Status of Coal Industry in the Philippines

by: **Edgardo B.Cruz**
AFOC Philippines

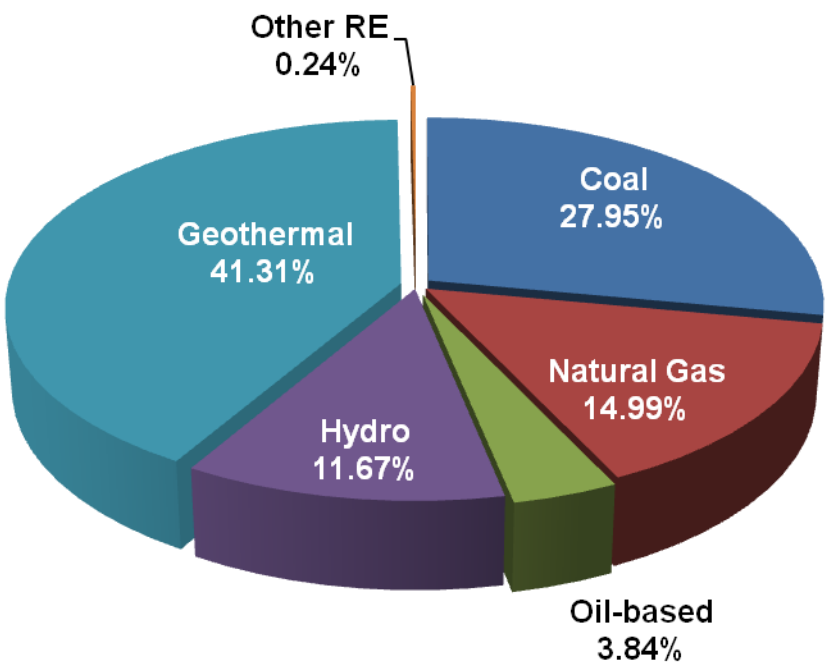
ASEAN Forum on Clean Coal Technology
Chiang Mai, Thailand
November 11-13, 2013

PRESENTATION OUTLINE

- Power Generation Mix
- Primary Energy Mix
- Historical Philippine Coal Supply / Demand
- 2012 Coal Reserves
- Incentives to Coal Operating Contract Holders
- Benefits to Host Communities of Coal Mining Projects
- Overview of the Philippine Power Sector
- Current Situation Power Sector: 2012 Capacity & Generation
- 2012 Capacity and Electricity Demand, in MW
- Luzon Supply – Demand Outlook 2013 – 2020
- Visayas Supply – Demand Outlook 2013 – 2020
- Mindanao Supply – Demand Outlook 2013 – 2020
- Potential Areas for Mine-Mouth Coal-Fired Power Plants
- Incentives to Coal Power Plant Operators
- Benefit of Coal Power Plant to Communities
- Plans and Programs

