

A nighttime cityscape featuring a complex multi-level highway interchange with light trails from traffic. In the background, several tall skyscrapers are illuminated against a dark sky. The overall scene is a vibrant urban environment.

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The Practice of Doing Good





2019 • Manila, Philippines

The Role of PPPs in Building a Resilient and Sustainable Future: The Philippine Setting

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DISCUSSION OUTLINE

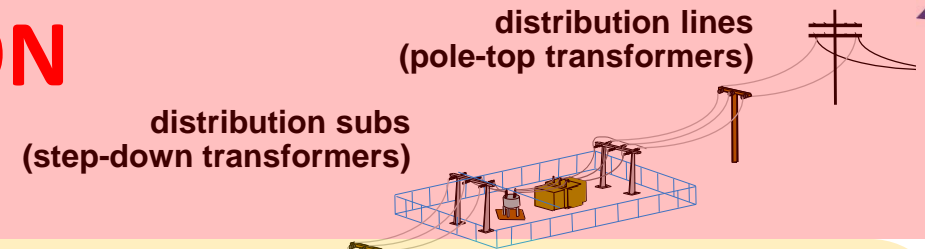
Part 1	Development of Regulatory Regime for Electricity Industry in the Philippines <ul style="list-style-type: none">• 1980s-1990s: Power Crisis• 1995-2001: Liberalization of Power Generation• 1996: Build-Operate-Transfer Law
Part 2	Restructuring of the Electric Power Industry through EPIRA <ul style="list-style-type: none">• 4 Sectors: Generation, Transmission, Distribution and Supply• NPC Privatization, PSALM and TRANSCO• WESM Creation
Part 3	Legal Framework: Renewable Energy Act of 2008 <ul style="list-style-type: none">• Available Renewable Energy Resources, Supply Mix and Demand Outlook• Fiscal Incentives and Non-Fiscal Incentives
Part 4	RE Mechanisms: The New Approach and Targets <ul style="list-style-type: none">• Renewable Portfolio Standards for On-Grid Areas and Off-Grid Areas• Green Energy Option Rules• Renewable Energy Market
Part 5	Moving Forward for LGUs <ul style="list-style-type: none">• Determine available RE resources and conduct feasibility studies• Ascertain market for power and seek private capital• Facilitate permits and licensing requirements
Part 6	Developing a Renewable Energy Plant for Available Markets

PART 1: ELECTRIC POWER INDUSTRY

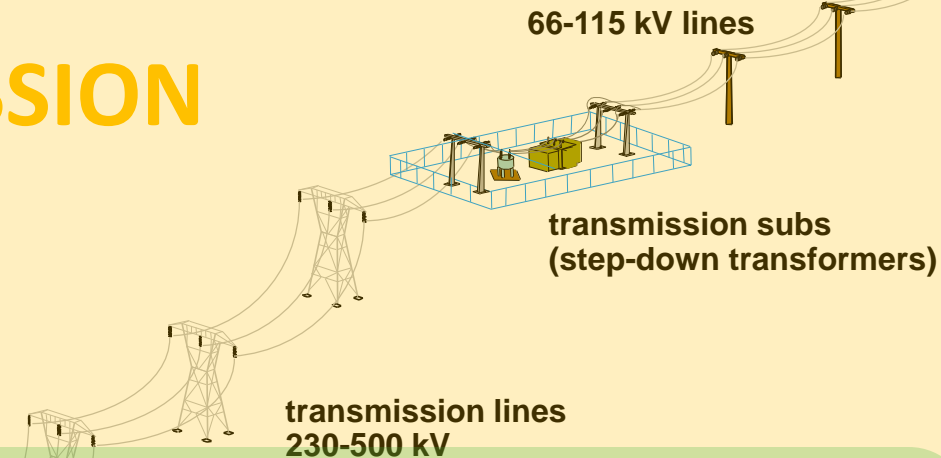
REGULATORY REGIME

BASIC COMPONENTS OF POWER NETWORKS

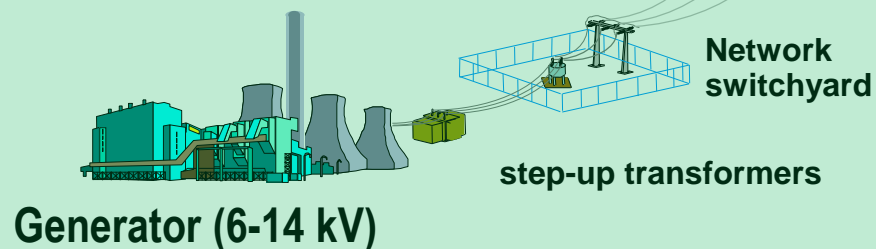
DISTRIBUTION



TRANSMISSION



GENERATION



PART 2: RESTRUCTURING

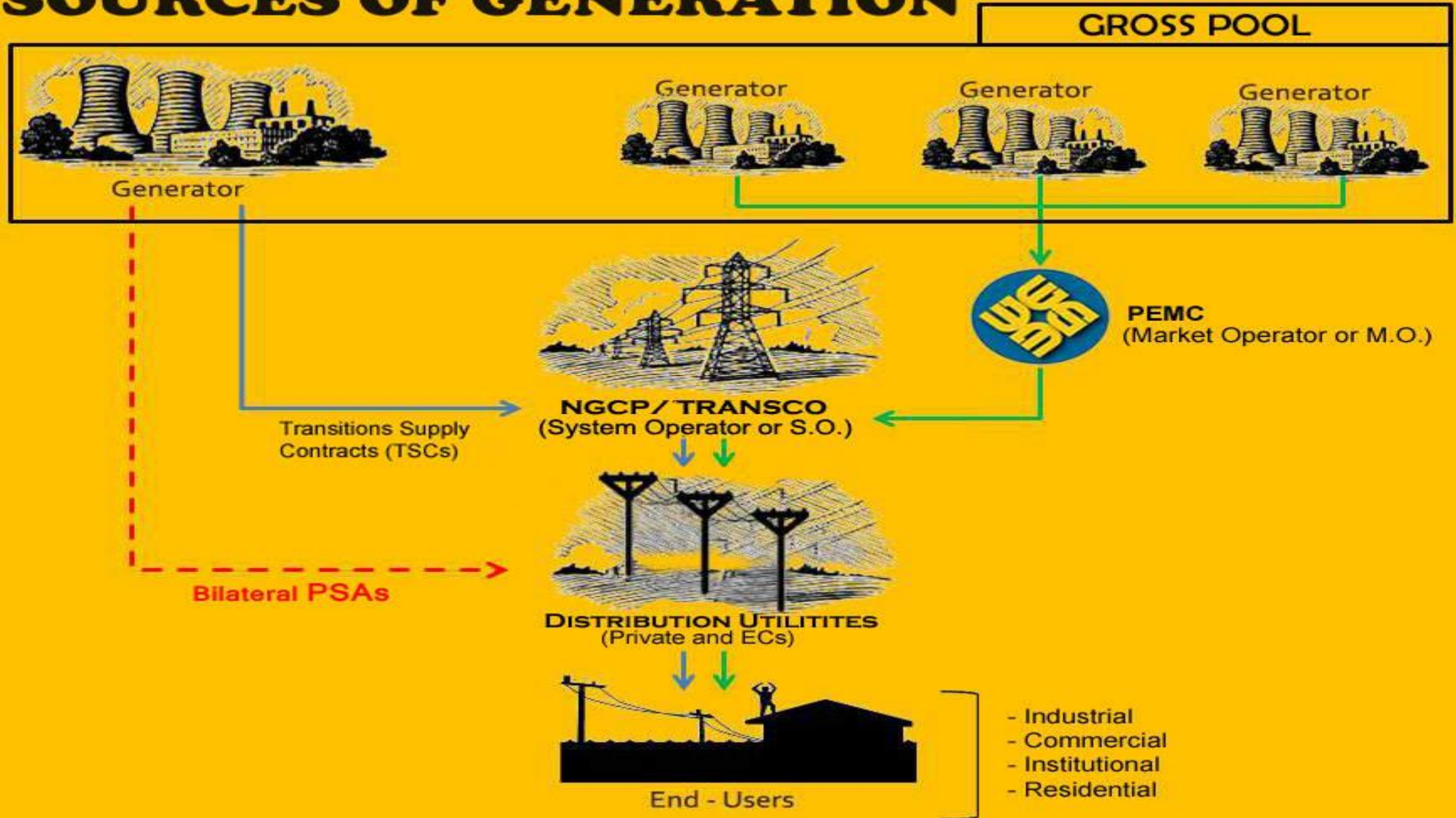
ELECTRIC POWER INDUSTRY REFORM ACT OF 2001

