

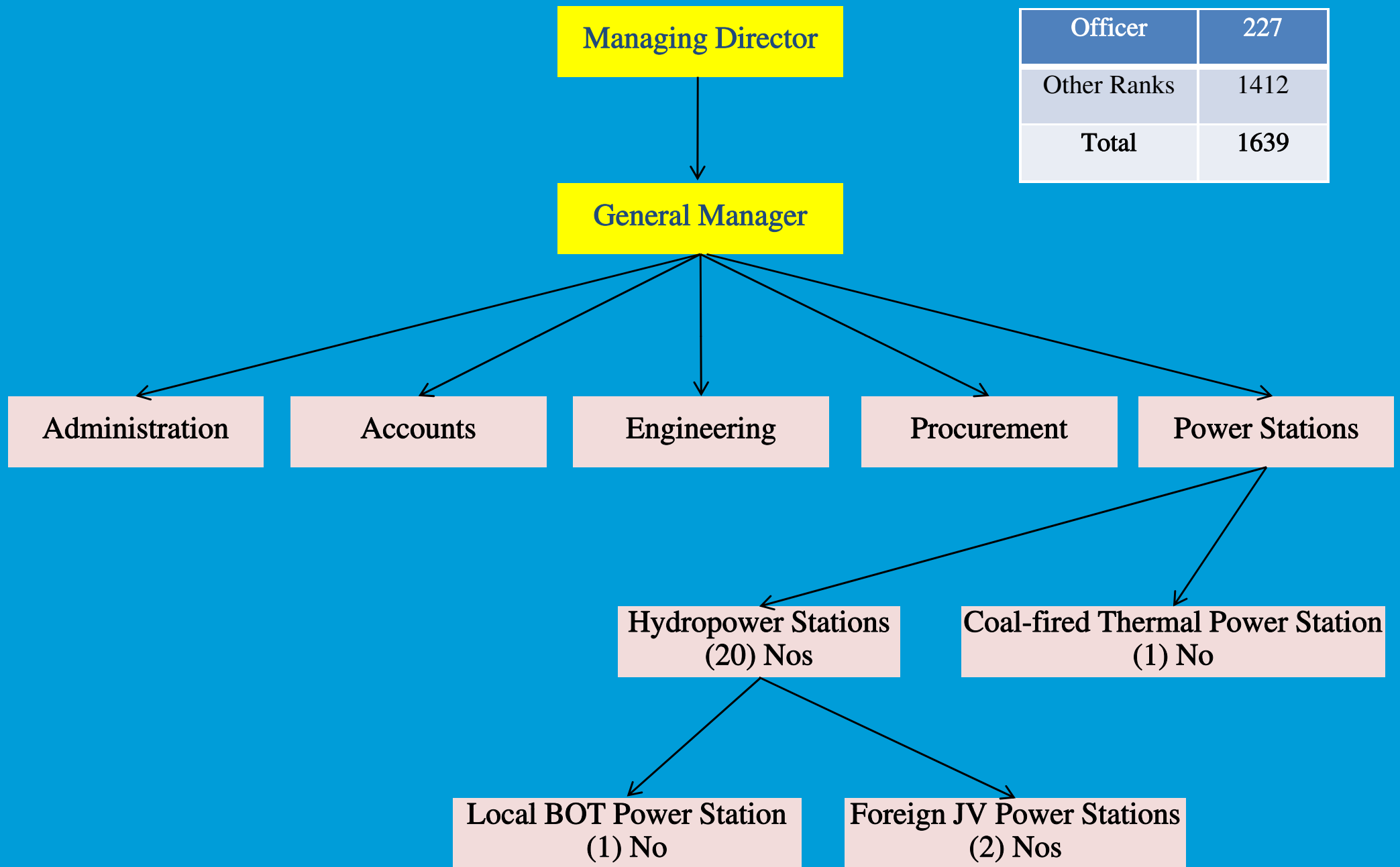
THE GOVERNMENT OF THE REPUBLIC OF THE UNION OF MYANMAR

Ministry of Electric Power

Hydropower Generation Enterprise

2nd July 2013

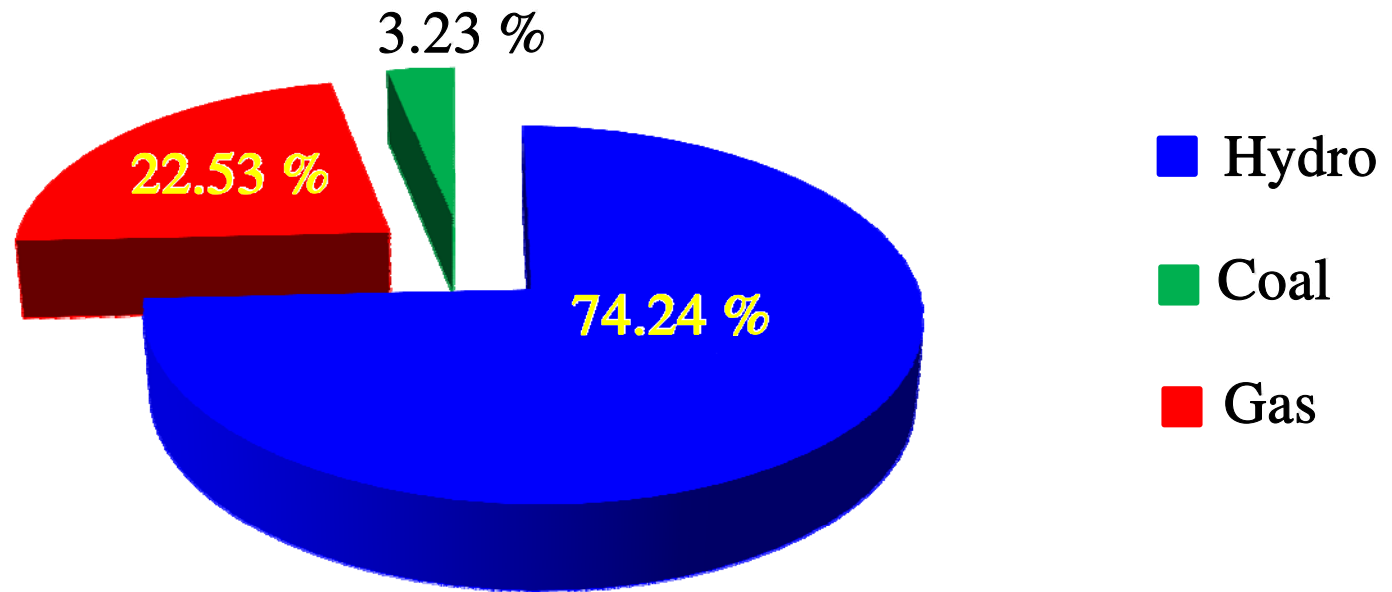
Organization Chart of Hydropower Generation Enterprise



Installed Capacity of Power Plants

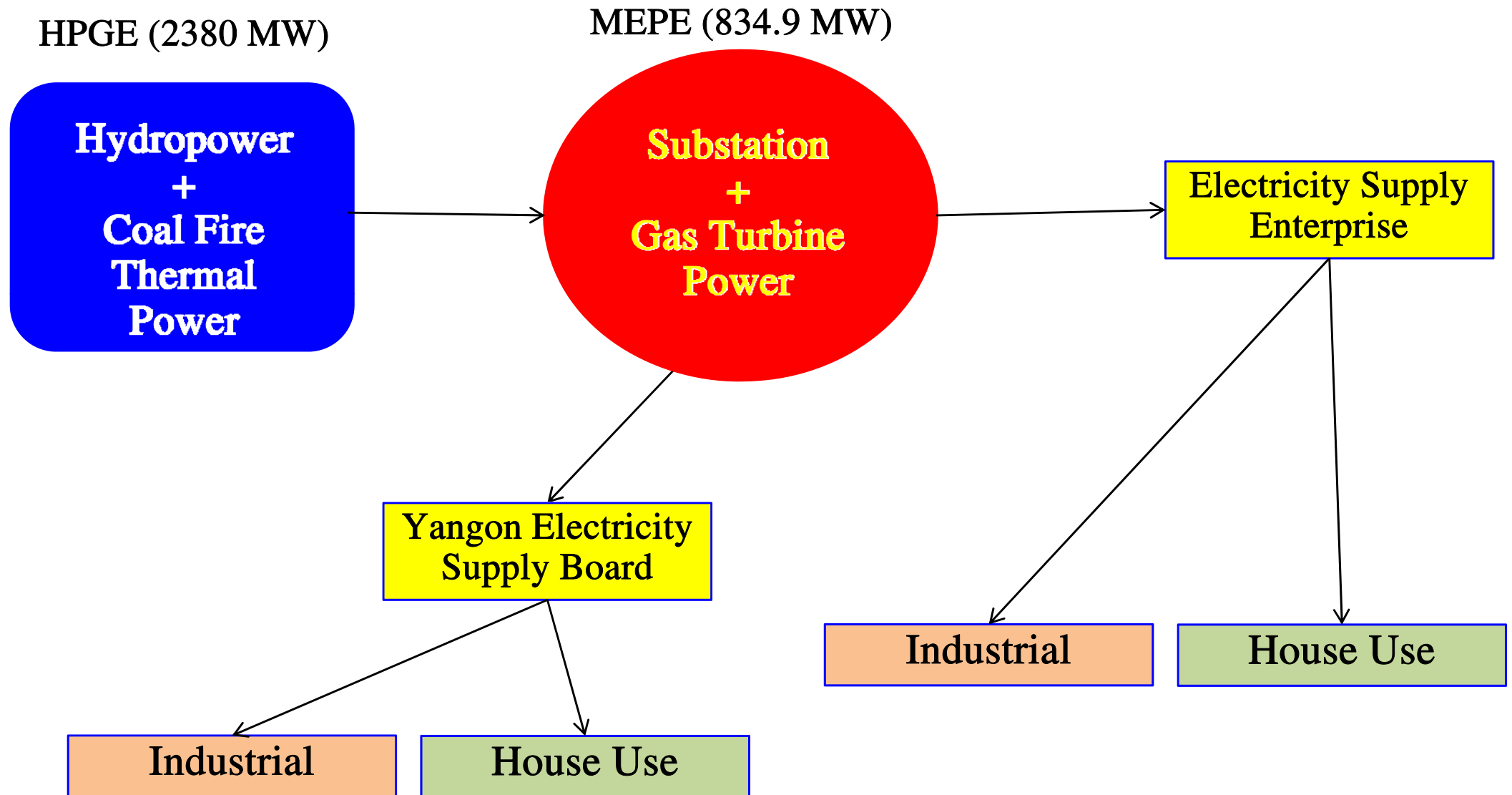
No.	Power Plant	No of Power Plant	To Local Power Supply	To China Power Supply
1	Hydropower	20	2260	520
2	Coal-fired Thermal	1	120	-
Total		21	2380	520

