



**JICA Tokyo International Center (JICA TOKYO)
Energy Policy (B)
Training Program in Japan**

Country Presentation of Myanmar

THE GOVERNMENT OF THE REPUBLIC OF THE UNION OF MYANMAR

Ministry of Electric Power

**Khaing Nyein Aye
Staff Officer (Engineer)
Department of Electric Power**

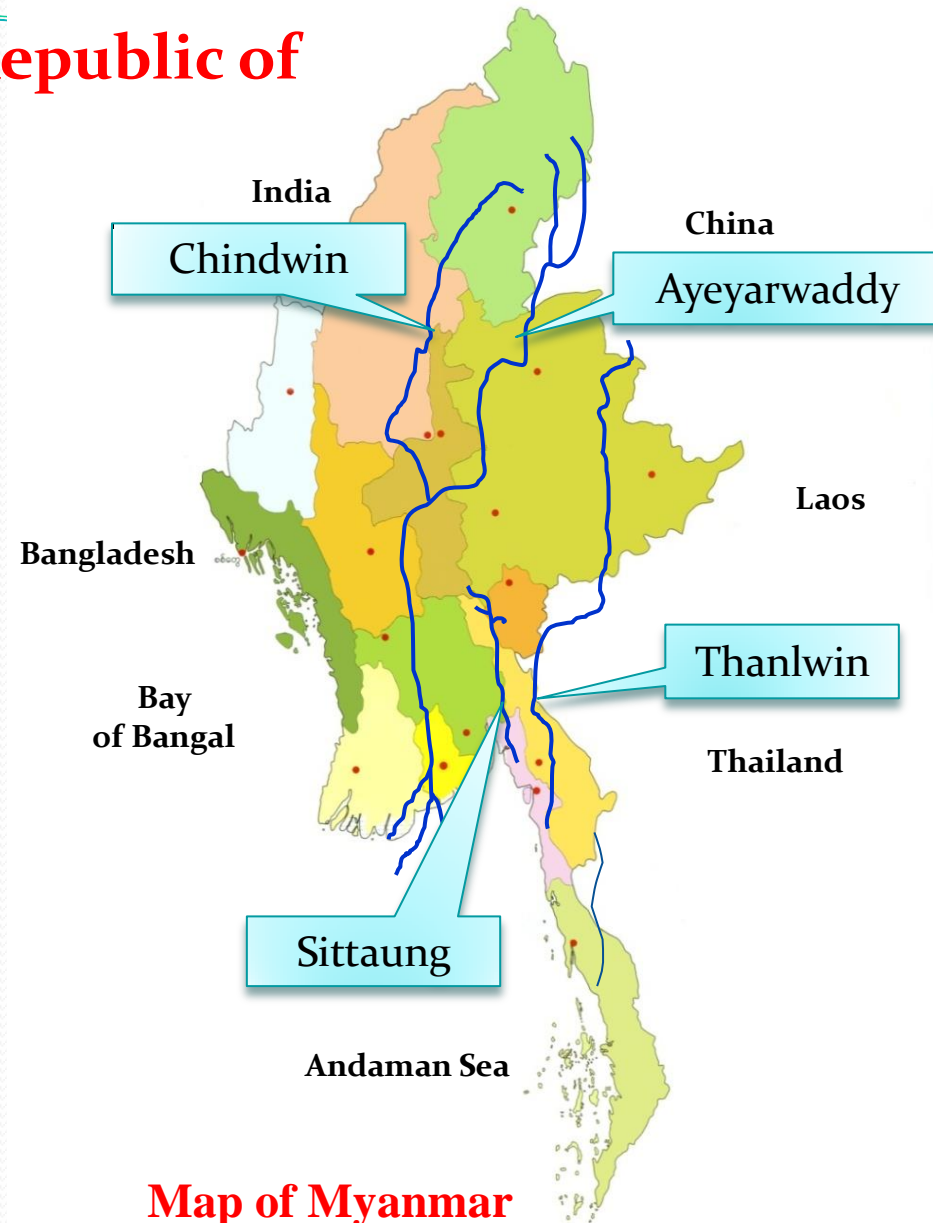
**Tokyo, Japan
23th June -13th July 2013**

