



Linking Power-Related DEVELOPMENT PLANS

IRMA C. EXCONDE
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Energy Consumers and Stakeholders' Conference

E-Power Mo!

12 July 2017

Philippine International Convention Center (PICC)



Presentation Outline

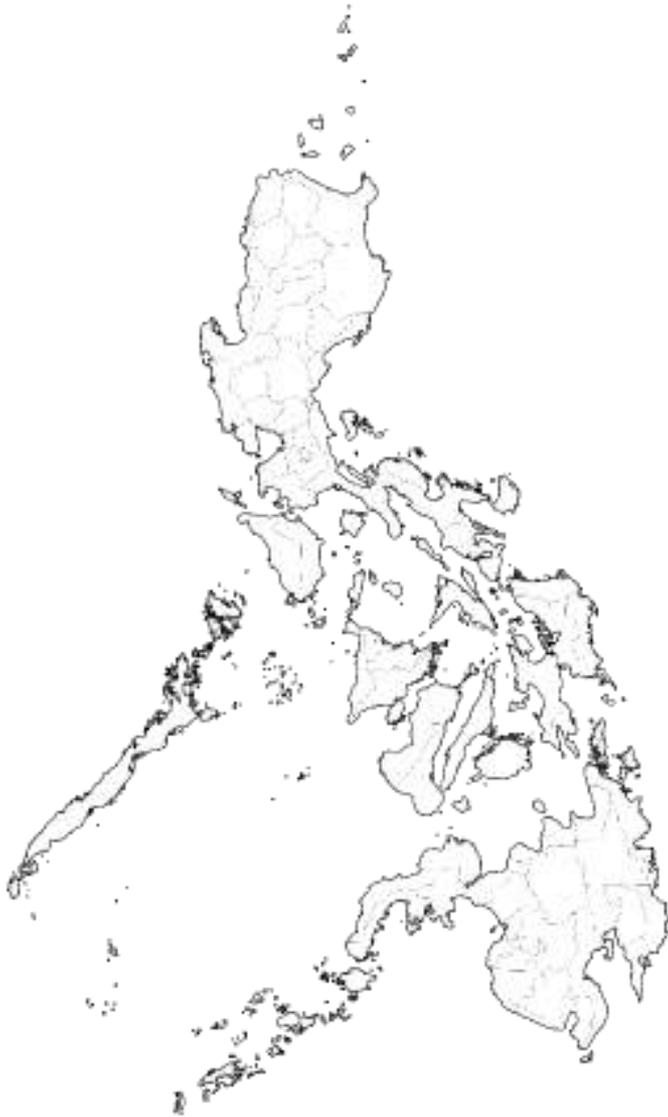
I. Overview of the Philippine Power System

II. Development Plans

- A. Distribution Development Plan (**DDP**)
- B. Transmission Development Plan (**TDP**)
- C. Missionary Electrification Development Plan (**MEDP**)
- D. Household Electrification Development Plan (**HEDP**)
- E. Power Development Plan (**PDP**)



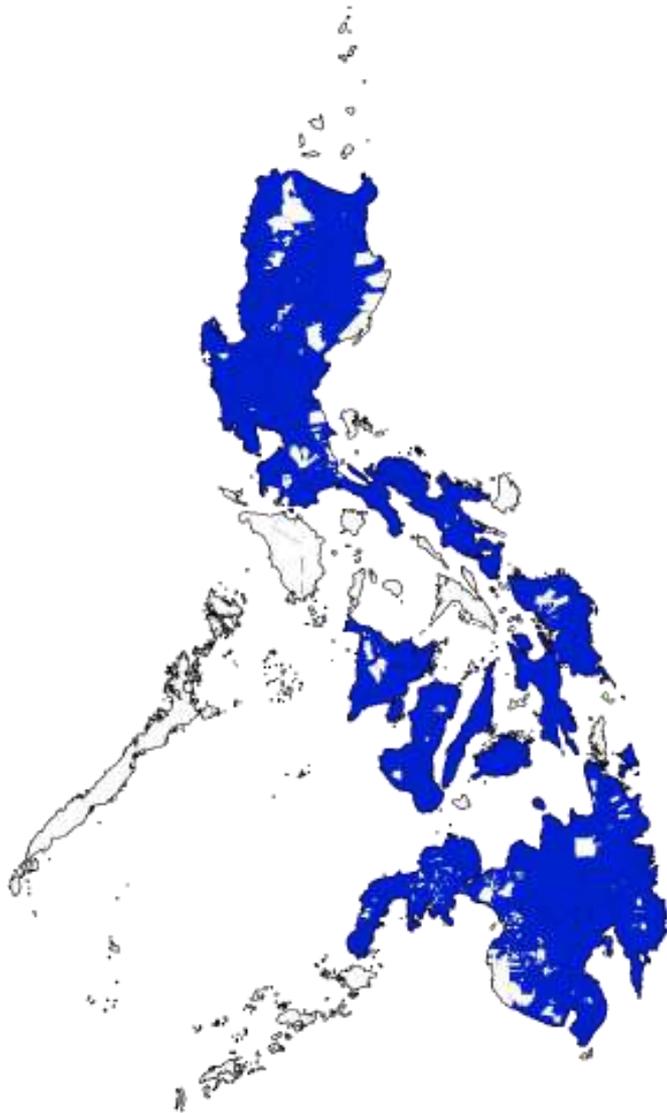
Philippine Power System



Power System



Philippine Power System



Power System

Grid

- **Luzon, Visayas** and **Mindanao** grids
- Connected to main transmission backbone



Interconnection Line Capacity

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



Philippine Power System



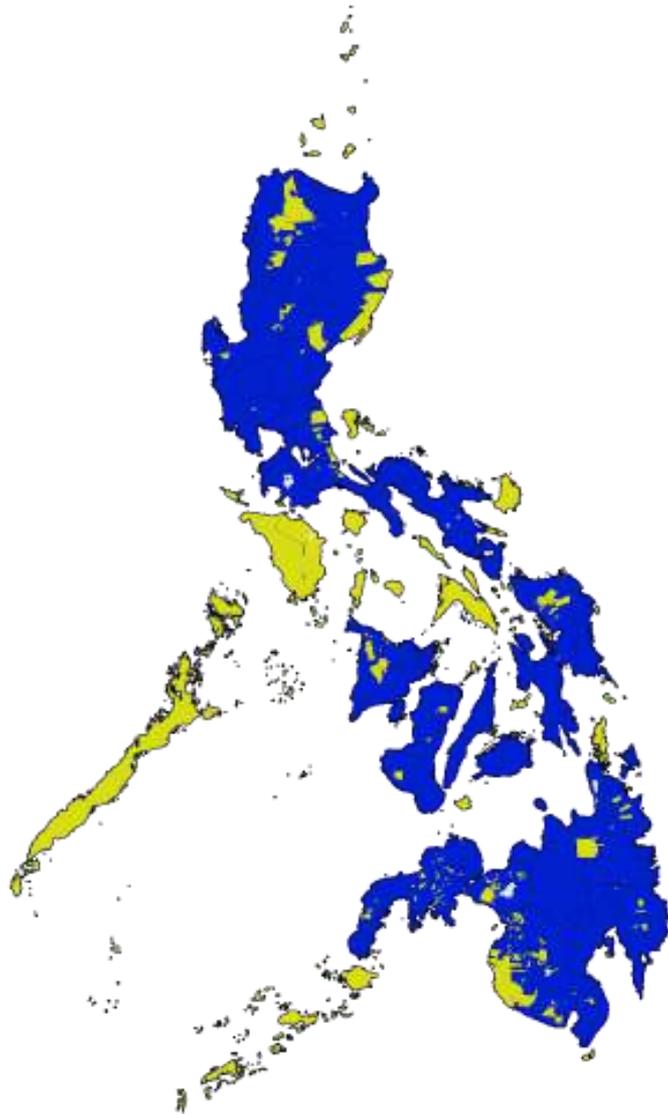
Power System

Off-Grid

- Missionary areas
- Also known as Small Islands and Isolated Grid (SIIG)
- Power supplied by NPC SPUG and Private Sector (New Private Provider and Qualified Third Party)



Philippine Power System



Power System

Grid

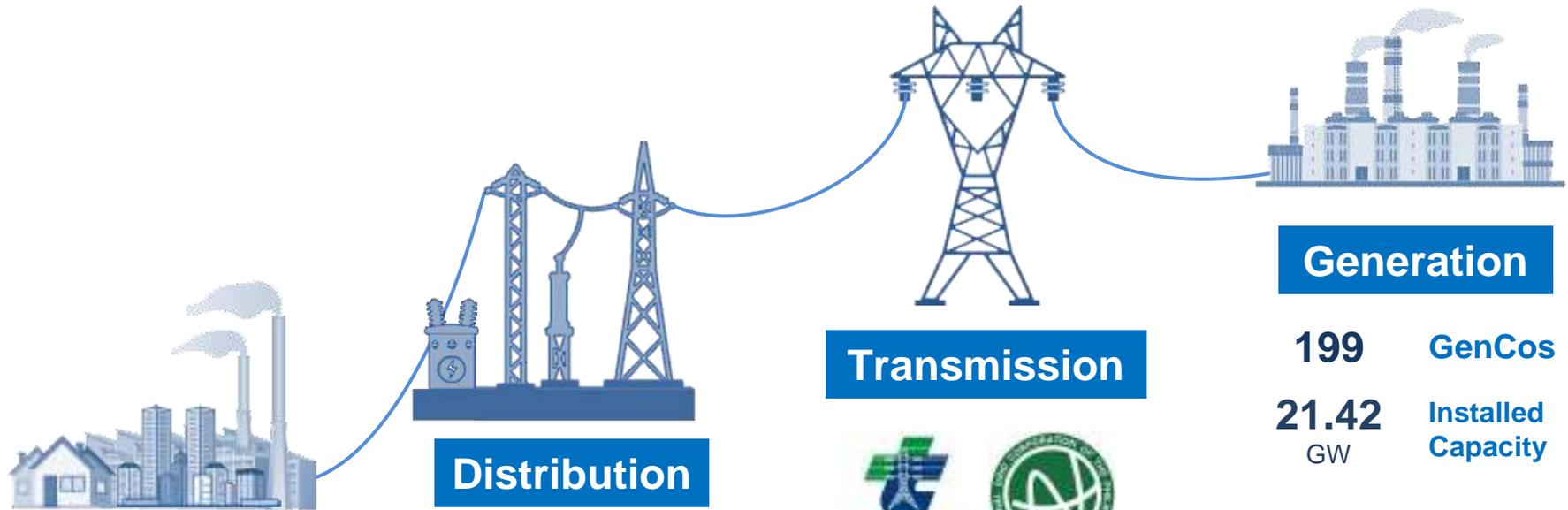
- Luzon, Visayas and Mindanao grids
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Off-Grid

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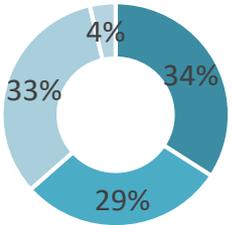


Grid Power System



Load

74,154 GWh



2016 Electricity Sales

- Residential
- Commercial
- Industrial
- Others

Distribution

- 23 **PIOU**s
- 100 **EC**s
- 2 **LGUOU**s

Transmission

31,501 MVA

20,053 ckt-km

Generation

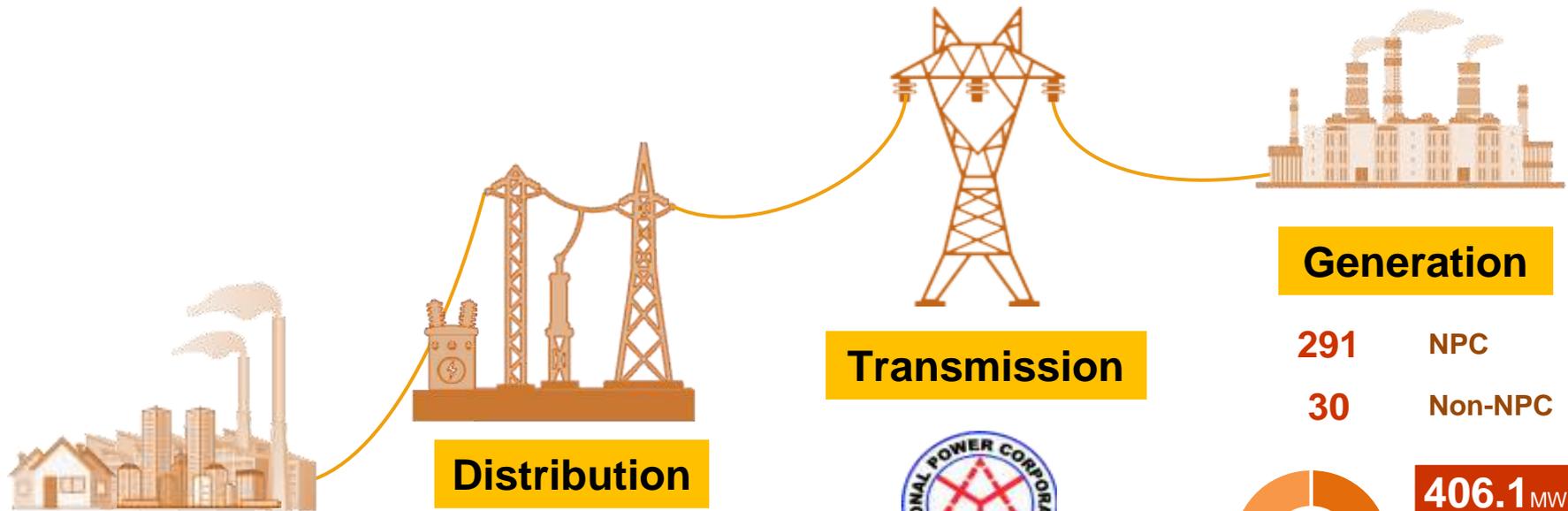
- 199 **GenCos**
- 21.42 **GW** Installed Capacity
- 90,798 **GWh** Gross Generation
- 48% **Coal**
- 22% **Nat Gas**
- 24% **RE**
- 6% **Oil-based**

Peak Demand: 13.272 GW

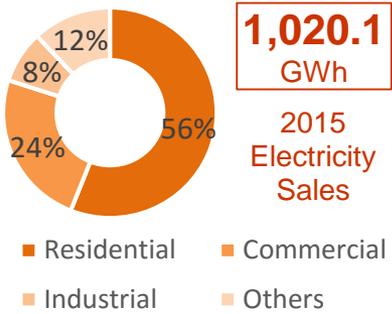
- PIOU**s - Private-Investor Owned Utilities
- EC**s - Electric Cooperatives
- LGUOU**s - LGU-Owned Utilities

Sources of Data: DOE; NGCP

Off-Grid Power System



Load



64.3%*
Energized

Distribution

- 21** ECs
- 2** MPCs
- 3** LGUOUS
- 1** QTP

ECs - Electric Cooperatives
 MPCs - Multi-Purpose Cooperatives
 LGUOUS - LGU-Owned Utilities
 QTP - Qualified Third Parties

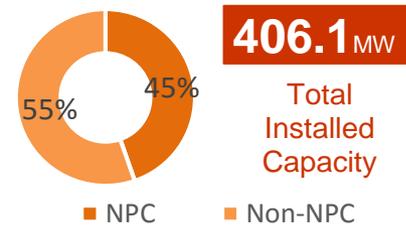
Transmission



170 MVA
770 ckt-km

Generation

291 NPC
30 Non-NPC



1,075 GWh Gross Generation

96% Diesel
4% Hydro

Source of Data: DOE; NPC

DOE's Mandate

EPIRA, Sec. 37(c):



Prepare and update annually a **Power Development Program (PDP)** and integrate the same into the Philippine Energy Plan. The PDP shall consider and **integrate** the individual or joint **development plans** of the **transmission, generation**, and **distribution** sectors of the electric power industry, which are submitted to the Department