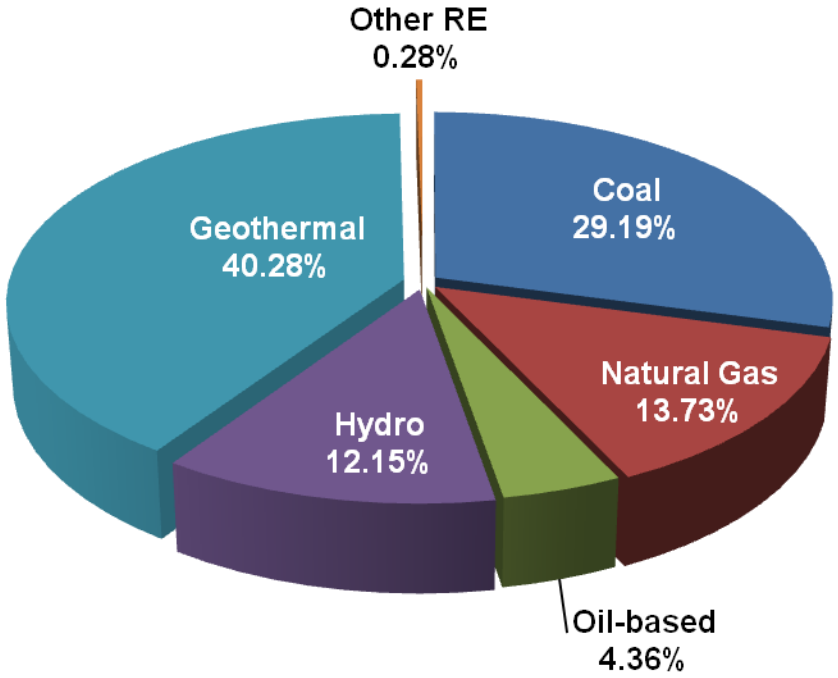
Power Generation Mix

2011



Total Energy (MTOE): 20.70
Self-sufficiency : 68.20%

2012*

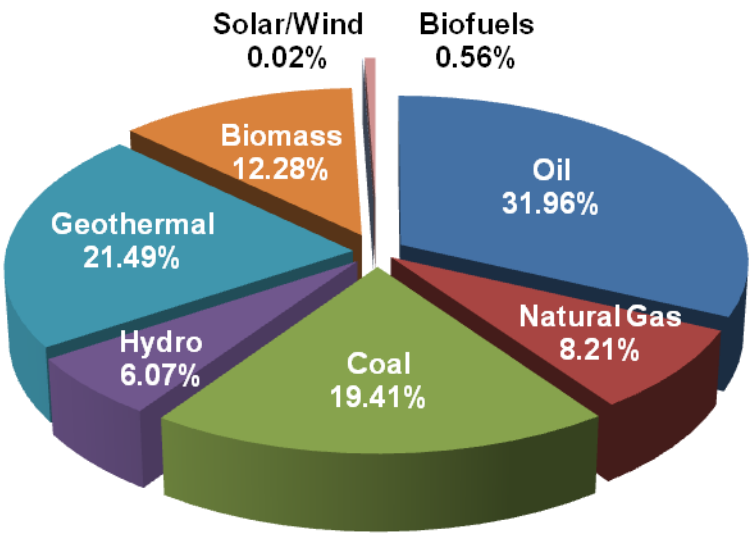


Total Energy (MTOE): 21.80
Self-sufficiency : 66.43%

* Preliminary

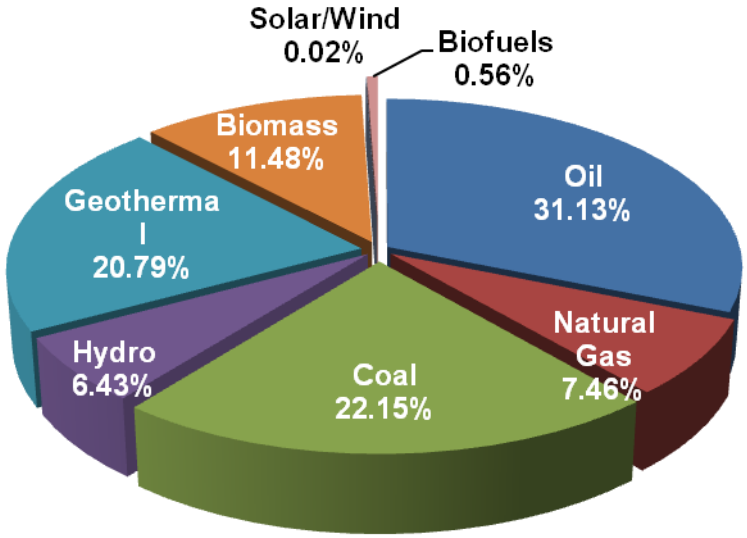
Primary Energy Mix

2011



Total Energy (MTOE): 39.80
Self-sufficiency : 59.57%

2012*

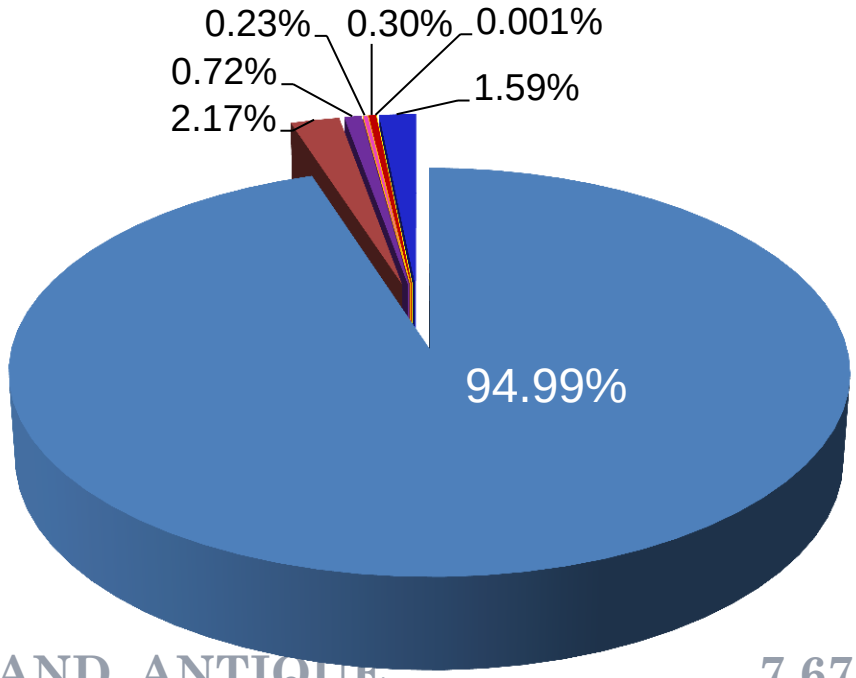


Total Energy (MTOE): 42.04
Self-sufficiency : 57.44%

Philippine Coal Supply / Demand

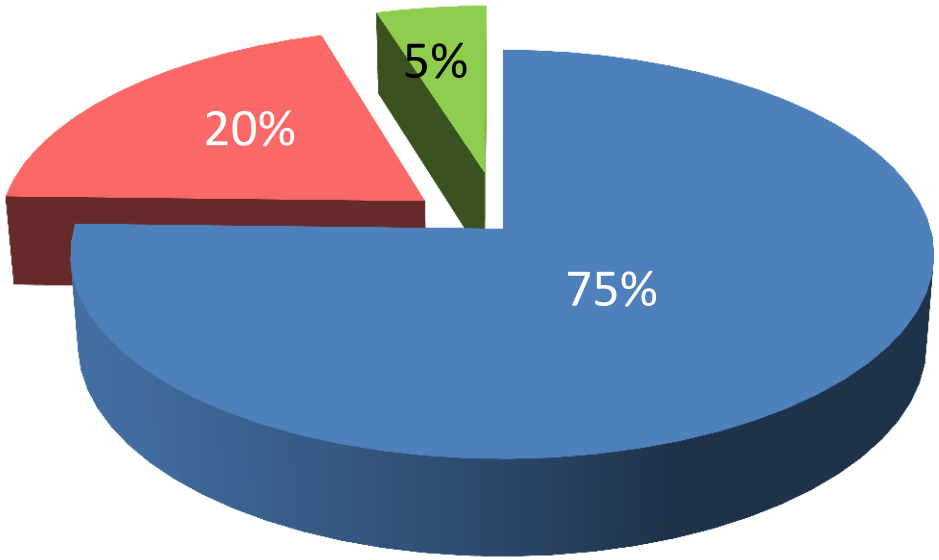
2012 Coal Production

(Run of Mine)



SEMIRARA ISLAND, ANTIQUE	7,678,351 MT
ZAMBOANGA SIBUGAY	175,447
CEBU	85,443
SURIGAO	23,992
BATAN ISLAND, ALBAY	18,887
NEGROS	75
SSCM	128,202
Total	8,083,096 MT

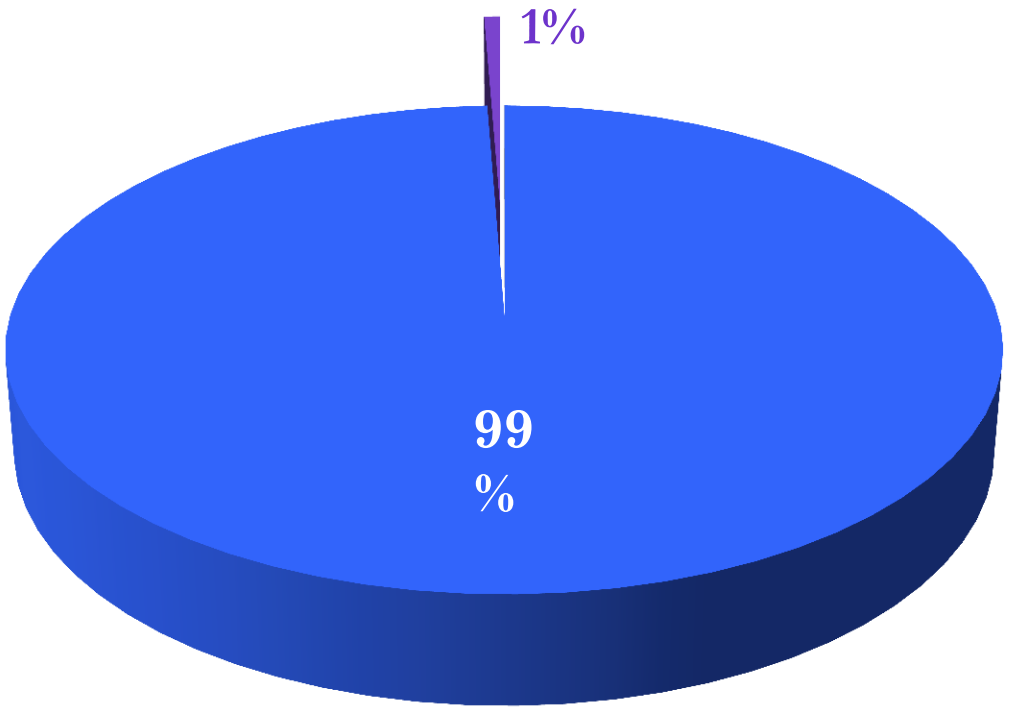
2012 Coal Consumption
(Run of Mine)