Power Sector in Myanmar



No.	Kind of Power Plant	Number of Power Plant	Installed Capacity (MW)	To Local Power Supply (MW)	To China Power Supply (MW)
1	Hydropower	20	2780	2260.0	520
2	Coal-fired Thermal	1	120	120.0	-
3	Gas	11	834.9	834.9	-
Total		32	3734.9	3214.9	520

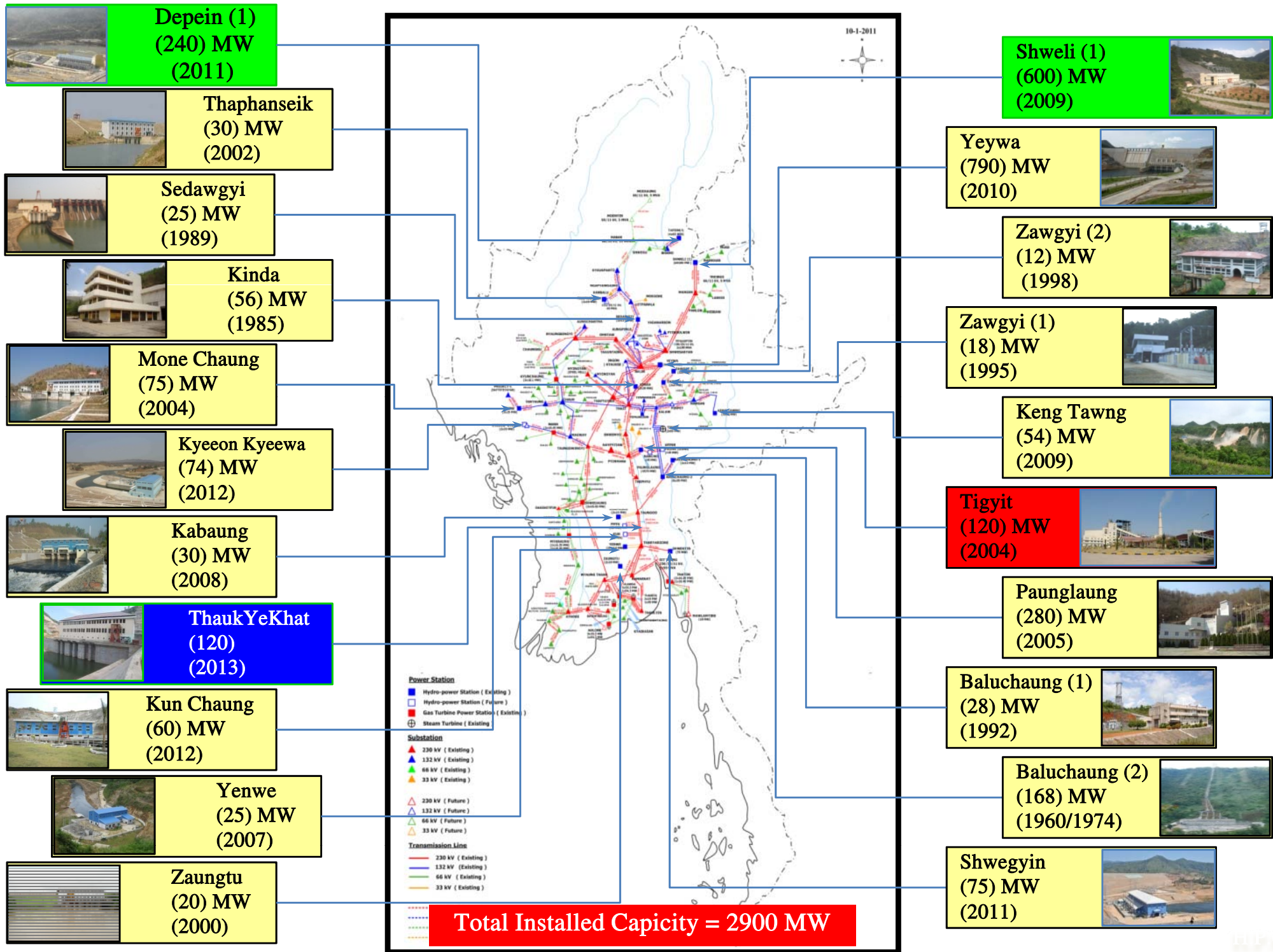
Power Supply & Distribution in Myanmar



List of Power Station

No.	Name of Power Station	Quantity	Total Installed Capacity (MW)
Run-off River			
1	Zawgyi No.(1)	3	18
2	Keng Tawng	3	54
Irrigation			
3	Kinda	2	56
4	Sedawgyi	2	25
5	Zawgyi No. (2)	2	12
6	Thaphanseik	3	30
7	Mone Chaung	3	75
8	Kyeeon Kyeewa	2	74
Dam Type			
9	Baluchaung No.(1)	6	168
10	Baluchaung No.(2)	2	28
11	Zaungtu	2	20
12	Paunglaung	4	280
13	Yenwe	2	25
14	Kabaung	2	30
15	Yeywa	4	790
16	Shwegyin	4	75
17	Kun Chaung	3	60
Foreign JV Power Plant			
18	Shweli No.(1)	6	600
19	Dapein No.(1)	4	240
Coal-fired Thermal Power Station			
20	Tigyit	2	120
Local BOT Power Station			
21	TaukYe Khat No. (2)	3	120
Total		61	2900

Location of Power Station

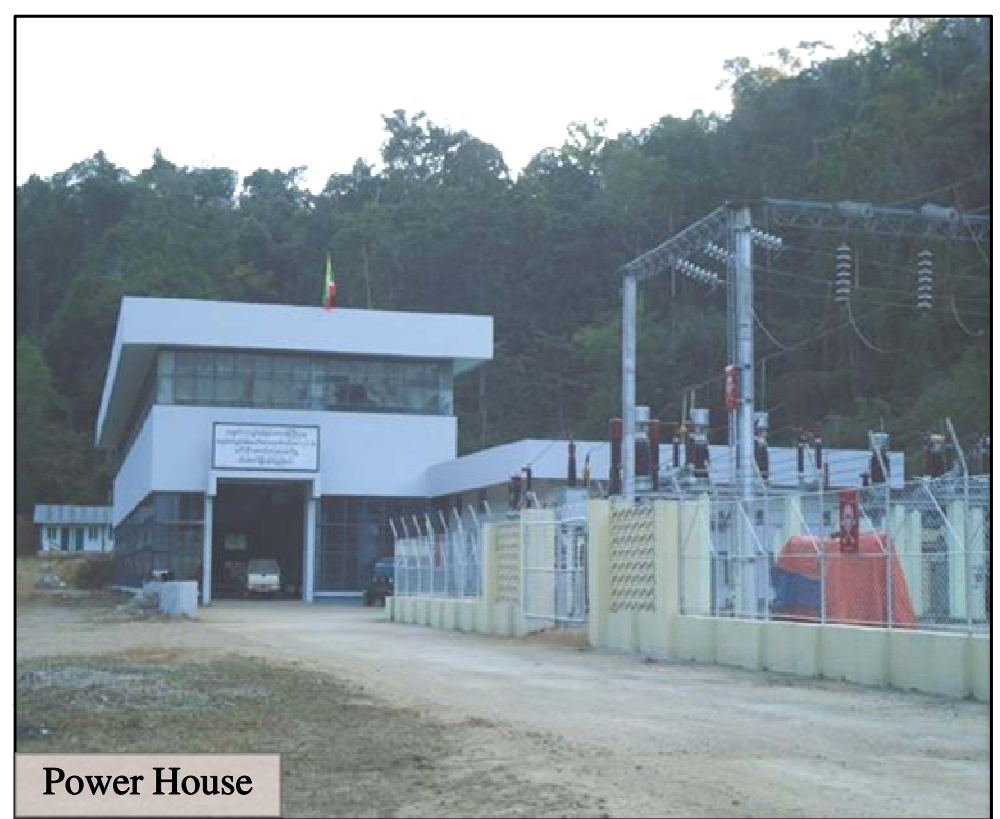


Sailent Features of Hydropower Stations and Coal-fired Thermal Power Station, Hydropower Generation Enterprise



Zawgyi No. (1)

Location	-	Yatsauk Township, Shan State
Creek	-	Zawgyi
Construction Starting	-	March 1993
Commissioning	-	28 th July 1995, 2011 (Replacement and Renovation)
Installed Capacity	-	18 MW (3 × 6 MW)
Rated Head	-	383.877 ft (117 m)
Discharge	-	3 × 218.73 ft ³ /s = 656.21 ft ³ /s
Type of Turbine	-	Francis (Horizontal)
Annual Design Generation	-	35 GWh
Transmission Line	-	66 kV Aungthabye Line (50) miles 11 kV Bahtoo Line (11) miles
Low Pressure Pipe Line	-	902 ft (φ - 8 ft)
Penstock	-	1050 ft (φ - 8 ft)
Construction Cost	-	MMK - 94.27 million USD - 9.98 million



Power House

Zawgyi No. (1)



