

# Energy Investment Opportunities in the Mindanao Region

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Mindanao Energy Investment Forum  
11 October 2018  
Davao City



# Presentation Outline

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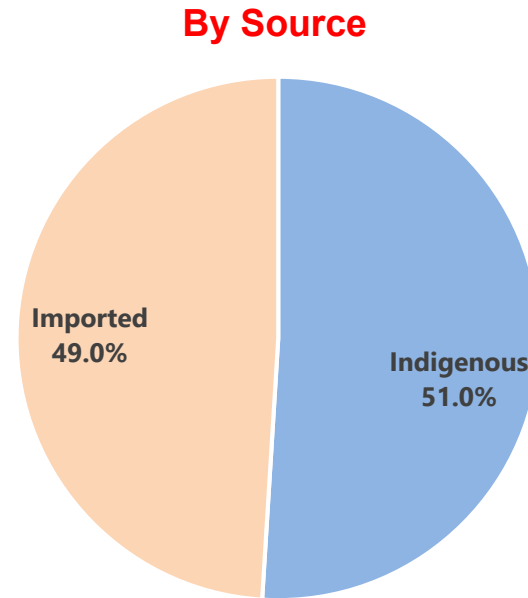
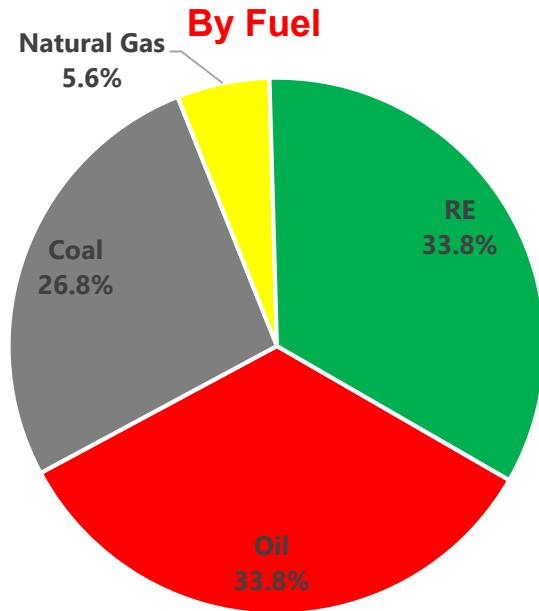
- Philippines Energy Situationer
- Mindanao Power Situationer
- Investment Opportunities



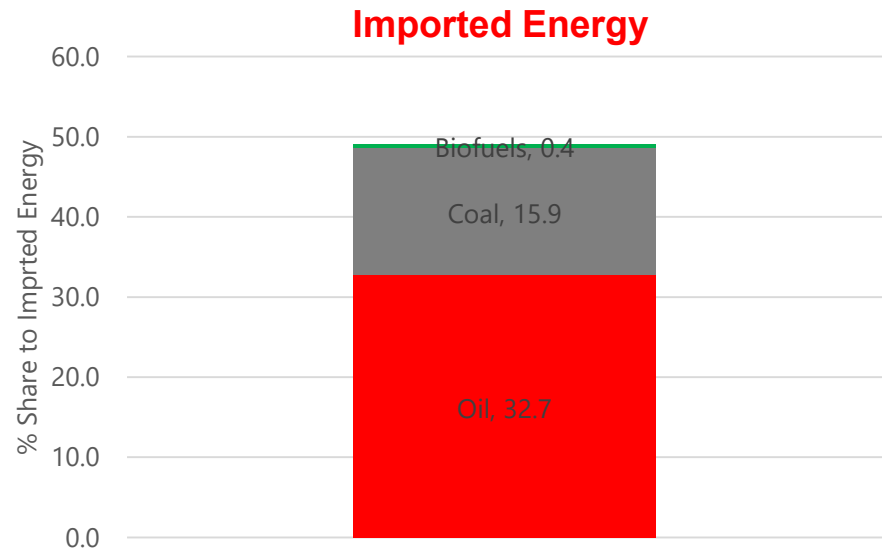
# Energy Situationer



# 2017 Total Primary Energy Supply



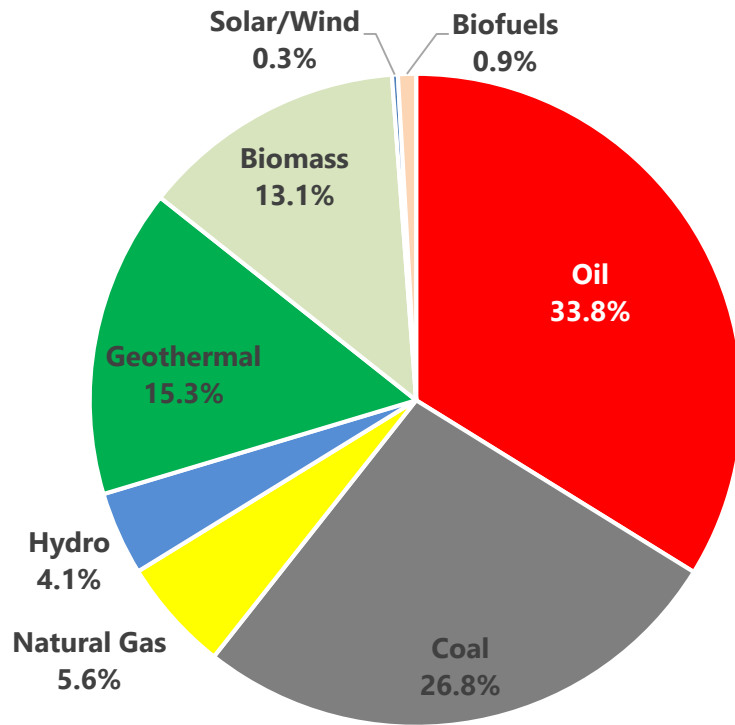
Total Energy	57.71 MTOE
Self-Sufficiency	51.0%
Renewable Energy (RE)	33.8%
Clean Energy (RE + Nat Gas)	39.4%



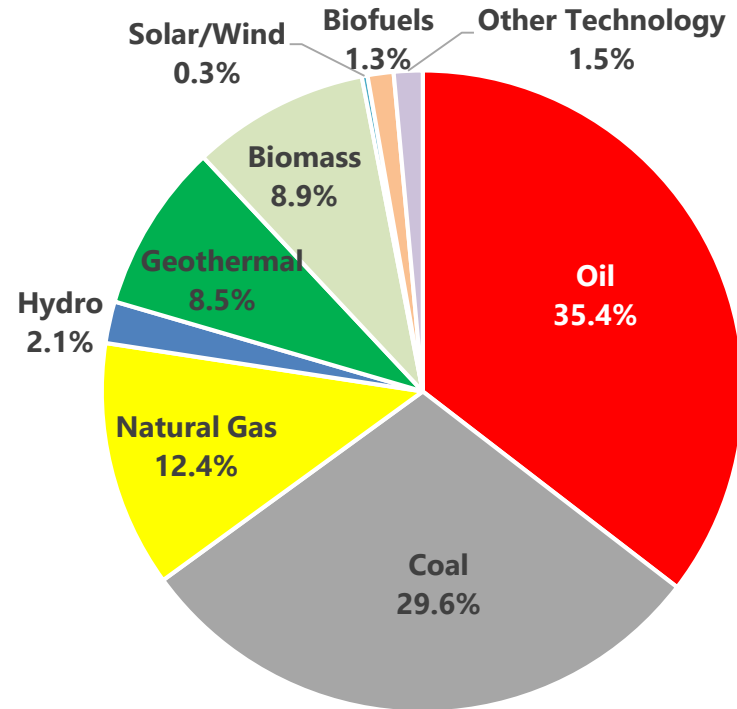
\* Preliminary as of 24 April 2018



# Total Primary Energy Supply, 2017 and 2040



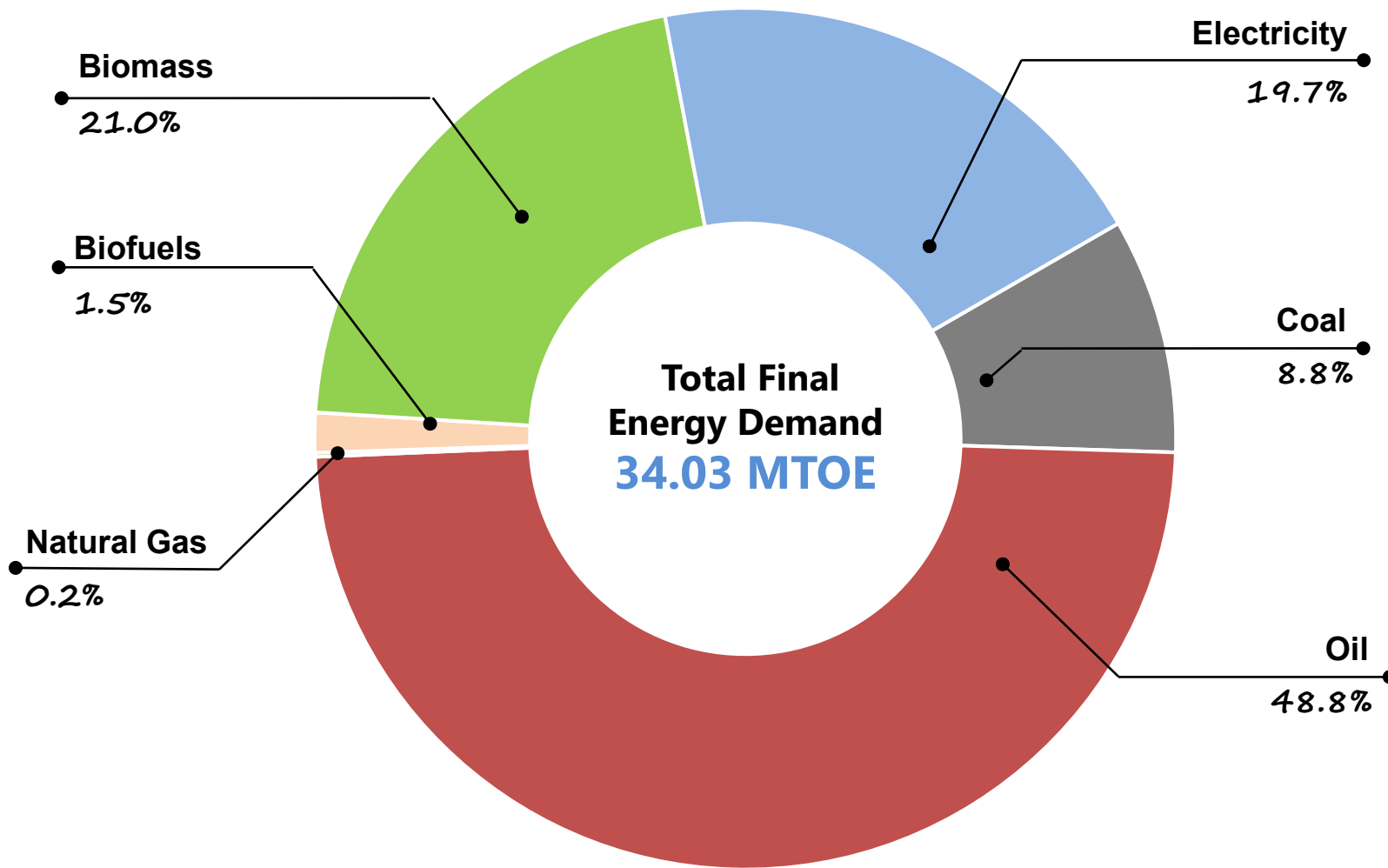
**2017 (preliminary)**  
**Total Energy: 57.7 MTOE**