POWER	**12,777,172 MT**
CEMENT	**3,356,321**
IND'L/DIRECT PROCESS	**815,173**
TOTAL	**16,948,666 MT**

2012 Coal Importation

(Run of Mine)

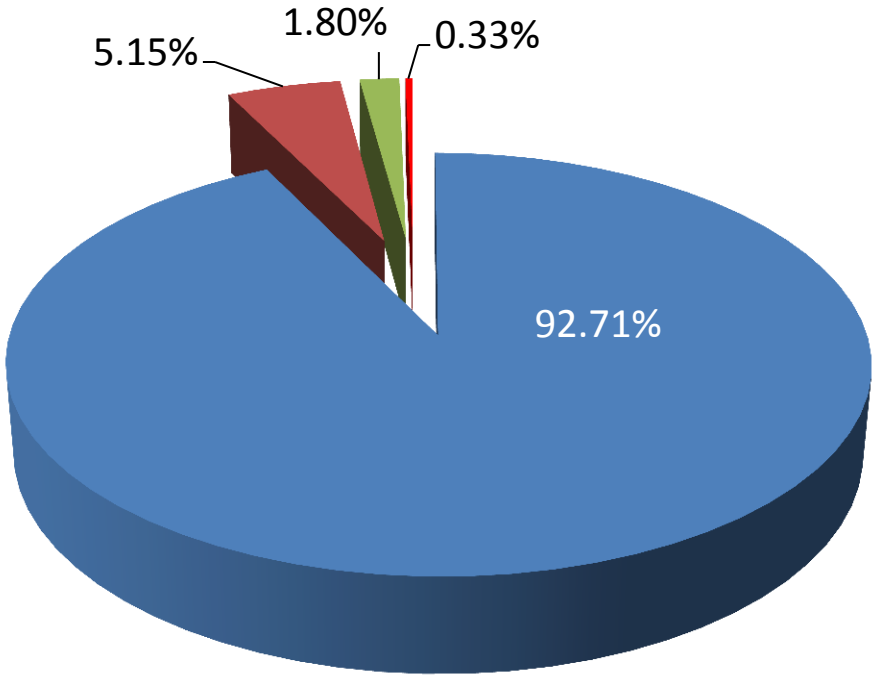


INDONESIA	**8,999,715 MT**
AUSTRALIA	**65,000**
TOTAL	**9,064,715 MT**

2012 Coal Export

Semirara Mining Corporation

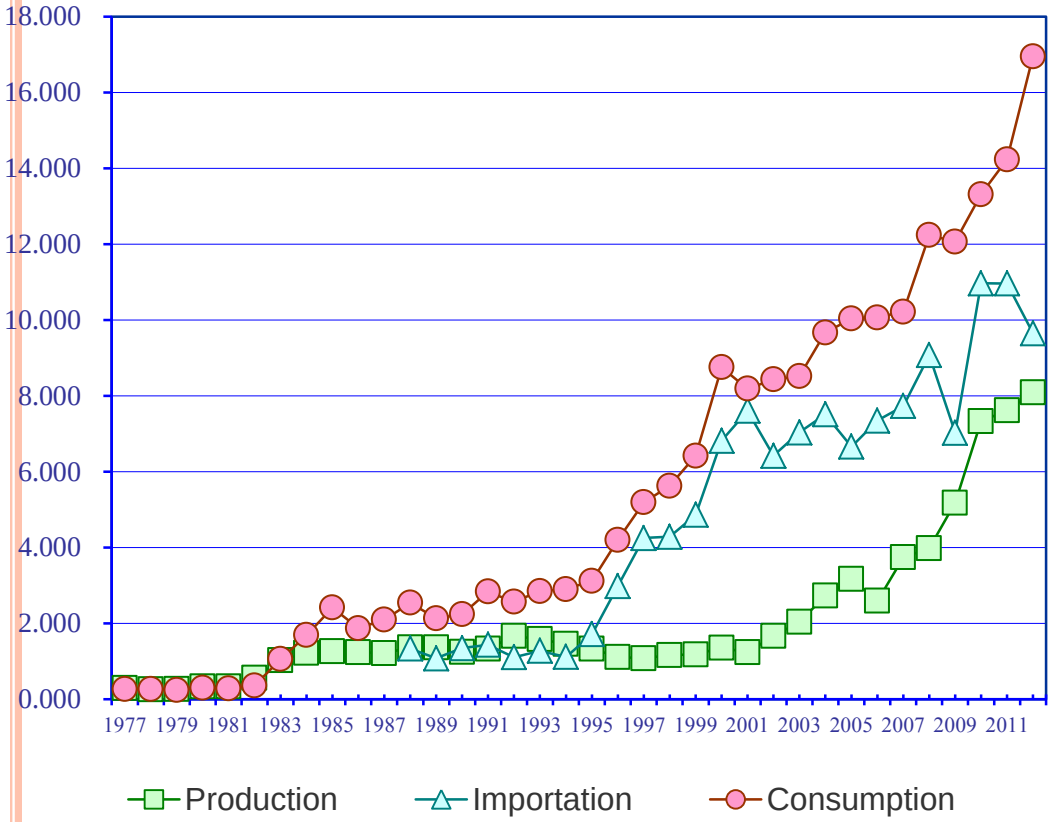
(Run of Mine)



China	2,941,691
Thailand	163,551
India	57,054
Taiwan	10,564
Total	3,172,860

1977 - 2012 Historical Coal Production, Importation and Consumption

(in Million MT)



