



THE REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF ELECTRICITY AND ENERGY

ENERGY POLICY (B)

Presented by

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WORLD

Location Of Myanmar





The State Logo



National Flag

"The yellow represents solidarity; the green symbolizes peace, tranquility and lush greenery; the red represents courage and determination; and the white star stands for the **significance** of the union of the country."



NAYPYIDAW

EXPLORING MYANMAR'S BEAUTY

PRESIDENT U WIN MYINT



- He is the second elected president from National League for Democracy .
- He worked as a High Court senior lawyer and High Court advocate in Danubyu and Pathein, Ayeyawady Region.
- He was appointed as NLD' s committee secretary for Ayeyawady Region and later became secretary of the NLD' s Central Executive Committee. (Ref: Pyidaungsu Hluttaw)
- He was elected as the 10th [President of Myanmar](#) by the Pyidaungsu Hluttaw on 28 March 2018, with 403 out of 636 lawmakers voting for him.

The State Counsellor of Myanmar (Daw Aung San Su Kyi)

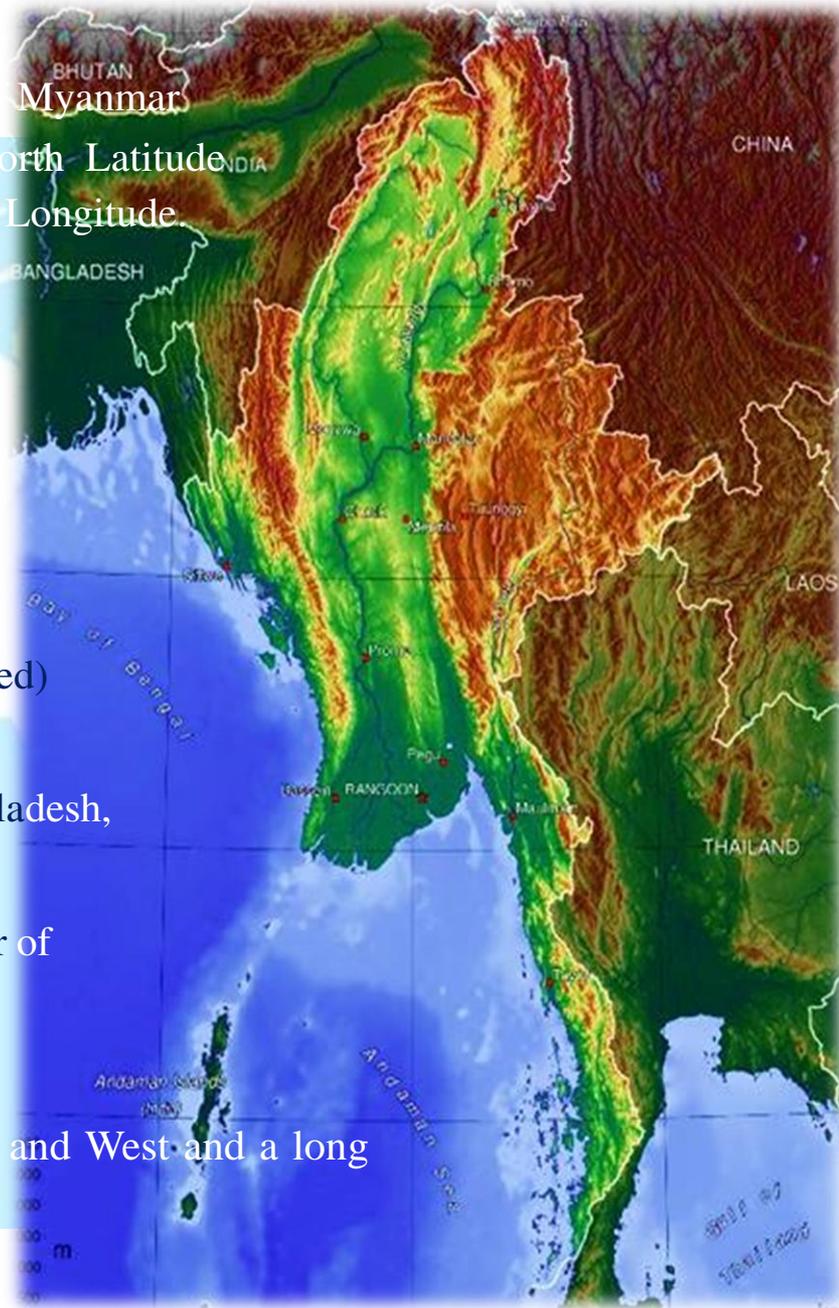


- The Noble Winner Prize “ Aung San Su Kyi” - Nation League For Democracy (NLD) party
- NLD party is majority win in myanmar’ s first openly contested election in 25 years in Nov, 2015
- In 1991, “ The Lady ” as she is known ,was awarded the Noble Peace Prize called her
- “An outstanding example of the power of the powerless”
- Parents - General Aung San , Myanmar’ s independant hero, the national mother Daw Khin Kyi, myanmar ambassador in delhi, India ,in 1960.

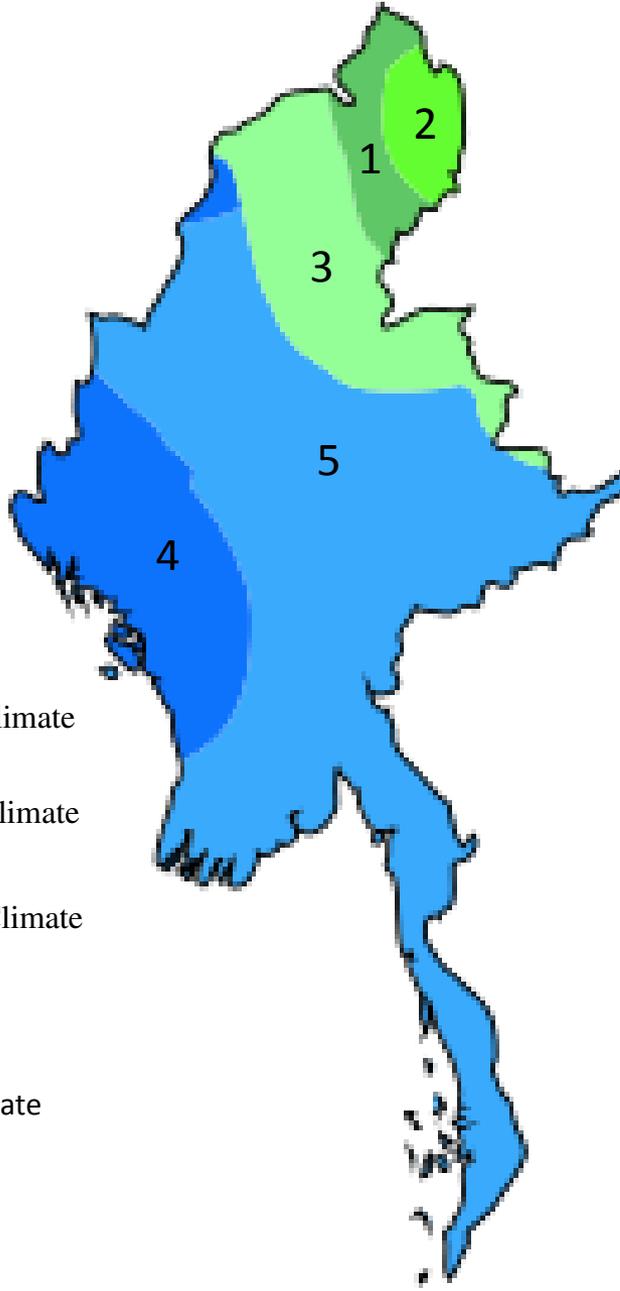
Introduction

Official Name:	The Republic of the Union Myanmar
Location:	Between 9° 32' and 28° 31' North Latitude and 92° 10' and 101° 10' East Longitude
Former Capital:	Yangon
Administration City:	Nay Pyi Taw
Area:	676,578 sq. km
International Boundary:	5860 km
Races:	135
States & Division:	14
Population (Average Growth Rate - 1.75% Per Annum)	53.86 millions (2018 estimated)
Neighbouring Countries:	China, Laos, Thailand, Bangladesh, India
Seacoast:	Bay of Bengal, Upper Corner of Andaman Sea

It is characterized by mountain ranges in the North, East and West and a long coastal strip in the South and West.



Climate Condition of Myanmar



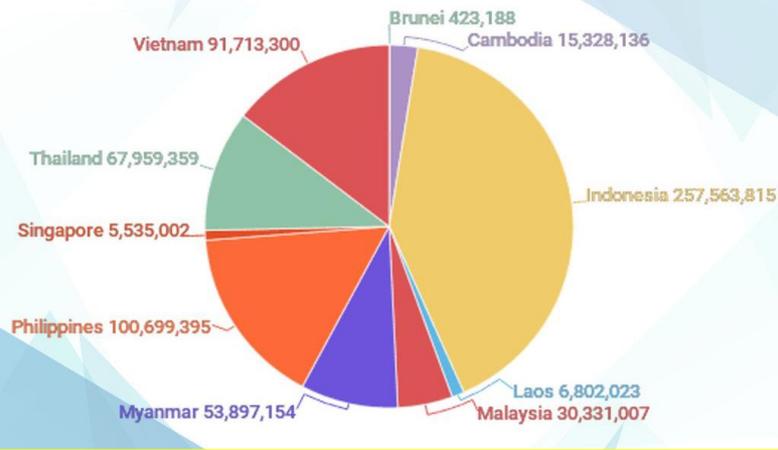
1. Humid Subtropical climate
2. Temperate Oceanic Climate
3. Humid Subtropical Climate
4. Monsoon Climate
5. Tropical Savanna Climate

Tropical monsoon in the lowlands below 2,000 m (6,562 ft); cloudy, rainy, hot, humid summers (southwest monsoon, June to September); less cloudy, scant rainfall, mild temperatures, lower humidity during winter (northeast monsoon, December to April). Climate varies in the highlands depending on elevation; subtropical temperate climate at around 2,500 m (8,202 ft), temperate at 3,000 m (9,843 ft), cool, alpine at 3,500 m (11,483 ft) and above the alpine zone, cold, harsh tundra and Arctic climate. The higher elevations are subject to heavy snowfall and bad weather.

There are three distinct seasons in Myanmar: The cold and dry season, from November to February, with average monthly temperatures of between 20°C and 24°C. The hot-dry season from March to April with average monthly temperatures between 30°C and 35°C. The wet season between May and October with average temperature between 25°C and 30°C. Annual rainfall in the delta region is approximately 2,500 millimetres (Yangon 2700 mm), while average annual rainfall in the Dry Zone is less than 1,000 millimetres (Mandalay 840 mm), the coastal regions receiving over 5,000 millimetres of rain annually.

Most Populous ASEAN Member States

(Figures as of 2015)



POPULATION

Population change rates in 2017

According to our estimations, daily change rates of Myanmar population in 2017 will be the following:

- 2 726 live births average per day (113.58 in an hour)
- 1 233 deaths average per day (51.37 in an hour)
- -269 emigrants average per day (-11.21 in an hour)

The population of Myanmar will be increased by 1 224 persons daily in 2017.

Myanmar Population Forecast

Year	Population	Yearly % Change	Yearly Change
2020	56,242,419	0.86 %	469,053
2025	58,373,480	0.75 %	426,212
2030	60,242,161	0.63 %	373,736
2035	61,751,905	0.5 %	301,949
2040	62,803,575	0.34 %	210,334
2045	63,387,320	0.19 %	116,749
2050	63,574,941	0.06 %	37,524

The total population projected at about 53 million people in country and 70% of population resides in rural area and most of them directly engage with agricultural works and their livelihood is mainly dependent on the agricultural products. 90% of population are Buddhism.