**2040 Outlook**  
**Total Energy: 137.8 MTOE**



# 2017 Total Final Energy Consumption by Fuel

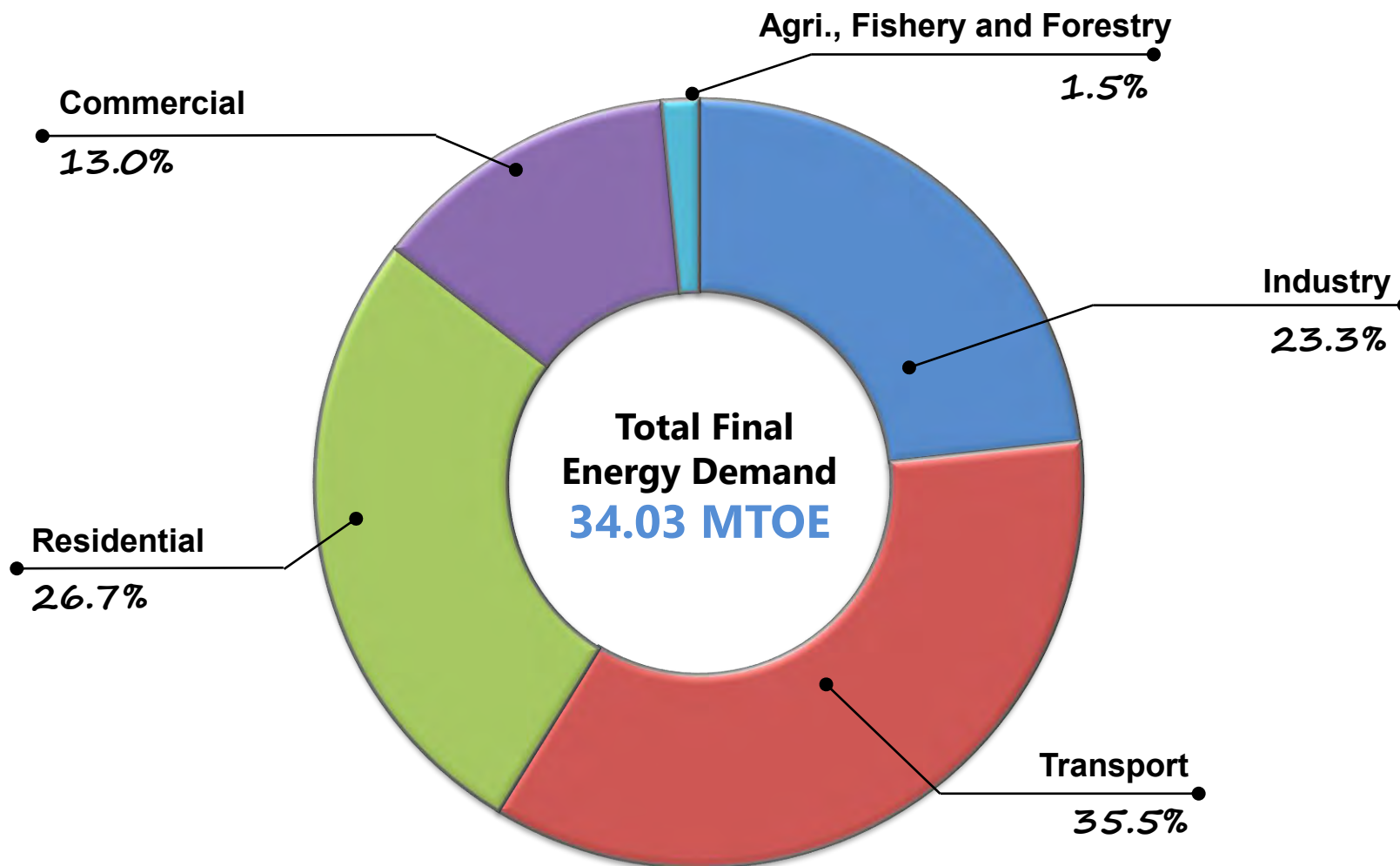


\* Preliminary as of 24 April 2018

\*\* Excludes non-energy used



# 2017 Total Final Energy Consumption by Sector



\* Preliminary as of 24 April 2018

\*\* Excludes non-energy used



# Power Supply and Demand Outlook



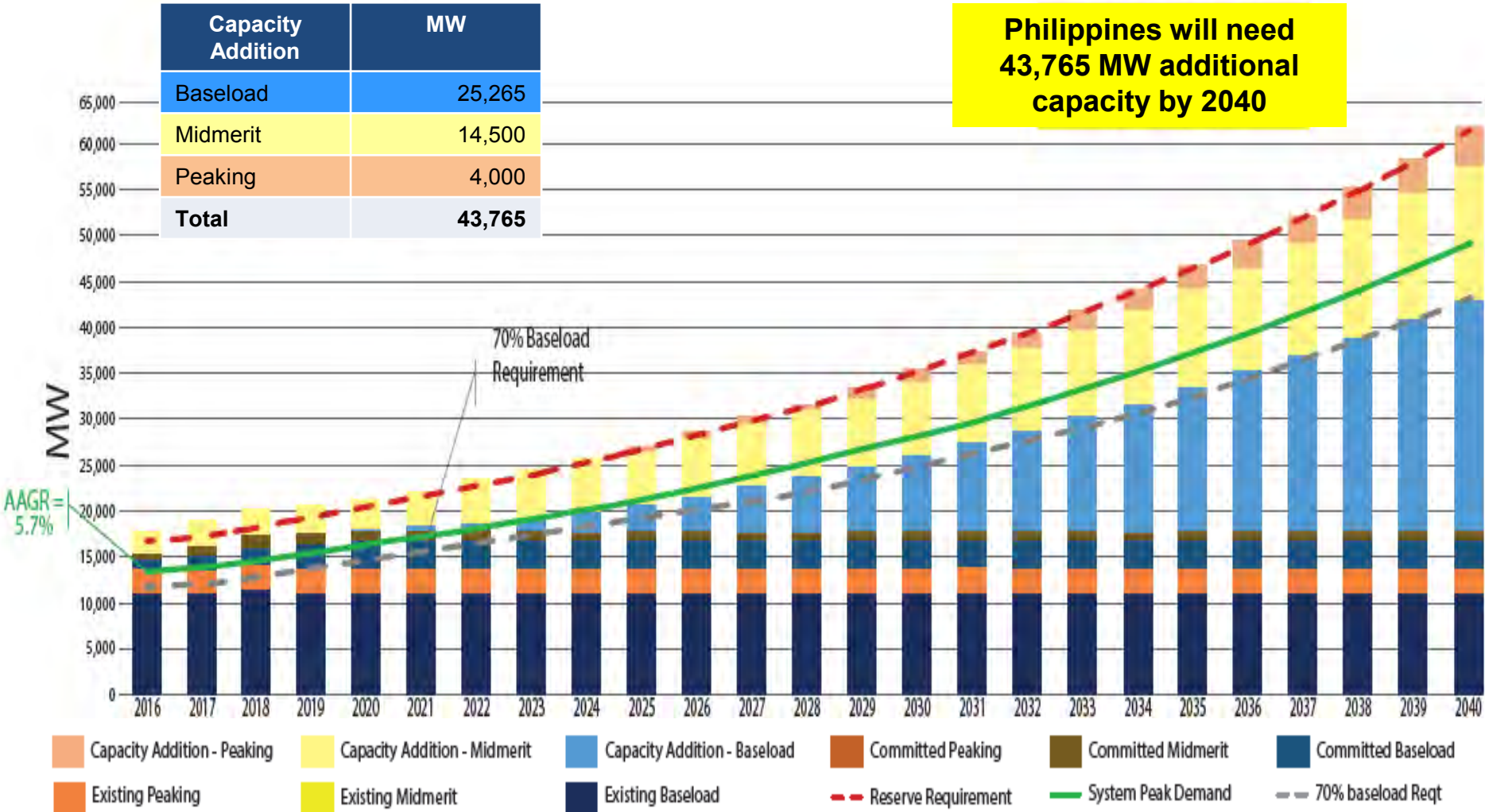


# Philippines Power Demand and Supply Outlook

## Philippines Demand and Supply Outlook, 2016-2040

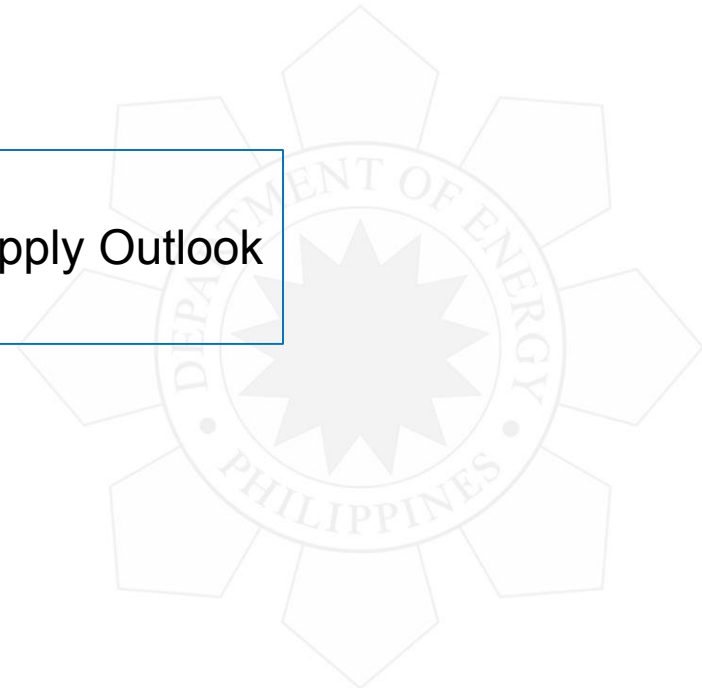
Capacity Addition	MW
Baseload	25,265
Midmerit	14,500
Peaking	4,000
<b>Total</b>	<b>43,765</b>

**Philippines will need 43,765 MW additional capacity by 2040**

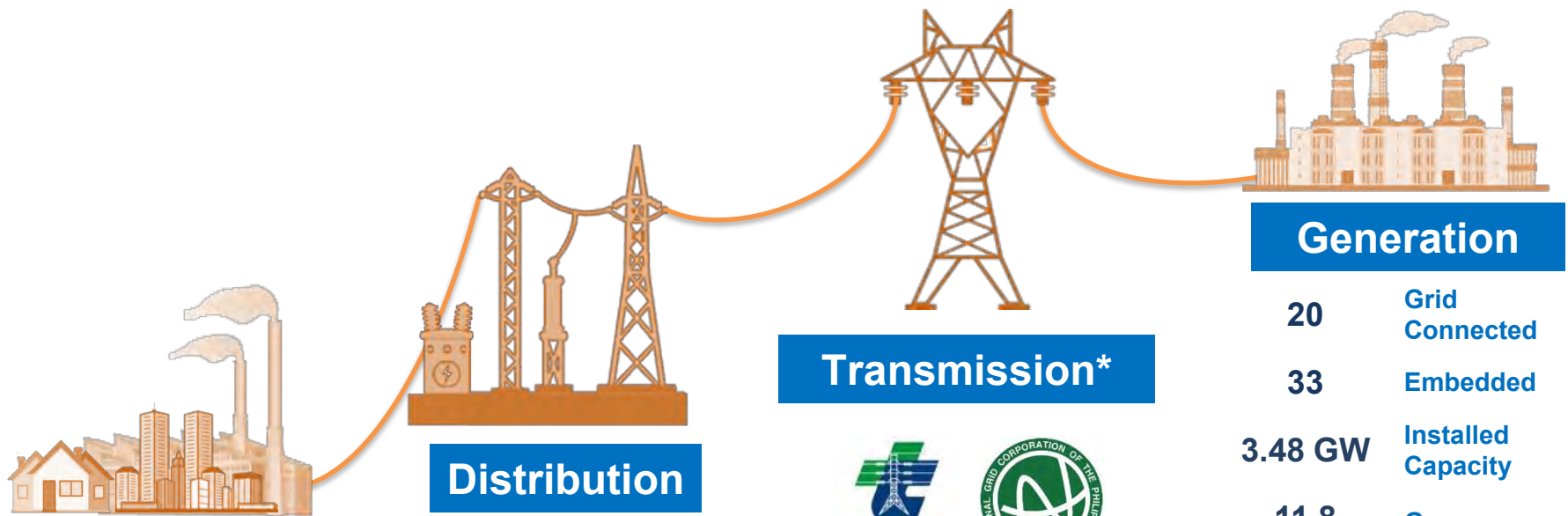


# Mindanao Power Situation and Outlook

- 2017 Mindanao Power Grid
- 2018 – 2040 Demand and Supply Outlook
- 2018 – 2020 Power Outlook