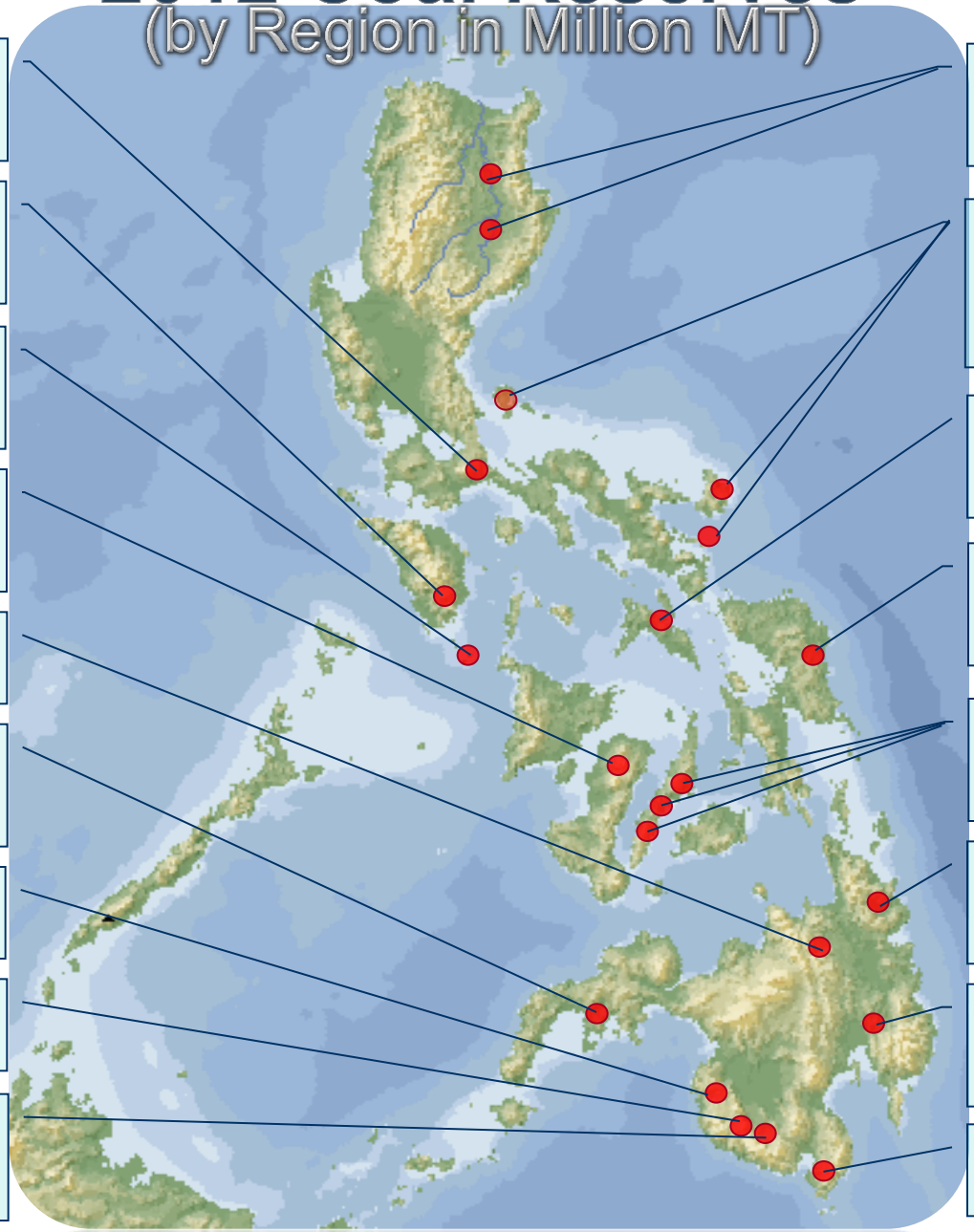
YEAR	PRODUCTION	IMPORTATION	CONSUMPTION
1977	0.285		0.259
1978	0.254		0.265
1979	0.263		0.238
1980	0.329		0.298
1981	0.331		0.278
1982	0.558		0.354
1983	1.020		1.054
1984	1.216		1.686
1985	1.262		2.414
1986	1.236		1.869
1987	1.208		2.090
1988	1.358	1.330	2.539
1989	1.360	1.075	2.130
1990	1.243	1.344	2.234
1991	1.326	1.435	2.833
1992	1.661	1.103	2.565
1993	1.582	1.273	2.847
1994	1.449	1.113	2.897
1995	1.329	1.710	3.116
1996	1.108	2.983	4.197
1997	1.076	4.248	5.189
1998	1.157	4.282	5.624
1999	1.177	4.858	6.416
2000	1.353	6.814	8.749
2001	1.230	7.601	8.184
2002	1.665	6.417	8.431
2003	2.030	7.035	8.513
2004	2.726	7.510	9.667
2005	3.163	6.656	10.036
2006	2.588	7.344	10.062
2007	3.737	7.729	10.215
2008	3.977	9.072	12.235
2009	5.176	7.027	12.064
2010	7.329	10.966	13.312
2011	7.612	10.963	14.234
2012	8.083	9.065	16.949

2012 Summary of Regional Coal Reserves

(in Metric Tons)

	Resource Potential	Positive Reserves	Probable Reserves	In-situ Reserves	Mineable Reserves
Cagayan Valley	336,000,000	80,104,730	3,695,000	82,568,063	70,182,854
Cebu					
Central	40,000,000	3,354,055	4,763,160	6,529,495	3,917,697
Northern	75,000,000	2,229,719	655,727	2,666,870	1,600,122
Southern	50,000,000	1,180,049	1,870,206	2,409,980	1,445,988
Davao	100,000,000	208,000		208,000	124,800
Masbate	2,500,000	74,994		74,994	44,996
Mindoro	100,000,000	1,310,641	198,000	1,442,641	865,585
Negros	4,500,000	1,204,952	1,213,387	2,013,877	1,208,326
Polillo, Batan & Catanduanes	17,000,000	4,960,300	1,604,675	6,017,492	3,610,495
Quezon	2,000,000	93,000		93,000	55,800
Samar	27,000,000	7,474,890	1,667,725	8,586,707	7,278,807
Semirara	570,000,000	90,674,437	43,820,358	119,888,009	101,904,808
Surigao	209,000,000	28,873,754	60,978,034	69,525,777	47,544,641
Zamboanga	45,000,000	33,991,157	5,984,679	37,980,943	22,788,566
Bukidnon	50,000,000				
Maguindanao	108,000,000				
Sarangani	120,000,000				
South Cotabato	230,400,000	35,093,186	68,959,017	81,065,864	48,639,518
Sultan Kudarat	300,300,000				
Total	**2,366,700,000**	**290,798,400**	**195,409,968**	**421,071,712**	**311,213,004**

2012 Coal Reserves
(by Region in Million MT)



QUEZON
Resource Potential - 2.00
In-situ Reserves - 0.09

MINDORO
Resource Potential - 100.00
In-situ Reserves - 1.44

SEMIRARA
Resource Potential - 570.00
In-situ Reserves - 120.00

NEGROS
Resource Potential - 4.50
In-situ Reserves - 2.01

BUKIDNON
Resource Potential - 50.00

ZAMBOANGA
Resource Potential - 45.00
In-situ Reserves - 37.98

MAGUINDANAO
Resource Potential - 108.00

SULTAN KUDARAT
Resource Potential - 300.30

SOUTH COTABATO
Resource Potential - 230.40
In-situ Reserves - 81.06

CAGAYAN VALLEY
Resource Potential - 336.00
In-situ Reserves - 82.57

BATAN-POLILLO-CATANDUANES
Resource Potential - 17.00
In-situ Reserves - 6.02

MASBATE
Resource Potential - 2.50
In-situ Reserves - 0.08

SAMAR
Resource Potential - 27.00
In-situ Reserves - 8.59

CEBU
Resource Potential - 165.00
In-situ Reserves - 11.61

SURIGAO
Resource Potential - 209.00
In-situ Reserves - 69.53

DAVAO
Resource Potential - 100.00
In-situ Reserves - 0.21

SARANGANI
Resource Potential - 120.00

Incentives to Coal Operating Contract Holders

- Recovery of operating expenses not exceeding 90% of the gross proceeds from production in any year with carry forward of unrecovered cost;
- Special allowance of up to 40% of the net proceeds;
- Exemption from all taxes except income tax
- Exemption from payment of tariff duties and compensating tax on importation of machinery, equipment, spare parts and all materials required for the coal operations
- Entry of alien technical and specialized personnel

Benefits to Host Communities of Coal Mining Project

- 3% Government share from proceeds of coal sales
- Income tax
- Corporate social responsibility