Turbine and Generator Hall

Water Fall and Power House



Keng Tawng



Keng Tawng

Location	- Monage Township, Shan State
Creek	- Nantein
Construction Starting	- 2003
Commissioning	- 2009
Installed Capacity	- 54 MW (3 × 18 MW)
Rated Head	- 427 ft
Discharge	- 3 × 600 ft ³ /s = 1800 ft ³ /s
Type of Turbine	- Francis (Vertical)
Annual Design Generation	- 377.6 GWh
Transmission Line	- 132 kV Kengtawng-Nansang Line (74) miles 11 kV Kengtawng Line (20) miles
Penstock	- 2600 ft (φ - 15~5 ft)
Construction Cost	- MMK - 14538.181 million USD - 19.423 million

Kinda

Location	- Myitthar Township, Mandalay Region
River	- Panlaung
Construction Starting	- 1981
Commissioning	- 1985
Installed Capacity	- 56 MW (2 × 28 MW)
Rated Head	- 183.7 ft
Discharge	- 2 × 1976 ft ³ /s = 3952 ft ³ /s
Type of Turbine	- Francis (Vertical)
Annual Design Generation	- 165 GWh
Transmission Line	- 132 kV Thazi Line (48.4) miles 132 kV Kinda-Ingon Line (32.2) miles 11 kV Ywangan Line (11) miles 11 kV Mong Maw Line (16) miles
Penstock	- 100 ft (φ - 10.5 ft)
Construction Cost	- MMK - 189.18 million DEM - 127.6 million



Power House

Kinda



Turbine Hall

Power House and Spillway



Sedawgyi

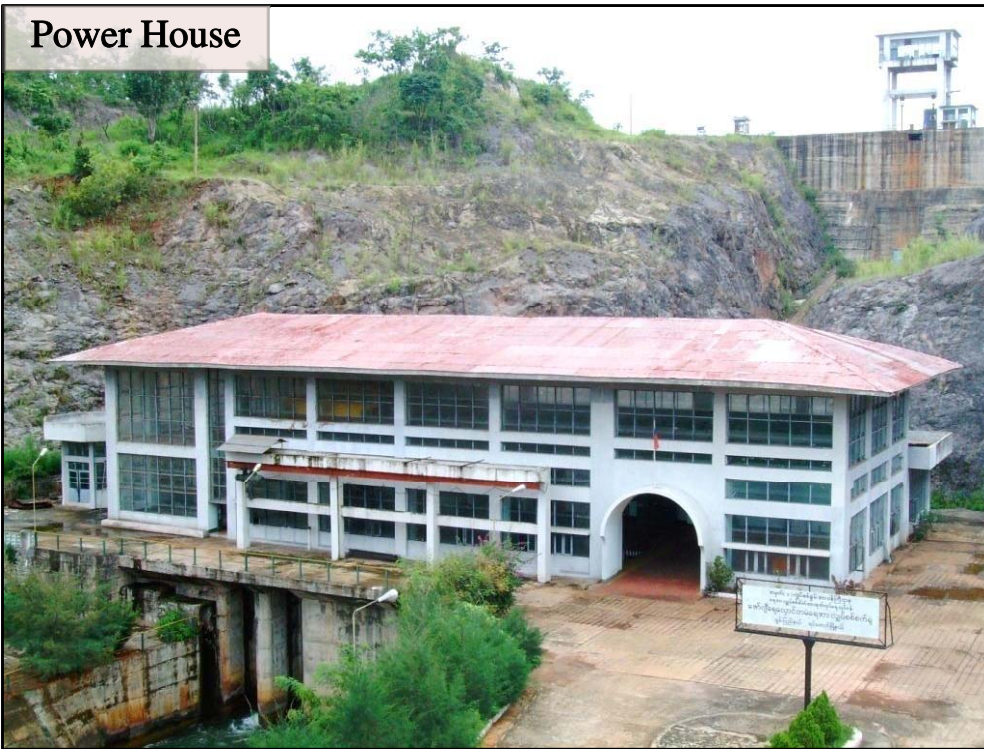


Generator Hall

Sedawgyi

Location	- Madayar Township, Mandalay Region
Creek	- Chaung Ma Gyi
Construction Starting	- June, 1984
Commissioning	- 6 th June 1989
Installed Capacity	- 25 MW (2 × 12.5 MW)
Rated Head	- 92.63 ft
Discharge	- 2 × 1592.5 ft ³ /s = 3185 ft ³ /s
Type of Turbine	- Kaplan (Vertical)
Annual Design Generation	- 134 GWh
Transmission Line	- 132 kV Mandalay Line (36.75) miles 132 kV Kyaukpahtoe Line (131.6) miles
Penstock	- 150 ft (φ - 14 ft)
Construction Cost	- MMK - 189.18 million USD - 16.6 million

Power House



Zawgyi No. (2)

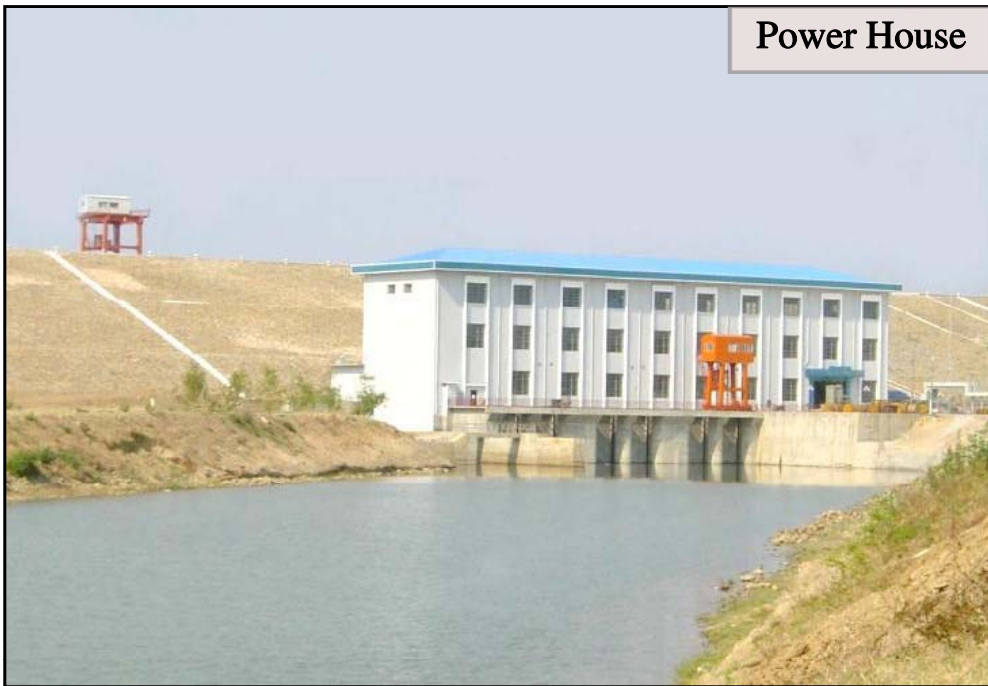


Generator Hall

Zawgyi No. (2)

Location	-	Yatsauk Township, Shant Sate
Creek	-	Zawgyi
Construction Starting	-	25.9.1995
Commissioning	-	1998
Installed Capacity	-	12 MW (2 × 6 MW)
Rated Head	-	106.6 ft
Discharge	-	2 × 870 ft ³ /s = 1740 ft ³ /s
Type of Turbine	-	Francis (Vertical)
Annual Design Generation	-	30 GWh
Transmission Line	-	66 kV Zawgyi (1) Line (17) miles 11 kV Inntaw (8) miles
Low Pressure		
Pipe Line	-	105 ft (φ - 9.8 ft)
Penstock	-	320 ft (φ - 16.4 ft)
Construction Cost	-	MMK - 500 million USD - 8 million

