

2022 Virtual Energy Investment Forum

Power Situation and Power Outlook

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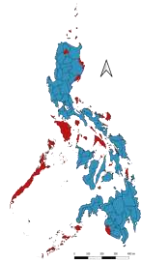
October 28, 2022



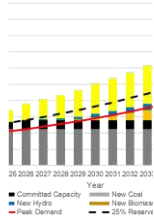
DEPARTMENT OF ENERGY
Philippines



Presentation Outline



Power Situation



Power Outlook to 2040

02

Customer Contracting Options

- Interruptible Load Program
- Green Energy Option Program
- Retail Competition and Open Access
- Directly Connected

Power-Related Policies



Power Statistics: Grid and Off-Grid

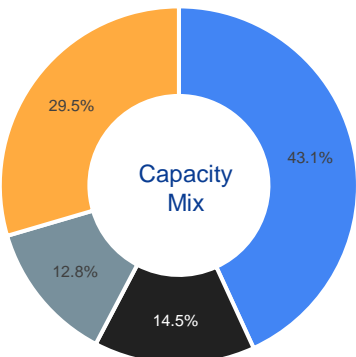
GRID

27,044 MW

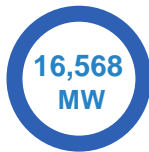
Total Installed Capacity

24,112 MW

Total Dependable Capacity

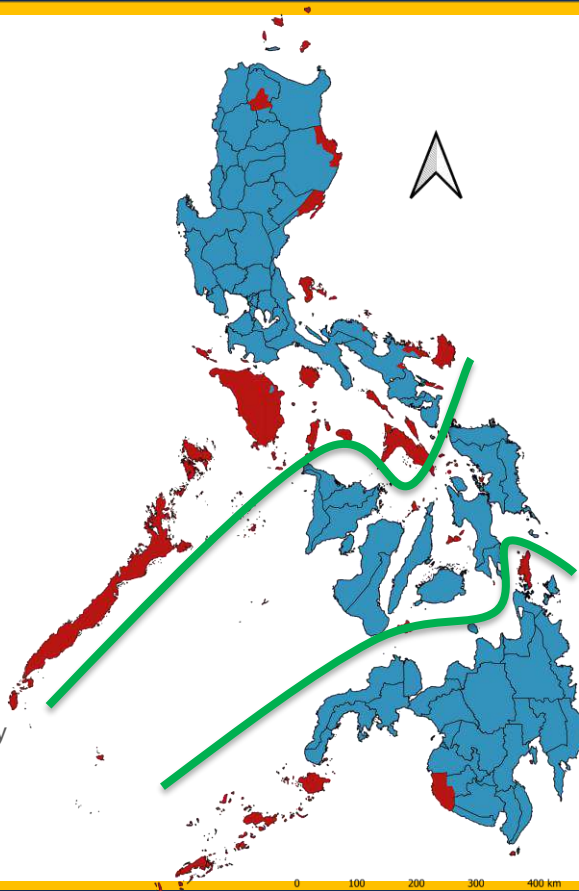


Data as of 30 June 2022



Peak Demand YTD

- Coal
- Oil Based
- Natural Gas
- Renewable Energy



OFF-GRID

648 MW

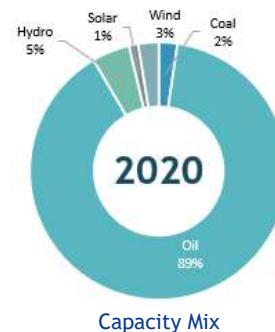
Total Installed Capacity

504 MW

Total Dependable Capacity



2020 Peak Demand



■ Grid

■ Off-Grid

Data as of 31 December 2020



Power Sector Highlights



Coal, 42.0%
Installed: 11,684 MW



Oil-Based, 16.2%
Installed: 4,503 MW



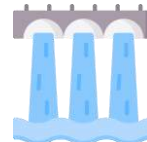
Natural Gas, 12.4%
Installed: 3,453 MW



Renewable Energy, 29.3%
Installed: 8,150 MW



Solar, 5.4%
Installed: 1,491 MW



Hydroelectric, 13.6%
Installed: 3,783 MW



Wind, 1.6%
Installed: 443 MW



Geothermal, 7.0%
Installed: 1,932 MW



Biomass, 1.8%
Installed: 501 MW

Source: DOE List of Existing Power Plants – Grid-Connected and Off-Grid Connected (As of August 2022)

Icon made by [Freepik](#), [lcongeek26](#), [Smashicon](#), [Umeicon](#), [Skyclick](#), and [RafelDesign](#) from [www.flaticon.com](#)



