

Energy Investment Opportunities

Atty. Felix William B. Fuentebella
Undersecretary
Department of Energy

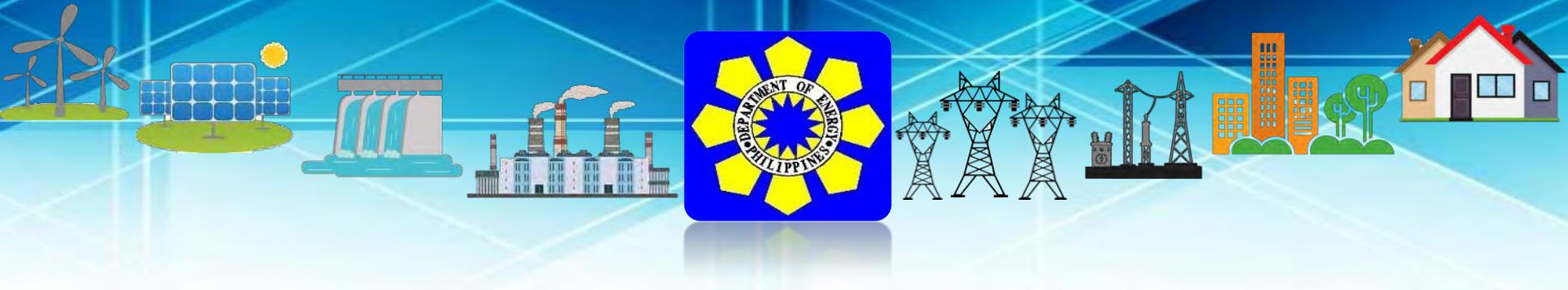
Mindanao Energy Investment Forum
Waterfront Insular Hotel Davao
03 April 2019



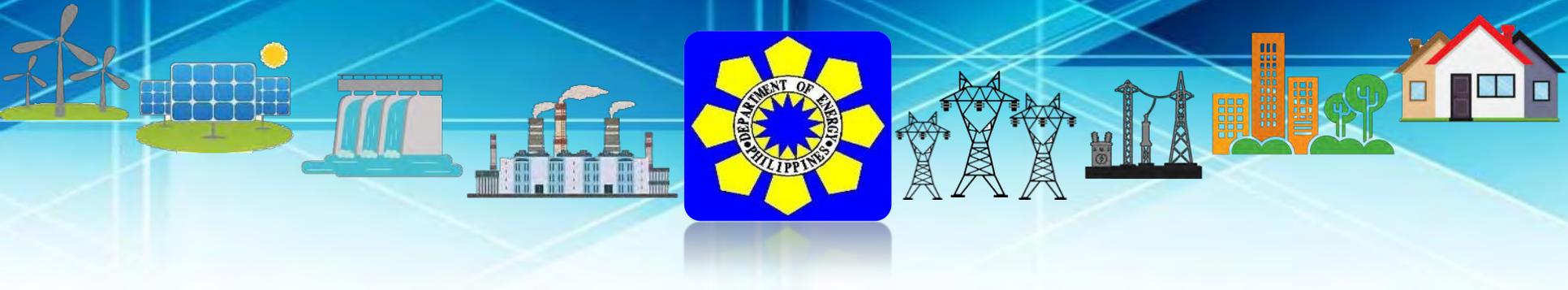
Presentation Outline

- ❑ Investment Opportunities
- ❑ Philippines Energy Situationer
- ❑ Policy Initiatives
- ❑ Enabling Laws for Investors





Investment Opportunities



Upstream Oil & Gas and Coal



Upstream Oil, Gas and Coal

PRODUCTION (2017-1H 2018)



OIL
2.26 MMB



GAS
213.74 BCF



COAL
20.52 MMT

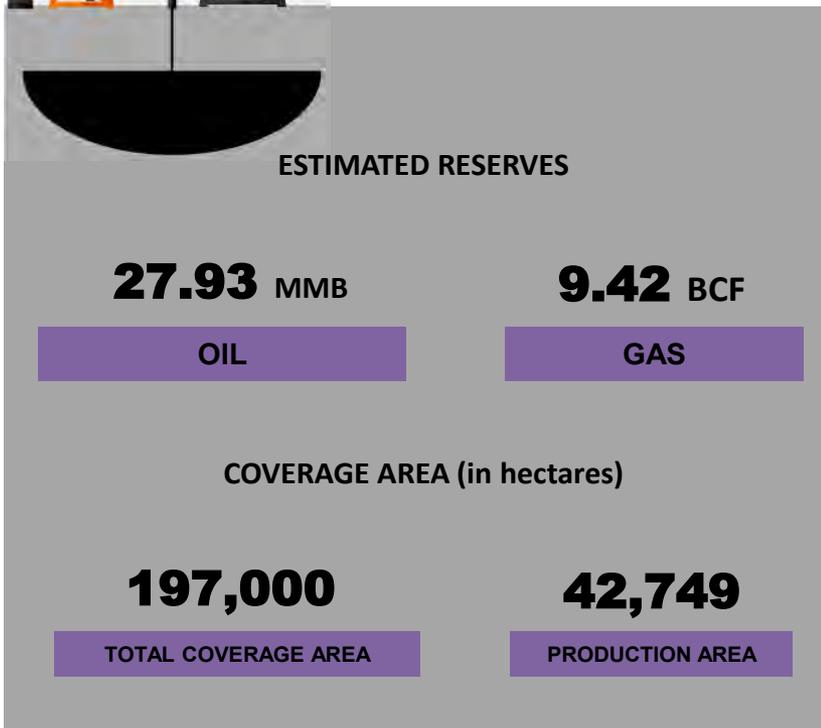


CONDENSATE
5.92 MMB

NEW OIL AND GAS FIELD DISCOVERY



ALEGRIA, CEBU



Upstream Coal and Oil & Gas

Petroleum Service Contracts (SCs) Exploration & Development

23 Active Service Contracts (as of December 2018)

- 7 SCs in the Production Stage
- 16 SCs in the Exploration Stage
(6 SCs under Force Majeure, 4 SCs under Technical Moratorium)

Coal Operating Contracts (COCs) Exploration & Development

73 Active Coal Operating Contracts (as of December 2018)

- 41 COCs in the Exploration Stage
- 32 COCs in the Development and Production Stage