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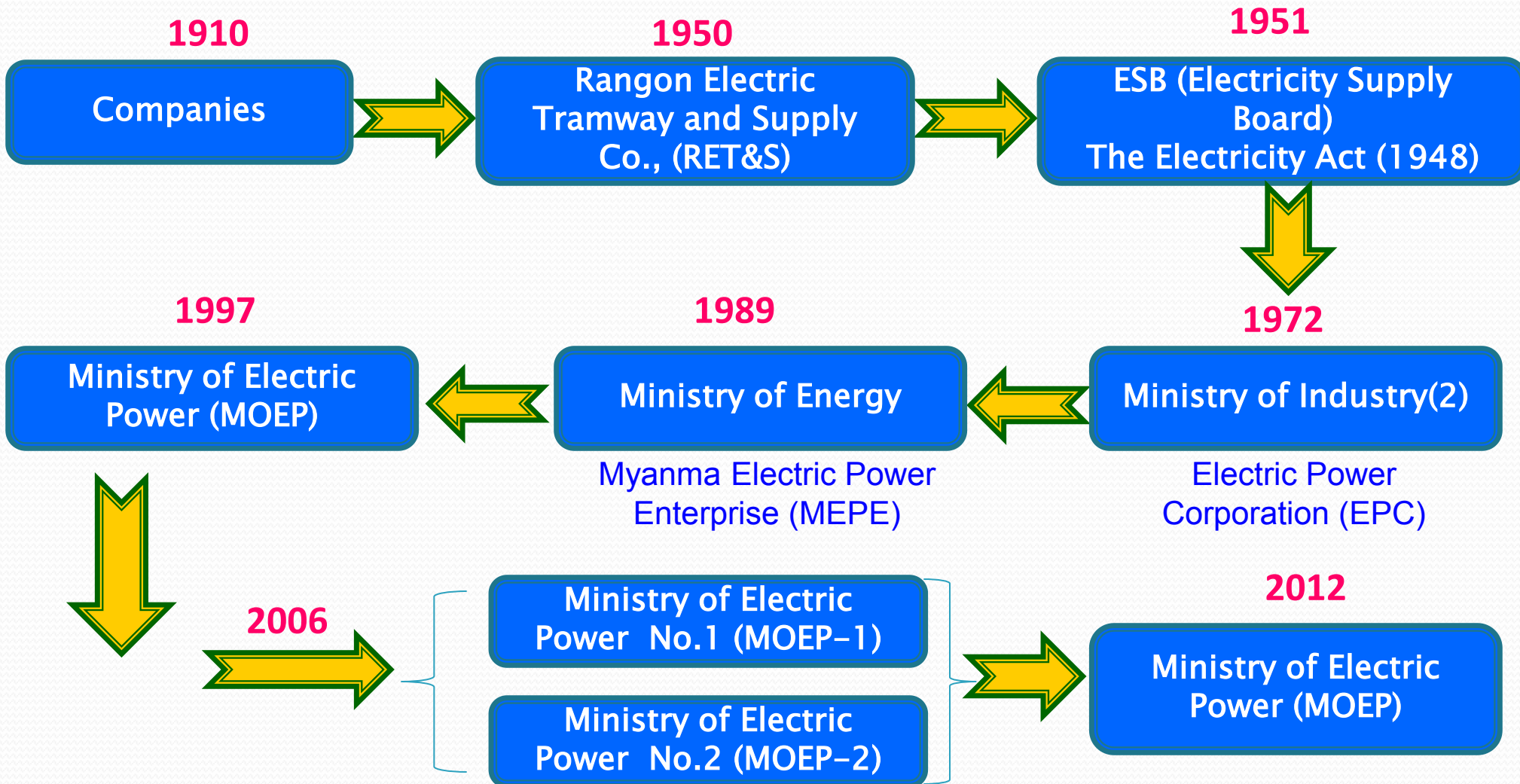
- ❖ General Information of Myanmar
- ❖ Past Energy Demand and Supply
- ❖ Outlook of Energy Demand and Supply
- ❖ Policies and Objectives
- ❖ Current Issues and Causes
- ❖ Generation Expansion Plan