Philippine Power Sector Roadmap Towards



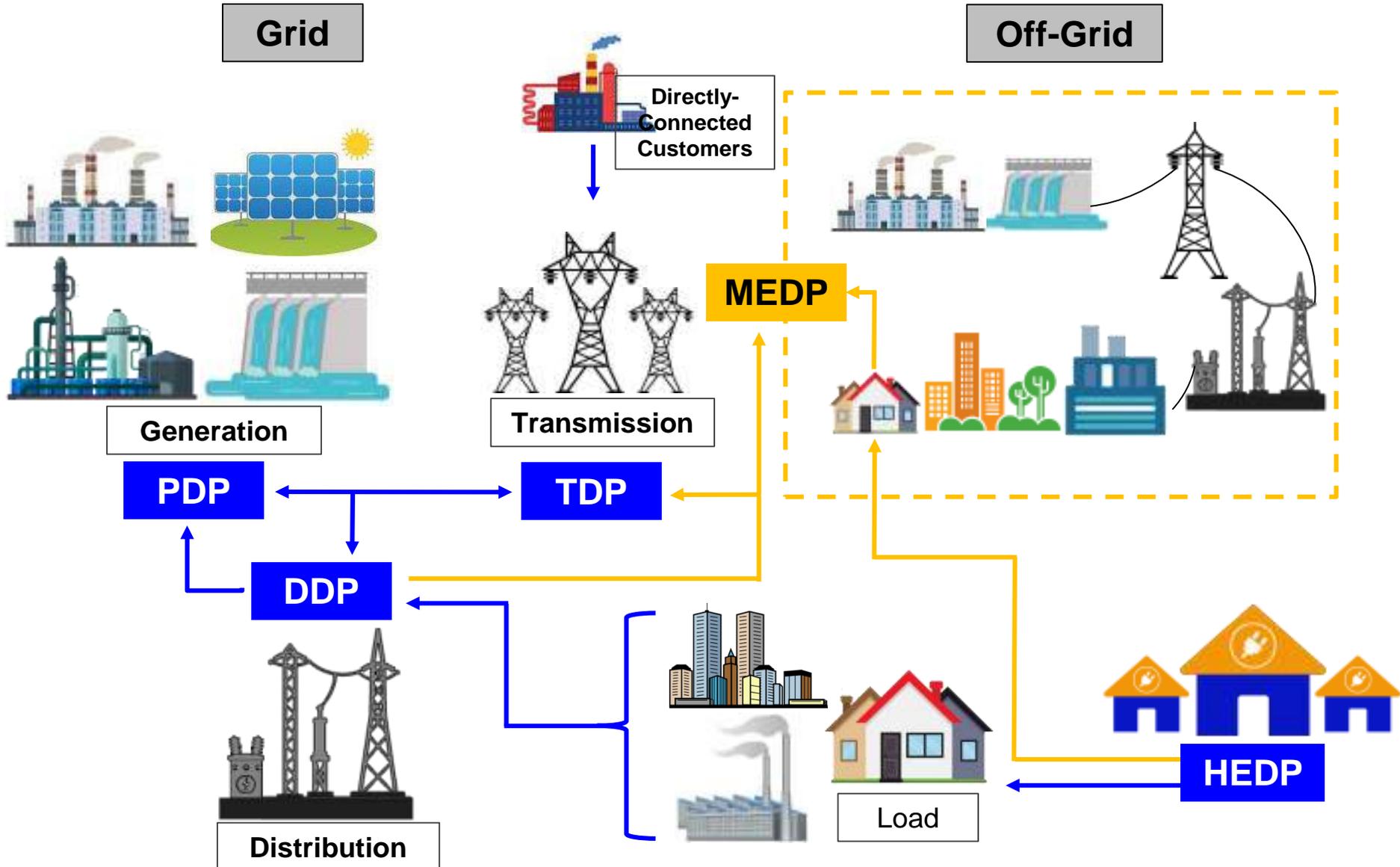
**Quality, Reliable,
Affordable and Secured
Supply**

**Transparent and Fair
Playing Field in the
Power Industry**

**Electricity
Access for All
Filipinos**



Power-Related Development Plans Linked



Key Elements of the DDP



Demand

- Number of Customers
- Demand (MW) and Energy (MWh)
- Accounting of unserved energy



Supply

- Power Supply Sources
- Uncontracted supply requirement for CSP



Household Electrification

Barangay Sitio Electrification Program (BSEP)
Household Electrification Development Plan (HEDP)



Capital Expenditure (CAPEX) Program

- Infrastructure Projects
- Investment Requirements



Policy Integration in the DDP



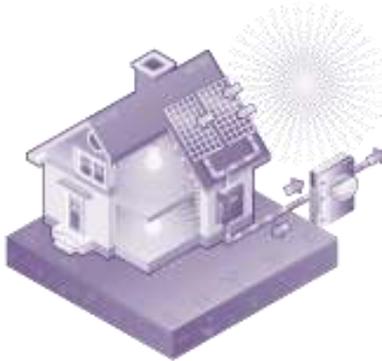
Competitive Selection Process (CSP)



Retail Competition and Open Access (RCOA)



Renewable Portfolio Standard (RPS)



Net Metering



WESM



Resilient infrastructures



Conduct of DDP Deliberations



Major Issues identified during the DDP Deliberations

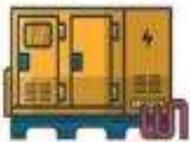
ISSUES

ACTIONS/UPDATES

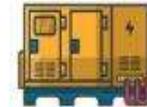
CAPITAL EXPENDITURES



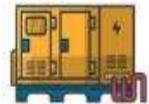
On-going coordination among DOE, NEA and ERC



Mindanao Modular Genset Program



Proposed
Amendment of
Executive Order
to include Luzon
And Visayas



Major Issues identified during the DDP Deliberations

ISSUES



Relocation
of Poles



ACTIONS/UPDATES

Signed DOE-DPWH Joint Circular
on July 10



Info on Entry of Large Loads



Coordination of DUs and LGUs



Major Issues identified during the DDP Deliberations

ISSUES

ACTIONS/STATUS

Distribution Line Rehabilitation for Calamity-Stricken Areas



Explore Sources of Funding Support



Island Interconnection

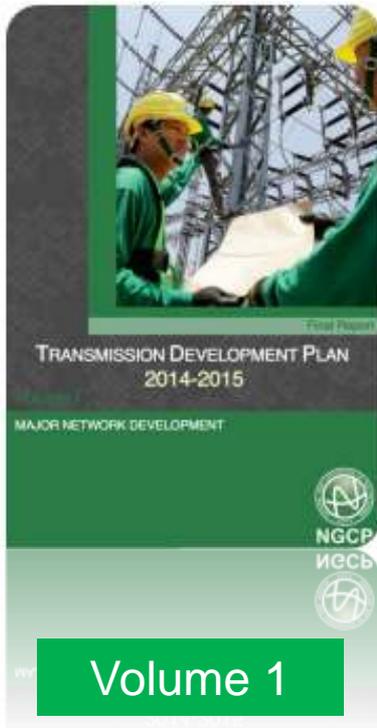


On-going studies

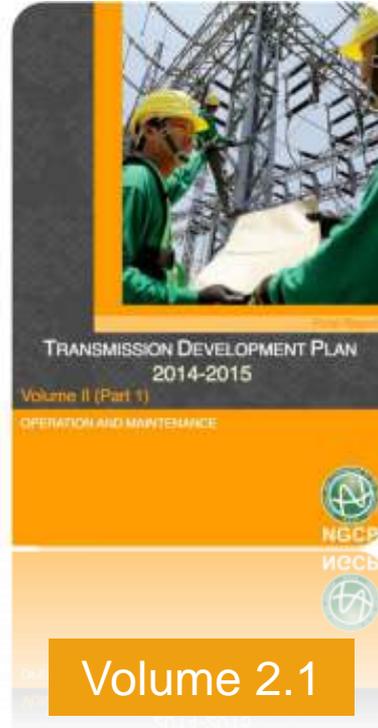


Transmission Development Plan

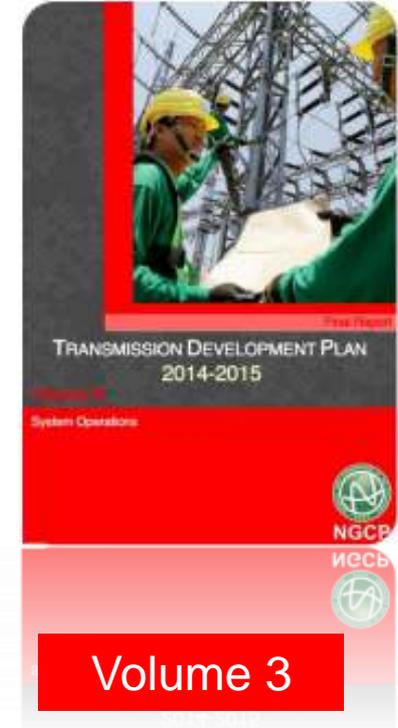
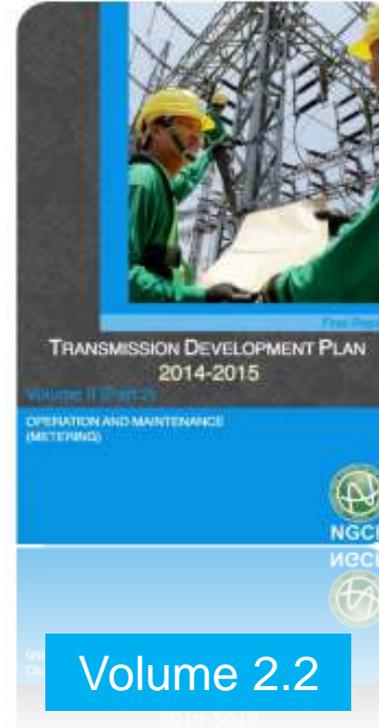
Major Contents



Major Network
Development



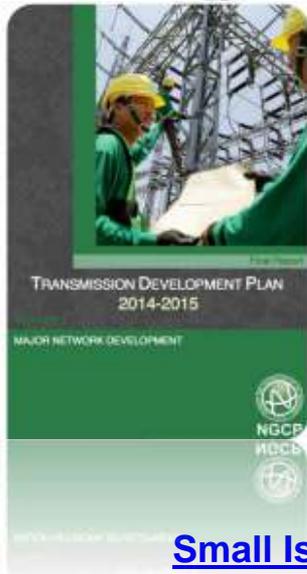
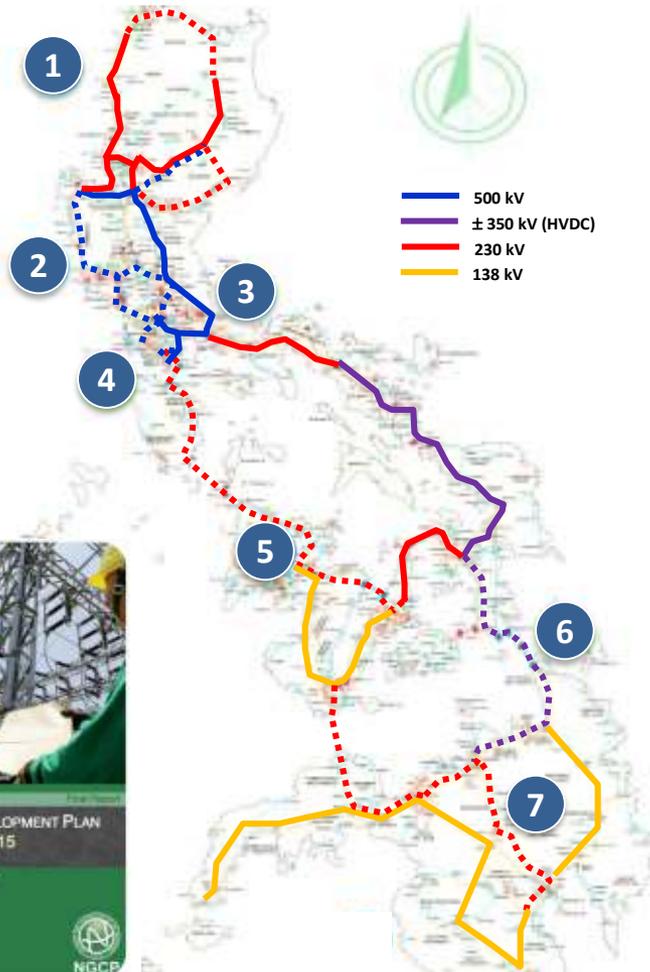
Operations and
Maintenance



System
Operations



Transmission Master Plan (Volume 1)



[Small Island Interconnection Projects](#)

- 1 [Northern Luzon 230 kV Backbone \(2023\)](#)
 - 2 [Western Luzon 500 kV Backbone \(2024\)](#)
 - 3 **Metro Manila 500 kV Backbone Loop**
 - 4 [Batangas-Mindoro Interconnection \(2021\)](#)
 - 5 [Cebu-Negros-Panay 230 kV Backbone \(2020\)](#)
 - 6 [Visayas-Mindanao Interconnection \(2020\)](#)
 - 7 [Energization of the Mindanao Backbone to 230 kV \(2018\)](#)
- [Ideal Location of Power Plants](#)
- [Identified Area for Bulk Load Growth](#)



Northern Luzon 500kV Backbone (2023)



Western Luzon 500kV Backbone (2024)

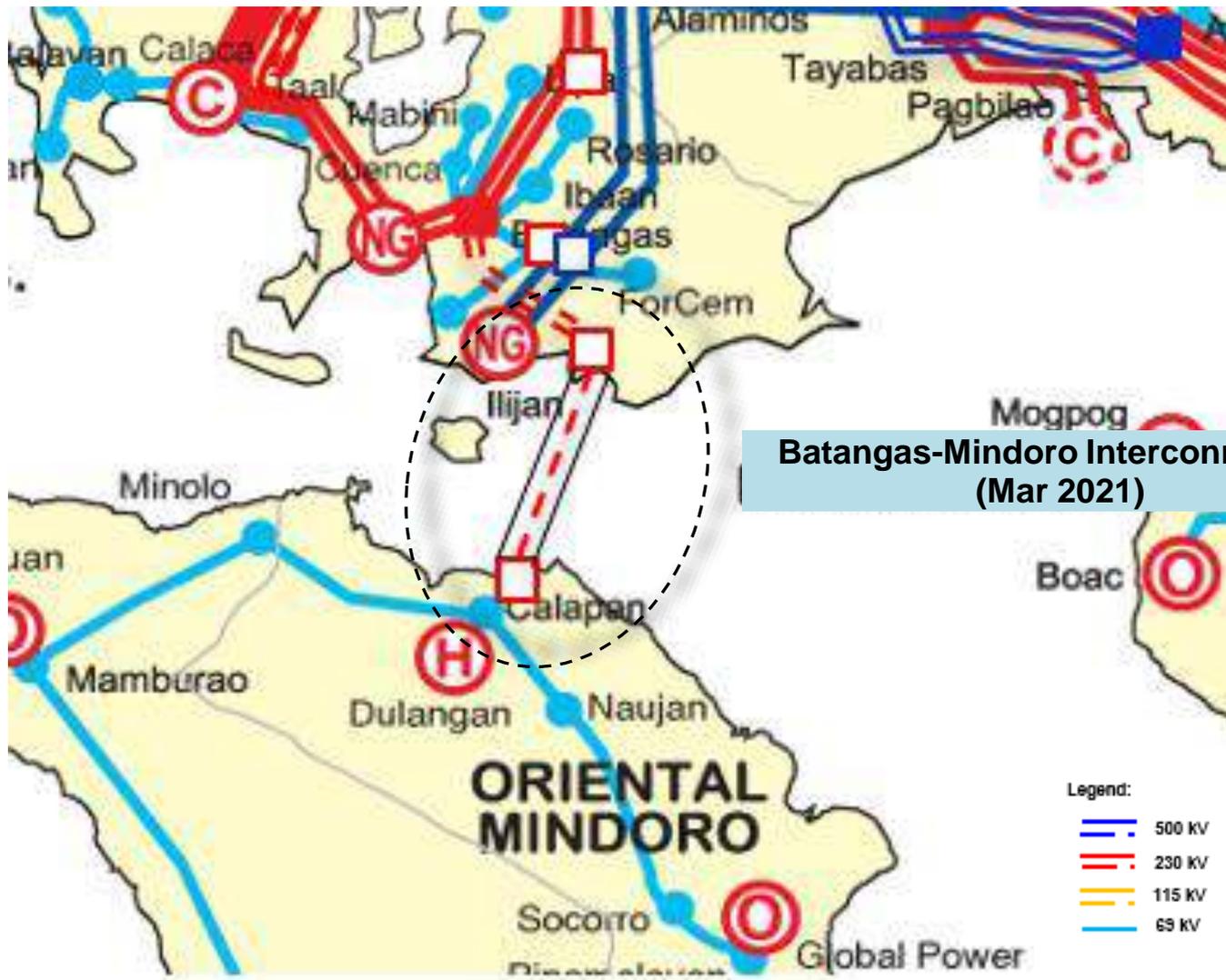
Western 500 kV Backbone – Stage 2
(Jun 2024)