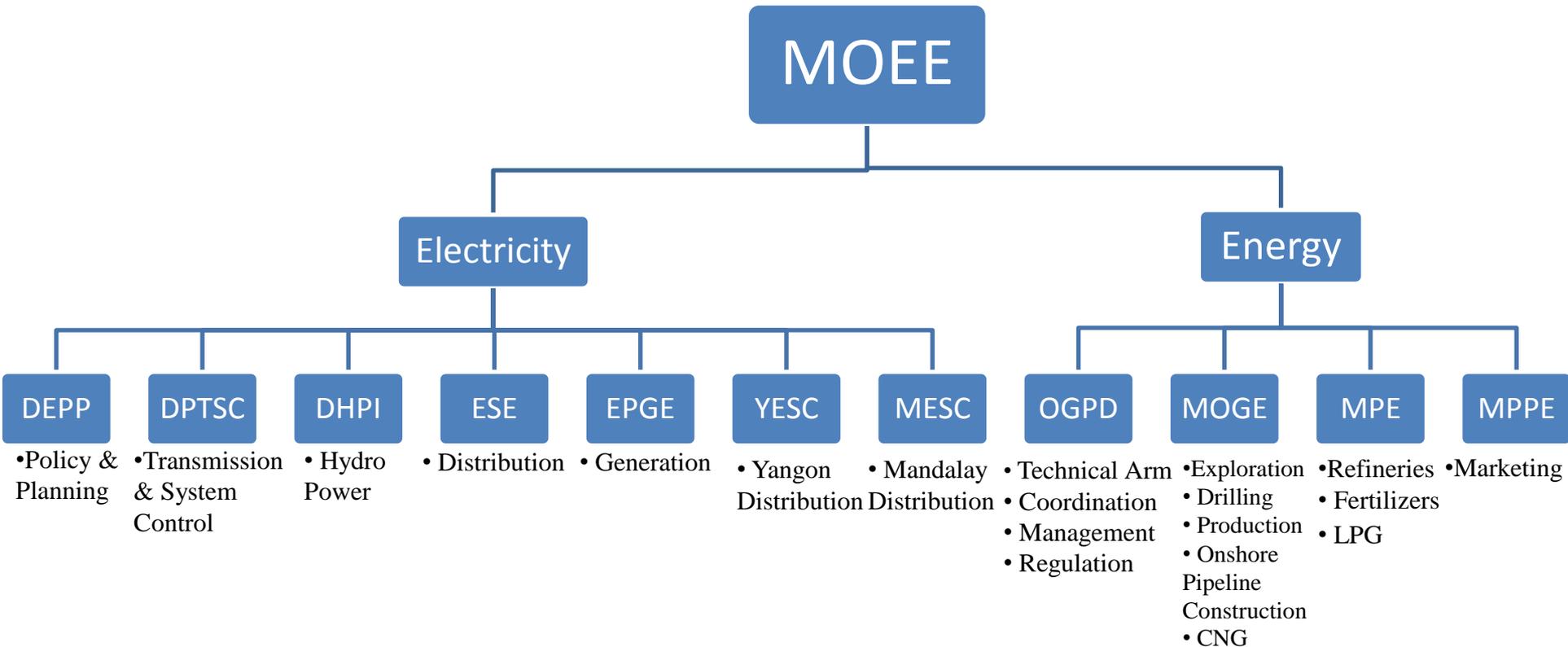
Economic Condition of Myanmar

	2015	2016	2017*
Population (million)	51.8	52.3*	52.6
GDP (US\$ billion)	62.9	68.3*	75.7
GDP per capita (US\$)	1,213	1,307*	1,439
Real GDP growth (%)	7.3	6.5*	6.9
Inflation (%)	11.4	9.8	9.1
Imports of goods (US\$ billion)	16.9	18.9*	21.2
Exports of goods (US\$ billion)	12.2	14.3*	16.9
Import (% change)	+4.2	+11.8	+12.1
Export (% change)	+6.5	+16.9	+18.8
Exchange rate Kyat (Kt):US\$ (average)	1,169	1,232	1,351

* Estimates

Source: IMF, World Bank, ASEAN Secretariat, Central Bank of Myanmar, Asian Development Bank

II. Organizational Structure of Ministry of Electricity and Energy



- Previously, we have the two separate ministries as Ministry of Electric Power & Ministry of Energy.
- Currently, these two ministries are merged as Ministry of Electricity and Energy for compact and perform the functions in efficient and effectively
- MOEE is taking the responsibilities of electricity, oil & gas and renewable energy(Hydro, solar, bio-fuel & geothermal) sub-sectors



Water Resources in Myanmar

Myanmar

- ❖ 24th most populous country in the world and the 40th Largest Country by area.

Water Resources

- ❖ Possesses 12% of Asia's freshwater Resources
- ❖ 16% in ASEAN Countries

Major Rivers

- ❖ Ayeyawady,
- ❖ Chindwin,
- ❖ Sittaung,
- ❖ Thanlwin

Hydropower

- ❖ 6% of Asia's Hydropower Potential >100,000 MW

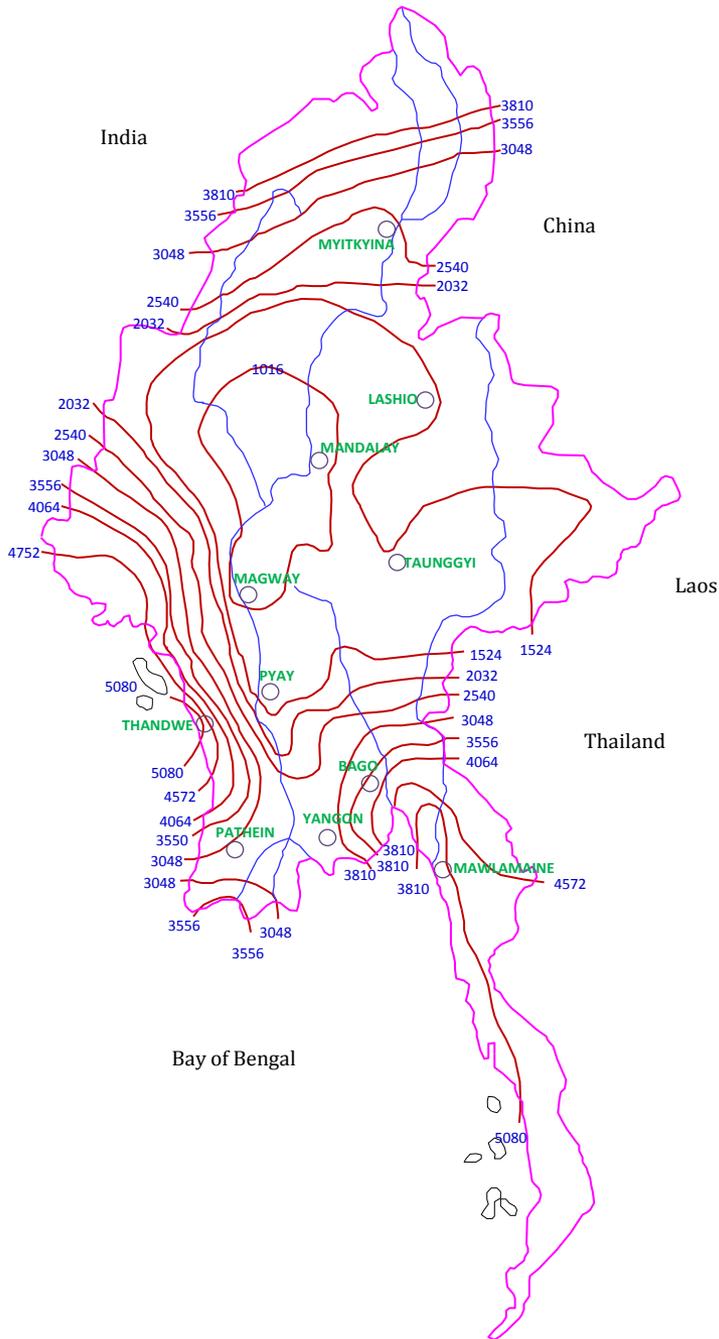
- ❖ The water basin characteristics in Myanmar are quite variable due to the differences in physiographic features.
- ❖ The principal water courses flowing separately in Myanmar comprise four major rivers, the Ayeyarwady, Sittaung, Thanlwin., Bago and their major tributaries.
- ❖ All rivers with the exception of the Thanlwin within Myanmar territory and can be considered nationally own water assets.
- ❖ Their drainage area is spread widely over the country, amounting some 876.73 million acre-ft (1,082 km³) of water volume per annum from a drainage area of about 284,800 sq-miles (738,230 km²).



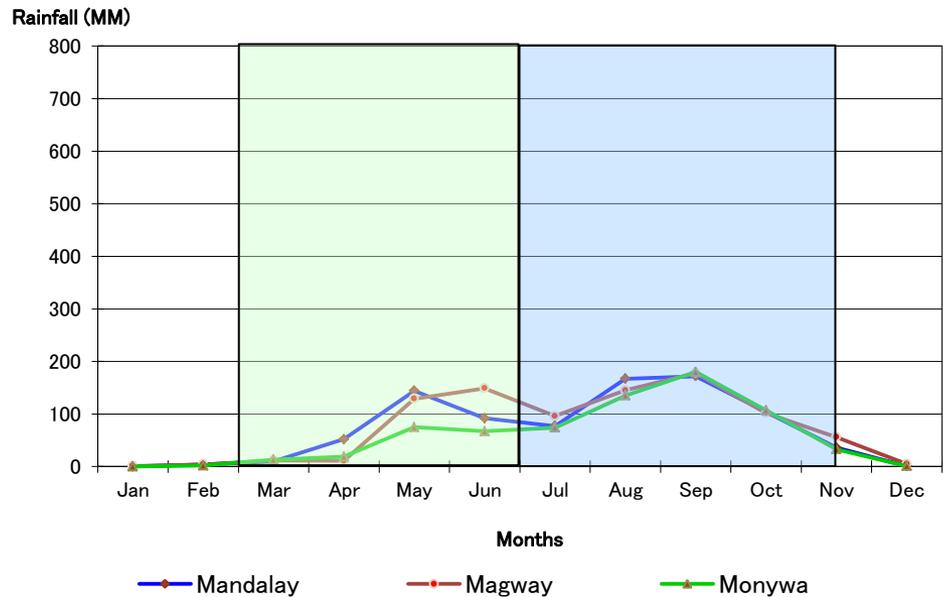
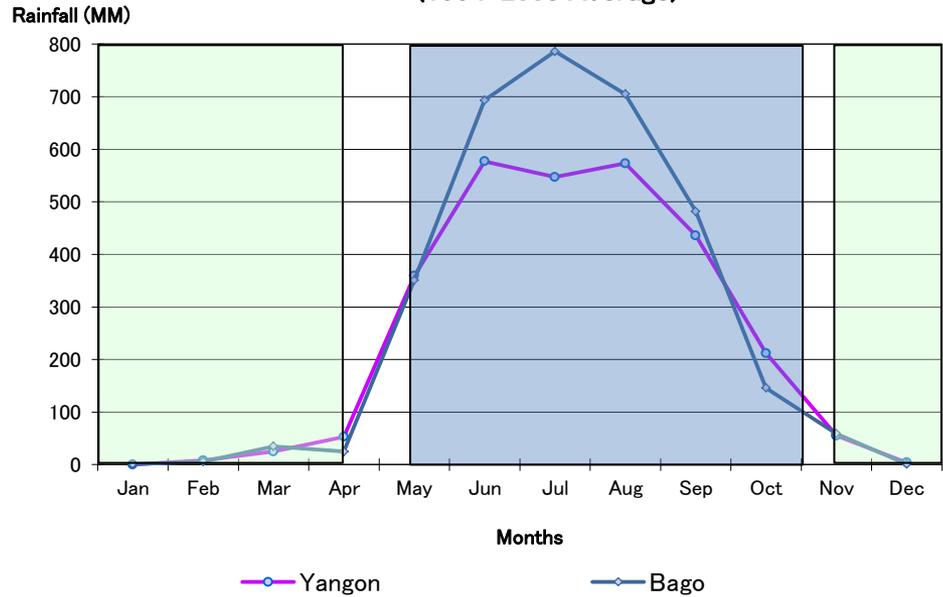
THE AYEYARWADY RIVER



