

Investment Opportunities in the Philippine Energy Sector



Investment Promotion Office
Department of Energy



Investment Opportunities

- Power
- Oil & Gas
- Coal
- Natural Gas
- Alternative Fuels
- Renewable Energy



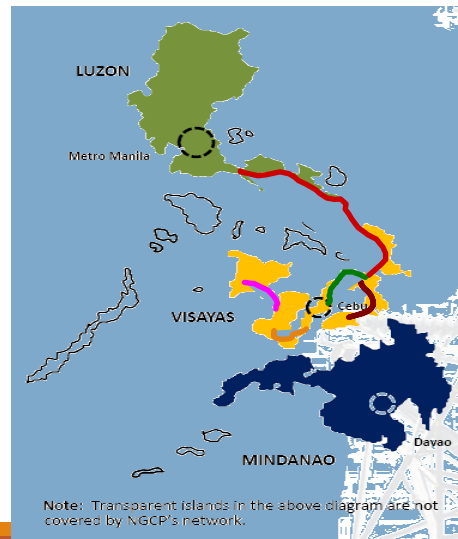
Power

POWER SITUATIONER

FUEL TYPE	LUZON		VISAYAS		MINDANAO		PHILIPPINES	
	MW	% Share	MW	% Share	MW	% Share	MW	% Share
Coal	4,531	36.16	806	32.91	232	11.32	5,568	32.71
Oil Based	1,778	14.19	670	27.39	625	30.50	3,074	18.05
Natural Gas	2,861	22.84	1	0.04			2,862	16.81
Geothermal	824	6.58	915	37.39	108	5.29	1,848	10.85
Hydro	2,462	19.66	11	0.47	1,047	51.09	3,521	20.68
Wind	33	0.26					33	0.19
Biomass	38	0.31	44	1.81	36	1.75	119	0.70
Solar					1	0.05	1	0.01
TOTAL	12,528		2,448		2,049		17,025	

Interconnection Line Capacity

- Leyte-Luzon (440 MW)
- Leyte-Cebu (400 MW)
- Leyte-Bohol (100 MW)
- Cebu-Negros (200 MW)
- Negros-Panay (100 MW)



Source: DOE List of Existing Power Plants as of May 2013

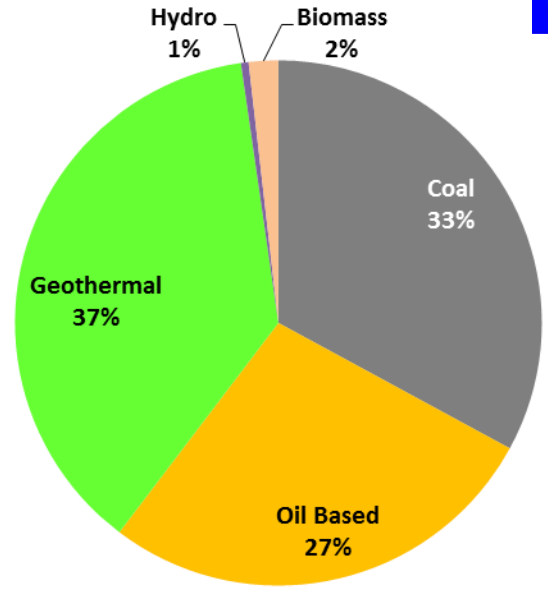
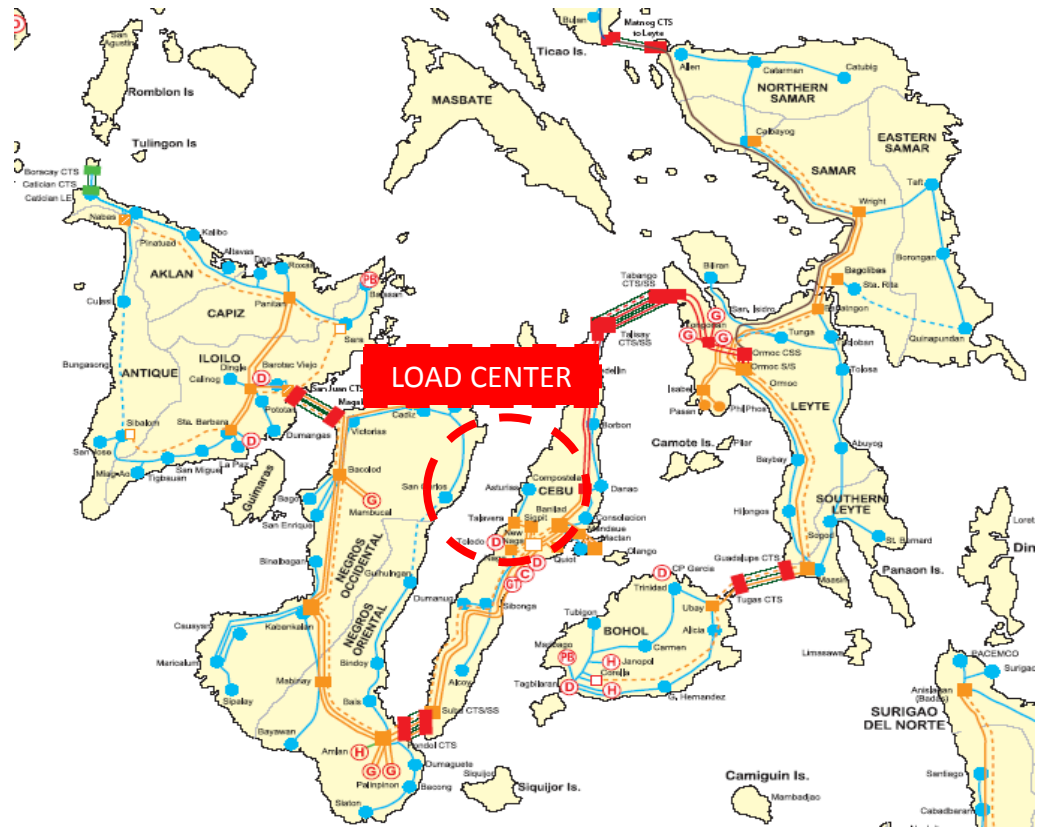
- Includes embedded generators
- Excludes off-grid generator

