 MW

## Gas Turbine Power Stations

12. Kyunchaug	54.3 MW
13. Mann	36.9 MW
14. Myanaung	34.7 MW
15. Shwedaung	55.35 MW
16. Ywama	36.9 MW
	24.0 MW
17. Thaketa	57 MW
18. Ahlone	99.9 MW
19. Hlawga	99.9 MW
20. Thaton	50.95 MW

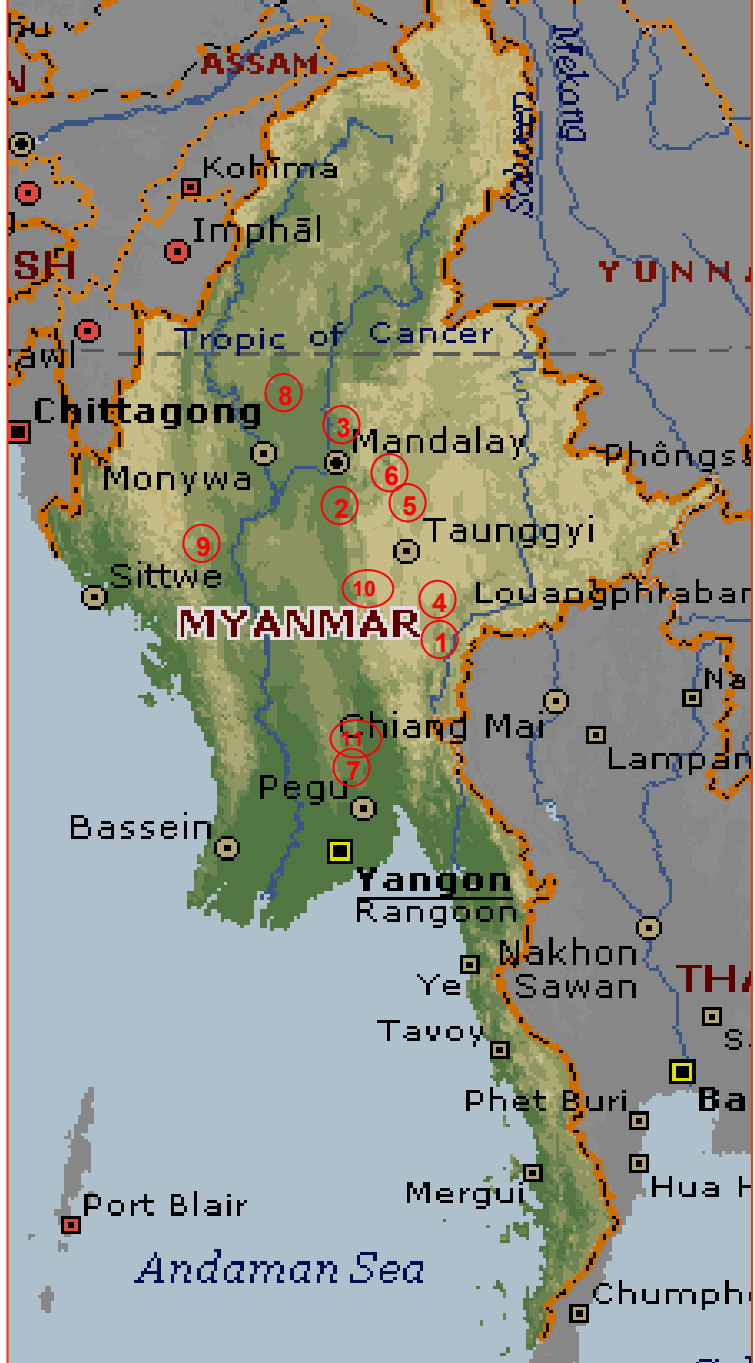
## Steam Turbine Power Station

21. Mawlmyaing	12 MW
22. Tigyit	120 MW
23. Hlawga C.C	54.3 MW
24. Ywama C.C	9.4 MW
25. Ahlone C.C	54.3 MW
26. Thaketa C.C	35.0 MW