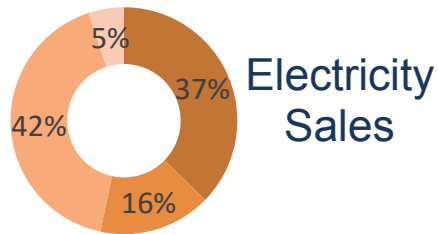


# Mindanao Grid Power System\*



## Load

9.5 TWh



- Residential
- Commercial
- Industrial
- Others

## Distribution

4 **PIOUs**

34 **ECs**

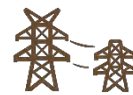
1 **LGUOU**

- PIOUs** - Private-Investor Owned Utilities
- ECs** - Electric Cooperatives
- MPC** - Multi-purpose Cooperative

## Transmission\*



3,727  
MVA



5,832  
ckt-km

**Peak Demand: 1.76 GW**

## Generation

20 **Grid Connected**

33 **Embedded**

3.48 GW **Installed Capacity**

11.8 **Gross Generation TWh**

**53%**  
**Coal**

**0%**  
**Nat Gas**

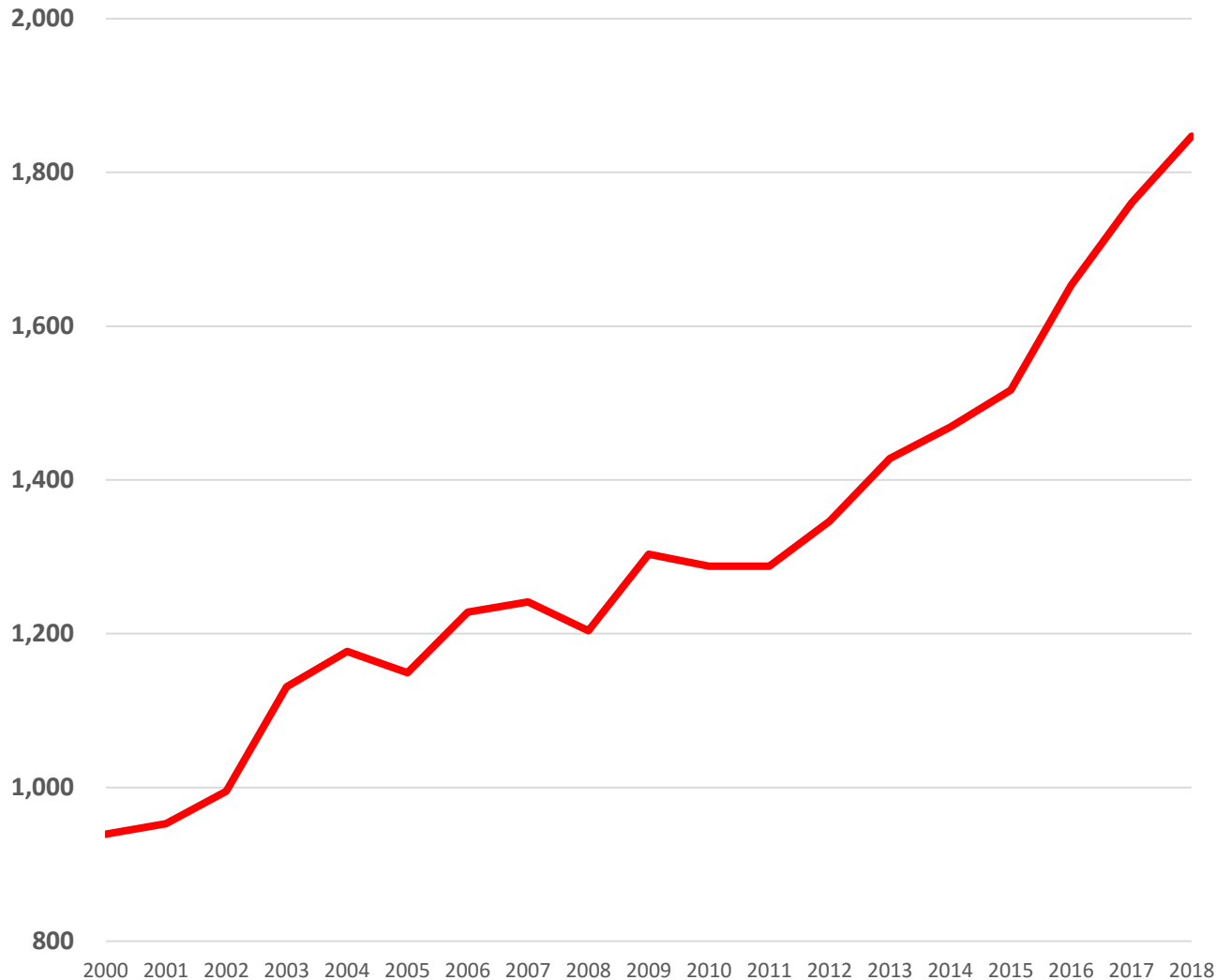
**40%**  
**RE**

**7%**  
**Oil-based**

\*2017 DOE Power Statistics  
 \*\*\* Based on 2014-2015 TDP  
 Sources of Data: DOE; NGCP



# Historical System Demand



Year	Mindanao	% GR
2000	939	
2001	953	1.5
2002	995	4.4
2003	1,131	13.7
2004	1,177	4.1
2005	1,149	(2.4)
2006	1,228	6.9
2007	1,241	1.1
2008	1,204	(3.0)
2009	1,303	8.3
2010	1,288	(1.2)
2011	1,288	0.0
2012	1,346	4.5
2013	1,428	6.1
2014	1,469	2.9
2015	1,517	3.3
2016	1,653	9.0
2017	1,760	6.5
2018*	1,847	4.9

\* 2018 Actual Peak Demand to Date as of 23 May 2018



# Mindanao Newly Operational Power Plants

(Jan 2017 to June 2018)

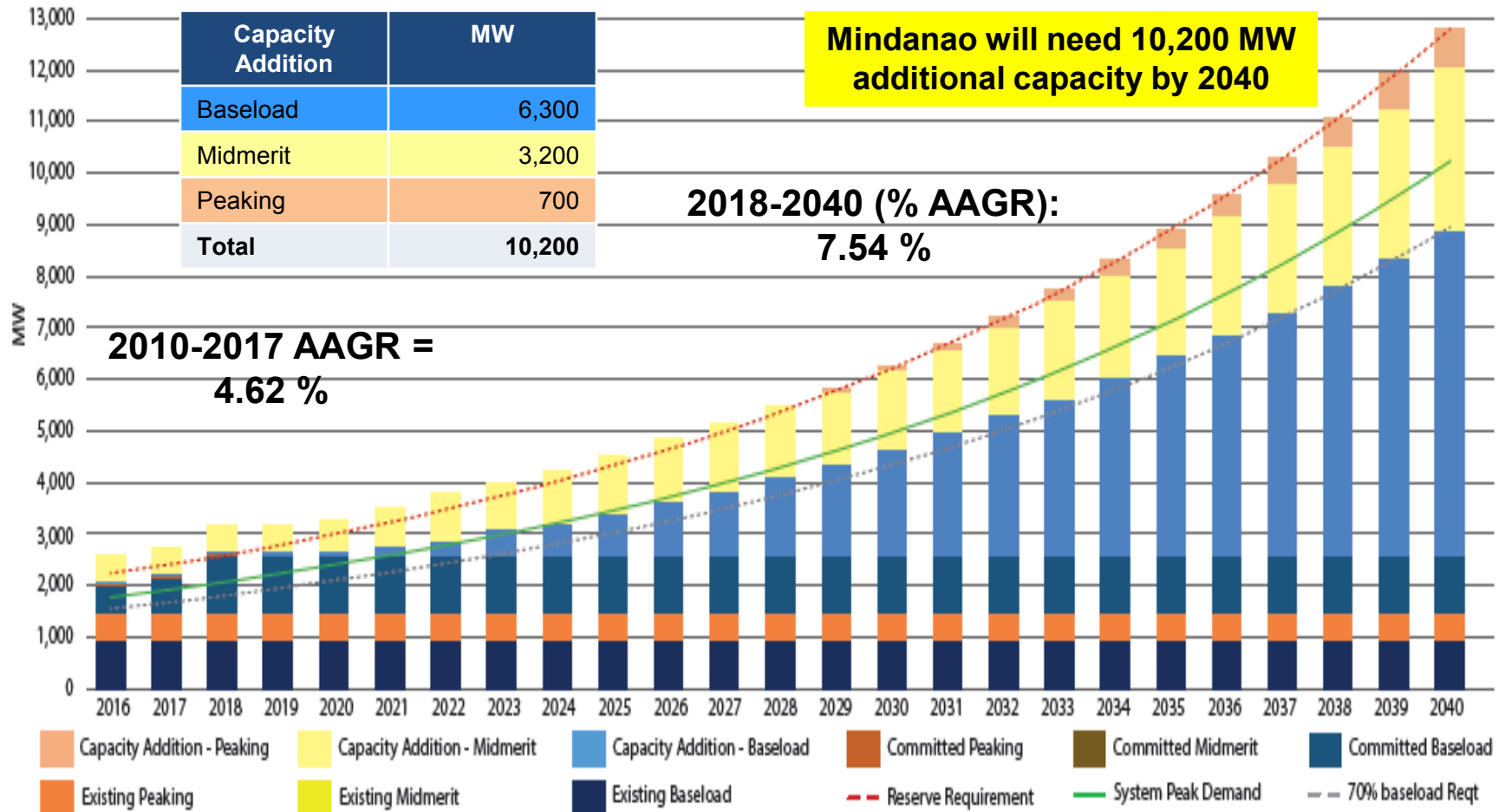
POWER PLANT	CAPACITY (MW)		OWNER/ OPERATOR	COD
FACILITY NAME	INS	DEP		
<b>COAL</b>	<b>450</b>	<b>405</b>		
SMC Malita U2	150	135	SMC Consolidated Power Corporation	Feb 2018
FDC MISAMIS U3	135	120	FDC Utilities, Inc.	May 2017
MPC Balingasag U1	55	50	Minergy Power Corporation	Sep 2017
MPC Balingasag U2	55	50		
MPC Balingasag U3	55	50		
<b>DIESEL</b>	<b>74.7</b>	<b>72</b>		
NAC DPP	10.9	8.2	Nickel Asia Corporation (NAC)	Dec 2017
PACERM-1	10.5	10.5	PACERM-1 Energy Corporation	2017
ZAMCELCO DPP	16	16	ZAMCELCO	2017
PBI	10.4	10.4	Peak Power Bukidnon	Mar 2018
PSFI 2	5.2	5.2	Peak Power San Francisco	Jan 2018
PSI 2	13.9	13.9	Peak Power Soccsargen	Sep 2017
KEGI Jimenez	7.8	7.8	King Energy Generation Inc.	Oct 2017
<b>BIOMASS</b>	<b>15</b>	<b>13</b>		
LAMSAN Biomass	15	13	Lamsan Power Corp	May 2018
<b>HYDRO</b>	<b>3</b>	<b>3</b>		
New Bataan	3	3	Euro Hydro Power	Mar 2018
<b>Total</b>	<b>543</b>	<b>493</b>		