VISAYAS POWER
SUPPLY and DEMAND OUTLOOK
2014-2020

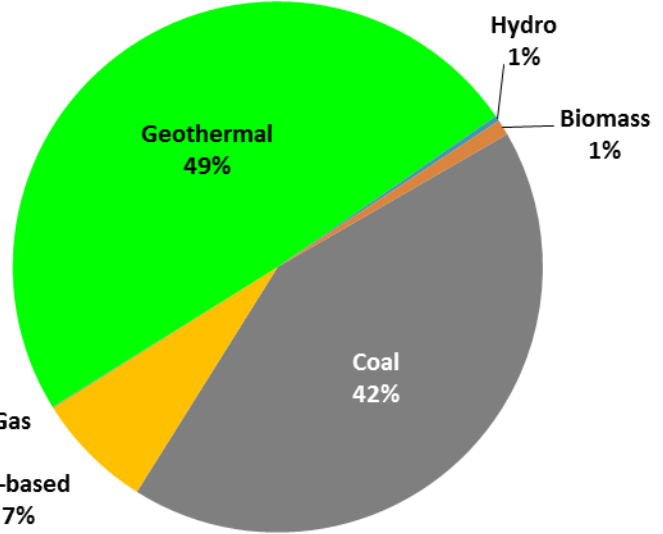


VISAYAS POWER SECTOR SITUATIONER

2013 CAPACITY AND GENERATION



Installed Capacity: 2,448 MW



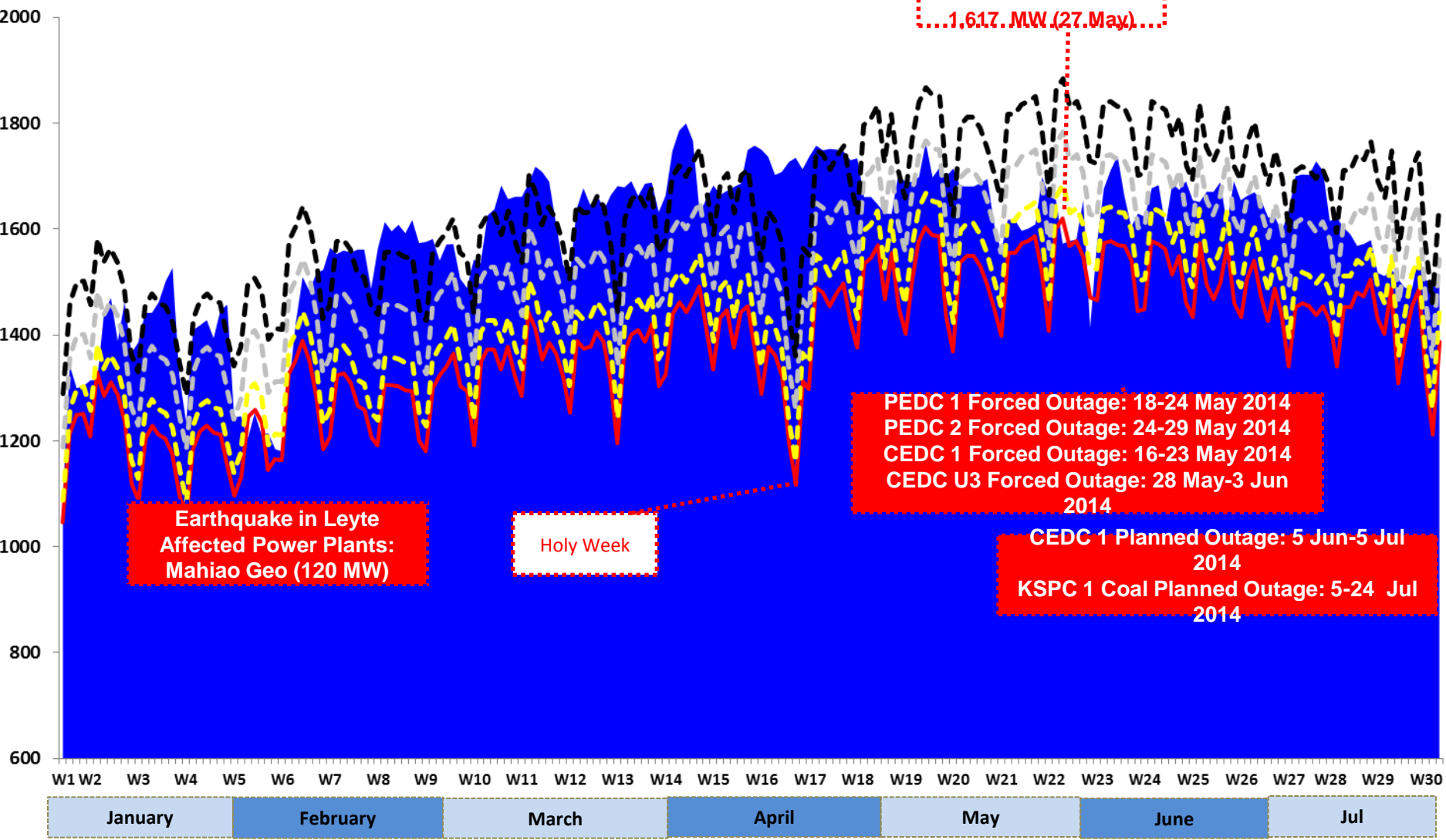
Gross Generation: 11,100 GWh

- Note:
- Installed capacity based on Existing Power Plants as of March 2014
 - 2013 Gross generation includes off-grid areas

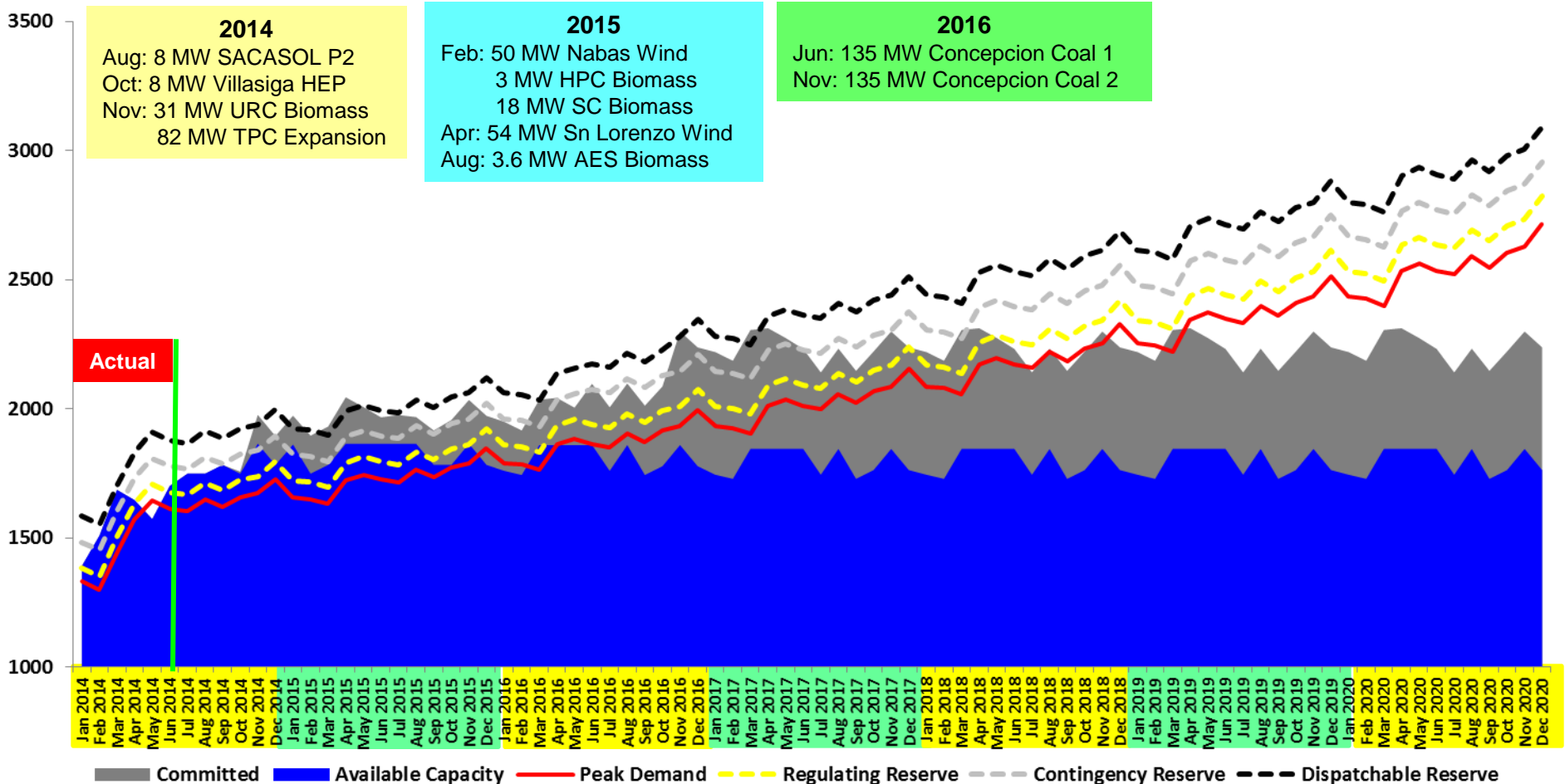


VISAYAS SUPPLY-DEMAND SITUATION

1 JANUARY to 21 JULY 2014

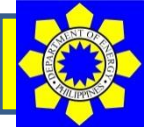


VISAYAS SUPPLY-DEMAND OUTLOOK 2014-2020



Notes

- a. Reserve Margin (RM) i.e. 4% regulating reserve and largest online unit for contingency and dispatchable reserve requirement (100 MW to increase by 135 MW in 2016)
- 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 2014-2015.
- 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 4.35 percent average forced outage of the total available capacity