Luzon Power Outlook 2023

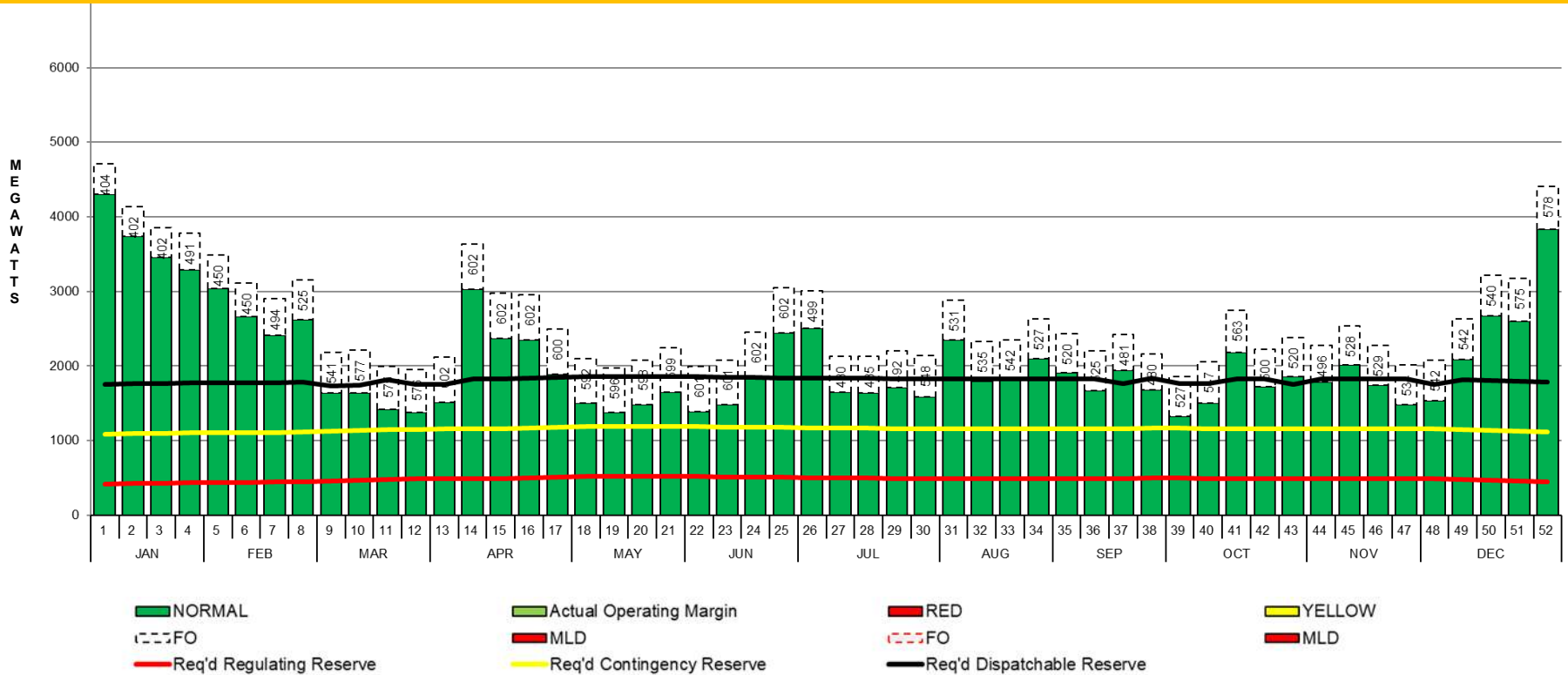
Basic Assumptions

- ❖ Peak Demand - 13,125 MW
- ❖ Power Plants Preventive Maintenance Schedule, as of June 2022
- ❖ Malaya Unit 1 not available while Malaya Unit 2 available at 350MW
- ❖ No HVDC power import from Visayas considered
- ❖ No Bataan Plant Output Limitation (GNPD Units 1 and 2 available at 668MW)
- ❖ Commercial Operations of New Power Plants based on DOE Committed Power Projects, as of July 31, 2022
 - ❖ SMC Mariveles Unit 2 (150MW) – April 2023
 - ❖ SMC Mariveles Unit 3 (150MW) – August 2023
 - ❖ SMC Mariveles Unit 4 (150MW) – December 2023
- ❖ Deration of hydro power plants for summer months (April to June)
- ❖ No scheduled preventive maintenance for non-hydro plants for April to June



