



UNDERSTANDING THE ENERGY SUPPLY CHAIN

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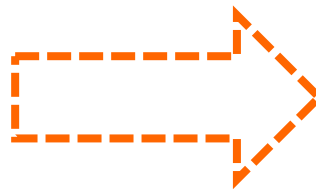


PRESENTATION OUTLINE

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Power Demand and Supply Chain

- Power Myth
- Transformation of fuel into electricity
- Types of Power Plant



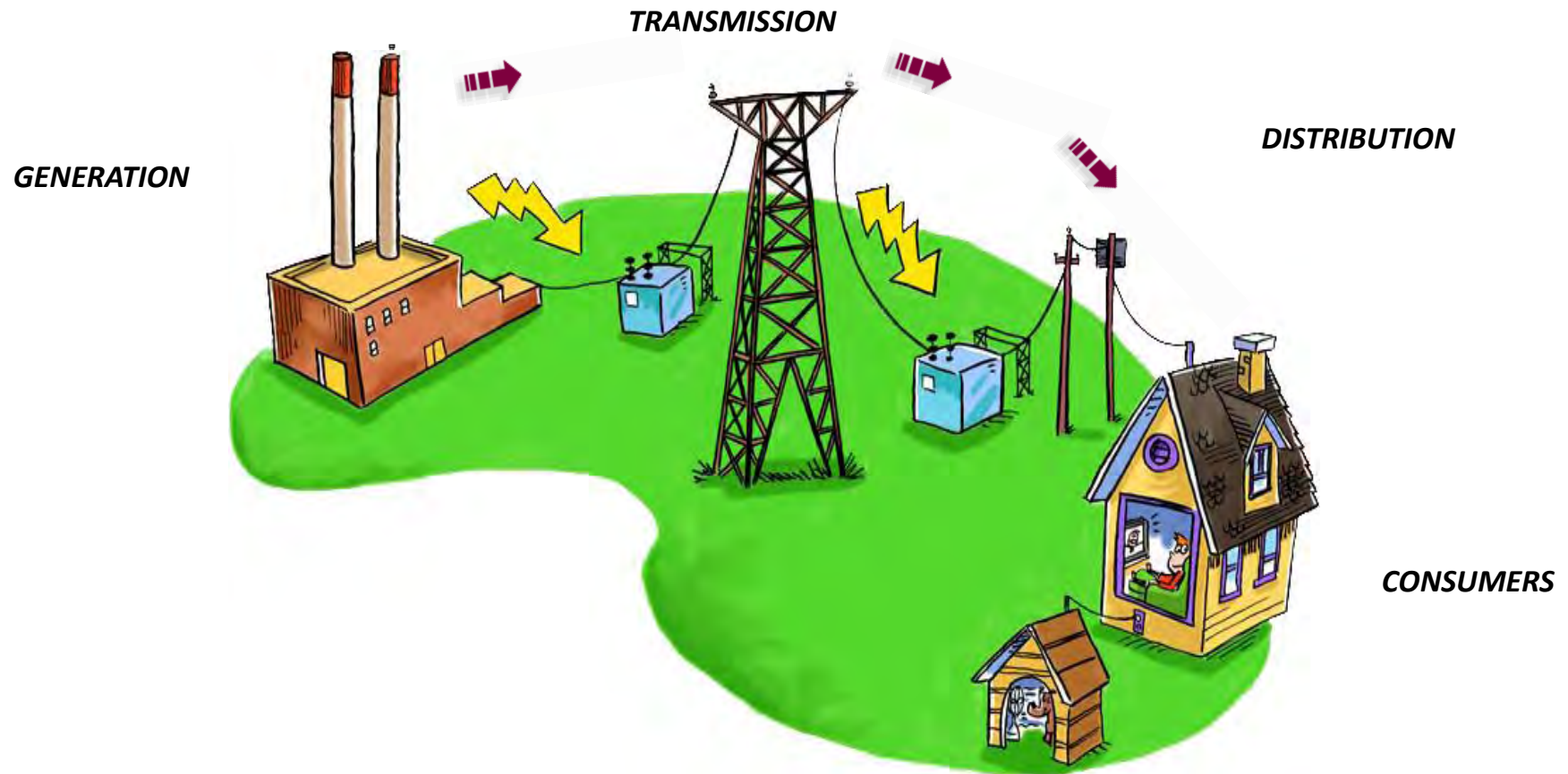
2

What is WESM

- WESM Basic Features
- How WESM bidding works
- RTD Scenarios



Power Demand and Supply Chain



Reality Check



Bakit sobrang **mataas** ang presyo ng ating kuryente?

Bakit parang **mas mababa** ang presyo ng kuryente nung panahon ng **NPC**?

Bakit mas **mataas** ang presyo ng kuryente natin compared sa ibang ASEAN countries?

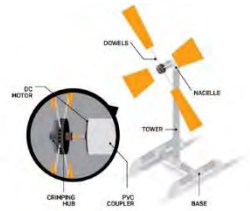
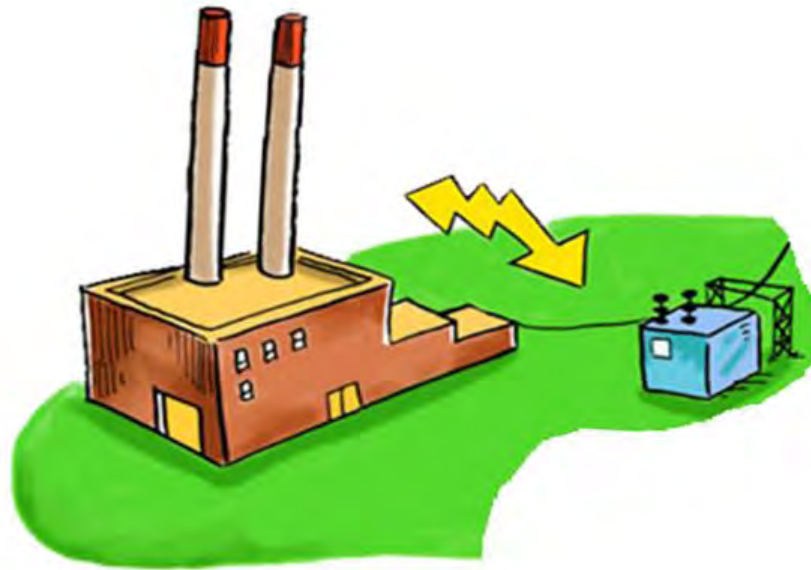
Mali ba ang composition ng power generation mix ng ating bansa?