COMMITTED POWER PROJECTS

Visayas Grid Committed Power Projects, 587.6 MW

Type.	Name of the Project	Project Proponent	Mother/ JV Company	Location	Rated Capacity (MW)	Target Testing & Commissioning	Target Commercial Operation
SOLAR	SACASOL P2	San Carlos Solar Energy Inc.	Conergy (German)	San Carlos City, Negros Occidental	8	Jun-14	Aug-14
GEOHERMAL	Nasulo Geothermal Project	Energy Development Corporation (EDC)	Energy Development Corporation (EDC)	Nasuji, Valencia, Negros Oriental	50	Jun-14	Aug-14
HYDRO	Villasiga HEP	Sunwest Water & Electric Co., Inc. (SUWECO)	Sunwest Water & Electric Co., Inc. (SUWECO)	Brgy. Igsoro, Bugasong, Antique	8	May-14	Oct-14
BIOMASS	46 MW Universal Robina Corporation Bagasse Cogeneration Facility	Universal Robina Corporation	JG Summit Holdings Inc.	Negros Occidental	31	Sep-14	Nov-14
COAL	TPC Coal-Fired Power Plant Expansion Project (1 x 82 MW Coal-Fired Power Plant)	Toledo Power Company	Global Business Power Corporation	Toledo City, Cebu	82	Sep-14	Nov-14
WIND	Nabas Wind Power Project	Petrogreen Energy Corporation	Petrogreen Energy Corporation	Brgy. Pawa, Nabas, Aklan	50	Dec-14	Feb-15
BIOMASS	20 MW SCBiopower Bagasse-Fired Power Generation Project	San Carlos Biopower Inc.	Bronzeoak Philippines	Negros Occidental	18	Dec-14	Feb-15
BIOMASS	8.0 MW HPCo Bagasse Cogeneration Plant	Hawaiian Philippines Company	Hawaiian Philippines Company	Negros Occidental	3	Dec-14	Feb-15
WIND	54 MW San Lorenzo Wind Power Project	Trans-Asia Renewable Energy Corporation	Trans Asia Oil and Energy Development Corporation (TAOil)	San Lorenzo, Guimaras Island	54	Feb-15	Apr-15
	(8 MW & 46 MW)						

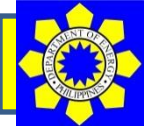


COMMITTED POWER PROJECTS

Visayas Grid Committed Power Projects, 587.6 MW

Type	Name of the Project	Project Proponent	Mother/ JV Company	Location	Rated Capacity (MW)	Target Testing & Commissioning	Target Commercial Operation
BIOMASS	Consolacion Landfill Methane Recovery and Electricity Generation	Asian Energy System Corporation	Asian Energy System Corporation	Cebu	3.6	Jun-15	Aug-15
COAL	2 X 135 MW Concepcion Coal-fired Power Plant	Palm Thermal Consolidated Holdings Corp.	AC Energy Holdings, Inc./ Palm Thermal Consolidated Holdings Corporation/ Jin Navitas Resource, Inc.	Brgy. Nipa, Concepcion, Iloilo	270	U1 - Sep 2015 U2 - May 2016	U1 - Jun 2016 U2 - Nov 2016
	Phase 1-135MW Unit) (1st						
BIOMASS	26 MW VMCI Bagasse-Fired Cogeneration Plant	Victorias Milling Company Inc.	Victorias Milling Company Inc.	Negros Occidental	2	TBA	TBA
HYDRO	Cantakoy HEP	Quadrivier Energy Corp.	Quadrivier Energy Corp.	Danao, Bohol	8	TBA	TBA
TOTAL					587.60		

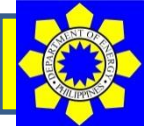
* off grid



INDICATIVE POWER PROJECTS

Visayas Grid Indicative Power Projects, 776.2 MW

Name of the Project	Project Proponent	Mother/ JV Company	Location	Rated Capacity (MW)	Target Commissioning
PEDC Expansion Project Former report (1x150 MW Circulating Fluidized Bed (CFB) Coal-Fired Power Plant)	Panay Energy Development Corporation (Global Business Power Corporation)	Global Business Power Corporation	Brgy. Ingore, La Paz, Iloilo	150	Dec-2015
1 X 20 MW FDC Danao CFB Coal Power Plant	FDC Utilities, Inc.	FDC Utilities, Inc.	Danao City, Cebu	20	Dec-2016
300 MW Therma Visayas Energy Project	Therma Visayas Inc.	Aboitiz Power Corporation	Brgy. Bato, Toledo City, Cebu	300	Mar-2017
TOTAL COAL				470	
49 MW Biliran Geothermal Plant Project	Biliran Geothermal Incorporated	Orka Energy Philippines (Iceland)	Biliran, Biliran	49	Dec-2015
Dauin Geothermal Project	Energy Development Corporation (EDC)	Energy Development Corporation (EDC)	Dauin, Negros Oriental	40	Dec-2018
Southern Leyte Geothermal Plant Geothermal Project (formerly known as Mt. Cabalian Geothermal)	Energy Development Corporation	Energy Development Corporation (EDC)	Cabalian, Southern Leyte	TBA	TBA
TOTAL GEOTHERMAL				89	
Leyte Solar Photovoltaic Power Project	Phil. Solar Farm-Leyte, Inc.	Phil. Solar Farm-Leyte, Inc.	Ormoc City, Leyte	30	Jan-2015
TOTAL SOLAR				30	
Pulupandan Wind Power Project	First Maxpower International Corporation	First Maxpower International Corporation	Pulupandan, Negros Occidental	50	Nov-2015
TOTAL WIND				50	