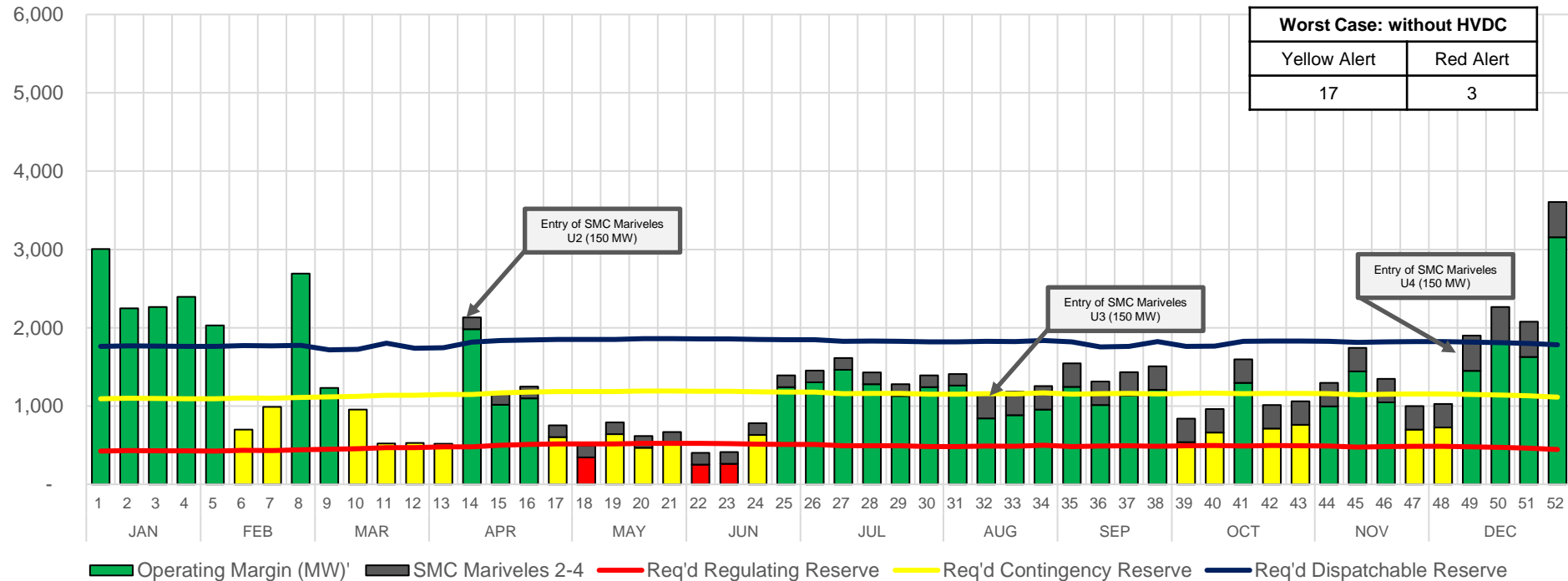
Luzon Power Outlook 2023

Scenario with Forced Outage



Luzon Power Outlook 2023

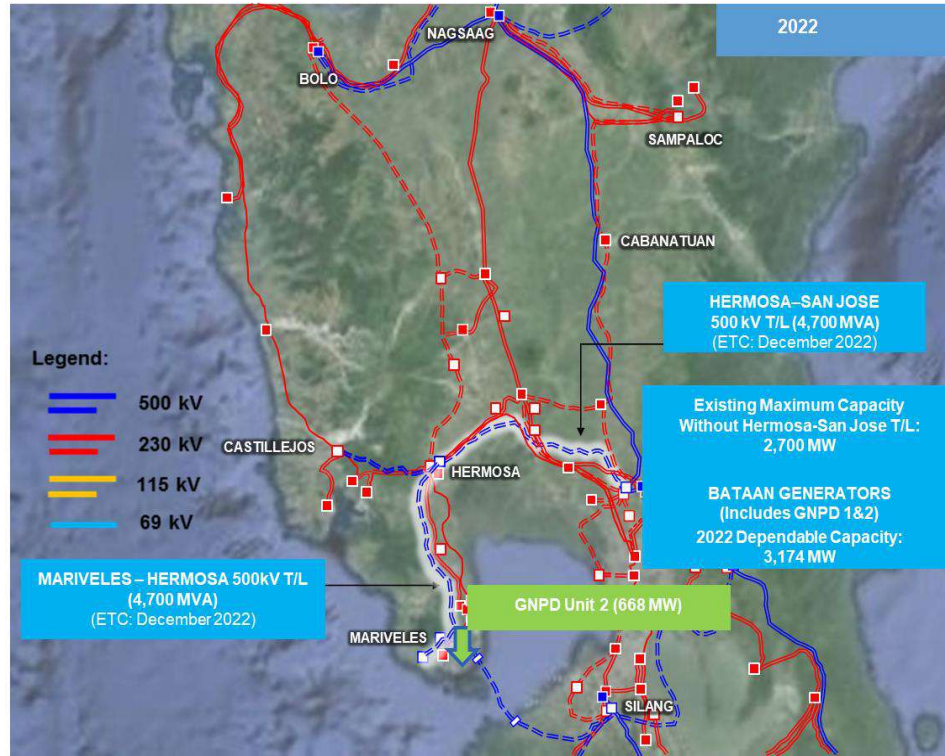
Scenario with Forced Outage & without Output from Ilijan Power Plant



Source: NGCP



Luzon Transmission Constraints (474 MW Stranded Capacity)



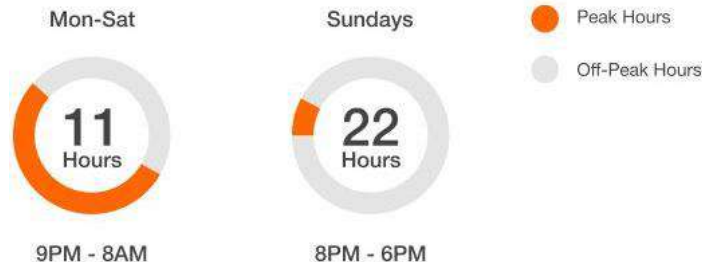
The transmission constraint from the power plants in Bataan to the load center in Metro Manila to be addressed immediately through:

1. Improvement of system operations to maximize available plants;
2. NGCP's timely completion of transmission projects (December 2022);
3. Assistance on specific project segments where government is the reason for the delay (e.g., LGUs and courts' timely action on right-of-way issues) and provision of necessary intervention.



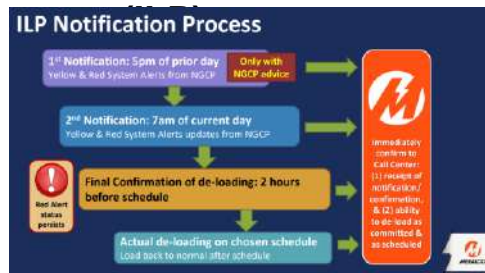
Demand-Side Management Programs/Initiatives

TIME-OF-USE (TOU)



- Peak/Off-Peak (POP) rates program is an alternative energy pricing scheme that is based on the time-of-day electricity is generated and on the cost of supplying electricity during that time
- When enrolled, electricity generation charges are cheaper during hours of the week.

INTERRUPTIBLE LOAD PROGRAM



- ILP is a voluntary, demand-side management program that allows customers to operate their generating sets & collectively reduce electricity drawn from the grid when power interruptions are imminent to ration limited power supply.
- As of October 2022, MERALCO has 569.55 MW Committed De-loading capacity from 270 enrolled Participating Customers.