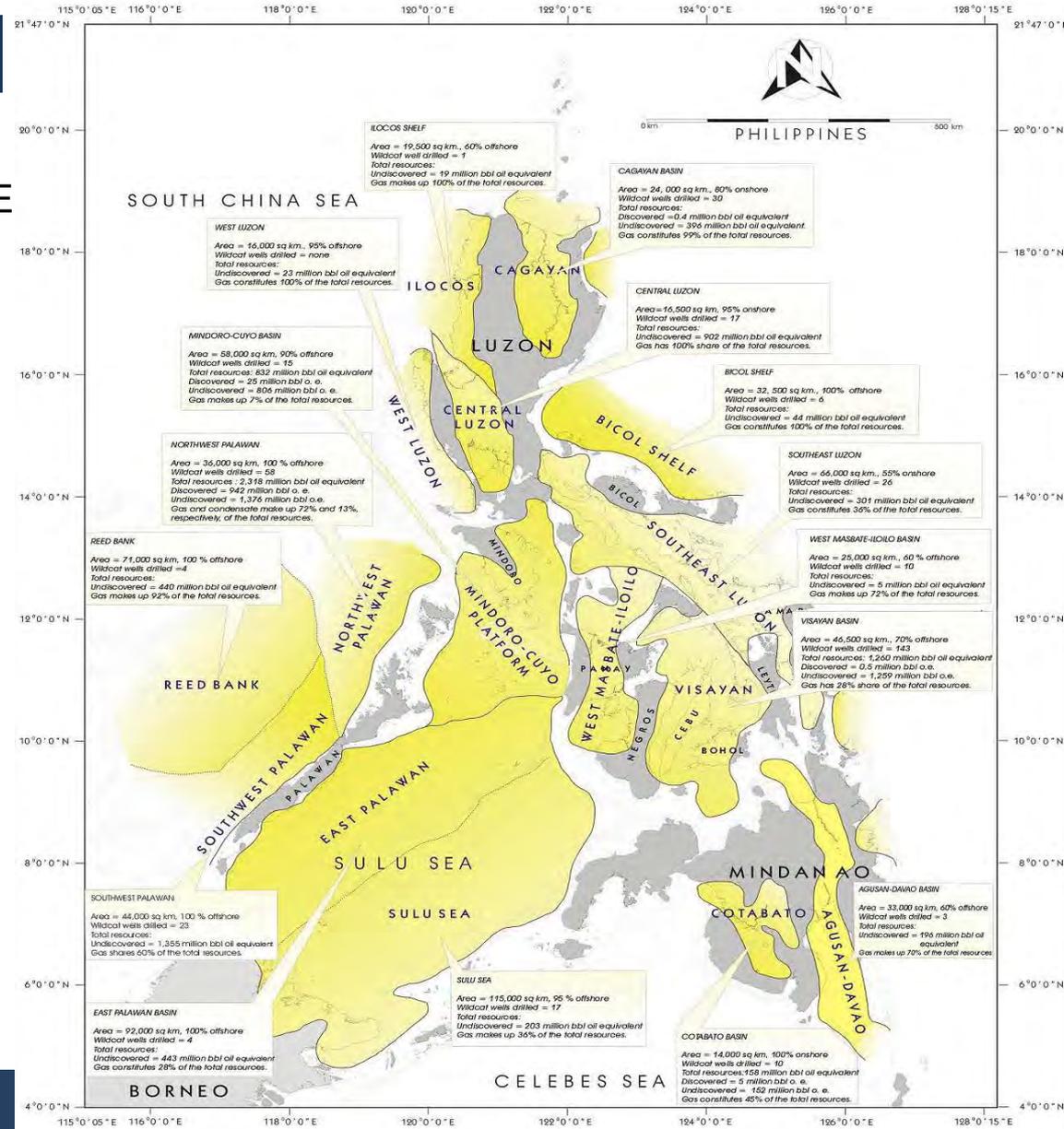
Upstream Oil & Gas

Philippine Sedimentary Basins

Total area: 709,000 sq km

Combined Potential: 4,777 MMBFOE

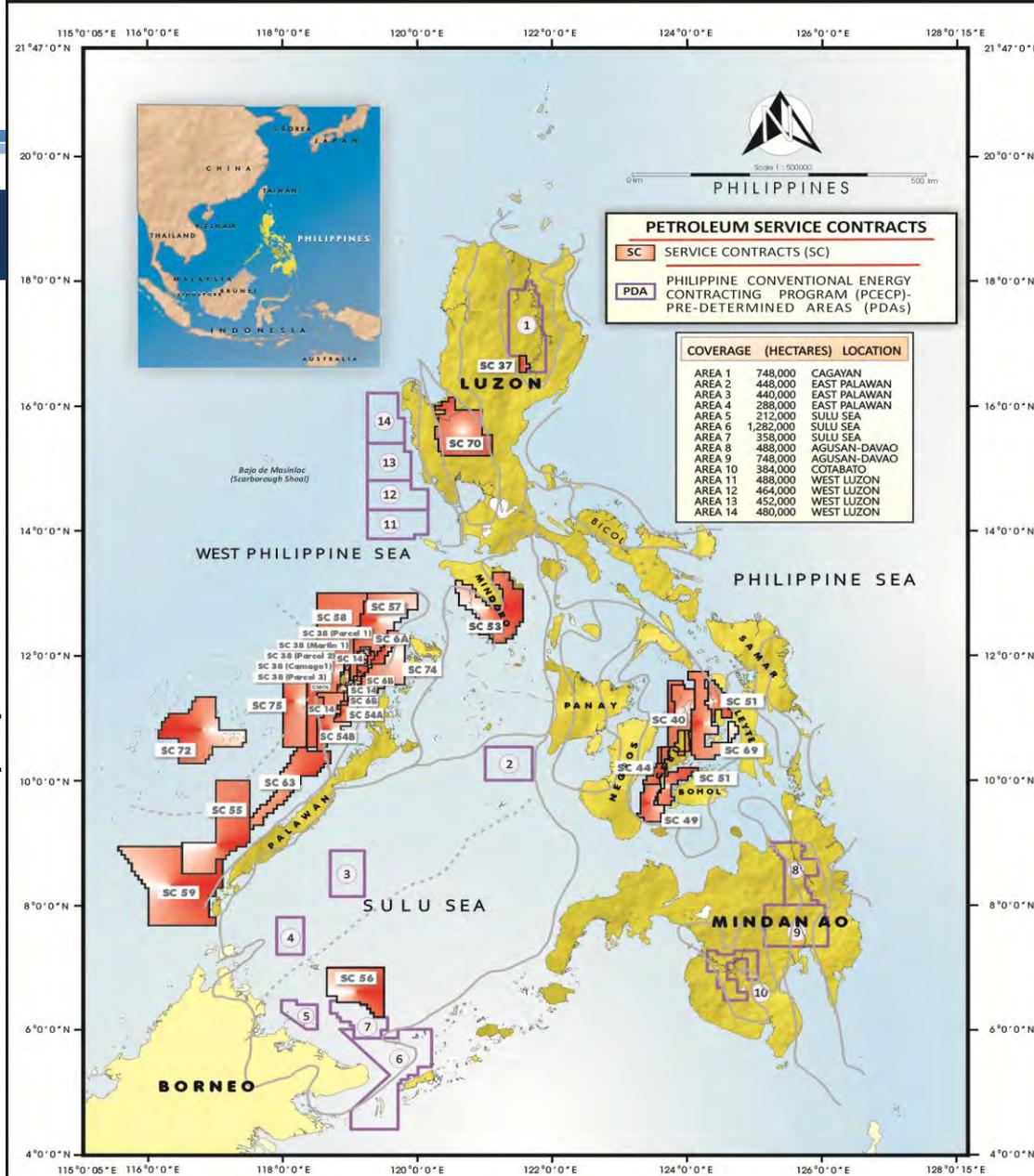
1. Ilocos Shelf
2. Cagayan Basin
3. Central Luzon Basin
4. Bicol Shelf
5. Southeast Luzon Basin
6. Mindoro-Cuyo Basin
7. West Masbate-Iloilo Basin
8. Visayan Basin
9. Agusan-Davao Basin
10. Cotabato Basin
11. Sulu Sea Basin
12. East Palawan Basin
13. Southwest Palawan Basin
14. Reed Bank Basin
15. Northwest Palawan Basin
16. West Luzon Trough



Upstream Oil & Gas

2018 PCECP Areas for Offer

1. Cagayan – 748,000 has.
2. East Palawan – 448,000 has.
3. East Palawan – 440,000 has.
4. East Palawan – 288,000 has.
5. Sulu Sea – 212,331 has.
6. Sulu Sea – 1,282,335 has.
7. Sulu Sea – 358,000 has.
8. Agusan – Davao – 488,000 has.
9. Agusan – Davao – 748,000 has.
10. Cotabato – 384,000 has.
11. West Luzon – 488,000 has.
12. West Luzon – 464,000 has.
13. West Luzon – 452,000 has.
14. West Luzon – 480,000 has.



Upstream Coal

Summary of Regional Coal Reserves (in Million Metric Tons)