Legend:

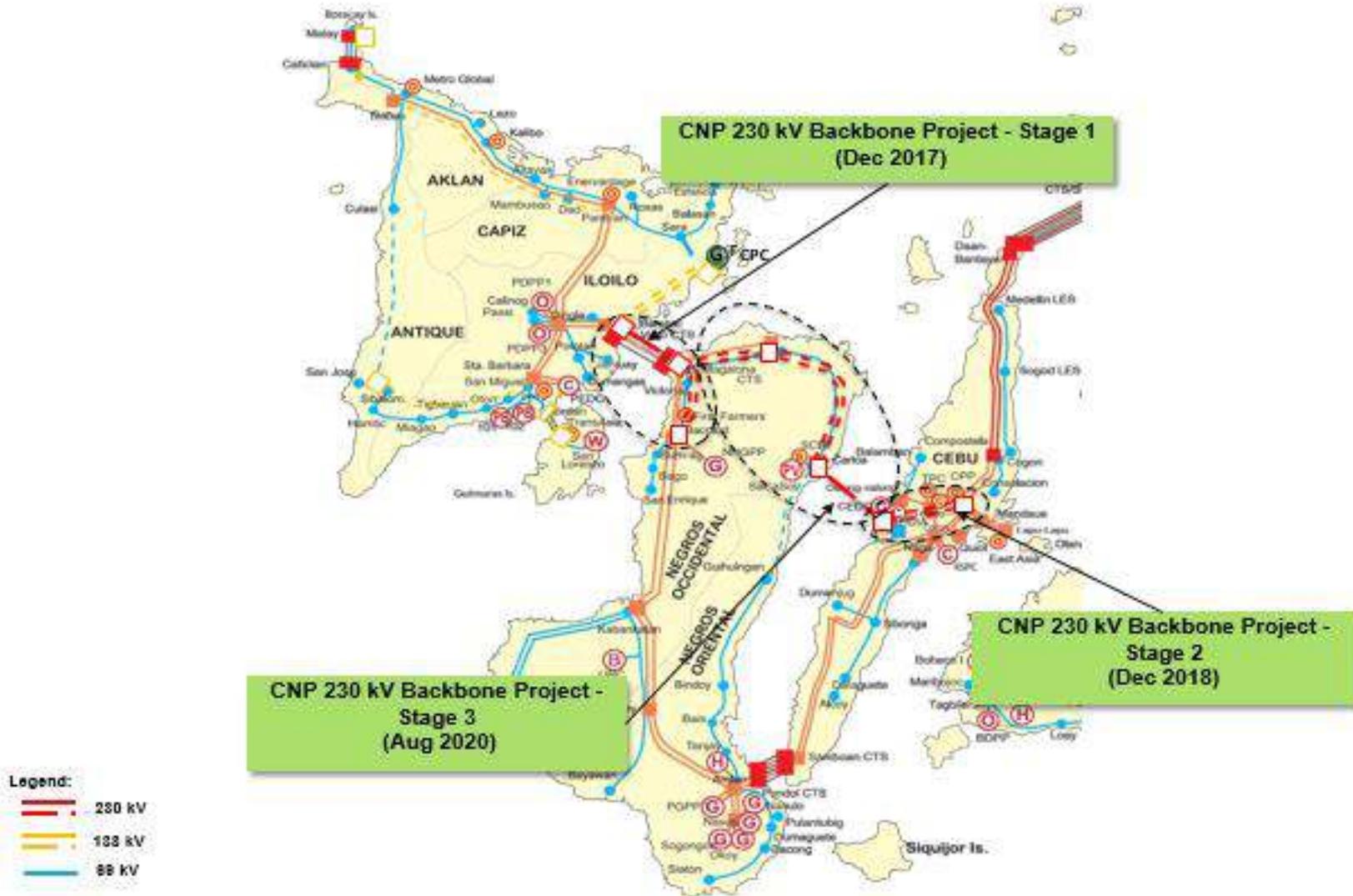
- 500 kV
- 230 kV
- 115 kV
- 69 kV



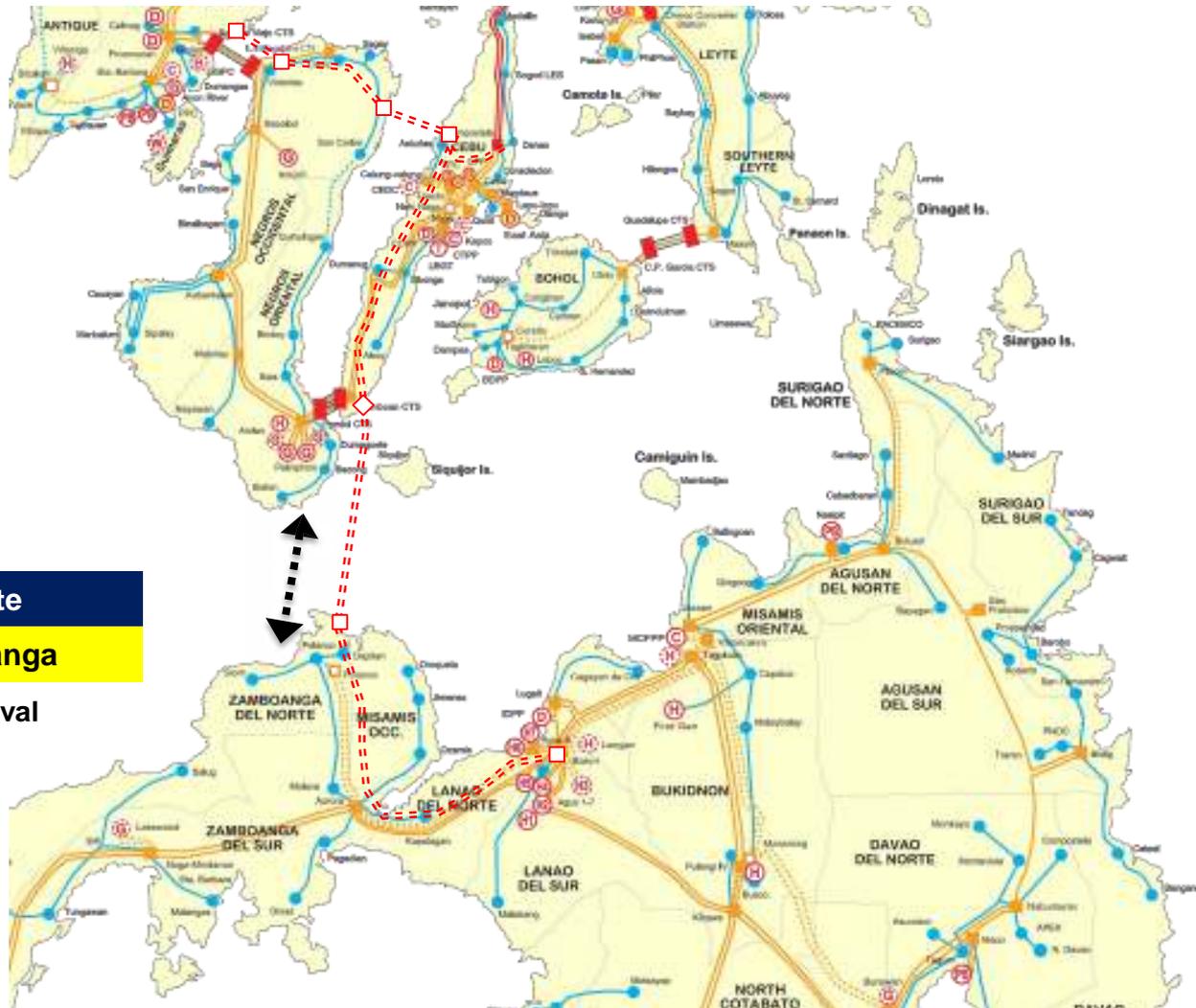
Batangas-Mindoro Interconnection (2021)



Cebu-Negros-Panay 230 kV Backbone (2020)



Visayas-Mindanao Interconnection Project (2020)



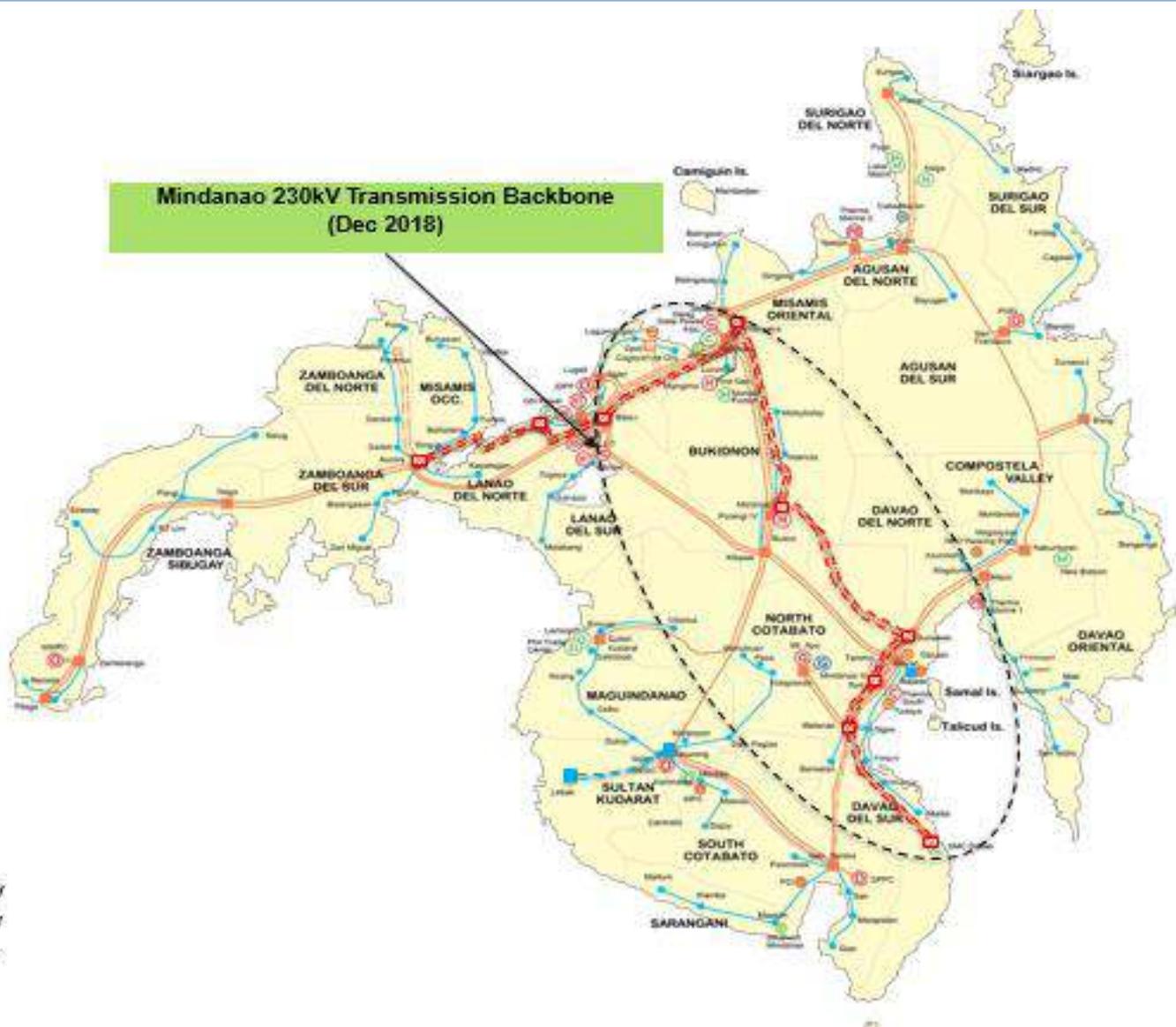
Western Route

Cebu-Zamboanga

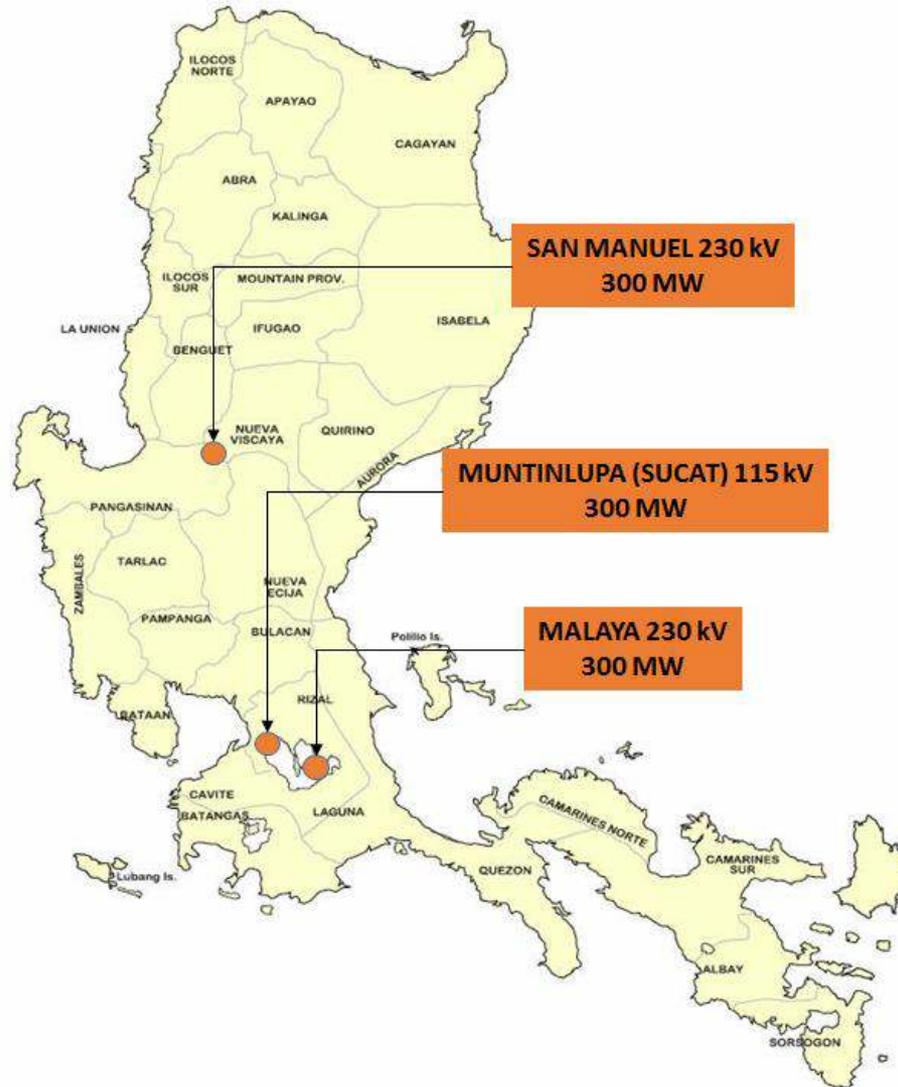
For ERC Approval



Energization of the Mindanao Backbone to 230kV (2018)