Isohyetal Map of Myanmar



Monthly Rainfall at Selected Stations
(1994–2003 Average)



Mandalay, Magway and Monywa 700 ~ 900 mm

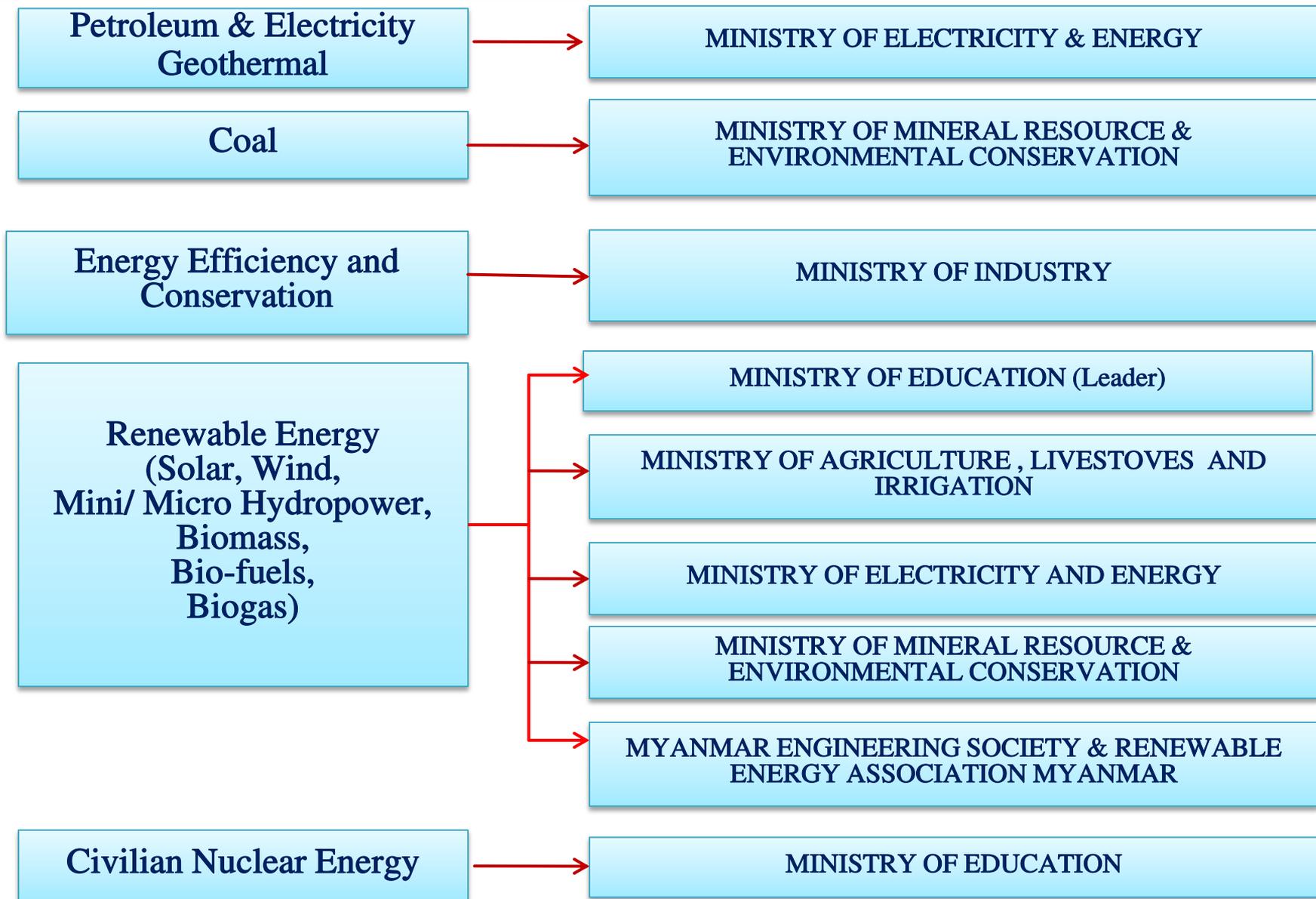
Tentative National Energy Policy of Myanmar

1. To minimize the environmental impacts, to include natural resources utilization plan for future generations , to invite the local and foreign investments and to continuously carry out Corporate Social Responsibility (CSR) activities in extraction and utilization of natural resources in order to fulfill the nation's energy needs.
2. To adopt prioritized plans on Energy Efficiency and Conservation
3. In defining the energy pricing in accordance with the market oriented economy, the necessary laws and regulations shall be promulgated by observing the ASEAN and international energy pricing policy in order to maintain the stability of energy prices, to guarantee the economic benefits for both energy producers and energy consumers, to ensure affordable energy price for the people, to ensure affordable energy price for the people and to set up an energy fund.
4. To follow energy standards and specifications which are appropriate for the nation and which are also in compliance with ASEAN and international practices.
5. To promote private sector participation or privatization according to the State's economic policy for realizing the success of State's Own Enterprises.

Tentative National Energy Policy of Myanmar

6. To lay down the short term and long term plans for not only renewable energy and hydropower projects but also feasible utilization of Liquefied Natural Gas (LNG) in thermal power plants to generate more electricity in order to meet the increased demand which will accompany with the nation's GDP growth.
7. To participate in regional energy trading (such as electric power, crude oil and natural gas) by expanding the power grid and pipeline network to neighboring countries including ASEAN nations.
8. To implement the following short term and long term plans in order to get power generation stability by conserving the water catchment areas of hydropower dams and the reservoirs, rehabilitating the aged plants and constructing the new ones in the grid system and replacing the ineffective transmission lines, constructing newlines, expanding the network system and building substations in the national grid system.
9. To prioritize the use of solar, wind, hydro, biomass and other renewable energy resources in fulfilling the electricity demand of off-grid areas.
10. To establish Energy Database System and to draw and implement the energy supply plans by surveying the nation's energy demand annually.
11. To formulate a plan on civilian use of nuclear energy.
12. To set up the energy stockpiling plan for future energy security

Institutional Framework for Myanmar Energy Sector



Energy Resources in Myanmar

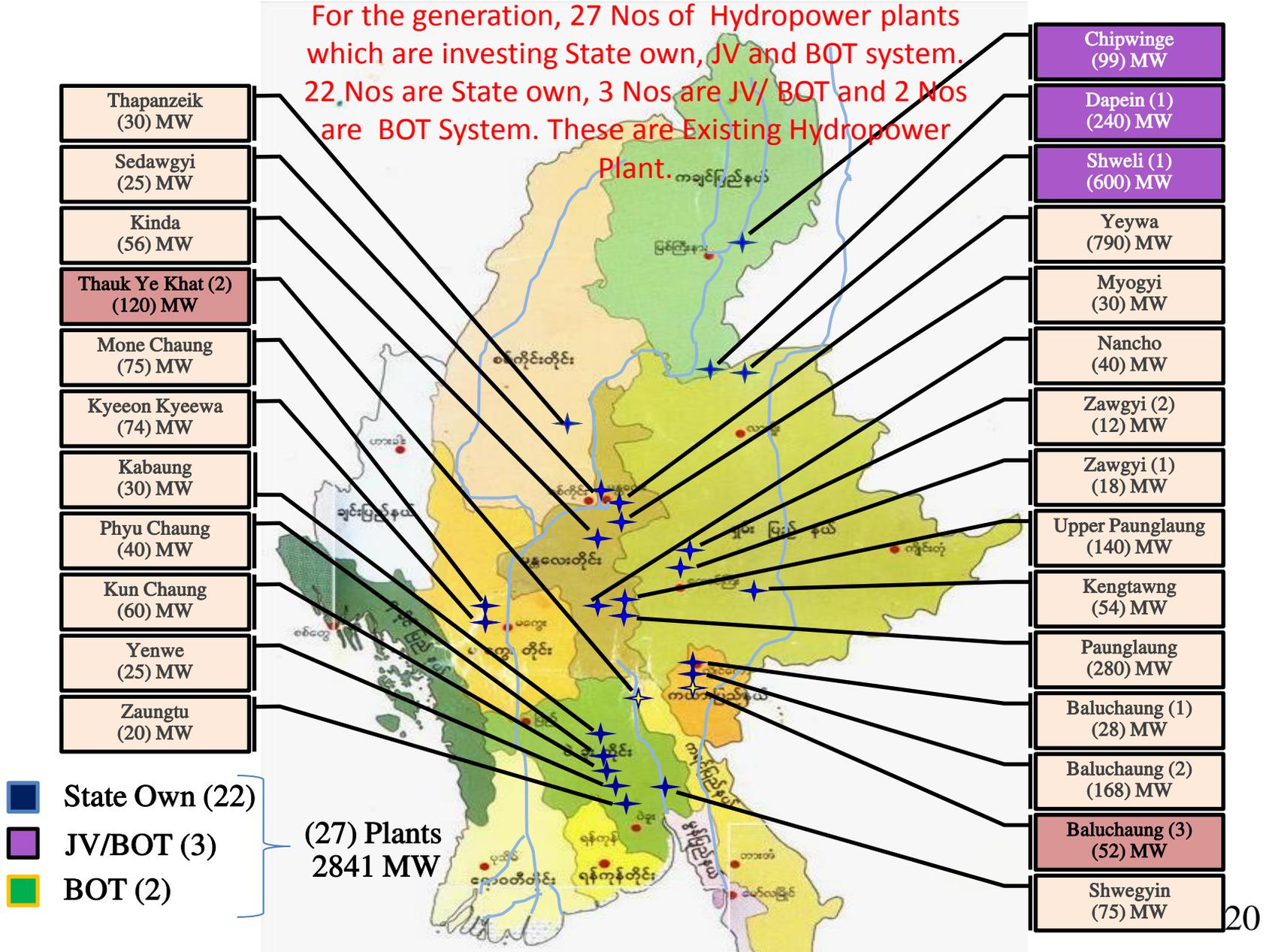
Resource		Reserve
Hydropower		>100 GW (Estimate)
Crude Oil	Onshore	102 MMbbl (Proven)
	Offshore	43 MMbbl (Proven)
Natural Gas	Onshore	5.6 TCF (Proven)
	Offshore	11 TCF (Proven)
Coal		540 million tons (Estimate)
Wind		365 .1 TWh/year
Solar		52,000 TWh/year