QUEZON
Resource Potential - 2.00
In-situ Reserves - 0.09

MINDORO
Resource Potential - 100.00
In-situ Reserves - 1.44

SEMIRARA
Resource Potential - 550.00
In-situ Reserves - 96.19

NEGROS
Resource Potential - 4.50
In-situ Reserves - 2.01

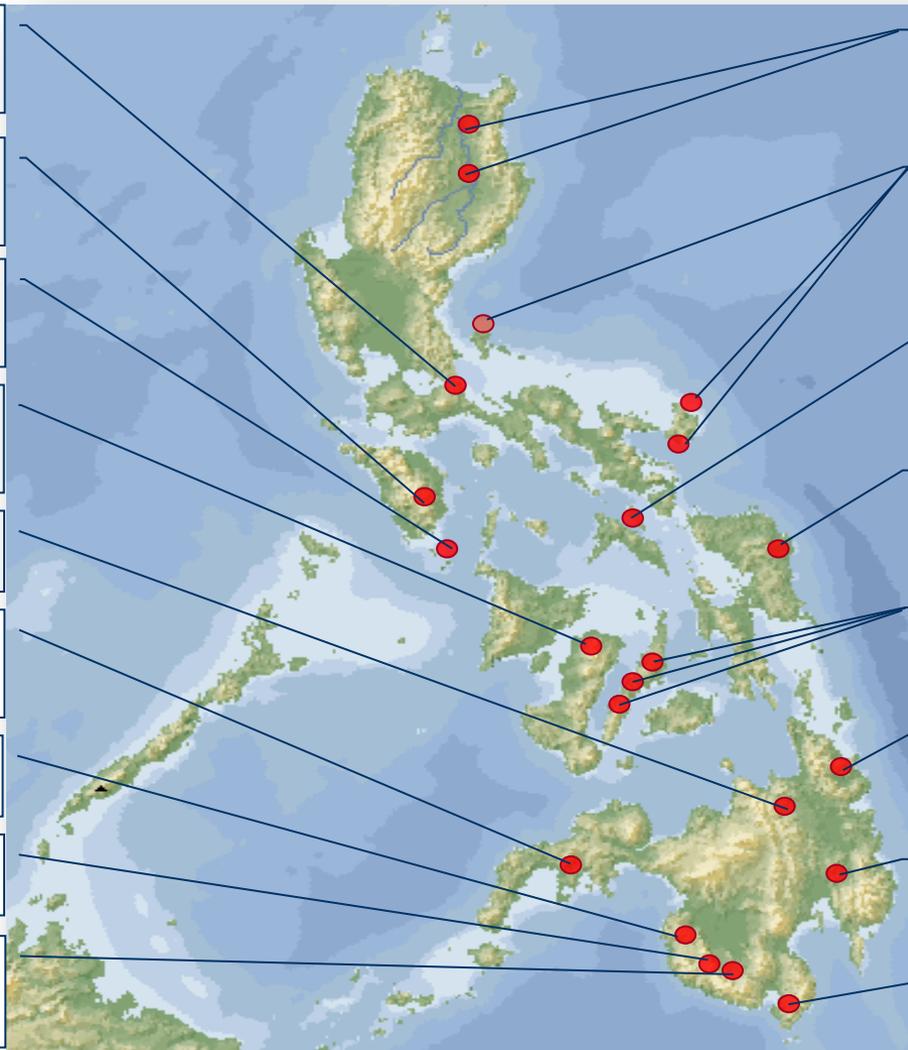
BUKIDNON
Resource Potential - 50.00

ZAMBOANGA
Resource Potential - 45.00
In-situ Reserves - 38.05

MAGUINDANAO
Resource Potential - 108.00

SULTAN KUDARAT
Resource Potential - 300.30

SOUTH COTABATO
Resource Potential - 230.40
In-situ Reserves - 81.07



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

BATAN-POLILLO-CATANDUANES
Resource Potential - 17.00
In-situ Reserves - 6.77

MASBATE
Resource Potential - 2.50
In-situ Reserves - 0.07

SAMAR
Resource Potential - 27.00
In-situ Reserves - 8.59

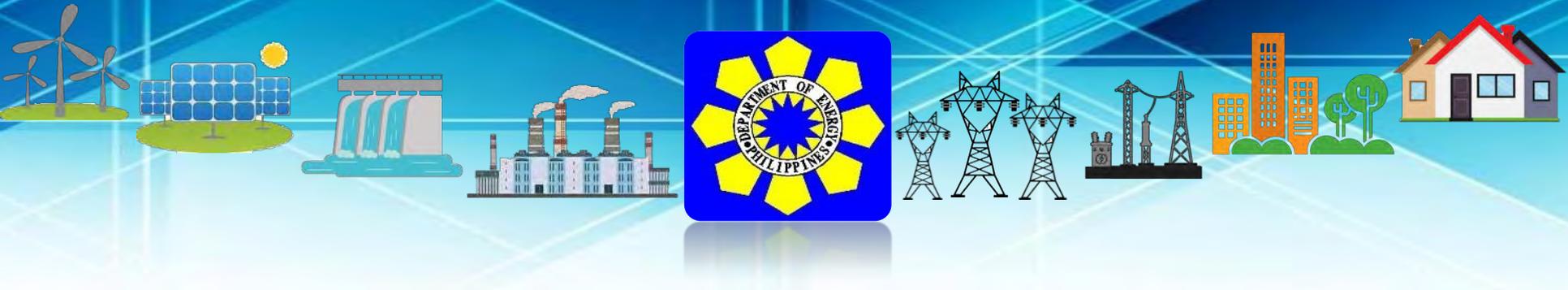
CEBU
Resource Potential - 165.00
In-situ Reserves - 11.84

SURIGAO
Resource Potential - 209.00
In-situ Reserves - 69.73

DAVAO
Resource Potential - 100.00
In-situ Reserves - 2.37

SARANGANI
Resource Potential - 120.00





Renewable Energy



Renewable Energy

National Renewable Energy Program

Renewable Energy Targets, 2010 - 2030		
Sector	Target Additional Capacity	Target Year
Biomass	277 MW	2015
Wind	2,345 MW	2022
Hydropower	5,398 MW	2023
Ocean Power	75 MW	2025
Geothermal	1,495 MW	2030
Solar	284 MW	2030
Total	9,874 MW	



Renewable Energy

Renewable Energy Projects in the Philippines

RESOURCES	AWARDED PROJECTS				INSTALLED CAPACITY (MW)	
	Grid-Use	Own-Use	Grid-Use (MW)	Own-Use (MW)	Grid-Use	Own-Use
Hydro Power	455		13,445.16		975.79*	
Ocean Energy	7		26.00			
Geothermal	40		555.00**		1,906.19	
Wind	64	1	2,381.50		426.90	0.006
Solar	216	16	6,512.12	4.286	925.34	3.218
Biomass	57	24	334.17	16.77	449.01	128.16
Sub-Total	839	41	23,260.17	21.056	4,683.23	131.38
TOTAL	880		23,281.23		4,814.61	

As of March 2018

* excluding 49 installed projects with 2,643.68MW capacity under RA 7156, CA 120, PD 1645, RA 3601 & Own-Use

** excluding 1 potential project with 20MW capacity under PD 1442.



Renewable Energy

Policies to Promote Renewable Energy

- **Net-Metering for RE**

A Renewable Energy Policy Mechanism which shall provide consumers to produce its own electricity requirement with maximum capacity of 100 kW.

- **RE Portfolio Standards (On-Grid and Off-Grid)**

Market based policy that requires the mandated electricity industry participants to source an agreed portion of their supply from eligible RE Resources

- **Must and Priority Dispatch for Variable REs**

DOE Circular No. DC2015-03-0001 dated 20 March 2015 promulgated the implementation framework

- **Renewable Energy Market (REM)**

Venue for trading of Renewable Energy Certificates (RE Certificates)

- **Green Energy Option**

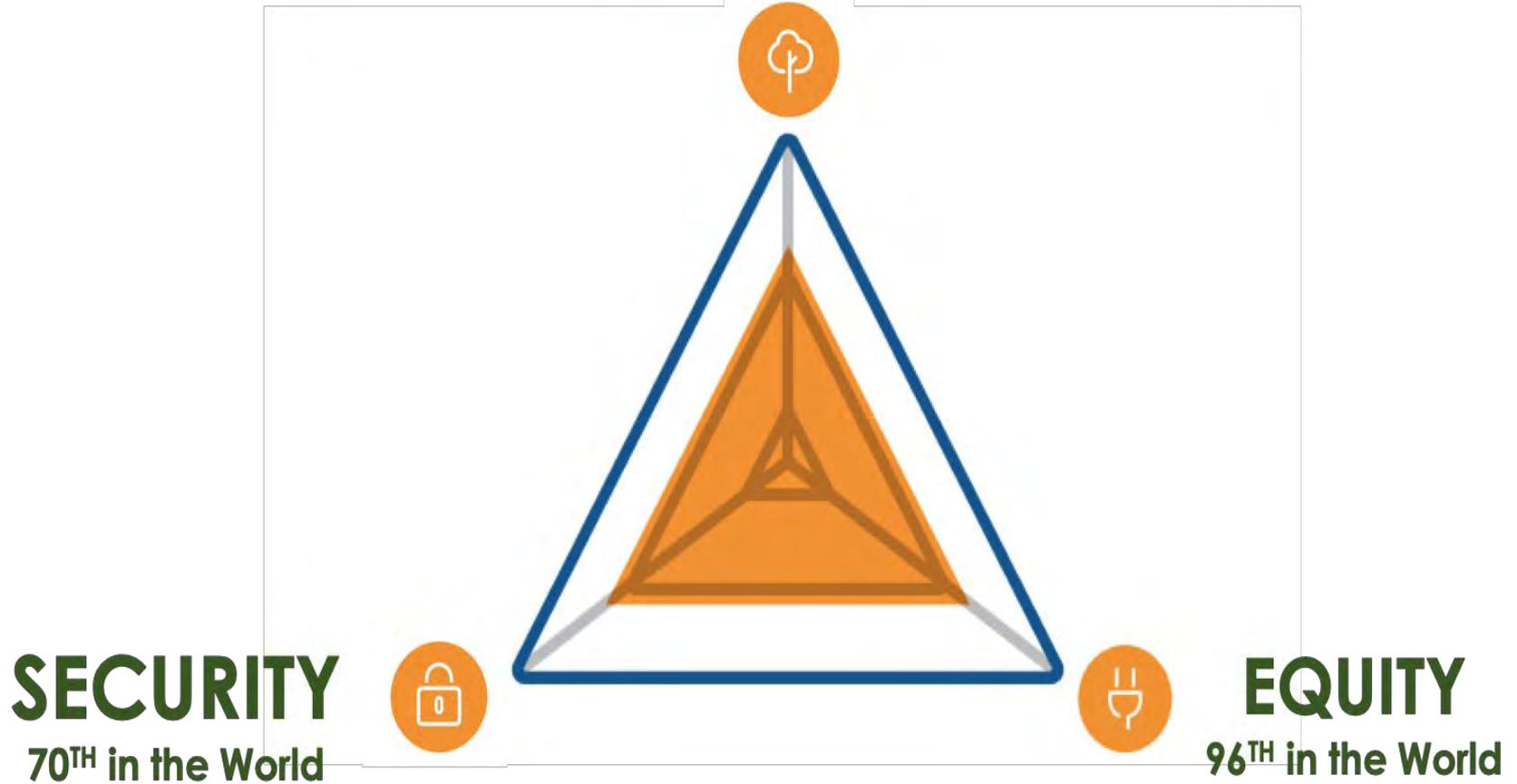
Mechanism to provide end-users the option to choose RE as their sources of energy