REORGANIZATION

The Electric Power Industry shall be divided into 4 sectors

- **Generation** of electric power, a business affected with public interest, shall be competitive and open
- **Transmission** of electric power shall be regulated common electricity carrier business, subject to the ratemaking powers of the ERC
- **Distribution** of electricity to end-users shall be a regulated common carrier business requiring a national franchise, subject to regulation by the ERC
- **Supply** sector is a business affected with public interest. Except for distribution utilities and electric cooperatives with respect to their existing franchise areas, all suppliers of electricity to the contestable market shall require a license from the ERC

SOURCES OF GENERATION



Creation of ERC

Unbundling

TRANSCO Concession Agreement

IPP Administrators

WESM

Role of DOE

Remove Cross-Subsidies

Privatization of NPC Generation

Retail Electricity Suppliers

Retail Competition

THE LONG AND BUMPY ROAD TO RETAIL COMPETITION



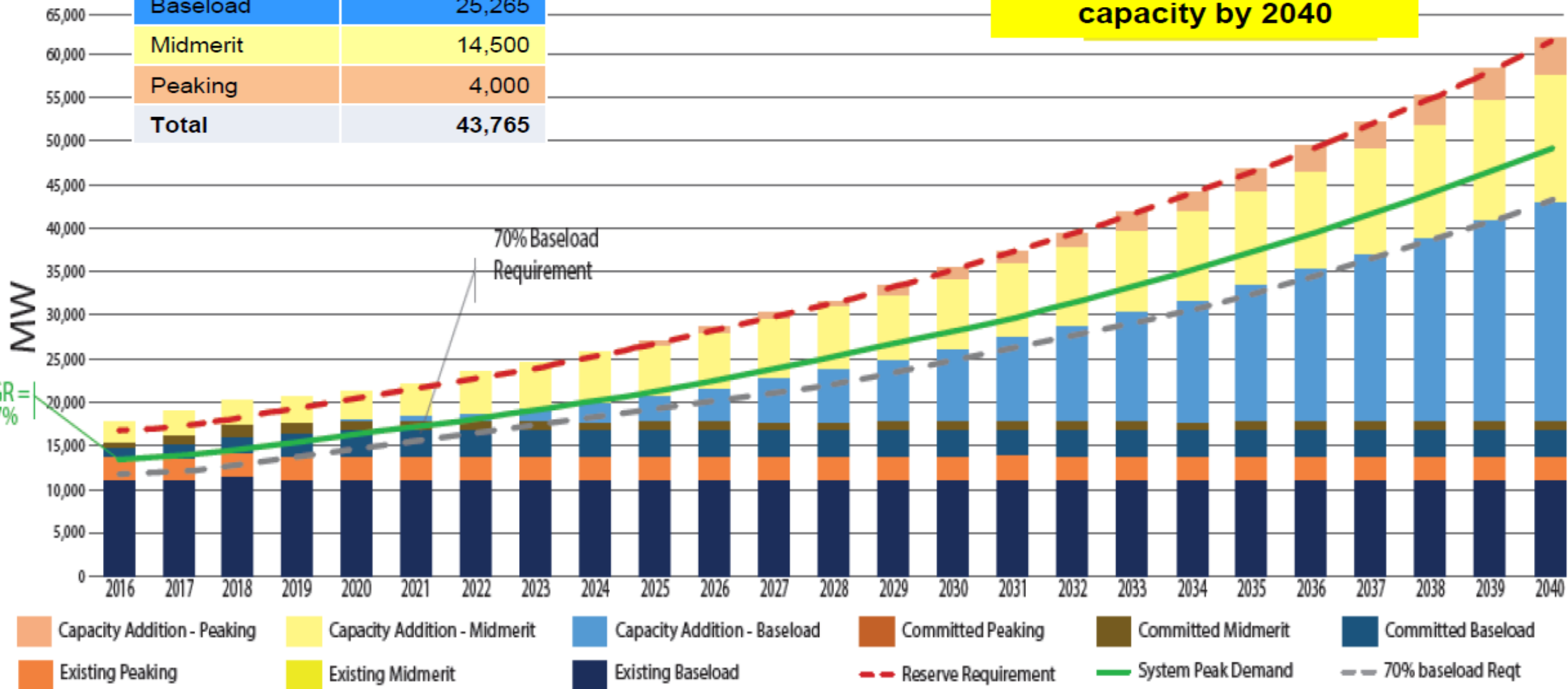
PART 3: RE LEGAL FRAMEWORK

BACKGROUND

Philippines Demand and Supply Outlook, 2016-2040

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

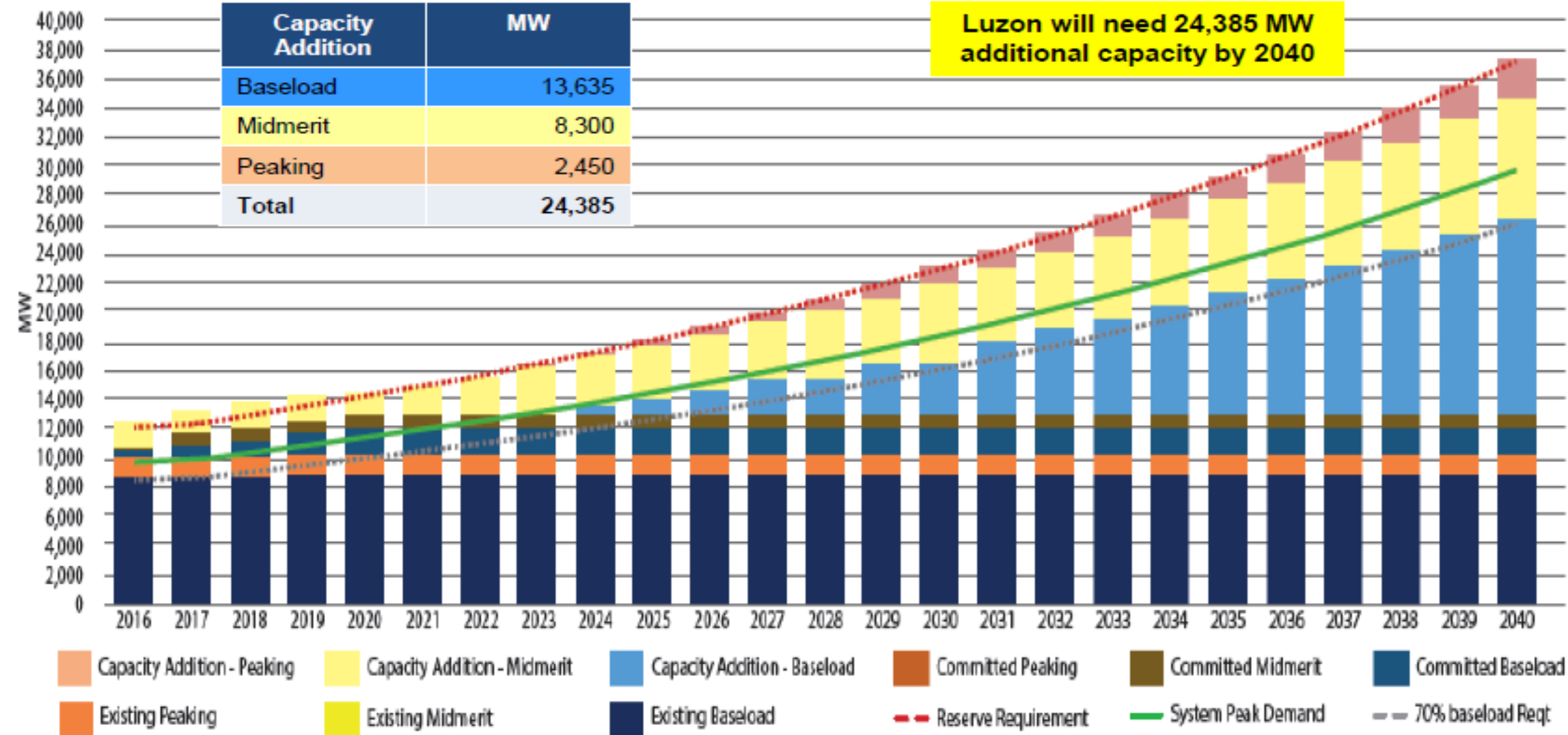
Philippines will need 43,765 MW additional capacity by 2040