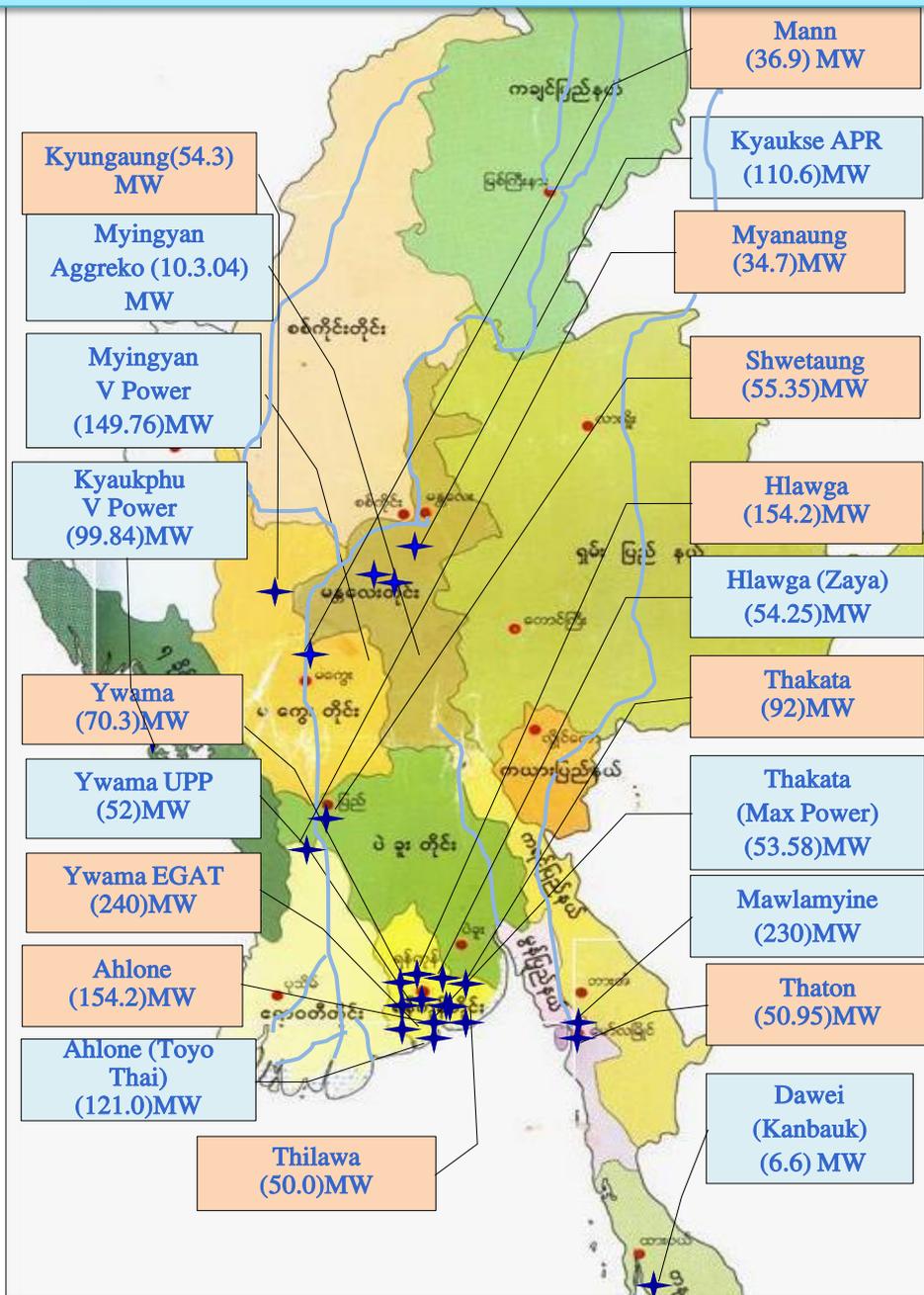
(Source: Ministry of Energy 2013, ADB 2012 and JEPIC 2012)

Existing Hydropower Plants

For the generation, 27 Nos of Hydropower plants which are investing State own, JV and BOT system. 22 Nos are State own, 3 Nos are JV/ BOT and 2 Nos are BOT System. These are Existing Hydropower Plant.

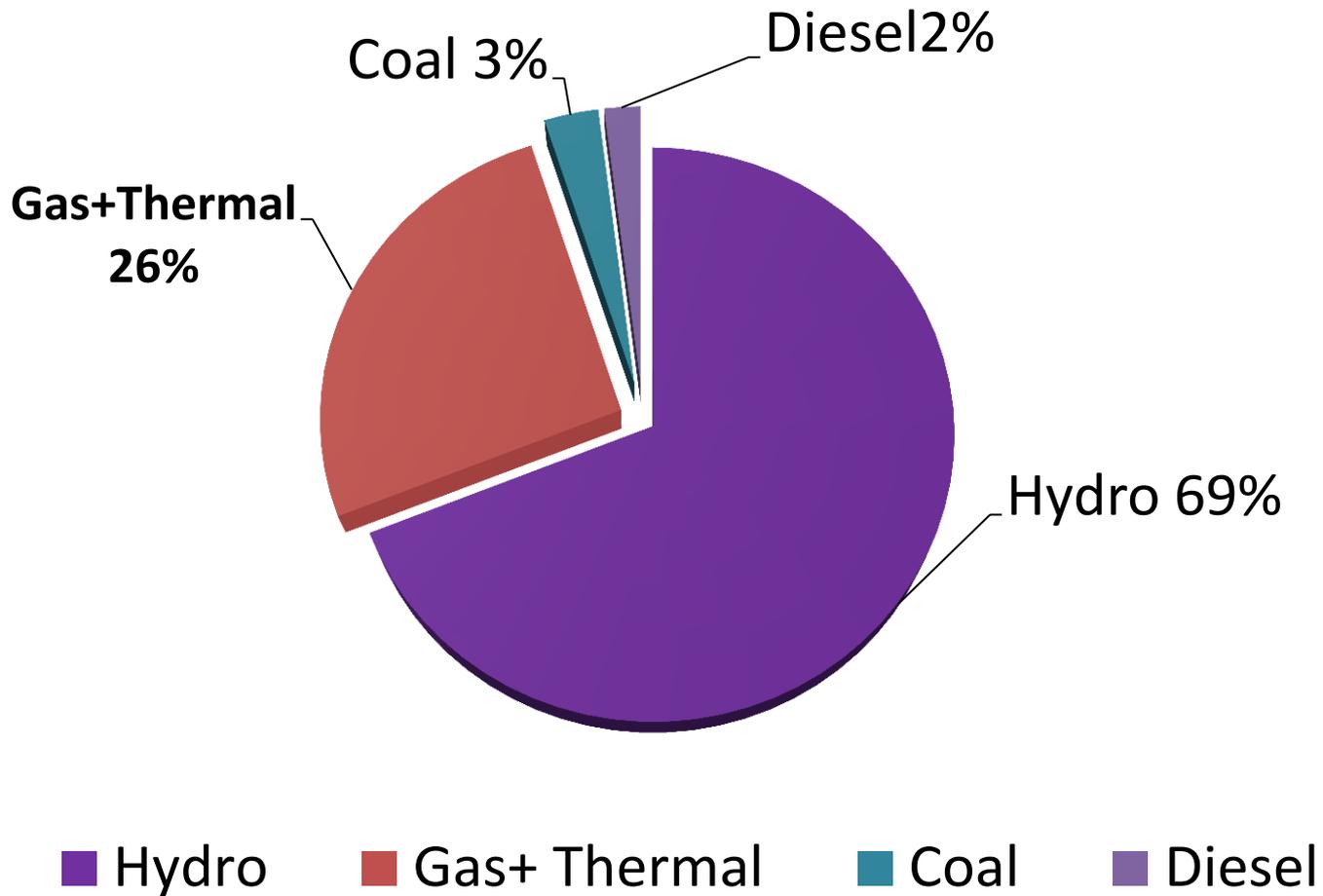


Gas Turbine Power Plants

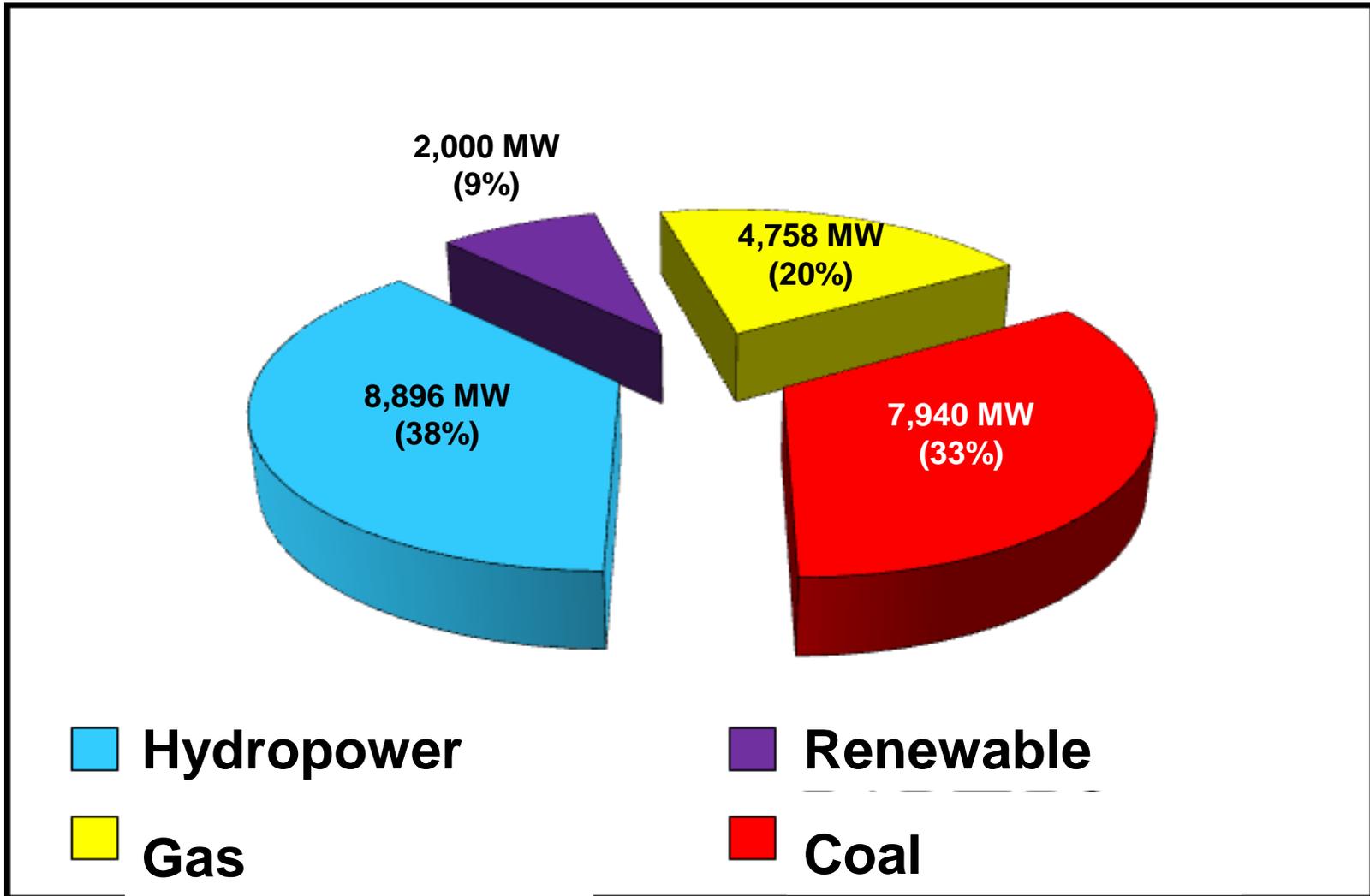


Total Power Plant - No(21)
Total Installed - 2452.4 MW
Capacity
(mostly situated in Yangon area)

Current Status of Electricity Supply in 2017-2018



Scenario on Generation Mix (2030 -2031)

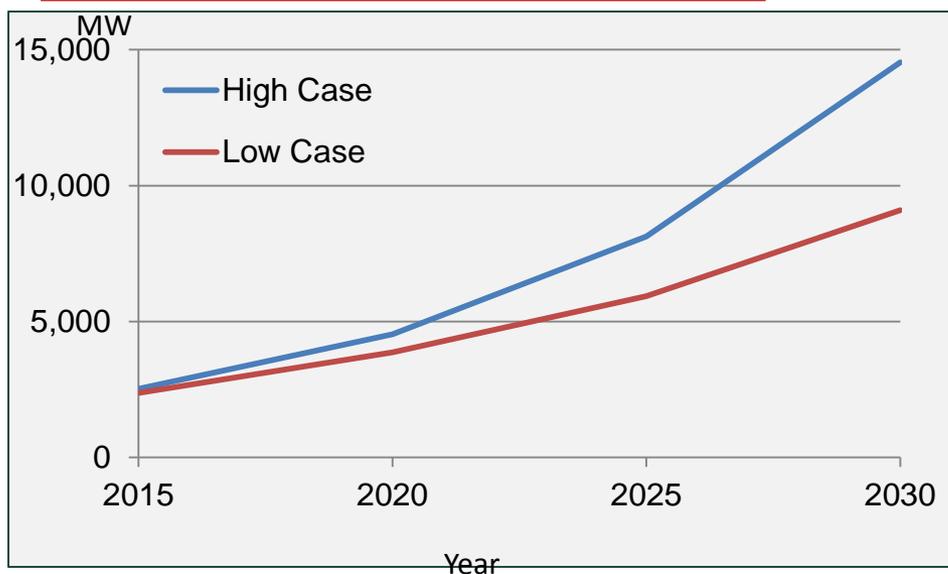


Estimated Total Installed Capacity : 23,594 MW

Demand Forecast Results

The maximum power demand in Myanmar will vary from the minimum at around 9,100 MW to the maximum at 14,542 MW by 2030, forecasted based on macro analysis.