## Existing Substations

- |                 |                  |                  |                    |
|-----------------|------------------|------------------|--------------------|
| 1. Bhamaw       | 15. Nyaungoo     | 28. Taungoo      | 41. Ngaphe         |
| 2. Shwegu       | 16. Sale         | 29. Hinthada     | 42. Malun          |
| 3. Kyaukpahto   | 17. Aungthapye   | 30. Bago         | 43. Nyaungchedauk  |
| 4. Ngapyawdine  | 18. Chauk        | 31. YeKyi        | 44. Kyankhin       |
| 5. Letpanhla    | 19. Thazi        | 32. Pathein      | 45. Myainggalay    |
| 6. Monywa       | 20. Kalaw        | 33. Myaungmya    | 46. Bayintnaung    |
| 7. Nyaungbingyi | 21. Magwe        | 34. Pha-an       | 47. Mann           |
| 8. Aungpinle    | 22. Taungdwingyi | 35. Myaungtaga   | 48. Yinmarpin      |
| 9. Mandalay     | 23. Pyinmana     | 36. Ingone       | 49. Kyaukchaw      |
| 10. Pyinoolwin  | 24. Thayet       | 37. Kyaukpadaung | 50. Hlaing Tha Yar |
| 12. Myingyan    | 25. Kyawswa      | 38. Pozoland     | 51. Thayargone     |
| 13. Pakokku     | 26. Pyi          | 39. Ta-nyaung    | 52. Athoke         |
| 14. Wazi        | 27. Sinde        | 40. Pakhange     |                    |

# Location of Hydropower Stations under Operation



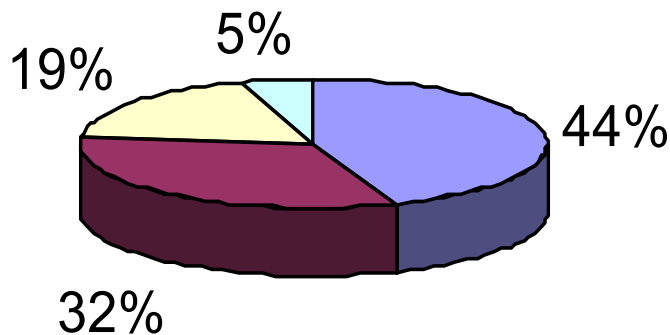
- 1. **Baluchaung(2)**  
  - 1<sup>st</sup> phase - 84 MW
  - 2<sup>nd</sup> phase - 84 MW
- 2. **Kinda** - 56 MW
- 3. **Sedawgyi** - 25 MW
- 4. **Baluchaung (1)** - 28 MW
- 5. **Zawgyi (1)** - 18 MW
- 6. **Zawgyi (2)** - 12 MW
- 7. **Zaungtu** - 20 MW
- 8. **Thapanzeik** - 30 MW
- 9. **Mone** - 75 MW
- 10. **Paunglaung** - 280 MW
- 11. **Yenwe** - 25 MW

# Installed Capacity (MW) as of May 2007

	<u>Grid System</u>	<u>Isolated</u>	<u>Total</u>	<u>Percentage</u>
<b>Installed Capacity</b>	<b>1644.97</b>	<b>105.23</b>	<b>1750.20</b>	<b>100.00%</b>
Hydroelectric	737.00	33.68	770.68	44.03%
Gas Turbine	550.10	10.90	561.00	32.05%
Steam Turbines	332.90	-	332.90	19.02%
Diesel	24.97*	60.65	85.62	4.90%

(\* Stand by)