Power House



Thaphanseik



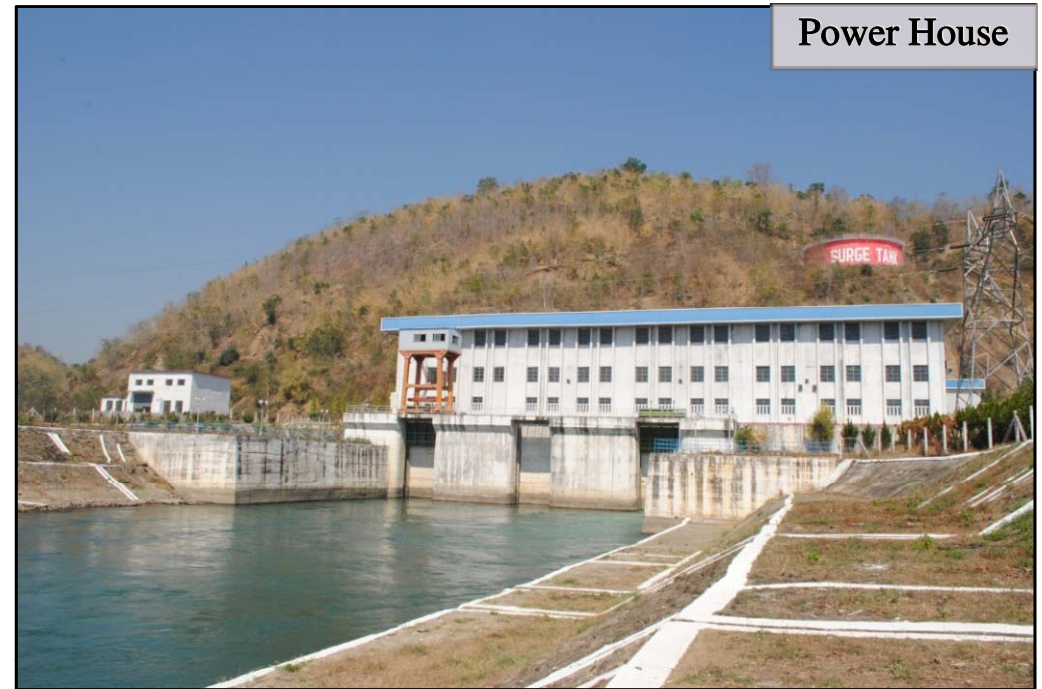
Generator Hall

Thaphanseik

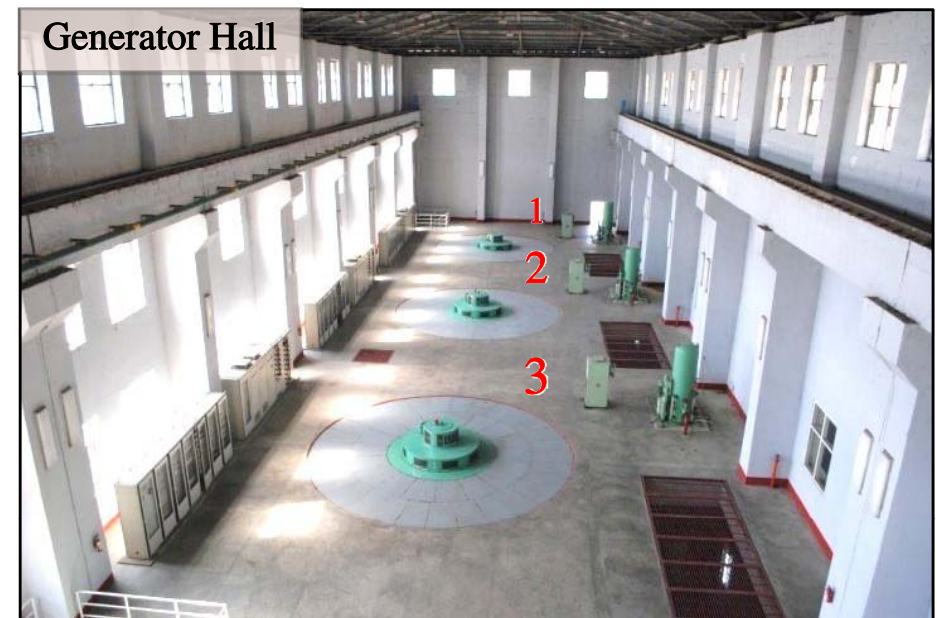
Location	-	Kyunhla Township, Sagaing Region
River	-	Mue
Construction Starting	-	1998
Commissioning	-	2002
Installed Capacity	-	30 MW (3 × 10 MW)
Rated Head	-	62 ft
Discharge	-	2 × 2228 ft ³ /s = 6684 ft ³ /s
Type of Turbine	-	Kaplan (Vertical)
Annual Design Generation	-	117.2 GWh
Transmission Line	-	33 kV Thaphanseik-Kantbalu Line (1) (15.21) miles 33 kV Thaphanseik- Ngapyawdaing Line (2) (19.8) miles 132 kV Thaphanseik- Ngapyawdaing Line (36) miles
Penstock	-	1472 ft (φ - 20 ft)
Construction Cost	-	MMK - 1384.82 million USD - 20 million

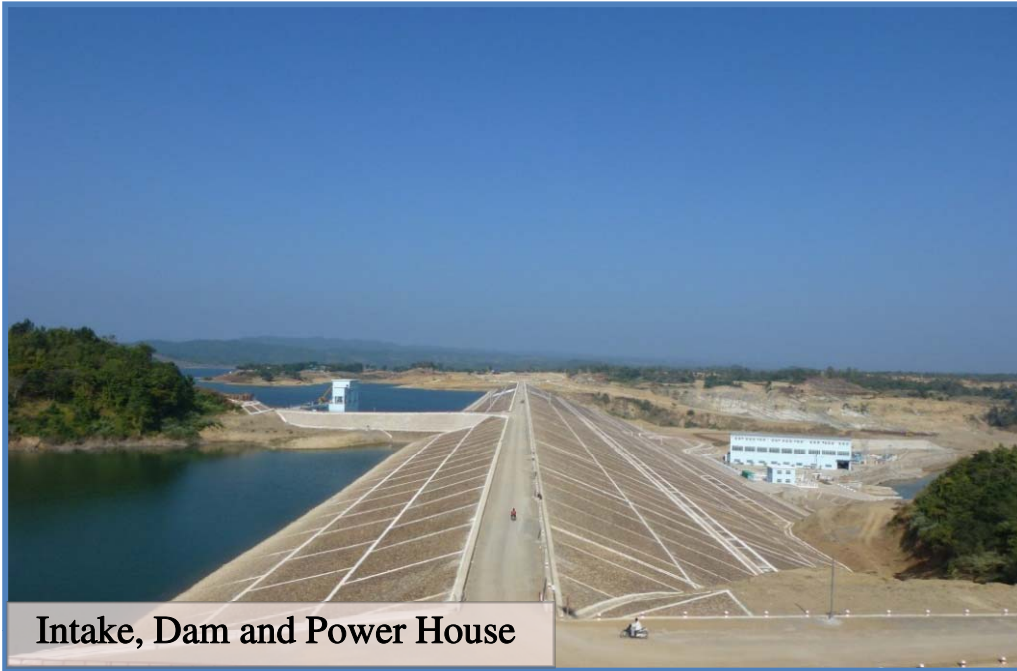
Mone Chaung

Location	- Satotaya Township, Magway Region
Creek	- Mone
Construction Starting	- 1997~1998
Commissioning	- 2004
Installed Capacity	- 75 MW (3 × 25 MW)
Rated Head	- 124.68 ft
Discharge	- 3 × 2010 ft ³ /s = 6030 ft ³ /s
Type of Turbine	- Francis (Vertical)
Annual Design Generation	- 330 GWh
Transmission Line	- 132 kV Mone-Chauk Line (61) miles
Penstock	- 450 ft (φ - 13.9 ft)
Construction Cost	- MMK - 3824.11 million USD - 31.99 million



Mone Chaung





Intake, Dam and Power House

Kyeeon Kyeeewa



Generator Hall

Kyeeon Kyeeewa

Location	- Pwint Phu Township, Magway Region
Creek	- Mone
Construction Starting	- 2002-2003
Commissioning	- 2012
Installed Capacity	- 74 MW (2 × 37 MW)
Rated Head	- 112.5 ft
Discharge	- 2 × 2148 ft ³ /s = 4296 ft ³ /s
Type of Turbine	- Kaplan (Vertical)
Annual Design Generation	- 370 GWh
Transmission Line	- 132 kV Minbu Line (43) miles
Penstock	- No (1) - 853 ft No (2) - 914 ft (φ -18 ft)
Construction Cost	- MMK - 74270 million USD - 18.43 million

Power House



Baluchaung No. (1)

Generator Hall



Baluchaung No. (1)

Location	-	Loikaw Township, Kayah State
Creek	-	Baluchaung
Construction Starting	-	1987
Commissioning	-	1992
Installed Capacity	-	28 MW (2 × 14 MW)
Rated Head	-	228.5 ft
Discharge	-	2 × 840 ft ³ /s = 1680 ft ³ /s
Type of Turbine	-	Francis (Vertical)
Annual Design Generation	-	200 GWh
Transmission Line	-	132 kV BLK (2) Line (9.3) miles 11 kV Loikaw Line (10.5) miles 11 kV Dawtchar Line (5.5) miles
Open Channel	-	24253 ft
Low Pressure Pipe Line	-	6646.9 ft (φ - 13.45 ft)
Penstock	-	520.66 ft (φ - 12.5 ft ~ 6.9 ft)
Construction Cost	-	MMK - 631.660 million JPY - 15.173 million

Baluchaung No. (2)

Location	- Loikaw Township, Kayah State,
Creek	- Baluchaung
Construction Starting	- 1954, Machine - 1, 2, 3 1970, Machine - 4, 5, 6
Commissioning	- 1960, Machine -1, 2, 3 1974, Machine - 4, 5, 6
Installed Capacity	- 168 MW (6 × 28 MW)
Rated Head	- 1388 ft
Discharge	- 6 × 280 ft ³ /s = 1680 ft ³ /s
Type of Turbine	- Pelton (Horizontal)
Annual Design Generation	- 1190 GWh
Transmission Line	- 230 kV Lawpita-Taungoo-Hlawga Line (250) miles 132 kV Lawpita-Kalaw-Thazi-Mandalay Line (1) & (2) (225) miles 33 kV Lawpita-Loikaw-Moby Line (22.5) miles 33 kV Lawpita-Phekhon Line (33) miles 33 kV Lawpita-Phasaung Line (77) miles 11 kV Lawpita Line (5) miles
Open Channel	- 19640 ft
Low Pressure Pipe Line	- 3568 ft (φ - 9 ft)
Penstock	- 3570 ft (φ - 9.3 ft ~ 9 ft)
Construction Cost	- MMK - 139.6 million JPY - 181.5 million
Renovation	- Renovation was conducted in 1992-1993.
Rehabilitation	- Rehabilitation - First Phase was conducted in 2003-2004.