Brief Introduction of the Republic of the Union of Myanmar

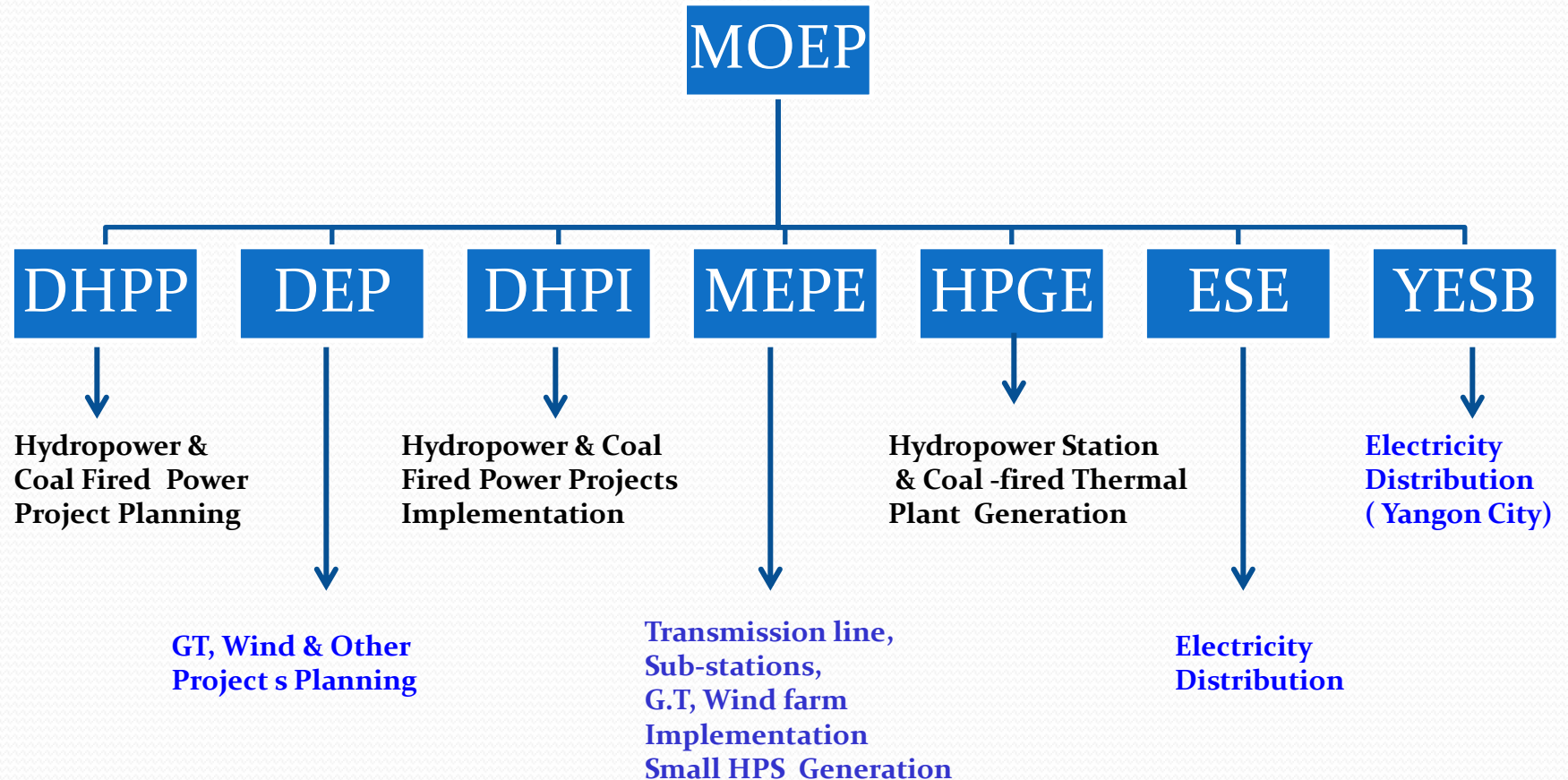
- Located in South East Asia
- Population – 59.78 millions
(Average growth rate-1.75% per annum)
- Total Area – 676,552 sq.km
(Total international boundary - 5860 km)
(Coastal strip - 2833 km)
- Neighboring Countries
 - China on North and North - East
 - Laos on East
 - Thailand on South - East
 - Bangladesh and India on North - West
- Four Major Rivers
 - Ayeyawady (2,063 km)
 - Chindwin (1,151 km)
 - Sittaung (310 km)
 - Thanlwin (1,660 km)