Source: MERALCO



Visayas Power Outlook 2023

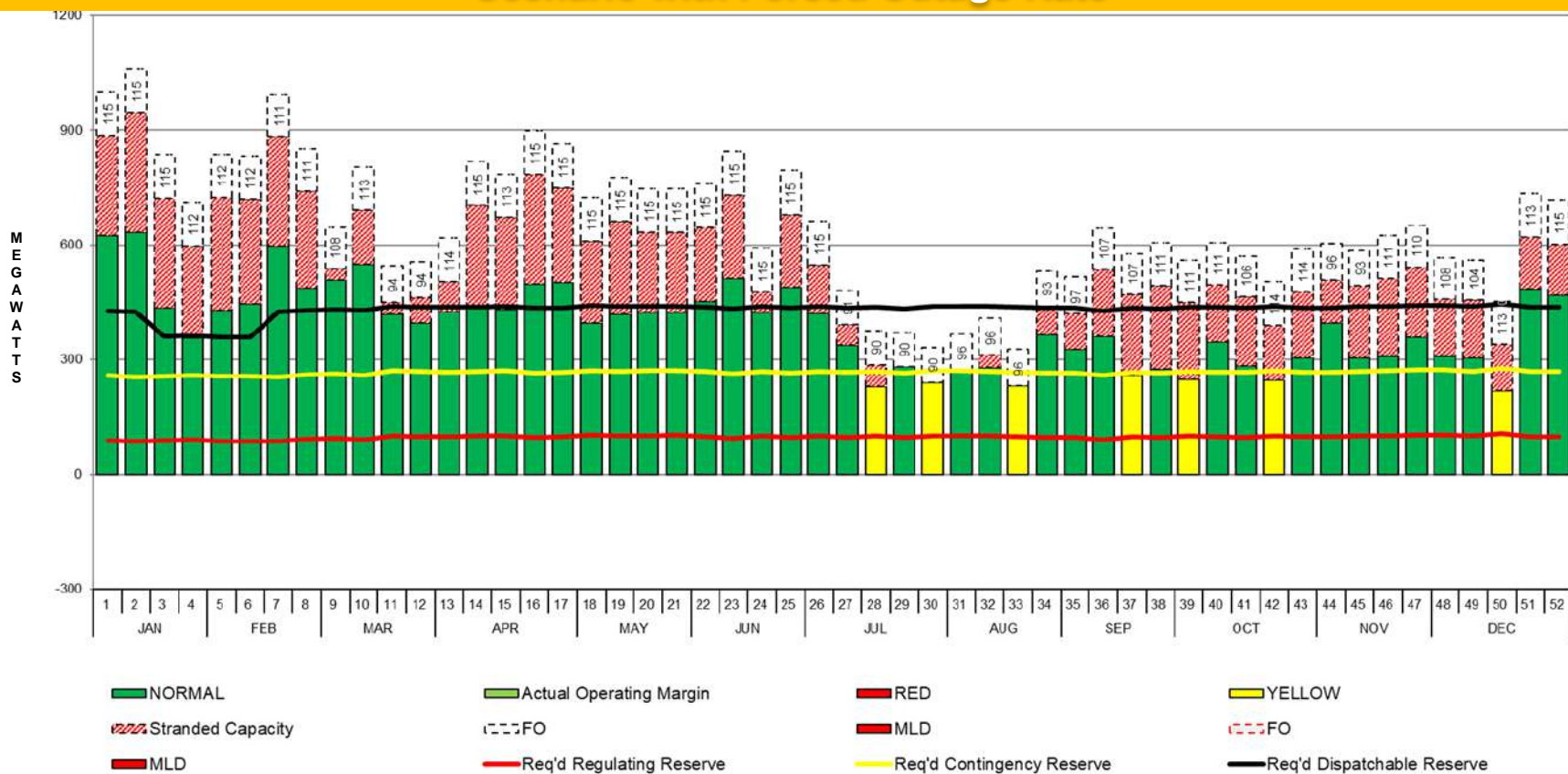
Basic Assumptions

- ❖ Peak Demand - 2,691MW
- ❖ Power Plants Preventive Maintenance Schedule, as of June 2022
- ❖ Transmission Project Completion
 - Dumanjug Bus-in Colon – Samboan 138kV T/L - Sept. 2022
 - Dumanjug-Santander ± 350 kV HVDC T/L - Oct. 2022
 - Dumanjug-Alegria ± 20 kV Electrode Line - Oct. 2022
 - Magdugo Bus-In Calongcalong-Colon 138kV T/L - Oct 2022
 - Cebu-Magdugo 230kV T/L - Nov. 2022



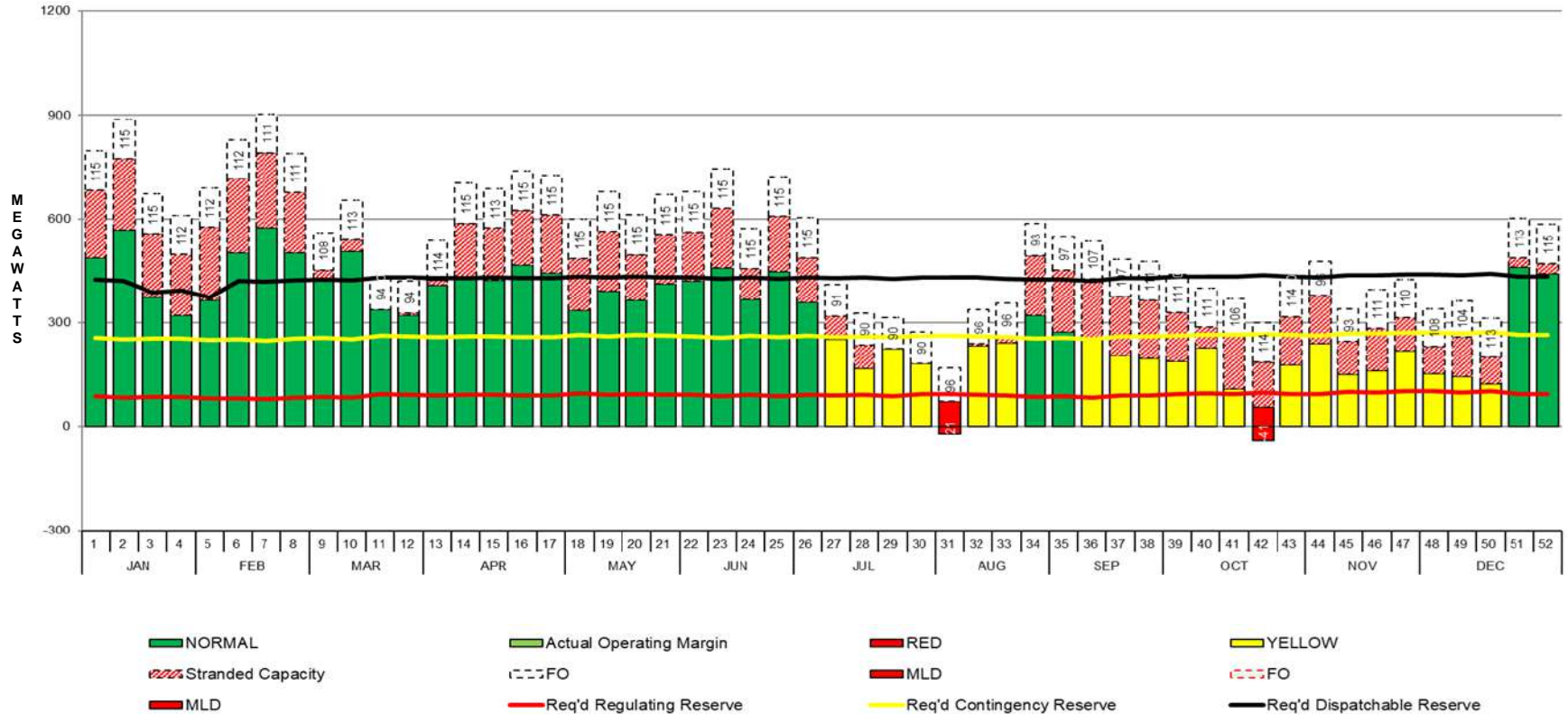
Visayas Power Outlook 2023 (Afternoon Peak)