\*Excluding Battery Energy Storage



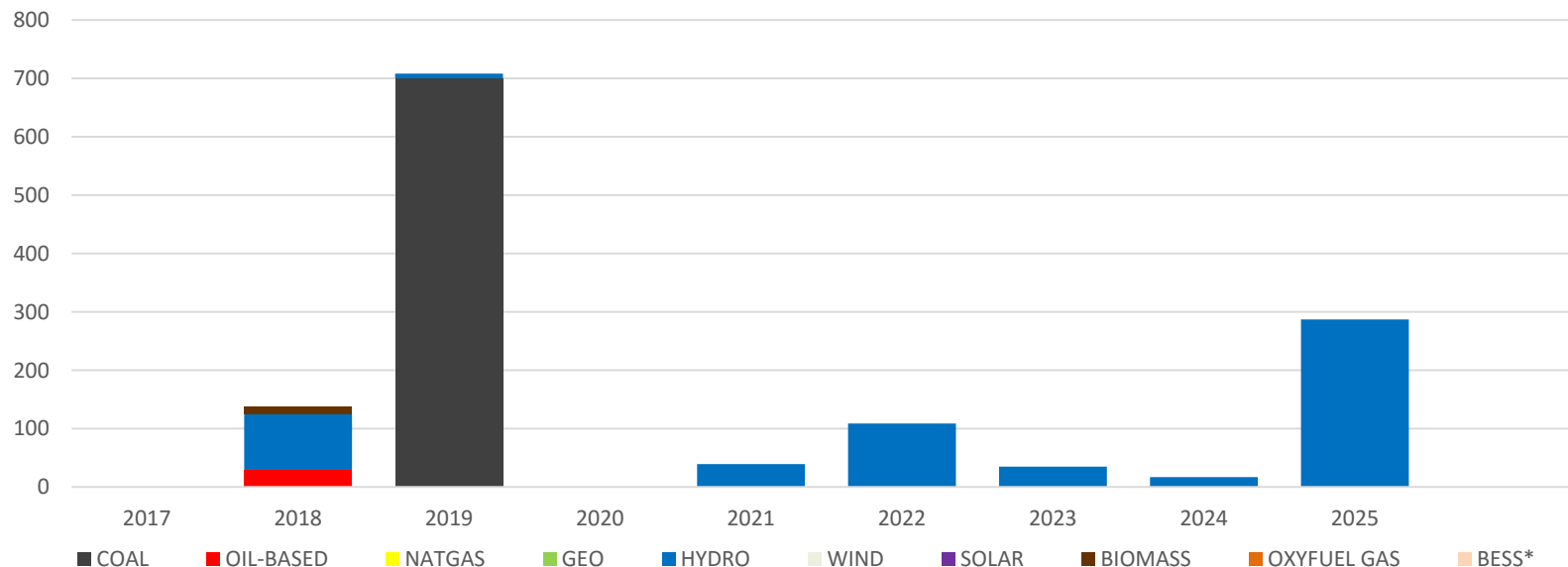
# Mindanao Demand and Supply Outlook, 2016-2040

## Mindanao Demand and Supply Outlook, 2016-2040



# Mindanao Committed Power Projects

Plant Type	2017	2018	2019	2020	2021	2022	2023	2024	2025	TBD	TOTAL by Type
COAL	0	0	700	0	0	0	0	0	0	0	700.00
OIL-BASED	0	29.54	0	0	0	0	0	0	0	0	29.54
NATGAS	0	0	0	0	0	0	0	0	0	0	0.00
GEO	0	0	0	0	0	0	0	0	0	0	0.00
HYDRO	0	96.2	8	0	39.2	108.7	34.8	16.85	287.14	0	590.89
WIND	0	0	0	0	0	0	0	0	0	0	0.00
SOLAR	0	0	0	0	0	0	0	0	0	0	0.00
BIOMASS	0	12	0	0	0	0	0	0	0	0	12.00
OXYFUEL GAS	0	0	0	0	0	0	0	0	0	0	0.00
BESS*	0	0	0	0	0	0	0	0	0	0	0.00
<b>TOTAL by year</b>	<b>0.00</b>	<b>137.74</b>	<b>708.00</b>	<b>0.00</b>	<b>39.20</b>	<b>108.70</b>	<b>34.80</b>	<b>16.85</b>	<b>287.14</b>	<b>0.00</b>	<b>1,332.43</b>

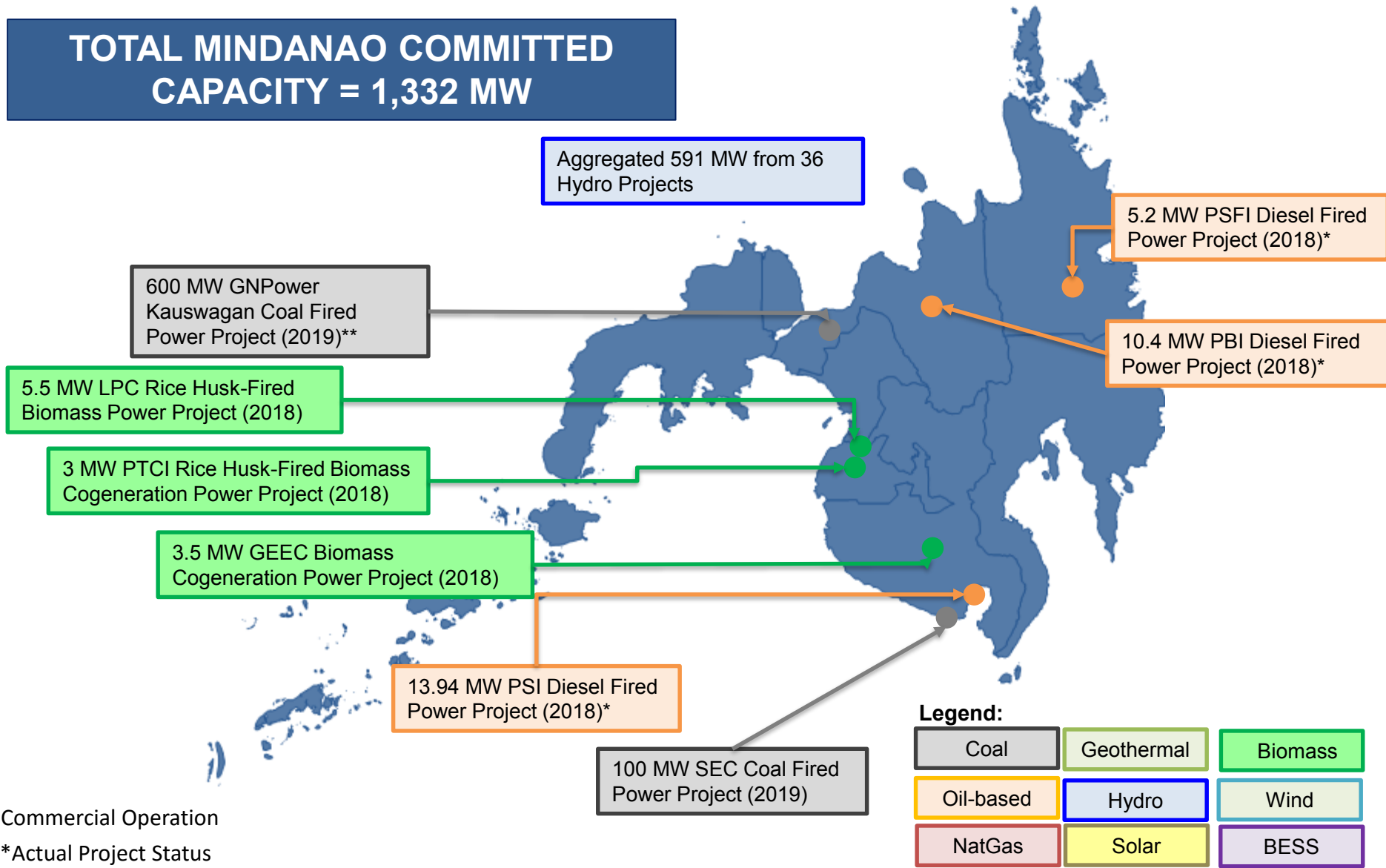


Note: TBD – To be Determined



# Mindanao Committed Power Projects

**TOTAL MINDANAO COMMITTED CAPACITY = 1,332 MW**



\*Commercial Operation

\*\*Actual Project Status



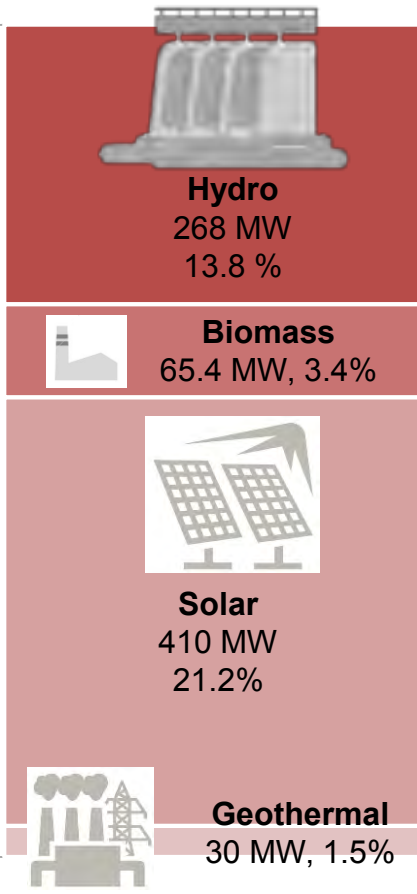
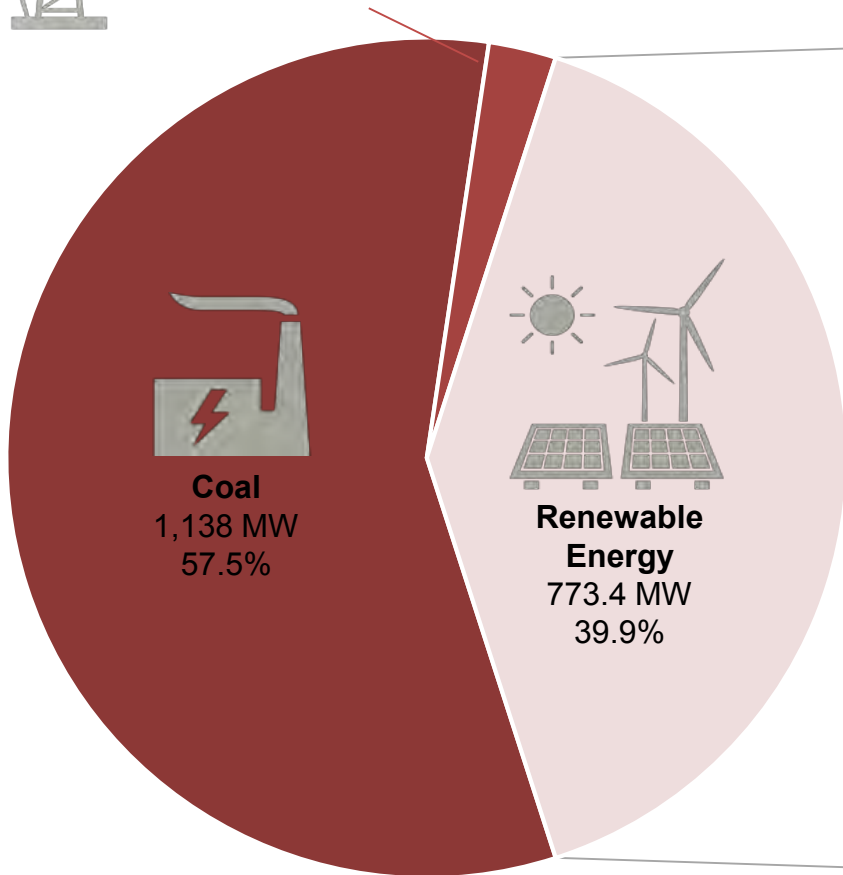