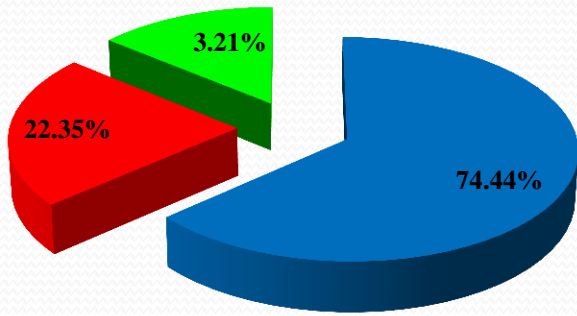
Background History of Organization



Structure and Functions of MOEP

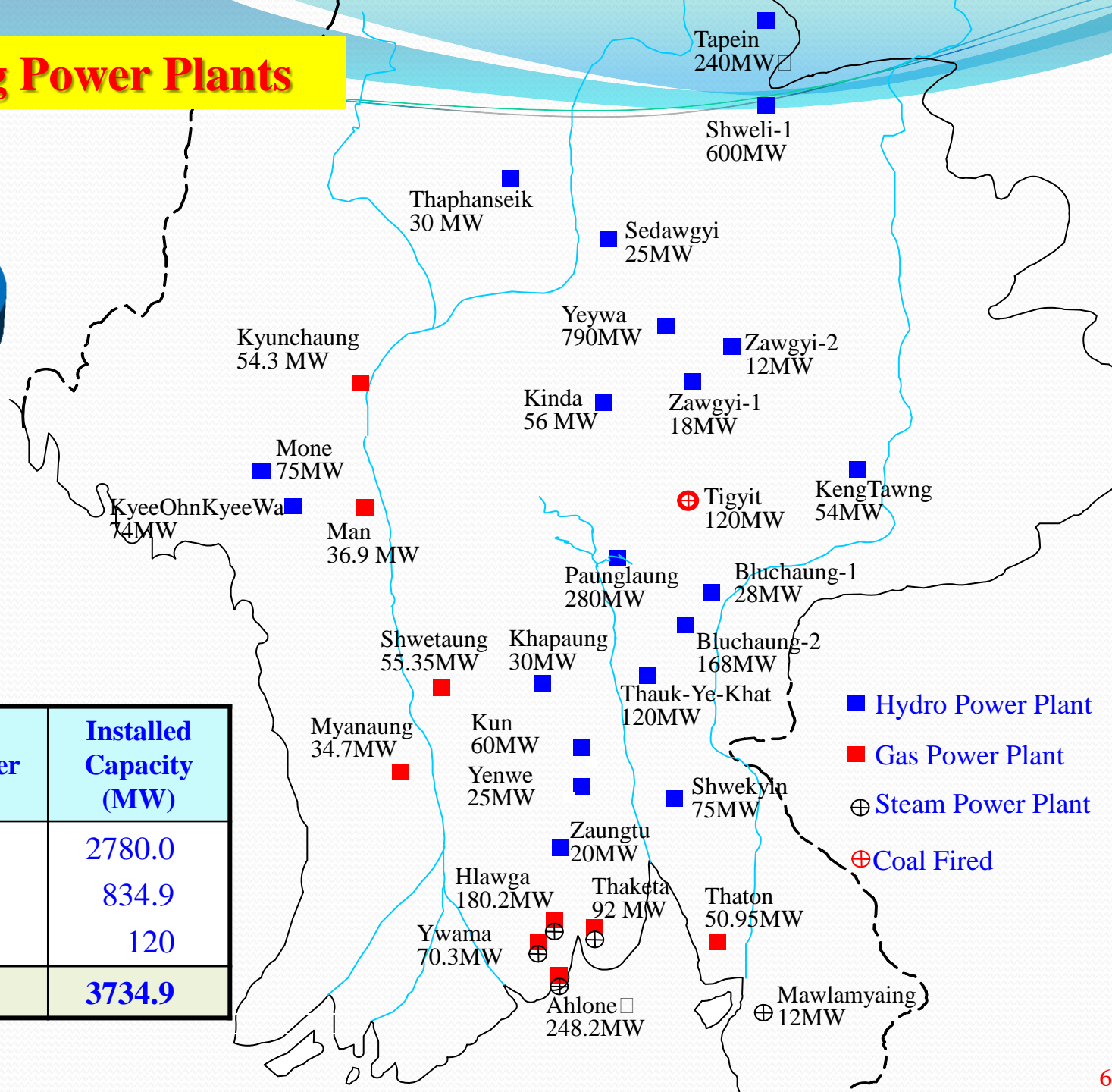


Location of Existing Power Plants



■ Hydroelectric ■ Gas ■ Coal

Sr. No.	Type of Power Plant	Number	Installed Capacity (MW)
1.	Hydro Power	20	2780.0
2.	Gas	10	834.9
3.	Coal	1	120
Total		31	3734.9



■ Hydro Power Plant
 ■ Gas Power Plant
 ⊕ Steam Power Plant
 ⊕ Coal Fired

National Grid System

Existing Transmission Lines

Voltage (kV)	Nos. of Line	Length	
		miles	km
230	47	1,982.65	3,190.77
132	43	1,542.24	2,481.99
66	149	2,489.10	4,005.82
Total	239	6,013.99	9,678.58

Existing Substations

Voltage (kV)	Nos. of Substation	Capacity (MVA)
230	34	3,960
132	33	1,753.5
66	120	2,580.6
Total	185	8,294.1

Existing Distribution Lines & Substations

Voltage (kV)	Length		Capacity (MVA)
	miles	km	
33	4,516.48	7,268.57	4,278.89
11	8,682.98	13,973.90	4,399.38
6.6	824.51	1,326.92	1,475.23
0.4	12,032.34	19,364.17	-
Total	26,056.31	41,933.56	10,153.50