## Installed Capacity (MW)

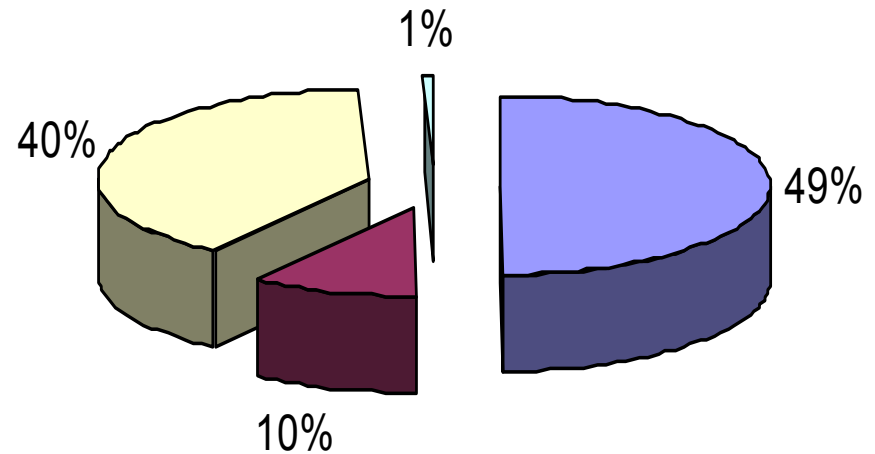


■ Hydroelectric ■ Gas Turbine ■ Steam Turbines ■ Diesel

# Total Units Generated for the Year 2005-2006

## Units Generated (mill kWh)

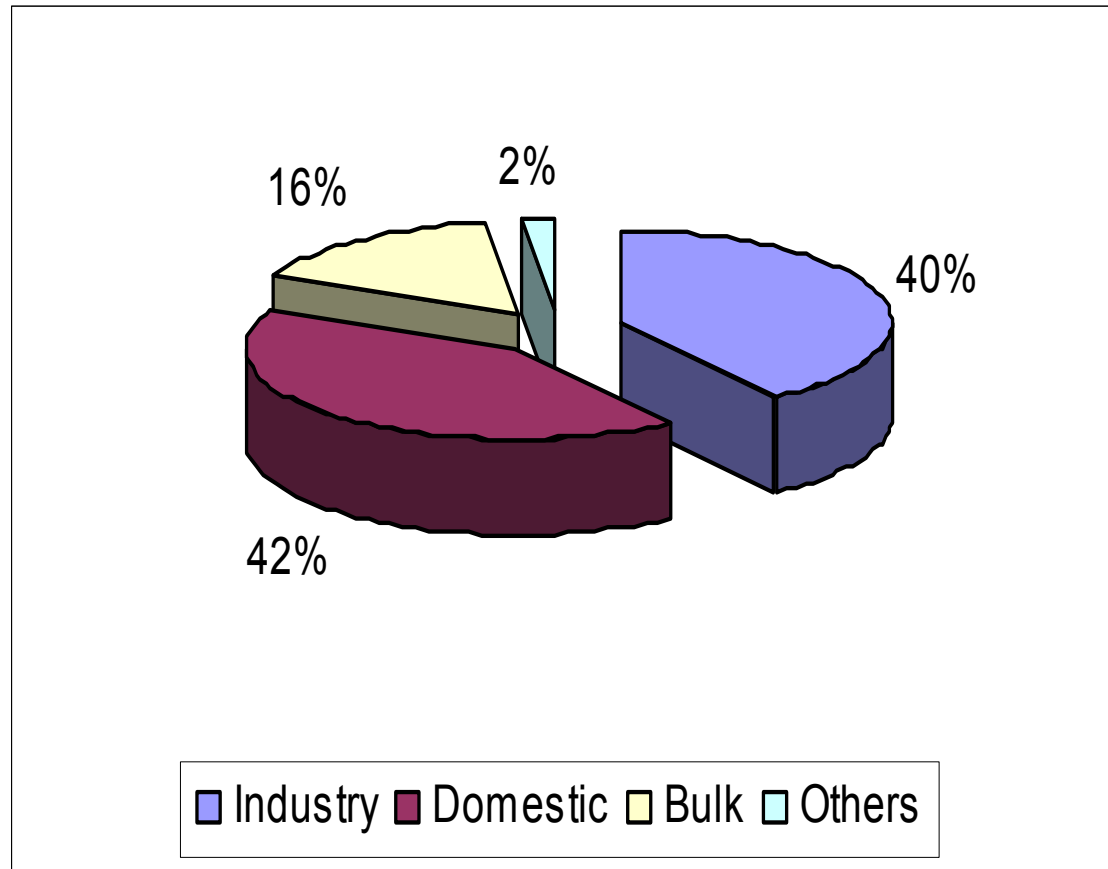
Hydro	2996.79
Steam	588.74
Gas	2395.69
Diesel	33.73
<b>Total</b>	<b>6014.95</b>