# Mindanao Indicative Power Projects



**Oil Based**  
25.88 MW  
2.3%

**TOTAL MINDANAO INDICATIVE  
CAPACITY = 1,937.28 MW**



■ Coal ■ Oil ■ Hydro ■ Biomass ■ Solar ■ Geothermal



# Mindanao 2018-2020 Short Term Power Outlook

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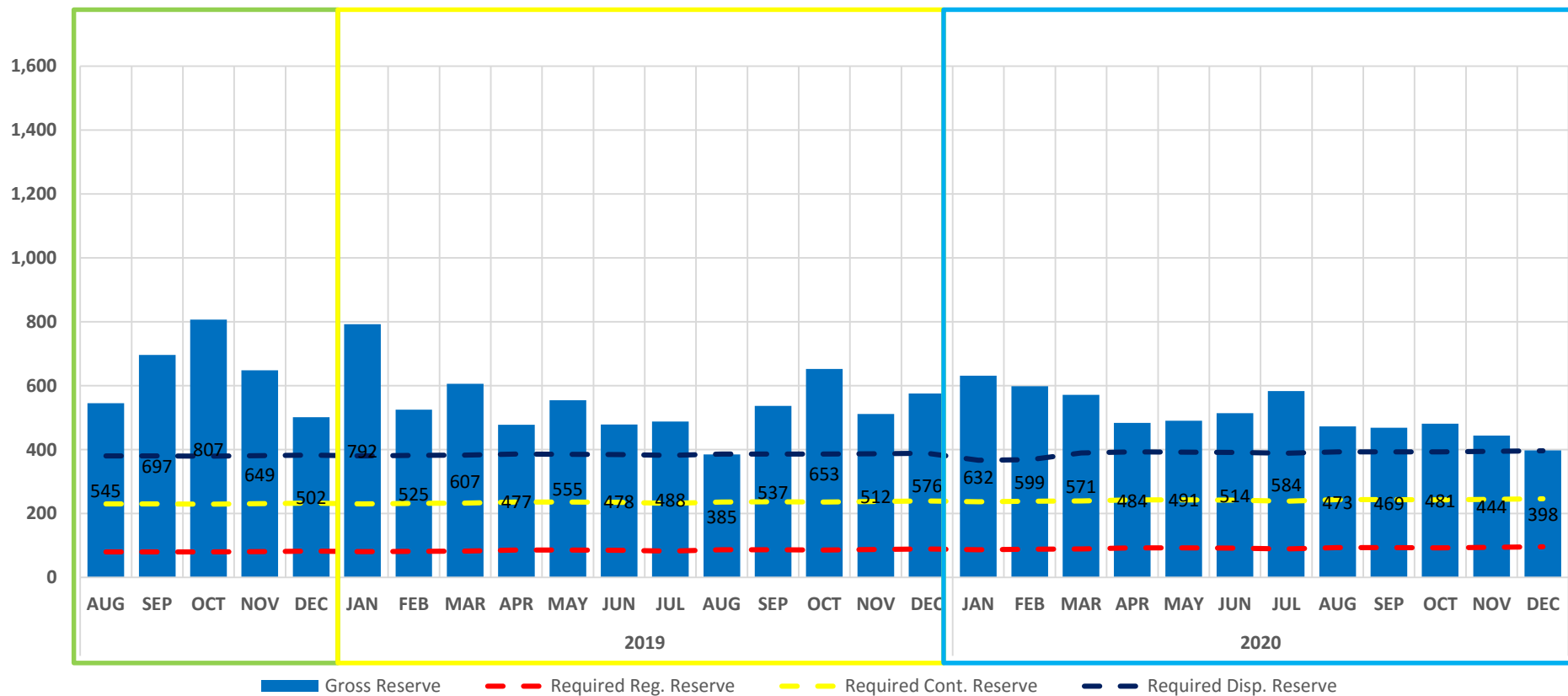
- **Assumptions**

- DOE Peak Demand forecast\*
  - 2018 – 2,064 MW
  - 2019 – 2,229 MW
  - 2020 – 2,407 MW
- Committed Power projects based on **actual project status**
- Preventive Maintenance Schedule (PMS) considered based on NGCP Grid Operating Program (GOP) 2018-2020



# Mindanao 2018-2020 Power Outlook

- Reserve Profile w/o Committed Power Projects



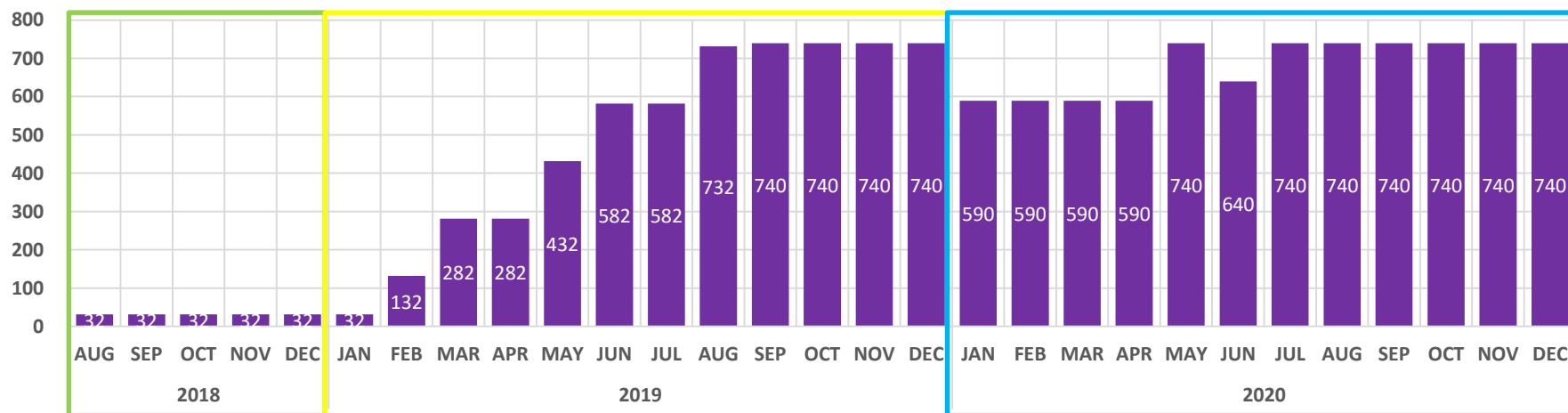
2018-2020 Monthly	2018					2019												2020											
	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Total Available Capacity	2,545	2,700	2,800	2,673	2,566	2,805	2,568	2,675	2,627	2,698	2,600	2,545	2,545	2,700	2,805	2,698	2,805	2,805	2,805	2,805	2,805	2,805	2,805	2,805	2,805	2,805	2,805	2,805	2,805
System Demand	2,000	2,003	1,992	2,024	2,064	2,012	2,043	2,068	2,149	2,143	2,121	2,057	2,159	2,163	2,152	2,186	2,229	2,173	2,206	2,233	2,321	2,314	2,291	2,221	2,332	2,336	2,324	2,361	2,407
Gross Reserve	545	697	807	649	502	792	525	607	477	555	478	488	385	537	653	512	576	632	599	571	484	491	514	584	473	469	481	444	398
Required Reg. Reserve	80	80	80	81	83	80	82	83	86	86	85	82	86	87	86	87	89	87	88	89	93	93	92	89	93	93	93	94	96
Required Cont. Reserve	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
Required Disp. Reserve	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	130	130	150	150	150	150	150	150	150	150	150	150



# Mindanao 2018-2020 Power Outlook

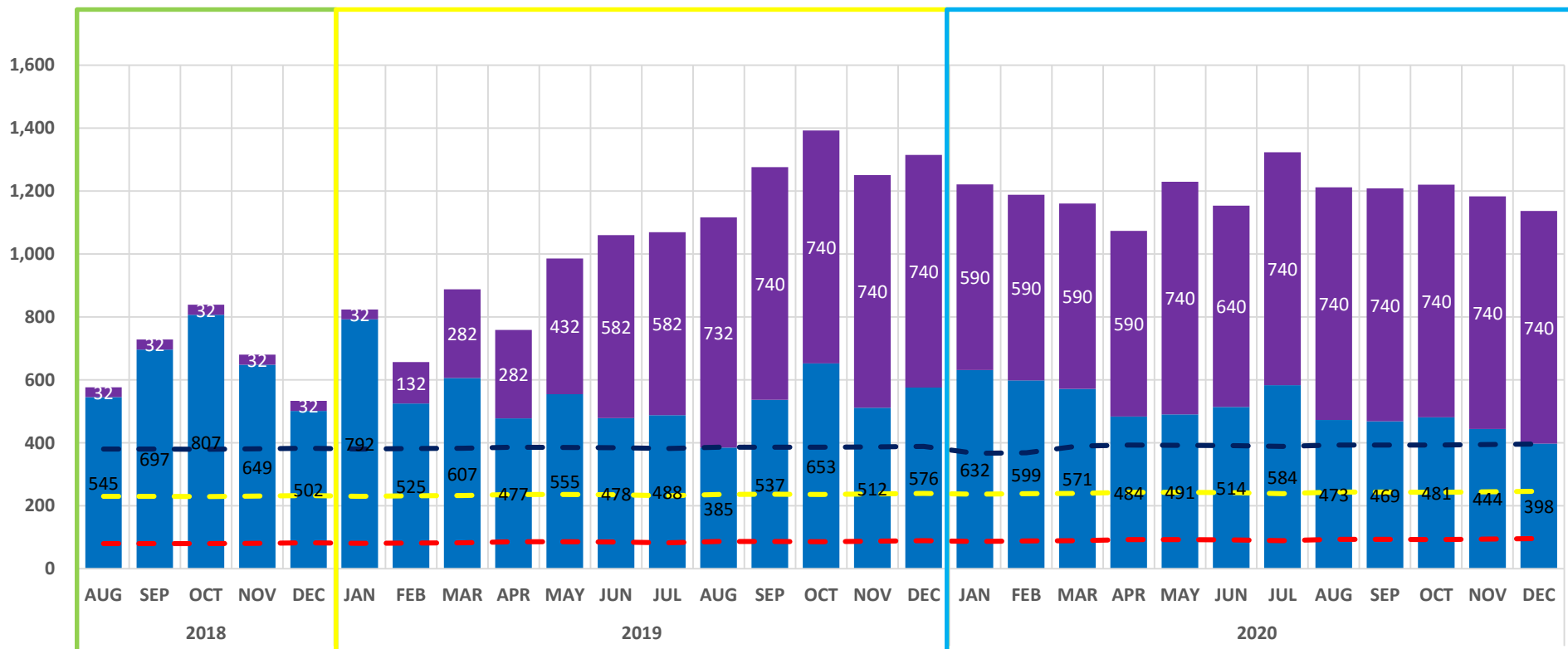
- Committed Power Projects

Power Project	Installed Cap (MW)	Target COD
MANOLO FORTICH 2 HYDRO	25.4	Aug-18
LAKE MAINIT HYDRO	25.0	Aug-18
PHILTRADE BIOMASS	3.0	Aug-18
GEEC BIOMASS	3.5	Aug-18
SEC 2 COAL	100.0	Jan-19
GNPK 1 COAL	150.0	Mar-19
GNPK 2 COAL	150.0	May-19
GNPK 3 COAL	150.0	Jun-19
GNPK 4 COAL	150.0	Aug-19
ASIGA GREEN ENERGY HYDRO	8.0	Aug-19
<b>Total</b>	<b>764.9</b>	



# Mindanao 2018-2020 Power Outlook

- Reserve Profile with Committed Power Projects



■ Gross Reserve   
 ■ Committed Capacity   
 - - - Required Reg. Reserve   
 - - - Required Cont. Reserve   
 - - - Required Disp. Reserve

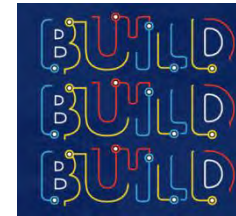
2018-2020 Monthly	2018					2019												2020											
	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Total Available Capacity	2,545	2,700	2,800	2,673	2,566	2,805	2,568	2,675	2,627	2,698	2,600	2,545	2,545	2,700	2,805	2,698	2,805	2,805	2,805	2,805	2,805	2,805	2,805	2,805	2,805	2,805	2,805	2,805	2,805
System Demand	2,000	2,003	1,992	2,024	2,064	2,012	2,043	2,068	2,149	2,143	2,121	2,057	2,159	2,163	2,152	2,186	2,229	2,173	2,206	2,233	2,321	2,314	2,291	2,221	2,332	2,336	2,324	2,361	2,407
Gross Reserve	545	697	807	649	502	792	525	607	477	555	478	488	385	537	653	512	576	632	599	571	484	491	514	584	473	469	481	444	398
Committed Capacity	32	32	32	32	32	32	132	282	282	432	582	582	732	740	740	740	740	590	590	590	590	740	640	740	740	740	740	740	740
Required Reg. Reserve	80	80	80	81	83	80	82	83	86	86	85	82	86	87	86	87	89	87	88	89	93	93	92	89	93	93	93	94	96
Required Cont. Reserve	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
Required Disp. Reserve	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	130	130	150	150	150	150	150	150	150	150	150



# 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**



# Policy Initiatives

## DOE's Legislative Agenda:

- Downstream Oil Industry Deregulation Bill
- LPG Industry Safety Bill
- Amending Sec. 45 of RA 9136
- Electric, Hybrid and Other Alternative Fuel Vehicles Promotions Bill
- Downstream Natural Gas Infrastructure Development Bill
- Energy Efficiency and Conservation Bill
- Green Vehicles Incentives Bills
- EVOSS Bill





# Policy Initiatives

- Department Circular No. 2013-03-0003, the DOE shall propose a National Strategy for the Smart Grid for the period until 2040.
- Executive Order No. 30 was signed by President R. Duterte on 28 June 2017 creating the Energy Investment Coordinating Council (EICC) in order to Streamline the Regulatory Procedures Affecting Energy Projects
- Department Circular No. DC2017-11-0012 Rules & Regulations Governing the Philippine Downstream Natural Gas Industry
- Department Circular No. 2017-12-0014 Providing Policies on the Implementation of Retail Competition and Open Access for Retail Electricity Suppliers