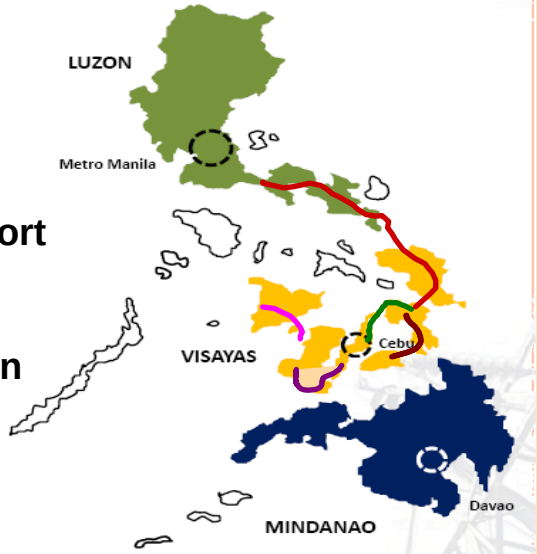
Overview of the Philippine Power Sector

2012 Capacity and Electricity Demand, In MW

GRID	Installed Capacity	Dependable Capacity	Available Capacity at Peak	Peak Hours	Date	Peak Demand	Actual Reserve at Peak	Required Reserve Margin
LUZON	12,528	11,349	8,944	2:00 PM	27 Apr	7,889	1,055	1,610
VISAYAS	2,448	2,103	1,731	7:00 PM	17 Dec	1,551	180	261
MINDANAO	2,049	1,614	1,311	7:00 PM	19 Dec	1,257*	50	250
TOTAL	**17,025**	**15,066**	**11,986**					

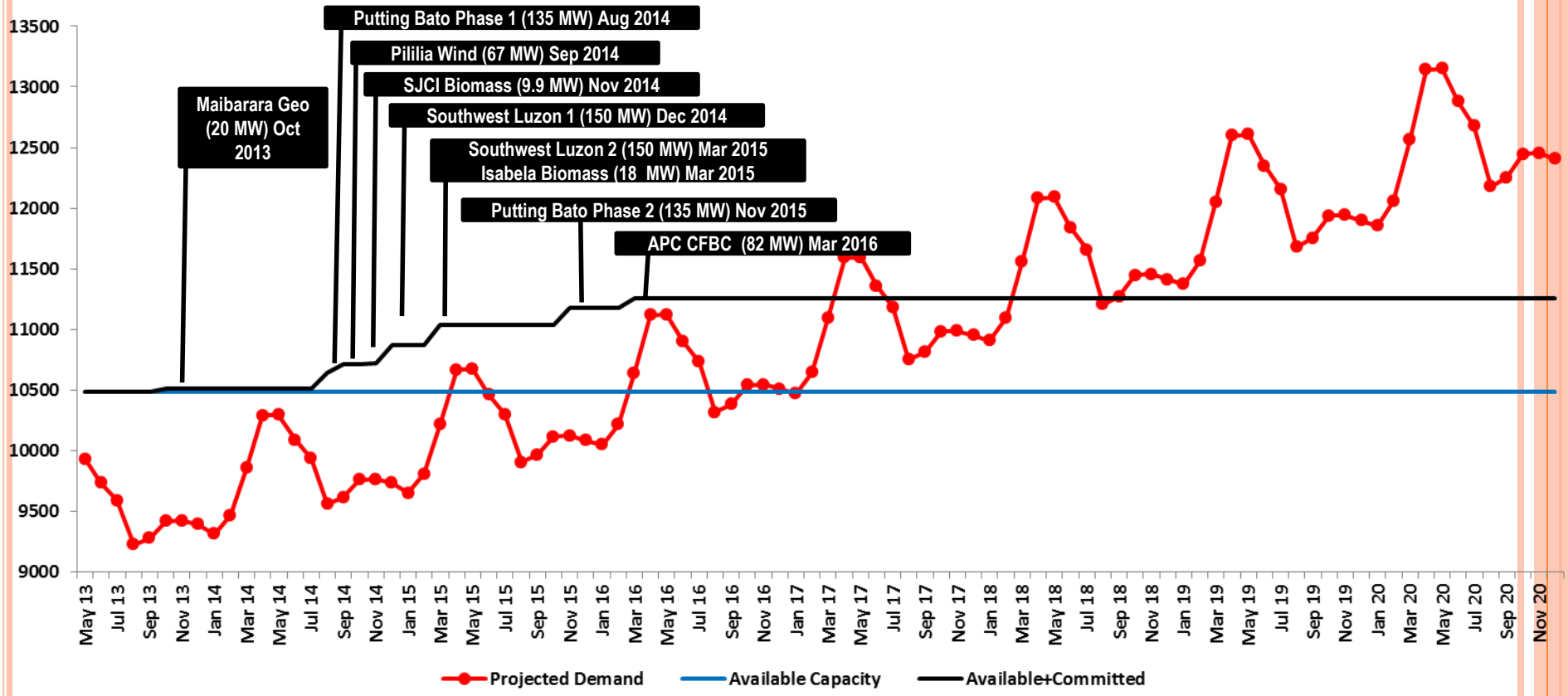
Notes:

- **Installed and Dependable capacity as of May 2013**
- **Available Capacity at peak demand based on NGCP-Daily Operations Report**
- **System Peak Demand for 2012**
- ***Curtailed demand for Mindanao grid**
- **Required Reserve Margin is 4 % of Peak Demand for Frequency Regulation and Largest Unit both for Contingency and Dispatchable Reserve**
  - 647 MW Largest Unit for Luzon
  - 100 MW Largest Unit for Visayas and Mindanao



Note: Transparent islands in the above diagram are not covered by NGCP's network.

Luzon Supply – Demand Outlook 2013 - 2020



Start of Critical Periods

On Available Capacity:

- Apr-May 2015: Projected Deficit of 184 MW
- Mar-Jul 2016: Projected Deficit of 240 to 635 MW

On Available Capacity + Committed:

- Apr-Jun 2017: Projected Deficit of 104 to 339 MW
- Mar-Dec 2018: Projected Deficit of 157 to 833 MW

Notes

a. Demand curve as plotted includes total of peak demand and required Reserve Margin (RM) i.e. 4% regulating reserve and contingency and dispatchable reserve requirement

b. 4.2 % peak demand growth rate resulted from observed 0.6 elasticity ratio of demand for electric power with national economic growth applied to 7 percent GDP growth rate (GR) target for 2013-2015.

c. 4.8 % peak demand growth rate resulted from observed 0.6 elasticity ratio of demand for electric power with national economic growth applied to 8 percent GDP growth rate (GR) target for 2016-2020.