■ Hydro ■ Steam ■ Gas ■ Diesel

# Total Units Sold for the Year 2005-2006

Units Sold (mill kWh)	
Industry	1758.31
Domestic	1813.87
Bulk	692.76
Others	88.55
<b>Total</b>	<b>4353.49</b>





## ELECTRICITY TARIFFS

SR. NO.	CONSUMER CATEGORY	ENERGY CHARGES ( KYAT PER KWH )		CAPACITY CHARGES ( KYAT PER HORSE POWER )	FIXED CHARGES i.e., METER MAINTENANCE
		GOVT. DEPT.	PUBLIC / GOVT. SERVANTS / GOVT. PENSIONERS / RELIGION / SOCIAL		
1	General Purpose	Flat Rate 25.00	Flat Rate 25.00	-	Single Phase 100 Three Phase 200
2	Domestic Power	Flat Rate 25.00	Flat Rate 25.00	-	Single Phase 100 Three Phase 200
3	Small Power	Flat Rate 25.00	Flat Rate 50.00	100.00	Single Phase 100 Three Phase 200 C.T Meter 500
4	Industrial	Flat Rate 25.00	Flat Rate 50.00	100.00	Three Phase 200 C.T Meter 500
5	Bulk	Flat Rate 25.00	Flat Rate 25.00	100.00	Three Phase 200 C.T Meter 500
6	Street Lighting	Flat Rate 25.00	Flat Rate 25.00	-	-
7	Temporary Lighting	Flat Rate 25.00	Flat Rate 50.00	-	Single Phase 100 Three Phase 200

# Hydropower Potential

Due to the topography and tropical monsoon climate, Myanmar possess abundant hydropower potential of about 39,720 MW of which about 25,000 MW is of large scale and remaining is of medium and small scale projects and table shows regional power potential of Myanmar. Because of topography, rainfall and drainage pattern Kayin, Shan and Kayah States on tremendous potential.

# The Hydropower Potential of Myanmar by region

# Generation Facilities

- ❑ In order to overcome the present insufficient power supply situation and to meet the electricity demand throughout the country, the Government laid down the energy policy to exploit and utilize enormous hydropower potentials of the country.
- ❑ At present, (19) hydropower projects are under implementation by the Department of Hydropower Implementation (DHPI), the Ministry of Electric Power (1) and the Department of Irrigation (ID), the Ministry of Agriculture and Irrigation.