Results of Demand Forecast



Results of Demand Forecast by region/state

Region /State	High Case (MW)		Low Case (MW)	
	FY2012	FY2030	FY2012	FY2030
Kachin	21	185	21	140
Kayah	8	162	8	130
Kayin	13	165	13	135
Chin	3	90	3	60
Mon	45	418	45	338
Rakhine	10	243	10	180
Shan	103	355	103	288
Sagaing	98	349	98	282
Tanintharyi	52	290	52	235
Bago	131	646	131	523
Magwe	106	293	106	238
Mandalay	457	2,731	457	2,203
Ayeyarwaddy	85	406	85	329
Yangon	742	8,209	742	4,019
Total	1,874	14,542	1,874	9,100

Year	High Case (MW)			Low Case (MW)		
	Total	Non-industry	Industry	Total	Non-industry	Industry
2012	1,874	1,265	609	1,874	1,265	609
2020	4,531	3,060	1,472	3,862	2,390	1,472
2030	14,542	9,819	4,723	9,100	5,631	3,468

Year	Special Economic Zone (MW) **			
	Thilawa	Kyaukphyu	Mandalay	Dawei
2020	180 – 200	100	100	180
2030	400 – 500	180	300	300 - 500

National Electricity Master Plan -JICA (2001-2031)

Wind



Solar



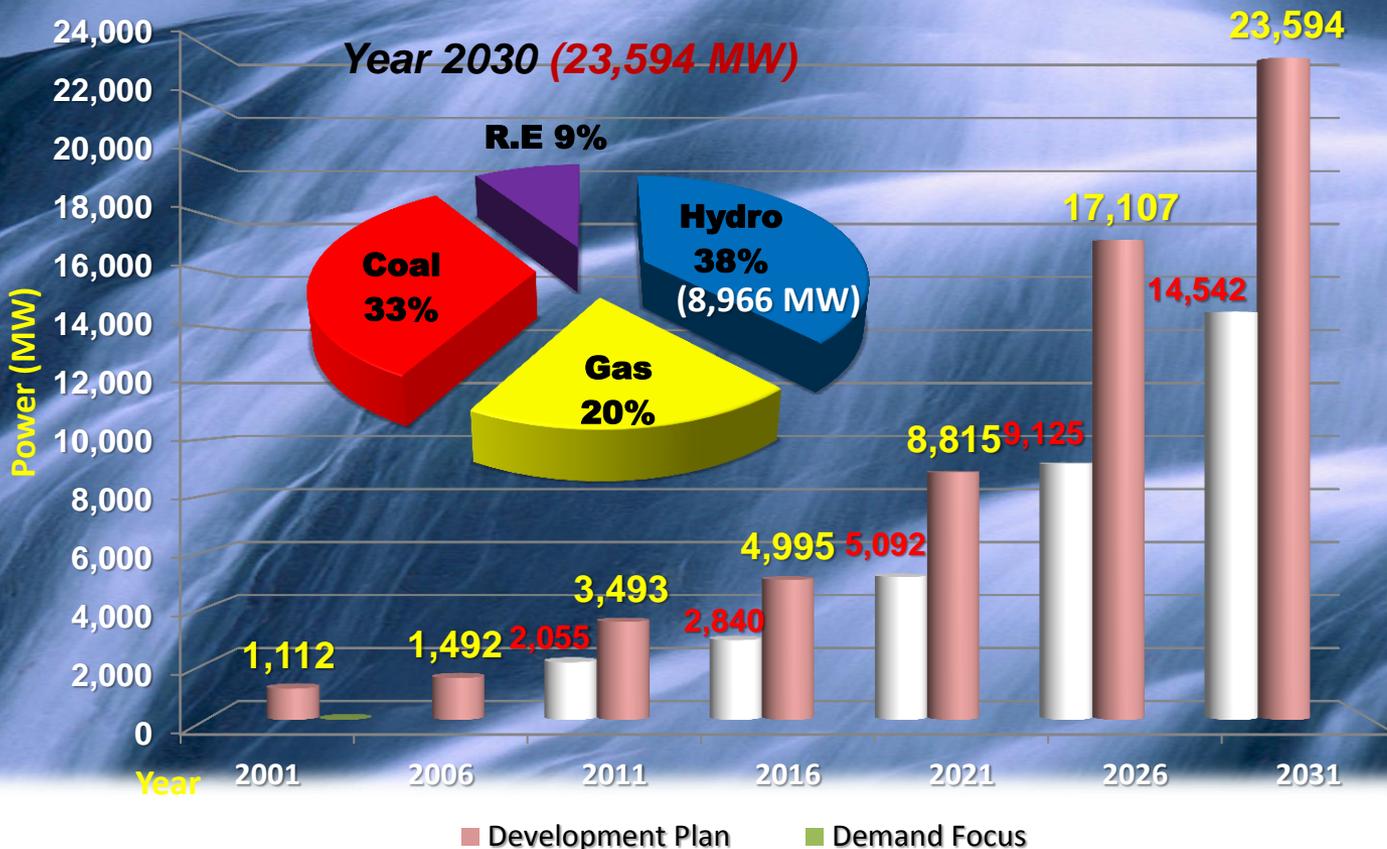
Hydro



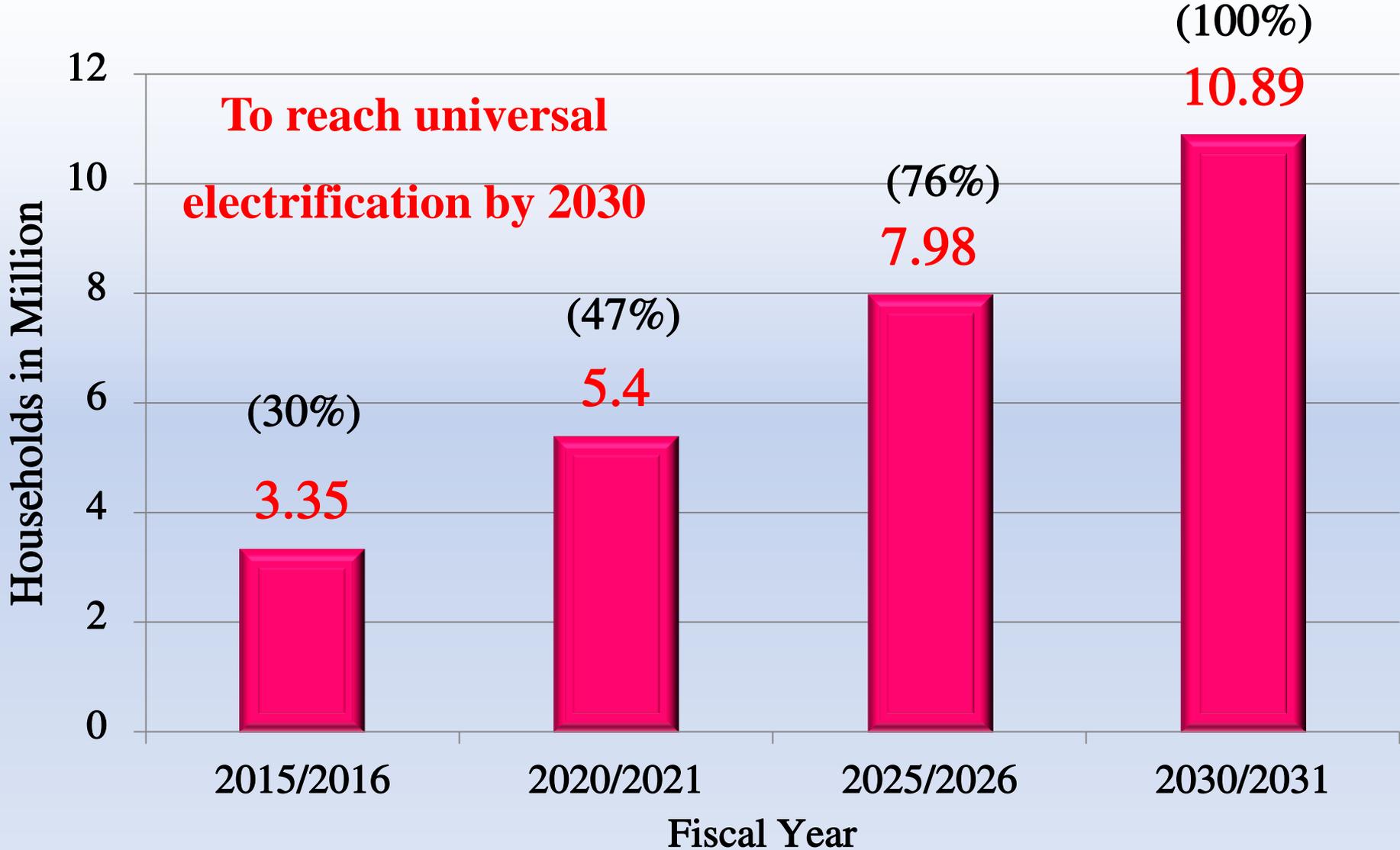
Gas



Thermal



National Electrification Plan – NEP



Existing National Grid System



Existing Transmission Lines

Voltage (kV)	Nos. of Line	Length (miles)
230	62	2848.75
132	40	1366.68
66	195	3704.55

Existing Substations

Voltage (kV)	Nos. of Sub-station	Capacity (MVA)
230	46	5,865
132	36	2,193.5
66	166	3338.61

Future

- (white) Hydro-power Station
- (orange) Gas Turbine Power Station
- (grey with X) Steam Turbine Power Station
- △ (red) 230 kV Substation
- △ (blue) 132 kV Substation
- △ (green) 66 kV Substation
- △ (yellow) 33 kV Substation
- △ (purple) 11 kV Substation

Existing

- (blue) Hydro-power Station
- (orange) Gas Turbine Power Station
- ⊗ (grey) Steam Turbine Power Station
- △ (red) 230 kV Substation
- △ (blue) 132 kV Substation
- △ (green) 66 kV Substation
- △ (yellow) 33 kV Substation
- △ (purple) 11 kV Substation

— (red) 230 kV Transmission Line

— (blue) 132 kV Transmission Line

— (green) 66 kV Transmission Line

— (yellow) 33 kV Transmission Line

— (purple) 11 kV Transmission Line

On-going 500kV Transmission Lines and Substations

500kV Transmission Lines

Sr. No	Particulars	Length (miles)	Completed (%)	To be Completed (Estimate)
1	Myeiktilar-Taungoo Transmission Line	146	65.88 %	2020
2	Taungoo-Phayagyi Transmission Line	117	Investigation	2021
3	Phayagyi - Hlaingtharyar Transmission Line	60	Investigation	2021