INDICATIVE POWER PROJECTS

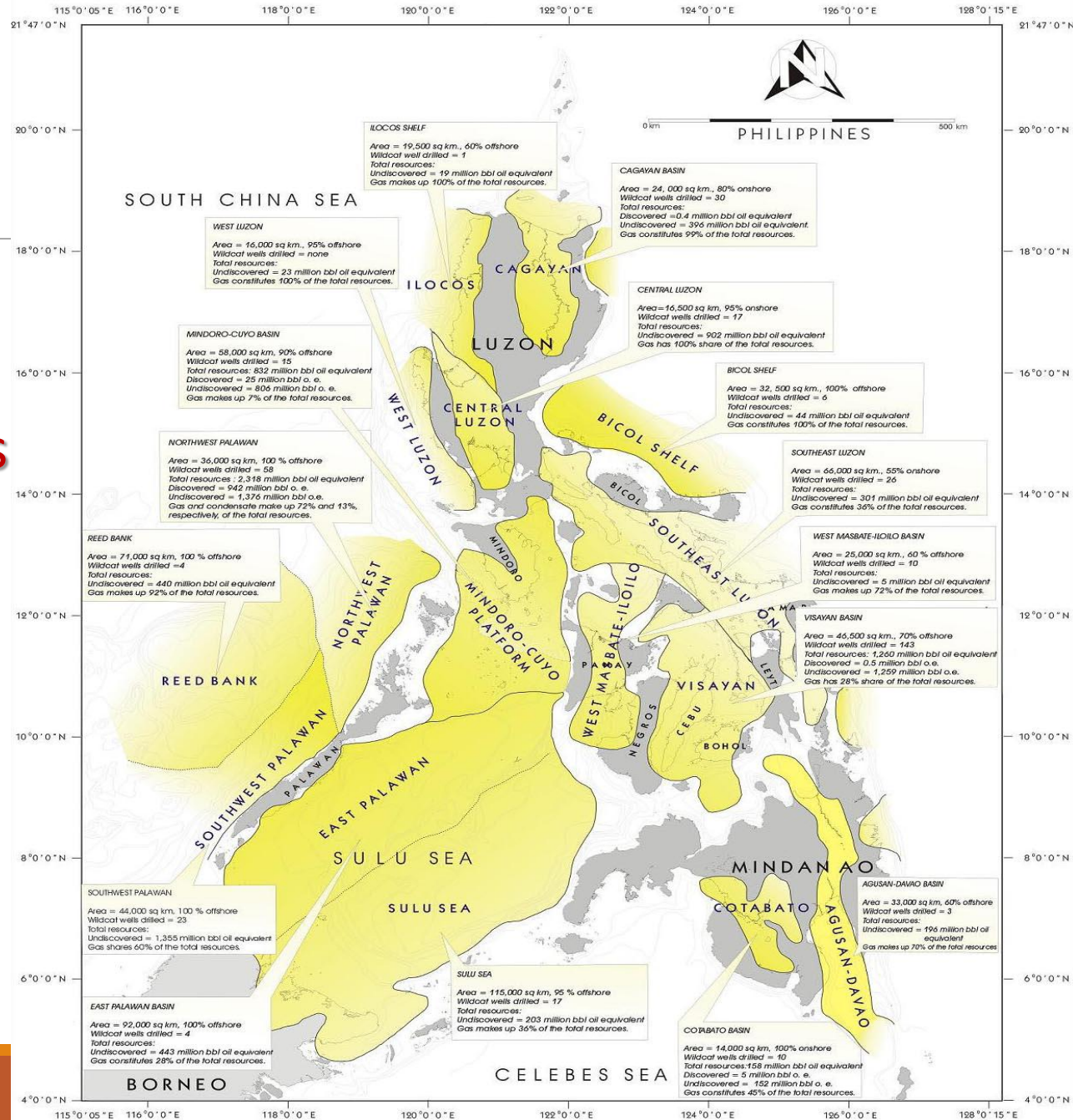
Visayas Grid Indicative Power Projects, 776.2 MW

Name of the Project	Project Proponent	Mother/ JV Company	Location	Rated Capacity (MW)	Target Commissioning
Igbulo (Bais) Hydroelectric Power Project	Century Peak Energy Corporation	Century Peak Metals Holdings Corp	Igbaras, Iloilo	5.1	Jan-2015
Hilabangan (Upper Cascade)	Century Peak Energy Corporation	Century Peak Metals Holdings Corp	Kabankalan, Negros Occidental	4.8	Aug-2015
Hilabangan (Lower Cascade)	Century Peak Energy Corporation	Century Peak Metals Holdings Corp	Kabankalan, Negros Occidental	3	Aug-2015
Maninila (Lower Cascade)	Century Peak Energy Corporation	Century Peak Metals Holdings Corp	San Remigio, Antique	4.5	Oct-2016
Maninila (Upper Cascade)	Century Peak Energy Corporation	Century Peak Metals Holdings Corp	San Remigio, Antique	3.1	Oct-2016
Sibalom (Upper Cascade)	Century Peak Energy Corporation	Century Peak Metals Holdings Corp	San Remigio, Antique	4.2	Oct-2016
Sibalom (Middle Cascade)	Century Peak Energy Corporation	Century Peak Metals Holdings Corp	San Remigio, Antique	4	Oct-2016
Sibalom (Lower Cascade)	Century Peak Energy Corporation	Century Peak Metals Holdings Corp	San Remigio, Antique	3.3	Oct-2016
Timbaban Hydroelectric Power Project	Oriental Energy and Power Generation Corporation	Oriental Peninsula Resources Group Inc (ORE)	Madalag, Aklan	18	Aug-2017
Loboc Hydro Power Project	Sta Clara Power Corporation	Sta Clara Int'l Corporation	Loboc, Bohol	1.2	TBA
TOTAL HYDRO				51.2	
46 MW Biomass-Fired Cogeneration Power Plant	Universal Robina Corporation	JG Summit Holdings Inc.	Kabankalan, Negros Occidental	46	Jul-2014
TOTAL BIOMASS				46	
40 MW Battery Storage Project	AES Philippines Power Partners Co., LTD.	AES Philippines Power Partners Co., LTD.	Kabankalan, Negros Occidental	40	Mar-2015
TOTAL BATTERY				40	
TOTAL				775.20	

Oil & Gas

Areas of Opportunities

There are **16** Sedimentary basins representing an area of over **700,000 sq km.**



Petroleum Basin Prospectivity Map

Most Prospective Basins

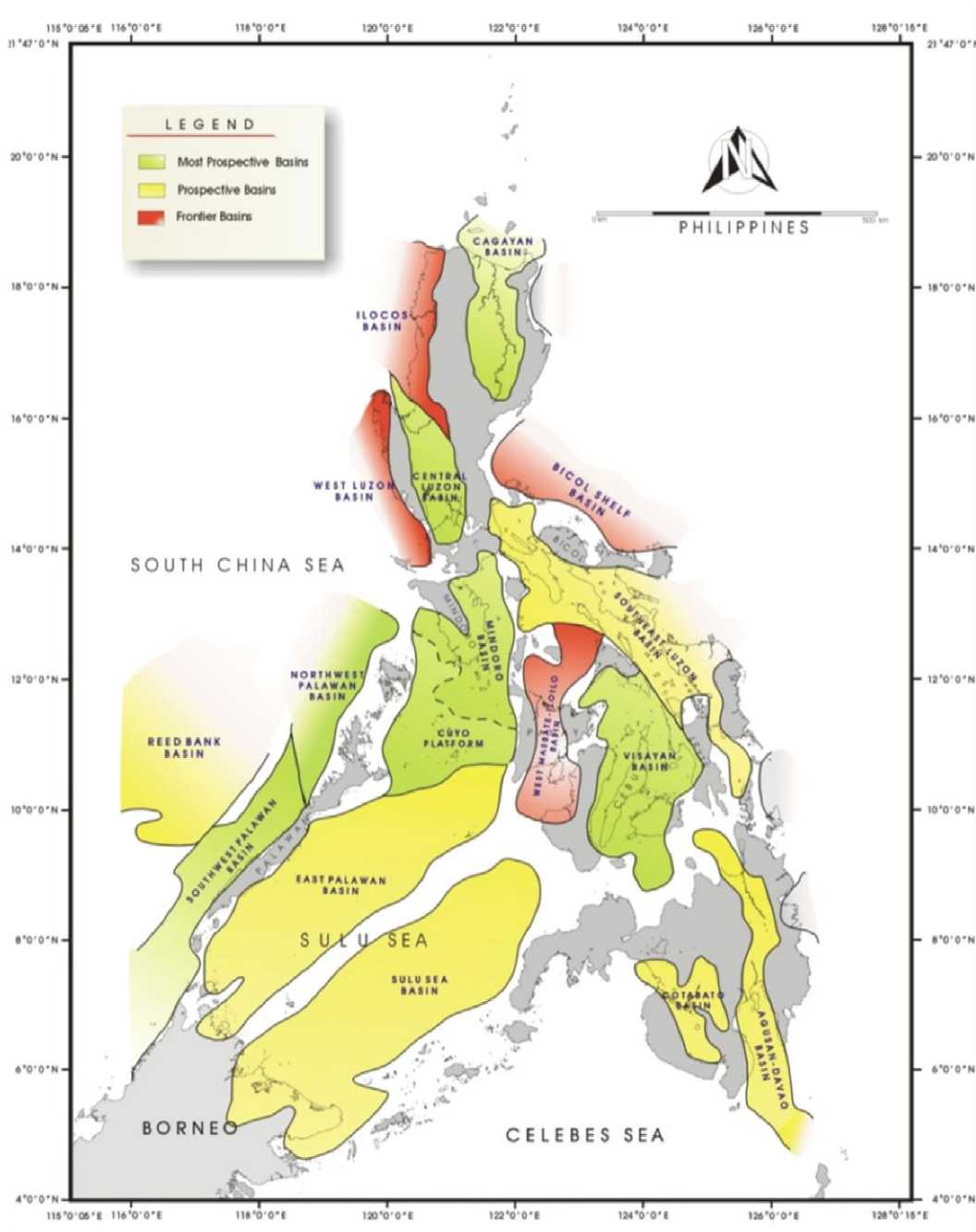
1. NW Palawan Basin
2. SW Palawan Basin
3. Sulu Sea Basin
4. Cagayan Basin
5. Visayan Basin
6. Central Luzon Basin
7. Mindoro-Cuyo Platform