Baluchaung No. (2)



Zaungtu

Location	- Bago Township, Bago Region
River	- Bago
Construction Starting	- 1.1.1994
Commissioning	- 2000
Installed Capacity	- 20 MW (2 × 10 MW)
Rated Head	- 89.9 ft
Discharge	- 2 × 1539 ft ³ /s = 3078 ft ³ /s
Type of Turbine	- Kaplan (Vertical)
Annual Design Generation	- 76 GWh
Transmission Line	- 66 kV Zaungtu-Kamanat Line (45.6) miles
Penstock	- 672 ft (2) Nos (φ - 16.4 ft)
Construction Cost	- MMK - 4232.45 million USD - 21.21 million



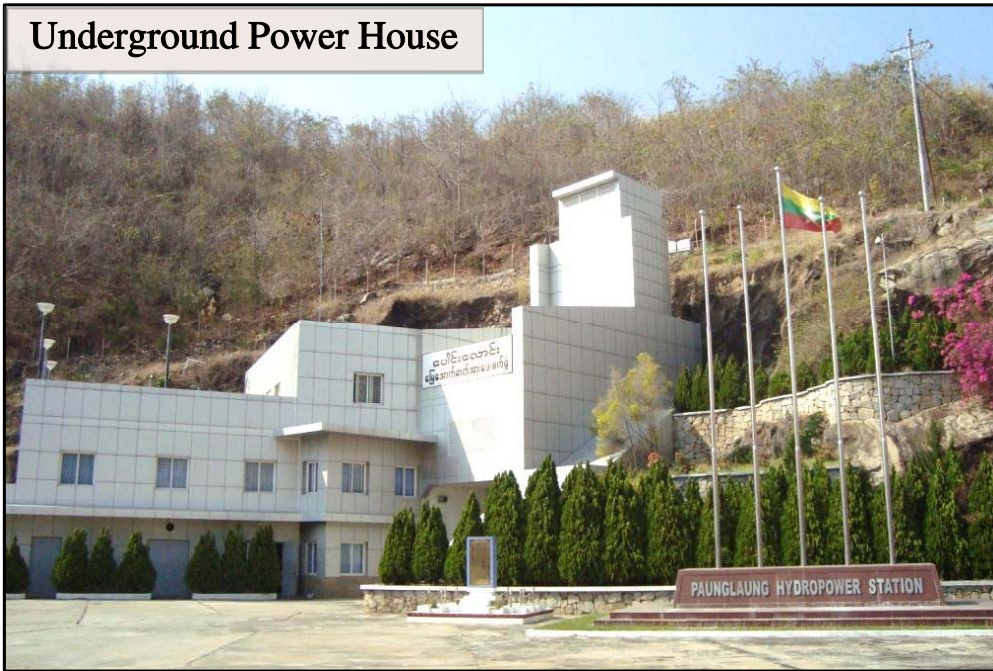
Power House

Zaungtu



Generator Hall

Underground Power House



Paunglaung



Paunglaung

Location	- Zayyarthiri Township, Nay Pyi Taw Territory
River	- Paunglaung River
Construction Starting	- 1.2.1997
Commissioning	- 2005
Installed Capacity	- 280 MW (4 × 70 MW)
Rated Head	- 340 ft
Discharge	- 4 × 2701.75 ft ³ /s = 10807 ft ³ /s
Type of Turbine	- Francis (Vertical)
Annual Design	
Generation	- 911 GWh
Transmission Line	- 230 kV Paunglaung-Pyinmana Line (1) & (2) (11) miles
Penstock	- 263 ft (2) Nos (φ - 28 ft)
Construction Cost	- MMK - 8476.25 million USD - 201.82 million

Yenwe

Location	- Kyauktaga Township, Bago Region
Creek	- Yenwe
Construction Starting	- 2001
Commissioning	- 2007
Installed Capacity	- 25 MW (2 × 12.5 MW)
Rated Head	- 187 ft
Discharge	- 2 × 883 ft ³ /s = 1766 ft ³ /s
Type of Turbine	- Francis (Vertical)
Annual Design Generation	- 123 GWh
Transmission Line	- 33 kV Yenwe-Thayagone Line (1) & (2) (18.5) miles 11 kV Dam Line (13.5) miles
Penstock	- 508 ft (φ - 18 ft)
Construction Cost	- MMK - 6513.535 million USD - 8.53 million

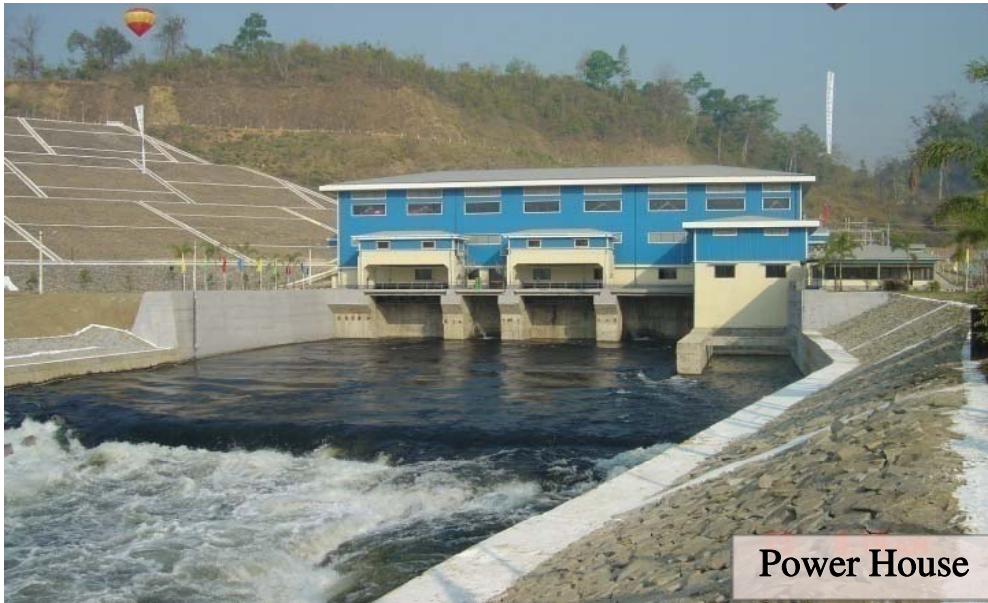


Power House

Yenwe



Generator Hall



Power House

Kabaung

Generator Hall



Kabaung

Location	- Oaktwin Township, Bago Region
Creek	- Kabaung
Construction Starting	- 2002-2003
Commissioning	- 2008
Installed Capacity	- 30 MW (2 × 15 MW)
Rated Head	- 152 ft
Discharge	- 2 × 1395 ft ³ /s = 1766 ft ³ /s
Type of Turbine	- Francis (Vertical)
Annual Design	
Generation	- 120 GWh
Transmission Line	- 33 kV Kabaung-Taung Oo Line (1) & (2) (15) miles
Penstock	- 210 ft (φ - 21 ft)
Construction Cost	- MMK - 8465.448 million USD - 8.92 million

Yeywa

Location	- Kyaukse Township, Mandalay Region
River	- Myitnge (Dote Hta Wati)
Construction Starting	- 2001-2002
Commissioning	- 2010
Installed Capacity	- 790 MW (4 × 197.5 MW)
Rated Head	- 299 ft
Discharge	- 4 × 7420 ft ³ /s = 29680 ft ³ /s
Type of Turbine	- Francis (Vertical)
Annual Design Generation	- 3550 GWh
Transmission Line	- 230 kV Yeywa-Belin Line (1) & (2) (24) miles 230 kV Yeywa-Meiktila Line (1) & (2) (74) miles
Penstock	- 492 ft (φ - 22 ft)
Construction Cost	- MMK - 288664.827 million USD - 238.092 million

Dam and Power House



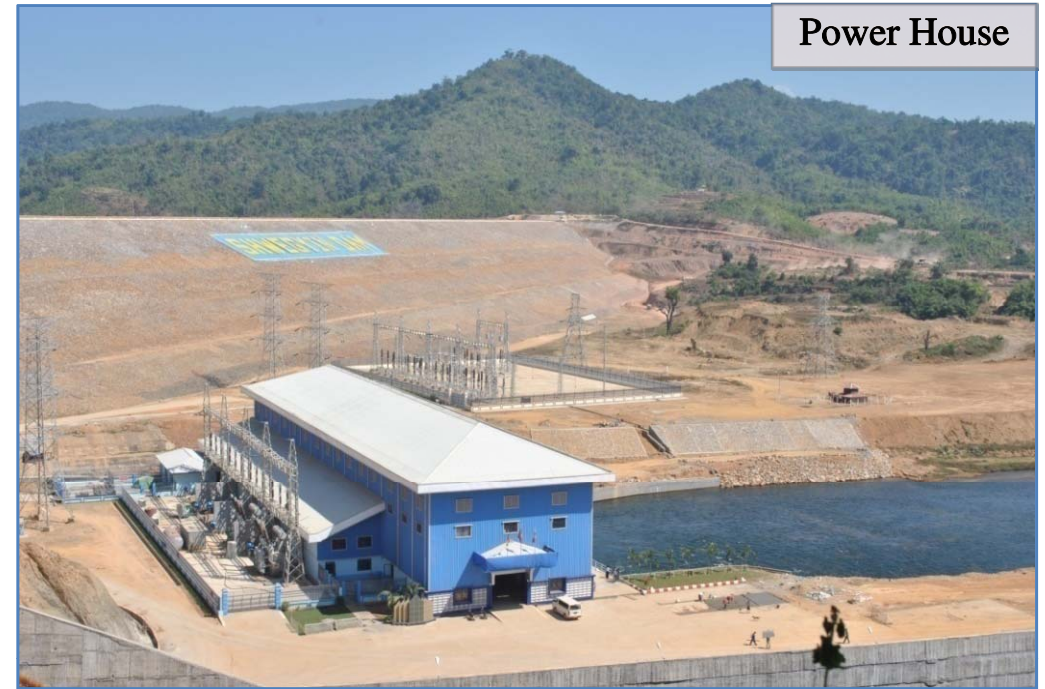
Yeywa



Generator Hall

Shwegyin

Location	- Shwegyin Township, Bago Region
Creek	- Shwegyin
Construction Starting	- 2002-2003
Commissioning	- 2011
Installed Capacity	- 75 MW (4 × 18.75 MW)
Rated Head	- 135.8 ft
Discharge	- 4 × 1900 ft ³ /s = 7600 ft ³ /s
Type of Turbine	- Francis (Vertical)
Annual Design Generation	- 262 GWh
Transmission Line	- 230 kV Thayagone Line (25) miles 11 kV Madauk Line (11) miles
Penstock	- 1100 ft , (2) Lines (ϕ - 25 ft)
Construction Cost	- MMK - 73631.92 million USD - 0.161 million