d. Assumed 6.6 percent average forced outage of the total dependable capacity

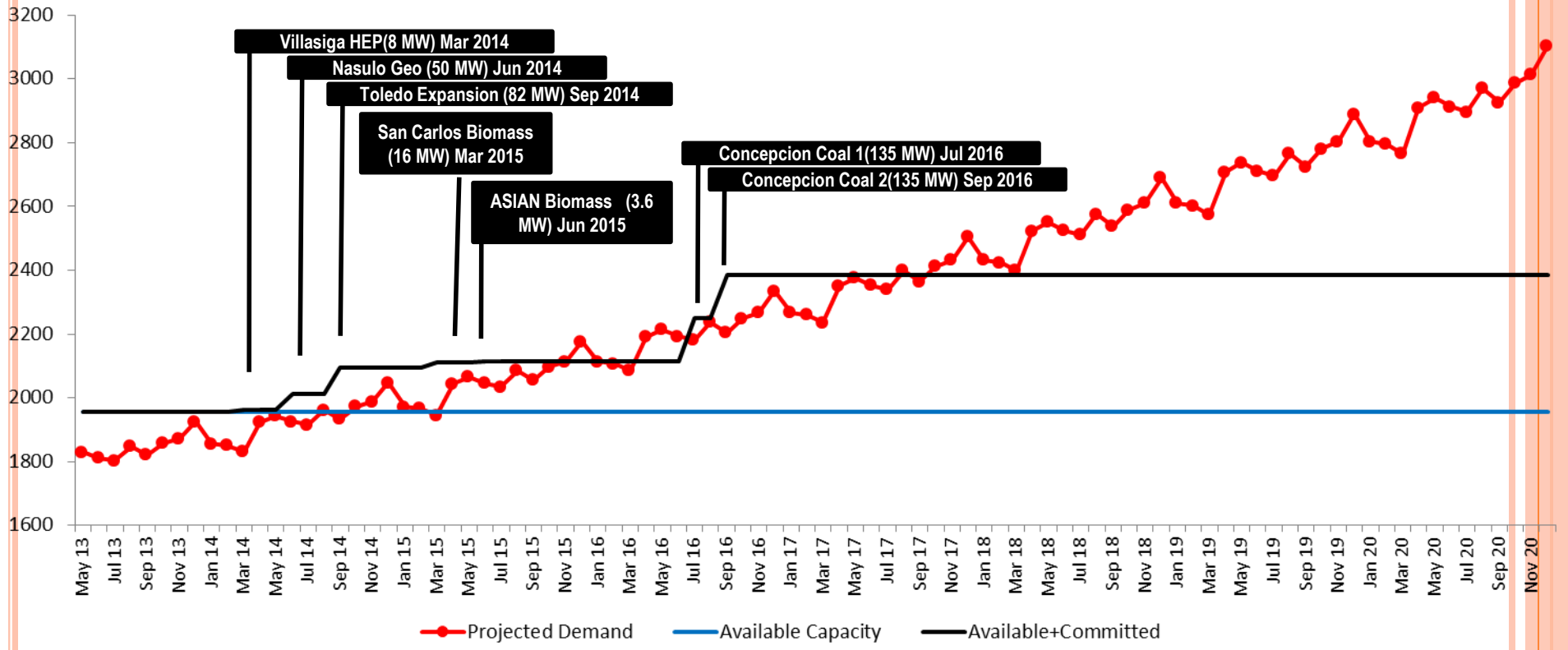
2012 Luzon Capacity Mix

Fuel Type	Capacity (MW)		Percent (%) Share		No. of Generating Facilities
	Installed	Dependable	Installed	Dependable	
Coal	4,531	4,219	36.16	37.18	8
Oil	1,778	1,586	14.19	13.97	12
Geothermal	824	587	6.58	5.17	3
Hydro	2,462	2,147	19.66	18.91	5
Biomass	38	34	0.31	0.30	21
Natural Gas	2,861	2,759	22.84	24.31	1
Wind	33	17	0.26	0.15	5
Total	**12,528**	**11,349**			**55**

Indicative Power Projects, Luzon

PLANT TYPE	2014	2015	2016	2017	2018	2019	2020	TOTAL
COAL		150	1,090	600	2,000		300	4,140
NATURAL GAS	600	550		1,200	2,950			5,300
OIL-BASED			150					150
GEOTHERMAL					40	80		120
HYDRO		8						8
SOLAR	20		30					50
WIND	168	45		154				367
BIOMASS		18						18
TOTAL	**788**	**771**	**1,270**	**1,954**	**4,990**	**80**	**300**	**10,153**

Visayas Supply – Demand Outlook 2013 - 2020



Start of Critical Periods

On Available Capacity:

- Nov-Dec 2014: Projected Deficit of 30 to 90 MW
- Apr-Dec 2015: Projected Deficit of 80 MW to Max 220 MW

On Available Capacity + Committed:

- Dec 2015: Projected Deficit of 60 MW
- Apr-Jun 2016: Projected Deficit of 70 to 100 MW
- Dec 2017-Dec 2018: Projected Deficit of 120 to 305 MW

Notes

a. Demand curve as plotted includes total of peak demand and required Reserve Margin (RM) i.e. 4% regulating reserve and contingency and dispatchable reserve requirement

b. 7 % peak demand growth rate resulted from observed 1 elasticity ratio of demand for electric power with national economic growth applied to 7 percent GDP growth rate (GR) target for 2013-2015.

c. 8 % peak demand growth rate resulted from observed 1 elasticity ratio of demand for electric power with national economic growth applied to 8 percent GDP growth rate (GR) target for 2016-2020.