Luzon Demand and Supply Outlook, 2016-2040

Capacity Addition	MW
Baseload	13,635
Midmerit	8,300
Peaking	2,450
Total	24,385

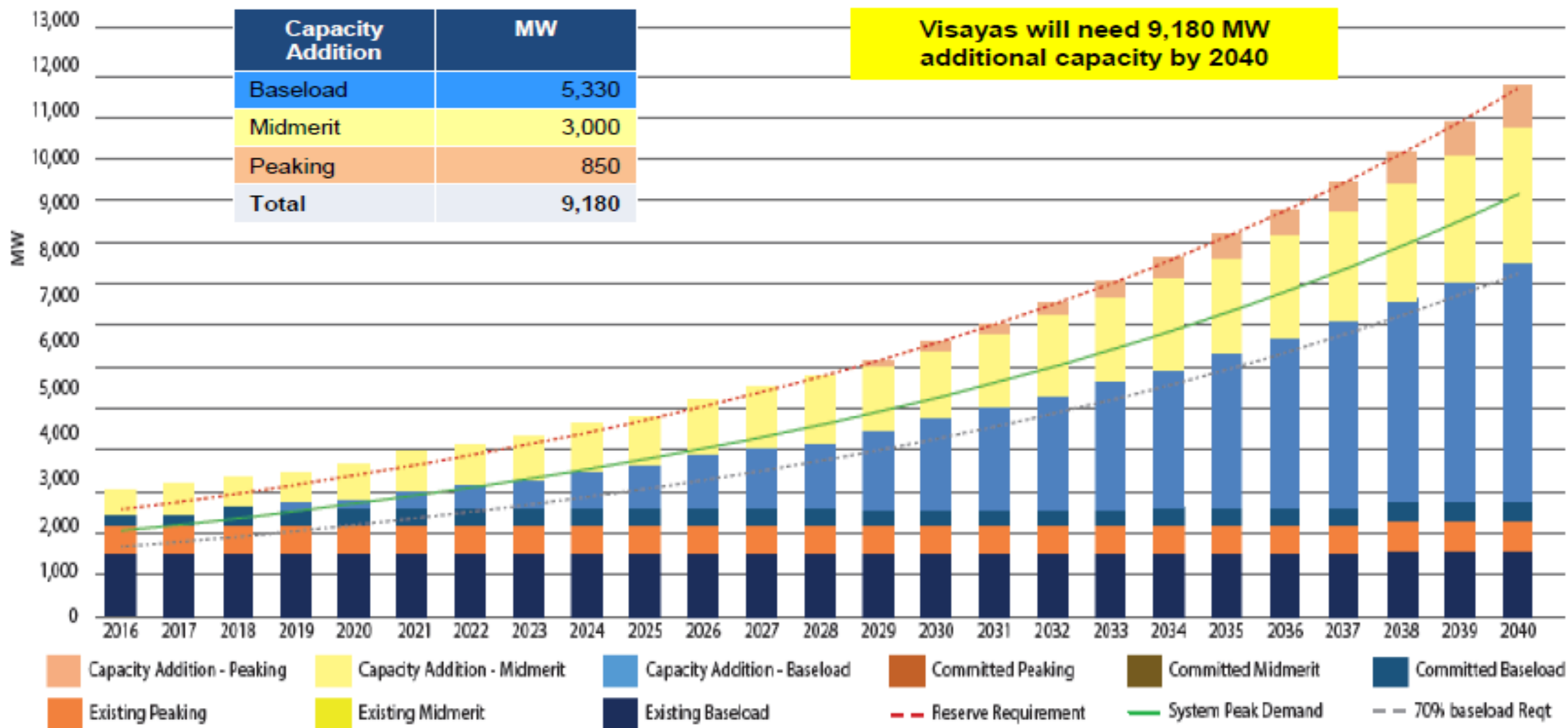
Luzon will need 24,385 MW additional capacity by 2040



Visayas Demand and Supply Outlook, 2016-2040

Capacity Addition	MW
Baseload	5,330
Midmerit	3,000
Peaking	850
Total	9,180

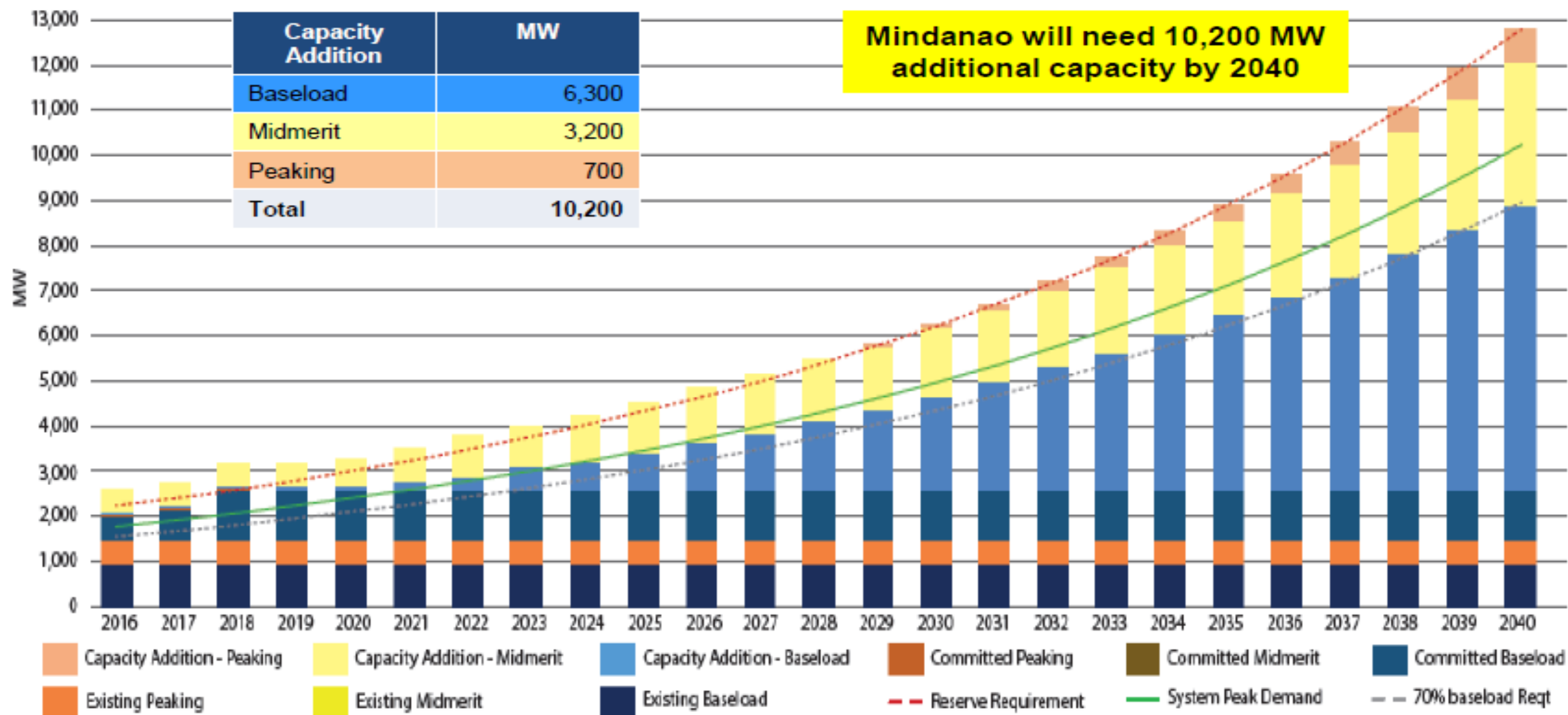
Visayas will need 9,180 MW additional capacity by 2040