Prospective Basins

1. East Palawan Basin
2. Reed Bank Basin
3. SE Luzon Basin
4. Agusan-Davao Basin
5. Cotabato Basin

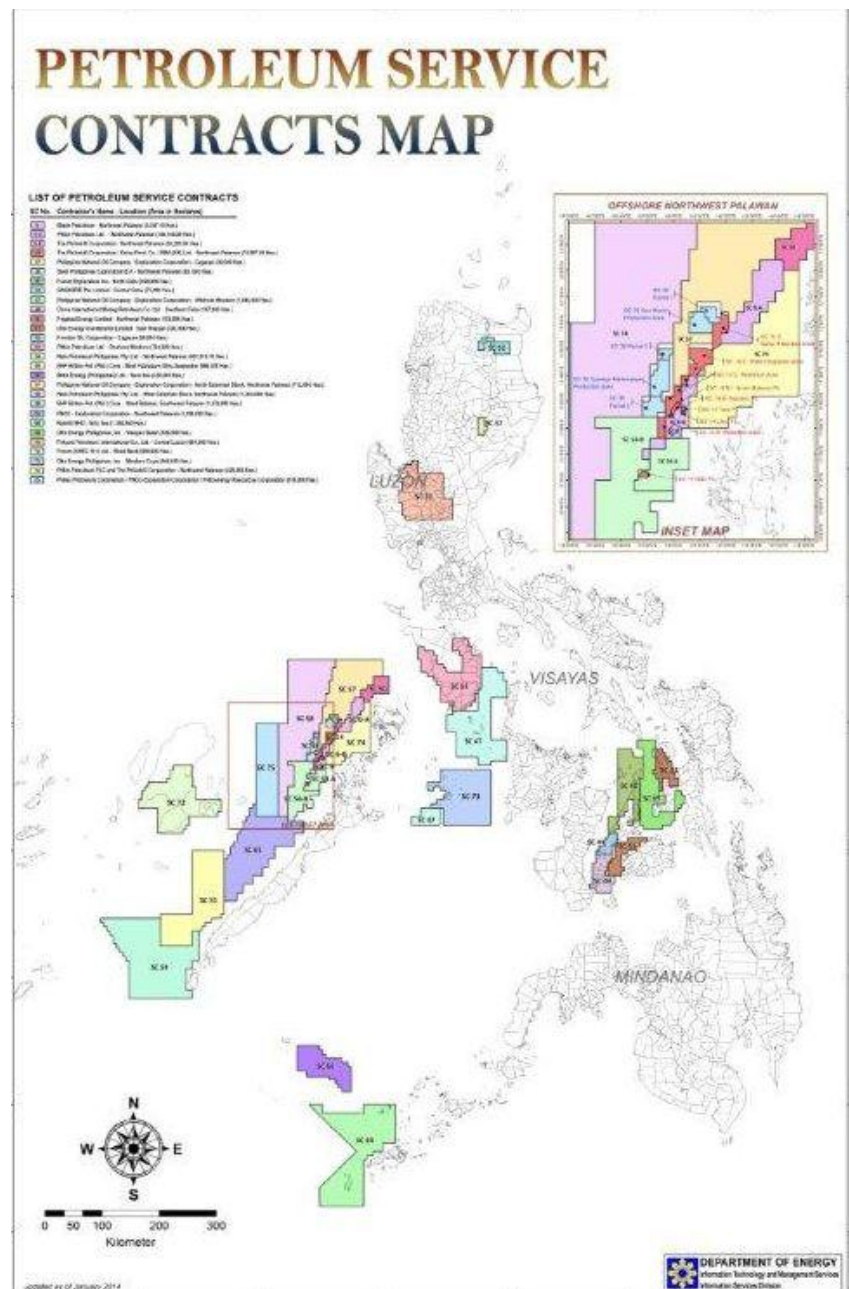
Frontier Basins

1. West Luzon Basin
2. West Masbate-Iloilo Basin
3. Ilocos Basin
4. Bicol Shelf Basin



Upstream Oil & Gas Exploration

- There are 29 existing petroleum service contracts

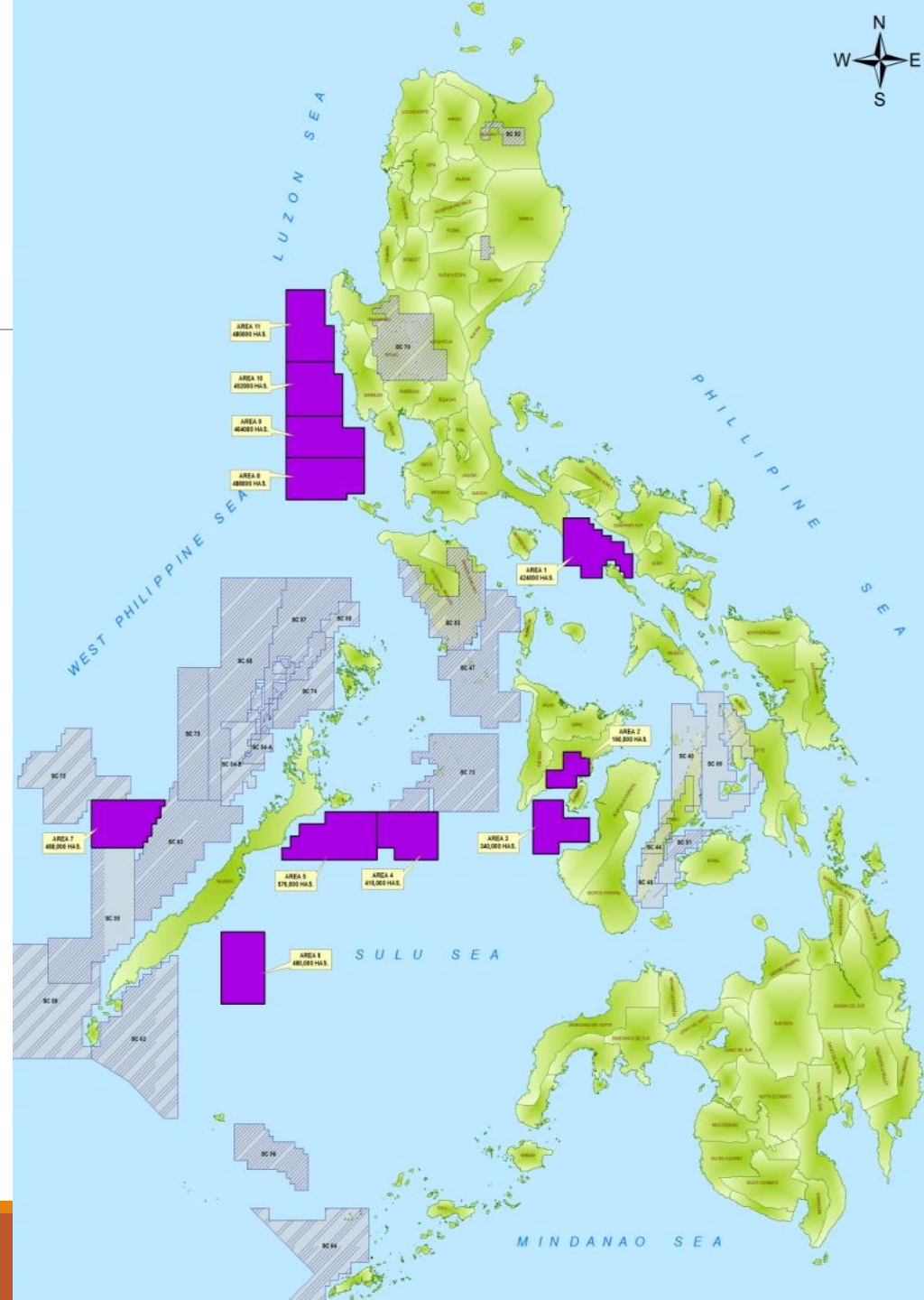


Existing Petroleum Service Contracts

Operator	PSC NO.	Location	Area (hectares)
Cadlao Development Corporation	6	NW Palawan	3,397.19
Pitkin Petroleum Ltd.	6A	NW Palawan	108,146.59
The Philodrill Corporation	6B	NW Palawan	53,293.95
The Philodrill Corporation / Galoc Production Co./ RMA (HK) Ltd	14	NW Palawan	70,887.52
Philippine National Oil Co. – Exploration Corp.	37	Cagayan	36,000.00
Shell Philippines Exploration B. V.	38	NW Palawan	83,000
Forum Exploration Inc.	40	North Cebu	458,000.00
Gas To Grid Pte. Ltd.	44	Central Cebu	75,000
Philippine National Oil Co. – Exploration Corp.	47	Offshore Mindoro	1,466,700
China International Mining Petroleum Co., Ltd.	49	South Cebu	265,000
Frigstad Energy	50	Calauit, NW Palawan	128,000
Otto Energy Investments Ltd.	51	East Visayan Basin	332,000
Frontier Oil Corp.	52	Piat San Jose, Cagayan	96,000
Pitkin Petroleum Ltd.	53	Onshore Mindoro	660,000
Nido Petroleum Phils. Pty. Ltd.	54	NW Palawan	(Area A = 401,616.15 Area B = 312,000)
BHP Billiton Pet. (Phil.) Corp.	55	West Palawan Ultra-Deepwater	900,000
Mitra Energy Ltd.	56	Sulu Sea	430,000
Philippine National Oil Co. – Exploration Corp.	57	Calamian Block, NW Palawan	712,000
Nido Petroleum Phils. Pty. Ltd.	58	West Calamian Block, NW Palawan	1,344,000
BHP Billiton Pet. (Phil.) Corp.	59	West Balabac, SW Palawan	1,476,000