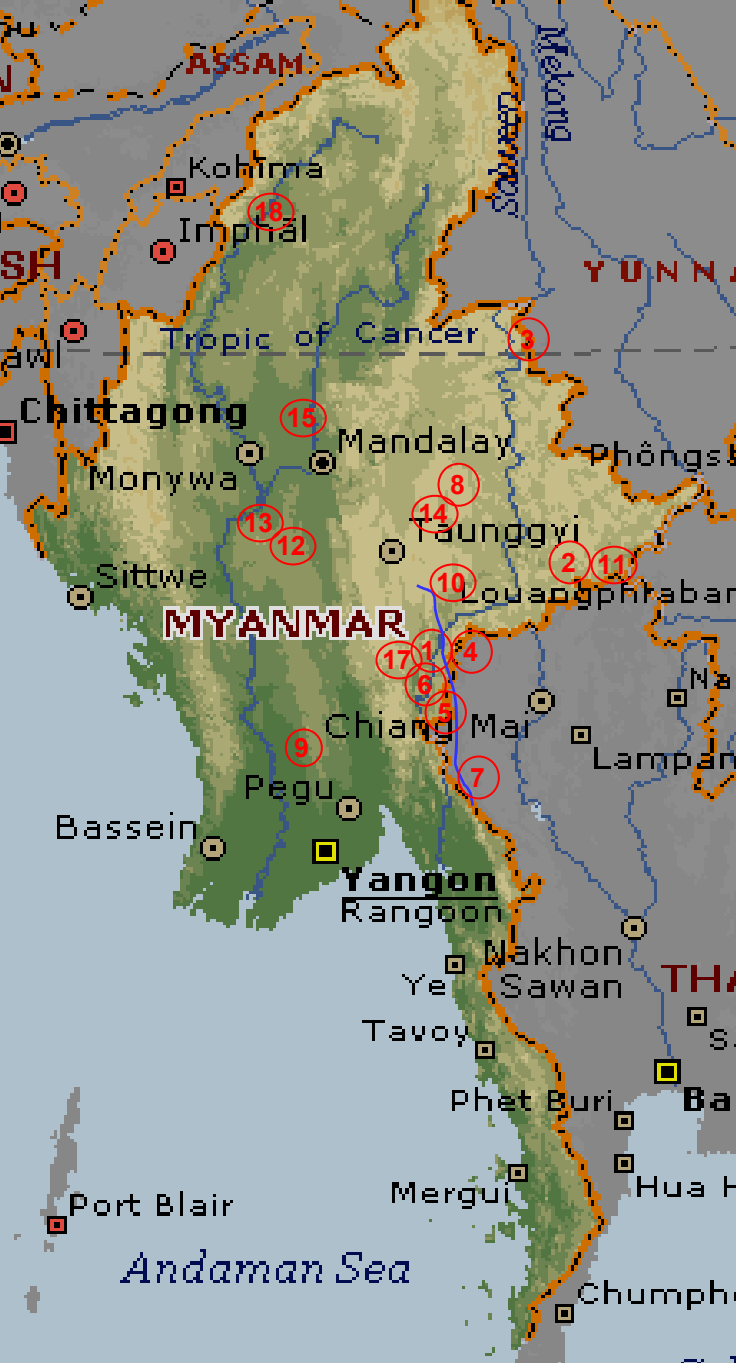
# Hydropower Projects Under Implementation

Sr.	Name	Installed Capacity (MW)	Annual Energy (GWh)	Year to be commissioned	Implementing Agency
1	Kabaung	30	120	Dec, 2007	ID + DHPI
2	Kengtawn	54	472	Dec, 2007	DHPI
3	Shweli (1)	600	4022	Dec, 2007	DHPI + Private
4	Pathi	2.2	8	Dec, 2007	DHPI
5	Kun	60	190	Dec, 2008	DHPI
6	Phyu	40	120	Dec, 2008	ID + DHPI
7	Shwekyin	75	262	Dec, 2008	DHPI
8	Yeywa	790	3550	Dec, 2009	DHPI
9	Thahtay	102	394	Dec, 2009	DHPI
10	Upper Paunglaung	140	434	Dec, 2009	DHPI

## Hydropower Projects Under Implementation

Sr.	Name	Installed Capacity (MW)	Annual Energy (GWh)	Year to be commissioned	Implementing Agency
11	Tasang	7110	35446	2020	DHPI + MDX
12	Kyee-on Kyee-wa	70	330	2008	ID
13	Bu-ywa	41	195	2009	ID
14	Myo Gyi	30	135	2009	ID
15	Manipur	340	1905	2010	ID+DHPI
16	Nancho	30	128	2009	DHPI
17	Thaukyegat	140	670	2011	DHPI
18	Tamanthi	1200	6685	-	DHPI
19	Ann	15	65	2009	DHPI

## Hydropower Projects under Implementation



Sr.	Name	Installed Capacity (MW)
1	Kabaung	30
2	Kengtawn	54
3	Shweli (1)	600
4	Pathi	2.2
5	Kun	60
6	Phyu	40
7	Shwekyin	75
8	Yeywa	790
9	Thahtay	102
10	Upper Paunglaung	140
11	Tasang	7110
12	Kyee-on Kyee-wa	70
13	Bu-ywa	41
14	Myo Gyi	30
15	Manipur	340
16	Nancho	30
17	Thaukyegat	140
18	Tamanthi	1200
19	Ann	15

## Transmission Facilities

The major electric power stations feed electricity into the National Grid System with 230 kV, 132 kV and 66 kV transmission lines and substations.