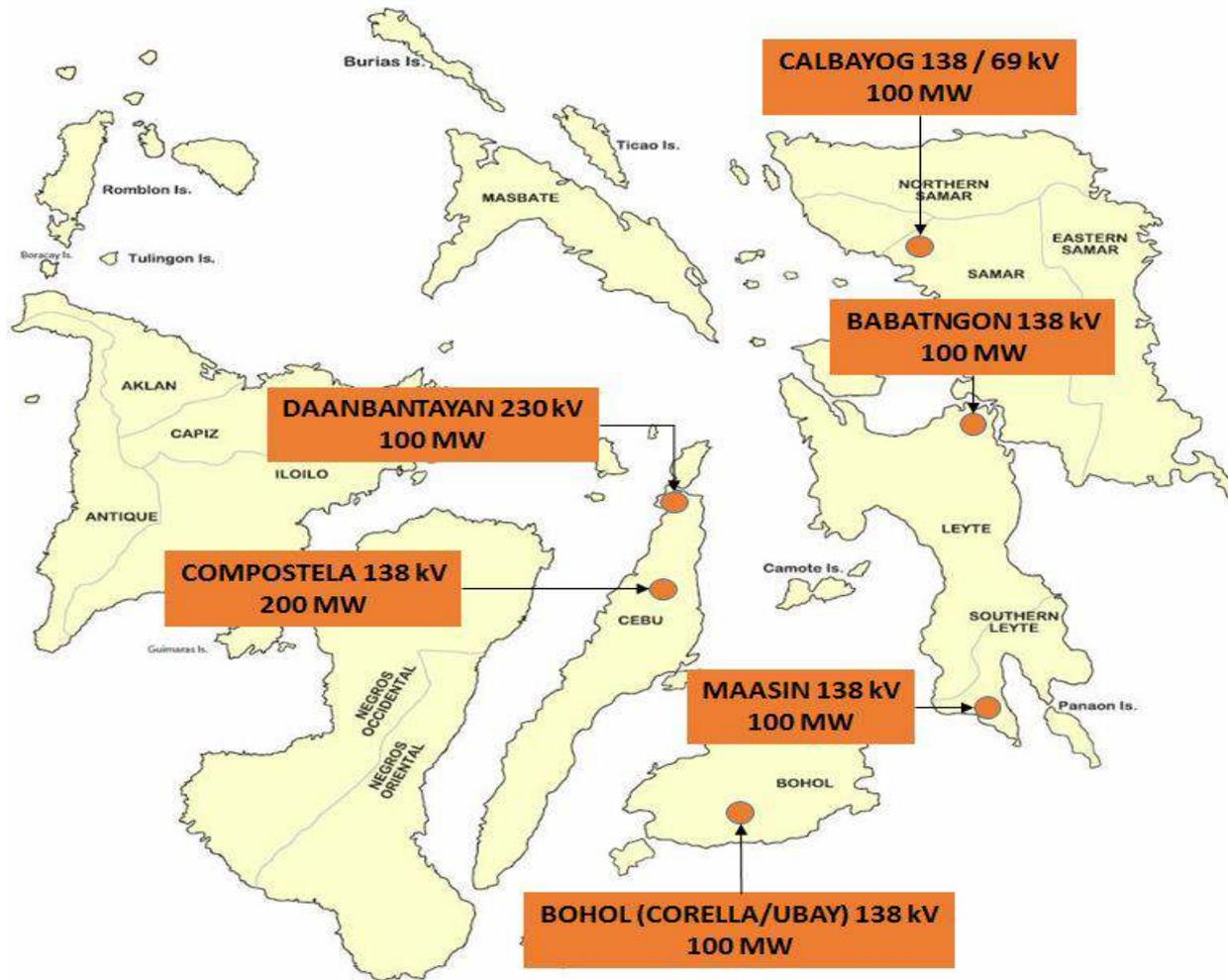
Ideal Location of Power Plants - Luzon



Note: Ideal Location of Power Plants without the need for any significant transmission reinforcement.



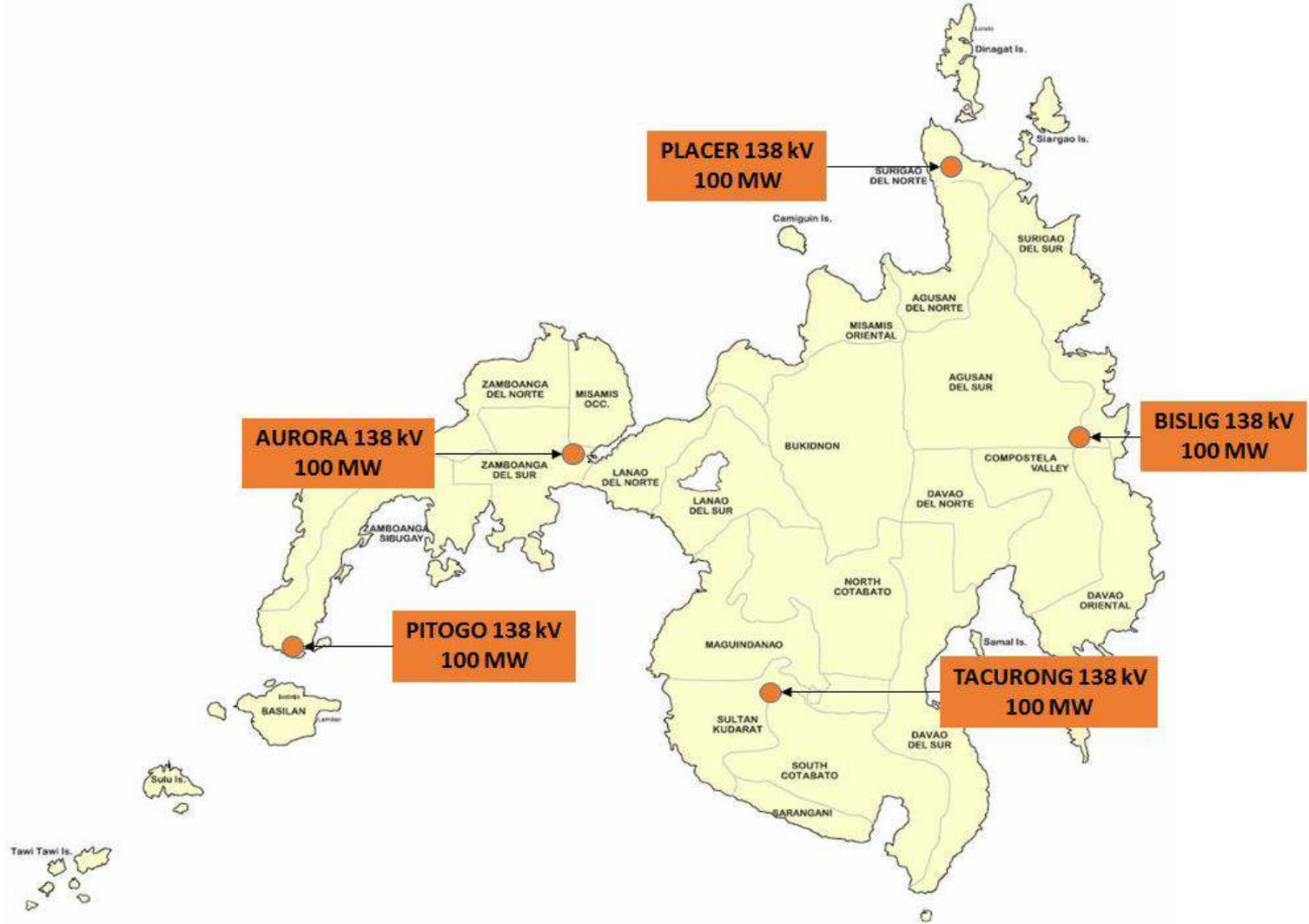
Ideal Location of Power Plants - Visayas



Note: Ideal Location of Power Plants without the need for any significant transmission reinforcement.



Ideal Location of Power Plants - Mindanao



Note: Ideal Location of Power Plants without the need for any significant transmission reinforcement.

Identified Sites for Bulk Load Growth

Grid	Areas where bulk load growth is recommended to absorb excess generation
Luzon	Ilocos Norte (250 MW), Ilocos Sur (30 MW), La Union (100 MW), Benguet (70 MW), Cagayan Valley (100 MW), Isabela (150 MW), Nueva Vizcaya (50 MW), Quirino (20 MW), Pangasinan (100 MW), Bataan (100 MW), Zambales (40 MW), SBMA (50 MW), Tarlac (100 MW), Nueva Ecija (50 MW), Batangas (150 MW), Laguna (200 MW), Quezon Province (250 MW) and Bicol Region (Camarines Norte to Sorsogon) (170 MW)
Visayas	Panay Island (130 MW), Negros Island (225 MW), Cebu Island (85 MW), Leyte (150 MW)
Mindanao	Zamboanga del Sur (170 MW), Zamboanga del Norte (25 MW), Lanao del Norte (8 MW), Misamis Oriental (60 MW), Bukidnon (8 MW), Surigao del Norte (60MW), Surigao del Sur (2 MW), Agusan del Sur (30 MW), Agusan del Norte (55 MW), Davao del Sur (20 MW), Compostela Valley (50 MW), Cotabato (40 MW), South Cotabato (65 MW), Sultan Kudarat (75 MW)



Small Island Interconnection Projects

Potential Small Island Interconnections:

Island	Interconnection Point (Town)	Length (kms)		2015 Peak Demand (MW)	2040 Peak Demand (MW)
		Submarine	Overhead		
LUZON					
Palawan	San Jose	252	173	43.7	261.42
Masbate	San Jacinto	16	16	15.51	37.04
Catanduanes	Presentacion	32	17	9.13	33.74
Tablas	San Jose	61	36	6.14	26.96
Marinduque	General Luna	23	11	8.57	23.71
Busuanga	San Jose	84	52	3.93	16.96
Ticao	Abuyog	20	35	1.71	2.58
Lubang	Calaca	54	20	0.73	1.54



Small Island Interconnection Projects

Potential Small Island Interconnections:

Island	Interconnection Point (Town)	Length (kms)		2015 Peak Demand (MW)	2040 Peak Demand (MW)
		Submarine	Overhead		
VISAYAS					
Siquijor	Bacong	20	24	4.56	16.58
Bantayan	Medellin	21	24	4.5	12.56
Camotes	Isabel	18	8	3	11.83
Semirara	San Jose	33	0		
Siasi	Parang	43	32	0.66	1.84



Small Island Interconnection Projects

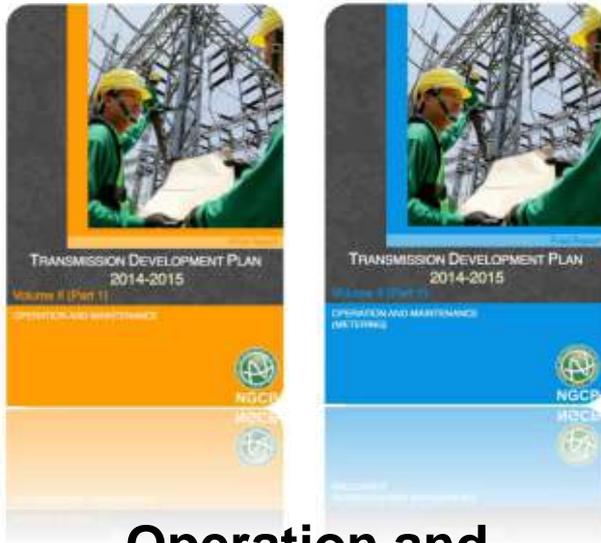
Potential Small Island Interconnections:

Island	Interconnection Point (Town)	Length (kms)		2015 Peak Demand (MW)	2040 Peak Demand (MW)
		Submarine	Overhead		
Mindanao					
Tawi-Tawi	Pagatpat	84	60	4.92	31.93
Basilan	Pitogo	27	12	8.3	29.04
Sulu	Taberlongan	100	34	7.87	20.11
Samal	Lasang	9	21	5.96	14.81
Dinagat	Canlanipa	30	15	3.06	13.22
Siargao	Cagdiano	13	7	4.29	11.28
Camiguin	Esperanza	30	37	4.02	8.95
Siasi	Parang	43	32	0.66	1.84



Transmission Development Plan (Volume 2)

Major Contents



Operation and Maintenance

- 1 Installation, Replacement, Rehabilitation of High Voltage Equipment's
- 2 Installation, Replacement & Acquisition of Spares for Protection & Secondary Device
- 3 Rehabilitation and Acquisition of Spares for transmission lines
- 4 Replacement and Acquisition of Test & Measuring Equipment, Tools and Service Vehicles
- 5 Construction and Rehabilitation of Substation and Support Facilities
- 6 Programmed Acquisition, Replacement, and Upgrading of Metering Assets



Transmission Development Plan (Volume 3)

Major Contents



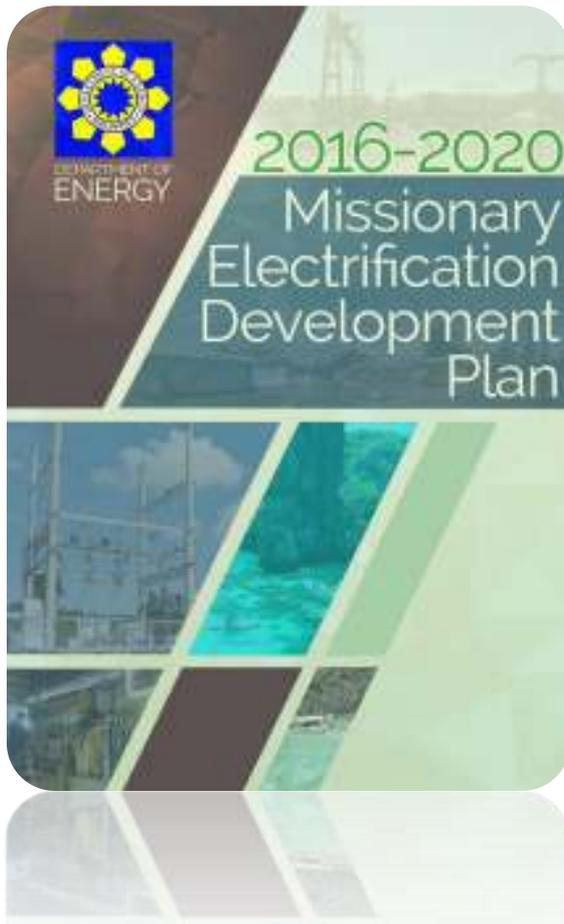
System Operations

- 1 Improvement of Telecommunication Backbone
- 2 Improvement of Automation in Supervisory Control
- 3 Energy Management System Enhancement Plan



Missionary Electrification Development Plan

Major Contents



Status of Missionary Electrification in the Philippines



Remote and Unviable Electrification



Demand and Supply Outlook



Plans and Programs



Missionary Electrification Development Plan

Major Contents



Maps of Different Categories of Missionary Areas

Large Areas



Medium Areas



Small Areas

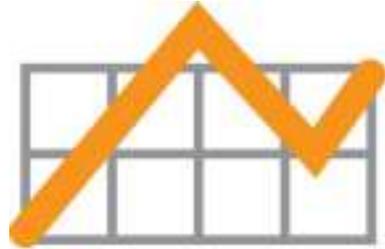


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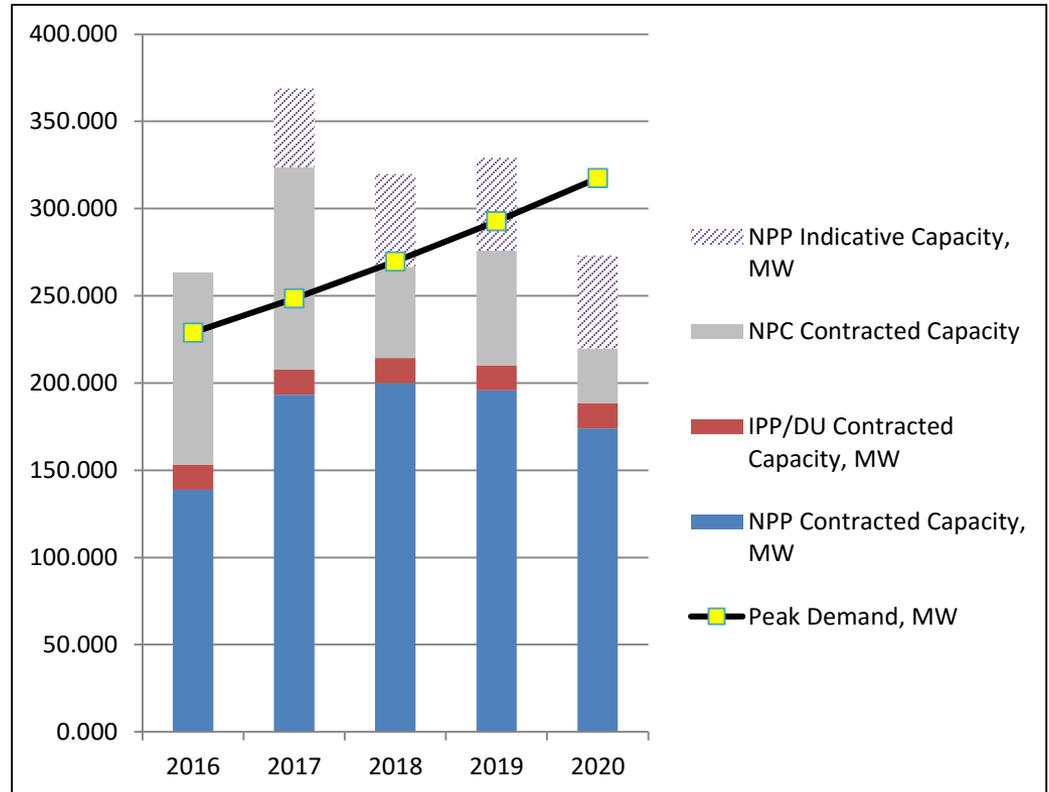