Philippine National Oil Co. – Exploration Corp.	63	SW Palawan	1,056,000
Otto Energy Phils. Inc.	69	Visayan Basin	704,000
Polyard Petroleum International Co. Ltd.	70	Central Luzon Basin	684,000
Forum (GSEC(101) Ltd.	72	Recto Bank	
Otto Energy Phils. Inc.	73	Mindoro Cuyo	
Pitkin Petroleum Ltd.	74	NW Palawan	
Philex Petroleum Corporation	75	NW Palawan	

PECR5

BASIN	AREAS
SOUTHEAST LUZON	AREA 1
MASBATE-ILOILO	AREAS 2 & 3
NORTHEAST PALAWAN	AREAS 4 & 5
SOUTHEAST PALAWAN	AREA 6
RECTO BANK	AREA 7
WEST LUZON	AREAS 8,9,10 & 11



Coal



Coal Basins of the Philippines



South China Sea

Philippine Sea

Sprattly Islands

Sulu Sea

Celebes Sea

Cagayan Valley

Luzon

Poilillo - Bataan - Catanduanes

Mindoro

Semirara

Masbate

Visayas

Samar - Leyte

Negros

Cebu

Suligao

Zamboanga

Mindanao

Davao

Colubato - Sarangani

Source: Geothermal & Coal Resources Development Division
Prepared by: Anil R. Rosales

COAL OPERATING CONTRACTOR (EXPLORATION)



COAL OPERATING CONTRACTOR DEVELOPMENT / PRODUCTION



PECR5 Areas for Offer

- Nominated by private companies
- Previously offered areas in PECR 4 with no winning applicants
- Located in traditional coal mining provinces in the following Coal Regions in Mindanao:
 - a. Surigao Coal Region
 - b. Agusan-Davao Coal Region
 - c. Zamboanga Coal Region
 - d. Cotabato-Saranggani Coal Region



Natural Gas

Natural Gas Industry

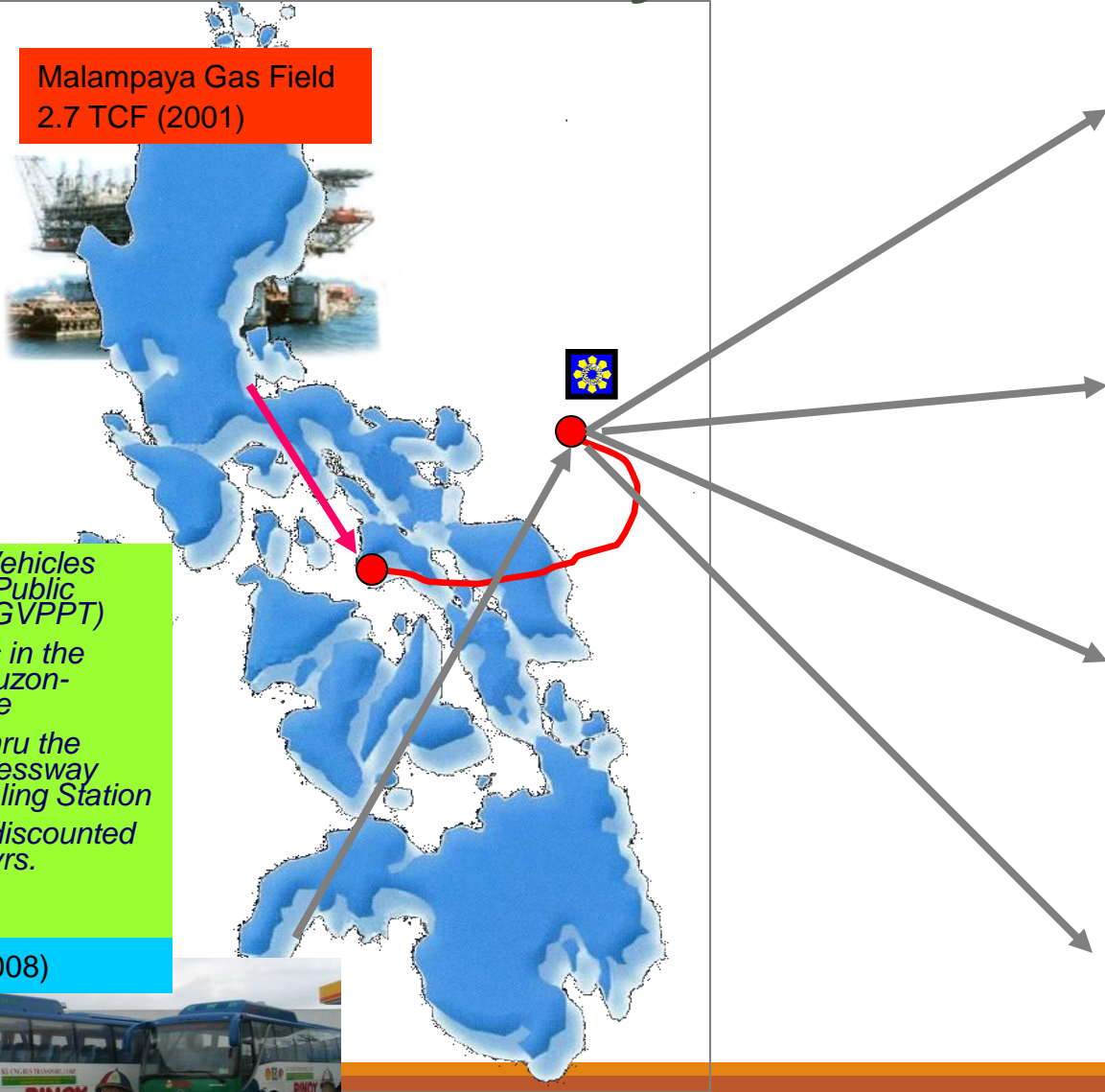
Malampaya Gas Field
2.7 TCF (2001)



Natural Gas Vehicles Program for Public Transport (NGVPPT)

- 200 buses in the Southern Luzon-Manila route
- serviced thru the South Expressway NGV Refueling Station
- at a fixed/discounted price for 7 yrs.