<b>230 kV Transmission Line</b>	<b>-</b>	<b>845 miles</b>
<b>132 kV Transmission Line</b>	<b>-</b>	<b>1056 miles</b>
<b>66 kV Transmission Line</b>	<b>-</b>	<b>1358 miles</b>



# Transmission Facilities

In order to reinforce the present National Grid System and to facilitate power transmission from new generating station to National Grid System, Ministry of Electric Power (2) carried out 21 transmission line projects at present and planned 41 transmission line projects to be implemented in the near future

## Transmission Projects Under Construction

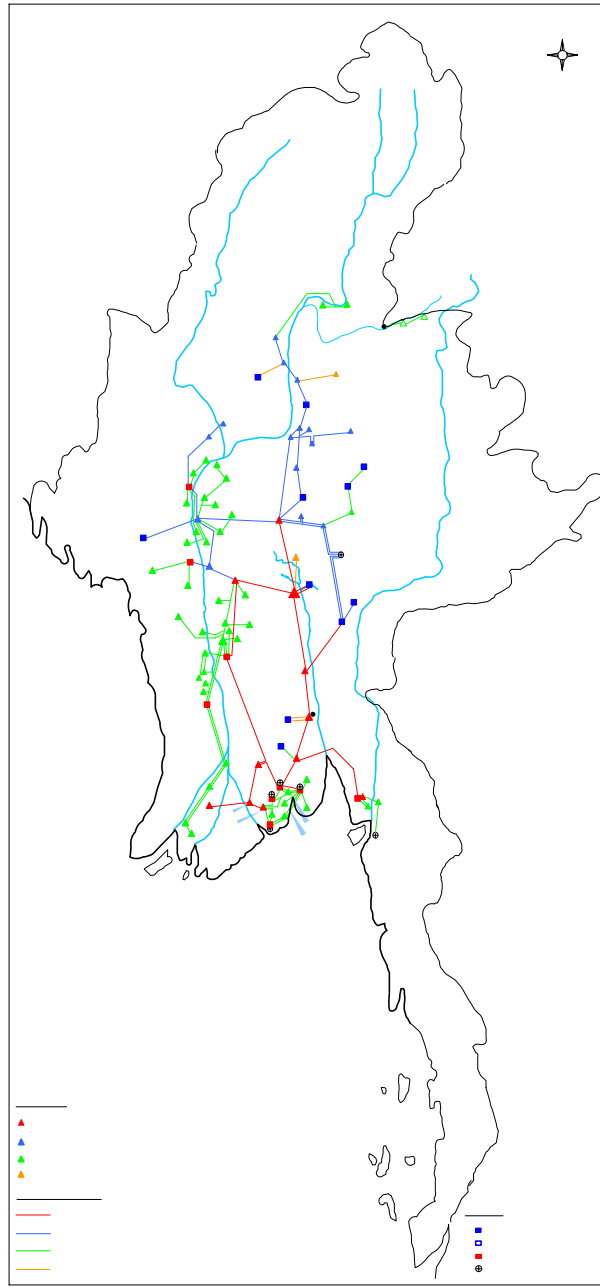
Sr.	From	To	Voltage (kV)	Circuit	mile
1	Yeywa	Belin	230	2	30
2	Yeywa	Meikhtila	230	2	80
3	Shwezaryan	Belin	230	2	25
4	Belin	Meikhtila	230	2	65
5	Meikhtila	Thazi	230	2	14
6	Shweli	Mansan	230	2	60
7	Mansan	Shwesaryan	230	2	120
8	Thaketa	Thanlyin	230	2	12
9	Taungoo	Tharyargone	230	2	56
10	Tharyargone	Bago	230	2	54
11	Bago	Thanlyin	230	2	65

## Transmission Projects Under Construction

Sr.	From	To	Voltage (kV)	Circuit	mile
12	Bago	Myaungtaga	230	1	50
13	Belin	Monywa	230	2	110
14	Meikhtila	Taungdwingyi	230	1	105
15	Phyu	(TGO – BGO)	230	2	4.5
16	Thazi	Myinchan	132	1	65
17	Kengtaung	Namsan	132	1	73
18	Kyee-on Kyee-wa	Mann	132	1	94
19	Kun	(TGO – BGO)	230	1	8
20	Taunggoo	Shwedaung	230	1	100
21	Upper – Paunglaung	Nancho	230	1	26