Tama nga ba na **privatized** ang planta ng NPC?

Kaya ba mataas ang ating power rate gawa ba ng **WESM**?



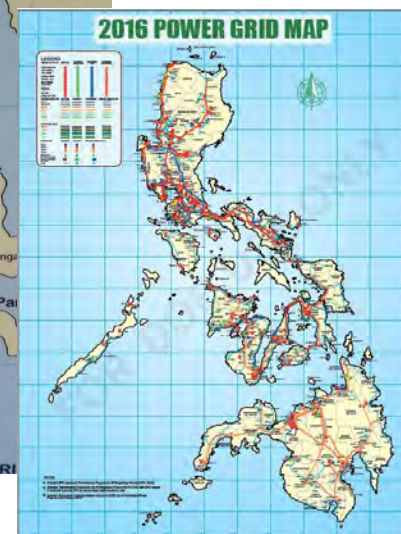
Transformation of fuel into electricity



NPC Assets



- NPC Power Plants 121 (11,361 MW)
- Transmission lines (10,494 ckt. km.)
- Substation Capacity (20,041 MVA)



Types of Power Plant



Base Load Plants

- Plants which can generate dependable power to consistently meet demand
- Produce continuous, reliable and efficient power at low cost
- Run 24/7 throughout the year except in cases of repairs or scheduled maintenance

1294 MW
Sual Coal-fired Power Plant



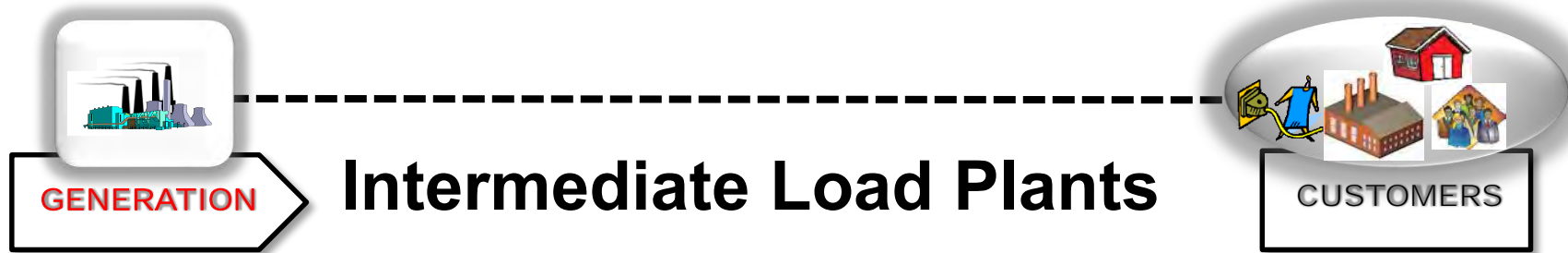
600 MW
Pagbilao Coal-fired Power Plant



610 MW
Leyte Geothermal Power Plant



Types of Power Plant



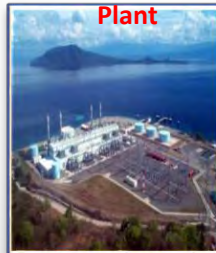
Fill the gap between base load and peaking plants

- Larger than peaking plants so the construction cost are higher
- They also run more efficiently

1060 MW
Sta Rita Natural Gas-fired Plant



1200 MW
Ilijan Natural Gas-fired Plant



500 MW
San Lorenzo Natural Gas-fired Plant

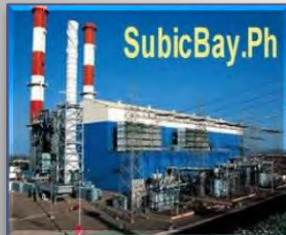


Types of Power Plant



- Provide power during peak system demand period
- Higher responsive to changes in electrical demand and can be started up relatively quickly (Hydroelectric Power Plant)
- Very expensive to operate, relative to the amount of power they produce and the cost of fuel to power them (Oil-based power plant)