Mindanao Demand and Supply Outlook, 2016-2040

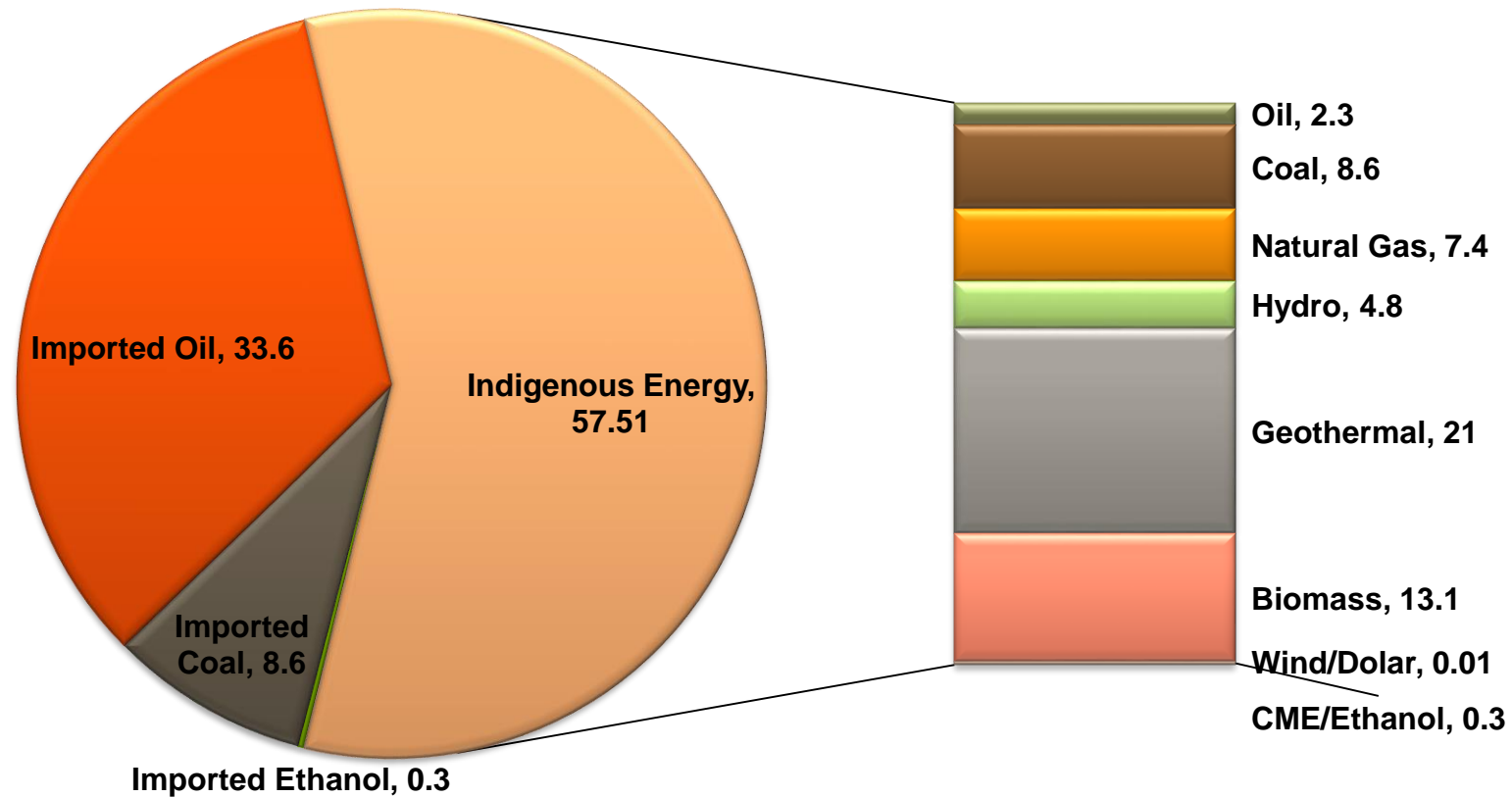
Capacity Addition	MW
Baseload	6,300
Midmerit	3,200
Peaking	700
Total	10,200