Scenario with Forced Outage Rate

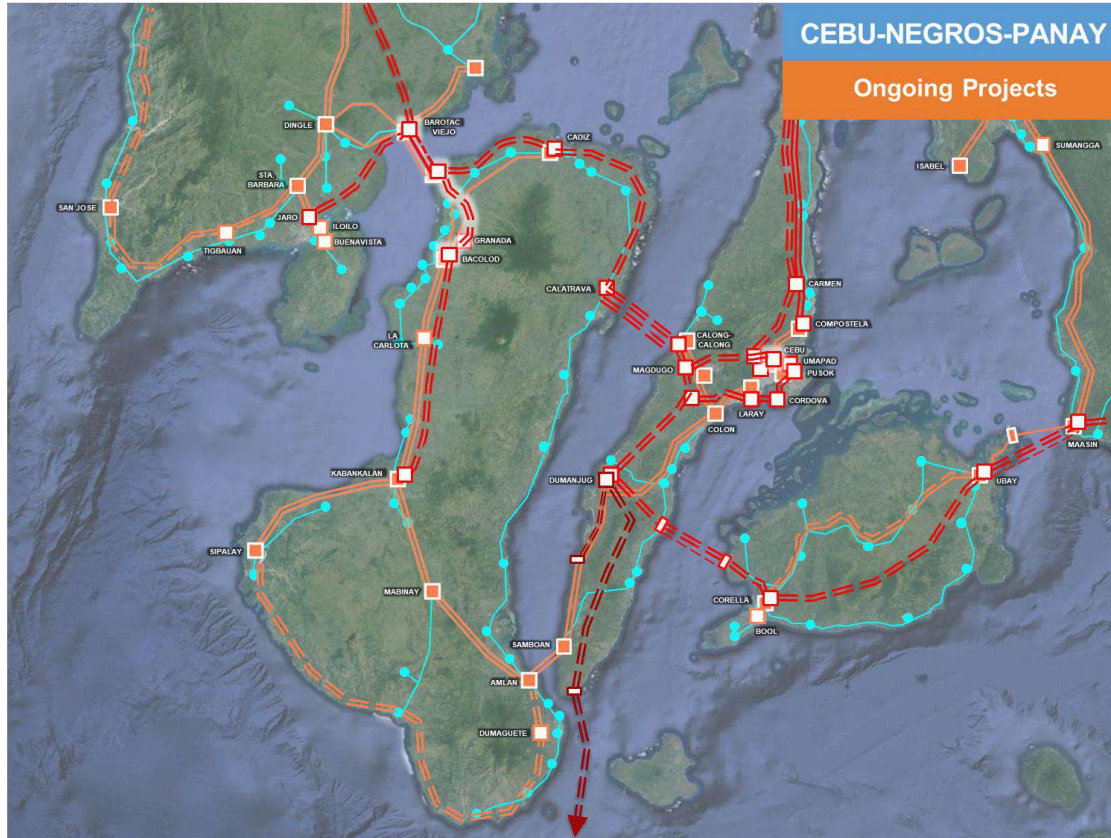


Visayas Power Outlook 2023 (Evening Peak)

Scenario with Forced Outage



Visayas Transmission Constraints



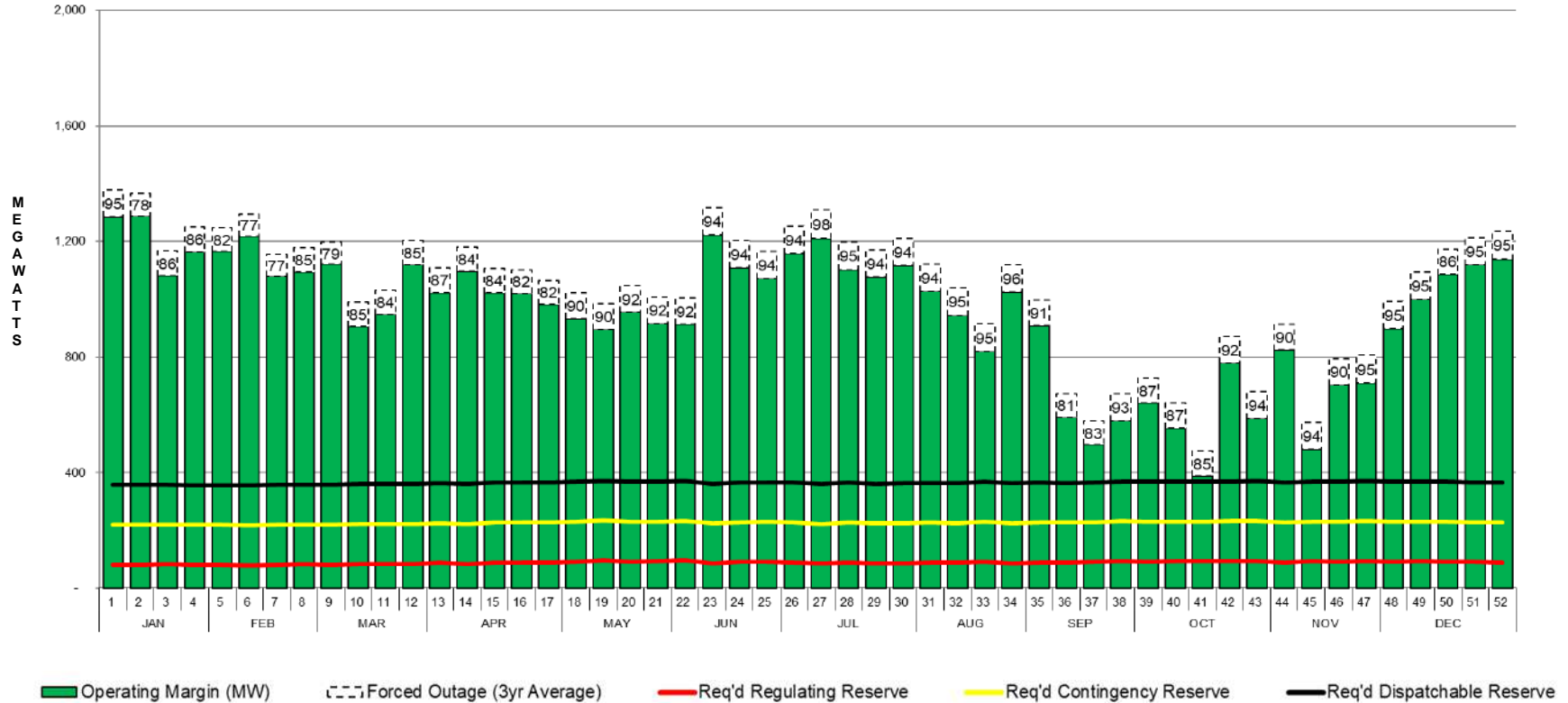
Project Completion Targets (as of August 2022):