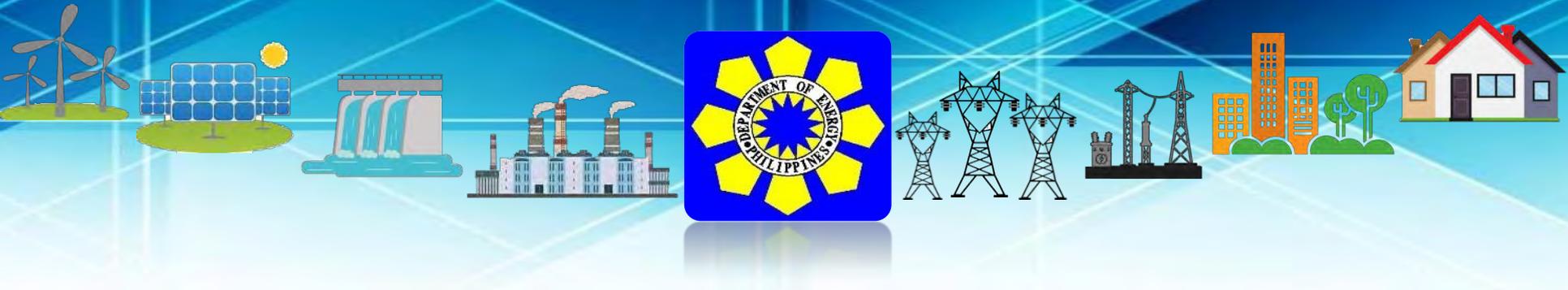


Energy Trilemma Index

SUSTAINABILITY

1ST in the World





Power Sector

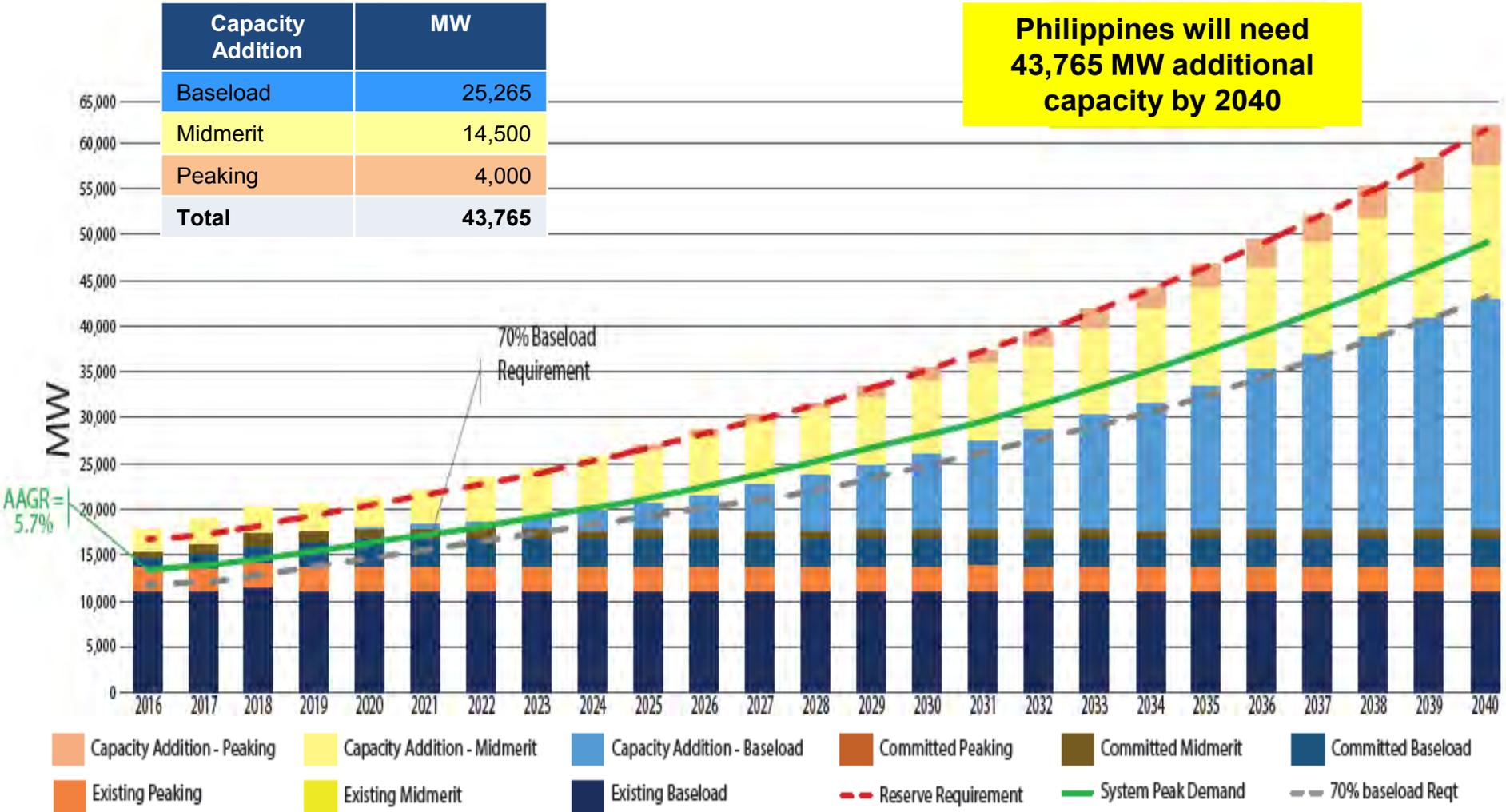


Philippines Demand and Supply Outlook 2016-2040

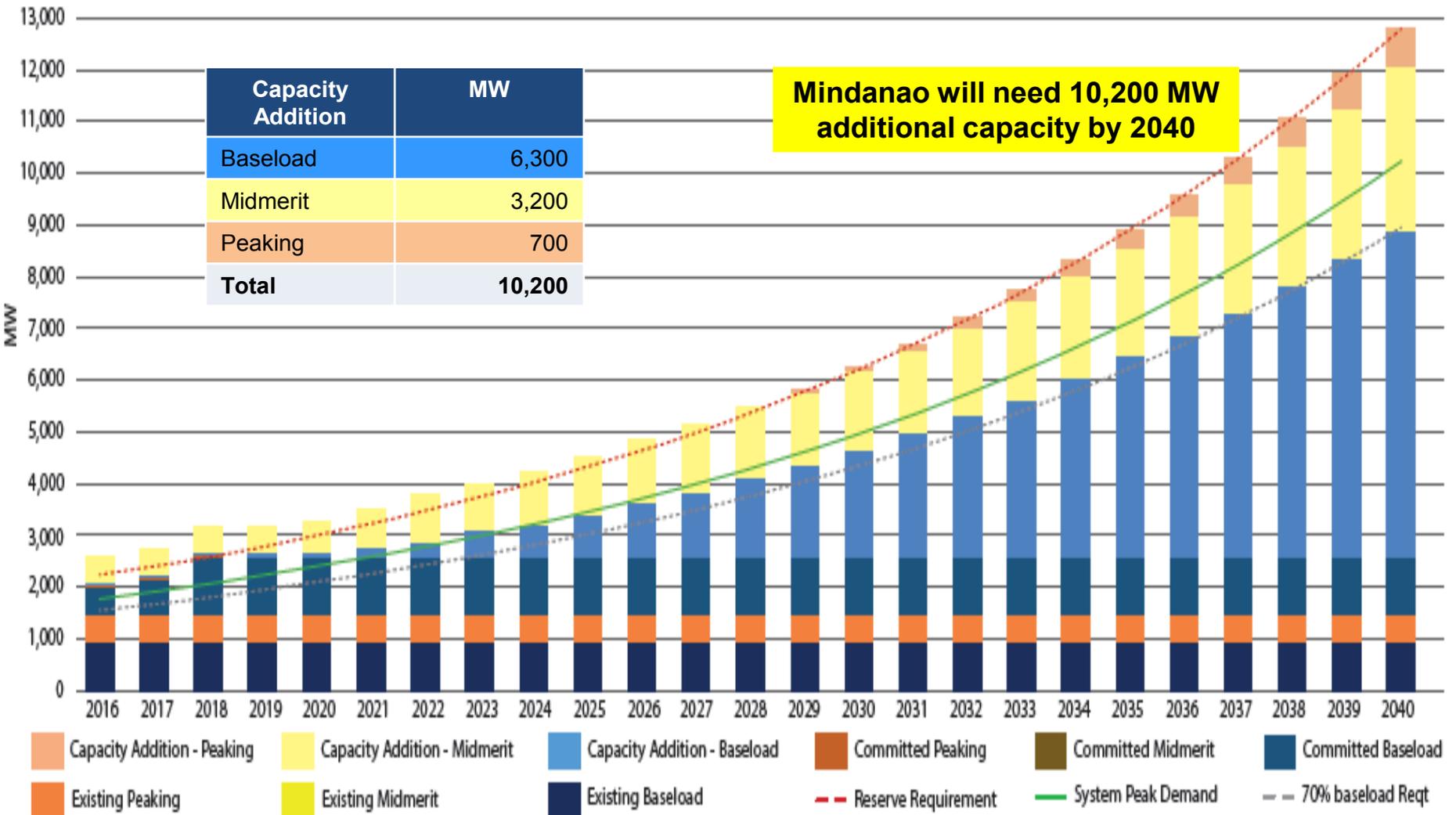
Philippines Demand and Supply Outlook, 2016-2040