CNG Bus (2008)



560 MW San Lorenzo First Gen IPP



1,000 MW Sta. Rita First Gen/IPP



1,200 MW Ilijan Power Plant NPC IPP (KEPCO)

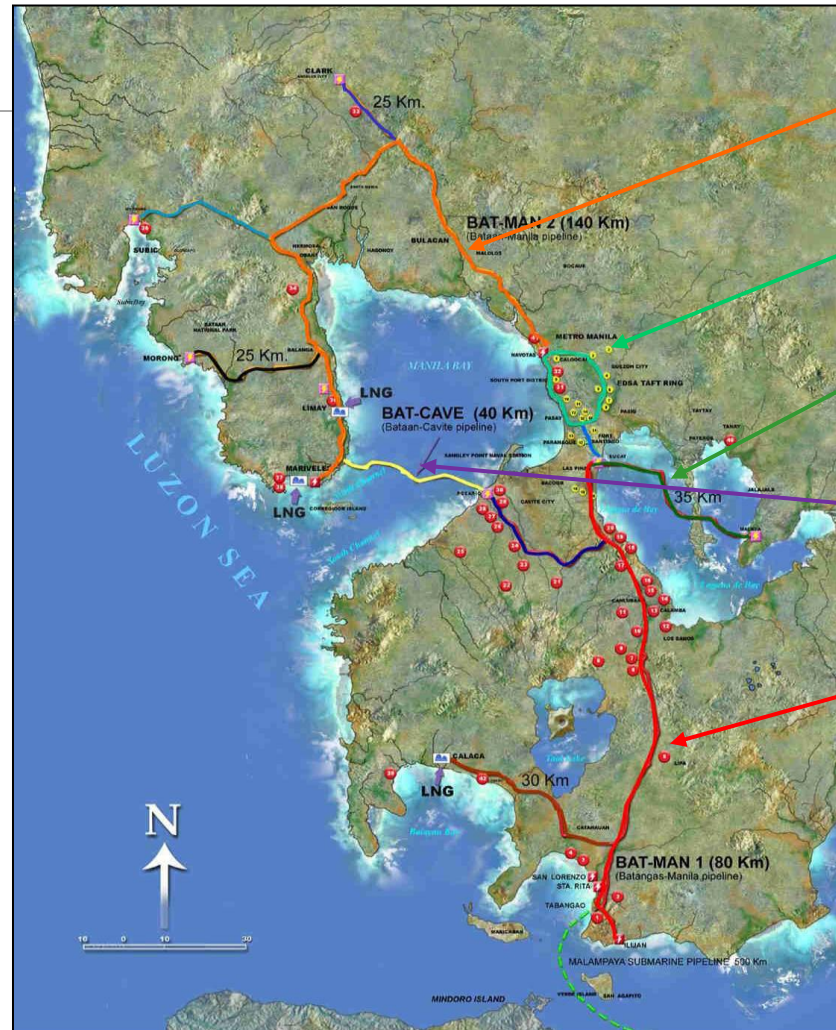


Shell Refinery



NATURAL GAS

- Develop strategic infrastructure for receiving, storage, transmission and distribution
- Promote use of natural gas beyond power
- Serve as major alternative fuel for transport especially public transport



BATMAN 2 (Bataan - Manila) 140 kms. (2020)
ET LOOP (EDSA – Taft Loop) 40 kms. (2020)
SU-MA (Sucat - Malaya) 35 kms. (2017)
BATCAVE (Batangas – Cavite) 40 kms (2022)
BATMAN 1 (Batangas Manila) 80-100 kms. (2015-17)

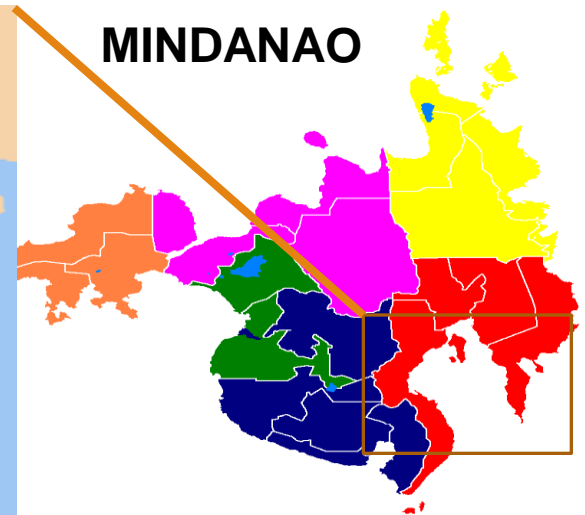
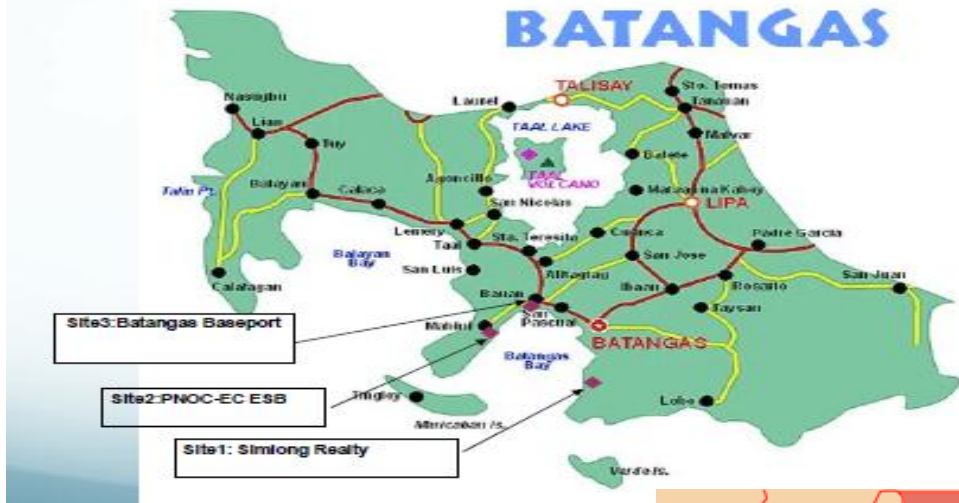
Downstream Natural Gas – Pipeline Projects

Luzon Critical Infrastructure Projects

Pipeline Projects	Target Year
105 k.m. Batangas-Manila (<i>BatMan 1</i>) Pipeline	2015-2017
15-k.m. Sucat-Fort Bonifacio Pipeline	2017
35-k.m. Sucat-Malaya (<i>Su-Ma</i>) Pipeline	2017
38-k.m. Sucat-Quirino Pipeline	2020
140-k.m. Bataan-Manila (<i>BatMan2</i>) Pipeline	2020
40-k.m. Metro Manila/EDSA-Taft Gas Pipeline – ET Loop	2020
40-k.m. Subic Pipeline (<i>from proposed BatMan2 to Subic</i>)	2021
25-k.m. Clark Pipeline (<i>from proposed BatMan2 to Clark</i>)	2022
40-k.m. Bataan-Cavite (<i>BatCave</i>) Pipeline	2022