116 MW
Subic Diesel Power Plant



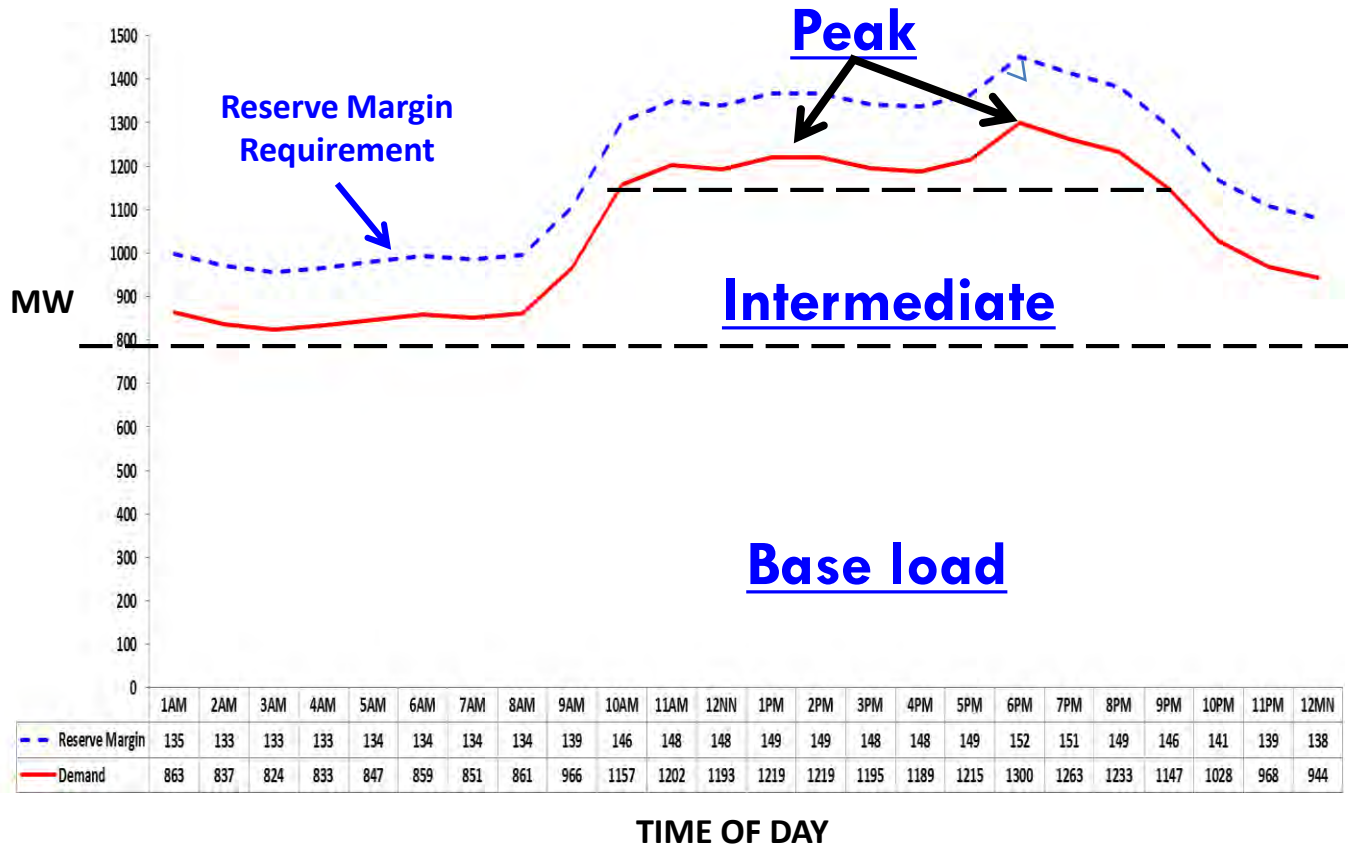
360 MW
Magat Hydroelectric Power Plant



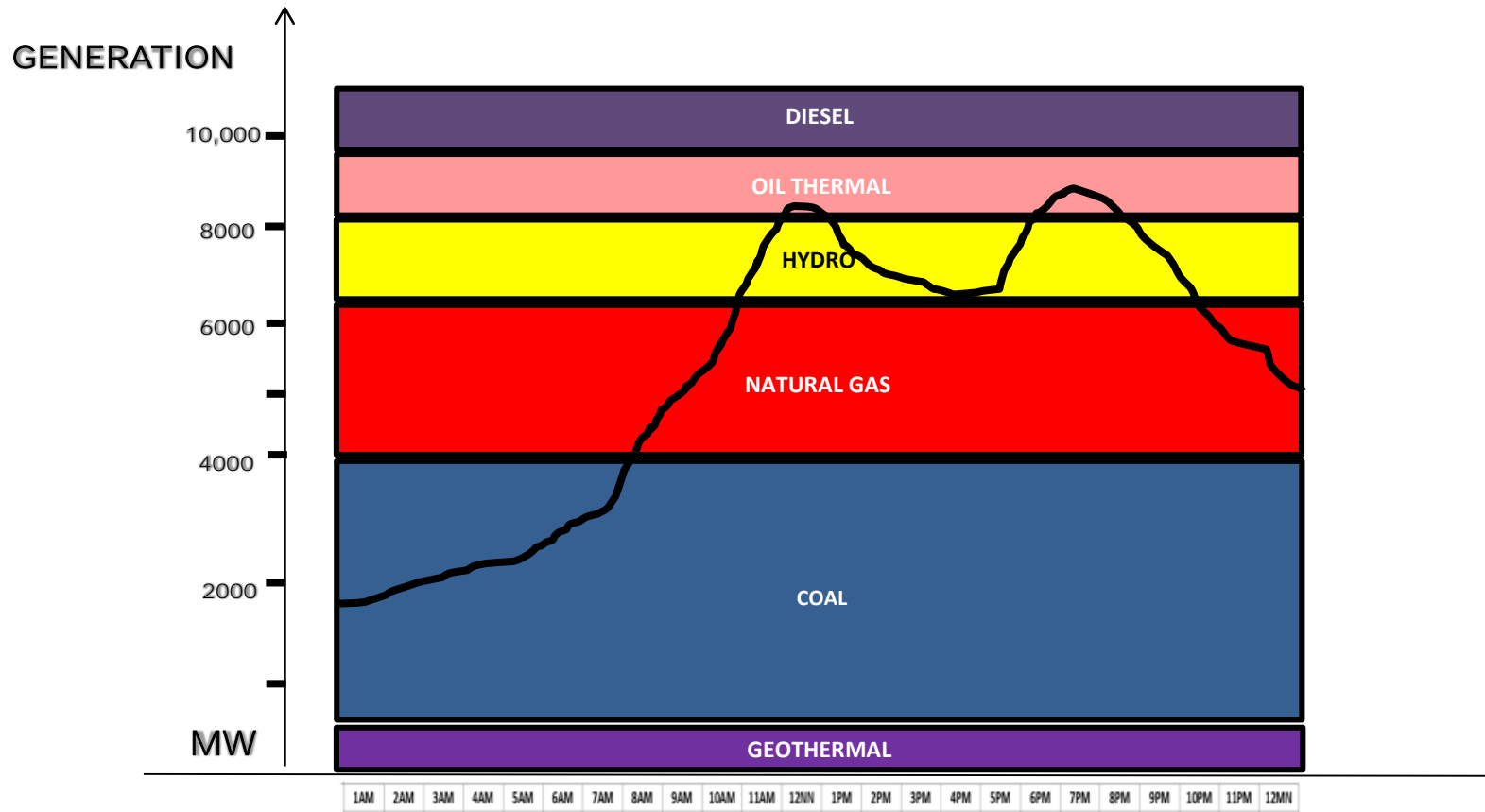
755MW
CBK Hydroelectric Power Plant



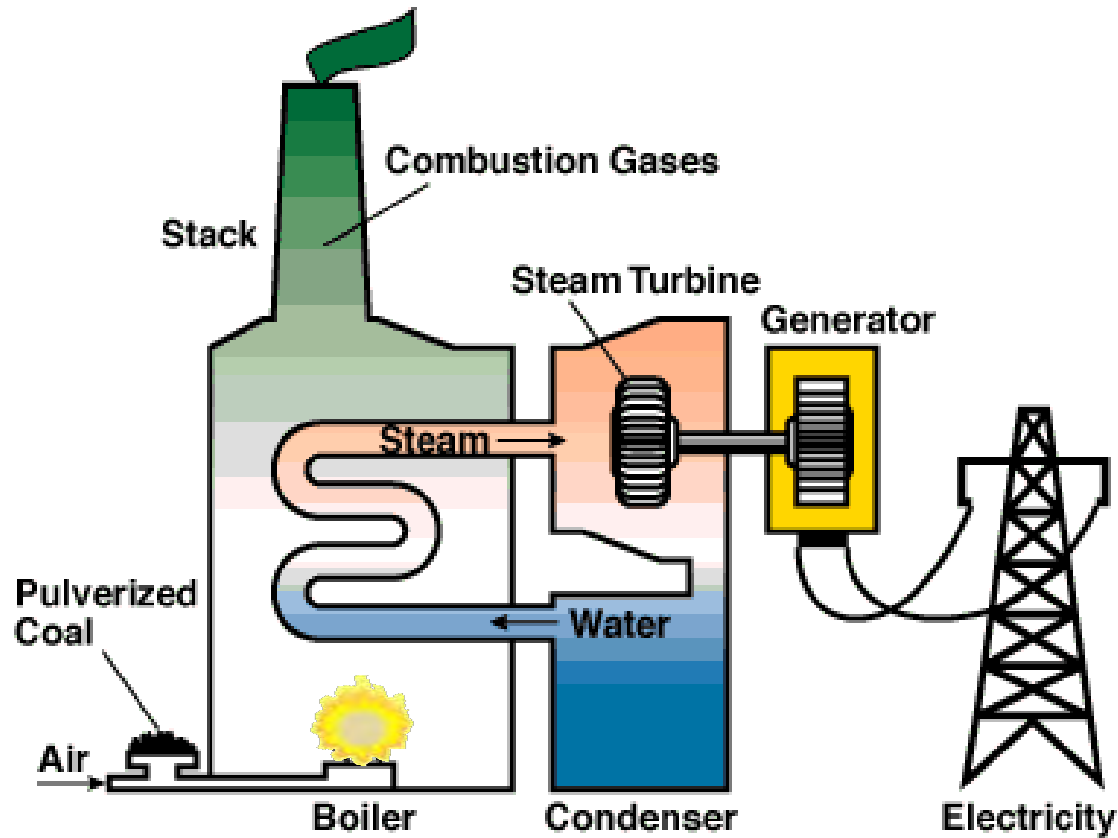
Typical Load Curve