d. Assumed 7 percent average forced outage of the total dependable capacity

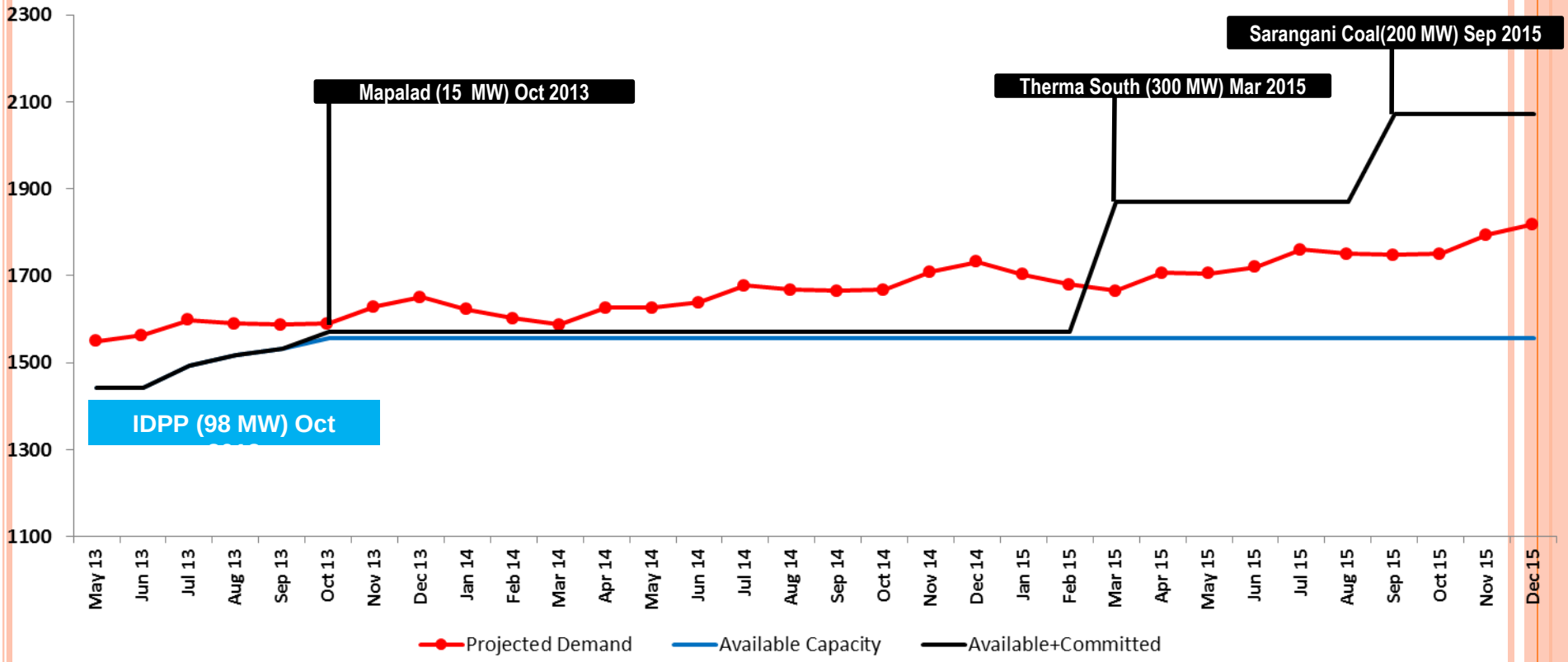
2012 Visayas Capacity Mix

Fuel Type	Capacity (MW)		Percent (%) Share		No. of Generating Facilities
	Installed	Dependable	Installed	Dependable	
Coal	806	777	32.91	36.93	5
Oil	670	505	27.39	24.03	17
Geothermal	915	777	37.39	36.94	3
Hydro	11	11	0.47	0.51	7
Biomass	44	32	1.81	1.54	3
Natural Gas	1	1	0.04	0.05	1
Total	**2,448**	**2,103**			36

Indicative Power Projects, Visayas

PLANT TYPE	2014	2015	2016	2017	2018	2019	2020	TOTAL
COAL		150	20	300				470
GEOTHERMAL					40			40
HYDRO		6		18				24
SOLAR		30						30
WIND	104	50						154
TOTAL	**104**	**236**	**20**	**318**	**40**	**-**	**-**	**718**

Mindanao Supply – Demand Outlook 2013 - 2020



Critical Periods

On Available Capacity:

- 2013: Projected Deficit of 50 to 110 MW
- 2014 : Projected Deficit of 50 to 190 MW
- 2015: Projected Deficit 120 to 280 MW

Notes

a. Demand curve as plotted includes total of peak demand and required Reserve Margin (RM) i.e. 4% regulating reserve and contingency and dispatchable reserve requirement

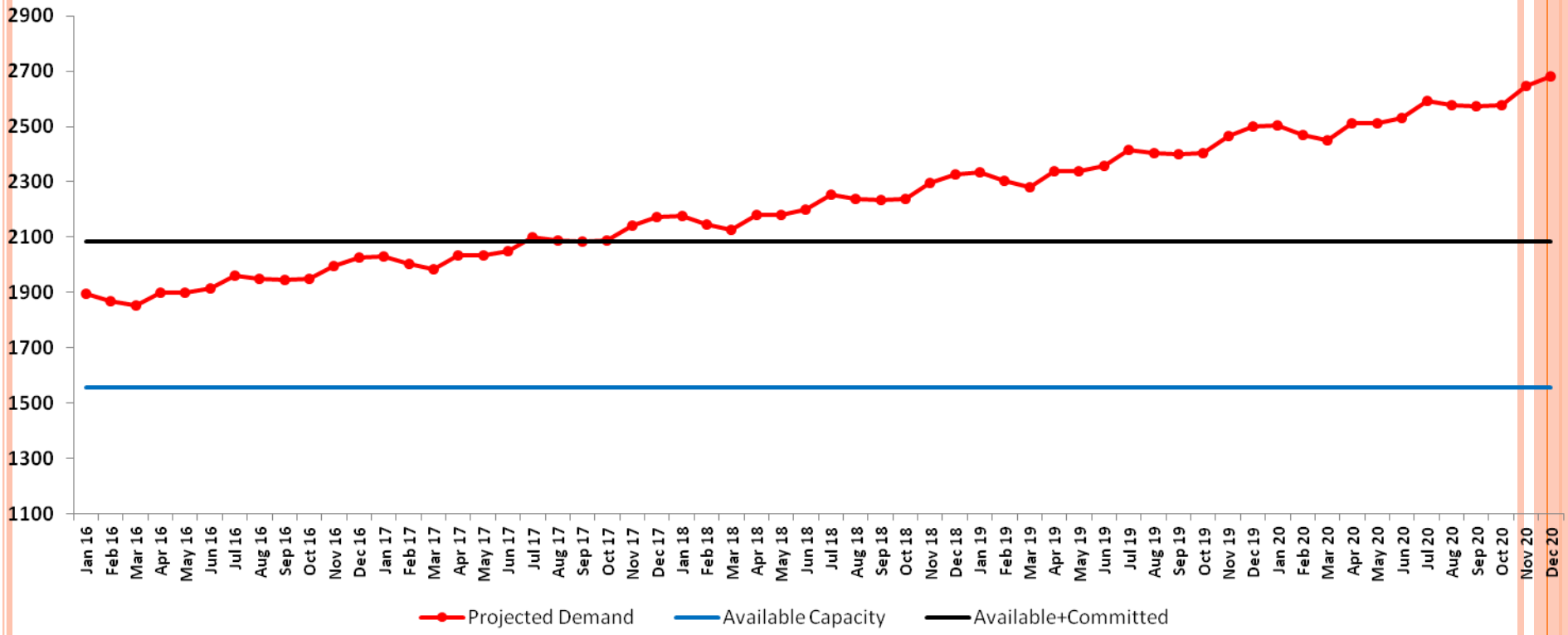
b. 5.6 % peak demand growth rate resulted from observed 0.8 elasticity ratio of demand for electric power with national economic growth applied to 7 percent GDP growth rate (GR) target for 2013-2015.

c. 12.8 % peak demand growth rate resulted from observed 1.6 elasticity ratio of demand for electric power with national economic growth applied to 8 percent GDP growth rate (GR) target for 2016

d. 8 % peak demand growth rate resulted from observed 1 elasticity ratio of demand for electric power with national economic growth applied to 8 percent GDP growth rate (GR) target for 2017-2020

e. Assumed 3.41 percent average forced outage of the total dependable capacity

Mindanao Supply – Demand Outlook 2013 - 2020



Next Critical Periods

On Available Capacity + Committed:

- Nov-Dec 2017: Projected Deficit of 55 to 85 MW
- 2018: Projected Deficit of 50 to 243 MW

Notes

a. Demand curve as plotted includes total of peak demand and required Reserve Margin (RM) i.e. 4% regulating reserve and contingency and dispatchable reserve requirement
b. 5.6 % peak demand growth rate resulted from observed 0.8 elasticity ratio of demand for electric power with national economic growth applied to 7 percent GDP growth rate (GR) target for 2013-2015.
c. 12.8 % peak demand growth rate resulted from observed 1.6 elasticity ratio of demand for electric power with national economic growth applied to 8 percent GDP growth rate (GR) target for 2016
d. 8 % peak demand growth rate resulted from observed 1 elasticity ratio of demand for electric power with national economic growth applied to 8 percent GDP growth rate (GR) target for 2017-2020
e. Assumed 3.41 percent average forced outage of the total dependable capacity