## Substation Projects Under Construction

Sr.	Name	Voltage Ratio (kV)	Capacity (MVA)
1	Shweli	230 / 66 / 11	45
2	Mansan	230 / 66 / 11	60
3	Shwesaryan	230 / 132 / 11	200
4	Shwesaryan	230 / 33 / 11	60
5	Thanlyin	230 / 33 / 11	100
6	Belin	230 / 132 / 11	160
7	Meikhtila	230 / 33 / 11	60
8	Monywa (Extension)	230 / 132 / 11	400
9	Shwemyo	230 / 33 / 11	100
10	The`Phyu (Yeni)	230 / 33 / 11	100
11	Myinchan	132 / 66 / 11	90
12	Namsan	132 / 66 / 11	75



## Transmission Projects to be Implemented in the Near Future

Sr.	From	To	Voltage (kV)	Circuit	mile
1	Nancho	Shwemyo	230	1, TB	28
2	Shweli (1)-(2)	Shweli (3)	230	2, TB	50
3	Shwekyin	Tharyargone	230	1	40
4	Shweli	Moemate	230	2, TB	20
5	Belin	Pakokku	230	1, TB	120
6	Belin	Meikhtila	230	1, TB	65
7	Meikhtila	Nay Pyi Taw	230	1, TB	90
8	Maei	Kyaukphyu	230	1, TB	75
9	Thahtay	Ann	230	1, TB	97
10	Thahtay	Athoke	230	1, TB	145
11	Shwedaung	Oakshitpin	230	1, TB	24
12	Hinthada	Athoke	230	1, TB	60
13	Athoke	Pathein	230	1, TB	40
14	Hutgyi	Mawlamyaing	230	2, TB	123
15	Namsan	Pimpet	132	1	53
16	Upper Kengtawn	Kholam	132	1	40

## Transmission Projects to be Implemented in the Near Future

Sr.	From	To	Voltage (kV)	Circuit	mile
17	Thahtay	Oakshitpin	230	1	70
18	Ann	Mann	132	1	80
19	Pimput	Kalaw	132	1	40
20	Hutgyi	(Thaton-Paan)	230	1	90
21	Hinthada	Myaungtaga	230	1	80
22	Myitkyeenar	Tarpain (1), (2), Shweli (1)	230	1	135
23	Upper Thanlwin	Kyaington	230	2, TB	312
24	Manipur	Pakoku	230	2, TB	180
25	Shwesaryay	Monywa	230	2, TB	30
26	Thaukyegat	Taungoo	230	1, TB	25
27	Bawgahta	Tharyargone	230	1, TB	20
28	Tanintharyi	Myeik	230	2, TB	40
29	Myeik	Mawlamyaing	230	2, TB	222
30	Myeik	Kawthaung	230	1, TB	250
31	Myitsone	Myitkyeenar	230	2, TB	60