Stacking of Power Plants



Coal Power Plant

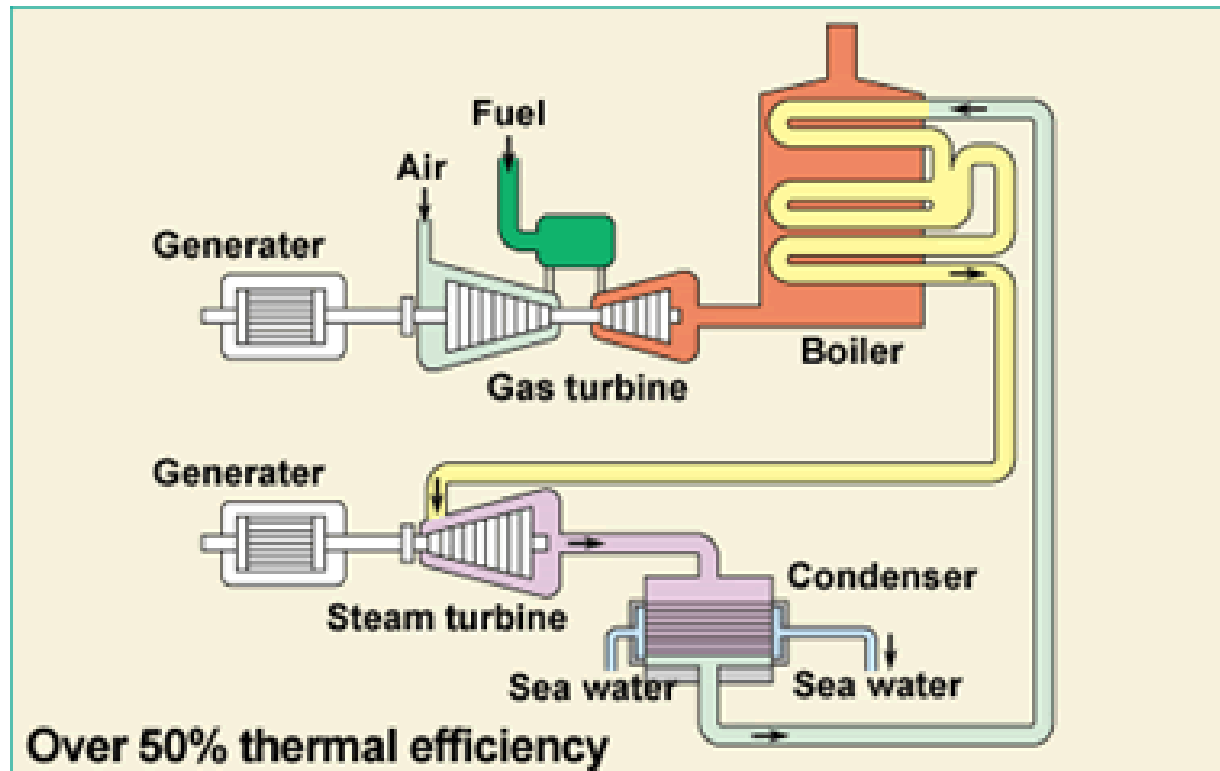


Pagbilao Power Plant

2 X 382 MW, Isla Grande-Quezon



Natural Gas Power Plant

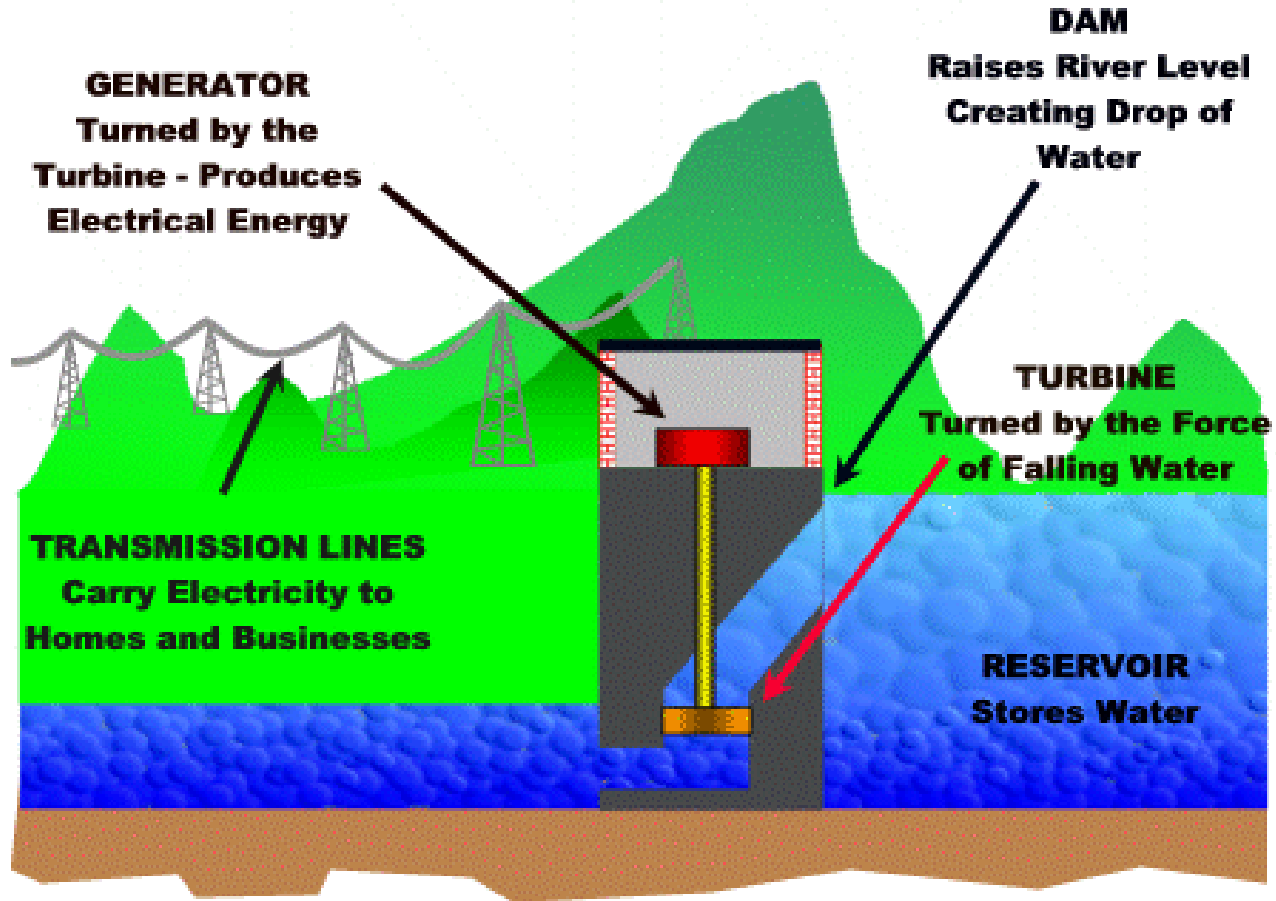


Natural Gas Combined Cycle Power Station