Mindanao will need 10,200 MW additional capacity by 2040



PRIMARY ENERGY SUPPLY MIX

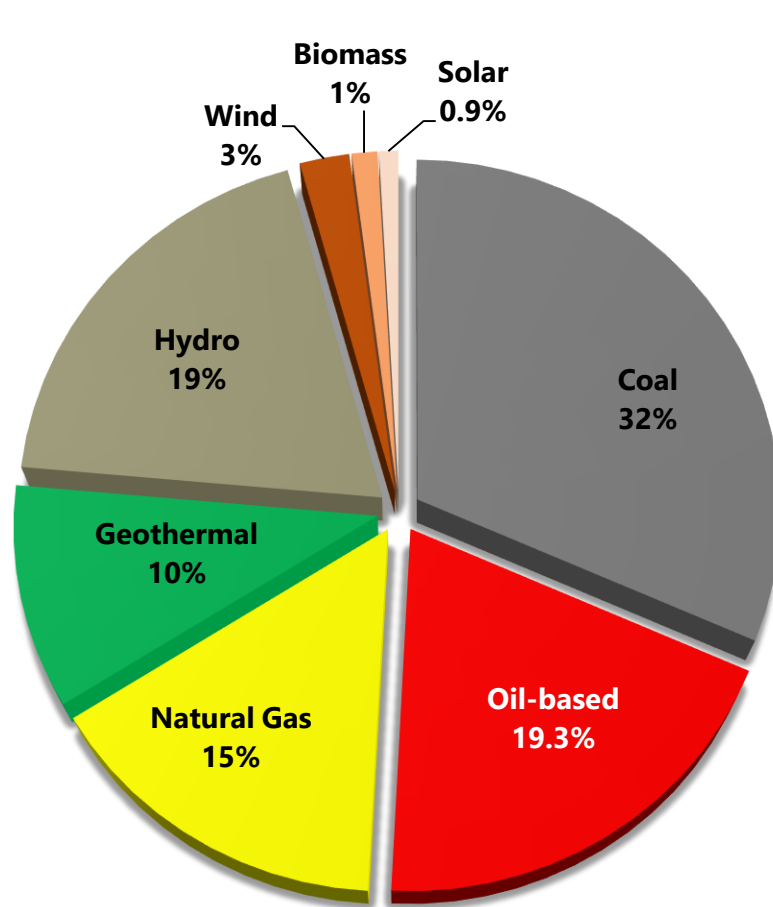
2015-2016



ENSURED SUFFICIENT SUPPLY

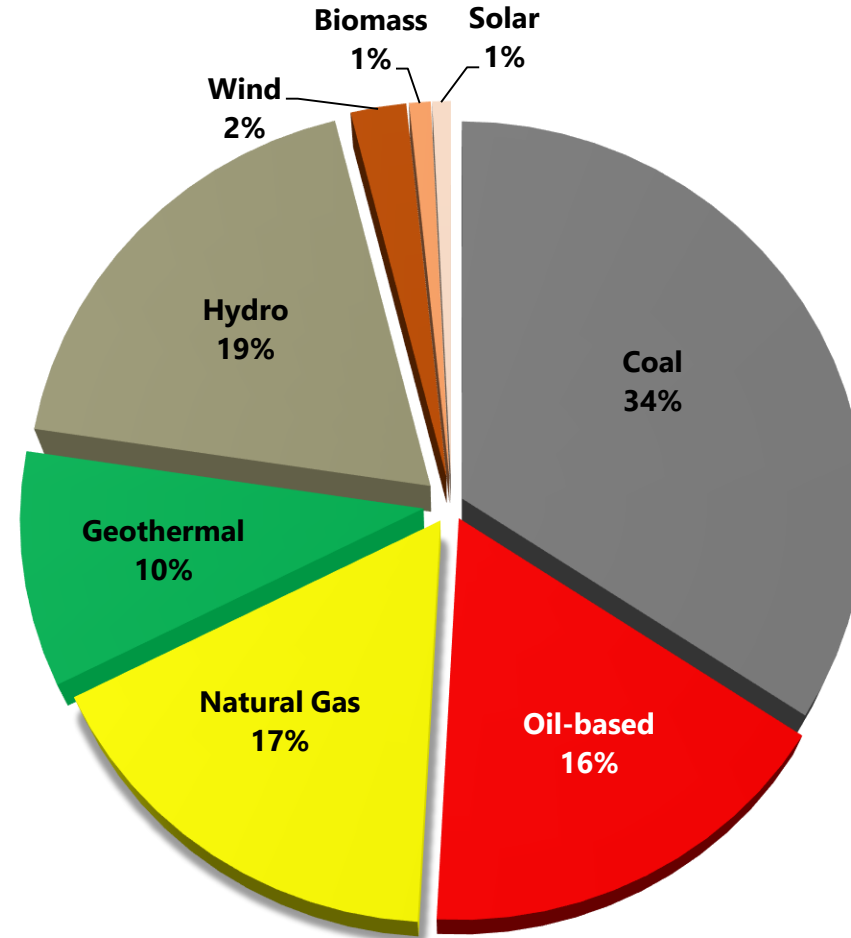
2015 CAPACITY MIX

INSTALLED



Total Installed Capacity = 18,765 MW
RE Share = 34%

DEPENDABLE



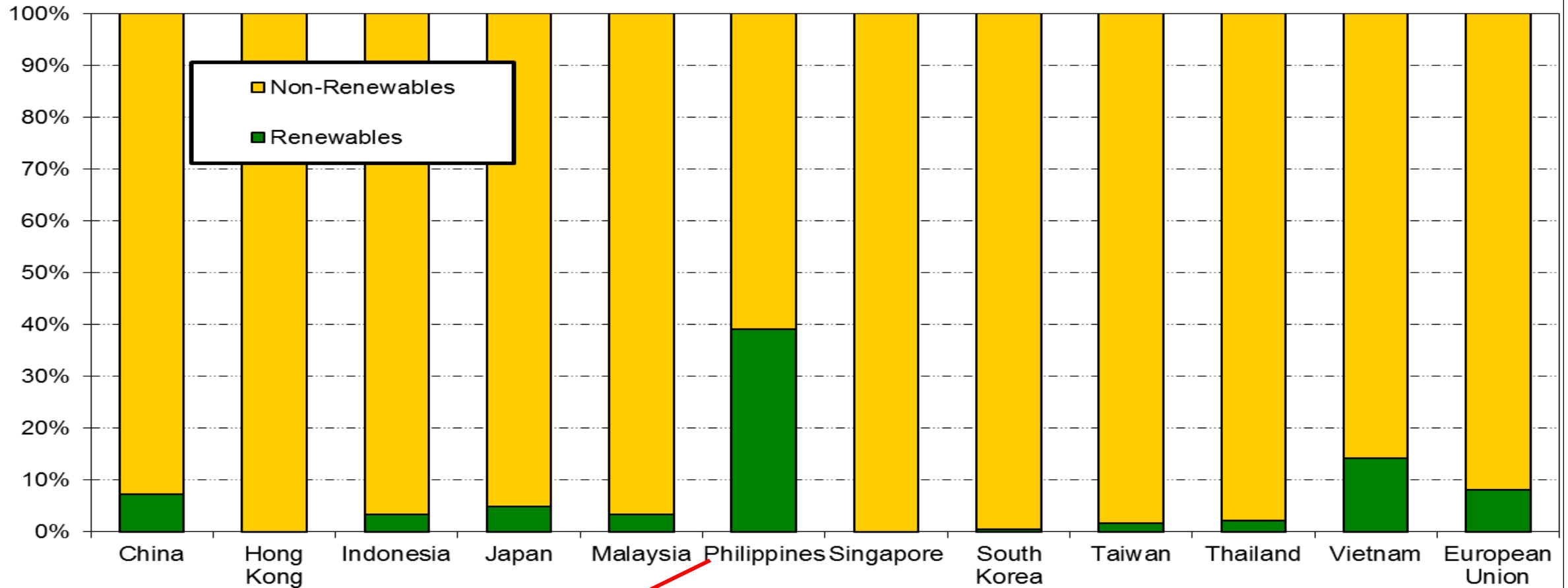
Total Dependable Capacity = 16,432 MW
RE Share = 32%

RENEWABLE ENERGY RESOURCES

- **Biomass (bagasse)** – Potential of 4,449.54 MW*
- **Geothermal Resource** – 1,200 MW
- **Solar Energy** – Average potential 5kWh/m²/day
- **Hydropower** - 10,500 MW
- **Ocean energy** - 170,000 MW
- **Wind resources** – 76,600 MW

2010 COMPARATIVE RE UTILIZATION

Share of RE and Non-RE



38.9% Renewables

COMPARATIVE ENERGY DATA

Country	Oil Production	Gas Production	Coal Production	RE Target
China (coal 70%)	3.99 mb/d (5 th)	94 bcm (8 th)	3,240 Mt (1 st)	30% (2035)
Vietnam (coal)	300 kb/d (35 th)	9.4 bcm (42 nd)	44.1 Mt (17 th)	5% (2020)
Thailand (natural gas 66%)	380 kb/d (32 nd)	30.8 bcm (25 th)	17.9 Mt (25 th)	25% (2021)* (currently 2%)
Indonesia (coal and oil)	1.09 mb/d (21 st)	82.8 bcm (12 th)	305.9 Mt (6 th)	25% (2025)* (currently 4%)
Malaysia (natural gas 60%)	693 kb/d (27 th)	58.6 bcm (16 th)	78 Mt	17% (2030)* (currently 5%)
Taiwan (nuclear, oil and natural gas)	276 kb/d (37 th)	310 m3 (71 st)	N/A	15% (2025)* (currently 8%)
India (coal 53%)	878 kb/d (24 th)	120 bcm (5 th)	569.9 Mt (3 rd)	15.9% (2022) (currently 11%)
South Korea (oil, coal and nuclear)	48 kb/d (65 th)	532 m3 (66 th)	3 MMst (short tons)	10% (2022)
PHILIPPINES (coal and gas)	9 kb/d (85th)	3.1 bcm (52nd)	7.2 Mt (31st)	35% (2030) (currently 30%)