Capacity Addition	MW
Baseload	25,265
Midmerit	14,500
Peaking	4,000
Total	43,765

Philippines will need 43,765 MW additional capacity by 2040



Mindanao Demand and Supply Outlook, 2016 - 2040



Mindanao Committed Power Projects

Total Mindanao Committed Capacity = 779.3 MW

600 MW GNPow
Kauswagan Coal Fired
Power Project (2019)

5.96 MW Biotech Biomass
Power Project (2019)

3 MW PTCI Rice Husk-Fired
Biomass Cogeneration Power
Project (2019)

12.4 MW Biogas Power Project
(2019)

100 MW SEC Coal Fired
Power Project (2019)

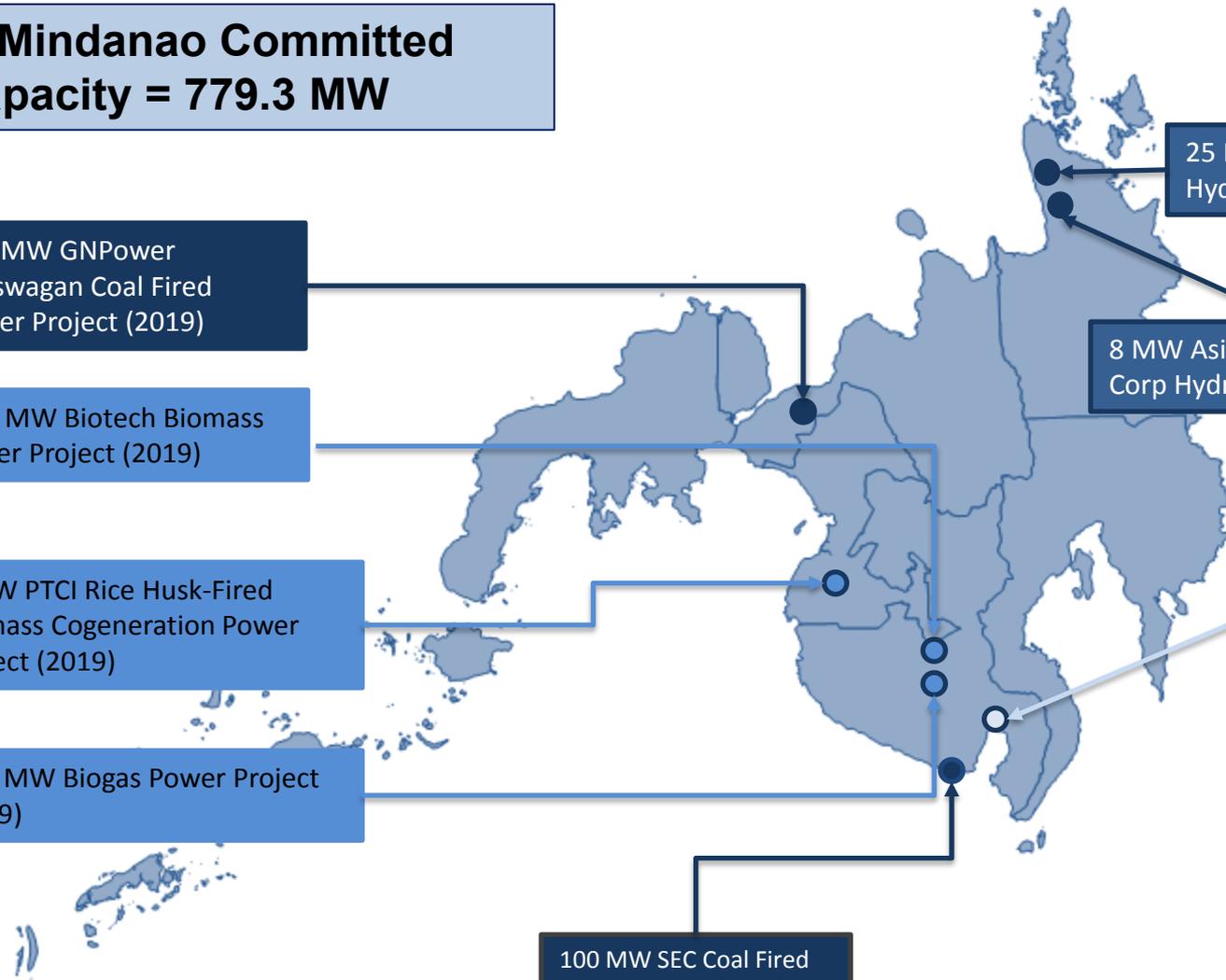
25 MW Lake Mainit
Hydro (2020)

8 MW Asiga Green Energy
Corp Hydro (2019)

25 MW ADGI Solar
(2019)

Legend:

- Solar
- Hydro
- Biomass
- Coal

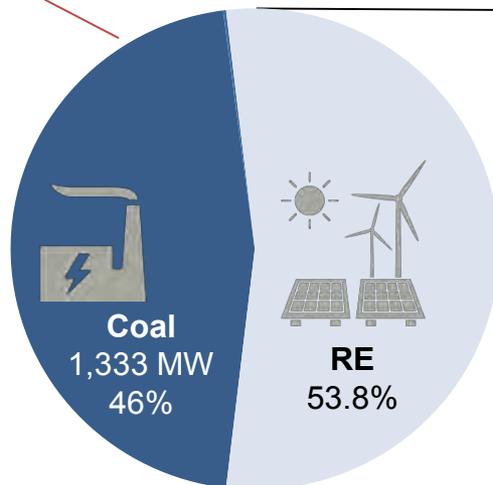


Mindanao Indicative Power Projects

TOTAL MINDANAO INDICATIVE CAPACITY = 2,895.4 MW



Oil Based
5.8 MW
0.2%



■ Coal

■ Oil

■ Hydro

■ Biomass

■ Solar

■ Geothermal



Hydro
603.2 MW
20.8%



Biomass
119.4 MW
4.1%



Solar
804 MW
27.8%



Geothermal
30 MW
1.3%



Mindanao Grid Committed Power Projects, 779.40 MW

Name of the Project	Project Proponent	Location	Rated Capacity (MW)	Target Testing & Commissioning	Target Commercial Operation
COAL			700.00		
GNPower Kauswagan Clean Coal-Fired Power Plan	GN Power Kauswagan Ltd. Co.	Kauswagan, Lanao del Norte	600	U1 – Jan19 U2 – Mar19 U3 – Mar19 U4 – Jun19	U1 – May9 U2 - Jul19 U3 - Sep19 U4 - Oct19
Southern Mindanao Coal Fired Power Station Unit 2	Sarangani Energy Corporation (SEC)	Maasim, Sarangani	100	Dec 2018	March 2019
BIOMASS			21.40		
PTCI Rice Husk-Fired Biomass Cogeneration Facility	Philippine Trade Center, Inc.	Maguindanao	3	Jun 2019	Dec 2019
Biogas Power Plant Project	Biotech Farms, Inc.	Banga, South Cotabato	12.40	Nov 2019	Dec 2019
Biomass Power Plant Project	Biotech Farms, Inc.	Tantangan, South Cotabato	5.96	Nov 2018	Sep 2019
HYDRO			33.0		
Asiga	Asiga Green Energy Corp.	Pangaylan, Santiago, Agusan del Norte	8.0	Nov 2018	Apr 2019
Lake Mainit	Agusan Power Corporation	Jabonga, Agusan del Norte	25.0	Nov 2020	Dec 2020
SOLAR			25.0		
GenSan Solar Power Project	Astronergy Development GenSan Inc.	General Santos City, South Cotabato	25.0	Nov 2019	Dec 2019
TOTAL			779.40		



Mindanao Grid Indicative Power Projects, 2,895.4 MW

Name of the Project	Project Proponent	Location	Rated Capacity (MW)	Target Commissioning
Hydropower				
Cabadbaran HEPP	First Gen Mindanao Hydropower Corp.	Cabadbaran, Agusan del Norte	9.75	Dec. 2025
Lower Maladugao River Mini-Hydropower Project	Bukidnon Maladugao Hydro Power Corporation	Kalilangan and Wao, Bukidnon	15.7	Dec. 2025
Maladugao (Upper Cascade) Hydroelectric Power Project	UHPC Bukidnon Hydro Power I Corporation	Kalilangan, Bukidnon	8.4	Dec. 2026
Sawaga River Mini Hydro Power Project	UHPC Bukidnon Hydro Power I Corporation	Kalilangan, Bukidnon	4.5	Dec. 2026
Liangan Hydropower Project	Liangan Power Corp.	Bacolod, Lanao del Norte	11.9	Dec. 2026
Malitbog	Philnewriver Power Corp.	Malitbog, Bukidnon	3.4	TBD
Clarin	Philnew Hydro Power Corporation	Clarin, Misamis Occidental	5.0	TBD
Mat-i-I	Philnewriver Power Corp.	Claveria, Cagayan de Oro	4.85	TBD
Silo-o	Maranao Energy Corporation	Malitbog, Bukidnon	3.29	TBD
Agus III	Maranao Energy Corporation	Pantar & Balo-I, Lanao del Sur & Lanao del Norte	225	TBD
Kitaotao 1	Hedcor Bukidnon, Inc.	Bukidnon	70	TBD
10 MW Cabulig-2 Hydroelectric Power Plant Project	Mindanao Energy Systems, Inc.	Jasaan, Misamis Oriental	10	TBD
Davao Hydroelectric Power Project	San Lorenzo Ruiz Olympia	Davao City	140	TBD
Solar			805.0	
Sumilao Solar Power Project	Sunasia Energy, Inc.	San Vicente, Sumilao, Bukidnon	2	Dec 2019
GenSan Solar Power Project Phase I	Del Sol Energy CGS, Inc.	General Santos City, So. Cotabato	48	TBD