Power House

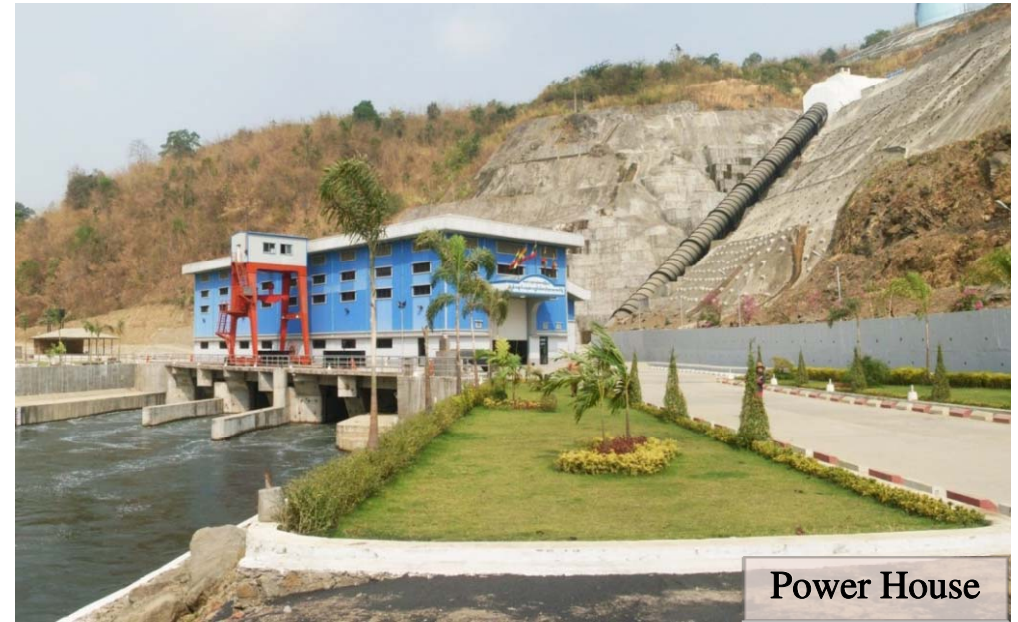
Shwegyin



Generator Hall

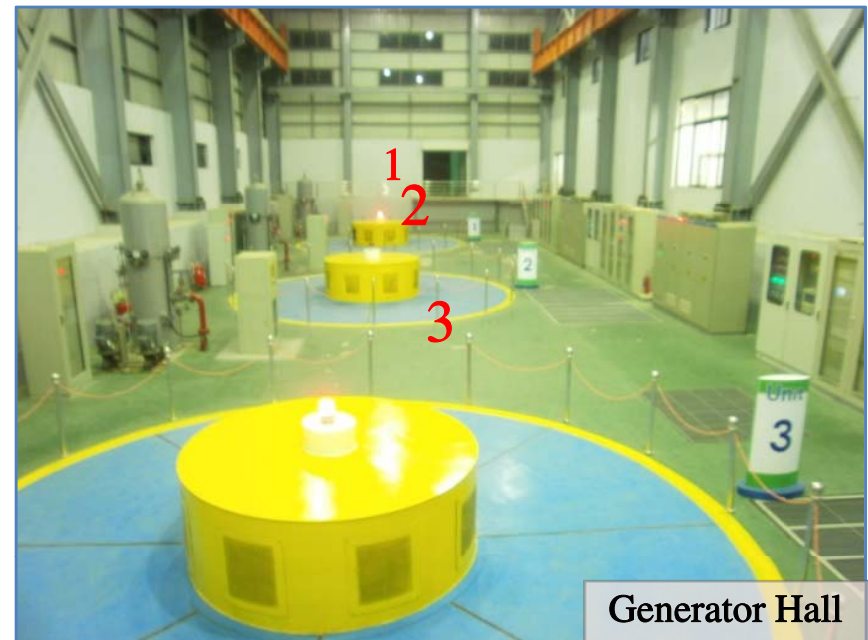
Kun Chaung

Location	- Phyu Township, Bago Region
Creek	- Kun
Construction Starting	- 2002-2003
Commissioning	- 2012
Installed Capacity	- 60 MW (3 × 20 MW)
Rated Head	- 347 ft
Discharge	- 3 × 777 ft ³ /s = 2331 ft ³ /s
Type of Turbine	- Francis (Vertical)
Annual Design Generation	- 190 GWh
Transmission Line	- 230 kV Kun-Taungoo Line (37.304) miles 230 kV Kun-Thayagone Line (30.82) miles
Penstock	- 1295 ft (φ - 15 ft)
Construction Cost	- MMK - USD -



Power House

Kun Chaung



Generator Hall

Shweli No. (1)

Location	- Nam Hkan Township, Shan State
River	- Shweli
Construction Starting	- 2002-2003
Commissioning	- 2009
Installed Capacity	- 600 MW (6 × 100 MW)
Rated Head	- 981 ft
Discharge	- 6 × 1328.7 = 7972.2 ft ³ /s
Type of Turbine	- Francis (Vertical)
Annual Design Generation	- 4022 GWh
Transmission Line	- 230 kV Shweli-Mansan-Shwesaryan Line (1) & (2) (180) miles
Penstock	- 3030 ft × (2) Nos (φ -17 ft)
Construction Cost	- Accordance with JVA, Construction Cost USD - 281.222 million Accordance with Supplement Agreement, Extra Construction Cost USD - 475 million

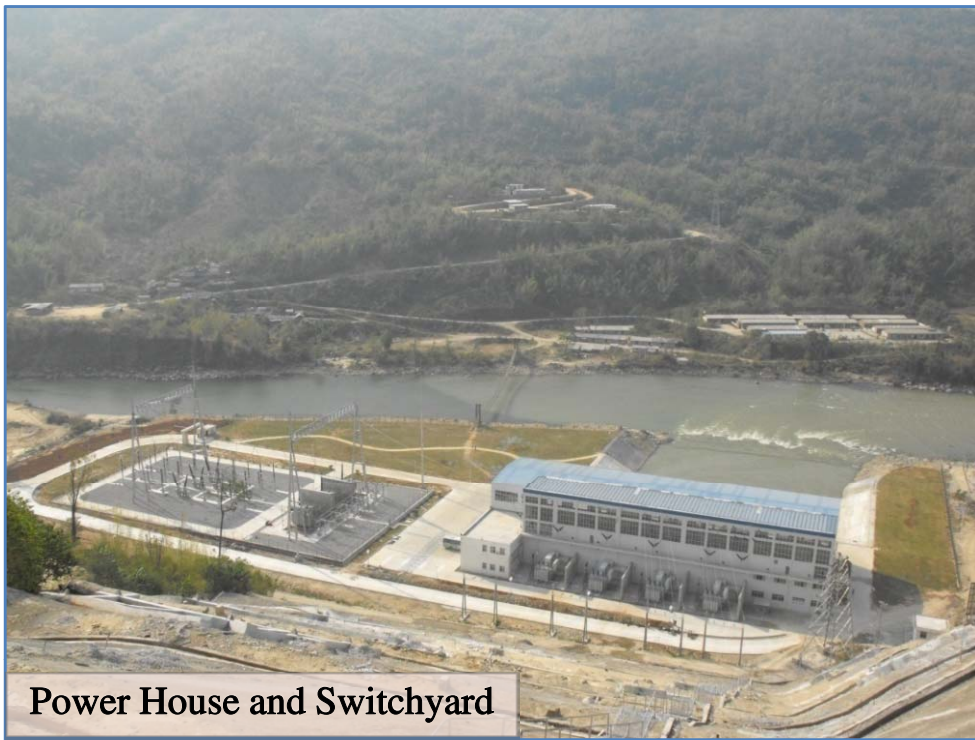


Power House

Shweli No. (1)

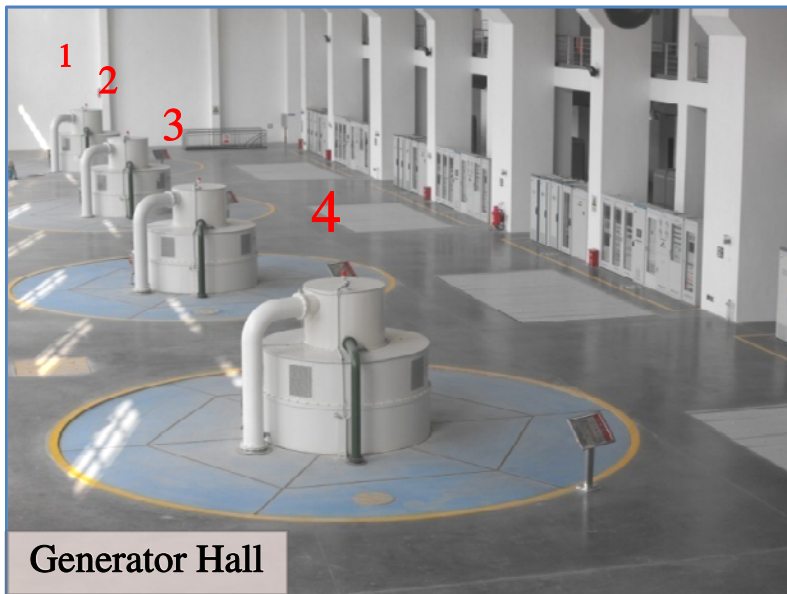


Generator Hall



Power House and Switchyard

Dapein No. (1)



Generator Hall

Dapein No. (1)

Location	- Bhamaw Township, Kachin State
River	- Dapein
Construction Starting	- 2007-2008
Commissioning	- 2011
Installed Capacity	- 240 MW (4 × 60 MW)
Rated Head	- 225 ft
Discharge	- 4 × 3407.75 ft ³ /s = 13631 ft ³ /s
Type of Turbine	- Francis (Vertical)
Annual Design Generation	- 1065 GWh
Transmission Line	- 110 kV Dapein-Bhamaw (23) miles 500 kV Dapein (1) - Daying Jing Stage-4 (1.5) miles
Penstock	- 1010 ft × (4) Nos (φ -16 ft)
Construction Cost	- USD - 240 million