Electrification

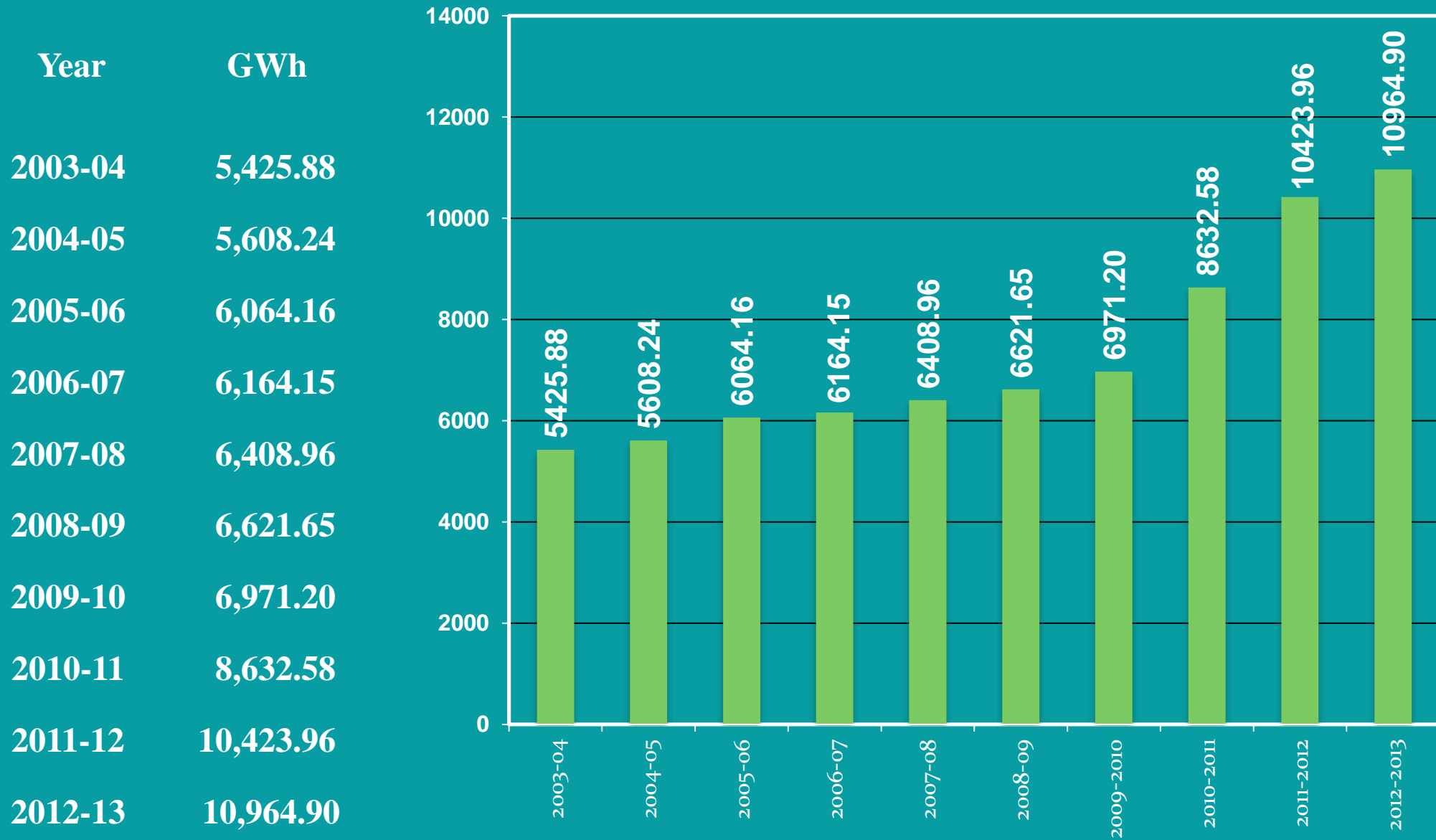
Location Map of Myanmar



Population	59.78 million
Numbers of Household	8.92 million
Electrified Household	2.58 million
Electrification Ratio (%)	29 %
Total Nos. of Village	64308
Nos. of Electrified Village	16425
Rural Electrification Ratio (%)	25.54%