1,200 MW Ilijan, Batangas



Hydro Electric Power Plant



Magat Hydroelectric Power Plant

360 MW Santiago City / Alfonso Lista, Ifugao / Ramon, Isabela



WESM Stakeholders



PHILIPPINE ELECTRICITY
MARKET CORPORATION
(PEMC)



NATIONAL GRID
CORPORATION
(NGCP)



DEPARTMENT OF
ENERGY
(DOE)



ENERGY REGULATORY
COMMISSION
(ERC)



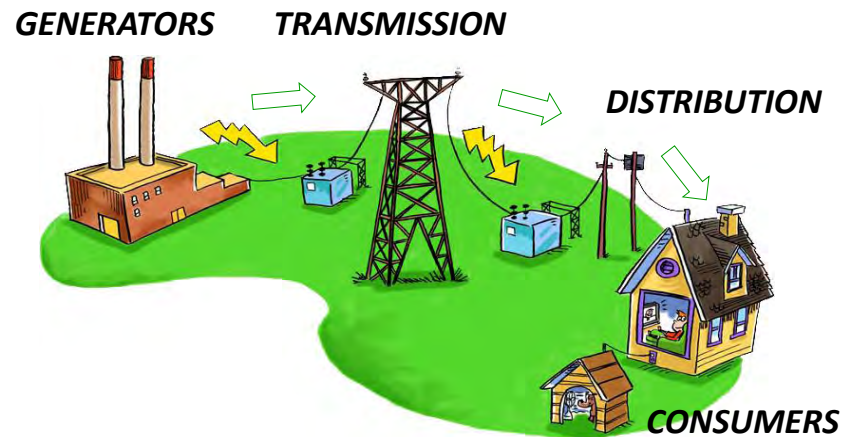
POWER GENERATION COMPANIES
(GENCOs)



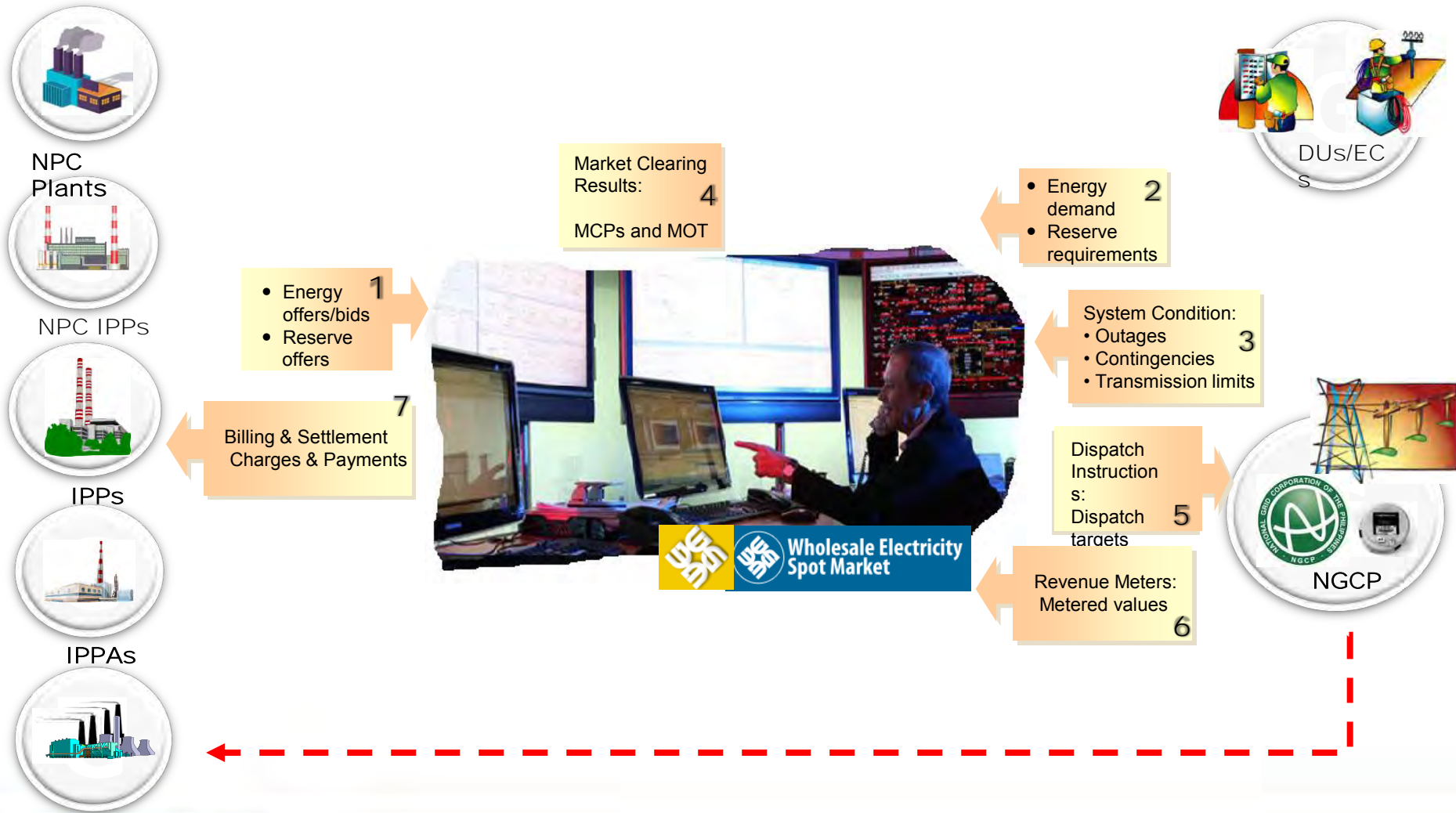
DISTRIBUTION UTILITIES
(DOs)