Missionary Electrification Development Plan

Major Contents



Demand and Supply Outlook



Missionary Electrification Development Plan

Major Contents



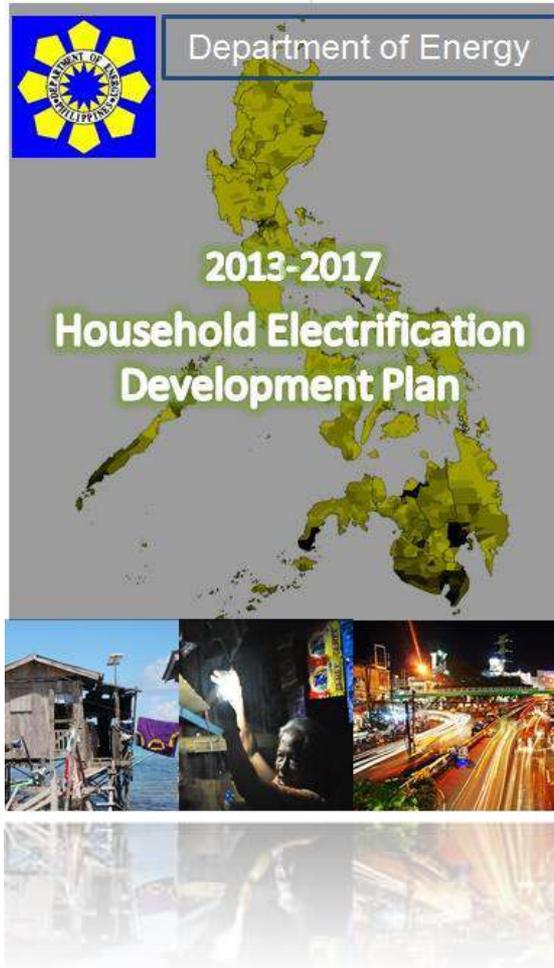
Plans and Programs

- 1 Improvement of the Private Sector Participation Program
- 2 Improvement of Operations and Services in Missionary Areas
- 3 Rationalization of the Universal Charge for Missionary Electrification
- 4 Implementation of NPC Missionary Electrification Plan
- 5 Island Interconnection Programs Integration with Transmission Development Plan



Household Electrification Development Plan

Major Contents



Status of Household Electrification in the Philippines



Grid Household Electrification Plan and Programs

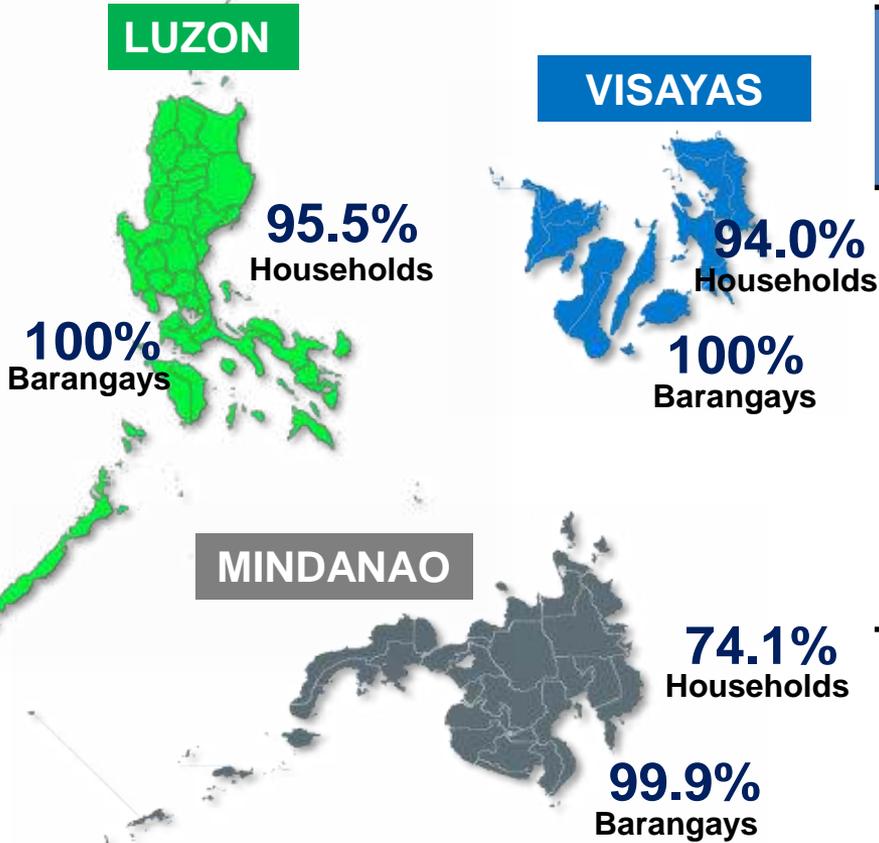


Off-Grid Household Electrification Plan and Programs



Philippine Rural Electrification Situationer

Household Electrification Development Plan (HEDP) Target: **90% HH Electrification by 2017**



Distribution Utilities (in Millions HH)	HH Population Projected C2010	Served HH	Unserved HH	HH Electrification Level (%)
119 Electric Cooperatives	13.34	11.72	1.61	87.92%
MERALCO	7.09	6.92	0.17	97.64%
Other Distribution Utilities	2.29	1.95	0.34	85.05%
Philippines	22.72	20.59	2.12	90.65%

Notes:

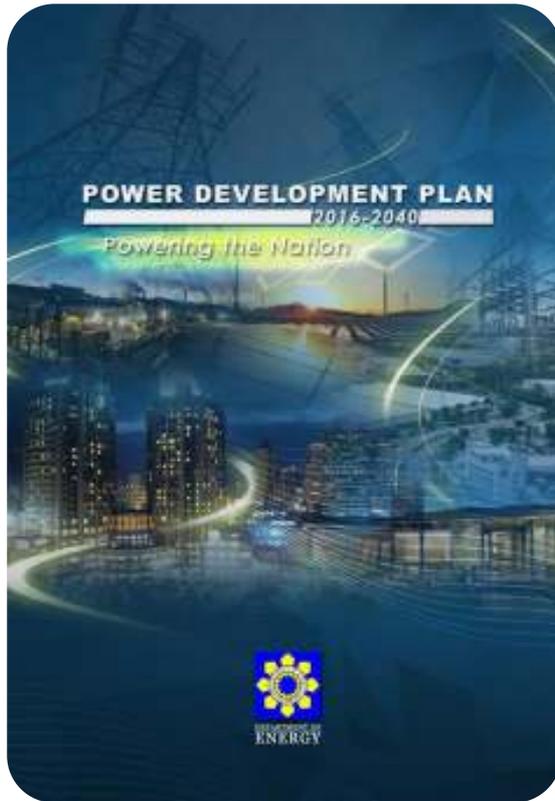
- The 2016 Household Population Number was projected and provided by NSO based from the 2010 Census
- Served Household figure was sourced from the consolidated Distribution Development Plan (DDP) 2017-2026 of all the Distribution Utilities (DU) and National Electrification Administration's (NEA) Status of Energization Reports (December 2016) except for the MERALCO which is based from its DDP 2016-2025
- NPC-SPUG Electrification Efforts are assumed to be included in concern Electric Cooperatives Household Energization Report