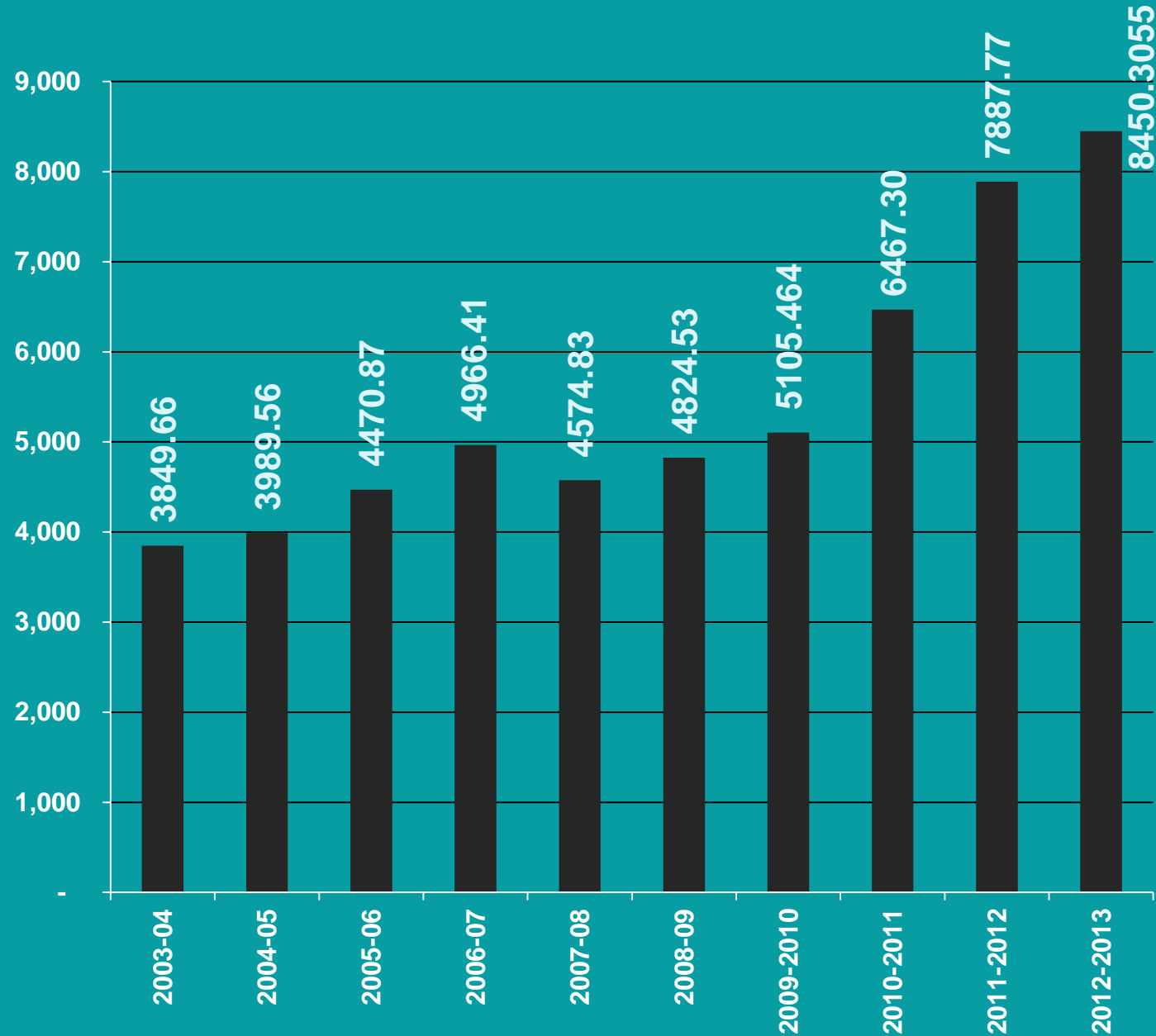


Generation Growth

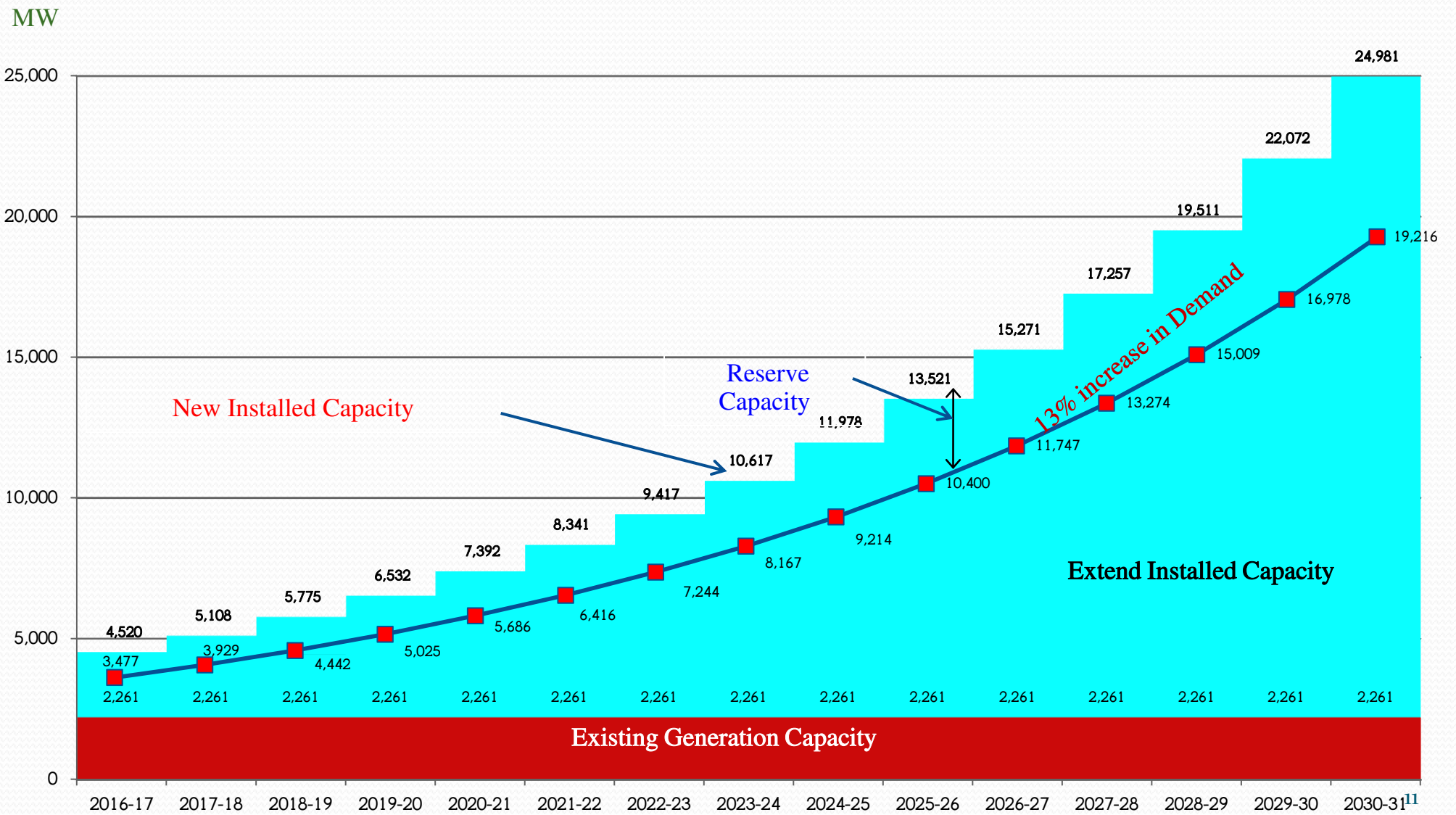


Power Consumption Growth

Year	GWh
2003-04	3849.66
2004-05	39,89.56
2005-06	4,470.87
2006-07	4,966.41
2007-08	4,574.83
2008-09	4,824.53
2009-10	5105.464
2010-11	6,467.30
2011-12	7,887.77
2012-13	8,450.305



Long Term Demand Forecast and Required Generating Capacity



Long Term Demand Forecast and Required Generating Capacity

(MW)

Project Term	Demand Forecast	Reserve Power	Installed Capacity	To be implemented during Each 5 year plan
From Yr.(2012-13) to Yr.(2015 - 16)	3,078	923	4,001	1,740
From Yr. (2016-17) to Yr.(2020 -21)	5,686	1,706	7,392	3,391
From Yr. (2021-22) to Yr.(2025 -26)	10,400	3,120	13,520	6,128
From Yr.(2026-27) to Yr.(2030 - 31)	19,216	5,765	24,981	11,461

Long Term Planned Target for Electricity Supply Up to Year 2030-31

Term	Expected Population (million)	Demand Forecast (MW)	Required Generation (GWh)	Target for Electrified Household (%)
Yr. 2011-12	60.44	1,806	10,444	27%
From Yr.(2012-13) to Yr.(2015-16)	63.14	3,078	17,797	34%
From Yr.(2016-17) to Yr.(2020-21)	66.69	5,686	32,874	45%
From Yr.(2021-22) to Yr.(2025-26)	70.45	10,400	60,132	60%
From Yr.(2026-27) to Yr.(2030-31)	74.42	19,216	111,100	80%

Power Plant Projects To be Completed during Year 2013 to 2016 (MW)

Sr. No.	Project Name	Type	Installed Capacity	2013	2014	2015	2016
1	Thaukyekhat-2	Hydro	120	120	120	120	120
2	Hlawga (Zeya Co.)	Gas	50	50	50	50	50
3	Ywama (MyanShwePyay Co.)	Gas	50	50	50	50	50
4	Thaketa (CIC Co.)	Gas	50	50	50	50	50
5	Ahlonge (Toyo Thai Co.)	Gas	100	80	100	100	100
6	Phyu	Hydro	40	-	40	40	40
7	Namcho	Hydro	40	-	40	40	40
8	Ywama (Transferred from Thailand)	Gas	240	-	240	240	240
9	Thaketa (BKB Co., Korea)	Gas	500	-	168	336	500