Tigyit

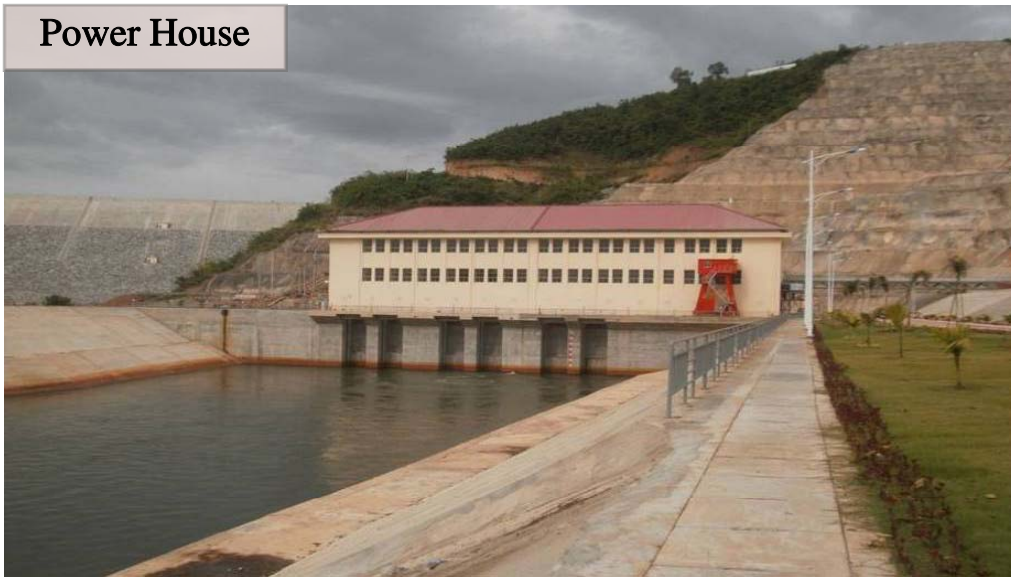
Location	- Pin Laung Township, Shan State
Construction Starting	- 2001
Commissioning	- 2005
Installed Capacity	- 120 MW (2 × 60 MW)
Type of Machine	- Coal-fired Thermal Power Turbine and Generator
Annual Design Generation	- 600 GWh
Transmission Line	- 132 kV Tigyit-Lawpita Line (1) & (2) (76.614) miles 132 kV Tigyit-Kalaw Line (1) & (2) (22) miles
Construction Cost	- MMK - 15115.185 million USD - 42.936 million



Tigyit



Power House



Thauk Ye Khat No. (2)



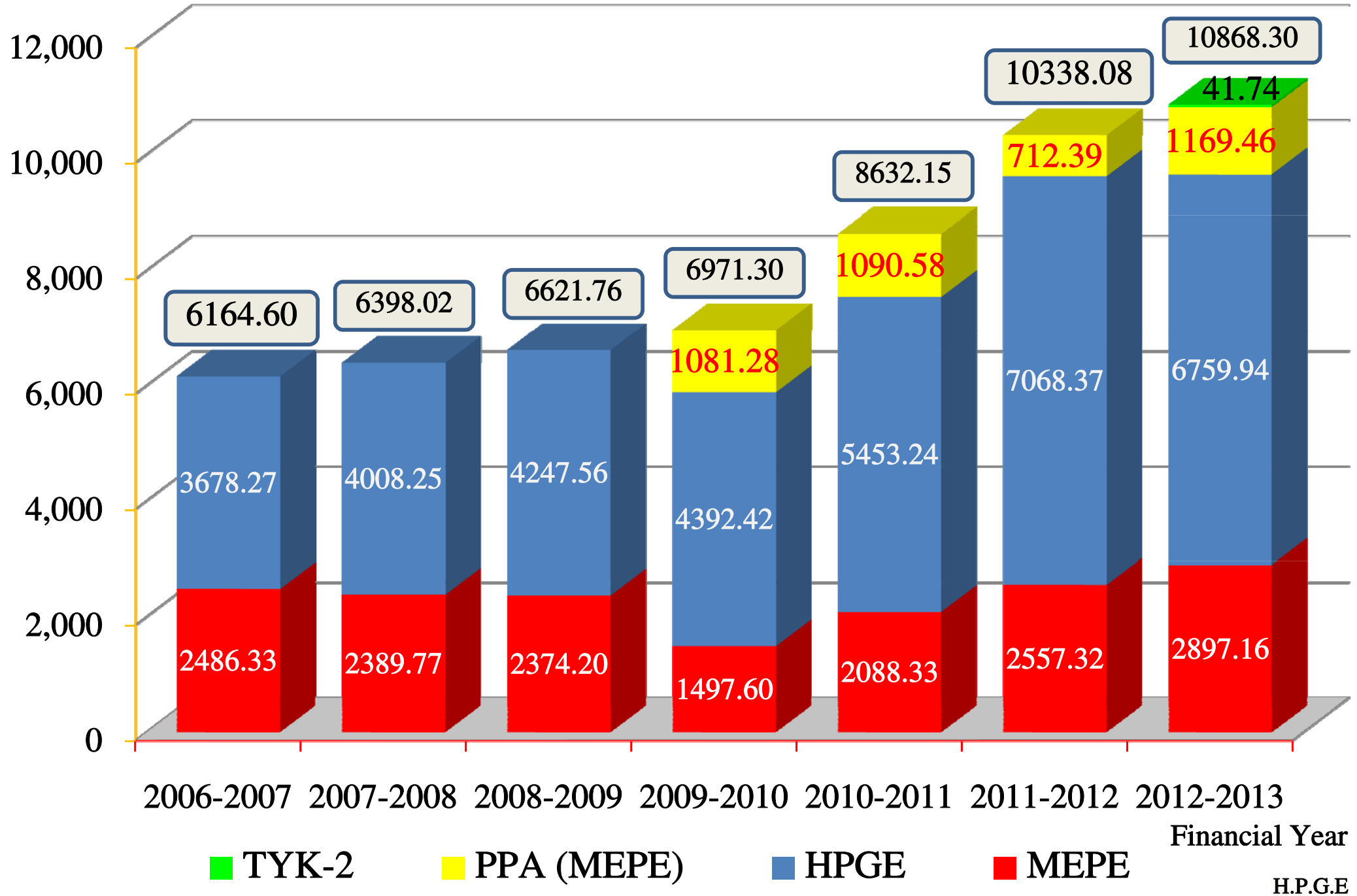
Generator Hall

Thauk Ye Khat No. (2)

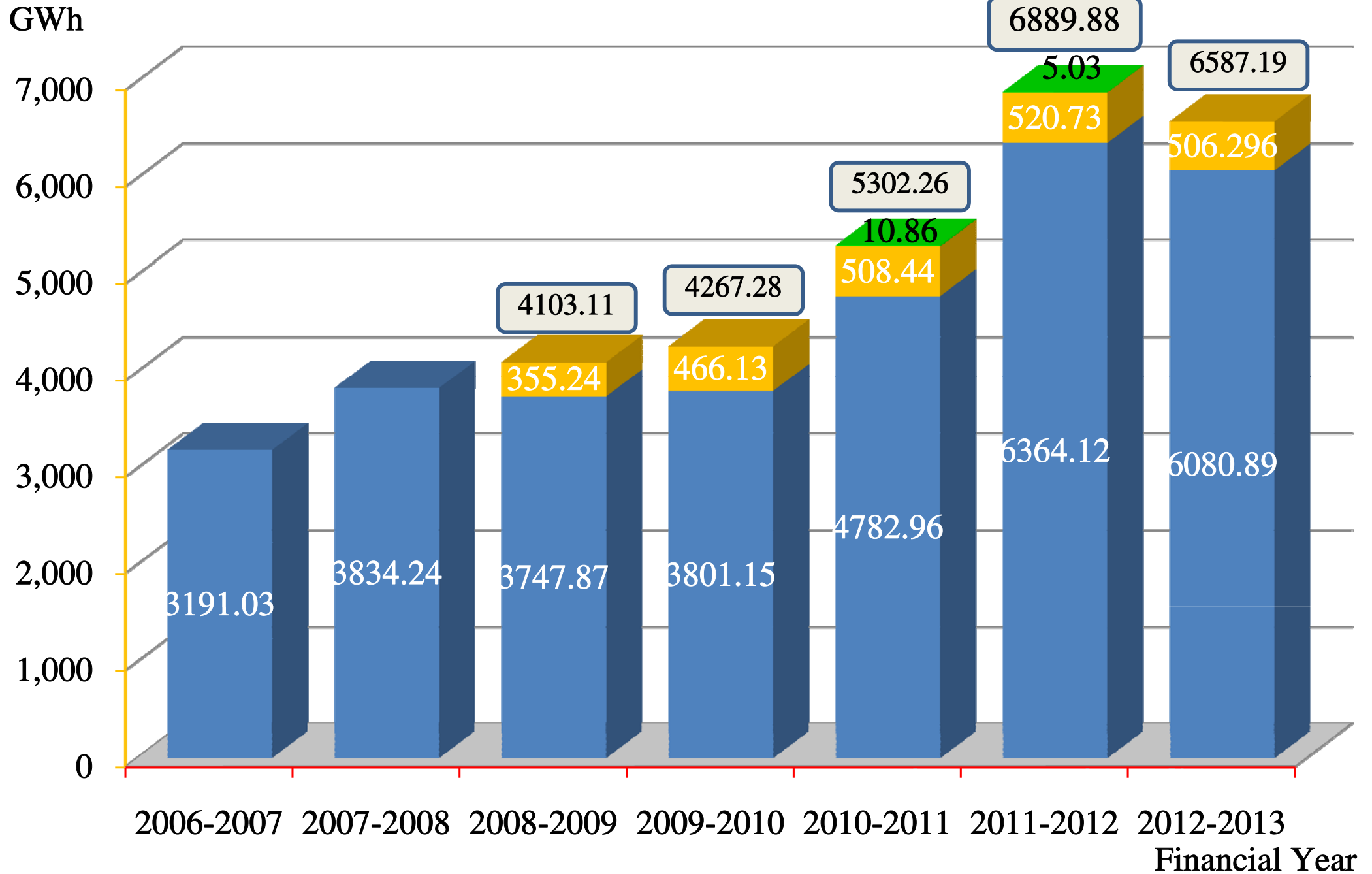
Location	- Taungoo Township, Bago Region
Creek	- Thauk Ye Khat
Construction Starting	- 2007-2008
Commissioning	- 2013
Installed Capacity	- 120 MW (3 × 40 MW)
Rated Head	- 269 ft
Discharge	- 3 × 2489.3 ft ³ /s = 7468 ft ³ /s
Type of Turbine	- Francis (Vertical)
Annual Design Generation	- 604 GWh
Transmission Line	- 230 kV Taungoo Line (13.09) miles
Penstock	- 1972 ft φ - 28 ft, (1) No
Construction Cost	- MMK - USD -