Percentage of households and barangays that have power per island



Power Development Plan to 2040

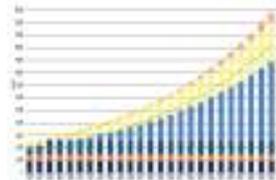
Major Contents



Philippine Electricity Profile



Five-Year Performance Assessment, 2011-2015



Demand and Supply Outlook, 2016-2040



Power Sector Roadmap

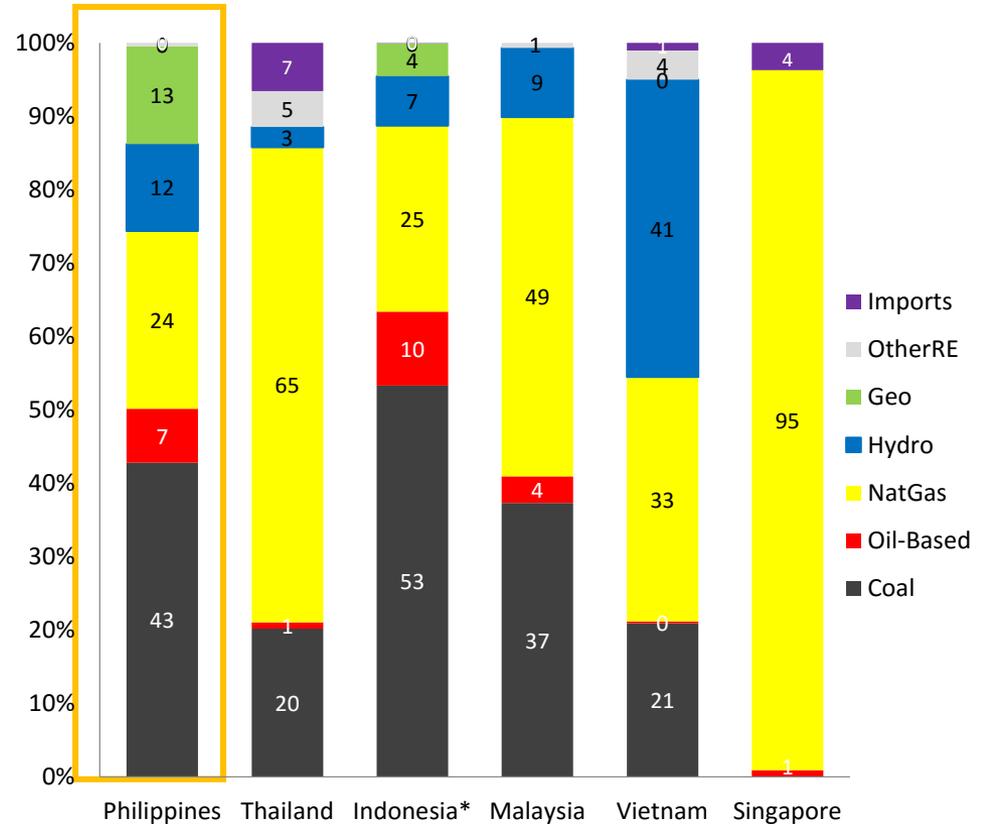


Power Development Plan to 2040

Major Contents



Philippine Electricity Profile



ASEAN Power Generation Mix

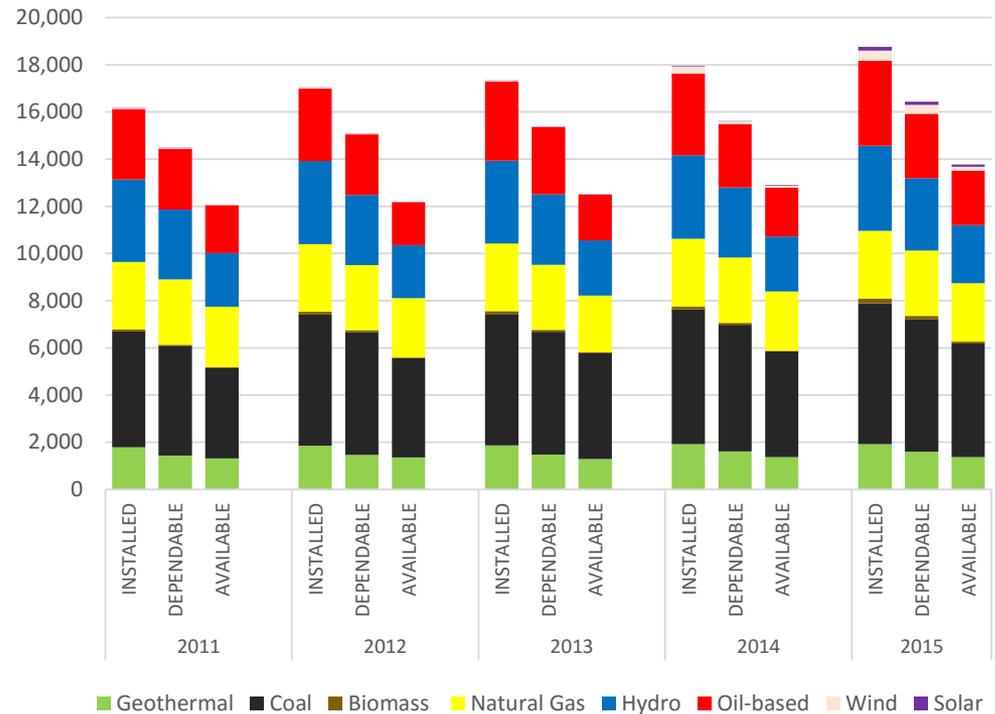


Power Development Plan to 2040

Major Contents



Five-Year Performance Assessment, 2011-2015



Installed, Dependable and Available Capacity

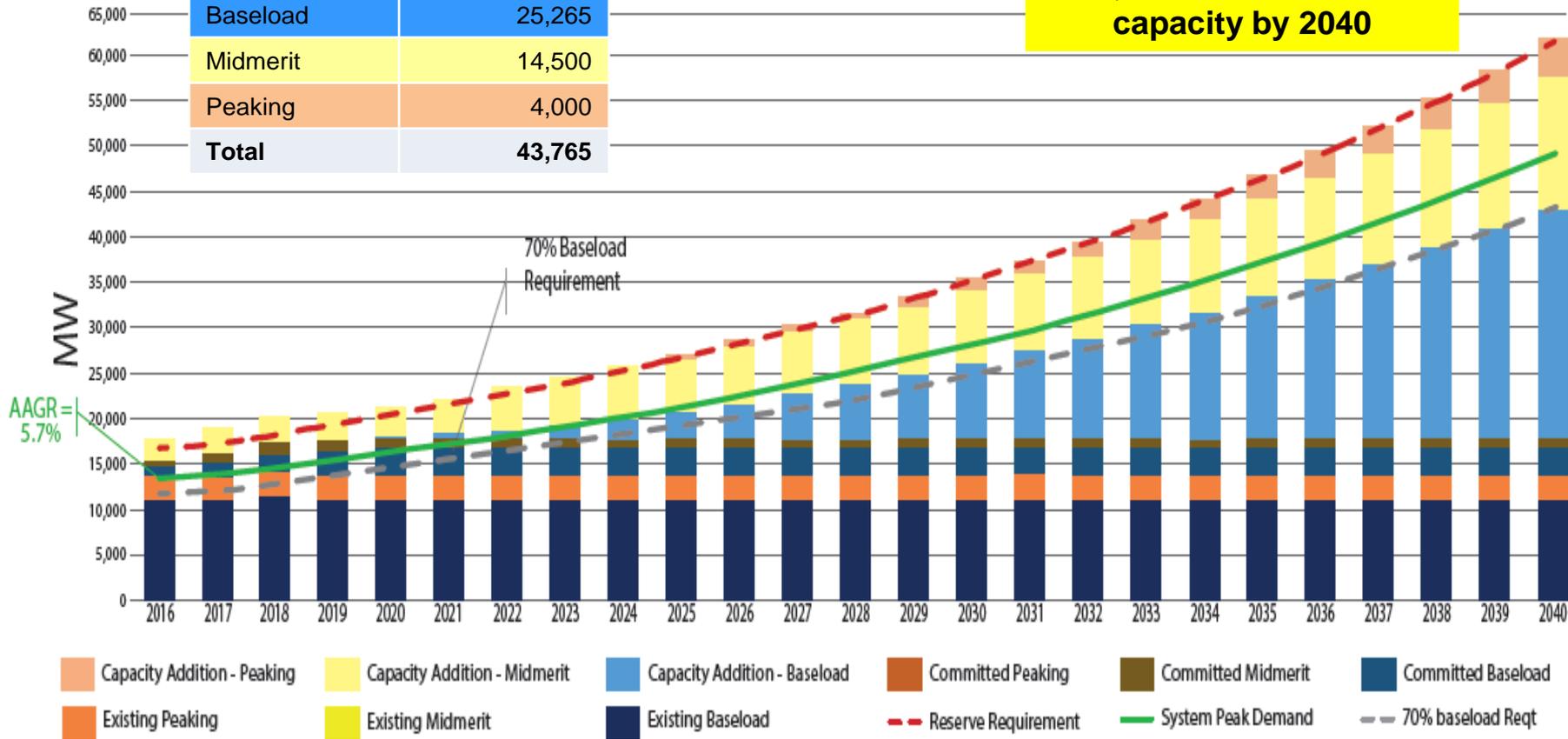


Power Development Plan to 2040

Philippines Demand and Supply Outlook, 2016-2040

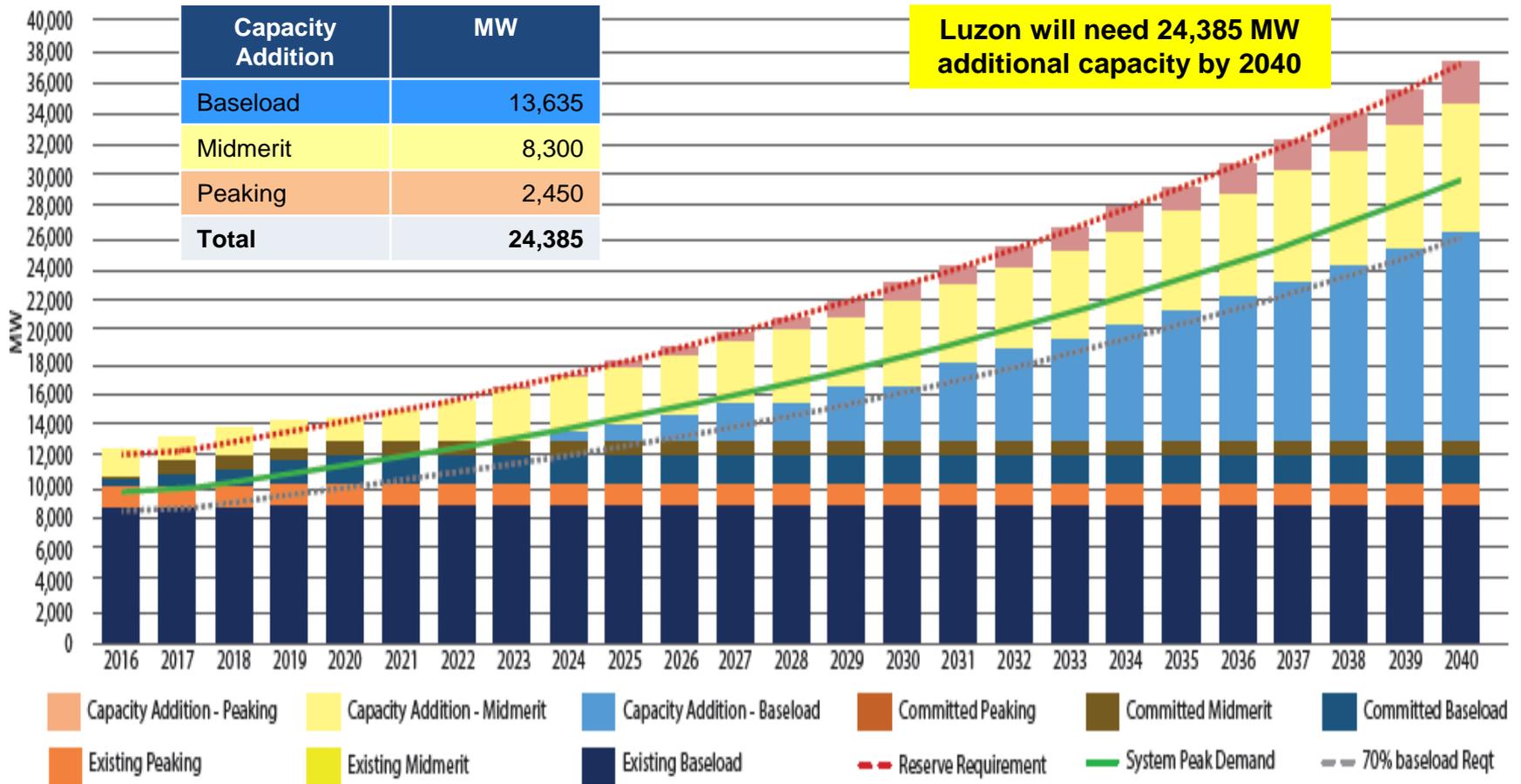
Capacity Addition	MW
Baseload	25,265
Midmerit	14,500
Peaking	4,000
Total	43,765

Philippines will need 43,765 MW additional capacity by 2040



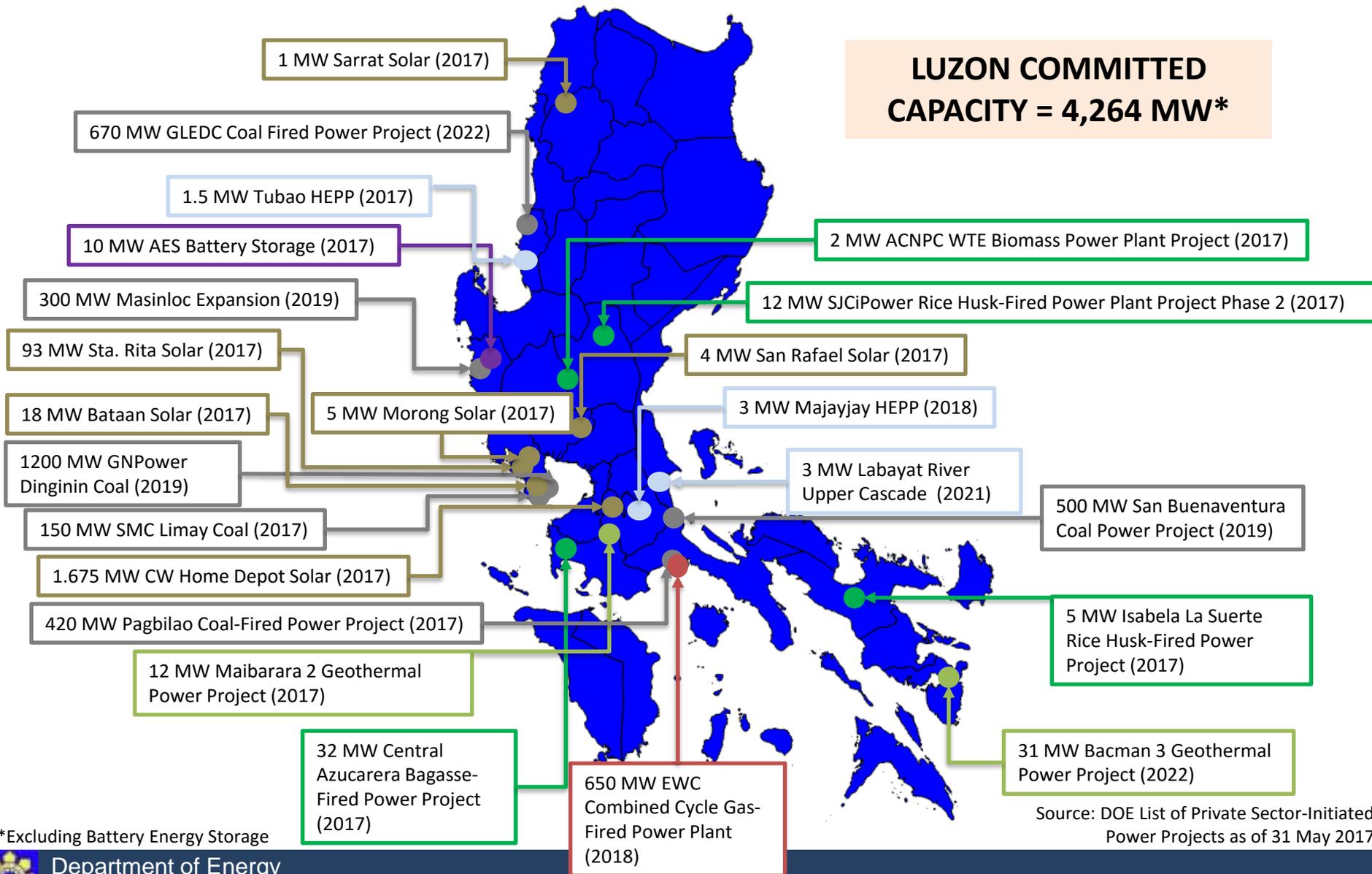
Power Development Plan to 2040

Luzon Demand and Supply Outlook, 2016-2040



Luzon Committed Power Projects

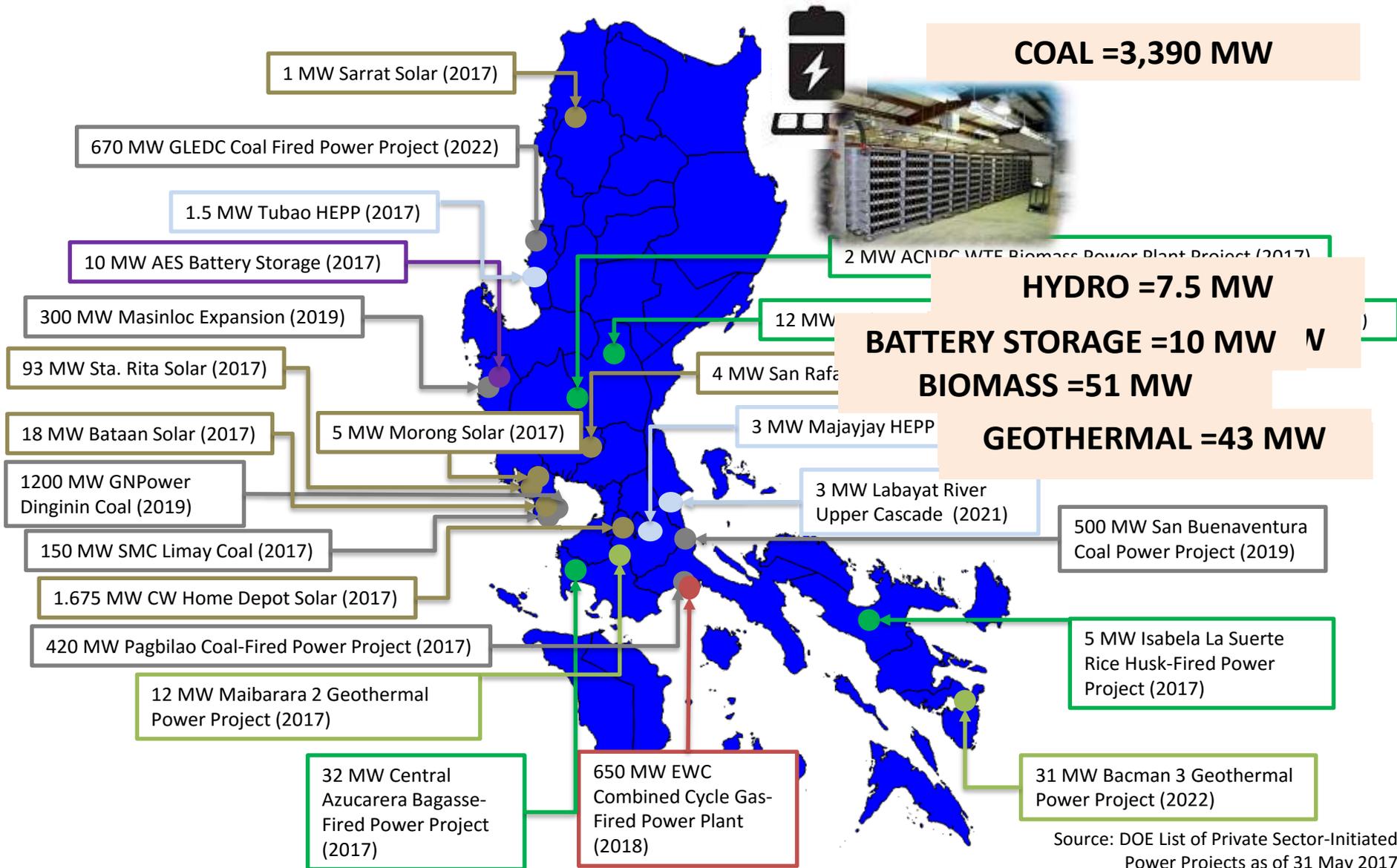
**LUZON COMMITTED
CAPACITY = 4,264 MW***