10	Hlawga (Hydrolancang Co., China)	Gas	530	-	126	378	530
11	Upper Paunglaung	Hydro	140	-	-	140	140
12	Baluchaung No.(3)	Hydro	52	-	52	52	52
13	Mawlanyaing (Myanmar Lighting)	Gas	50	-	-	50	50
14	Kyaukphyu	Hydro	50	-	-	50	50
15	Upper Baluchaung	Hydro	30	-	-	-	30
16	Kyunchaung (Extension)	Gas	70	-	-	-	70
17	Shwedaung (Extension)	Gas	80	-	-	-	80
Total			2192	350	1036	1696	2192

Policies

- To employ the available energy resources in power generation for the sufficient supply of electricity
- To promote the effective and efficient use of electricity for future energy sufficiency, reserves and sustainability in our nation
- To conduct the reliable power quality to be supplied safely
- To enhance the electricity distribution system to be developed in accordance with the advance technologies
- To adopt the environment-friendly ways in electricity generation, transmission and distribution
- To encourage the expansion of power transmission and distribution throughout the country and the Public-Private-Participation in each sector

Objectives

- In order to transmit the generated power, increased in the period of fifth five-year plan, through Myanmar Power System to Regions and States, the Transmission Lines and Primary Substations are to be implemented and also the Distribution Plans for electricity supply to the Industries and Public are to be worked out.
- To provide the technical know-how and policy support to the local people for their cooperation and participation in using alternative energy such as biomass in rural areas, far from the National Grid.
- To meet the electricity demand for the areas, where electricity through the National Grid is not accessible, are to be supplied by Mini Hydro and Diesel Generators.