PHILIPPINE RE LAWS

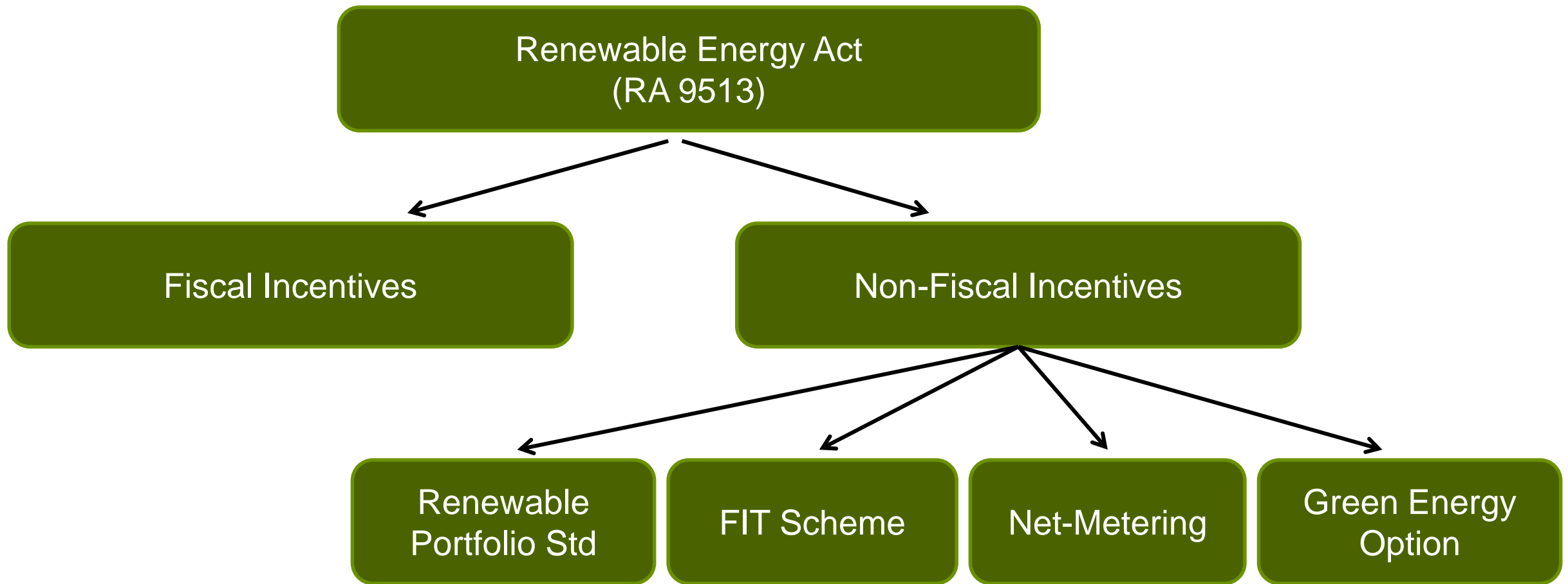
- **Biofuels Act of 2006** (Republic Act No. 9367)
 - Provides fiscal incentives and mandates the use of biofuel-blended gasoline and diesel fuels.
- **Renewable Energy Act of 2008** (Republic Act No. 9513)
 - Provides fiscal and non-fiscal incentives to private sector developers and manufacturers

RENEWABLE ENERGY ACT OF 2008

Accelerate the development of the country's renewable energy resources by providing fiscal and non-fiscal incentives to private sector investors and equipment manufacturers / suppliers.



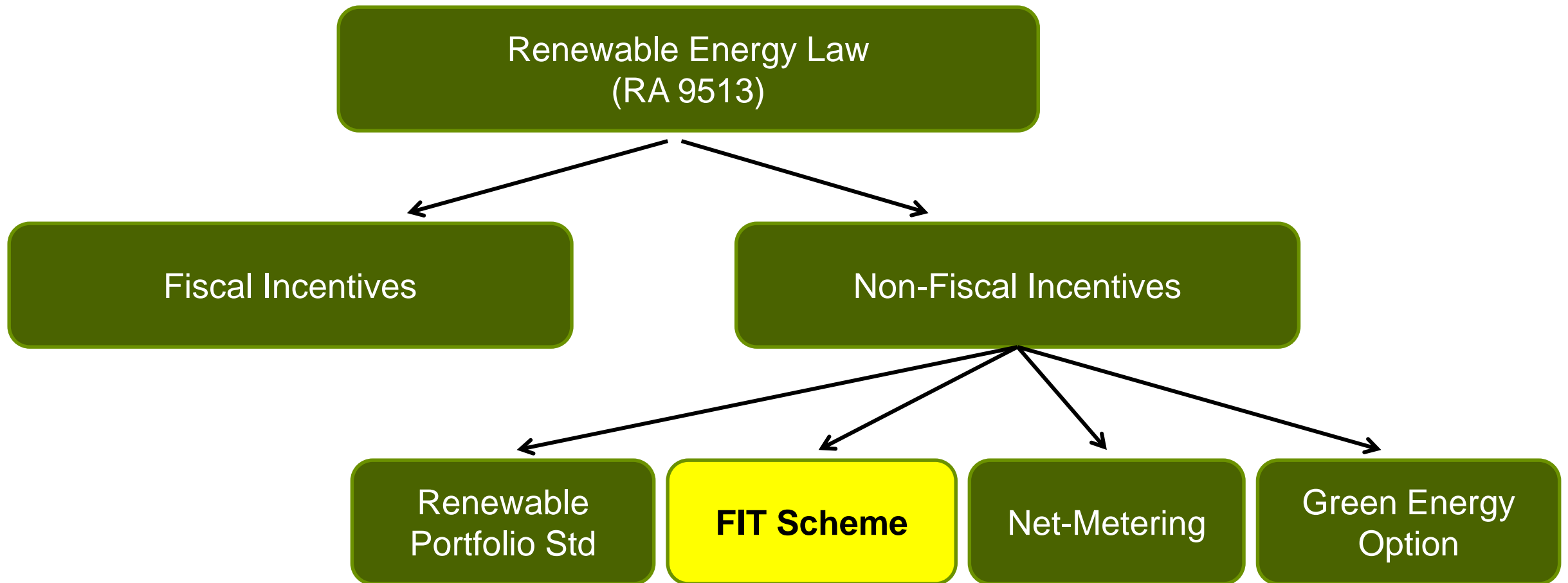
INCENTIVES UNDER RE ACT



FISCAL INCENTIVES

Incentives	RE Developers	Local RE Suppliers
7-Year Income Tax Holiday	Yes	Yes
Duty-free Importation	Yes	Yes
VAT-free Importation	No Tax Credit	Yes
Special Realty Tax Rate = 1.5 %	Yes	
Net Operating Loss Carryover	Yes	Yes
10% Corporate Tax Rate after ITH	Yes	
Accelerated Depreciation	Yes	Yes
Zero Percent VAT on RE Sales & Purchases	Yes	Yes
Cash Incentive = 50% of UC for Missionary Electrification	Yes	
Tax Exemption on Carbon Credits	Yes	
Tax Credit on Domestic Capital Equipment & Services	Yes	Yes

INCENTIVES UNDER RE LAW



FEED-IN TARIFF

Elements	Provisions under the RE Act, IRR & FIT Rules
Payment	.Guaranteed, on a fixed rate per kWh
Coverage	.Emerging technologies- biomass, solar, run-of-river hydro, ocean and wind, excluding generation for own use .For projects which enter into commercial operations after effectivity of the FITs with certain exceptions for existing plants .On-Grid areas only
Mandated duration	.Initial FITs- 20 years; Minimum – 12 years
Connection to Grid	.Priority connection, purchase, transmission and payment by grid system operator .NGCP to determine maximum penetration limits for intermittent REs .PEMC and NGCP to implement technical mitigation & improvements to ensure reliability of transmission
Dispatch	.Priority and must dispatch

FEED-IN TARIFF MONITORING BOARD

(as of June 2016)

RESOURCE	FOR NOMINATION / CONVERSION		WITH CERTIFICATE OF CONFIRMATION OF COMMERCIALITY		WITH CERTIFICATE OF ENDORSEMENT TO ERC	
	NO. OF PROJECTS	CAPACITY (MW)	NO. OF PROJECTS	CAPACITY (MW)	NO. OF PROJECTS	CAPACITY (MW)
HYDRO		-	86	732.12	4	26.60
WIND	7	1,023.55	11	715.30	6	393.90
SOLAR	15	565.18	47	1,227.73	20	525.95
BIOMASS			18	147.40	12	97.05
TOTAL	22	1,588.73	162	2,822.543	42	1,043.50