## Transmission Projects to be Implemented in the Near Future

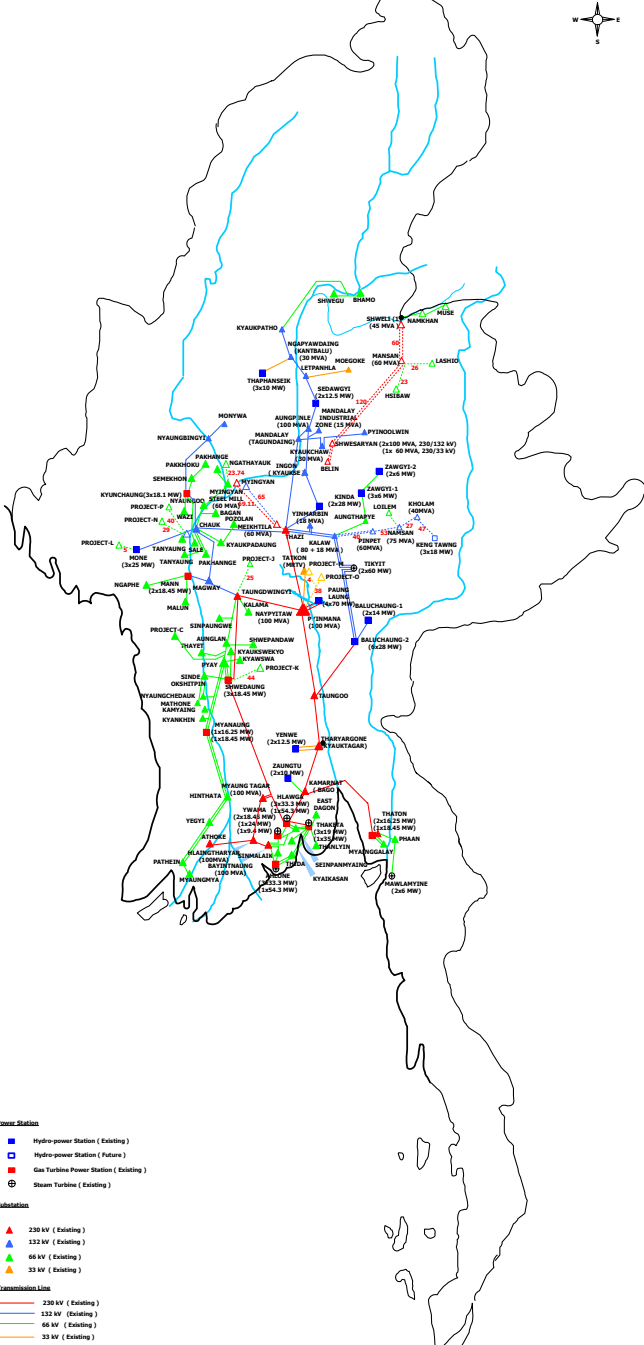
Sr.	From	To	Voltage (kV)	Circuit	mile
32	Myitkyeenar	Ohndaw	230	2, TB	320
33	Htamanthi	Hopin	230	2, TB	100
34	Htamanthi	(Phaungpyin, Kalaywa,Moneywar)	230	1, TB	340
35	Meikhtila	Nya Pyi Taw	230	1, TB	90
36	Tasang	Pyinmana	500	1, QB	200
37	Htamanthi	Monywar	500	1, QB	230
38	Belin	(TGO – BGO)	500	1, QB	300
39	Monywa	(Mann- Oakshitpin - Hinthada)	500	1, QB	350
40	Myitsone	(Moemate – Belin)	500	1, QB	430
41	Htamanthi	Myitsone	500	1, QB	220



## Substation Projects to be implemented in the near future

Sr.	Name	Voltage Ratio (kV)	Capacity (MVA)
1	Oak shitpin	500/230 kV	500
2	Pyinmana	500/230 kV	500
3	Monywar	500/230 kV	500
4	Mann	500/230 kV	500
5	Hinthada	500/230 kV	500
6	Belin	500/230 kV	500
7	Taungoo	500/230 kV	500
8	Bago	500/230 kV	500

# Future National Grid System



### Power Station

- Hydro-power Station ( Existing )
- Hydro-power Station ( Future )
- Gas Turbine Power Station ( Existing )
- ⊕ Steam Turbine ( Existing )

### Substation

- ▲ 230 kV ( Existing )
- ▲ 132 kV ( Existing )
- ▲ 66 kV ( Existing )
- ▲ 33 kV ( Existing )

### Transmission Line

- 230 kV ( Existing )
- 132 kV ( Existing )
- 66 kV ( Existing )
- 33 kV ( Existing )



## List of Hydropower Projects Under Planning

Sr.	Project	Installed Capacity (MW)	Dam Height (m)	Annual Energy (GWh)	Implementing Agency
1	Upper Bu-Ywa	150	137.5	534	ID+DHPI
2	Upper Sedawgyi	60	73.2	315	ID+DHPI
3	Hutgyi	1200	33	7335	Private Sector
4	Da Pein (1)	240	83.5	1081	Private Sector
5	Dayaing	25	-	88	DHPI
6	Thagyet	20	-	95	DHPI
7	Pyintha	30	62.5	170	ID

Thank You For Your Kind Attention