Objectives

- In order to be reliable the quality of Myanmar Power System which is conducted for generation, transmission, distribution and consumption of electric power and to supply the electricity with the least of power interruption and loss at the Standard Voltage Level, our skillful staffs shall carry out by getting technical know-how from abroad.
- To fulfill the power demand of Myanmar, not only Hydro Power Generation and also Gas Turbine Power Plants are to be in operation, and Wind Power and Solar Power Plants are economically and widely constructed to reinforce the power supply.

Current Issues and Causes

- Myanmar Power System mainly relies on Hydro power(77 % of power generation)
- The capacity of reinforced thermal power plant close to main load center is very low.
- Distribution facilities are old and required to be upgraded.
- Main load centers are very far from Major Hydropower plants
- The steps of voltage level from 230kV to 0.4 kV is too much.
- We have planned 500kV Transmission system and SCADA to be introduced.
- Obviously required to review the current power system and to make proper plan for future system

Current Issues and Causes

- The demand for Electricity in Myanmar is increasing rapidly year by year
- The current Transmission and Distribution facilities are old and needed to be upgraded
- Myanmar is rich in Power resources, especially Hydropower but we need higher techniques and investments.
- Require to obtain more sophisticated technologies to solve the problems in Power System
- The Transmission & Distribution Losses are high
- Myanmar is participating and cooperating in regional power trade among GMS & ASEAN Countries

Generation Expansion Plan

- ▶ In order to meet the present demand of power supply throughout the country, the Ministry of Electric Power is implementing a Large number of various kinds of hydropower projects and thermal power projects.
- ▶ Most of the major hydropower stations are located in northern part of the country, far from the main load center. So, long length of transmission lines and a large number of substations capacities have to be constructed and that leads voltage drop and system instability, especially in Yangon region.
- ▶ At present condition, in order to overcome these problems and to meet the required demand of Yangon region, (4) gas turbine power stations attached with (4) combined cycle power plants of maximum generation capacity (590.7) MW reinforce closely the Yangon distribution system.

Generation Expansion Plan

- ▶ Yangon region, located in the southern part of the country, is the main load center with maximum demand (791.69) MW for (943) thousands power consumers, which is (36.28)% of the whole country consumers.
- ▶ With the improvement of living standards and due to development of industry sector, the maximum demand of Yangon region has been focused to become (1000) MW coming years.
- ▶ In order to overcome this increasing demand and to solve the instability problem effectively, the following (4) gas turbine power projects have been planned to be implemented in order that they can supply power closely to the main load region.

1. Hlawga Power Plant (500)MW (MOU had been signed)
2. Thaketa Power Plant (500)MW (MOA had been signed)
3. Ahlone Power Plant (120)MW (MOA had been signed)
4. Ywama Power Plant (2X120)MW (Under implementation)

Power Sector in Myanmar: Summary of Strengths and Weaknesses

STRENGTHS

- ❖ Huge hydropower resources (estimated at more than 100 GW)
- ❖ Large gas reserves (11.8 tcf) and production (430 bcf in 2011) with potential for big discoveries
- ❖ Well developed power transmission system
- ❖ Strategic location in the regional energy market

WEAKNESSES

- ❑ Heavy reliance on seasonal hydropower generation and lack of domestic gas supply and capacity in gas-fired power generation
- ❑ Underinvestment in power sector resulting in load shedding of about 20% of demand and T&D losses of 19.43%
- ❑ Electrification ratio of about 29%
- ❑ Fragmented institutional and regulatory framework in the energy sector
- ❑ Electricity tariffs below the economic cost
- ❑ No legal requirements for social and environmental safeguards for infrastructure projects

Conclusion

- The electric power sector plays a vital role for the development of the state and social affairs.
- Due to the geographic conditions, most of the hydropower resources are in the northern part of Myanmar, however, the areas which are of great electricity consumers including Yangon region, are in the south. Therefore, 500 kVA high power transmission lines should be constructed so as to adjust electric power and also reduce the losses.
- Coal-fired Thermal Power Plant and Gas Turbine Power Plant Projects with high technologies which are of being low impact on EIA/SIA and short term construction periods, should be established in the highest power demand areas to fulfill the present power demands.

Conclusion

- Due to the generation mixed, hydropower projects should be inevitably implemented by utilizing the existing hydropower resources throughout the country. That is why, low tariff rate can be enjoyed, additional electricity going to be generated from the hydropower projects can also be sold the neighboring countries and the earning of the State will be increased, as a matter of fact.
- Integration of renewable energy resources has geographical, financial, technological, social and environmental barriers.

THANK YOU

Khaing Nyein Aye @ MOEP

kna.mm.eng@gmail.com



Contact : report@tky.iej.or.jp