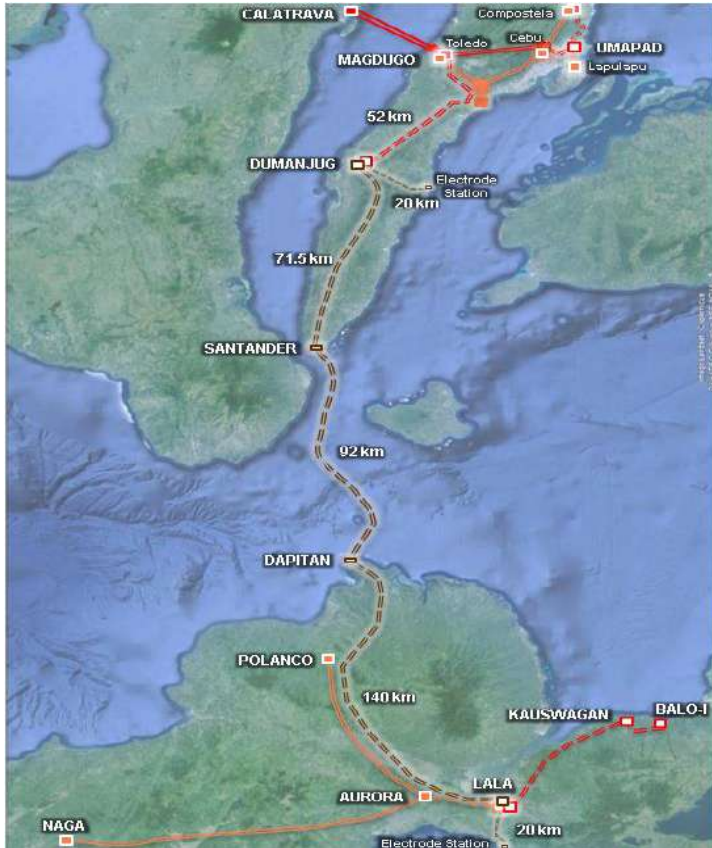
- Stage 1 (Negros-Cebu Interim): December 2022; Additional 85 MW upon energization
- Stage 2 (Cebu upgrading): October 2022
- Stage 3 (Cebu-Negros-Panay): June 2023; Additional 2x400 MW capacity from Panay and Negros to Cebu



Mindanao Power Outlook 2023

Scenario with Forced Outage



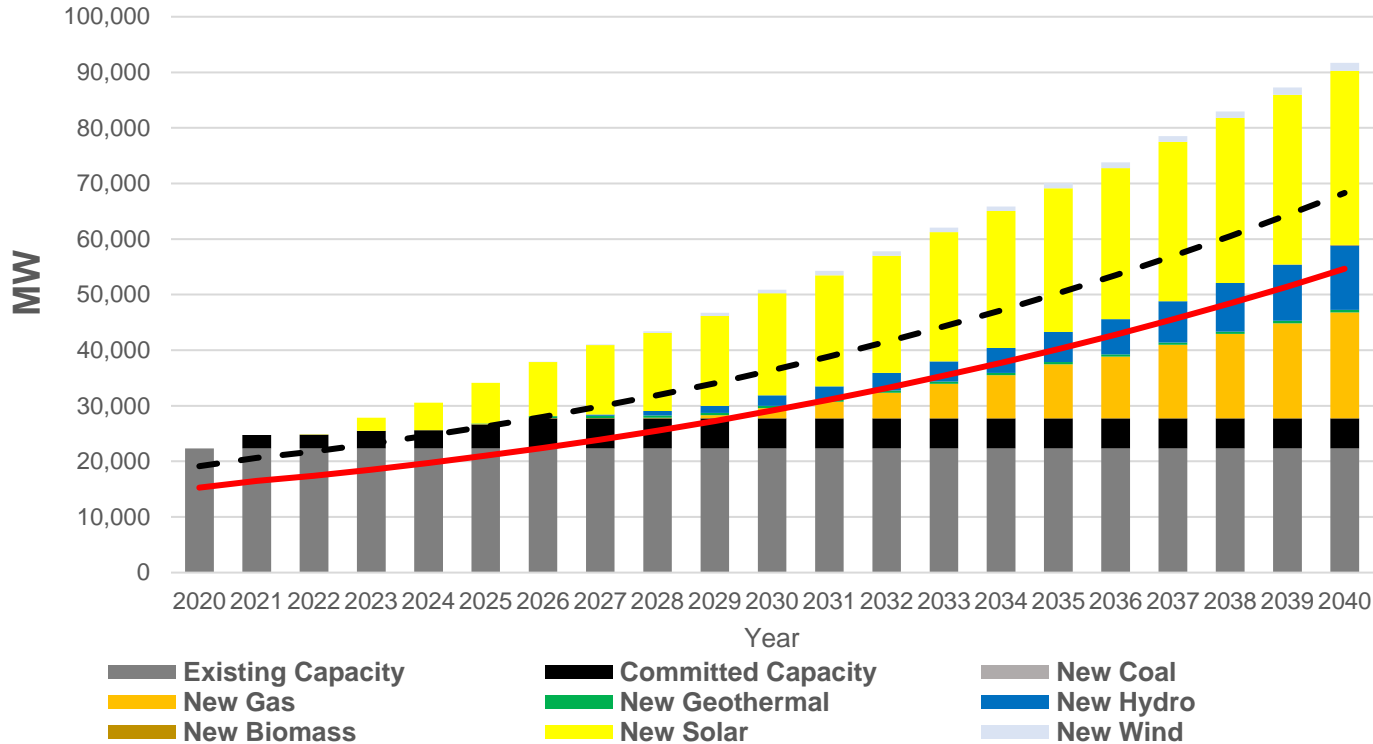


Project Status (as of August 2022):

- Capability of Mindanao-Visayas Interconnection Project (MVIP) is 450 MW of export
- Original target completion: December 2020 (based on 2016 Transmission Development Plan)
- Revised target completion: October 2022
- As of June 2022: 91.48% overall completion