# Policy Initiatives

- Department Circular No. DC2017-12-0015  
Promulgating the Rules and Guidelines Governing the Establishment of the Renewable Portfolio Standards for On-Grid Areas
- Department Circular No. DC2017-12-0017  
Adopting the Philippine Conventional Energy Contracting Program (PCECP)
- Department Circular No. DC2018-01-0002  
Adopting Policies for the Effective and Efficient Transition to the IMO for the WESM

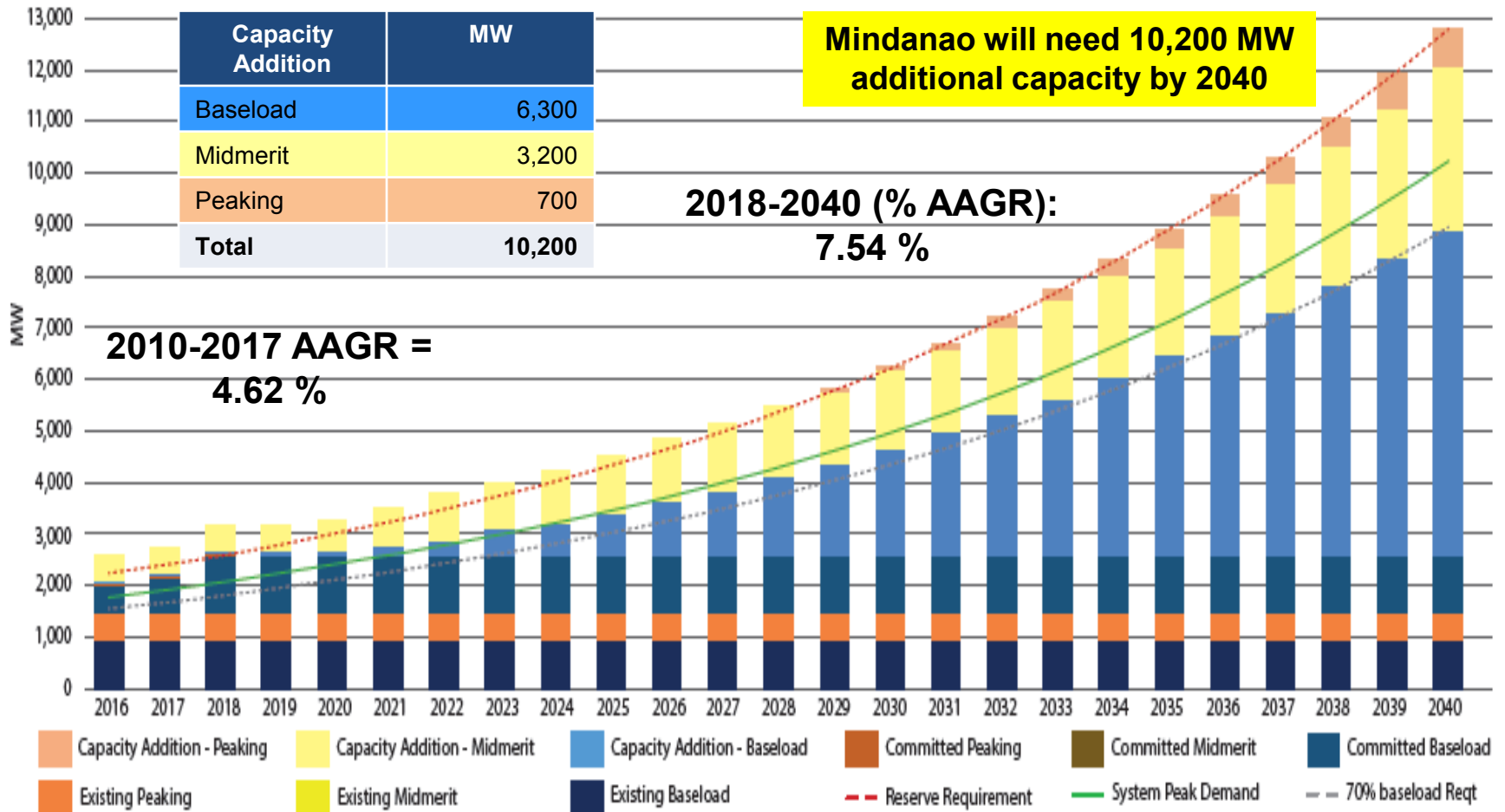


# Investment Opportunities



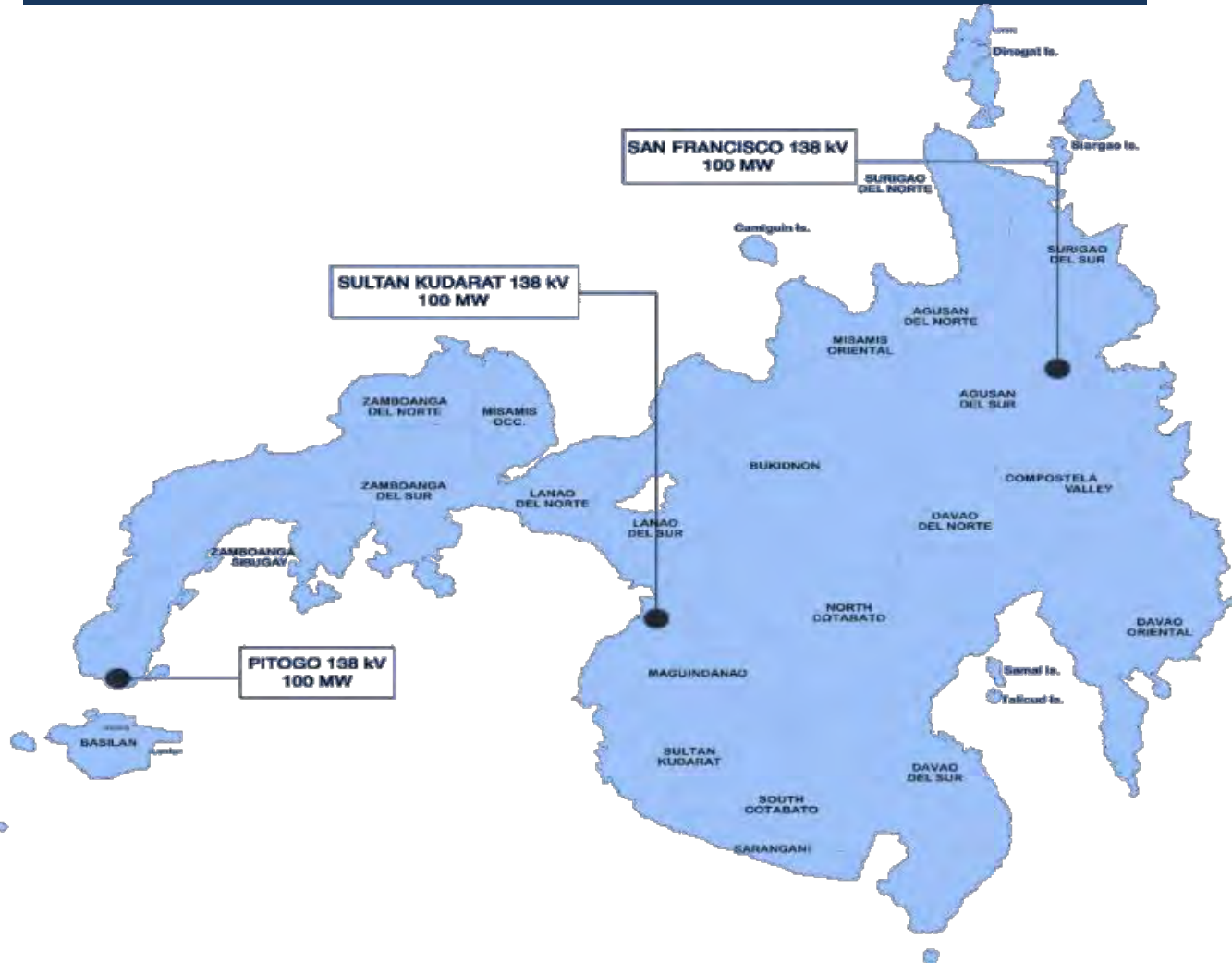
# Power

## Mindanao Demand and Supply Outlook, 2016-2040



# Power

## Ideal Location of New Power Plants in Mindanao



# ☐ 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
<b>Total</b>	<b>9,874 MW</b>	



# 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



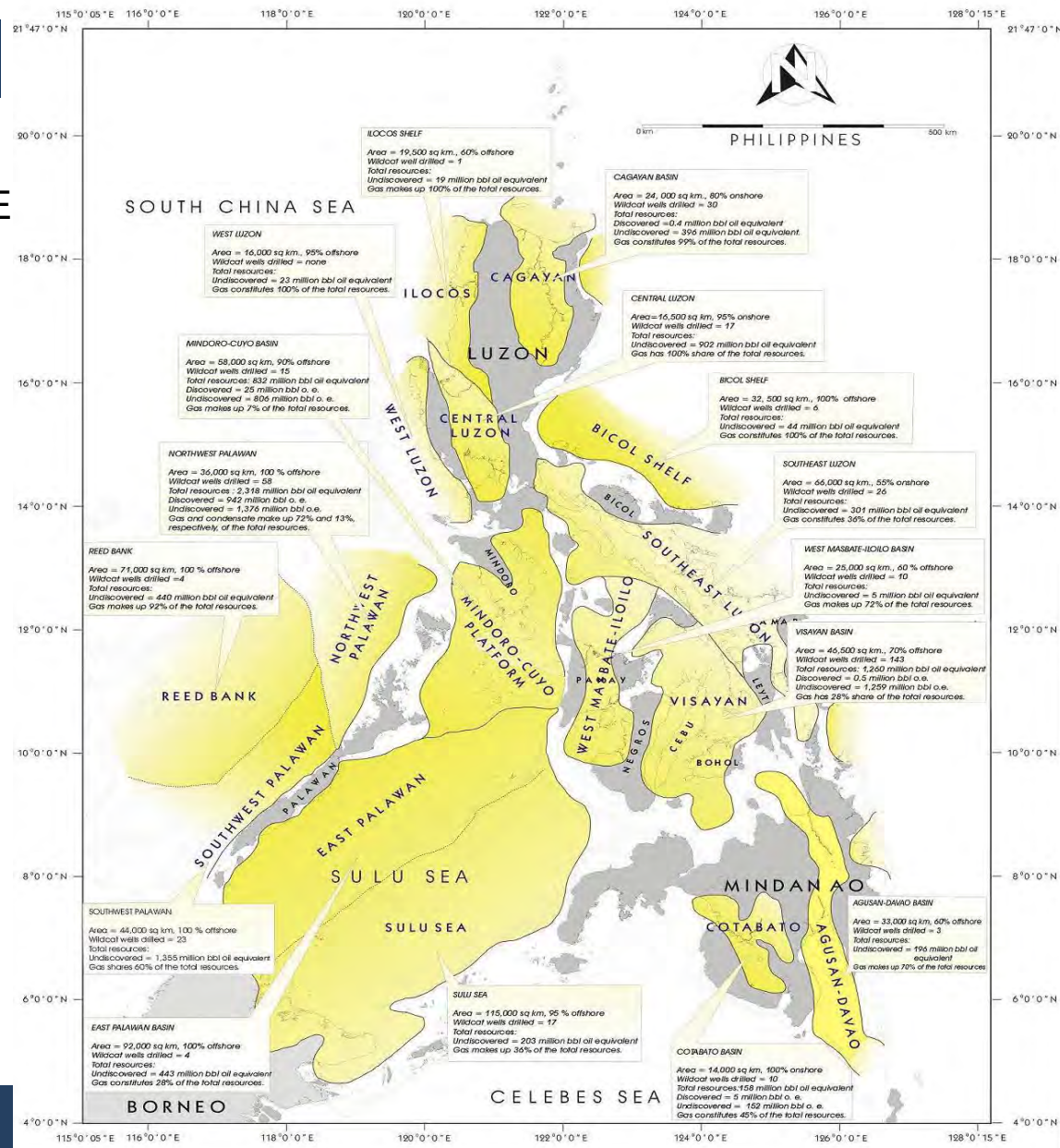
# Upstream Oil & Gas

## 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

## Sedimentary Basin in Mindanao

### Sulu Sea Basin

Area: 115,000 Sq. Km. 95% Offshore

Wildcat Wells Drilled: 17

Total Resources:

Undiscovered: 203 million BBL oil equivalent

Gas composed of 36% of the total resources

### Cotabato Basin

Area: 14,000 Sq. Kms. 100% Onshore

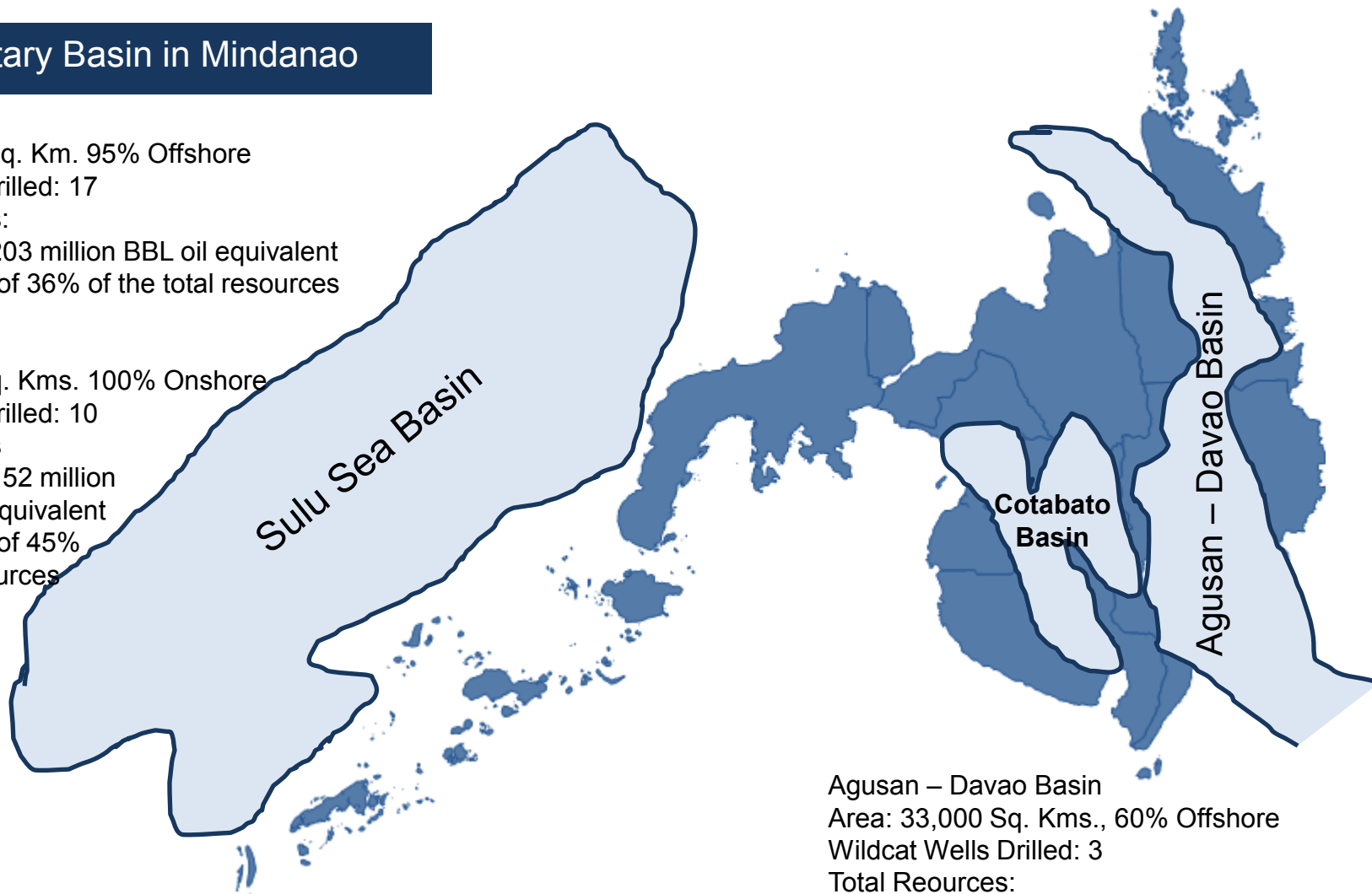
Wildcat Wells Drilled: 10

Total Resources

Undiscovered: 152 million

BBL oil equivalent

Gas composed of 45%  
of the total resources



### Agusan – Davao Basin

Area: 33,000 Sq. Kms., 60% Offshore

Wildcat Wells Drilled: 3

Total Resources:

Undiscovered: 196 million BBL oil equivalent

Gas makes up 70% of total resources



# Upstream Oil & Gas

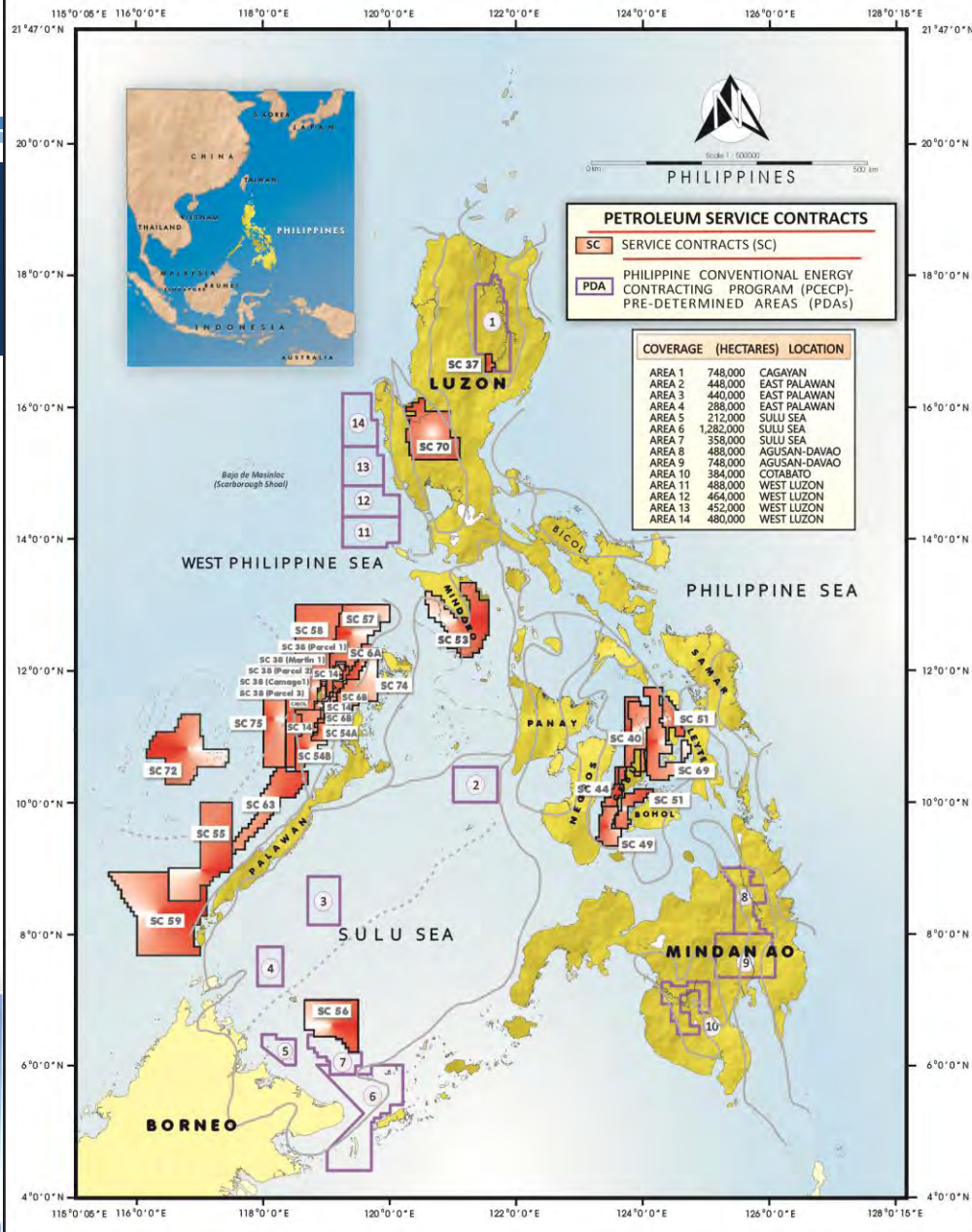
## Petroleum Service Contracts Exploration & Development

### 22 Petroleum Service Contracts (PSCs) As of June 2018

- 7 PSCs in the Production Stage
- 15 PSCs in the Exploration Stage

### Petroleum Service Contract (PSCs) in the Mindanao Region

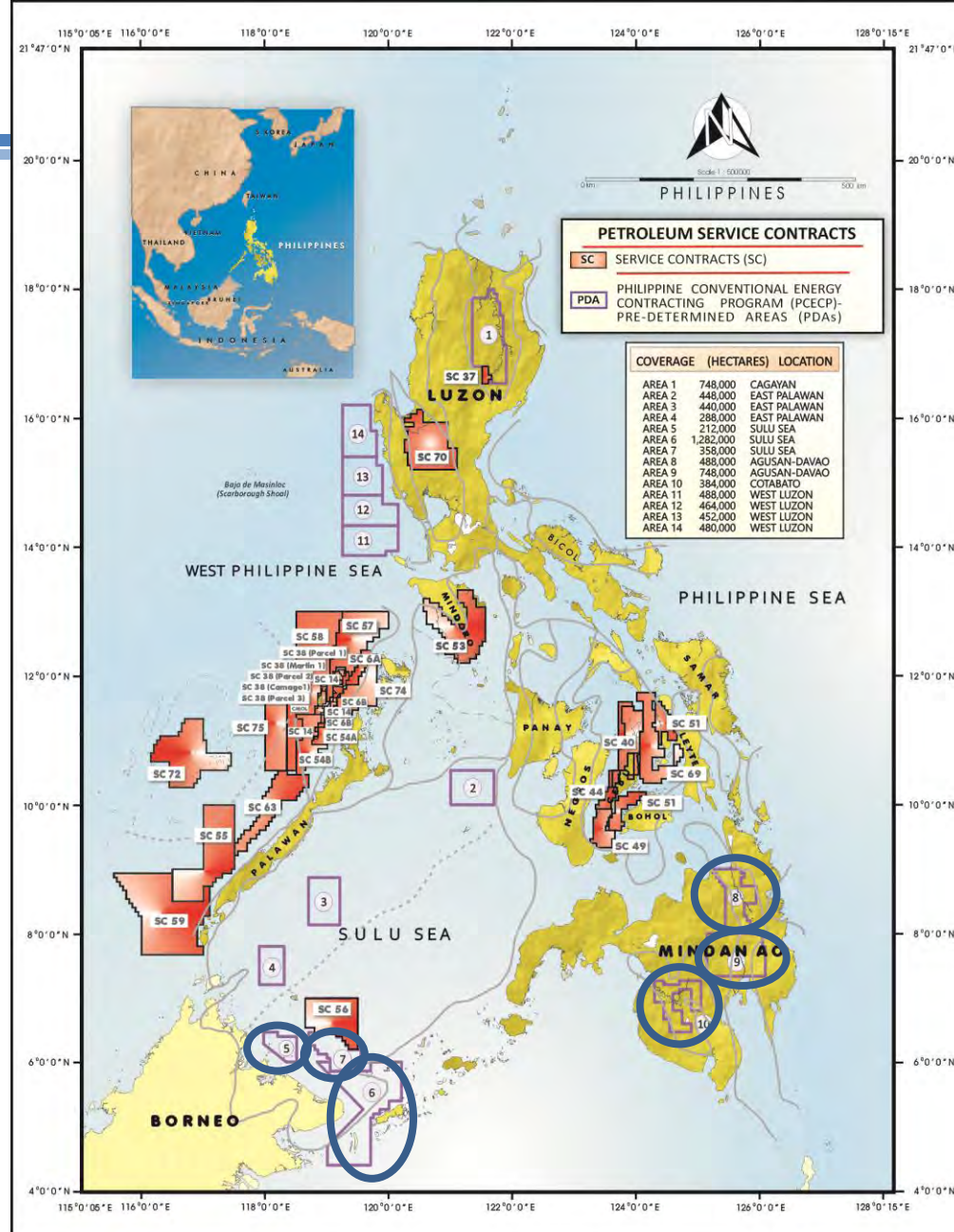
- 1 PSCs in the Exploration Stage located in Sulu Sea