*Excluding Battery Energy Storage

Source: DOE List of Private Sector-Initiated Power Projects as of 31 May 2017

Luzon Committed Power Projects

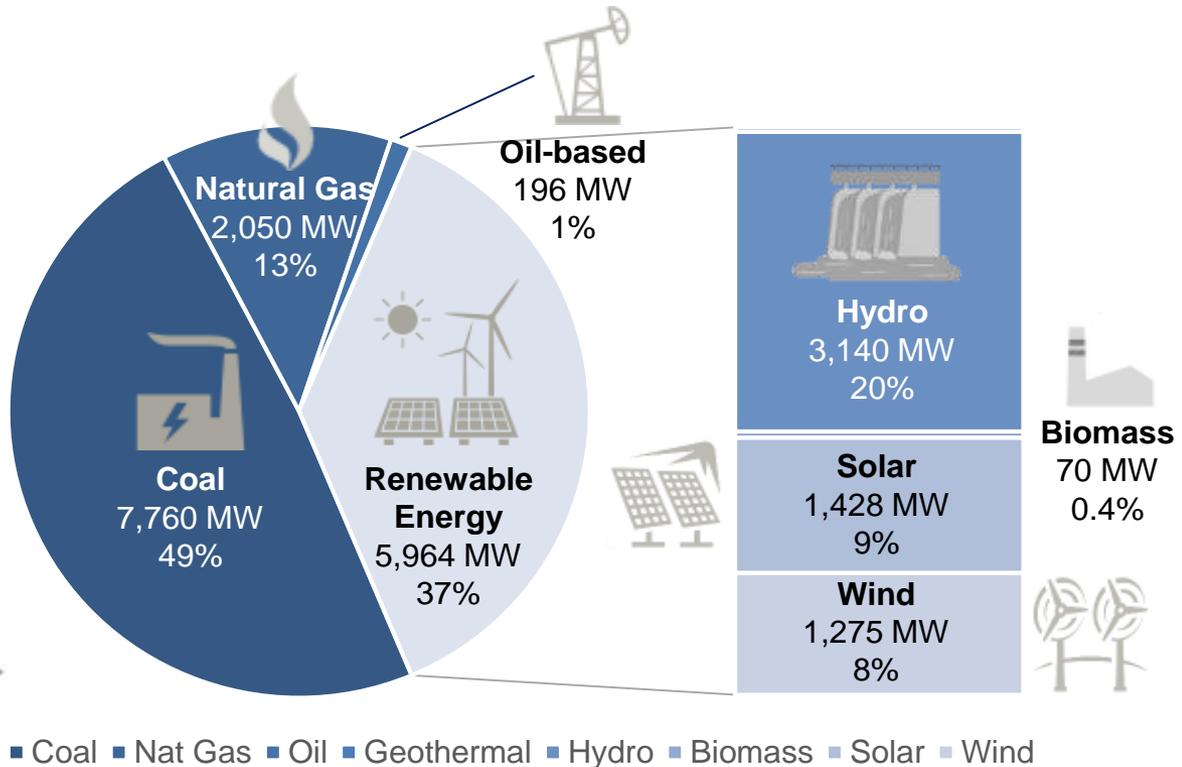


Source: DOE List of Private Sector-Initiated Power Projects as of 31 May 2017



Luzon Indicative Power Projects

**TOTAL LUZON INDICATIVE
CAPACITY = 15,970 MW**

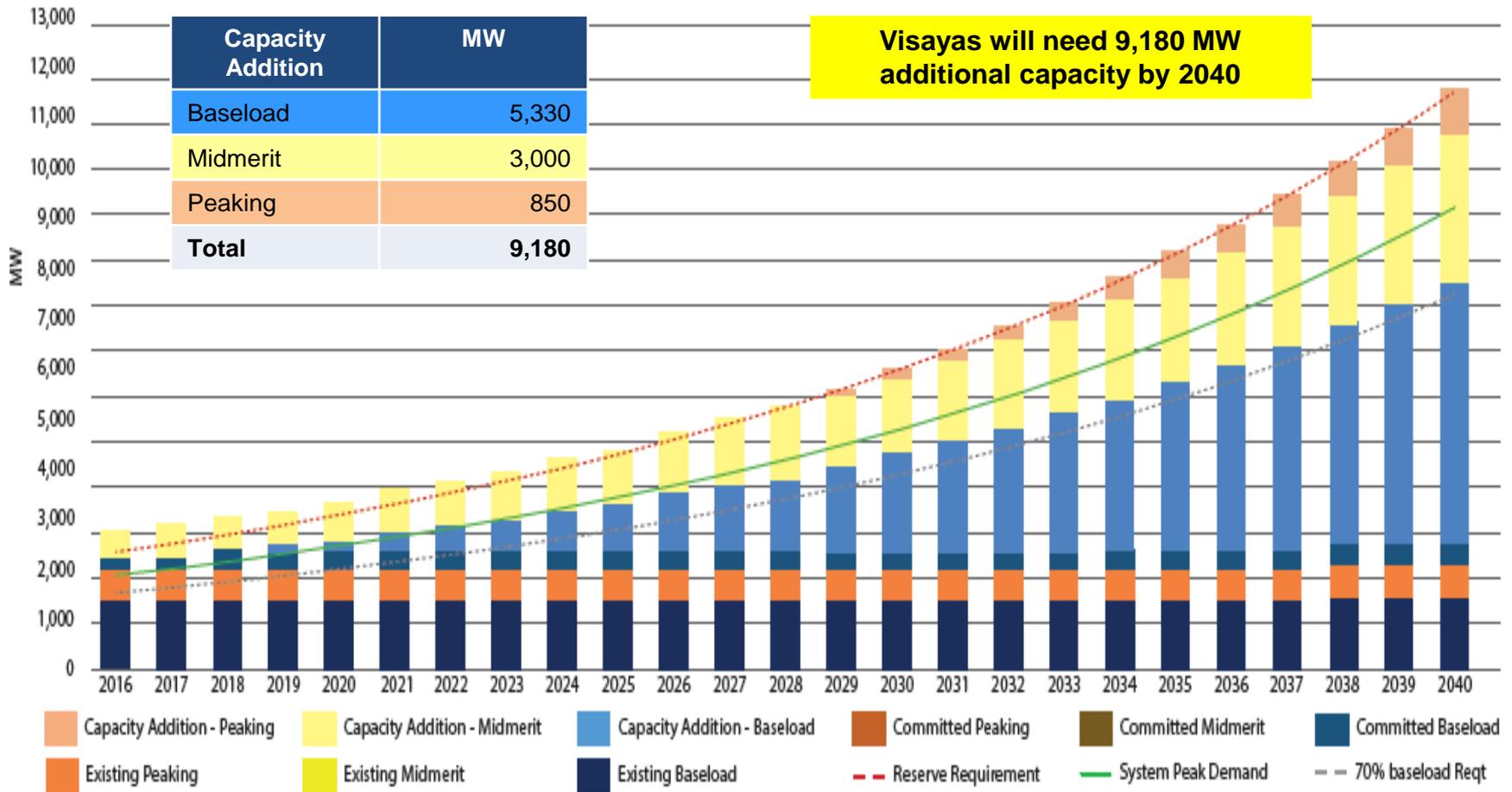


Source: DOE List of Private Sector-Initiated Power Projects as of 31 May 2017



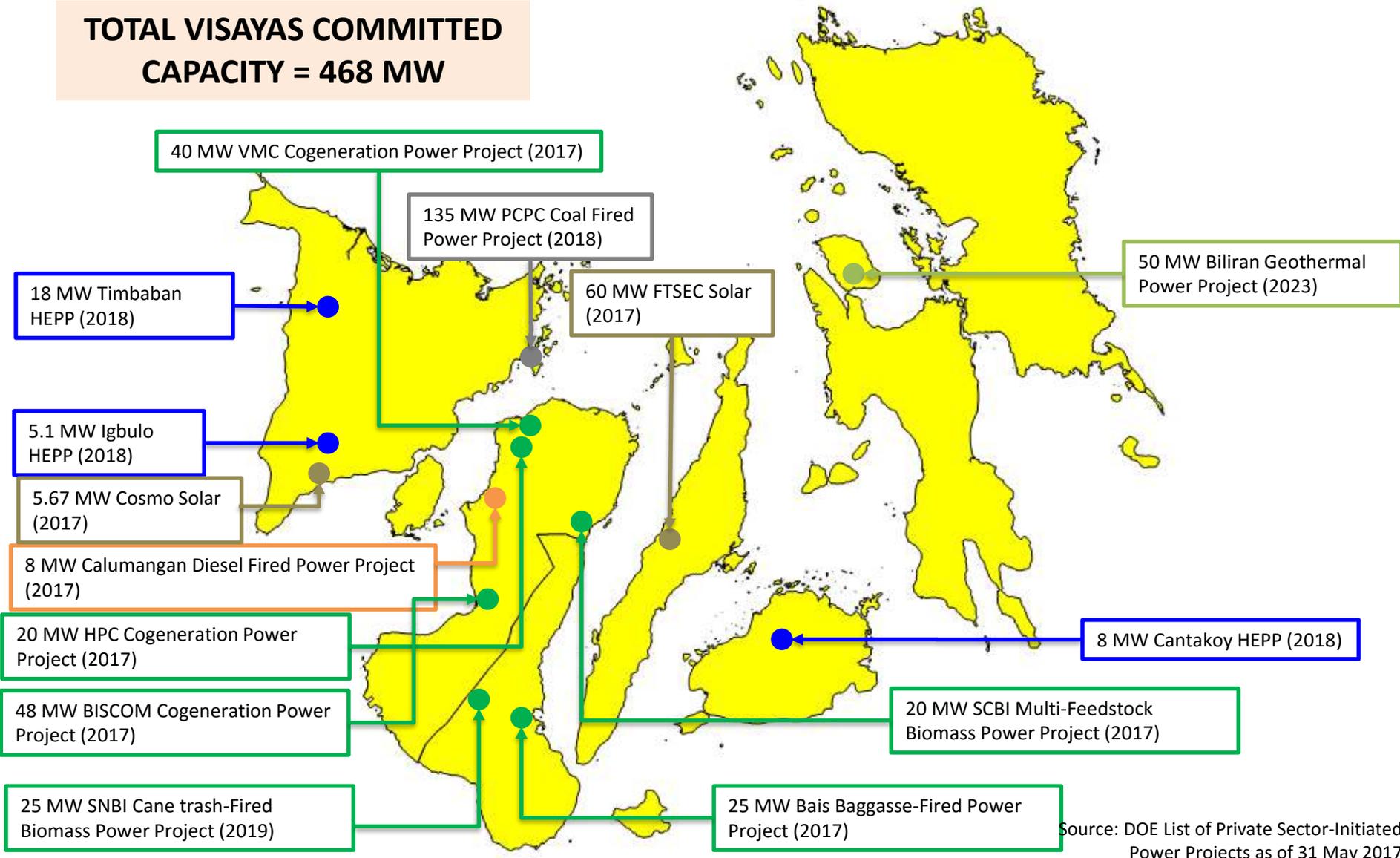
Power Development Plan to 2040

Visayas Demand and Supply Outlook, 2016-2040



Visayas Committed Power Projects

**TOTAL VISAYAS COMMITTED
CAPACITY = 468 MW**

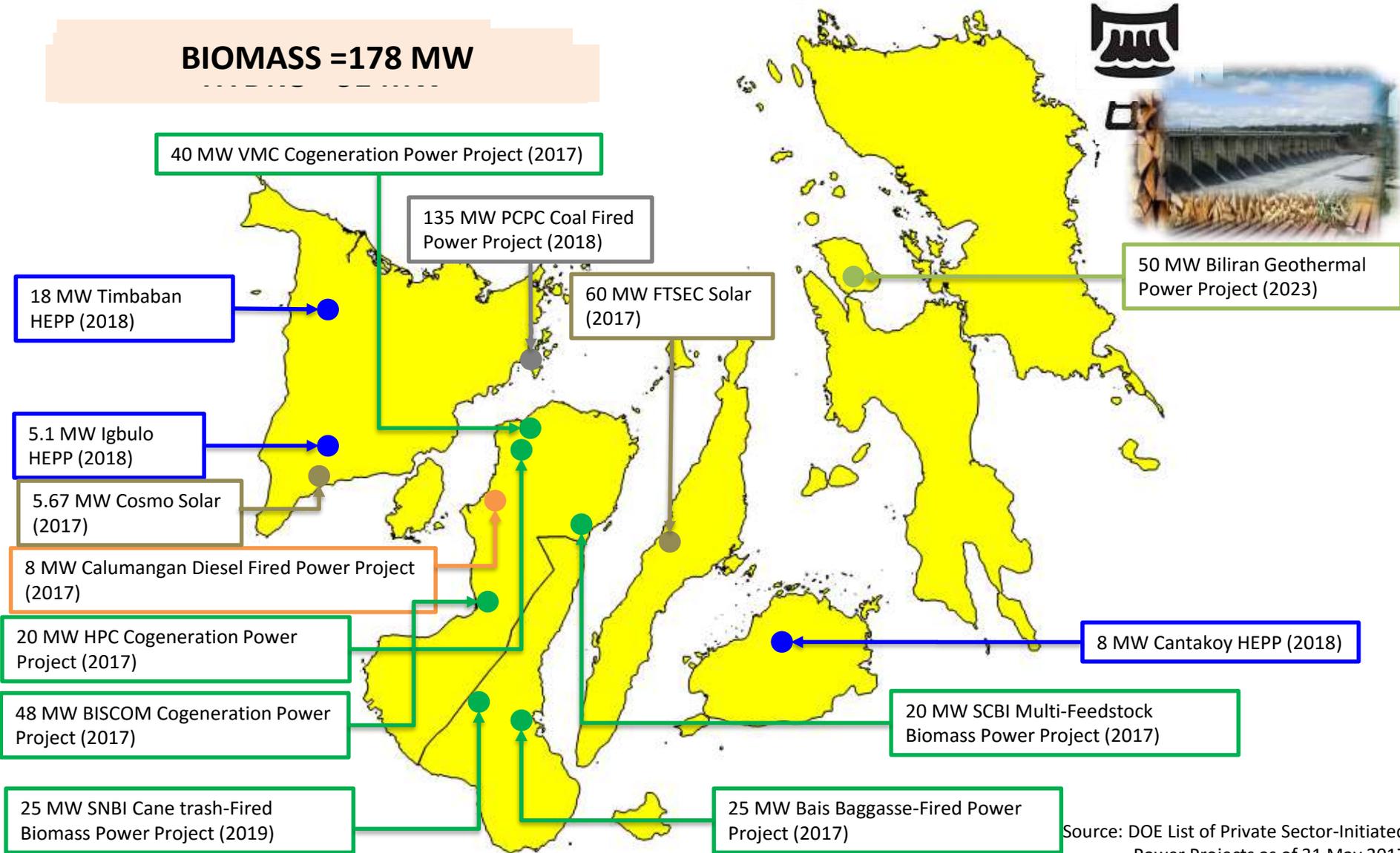


Source: DOE List of Private Sector-Initiated Power Projects as of 31 May 2017



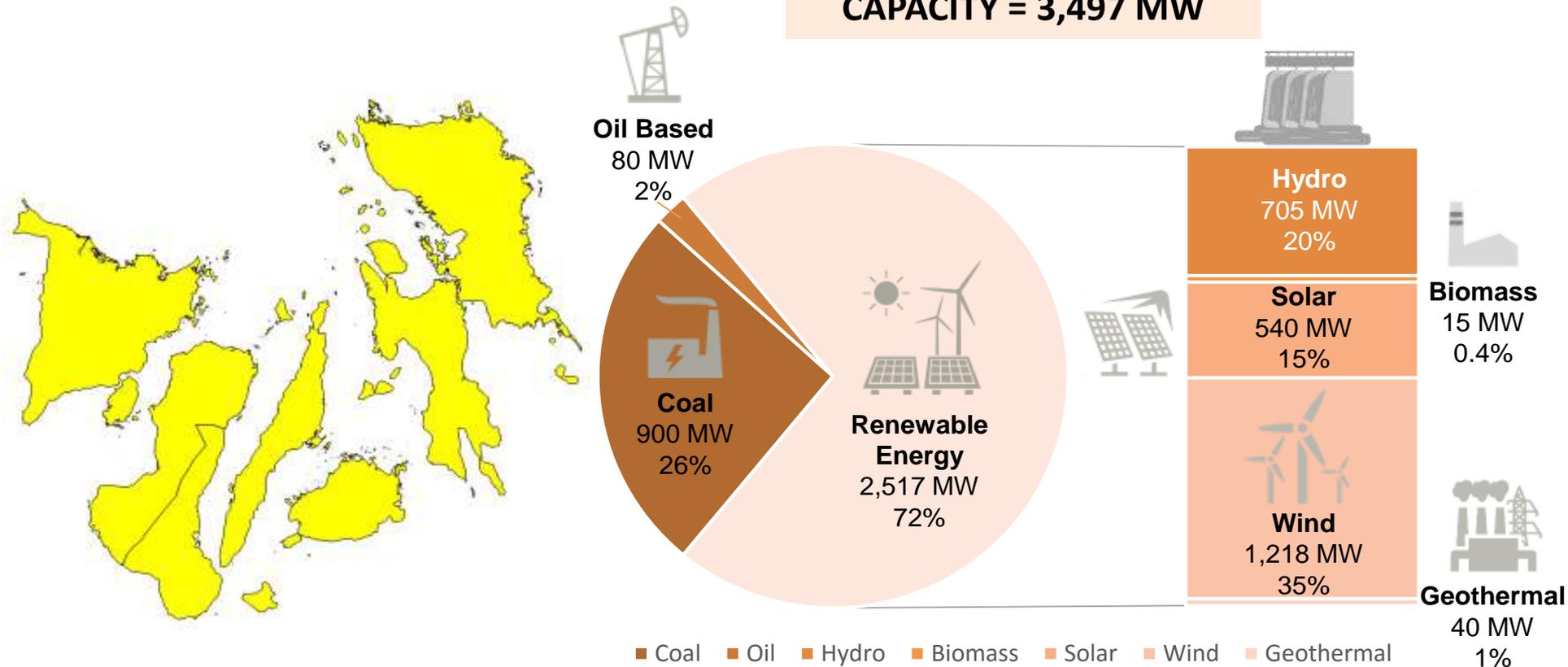
Visayas Committed Power Projects

BIOMASS =178 MW



Visayas Indicative Power Projects

**TOTAL VISAYAS INDICATIVE
CAPACITY = 3,497 MW**

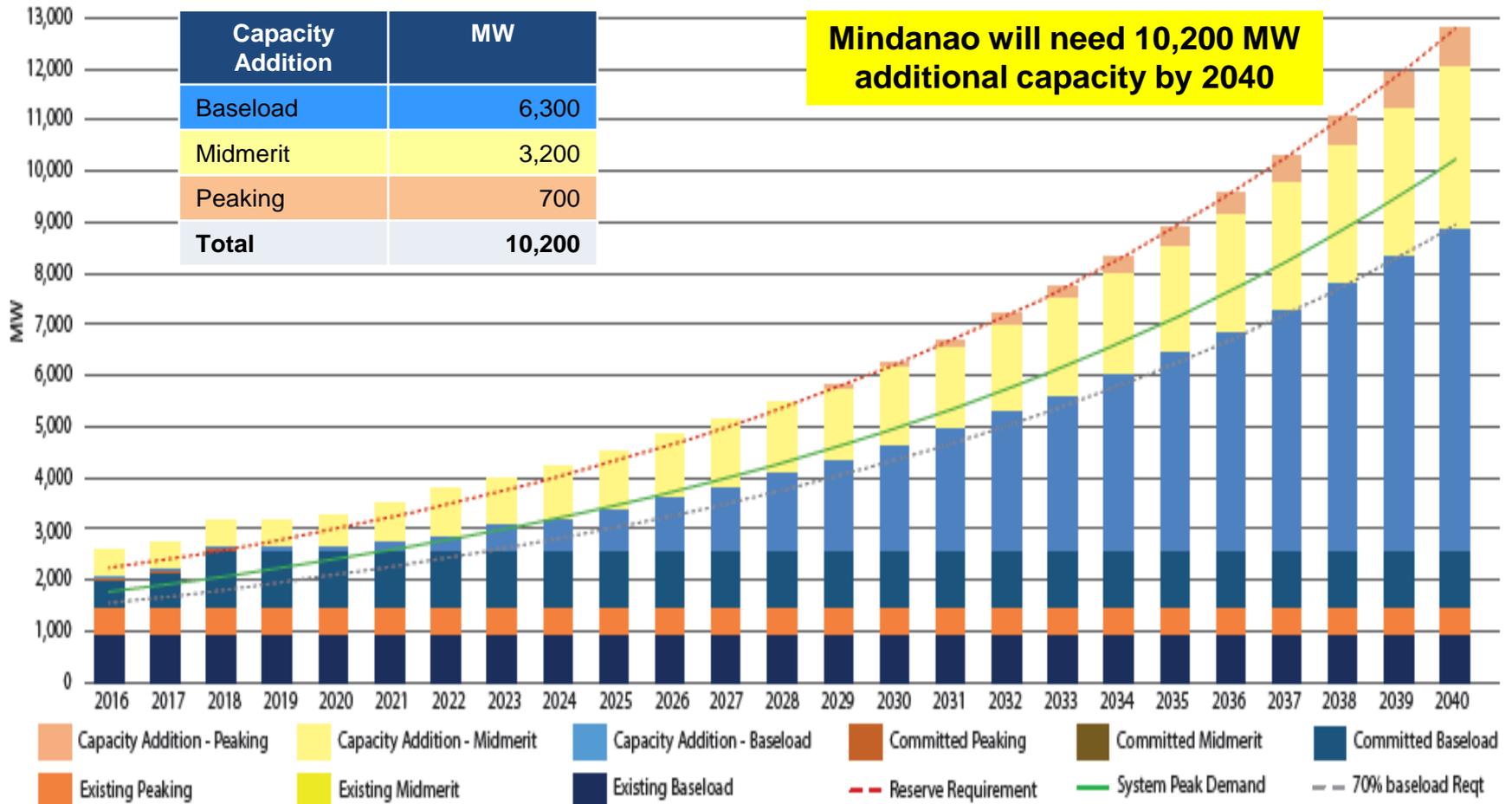


Source: DOE List of Private Sector-Initiated Power Projects as of 31 May 2017



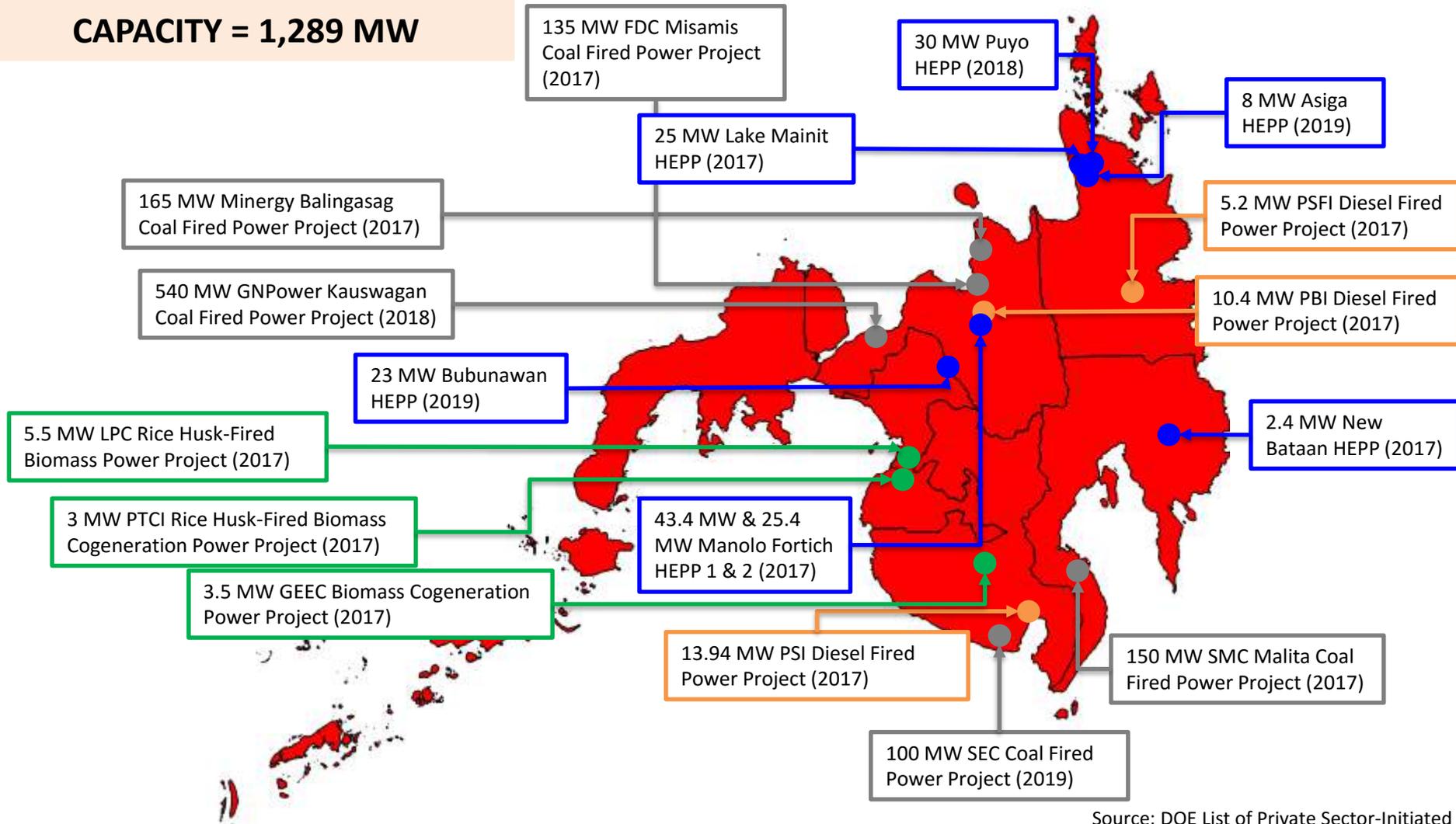
Power Development Plan to 2040

Mindanao Demand and Supply Outlook, 2016-2040



Mindanao Committed Power Projects

TOTAL MINDANAO COMMITTED CAPACITY = 1,289 MW



Source: DOE List of Private Sector-Initiated Power Projects as of 31 May 2017



Mindanao Committed Power Projects



135 MW FDC Misamis
Coal Fired Power Project
(2017)

30 MW Puyo
HEPP (2018)

8 MW Asiga
HEPP (2019)

25 MW Lake Mainit
HEPP (2017)

5.2 MW PSFI Diesel Fired
Power Project (2017)

165 MW Minergy Balingasag
Coal Fired Power Project (2017)

BIOMASS =12 MW

Coal Fired Power Project (2018)

10.4 MW PBI Diesel Fired
Power Project (2017)

OIL-BASED =30 MW

COAL =1,090 MW

2.4 MW New
Bataan HEPP (2017)