Power Supply Outlook to 2040

Scenario with RE @ 35% by 2030 onwards



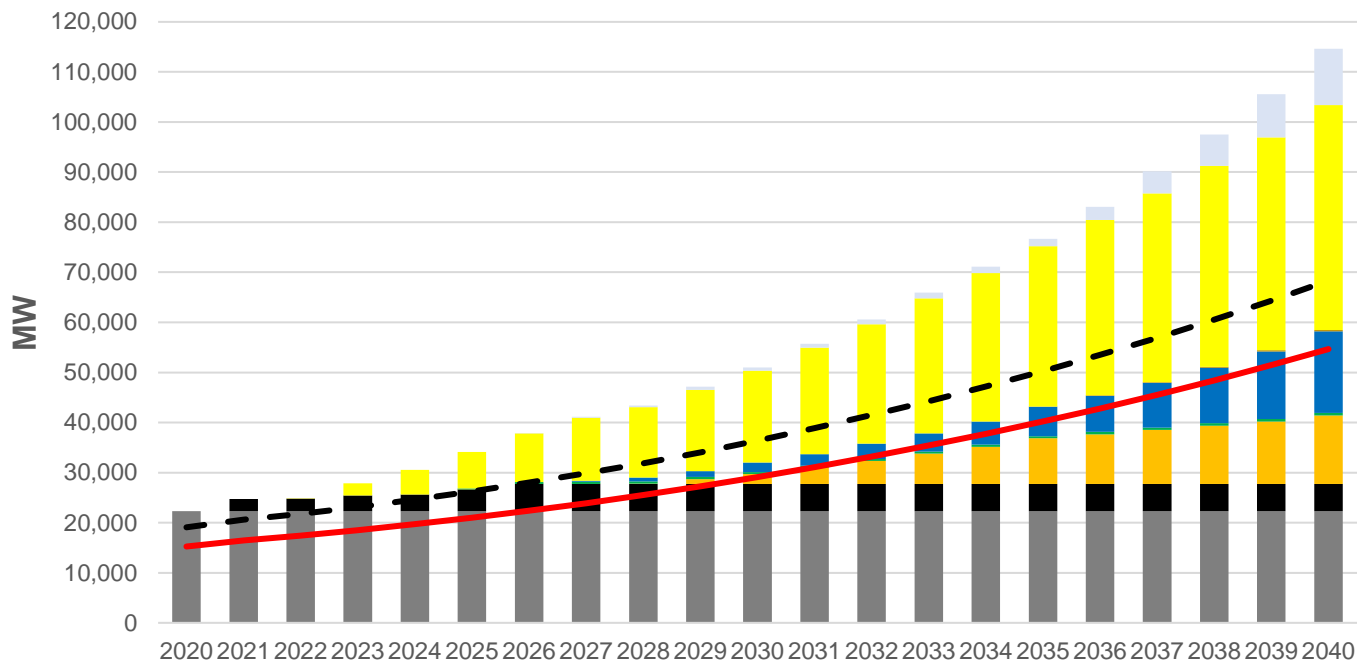
Year	Capacity (MW)	Demand (MW)
2025	34,125	21,019
2030	50,887	29,128
2035	70,056	40,209
2040	91,071	54,655

Source: DOE Power Development Plan 2020-2040



Power Supply Outlook to 2040

Scenario with RE @50% by 2040



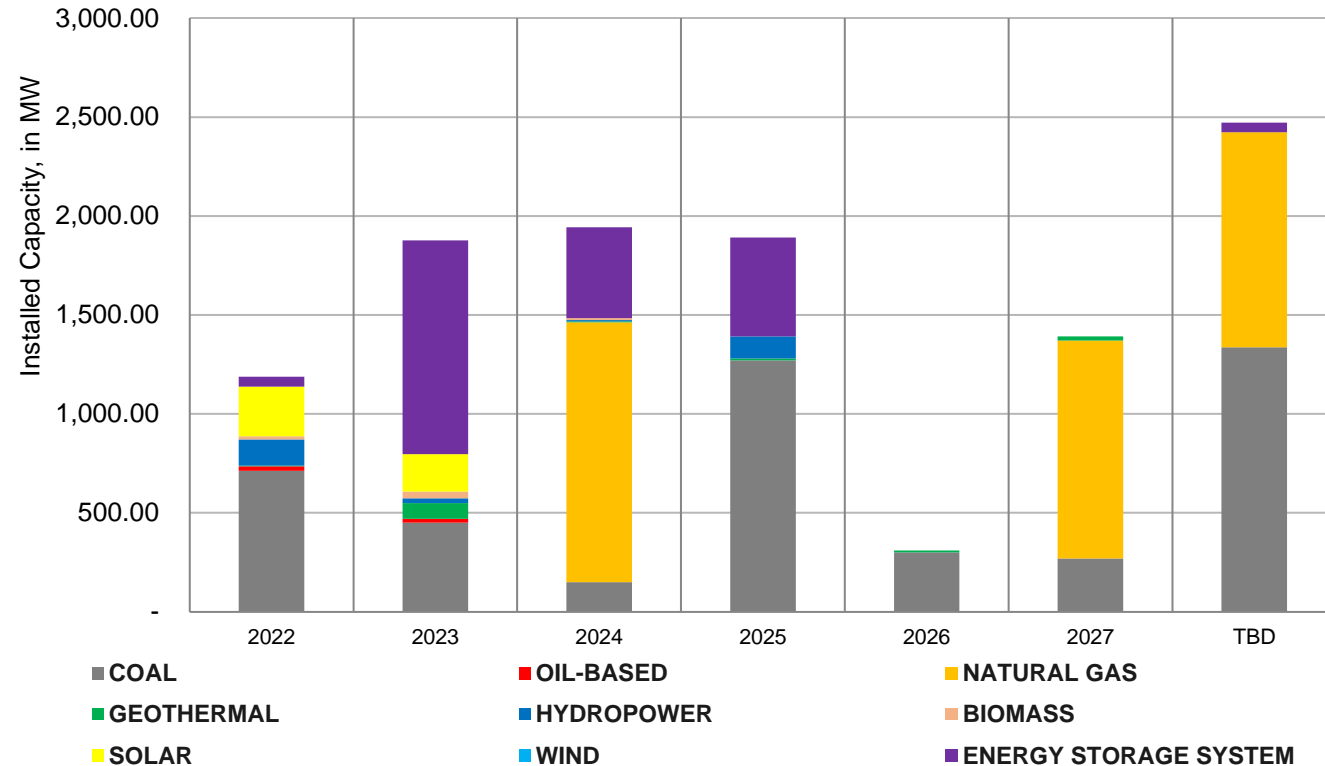
Year	Capacity (MW)	Demand (MW)
2025	34,125	21,019
2030	50,973	29,128
2035	76,682	40,209
2040	114,601	54,655