2011 NATIONAL RENEWABLE ENERGY PROGRAM

RE-based On-Grid Capacity Installation Targets

Sector	Installed Capacity, MW as of 2010	Target Capacity Addition by				Total Capacity Addition, MW 2011-2030	Total Installed Capacity by 2030
		2015	2020	2025	2030		
Geothermal	1,972.0	220.0	1,100.0	95.0	80.0	1,495.0	3,467.0
Hydro	3,333.0	343.3	3,161.0	1,891.8	0.0	5,396.1	8,729.1
Biomass	30.0	276.7	0.0	0.0	0.0	276.7	306.7
Wind	33.0	1,048.0	855.0	442.0	0.0	2,345.0	2,378.0
Solar	1.0	269.0	5.0	5.0	5.0	284.0 ⁹	285.0
Ocean	0.0	0.0	35.5	35.0	0.0	705.0	70.5
Total	5,369.0	2,157.0	5,156.5	2,468.8	85.0	9,855.4	15,236.3

⁹ Based on existing RE Service/Operating Contracts awarded and being evaluated by the DOE. The aspirational target of 1,528 MW solar power capacity will still be pursued.

PART 4: RE MECHANISMS

- I. RPS On-Grid Areas Rules**
- II. RPS Off-Grid Areas Rules**
- III. Green Energy Option Rules**
- IV. RE Market Rules**
- V. RE Trust Fund**

RPS ON-GRID RULES

- Refers to a market-based policy that requires the Mandated Participants to source a portion of their energy supply from Eligible RE Facilities
- **Minimum Annual RPS Requirement** - targeting RE share in the national energy mix to thirty five percent (35%) in MWh ("Ambisyon 2040"), the minimum annual target per grid shall be equal to the sum of the minimum target of all Mandated Participants in the grid calculated with the formula, all expressed in MWh:

$$RPS_{(n)} = ES_{(n-1)} * \sum_{m=0}^n K_m$$

- **Minimum Annual Incremental RE Percentage** - initially set at one percent (1%) to be applied to Net Electricity Sales of the Mandated Participant for the previous year
- **Eligible RE Facilities** – All RE Facilities after the effectivity of the RE Act
- **Mandated Participants** – DUs for their captive customers; Supplier of Last Resort; Local and licensed RES for Contestable Market upon RCOA commencement; Generating companies only to extent of their actual supply to their DCCs; Entities that operate as distributors within economic zones; Other entities recommended by NREB and approved by DOE

RPS OFF-GRID RULES

- **It is policy that requires NPC-SPUG or its Successors-in-Interests to source a minimum percentage or all of their energy requirement or supply, upon recommendation by NREB, from available renewable energy resources in the off-grid or missionary areas, as may be determined by DOE.**

- **Minimum Annual RPS Requirement** - Mandated Participant may initially be required to generate, procure and subsequently maintain a minimum percentage RE share in its portfolio consistent with the optimal supply mix as recommended by NREB and subsequently approved by DOE.

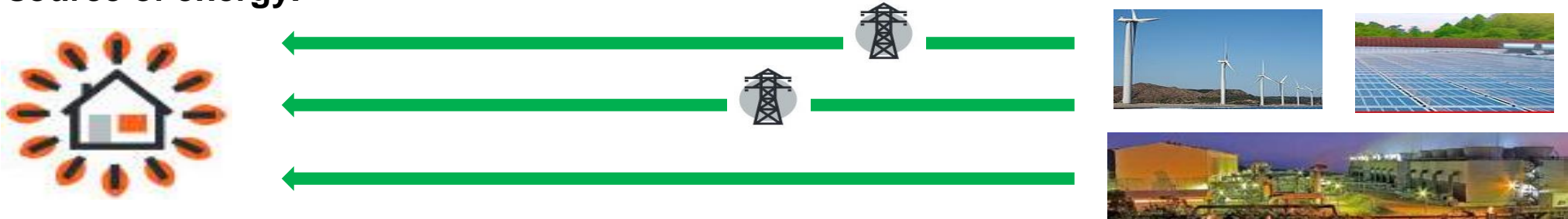
- **Annual Increase of RE Portfolio** - Annual incremental RE requirement for succeeding years shall also be determined based on the optimal RE mix determined by the attached MS Excel application or any internationally accepted application/software. Resulting incremental RE generation from the optimal RE mix shall not be lower than 1.0% of the previous year RE generation.

- **Eligible RE Facilities** - All RE Facilities and other emerging RE technology that may be later identified upon the recommendation of the NREB and approved by the DOE

- **Mandated Participants:** Generating Companies including NPC-SPUG and NPPs/QTPs; Distribution Utilities (DUs) with respect to their owned generation facilities; Other entities that generate electricity and serve off-grid areas as may be determined and approved by the DOE.

GREEN ENERGY OPTION RULES

- **A Renewable Energy Policy Mechanism which shall provide end-user the option to choose RE Resources as their source of energy.**



- **Eligible Renewable Energy Resources** - All renewable energy plants are covered by GEOP.
- **Mandated Sectors** - TRANSCO or its concessionaire NGCP, DUs, PEMC, and all relevant parties are hereby mandated to provide the mechanisms for the physical connection and commercial arrangements necessary to ensure the success of the GEOP.
- **Registration and Billing Procedures** - Firstly, interested consumers must register with their DUs or ECs their option to source RE power. The electricity suppliers are then required to inform its customers of the availability, type of RE Resources and its generation cost.

RE MARKET RULES

- **RE Market refers to the market where the trading of RE Certificates equivalent to an amount of power generated from RE resources is made. (Section 4 (qq), RE Act)**
- **PEMC will undertake the necessary rules changes in the WESM Rules and relevant Market Manuals to suit the operation of RE Market after its establishment by the DOE.**
- **There will be an establishment of an Renewable Energy Registrar under the DOE's supervision (2nd paragraph, Section 8, RE Act)**
- **The key functions of the RE Registrar are:**
 - Registry Administration
 - Operations of the REM
 - RPS Compliance and Reporting
- **There will be an establishment of a Renewable Energy Registrar under the DOE's supervision (2nd paragraph, Section 8, RE Act)**

PART 5: MOVING FORWARD FOR LGUs

- I. Determine available RE resources and conduct feasibility studies**
- II. Ascertain market for power and seek private capital**
- III. Facilitate permits and licensing requirements**
- IV. Reach off-grid or not connected areas**
- V. Look at LGU requirements: light posts, government buildings, health centers**

MAJOR PERMIT ISSUES

- **DAR-DA:** Land Conversion and Approvals
- **DOE:** RE Contract Application, Endorsements to ERC
- **NGCP:** Grid Impact Study, Upgrade of Transmission
- **ERC:** COCs, Point-to-Point Applications, FIT-All Adjustment, Power Supply Agreement Approvals, Ancillary Charges and Transmission Costs, Approval of NGCP Transmission Upgrades: **What Now?**
- **PEMC:** Market Participant Registration
- **DENR:** Environmental Compliance Certificate
- **NWRB:** Water permits
- **BIR:** Revenue Regulations for RE Law; VAT refund
- **LGUs:** Barangay, Municipality, City, Province endorsements
- **JCPC:** 15% requirement in EPIRA; Zero-VAT for RE sales and services
- **NREB:** RPS, GEO, RE Market, Net Metering Amendment, Extension of FIT deadline for undersubscribed hydro and biomass

EXAMPLES OF LGU PROJECTS

- **0.2 MW AMBANGAL HYDRO POWER PLANT:** Provincial Government of Ifugao
- **2 MW RIO CHICO HYDRO POWER PROJECT:** LGU of General Tinio, Nueva Ecija
- **0.82 MW LIKUD HYDRO POWER PROJECT:** Provincial Government of Ifugao
- **2.5 MW MALITA HYDRO PROJECT:** LGU of Malita, Davao del Sur
- **4 MW LOWER HIMOGAAN HYDRO PROJECT:** LGU of Sagay
- **2.23 MW GAKAON HYDRO POWER PROJECT:** LGU of Impasugong, Bukidnon
- **1 MW SIPANGPANG HYDRO PROJECT:** LGU of Cantilan, Surigao del Sur
- **1.6 MW KINANLIMAN HYDRO PROJECT:** Municipality of Real, Quezon