HYDRO=157 MW

Cogeneration Power Project (2017)

43.4 MW & 25.4
MW Manolo Fortich
HEPP 1 & 2 (2017)

3.5 MW GEEC Biomass Cogeneration
Power Project (2017)

13.94 MW PSI Diesel Fired
Power Project (2017)

150 MW SMC Malita Coal
Fired Power Project (2017)

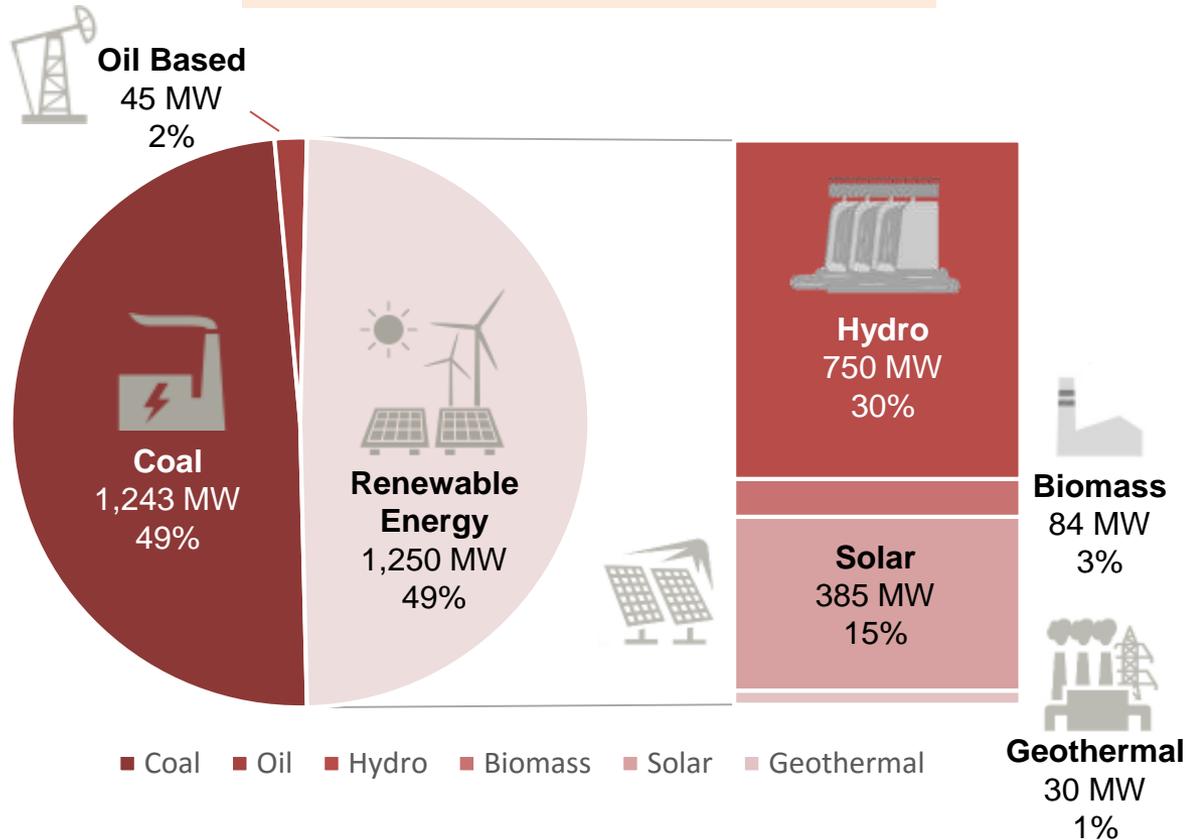
100 MW SEC Coal Fired
Power Project (2019)

Source: DOE List of Private Sector-Initiated
Power Projects as of 31 May 2017



Mindanao Indicative Power Projects

**TOTAL MINDANAO INDICATIVE
CAPACITY = 2,538 MW**



Source: DOE List of Private Sector-Initiated Power Projects as of 31 May 2017



Power Development Plan to 2040

Major Contents

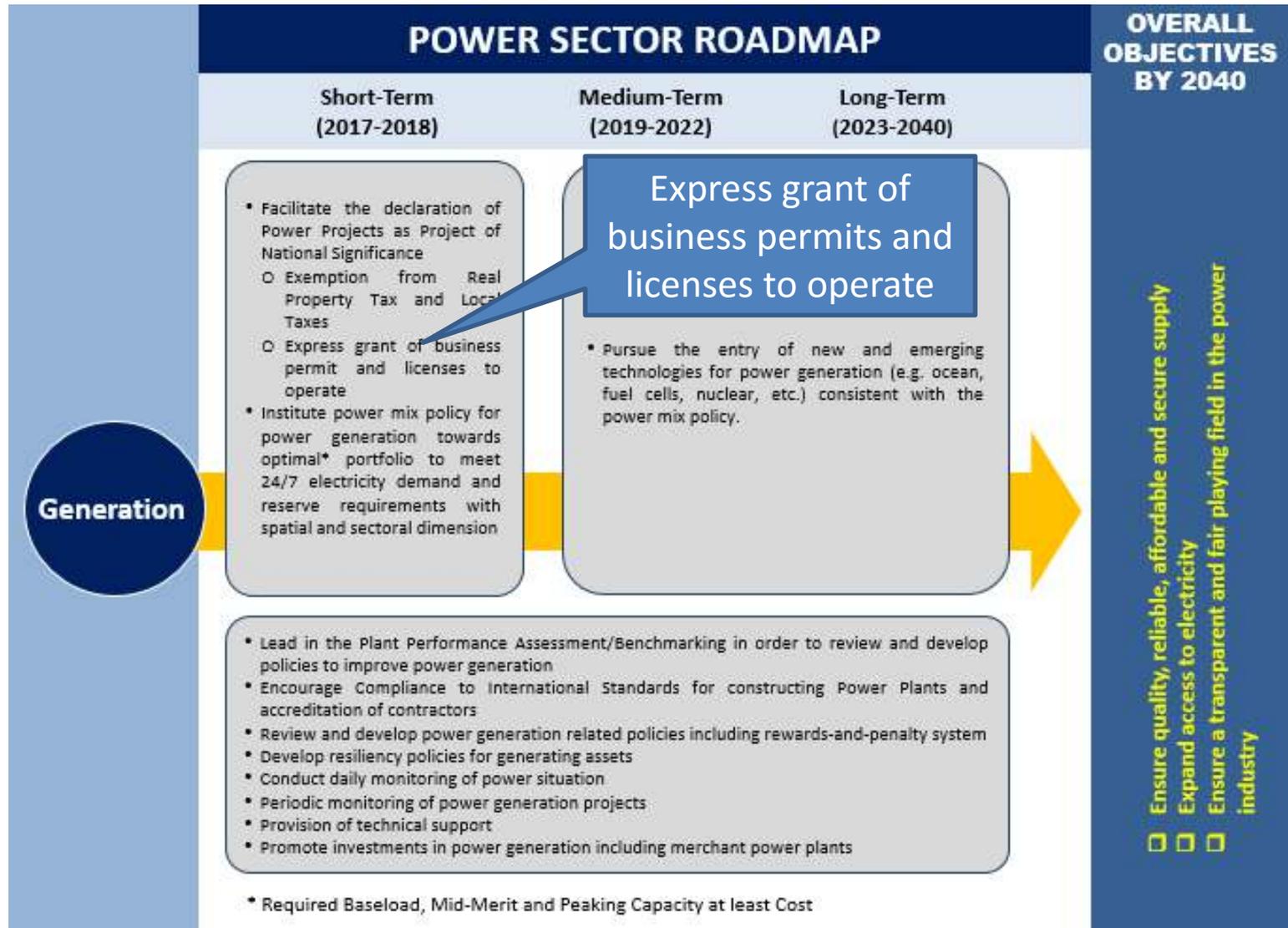


Power Sector Roadmap

- 1 **Generation**
- 2 **Transmission**
- 3 **Distribution and Supply**
- 4 **Market Development**
- 5 **Institutional and Support Mechanism**
- 6 **Missionary Electrification**
- 7 **Electrification**



Power Development Plan



DOE Endorsements for Power Projects



- Articles of Incorporation
- Amendment of the Article of Incorporation



- Conduct of System Impact Study (SIS)



- Certificate of Non-Overlap (CNO) - attesting that the project does not overlap with ancestral domain



DOE Endorsements for Power Projects



- Registration to BOI – for the availment of tax incentives



- Land Conversion from agricultural to industrial land



- Environmental Compliance Certificate



- Certificate of Compliance - requirement prior to commissioning of the Power Plant





“

Timely and synchronized completion of energy projects and implementation of development plans at the different levels of the power sector chain towards
Energy Security”





“ **E-SECURE** Mo, **E-SECURE** Natin,
Para sa Kinabukasan ng Lahat ”





Thank You!



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