DIRECTLY CONNECTED
CONSUMERS



How WESM Bidding Works



WESM Basic Features



GROSS POOL - All energy transactions are scheduled in the market



GROSS DISPATCH - Generators submit energy offers (price and Quantity) for central scheduling and dispatch



TRADING HOURS - 24 hours/day, 7 days per week



LOCATIONAL MARGINAL PRICE - Marginal price computed at each node or location to reflect transmission loss and/or congestion



WESM Basic Features



GOVERNANCE - Governed by stakeholders (PEMC)



TRADING GUARANTEES - Prudential guarantees to assure payment



NET SETTLEMENT - Bilateral Contract quantities transacted in the pool, but, can be settled outside of the market. Ex-ante price and quantity aligned with ex-post price and quantity



BILLING & SETTLEMENT - 60 days period for B&S



How WESM Bidding Works



GENERATION



CUSTOMERS
DUs/ECs



Hydro C
P 0,000/MWh
25 MW



Hydro B
50 MW
P
1,000/MWh



Wind/Solar
5 MW
Priority
Dispatch



Run-of-River
50 MW
Non-
Scheduled



Geogas F
P
3,000/MWh
150MW



Natgas E
- P
1,000/MWh
100MW

Coal D
P 2,500/MWh
115 MW



Diesel H
P 4,000/MWh
200 MW



Bunker G
P 3,500/MWh
300 MW



Biomass
5MW
Priority
Dispatch

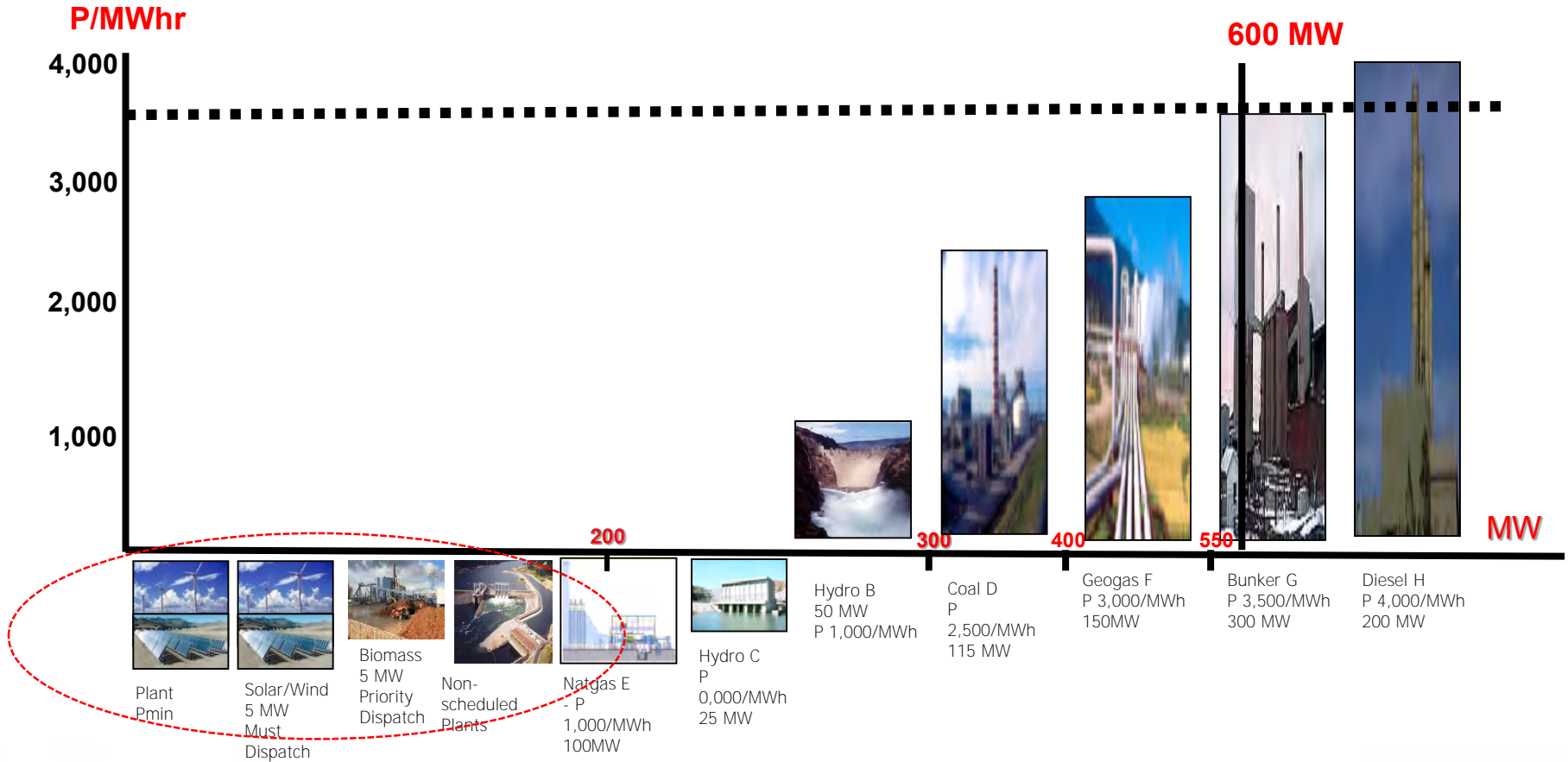


**Roxas Boulevard Demand
Requirements: 600 MW**

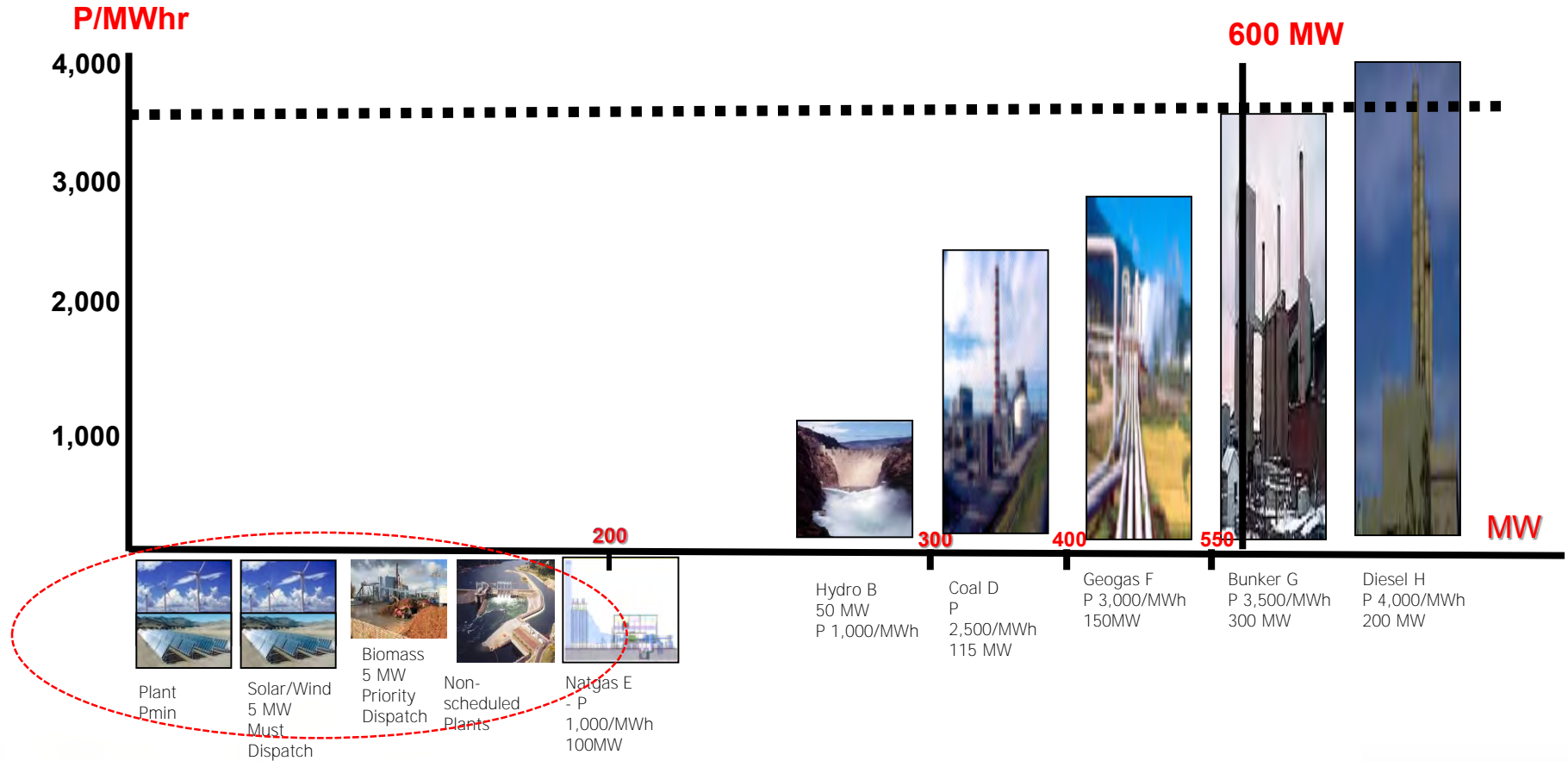


Merit Order Table

Market Clearing Price - Php 3,500/MWh (marginal cost of meeting demand)
Marginal Plant – Bunker G
Price Taker