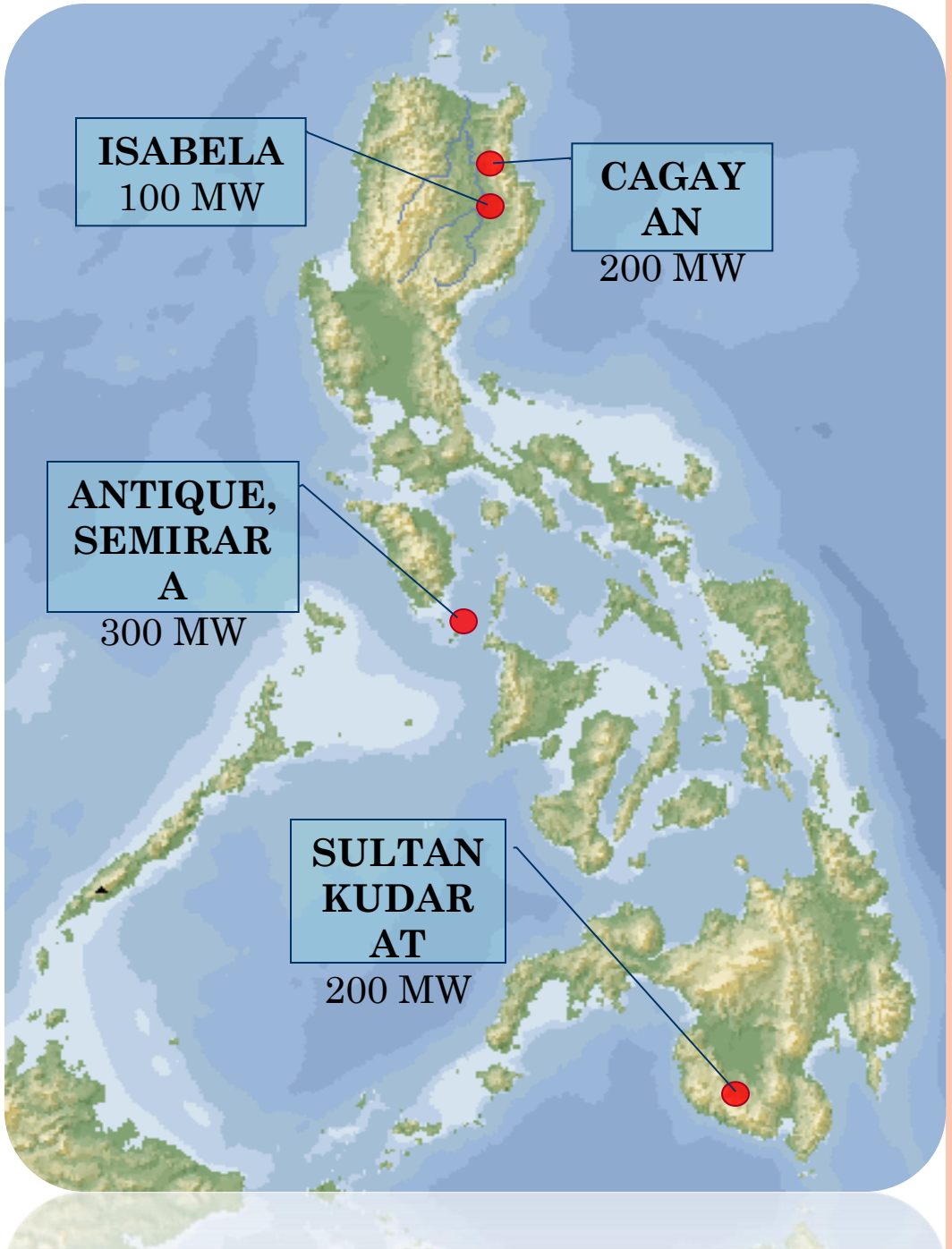
2012 Mindanao Capacity Mix

Fuel Type	Capacity (MW)		Percent (%) Share		No. of Generating Facilities
	Installed	Dependable	Installed	Dependable	
Coal	232	210	11.32	13.01	1
Oil	625	470	30.50	29.11	12
Geothermal	108	98	5.29	6.07	1
Hydro	1,047	826	51.09	51.17	12
Biomass	36	10	1.75	0.62	1
Solar	1	0	0.05	0.02	1
Total	**2,049**	**1,614**			**28**

Indicative Power Projects, Mindanao

PLANT TYPE	2014	2015	2016	2017	2018	2019	2020	TOTAL
COAL		270	655	515	300	300	300	2,340
GEOTHERMAL				50				50
HYDRO		94		6	10			110
SOLAR		35						35
TOTAL		**399**	**655**	**571**	**310**	**300**	**300**	**2,535**

Potential Areas for Coal Mine-Mouth Power Plants



Incentives to Coal Power Plant Operators

- Fiscal Incentives
  - Income tax holiday;
  - Exemption from taxes and duties on imported spare parts;
  - Exemption from wharfage dues and export tax, duty, impost and fees;
  - Modified duty rate for capital equipment by virtue of E.O. 313;
  - Tax credits; and
  - Additional deduction from taxable income
- Non-fiscal Incentives
  - Employment of foreign nationals;
  - Simplification of customs procedures
  - Importation of consigned equipment; and
  - The privilege to operate a bonded manufacturing/trading warehouse subject to custom rules and regulations.

Benefits of Coal Power Plant to Communities

- ER 1-94

  The Generation Company and/or energy resource developer shall set aside one centavo per kilowatt-hour (P0.01/k Wh) of the total electricity sales as financial benefit of the host communities of such Generation Facility where applicable.

- Income Tax
- Corporate Social Responsibility

Plans and Program
Coal Mining and Utilization

- Continue the regular conduct of PECR to offer prospective coal areas
- Pursue research and development activities to improve existing technologies for pollution control in the use of coal, particularly in coal-fired power plant
- Institutionalize the application of clean coal technologies such as fluidized bed combustion, flue gas desulfurization, electrostatic precipitation, etc.
- Promote adoption of local coal quality upgrading technologies such as coal washing/preparation and blending, and other advanced technologies
- Undertake studies on environment-friendly alternative uses of coal such as coal liquefaction, coal gasification and CBM technology

Plans and Program
Coal Mining and Utilization

- Formulate and implement policy reforms on:
  - Revised Coal Mine Safety Rules and Regulations
  - Revised Small-Scale Coal Mining Guidelines
  - Guidelines on Coal Trader's Accreditation and Coal End-users Registration
- Harmonize the national and local taxes imposed on energy development activities
- Continue international cooperation on energy resources e.g. establishment of ASEAN Coal Supply Security Agreement
- Encourage further investment on resource development
  - Establish one-stop shop for investors

THANK YOU

Asean Forum on Clean Coal Technology
Chiang Mai, Thailand
November 11-13, 2013