500kV Substations

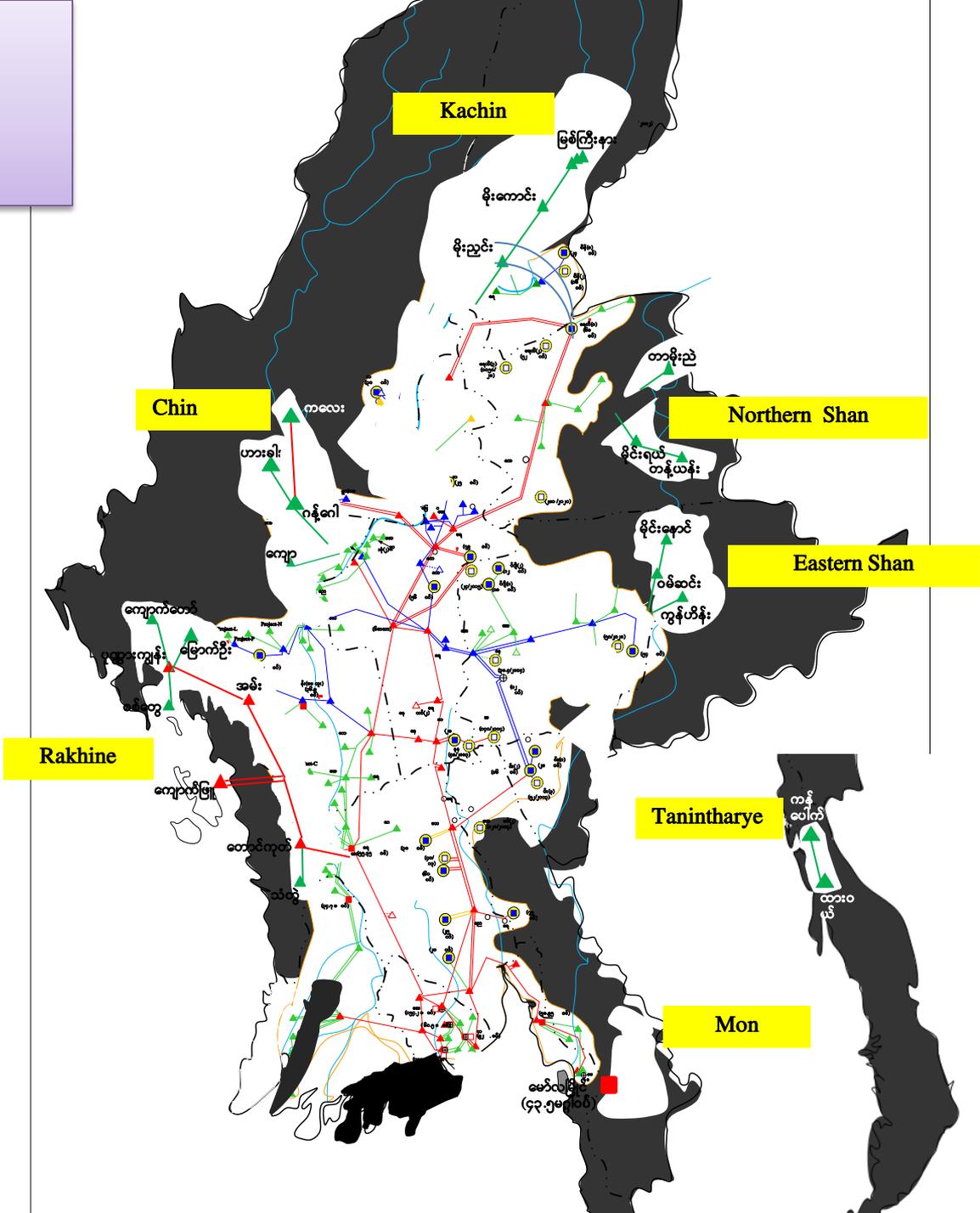
Sr. No	Particulars	Completed (%)	To be Completed (Estimate)
1	Myeiktilar Substation & Taungoo Substation	Investigation	2021
2	Phayagyi Substation & Hlaingtharyar substation	Investigation	2021

Electrified Areas in 2018

Total Household (Million) **10.88**

Electrified Household (Million) **4.35**

Electrified Household **39.98 %**



Market Price (Electricity)

Present Price		Consumed Ratio
For Residential		
1 unit to 100 units	35 kyats	60.45%
101 units to 200 units	40 kyats	
201 units and above	50 kyats	
For Commercial used		
1unit to 500 units	75 kyats	39.55%
501 units to 10,000 units	100 kyats	
10,001 units to 50,000 units	125 kyats	
50,001 units to 200,000 units	150 kyats	
200,001 units to 300,000 units	125 kyats	
300,001 units and above	100 kyats	

Strategic ways for Power Sector

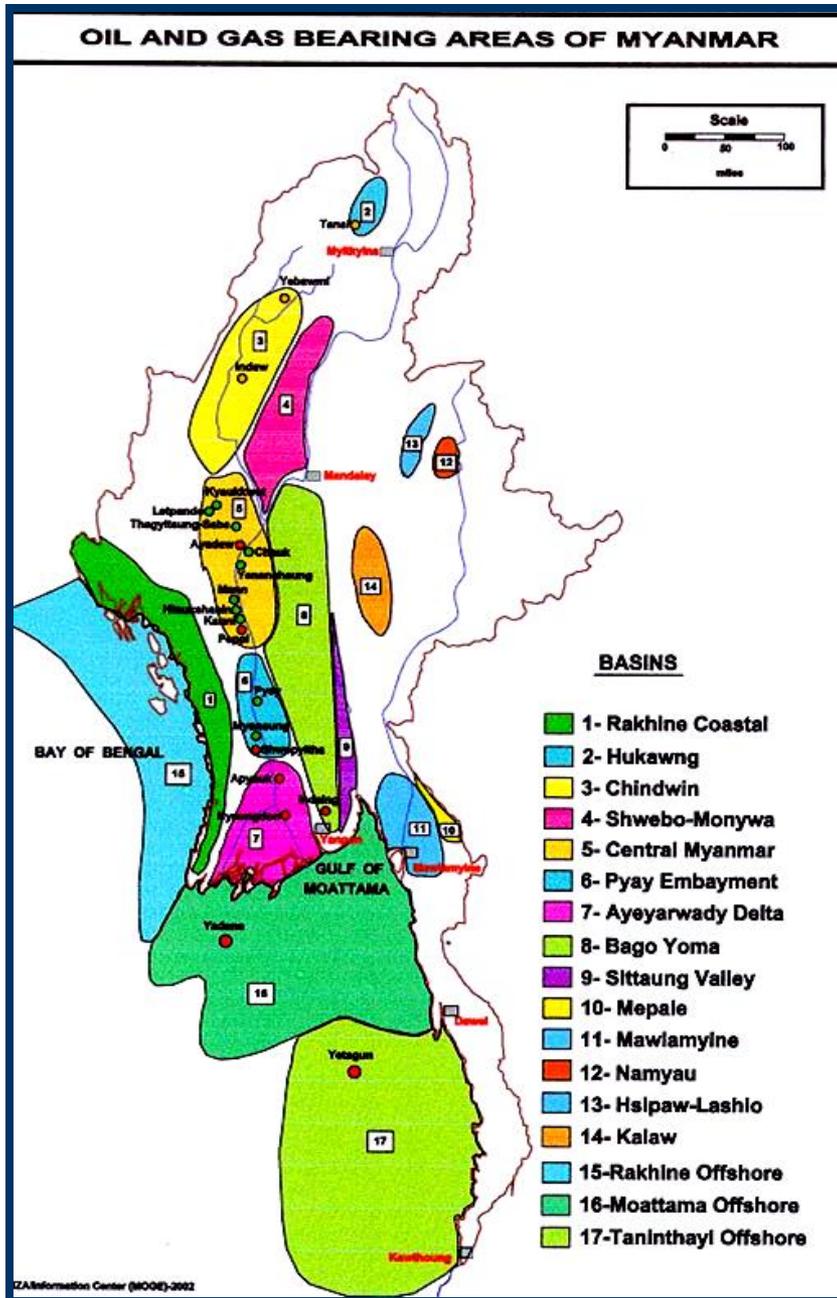
For power sector development, we have three kind of three strategic ways for Power Generation, Transmission and Distribution;

- ✓ National Budget System
 - ✓ International Loans
 - ✓ Cooperating with Local and foreign companies;
- Under JVA projects - 8 (Hydro-7 ,GT-1)
 - Under MOA projects -24 (Hydro -12, Wind -1, Solar-3, GT-3, Coal-5)
 - Under MOU projects - 47 (Hydro -28, Wind - 3, Solar-3, GT- 5,Coal-8)
 - Under Agreement projects - 3 (Hydro-3)
 - Under NTP projects - 4 (LNG -3 ,GT-1)
-
- Total projects - 86

Way Forward for Electric Sector

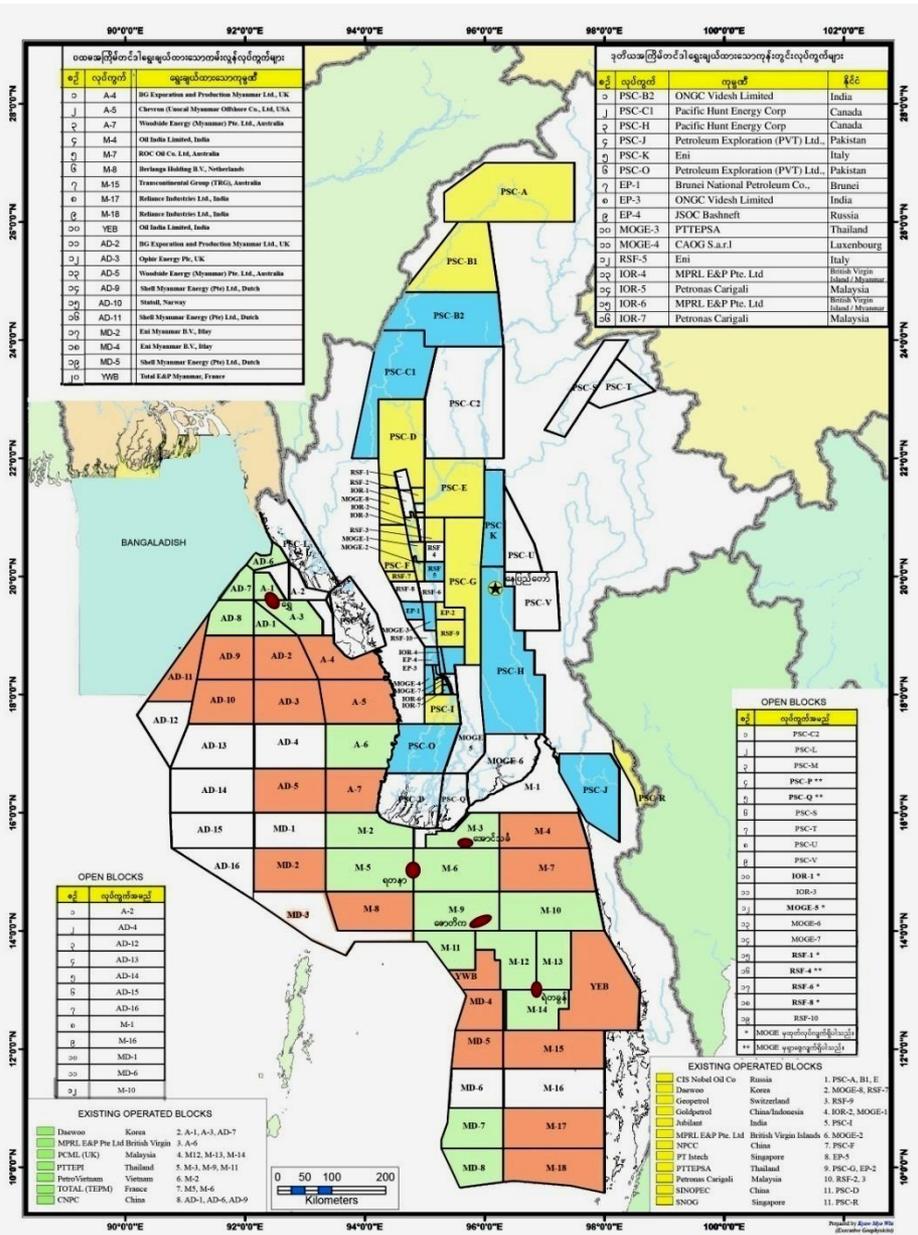
- ❑ To expand and construct more generation plants and thermal plants
- ❑ To make Public Awareness of Power Resource
- ❑ To upgrade transmission lines and substations
- ❑ To assist financing for all Power Project
- ❑ To review the Policy Framework for investment attraction

Sedimentary Basins of Myanmar



- A total of **17 sedimentary** basins have been identified to date, of which;
- **3 Onshore Tertiary basins** (Central, Pyay & Ayeyarwady Delta) are producing oil and gas
- **3 Offshore Tertiary basins** (Moattama, Rakhine & Tanintharyi Offshore) are producing gas and condensate
- **8 onshore Tertiary frontier basins** need further exploration
- **3 onshore Pre-Tertiary basins** are secondary Targets.