Mindanao Grid Indicative Power Projects, **2,895.4 MW**

Name of the Project	Project Proponent	Location	Rated Capacity (MW)	Target Commissioning
GenSan Solar Power Project Ph II	Del Sol Energy CGS, Inc.	Gen. Santos City, So. Cotabato	48	TBD
60 MW General Santos City Solar Power Project	Astroenergy Gensan Inc.	Gen. Santos City, So. Cotabato	60	TBD
San Francisco Solar Power Project	Gpower Inc.	San Francisco, Agusan del Sur	10	TBD
Jasaan Solar Power Project	Lohas and Soul Lighting, Inc.	Jasaan, Misamis Oriental	60	TBD
Sarangani Solar PV Power Plant	Total Power Incorporated	Alabel, Sarangani	100	TBD
Greenlight Solar Power Project	Greenlight Solar Farm Tapian Corp.	Datu Odin, Sinsuat, Maguindanao	50	TBD
Mabuhay Solar Power Project	Embrace Nature Power 1 Corp	Gen. Santos City, So. Cotabato	44	TBD
Conel Solar Power Project	Embrace Nature Power 1 Corp	Gen. Santos City, So. Cotabato	16	TBD
Lal-lo Solar PV Power Plant	Natures Renewable Energy & Development Corp.	Maasim, Sarangani	100	TBD
Ecoglobal Solar Power Plant	Ecoglobal, Inc	Zamboanga City Special Eco. Zone	30	TBD
Hayes Solar Power Project	Hayes Solar Energy Corp.	Villanueva, Misamis Or.	27	TBD
Opol Solar Power Project	Electra Ecoenergy Corp.	Brgy. Patag, Opol, Misamis Or.	25	TBD
Tantangan Solar Power Project	NVVPSE Five Inc.	Tantangan, So. Cotabato	65	TBD
Laguindingan Solar Power Proj.	Liberty Solar Energy Corp.	Laguindingan, Misamis Or.	20	TBD
Claveria Solar Power Project	The Ark Green Dynamic Resources Corp.	Claveria, Misamis Or.	60	TBD
Banale Solar Power Project	Astronergy Dev't. Pagadian, Inc.	Brgy. Banale, Pagadian	14	TBD
South Cotabato Solar Power Project	Astronergy Dev't Gensan, Inc.	Lanao del Norte/Lanao del Sur	24.96	TBD

Mindanao Grid Indicative Power Projects, **2,895.4 MW**

Name of the Project	Project Proponent	Location	Rated Capacity (MW)	Target Commissioning
BIOMASS			119.4	
Biomass Power Plant Project	Surallah Power Generation Inc	Surallah, So. Cotabato	6	Dec 2019
Napier Grass-Fired Biomass Power Plant Project	Manolo Fortich Biomass Energy Corporation	Bukidnon	12	Dec 2020
Malaybalay Bio-Energy Corporation Multi Feedstock Generating Facility	Malaybalay Bio-Energy Corporation	Bukidnon	10	Dec 2020
Woody Biomass Power Plant Project	CARAGA Renewable Energy Corp.	Agusan del Norte	23.5	Dec 2020
NAREDCO Biogas Power Plant	Natures Renewable Energy Development Corporation	Lal-lo Cagayan	24	Dec 2020
Napier Grass-Fired Biomass Power Plant Project	Pilipinas Joule Energy Corporation	Bukidnon	5	Dec 2020
Biogas Power Plant Project	Natures Renewable Energy Development Corporation	Maasim, Sarangani	24	Dec 2020
Crystal Sugar Bagasse-Fired Co-generation Power Plant	Crystal Sugar, inc.	Maramag, Bukidnon	14.9	TBD
OIL			5.88	
TPI Diesel Power Plant	Total Power Incorporated	Mati, Davao Oriental	5.88	Dec 2019
BESS			220.0	
Surigao / Butuan Battery Energy Storage	SMCGP Philippines Energy Storage Co. Ltd.	Surigao / Butuan	20	TBD
Zamboanga Battery Energy Storage	SMCGP Philippines Energy Storage Co. Ltd.	Zamboanga	200	TBD
TOTAL			2,895.4	



Summary of Mindanao Power Projects

Type of Power Plant	Committed			Indicative		
	No. of Proponents	Capacity (MW)	% Share	No. of Proponents	Capacity (MW)	% Share
Coal	2	700.0	89.8	4	1,333.0	46.0
Oil-Based	0	0.00	0.0	1	5.8	0.2
Natural Gas	0	0.0	0.0	0	0.0	0.0
Renewable Energy	6	79.4	10.2	47	1,556.6	53.8
Geothermal	0	0.0	0.0	1	30.0	1.0
Hydro	2	33.0	4.2	19	603.2	20.8
Biomass	3	21.4	2.7	8	119.4	4.1
Solar	1	25.0	3.2	19	804.0	27.8
Wind	0	0.0	0.0	0	0.0	0
TOTAL	8	779.4	100.0	52	2,895.4	100.0



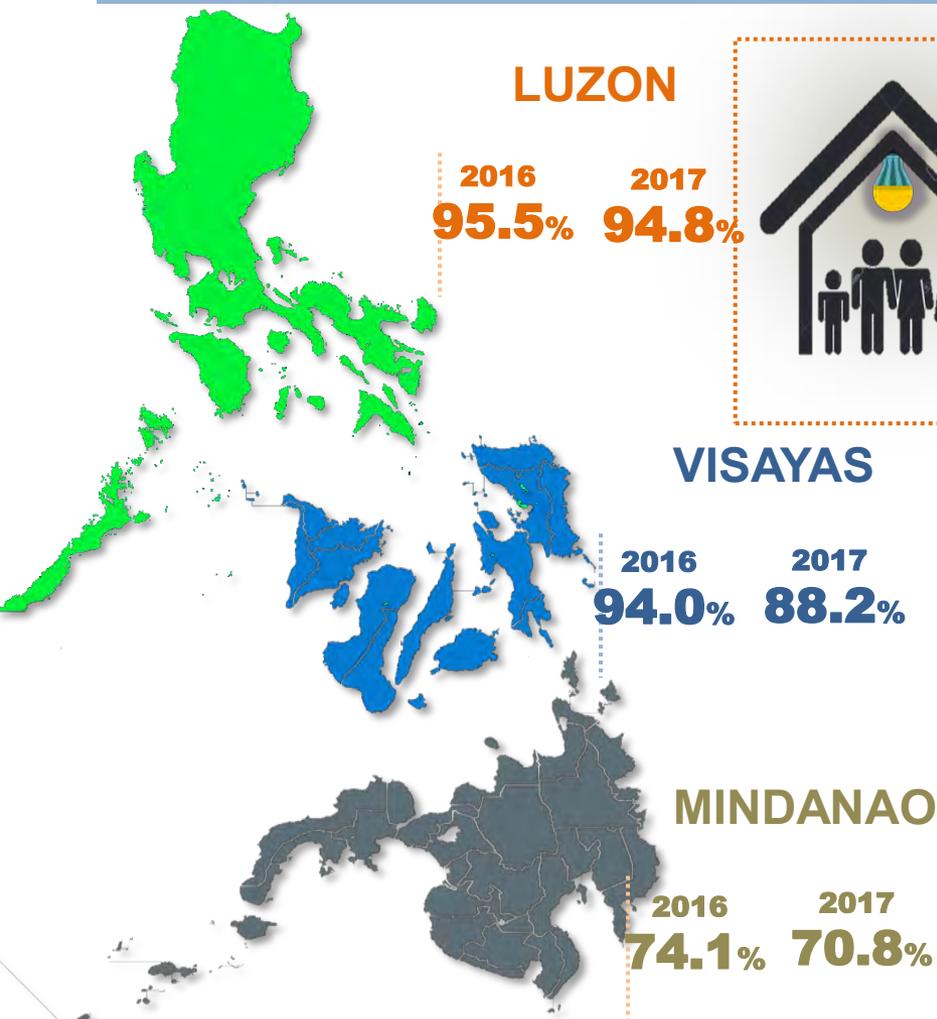
Technology-Neutral Energy Mix Policy

No “**one-size-fits-all**” approach for an ideal energy mix so both conventional and non-conventional sources must be considered.

Developing countries, like the Philippines, will need **cost-efficient** and **reliable energy** to meet its economic potential.



Expanded Energy Access



✓ 20.94 Million out of 23.7 Million households have electricity in the country

✓ 88.3% household electrification level



Total Electrification Program (TEP)

Electricity access for the unserved and underserved communities and households



2016 based on the 2010 Census
2017 based on the actual potential households identified by DUs



Micro-Grid and Distributed Generation

The Philippines unique situation of being archipelagic and prone to natural disasters must delve into electrification options that will provide continued electricity service. In the case of off-grid areas, solutions may be the implementation of micro-grid and distributed generation system.

SOLAR MICRO-GRID IN PALUAN, OCC. MINDORO

- First and largest solar-battery micro-grid in the country
- 6-MW micro-grid that uses a hybrid system of solar panels and diesel-powered generators benefitting 12 barangays in the Municipality of Paluan



Off-Grid

Investment Opportunities for Off-Grid Areas

Abundance of off-grid sites

- 7,641 islands, 1,702 potential off-grid sites.
- 2,399,108 households in the Philippines remain unserved.