NATURAL GAS – LNG Terminals

LNG Terminal Candidates in Batangas



Alternative Fuels

Compressed Natural Gas

	Particulars	Fuel Displacement & CO2 Avoidance	
		2010	2011
CNG	<ul style="list-style-type: none"> 41 CNG fed buses commercially operating along Batangas-Laguna-Manila route 6 Certificates of Accreditation issued CNG Bus Operators (KL CNG, RRCG, BBL, HM Transport, N. dela Rosa Liner and Greenstar Express) 2 Certificates of Authority to Import 10 CNG Buses each issued for RRCG and N. dela Rosa Liner 	<ul style="list-style-type: none"> 2,703,068 liters of diesel equivalent 1,529,823 kg CO2 	<ul style="list-style-type: none"> 3,259,582 liters of diesel equivalent 1,844,787 kg CO2



Targets: 15,000 units CNG buses; 16,000 units CNG taxis by 2030; 150 refilling stations nationwide

Natural Gas



- **CNG Daughter Station in Mamplasan, Binan, Laguna**
 - 41 buses from 7 accredited bus operators plying Batangas/Laguna to Manila
- **PNOC-EC will install 2 modular Daughter Stations in Laguna and Batangas**



Auto-LPG

Fuel Displacement & CO2 Avoidance

Particulars

2010

2011

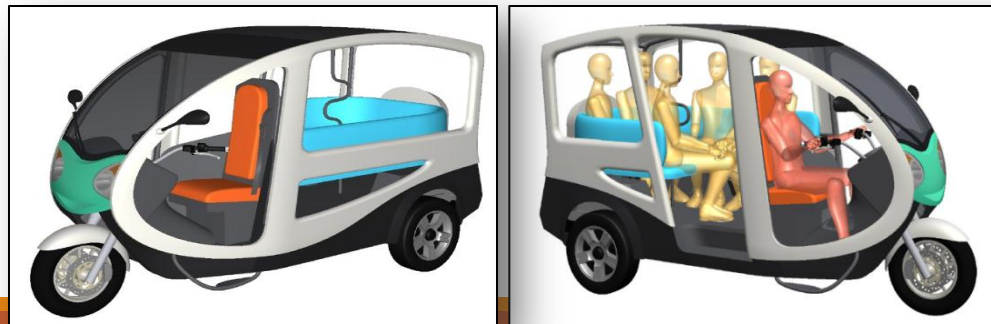
- | | | | |
|-----------------|---|---|---|
| Auto-LPG | <ul style="list-style-type: none"> ▪ 17,500 units of taxis converted to LPG as of end-2010 ▪ 19,052 units of taxis converted to LPG as of end-2011 ▪ 31 LPG conversion shops ▪ 222 auto-LPG refilling stations available nationwide | <ul style="list-style-type: none"> ▪ 127 Million liters of gasoline displacement ▪ 127,160 metric tons (MT) CO2 | <ul style="list-style-type: none"> ▪ 136 Million liters of gasoline displacement ▪ 138,437 metric tons (MT) CO2 |
|-----------------|---|---|---|

Area/ Region	Public Stations	Garage Based	Bulk Suppliers
Metro Manila	102	35	0
Luzon	6	2	4
Visayas	26	20	1
Mindanao	16	9	1
Total	150	66	6



E-Vehicles

- 523 existing electric vehicles
- Target: 100,000 e-trikes nationwide through a loan Agreement between the Philippine Government through Department of Finance and the Asian Development Bank
- First batch: 500 e-trikes



Registered/Accredited Biofuels Producers

Bioethanol Producers	Location	Registered Capacity (million liters)
Accredited		
San Carlos Bioenergy, Inc.	San Carlos City, Negros Occidental	40
Leyte Agri. Corp.	Ormoc City, Leyte	9
Roxol Bioenergy Corporation	La Carlota, Negros Occidental	30
Sub-Total		79
Registration with Notice to Proceed		
Canlaon Alcogreen Agro Industrial Corp.	Bago City, Negros Occidental	45
Universal Robina Corporation	Negros Oriental	30
Sub-Total		75

Renewable Energy

33MW Northwind Power Project

(Bangui, Ilocos Norte)



1MWe CEPALCO Solar Power Farm

(Cagayan de Oro City)



Awarded RE Projects as of 30 April 2014

RESOURCES	AWARDED PROJECTS		POTENTIAL CAPACITY MW		INSTALLED CAPACITY MW	
	Grid-Use	Own-Use	Grid-Use	Own-Use	Grid-Use	Own-Use
Hydro Power	336	1	5,075.96	1.50	131.45	
Ocean Energy	5		25.00			
Geothermal	42		780.00		1,867.69	
Wind	45	1	2,057.50	0.006	33.00	
Solar	65	5	1,103.206	1.574		
Biomass	41	24	310.45	3.30	143.80	143.18
Sub-Total	534	31	9,352.116	6.380	2,175.94	143.18
TOTAL	565		9,358.496		2,319.12	

Pending RE Projects as of 30 April 2014

RESOURCES	PENDING PROJECTS		POTENTIAL CAPACITY MW		INSTALLED CAPACITY MW	
	Grid-Use	Own-Use	Grid-Use	Own-Use	Grid-Use	Own-Use
Hydro Power	113		1,428.15		912.50	
Ocean Energy	-					
Geothermal	1		60.00		-	
Wind	6		27.00		-	
Solar	19	-	266.70	-		
Biomass	1	-	35.00	-	-	
Sub-Total	140	-	1,816.85	-	912.50	-
TOTAL	140		1,816.85		912.50	

Renewable Energy – FIT Rates & Installation Targets

Resource / Technology	ERC Approved Feed-in Tariff Rates (PhP/kWh)	ERC Approved Feed-in Tariff Rates (US\$/kWh)	Installation Targets
Run-of-River Hydropower	5.9	0.140	250
Biomass Energy	6.63	0.158	250
Wind Power	8.53	0.203	200
Solar Power	9.68	0.230	50
Ocean Energy	-		10
TOTAL			760

- FIT Rules approved by ERC on 12 July 2010 and took effect on 12 August 2010
- ERC approved the FIT Rates on 27 July 2012
- Issuance of DC 2013-05-009 prescribing DOE Guidelines for the Selection Process of Renewable Energy Projects Under FIT System and the Award of Certificate for FIT Eligibility

Renewable Energy Development

FIT Monitoring Board Summary (as of May 2014)

RESOURCE	FOR CONVERSION		WITH CERTIFICATE OF CONFIRMATION OF COMMERCIALITY		FIT INSTALLATION TARGETS
	NO. OF PROJECTS	CAPACITY (MW)	NO. OF PROJECTS	CAPACITY (MW)	(in MW)
HYDRO	20	84.3	35	374.15	250
WIND	1	84.0	11	635.5	200
SOLAR	4	118	6	122.0	50
BIOMASS	6	68.6	8	126.701	250
TOTAL	31	354.9	60	1,258.351	750

Note:

- Department Circular No. 2009-07-0011 entitled “Guidelines governing a transparent and competitive system of awarding renewable energy service/operating contracts and providing for the registration process or RE developers” is currently being revisited to facilitate the processing of RE Applications.
- FIT Rules approved by ERC on 12 July 2010 and took effect on 12 August 2010
- ERC approved the FIT Rates on 27 July 2012
- Issuance of DC 2013-05-009 prescribing DOE Guidelines for the Selection Process of Renewable Energy Projects Under FIT System and the Award of Certificate for FIT Eligibility

THANK YOU

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