The operations currently in Petroleum Sector



Onshore

- ❖ Operating - 37 Blocks
- ❖ Open - 16 Blocks
- ❖ Total - 53 Blocks

Offshore

- ❖ Operating - 38 Blocks
- ❖ Open - 13 Blocks
- ❖ Total - 51 Blocks

Existing Offshore Projects in Myanmar

YADANA PROJECT

TOTAL	31.24%
UNOCAL	28.26%
PTTEP	25.50%
MOGE	15.00%



Export 650 MMscfd
Domestic 200 MMscfd

YETAGUN PROJECT

PETRONAS	40.75%
NIPPON	19.40%
PTTEP	19.40%
MOGE	20.45%



Export 200 MMscfd
5,000 condensate

SHWE PROJECT

DAEWOO	51.00%
ONGC	17.00%
GAIL	8.50%
KOGAS	8.50%
MOGE	15.00%



Export 400 MMscfd
Domestic 100 MMscfd

ZAWTIKA PROJECT

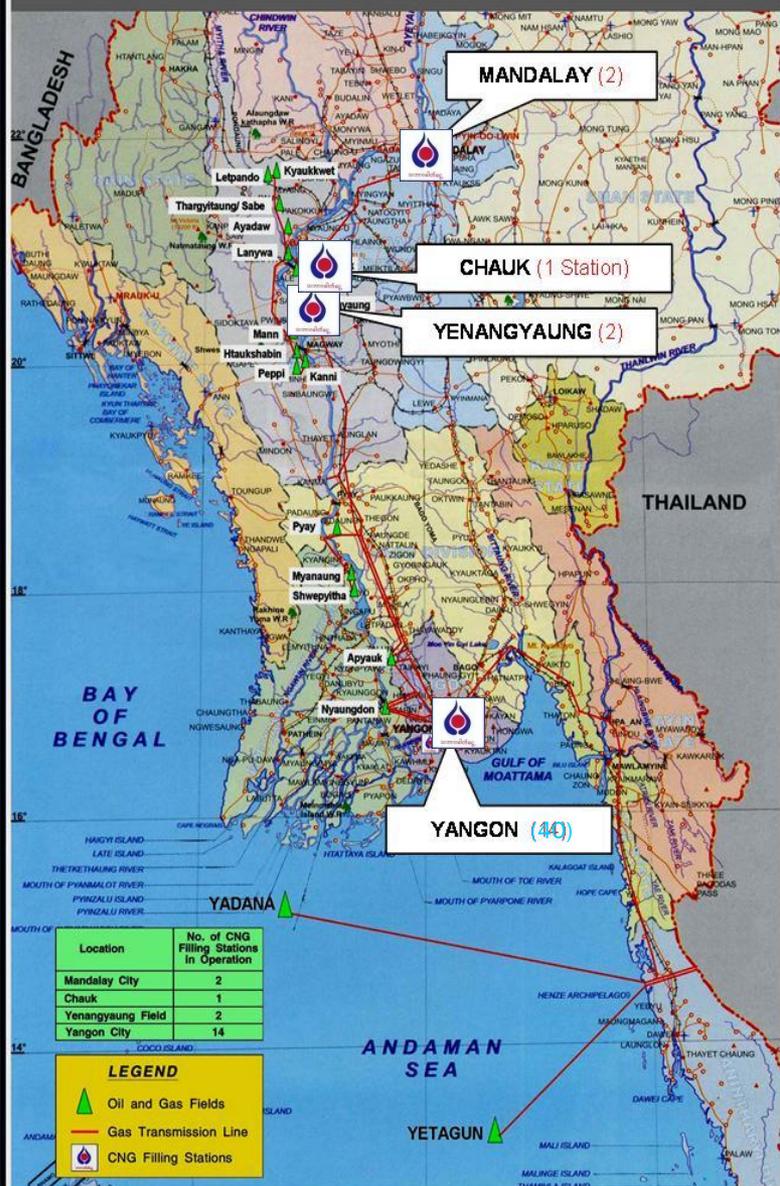
PTTEP	80.00%
MOGE	20.00%



Export 200 MMscfd
Domestic 100 MMscfd

CNG / NGV Converting Program

CNG FILLING STATION AND PIPELINE NETWORK IN MYANMAR



- ❖ Initiated in Myanmar since 1986.
- ❖ 1986 – August 2004 :
 - 5 CNG Refueling Stations -
 - 2 in Yangon City
 - 2 in Yenangyaung Field
 - 1 in Chauk Field
 - 587 NGVs
- ❖ CNG / NGV Programme was reactivated in August 2004 and widely used in 2005.
- ❖ As at 2016 :
 - 46 CNG Refueling Stations in Myanmar-
 - 41 in Yangon City
 - 2 in Mandalay City
 - 2 in Yenangyaung Oil Field
 - 1 in Chauk Oil Field
 - About 28,299 NGVs

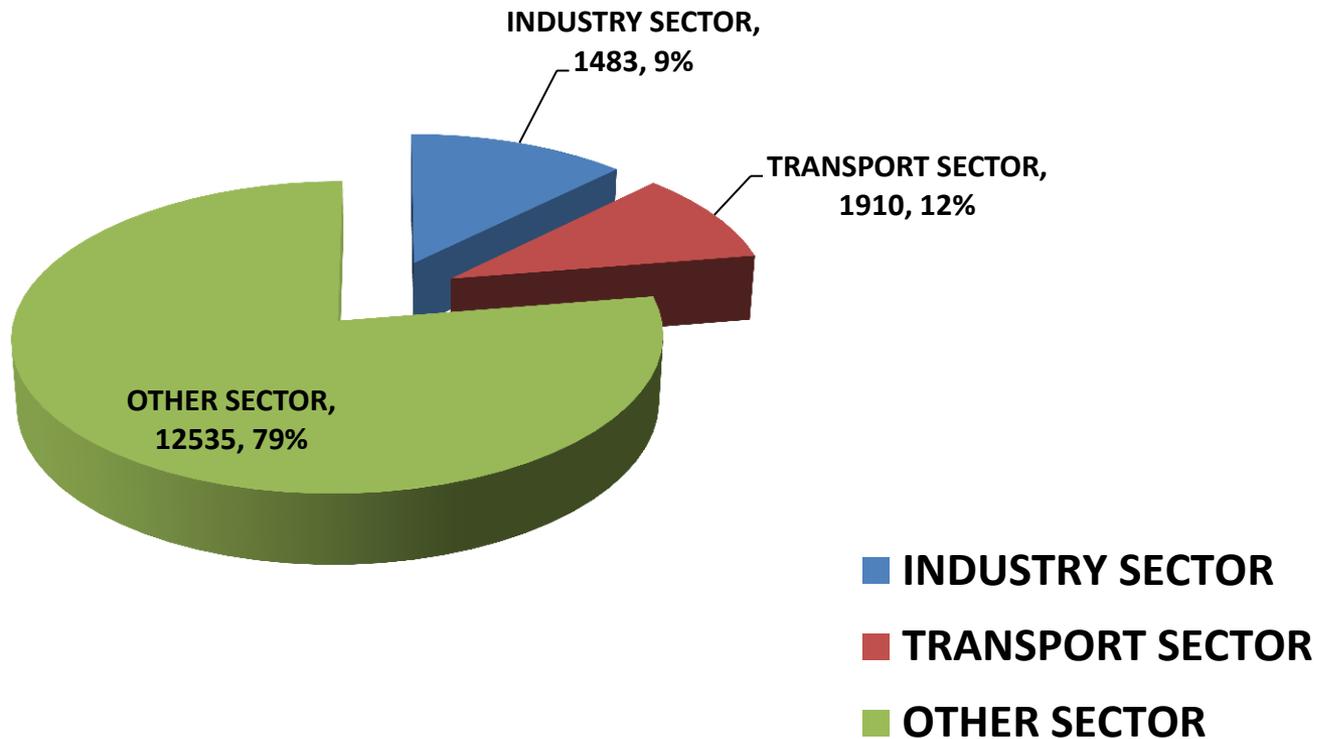
Market Price (Natural Gas)

Project	Unit	Price	
		MMK	USD
<u>Offshore</u>			
<u>Export Use</u>			
Yadana Project	1MMBTU		5.8333
Yetagun Project	1MMBTU		5.8333
Zawtika Project	1MMBTU		5.8333
Shwe Project	1MMBTU		5.9533

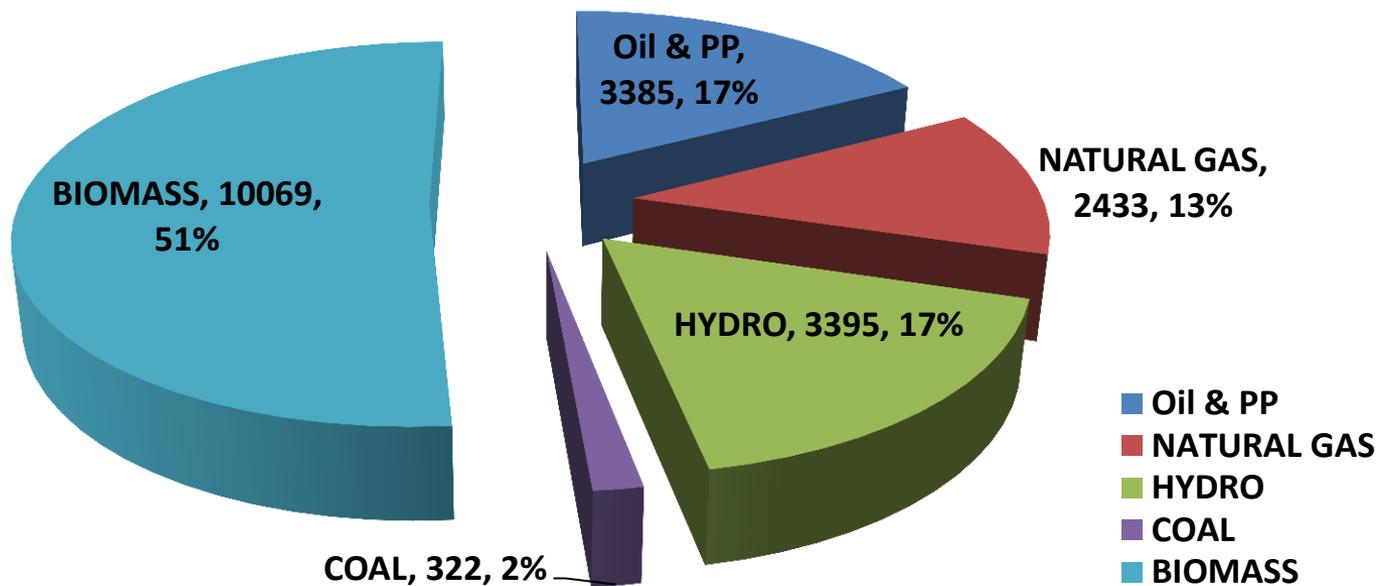
Market Price (Natural Gas) Domestic (Government & Private)