Opportunities for hybridisation of diesel mini-grids and power plants

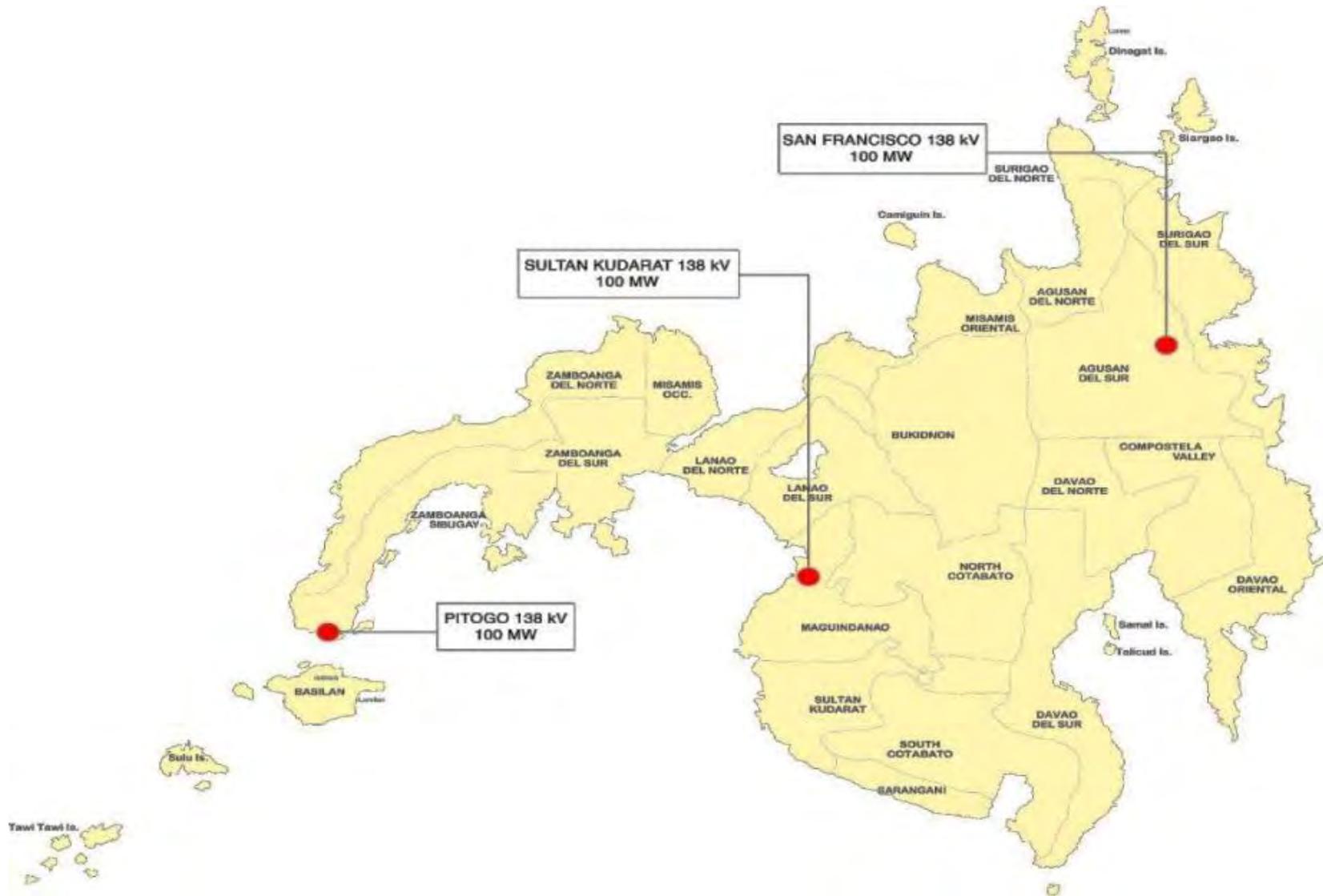
- 400 MW of diesel generating capacity installed in over 320 off-grid missionary areas.
- Recent study by ASEP revealed that savings of up to 4-5 PHP/kWh diesel power plants are possible.

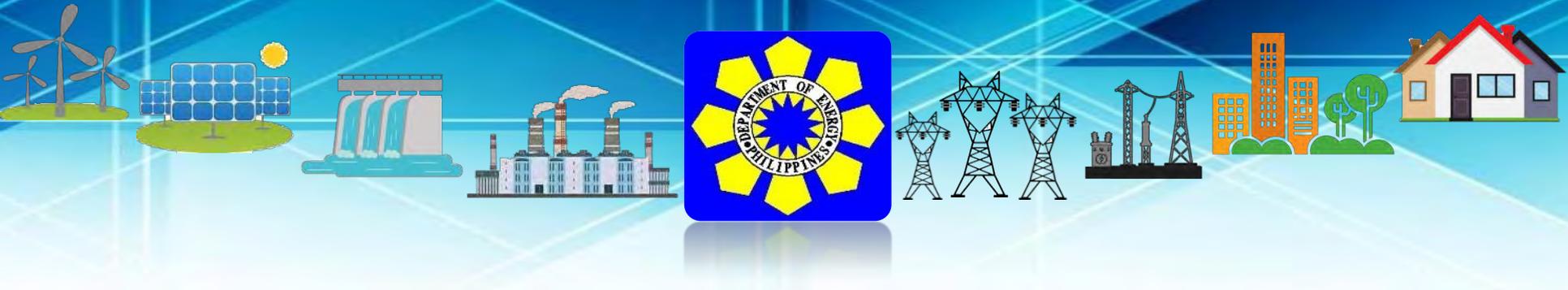
Policy frameworks for mini-grids being re-worked by government

- DOE aims to attain 100% electrification for all islands of the Philippines by 2022.
- Streamlining of the process for Qualified Third Parties (QTP) and New Power Producer (NPP) investments in hybrid and clean energy mini-grids in the Philippines under way.



Ideal Location of New Power Plants





Natural Gas Industry



Downstream Natural Gas

Integrated LNG Terminal



- Safeguard against the anticipated depletion of the Malampaya gas facility in 2024.
- Initial 200-MW power plant, storage facilities, liquefaction and regasification units.
- Output will serve PEZA areas.

Project Cost: **PHP 100 billion**
Targeted Completion: **2020**





Alternative Fuels & Energy Efficiency



Alternative Fuels and Energy Efficiency

Areas for Investment :

- Energy efficient appliances & equipment
- High efficiency motors
- Fuel efficient & low-carbon vehicles
 - Hybrid, electric, etc.
 - Charging stations for Alternative Energy Vehicles
- Energy efficient building technologies
 - Green building
 - Building Energy Management Systems Design and Architecture
- Energy Service Companies (ESCOs)





Energy Situationer



2017 Total Primary Energy Supply

ENERGY MIX

SOURCE



26.7%



5.6%



33.7%



33.9%

TOTAL

57.9_{MTOE}

INDIGENOUS

50.9%

IMPORTED

49.1%



32.9%



15.8%



0.4%



2017 Total Final Energy Consumption

Total Final Energy
Consumption

34.03
MTOE

BY FUEL



Electricity – 19.7%



Coal – 8.8%



Oil – 48.8%



Natural Gas – 0.2%



Biofuels – 1.5%



Biomass – 21.0%

BY SECTOR



Agriculture, Fishery and
Forestry – 1.5%



Industry – 23.3%



Transport – 35.5%



Residential – 26.7%

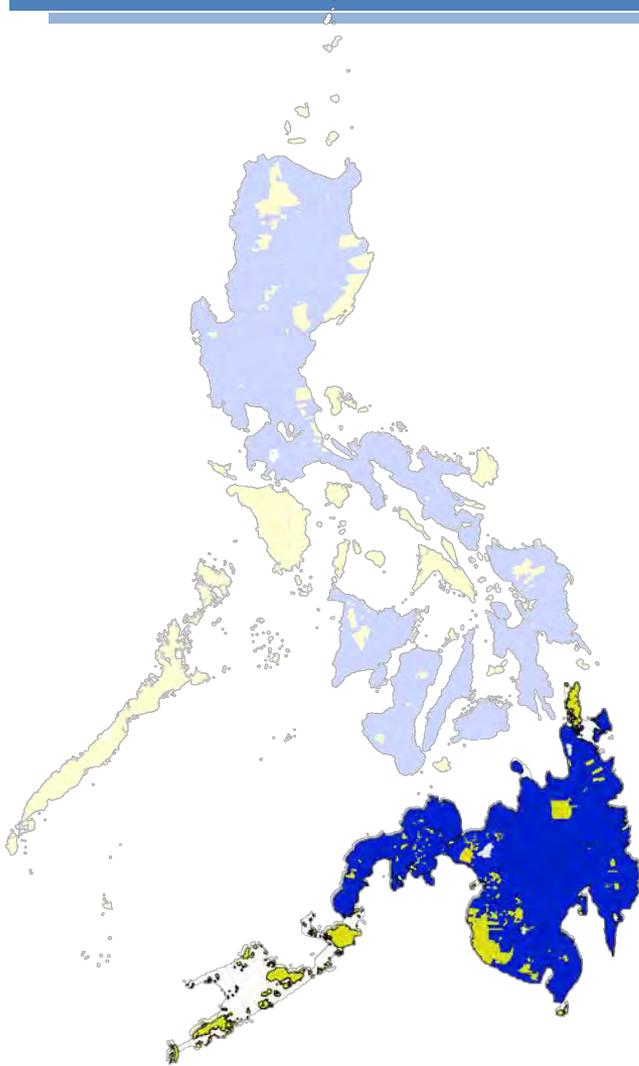


Commercial – 13.0%

* Preliminary as of 24 April 2018
** Excludes non-energy used



2018 Mindanao Power Demand and Supply Snapshot



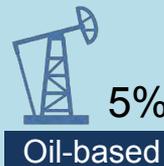
Blue and yellow fill colors correspond to grid and off-grid areas, respectively