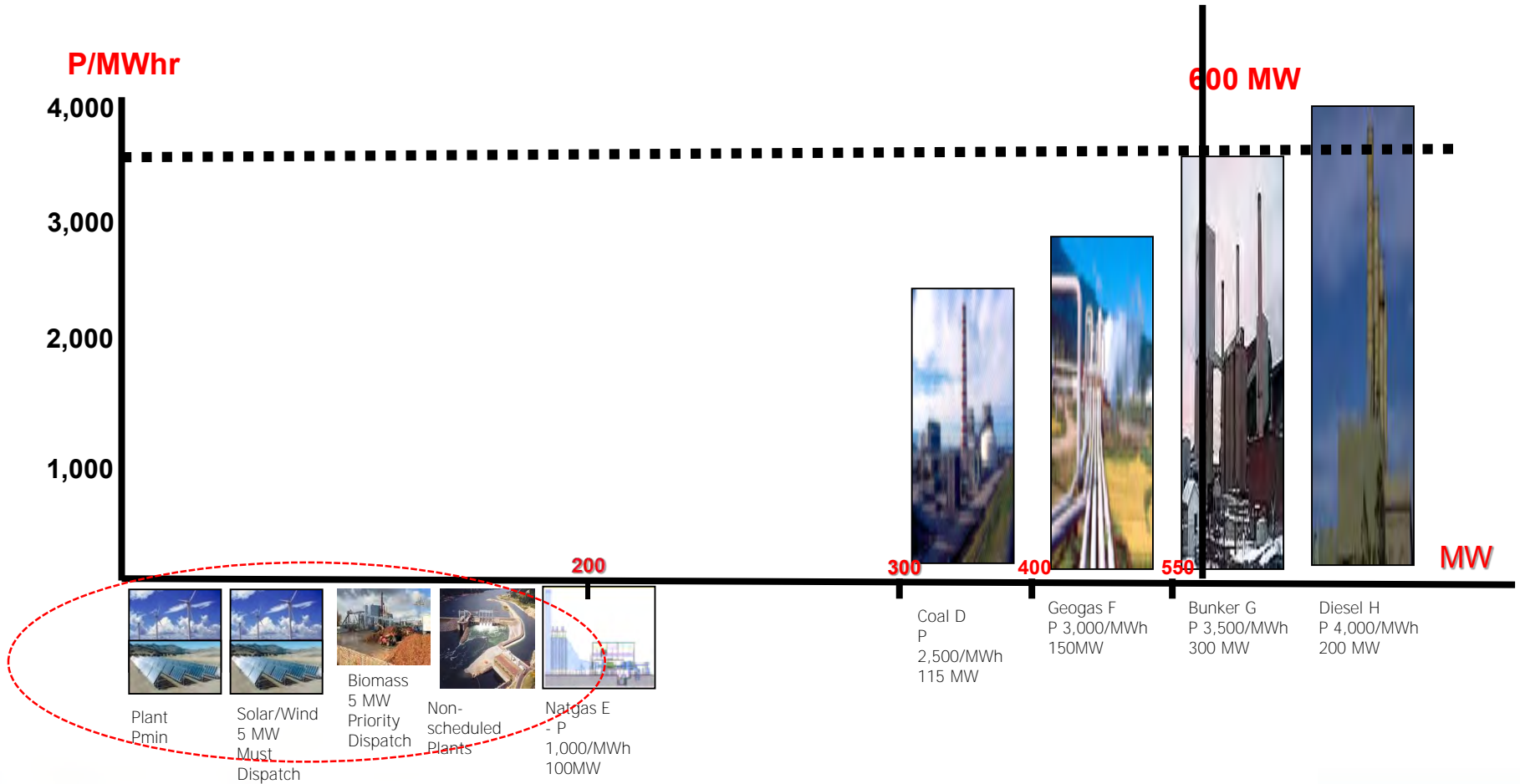


Merit Order Table

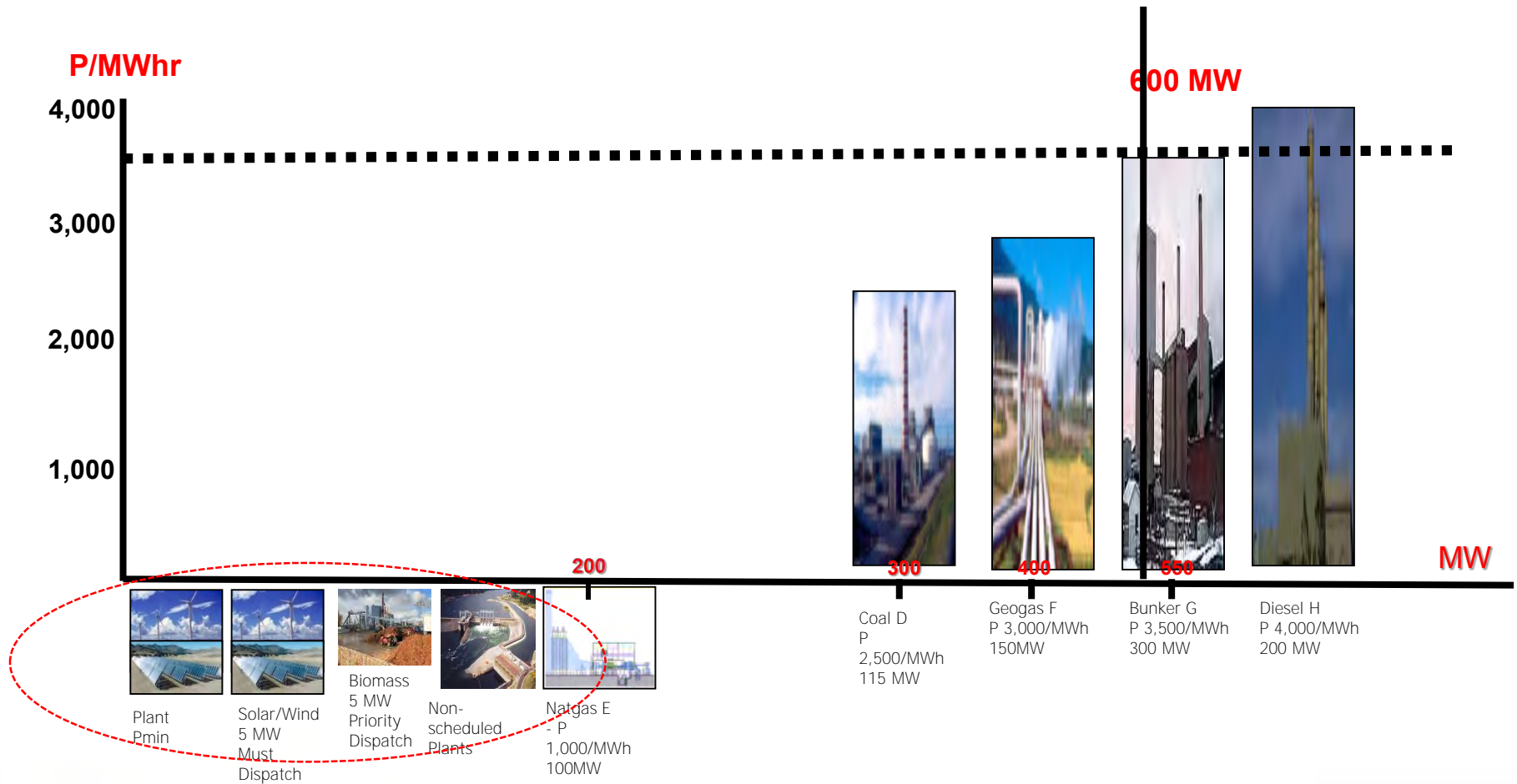


Merit Order Table

Market Clearing Price - Php 4,000/MWh (marginal cost of meeting demand)
 Marginal Plant – Diesel H
 Price Taker



Merit Order Table



Real Time Facility Status



Thank You!

DOE-Electric Power Industry Management Bureau (EPIMB)
Power Market Development Division (PMDD)



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