- Existing Capacity
- Committed Capacity
- New Coal
- New Gas
- New Geothermal
- New Hydro
- New Biomass
- New Solar
- New Wind
- Peak Demand
- 25% Reserve Margin

Source: DOE Power Development Plan 2020-2040



Total Committed Capacity, Philippines



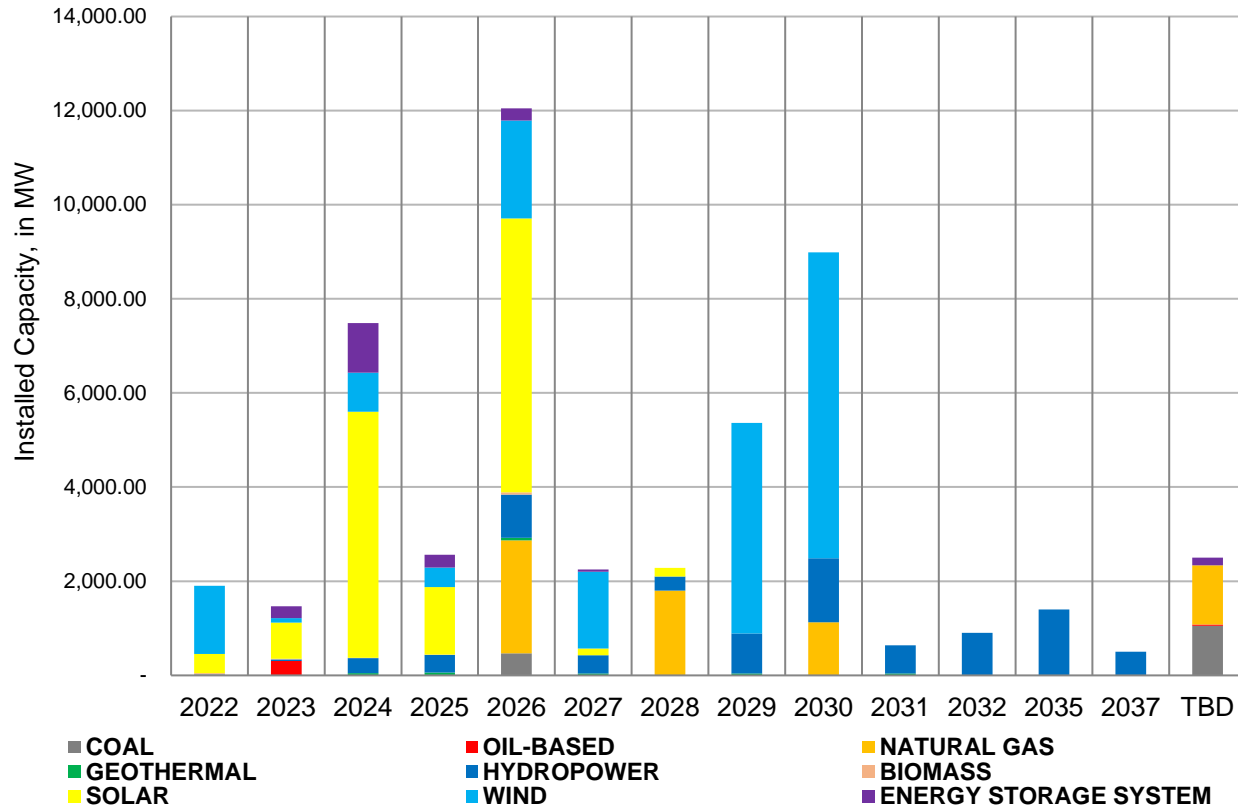
Plant Type	Total
COAL	4,488.40
OIL-BASED	41.75
NATURAL GAS	3,500.00
RENEWABLE ENERGY	904.53
GEOTHERMAL	129.00
HYDROPOWER	274.51
BIOMASS	60.60
SOLAR	440.42
WIND	-
TOTAL	8,934.68
ENERGY STORAGE SYSTEM (ESS)	2,139.13
BATTERY ESS	2,090.13
HYBRID ESS (Diesel-Battery System)	49.00

Note: TBD - To be determined

Source: DOE List of Private Sector-Initiated Power Projects as of 31 August 2022



Total Indicative Capacity, Philippines



Plant Type	Total
COAL	1,520.00
OIL-BASED	335.20
NATURAL GAS	6,588.00
RENEWABLE ENERGY	39,803.76
GEOTHERMAL	274.00
HYDROPOWER	7,958.00
BIOMASS	104.08
SOLAR	13,970.88
WIND	17,496.80
TOTAL	48,246.96
ENERGY STORAGE SYSTEM (ESS)	2,041.95
BATTERY ESS	2,041.95

Note: TBD - To be determined

Source: DOE List of Private Sector-Initiated Power Projects as of 31 August 2022



Supply Policy and Market Development Mechanisms

01

Prosumer

- Own use
- Net metering

02

Customer Contracting Options

- Interruptible Load Program (ILP)
- Green Energy Option Program (GEOP)
- Retail Competition and Open Access (RCOA)
- Directly-Connected Customers (DCC)

03

Grid & Generation Maintenance

- Grid Operation and Maintenance Program (GOMP)

04

DU Contracting

- Embedded Generation (RE 10-5-5 CSP Exempt)
- DU Contracting (in accordance with the CSP)

05

System Operator Contracting

- Ancillary Services

06

DOE Support for RE Development

- Green Energy Auction Program (GEAP)

- ❖ Timely development of transmission and distribution wires and facilities
- ❖ Invest and utilize smart home and smart grid technologies



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Investment Forum

END OF PRESENTATION

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October 28, 2022



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