# 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)

<b>QUEZON</b>
Resource Potential - 2.00
In-situ Reserves - 0.09

<b>MINDORO</b>
Resource Potential - 100.00
In-situ Reserves - 1.44

<b>SEMIRARA</b>
Resource Potential - 550.00
In-situ Reserves - 96.19

<b>NEGROS</b>
Resource Potential - 4.50
In-situ Reserves - 2.01

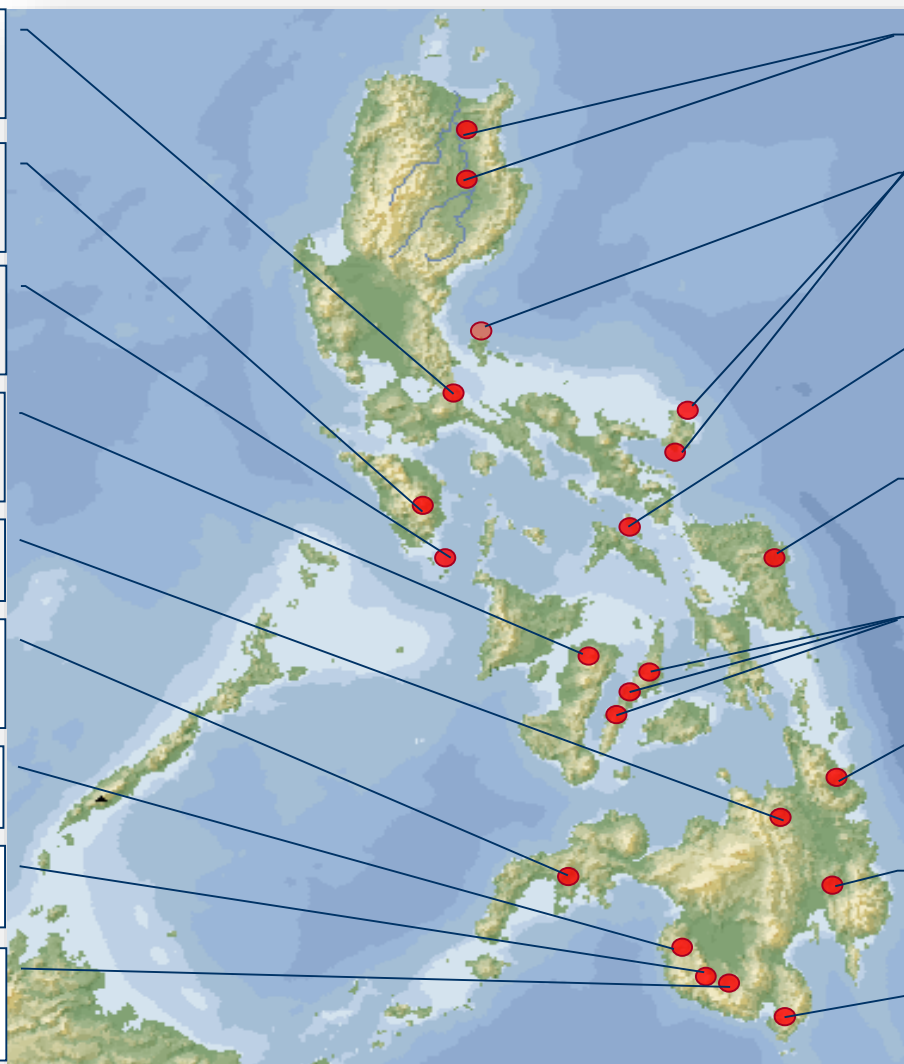
<b>BUKIDNON</b>
Resource Potential - 50.00

<b>ZAMBOANGA</b>
Resource Potential - 45.00
In-situ Reserves - 38.05

<b>MAGUINDANAO</b>
Resource Potential - 108.00

<b>SULTAN KUDARAT</b>
Resource Potential - 300.30

<b>SOUTH COTABATO</b>
Resource Potential - 230.40
In-situ Reserves - 81.07



<b>CAGAYAN VALLEY</b>
Resource Potential - 336.00
In-situ Reserves - 82.57

<b>BATAN-POLILLO-CATANDUANES</b>
Resource Potential - 17.00
In-situ Reserves - 6.77

<b>MASBATE</b>
Resource Potential - 2.50
In-situ Reserves - 0.07

<b>SAMAR</b>
Resource Potential - 27.00
In-situ Reserves - 8.59

<b>CEBU</b>
Resource Potential - 165.00
In-situ Reserves - 11.84

<b>SURIGAO</b>
Resource Potential - 209.00
In-situ Reserves - 69.73

<b>DAVAO</b>
Resource Potential - 100.00
In-situ Reserves - 2.37

<b>SARANGANI</b>
Resource Potential - 120.00



# Upstream Coal

## Areas for Investments in Coal

- Setting up of coal preparation plants
- Expansion of production of volumes of higher rank Philippine Coals
- Putting up of coal-fired power plants using Clean Coal Technologies
- Putting up of mine-mouth power plants
- Exploration of the Philippine Coal Basins and development of local coals

### Coal Basins in Mindanao:

#### Zamboanga

Resource Potential: 45 million MT

In-situ Reserves: 38.05 million MT

#### Maguindanao

Resource Potential: 108 million MT

#### Sultan Kudarat

Resource Potential: 300.30 million MT

#### South Cotabato

Resource Potential: 230.40 million MT

In-Situ Reserves: 81.07 million MT

#### Surigao

Resource Potential: 209 million MT

In-Situ Reserves: 69.73 million MT

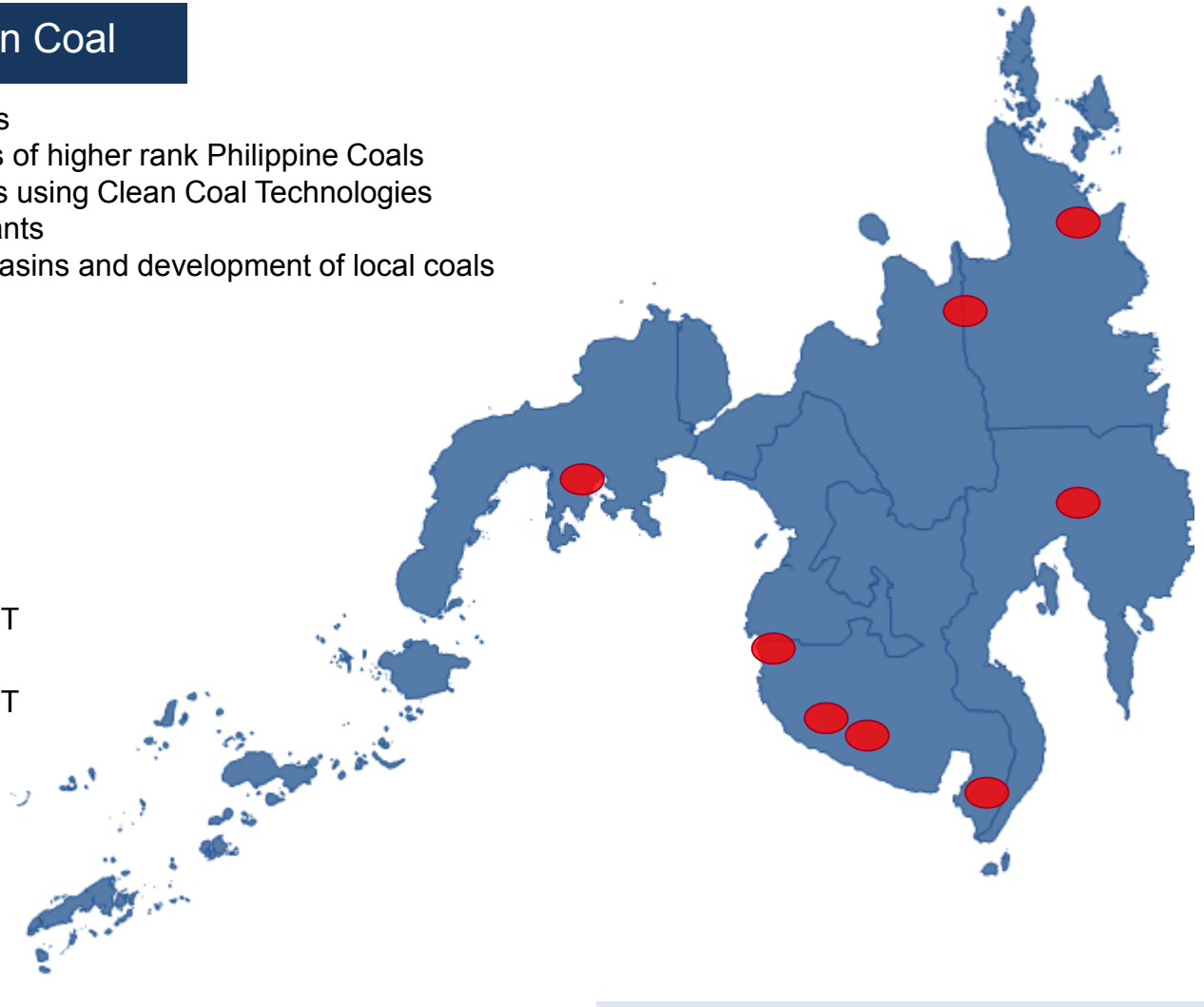
#### Davao

Resource Potential: 100 million MT

In-Situ Reserves: 2.37 million MT

#### Saranggani

Resource Potential: 120 million MT



**Total Resource Potential: 1,112.7 MMT**  
**Total In-Situ Reserves: 191.22 MMT**



# Upstream Coal

## Coal Operating Contracts Exploration & Development

### 73 Active Coal Operating Contracts (COCs) As of June 2018

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

### 41 Active Coal Operating Contracts (COCs) in the Mindanao Region

- 29 COCs in the Exploration Stage
- 12 COCs in the Development and Production Stage



# □ Downstream Oil

## List of Storage Facilities

Region	Province	City/ Municipality	No. of Depots	No. of Import Terminals	Total Storage Capacity (MB)
IX	Zamboanga del Norte	Dipolog City	1	0	13.80
IX	Zamboanga del Sur	Aurora	1	0	0.68
IX	Zamboanga del Sur	Zamboanga City	2	1	226.98
<b>Total Region 9</b>			<b>4</b>	<b>1</b>	<b>241.47</b>
X	Lanao del Norte	Iligan City	2	1	177.58
X	Misamis Oriental	Cagayan de Oro	2	1	666.15
X	Misamis Oriental	Villanueva	0	1	258.89
X	Misamis Oriental	Balingasag	0	1	13.68
X	Misamis Oriental	Tagoloan	3	1	495.81
X	Misamis Occidental	Jimenez	2	0	104.25
<b>Total Region 10</b>			<b>9</b>	<b>5</b>	<b>1,716.37</b>
XI	Davao del Sur	Davao City	1	6	813.17
XI	Davao del Sur	Sta. Cruz	1	0	240.84
<b>Total Region 11</b>			<b>2</b>	<b>6</b>	<b>1,054.01</b>
XII	South Cotabato	General Santos	3	0	132.05
XII	South Cotabato	Polomolok	1	0	0.68
<b>Total Region 12</b>			<b>4</b>	<b>0</b>	<b>132.73</b>
XIII	Agusan del Norte	Butuan City	1	0	0.68
XIII	Agusan del Norte	Cabadbaran City	1	0	51.39
XIII	Agusan del Norte	Nasipit	1	0	40.40
<b>Total Region 13</b>			<b>3</b>	<b>0</b>	<b>92.48</b>
ARMM	Tawi-tawi	Bongao	1	0	2.00
ARMM	Basilan	Isabela City	1	0	24.85
ARMM	Maguindanao	Parang	1	0	503.10
<b>Total ARMM</b>			<b>3</b>	<b>0</b>	<b>529.95</b>
<b>Total Mindanao</b>			<b>25</b>	<b>12</b>	<b>3,767.00</b>



# ❑ 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 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)



# Thank you!

For inquiries, please contact

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