Financial Yearly Power Generation

GWh

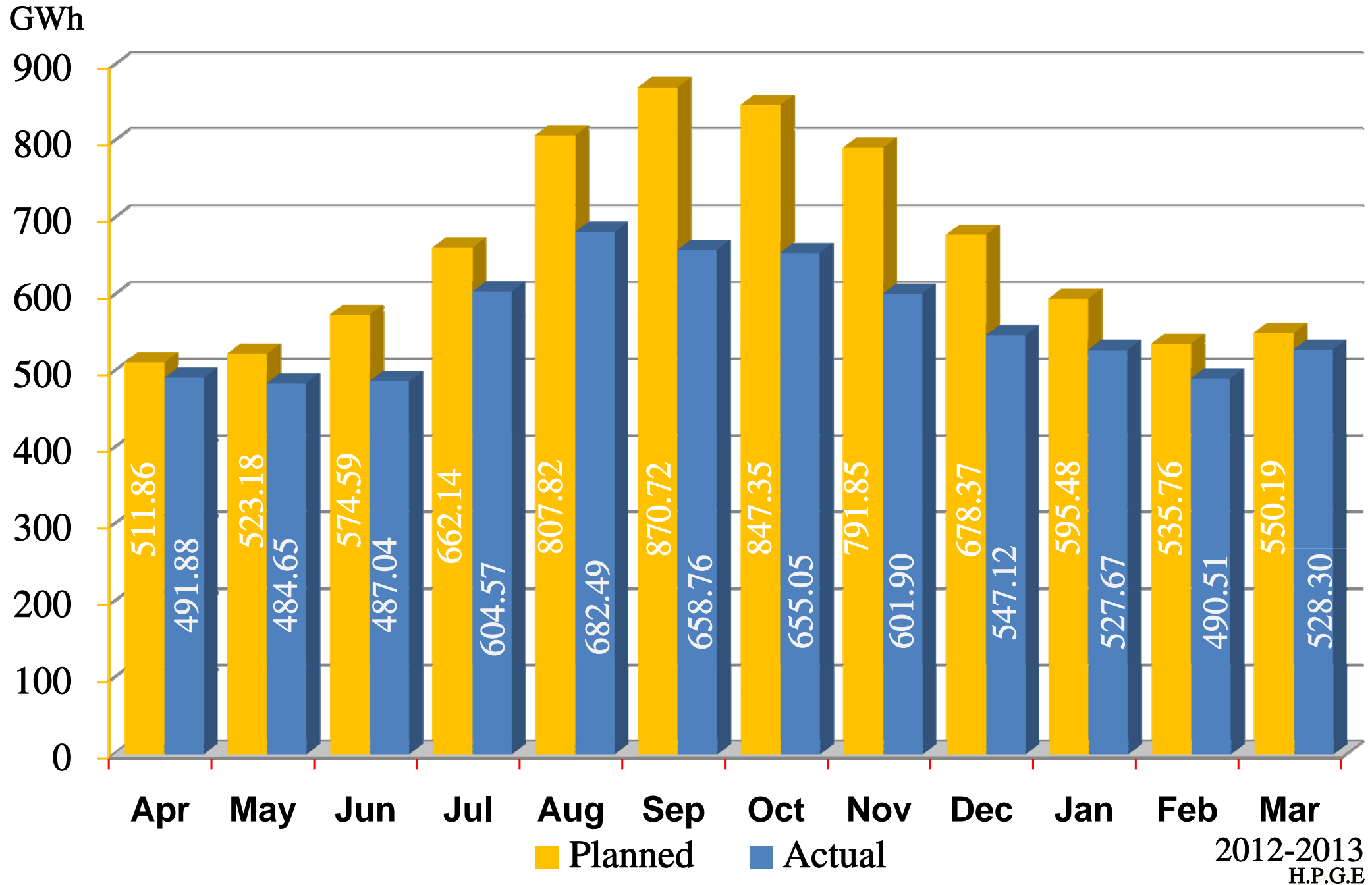


Financial Yearly More Power Purchasing

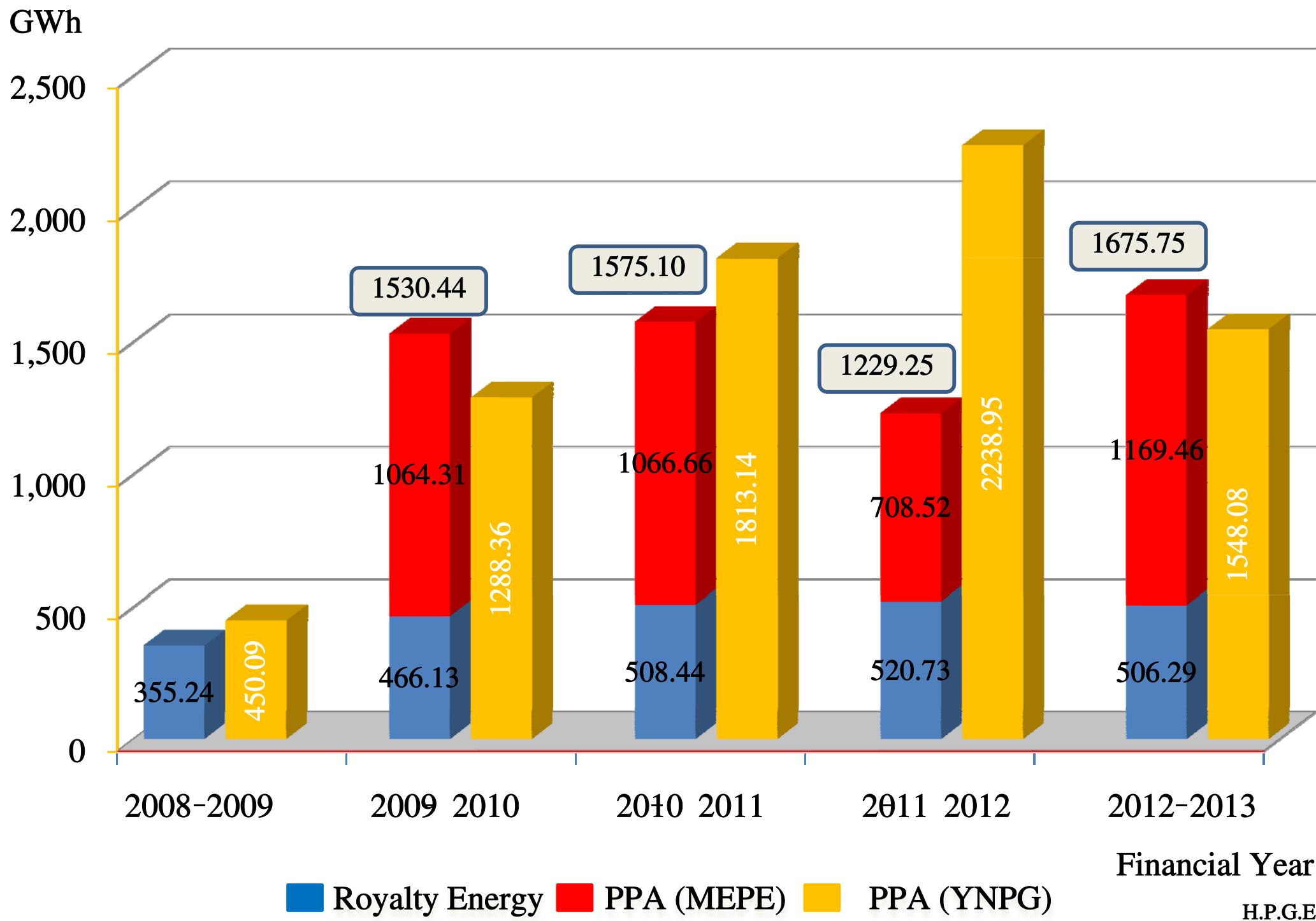


■ Royalty Energy (Dapein-1)
 ■ Royalty Energy (Shweli-1)
 ■ Other Power Station

2012-2013, Monthly Planned and Actual Power Generation from Power Stations of Hydropower Generation Enterprise



Power Purchasing Condition from Shweli-1 to Myanmar and China

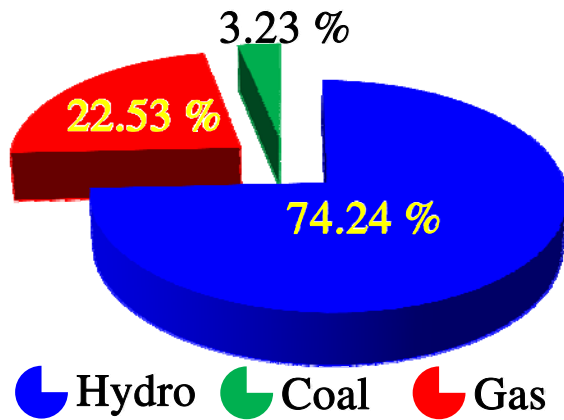


To complete the on-going projects in 2014

Sr. No.	Project	Installed Capacity (MW)	Completion Year	Location (Region/State)	Remarks
1	Upper Paunglaung	140	2013~2014	Mandalay	By MOEP
2	Nancho	40	2013~2014	Mandalay	By MOEP
3	Phyu	40	2013~2014	Bago	By MOEP
4	Baluchaung-3	52	2013~2014	Kayah	Local BOT Company
Total		272			

Thank you indeed

Power Sector in Myanmar



Subject	Hydro	Coal	Gas	Total
Power Plant	20	1	15	36
Installed Capacity (MW)	2780	120	834.9	3734.9
To Local Power Supply (MW)	2660	120	834.9	3214.9
To China Power Supply (MW)	520	-	-	520

Hydro Power Station

Gas Turbine Power Station

Coal-fire Thermal

Steam Turbine Power Station