1,853 MW
Peak Demand
(13 December 2018)

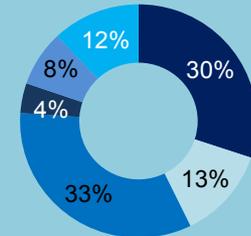
3,738 MW
Installed Capacity

3,210 MW
Dependable Capacity

12,769* GWh
Gross Generation



Electricity Sales and
Consumption
12,769* GWh



■ Residential ■ Commercial
■ Industrial ■ Others
■ Own-Use ■ Systems Loss

274 MW
Newly Installed Capacity

Power Projects
779.4 MW – Committed
2,895.4 MW - Indicative

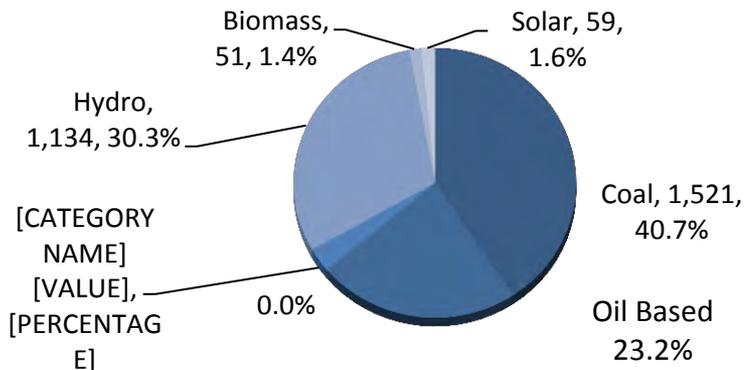


2018 Mindanao Capacity Mix

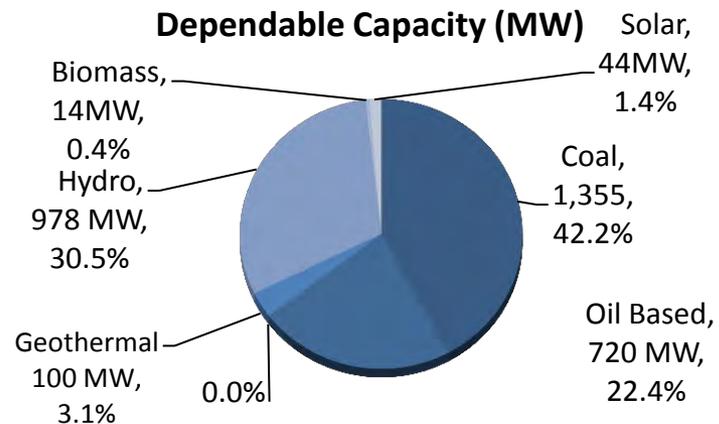


Fuel Type	Mindanao			
	Capacity (MW)		Percent Share (%)	
	Installed	Dependable	Installed	Dependable
Coal	1,521	1,355	40.7	42.2
Oil Based	866	720	23.2	22.4
<i>Diesel</i>	866	720	23.2	22.4
Natural Gas	0	0	0.0	0.0
Renewable Energy	1,352	1,136	36.2	35.4
<i>Geothermal</i>	108	100	2.9	3.1
<i>Hydro</i>	1,134	978	30.3	30.5
<i>Biomass</i>	51	14	1.4	0.4
<i>Solar</i>	59	44	1.6	1.4
<i>Wind</i>	0	0	0.0	0.0
Total	3,738	3,210	100.0	100.0

Installed Capacity (MW)



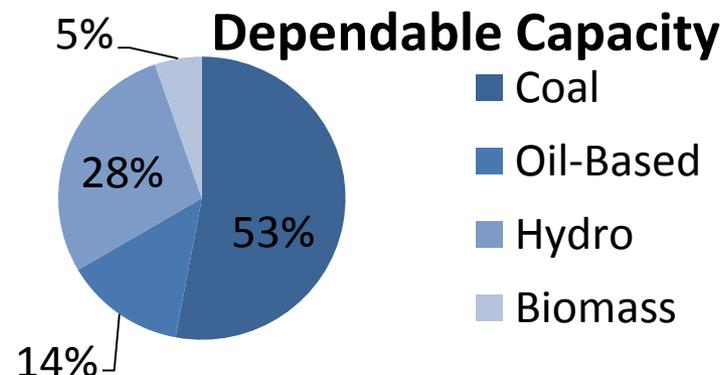
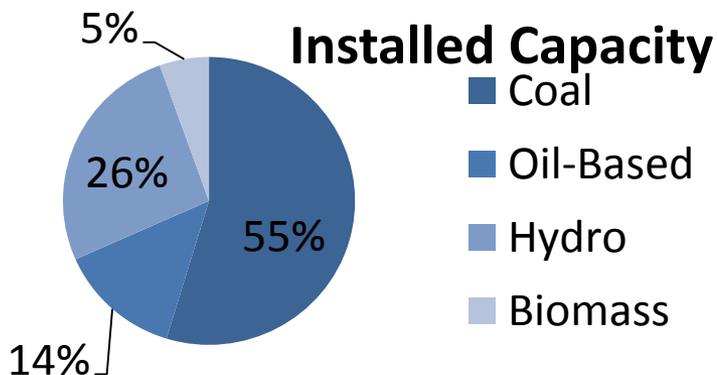
Dependable Capacity (MW)



NEWLY-OPERATIONAL POWER PLANTS - MINDANAO

As of 31 December 2018

POWER PLANT FACILITY NAME	CAPACITY, MW		LOCATION	OPERATOR
	INS	DEP	MUNICIPALITY / PROVINCE	
COAL	150.0	135.0		
SMC MALITA U2	150.0	135.0	Brgy. Culaman, Malita, Davao Occ.	San Miguel Consolidated Power Corporation
DIESEL	37.4	34.7		
KEGI - JIMENEZ	7.8	7.5	Brgy. San Isidro, Jimenez	King Energy Generation Inc
PBI	10.4	10.4	Bukidnon	Peak Power Bukidnon. Inc. (PBI)
PSFI 2	5.2	5.2	San Francisco, Agusan del Sur	Peak Power San Francisco (PSFI)
PSI 2	13.9	13.9	General Santos City	Peak Power Soccsargen, Inc. (PSI)
HYDRO	71.8	71.8		
NEW BATAAN HEPP	3.0	3.0	New Bataan, Compostela Valley	Euro Hydro Power (Asia) Holdings, Inc.
MANOLO FORTICH 1	43.4	43.4	Manolo Fortich, Bukidnon	HEDCOR Bukidnon, Inc.
MANOLO FORTICH 2	25.4	25.4	Manolo Fortich, Bukidnon	HEDCOR Bukidnon, Inc.
BIOMASS	15.0	13.5		
LAMSAN POWER CORPORATION	15.0	13.5	Maguindanao	Lamsan Power Corporation
Total	274.2	255		

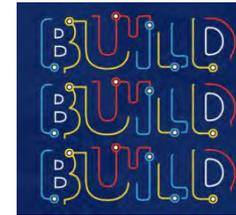




Policy Initiatives



Policy Initiatives



Strategic Directions 2017 - 2040

1

**ENSURE
ENERGY
SECURITY**

2

**EXPAND
ENERGY
ACCESS**

3

**PROMOTE A
LOW CARBON
FUTURE**

4

**STRENGTHEN
COLLABORATION
AMONG ALL
GOVERNMENT
AGENCIES
INVOLVED IN
ENERGY**

5

**IMPLEMENT,
MONITOR AND
INTEGRATE SECTORAL
AND TECHNOLOGICAL
ROADMAPS AND
ACTION PLANS**

6

**ADVOCATE THE
PASSAGE OF THE
DEPARTMENT'S
LEGISLATIVE
AGENDA**

7

**STRENGTHEN
CONSUMER
WELFARE AND
PROTECTION**

8

**FOSTER
STRONGER
INTERNATIONAL
RELATIONS AND
PARTNERSHIPS**



Nine-Point Agenda



100% Electrification by 2022



Technology Neutral Approach



Power to Meet Demand Needs by 2030



LNG Needs for Anticipated Depletion



Completion of Transmission Projects by 2020



Affordability, Choice and Transparency



Streamlining Domestic Policy to Cut Red Tape



Delivery of PSALM Privatization



More Efficient Power Use





Enabling Laws for Energy Investors



Enabling Laws for Investors

- ❑ Republic Act No. 11032 Ease of Doing Business Act of 2018
- ❑ Republic Act No. 11234 Energy Virtual One-Stop Shop (EVOSS) Act



For inquiries, please contact

***Investment Promotion Office
Department of Energy***



(+632) 479-2900 local 371



doe_ipo@yahoo.com



www.doe.gov.ph



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