Project	Unit	Price	
		MMK	USD
<u>Onshore</u>			
Government Use	1,000 ft ³	2,000	
Private Use	1,000 ft ³	6,060	
<u>Offshore</u>			
Government Use	1MMBTU		7.5
Private Use			
(i) Zawtika Gas			
(1) Private	1,000 ft ³		4.6698
(2) Joint Venture	1,000 ft ³		5.0105
(ii) Shwe Gas (Offtake Point)			
(1) Kyaukphyu	1MMBTU		7.7207
(2) Yenangyaung	1MMBTU		8.4551
(3) Taungtha	1MMBTU		8.8654
(4) Mandalay	1MMBTU		9.1728
(iii) Yadana Gas	1,000 ft ³		5.0389

Final Energy Consumption by Sector (2016-2017) KTOE

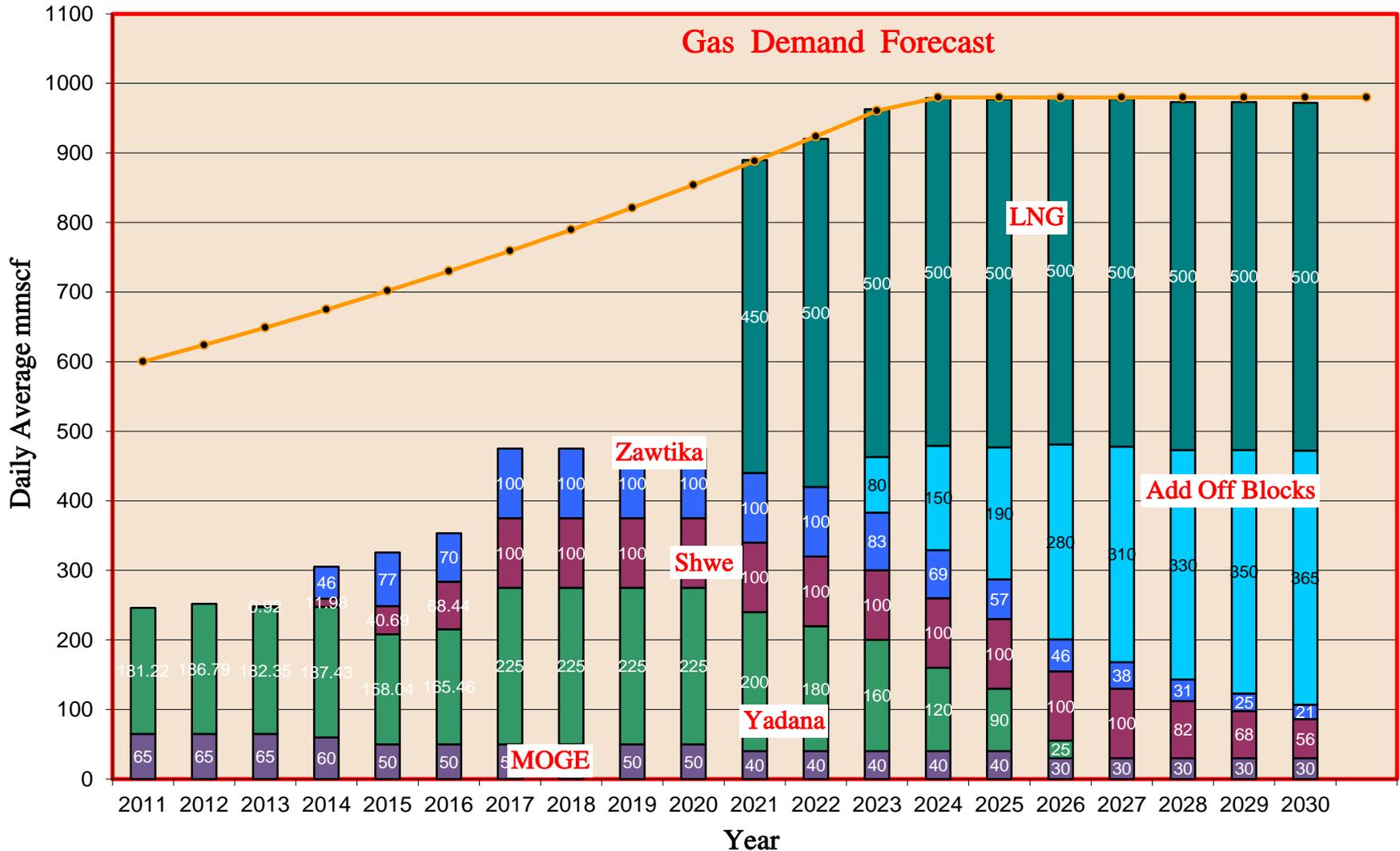


Primary Energy Supply (2016-2017) KTOE



Prediction for Gas Demand & Supply in Myanmar

GAS DEMAND AND SUPPLY FORECAST IN MYANMAR



Location of Petrochemical Plants

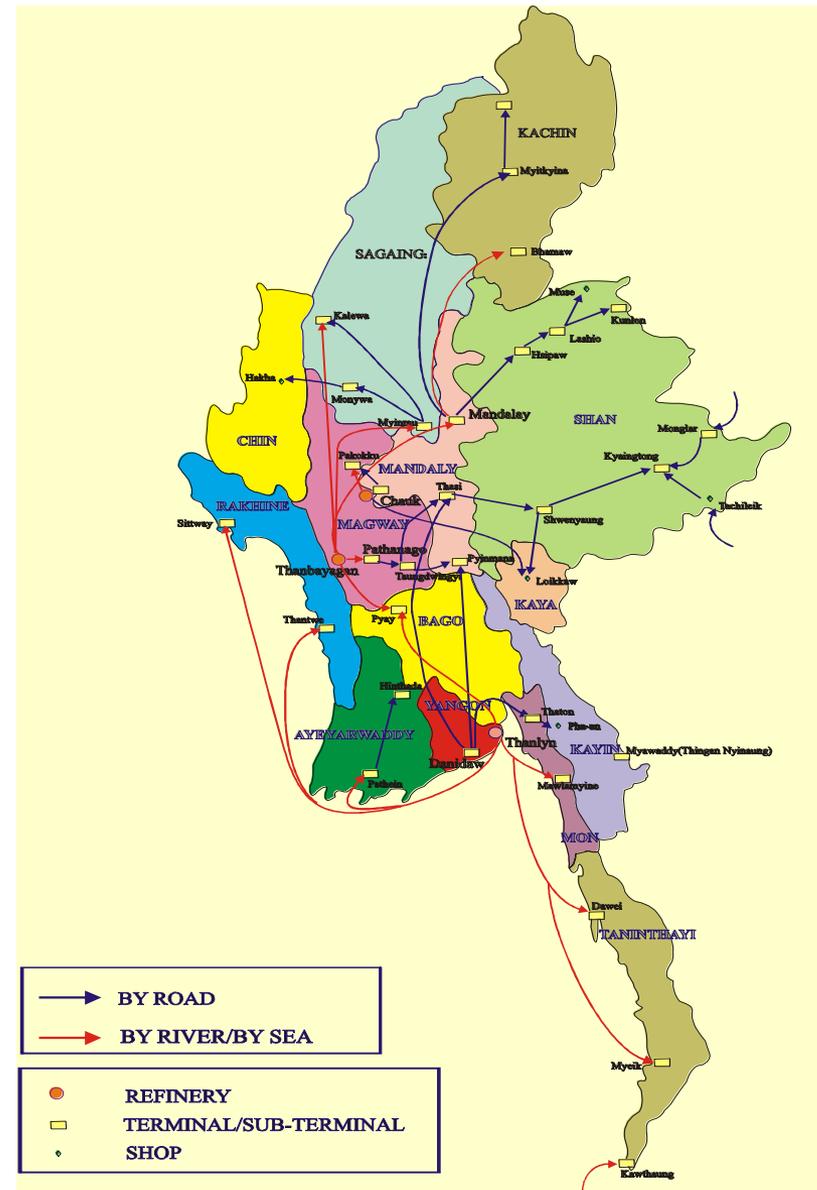


No	Factory	Place
1.	No(1) Refinery	Thanlyin(Yangon Reg)
2.	No(2) Refinery	Chauk (Magwe Reg)
3.	Petrochemical Complex	Min Hla (Magwe Reg)
4.	No(1) Fertilizer Factory	Sa-Le (Magwe Reg)
5.	No(2) Fertilizer Factory	Kyunchaung (Magwe Reg)
6.	No(3) Fertilizer Factory	Kyawzwa (Magwe Reg)
7.	No(4) Fertilizer Factory	Myaungdaga (Yangon Reg)
8.	No(5) Fertilizer Factory	Pathein (Ayeyarwaddy Reg)
9.	LPG Plant	Minbu (Magwe Reg)
10.	LPG Plant	Nyaungdon(Ayeyarwaddy Reg)
11.	LPG Plant	Kyunchaung,(Magwe Reg)
12.	Methanol Plant	Seiktha (Ayeyarwaddy Reg)

Petroleum Downstream Sector

- ✓ *Petroleum Products Distribution*
 - ❖ *fully privatized since 2010 and 2094 stations are permitted for distribution*
 - ❖ *12 fuel stations for government sector*
 - ❖ *Storage - 6 licenses*
 - ❖ *Transportation (Banker -15)*
 - ❖ *Aviation Turbine Fuel - 13*

We are allowing more local private companies to participate in petroleum products business since 2010. Until now, over 2000 stations are permitted around the country not only the local but also international investors.



LNG Business

- In Myanmar, LNG is one of the options for future gas supply to fulfill the domestic needs.
- **Currently, two existing out of 4 offshore projects are being declined.**
- **Accordingly, (3) foreign companies implement (3) LNG Projects, one is (1390) MW located in Ayeyarwady Region, one is (1230) MW located in Tanintharyi Region, one is (356) MW located in Yangon Region, totally (2976) MW.**
- **All technical and commercial assistance are provided by World Bank.**

Way Forward for Petroleum Sector

- ❖ To prospect on shore and offshore area.
- ❖ To supply sufficient gas for industries
- ❖ To upgrade old pipeline, plants and refineries
- ❖ To perform JV process for LNG Business
- ❖ To make trading, marketing and distribution of Petroleum Products
- ❖ To make capacity development for the people

Current Major Difficulties

- ❖ **Lack of exact laws and regulations for energy policy**
- ❖ **Low efficiency of old hydropower station and oil and gas industry**
- ❖ **Lack of advanced technology for power sector**
- ❖ **Institutional Capacity Building Development and lack of training**
- ❖ **Do not get budget for new projects**

Priority Subject and Reason

- ❖ I would like to study about “ENERGY POLICY”.
- ❖ **Because Energy Policy is very important for our Ministry.**
- ❖ **We need to know energy database system, to draw and execute the energy supply plans by surveying the nation’s energy demand annually.**
- ❖ **And then, we also need to know energy standards and specifications which are appropriate for the nation and which are also in compliance with ASEAN and international practices.**

Conclusion

- **Lastly, I would like to express my sincerely thanks to President and other Board Members from JICA.**
- **Currently, 39 % of Household can access electricity but 61% not yet. There are many opportunities to invest in electricity and petroleum sector for targeted plan 2030.**
- **We would like to invite the investors with the mutual benefit.**
- **We hope that our future collaboration will be crucial for both Organization.**



THANK YOU
FOR YOUR KIND ATTENTION