PART 6: AVAILABLE MARKETS

- I. Roll-Out and Monitor of RPS and GEOP**
- II. Implementation of RE Market**
- III. Update of National Renewable Energy Program**
- IV. Training of Distribution Utilities/Cooperatives**
- V. Address Administrative Matters (NCIP, DAR, BIR)**
- VI. Improve Regulatory Approvals (ERC)**
- VII. Reduce Transmission Charges and RE Cost**

SELLING RENEWABLE ENERGY POWER

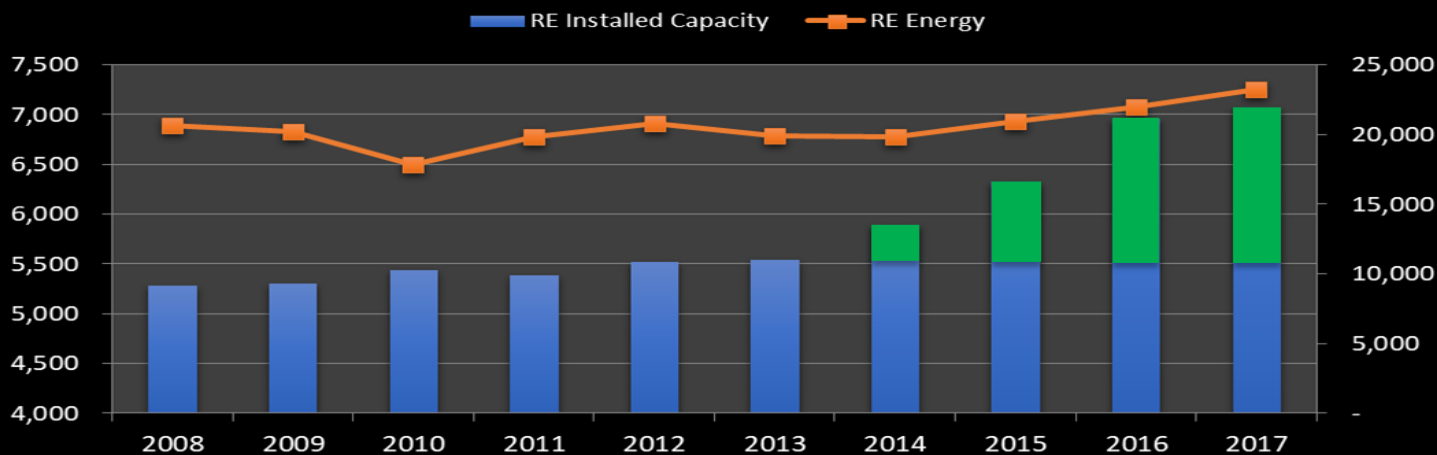
- I. **As a merchant plant in wholesale electricity spot market (RE certificates under RPS and REM Rules)**
- II. **As a retail electricity supplier selling to contestable customers (Green Energy Option)**
- III. **As a power producer under feed-in tariff system**
- IV. **As a power producer under a power supply agreement with a distribution utility or electric cooperative**

PHILIPPINE NATIONAL RENEWABLE ENERGY PROGRAM

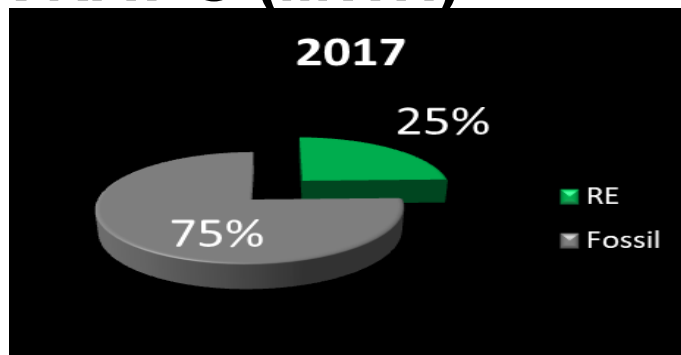
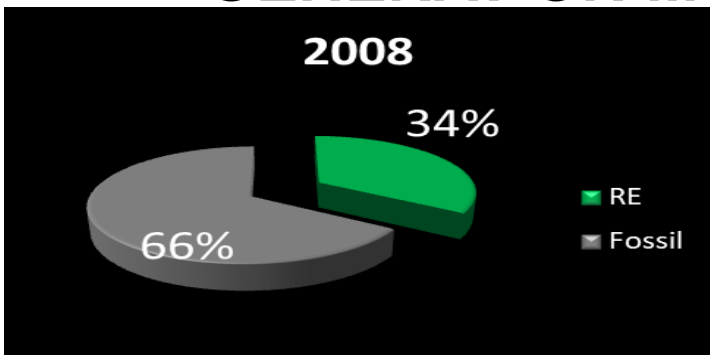
**WHAT RENEWABLE ENERGY HAS CONTRIBUTED TO THE
PHILIPPINE ECONOMY**

RE LAW IS STILL IN ITS INFANCY STAGE AS IT PICKED UP ITS GROWTH ONLY FROM 2014 TO 2016 FOLLOWING APPROVAL OF FIT IN 2012

RE Installed Capacity (MW) and Generation



GENERATION MIX RATIO (MWH)



- The guidelines for the Renewable Portfolio Standards and Green Energy Option Program were only issued recently in December 2017 and July 2018, respectively.
- In spite of the capacity additions of 1,836 MW by 2017, RE energy mix in our country has sadly **DECLINED** from **34% to 25%** against fossil fired power plants.
- The DOE is targeting to restore RE's share in energy mix to **35% by 2030**

WITH THE CONTINUED INCENTIVES TO RE INDUSTRY, SIGNIFICANT RESOURCES CAN BE FURTHER TAPPED TO SUPPORT THE DEVELOPMENT OF PHILIPPINE INDUSTRIES AND MAXIMIZE BENEFITS TO CONSUMERS

RESOURCES	AWARDED PROJECTS MW		INSTALLED CAPACITY MW		POTENTIAL CAPACITY MW	
	Commercial Use	Own Use	Commercial Use	Own Use	Commercial Use	Own Use
Hydro Power	444	-	975	-	13,468	-
Ocean Energy	7	-	-	-	26	-
Geothermal	41	-	1,906	-	575	-
Wind	65	1	427	-	2,461	-
Solar	216	16	905	3	6,883	4
Biomass	55	24	407	128	347	17
Subtotal	828	41	4,620	131	23,760	21
Total	869MW		4,751MW		23,781MW	



Source: DOE (As of December 2017)

Note :

- - excluding 49 installed projects with 2,643.68 MW capacity under RA 7156, CA 120, PD 1645, RA 3601 & Own Use
- - excluding 1 potential project with 20MW capacity under PD 1442
- Awarded – Development/Construction; Installed – Operating, Potential – Future

RESOURCES ARE INDIGENOUS, PRACTICALLY LIMITLESS, AND REDUCE THE COUNTRY'S DEPENDENCE ON IMPORTED FUEL

FOR EVERY PHP1.00 TAX INCENTIVE, RE INDUSTRY GIVES PHP12 BENEFIT TO THE COUNTRY

<i>Country Benefit</i>	<i>In Php</i>
Employment	1.19
National and Local Taxes and Community Contributions	1.24
Avoided Fossil Fuel Costs	7.77
Net Consumer Savings from RE (WESM Merit Order Effect)	1.38
TOTAL	11.58

**CONSIDERING ONLY NATIONAL AND LOCAL TAXES, THE RE INDUSTRY IS ALREADY
CONTRIBUTING MORE THAN THE INCENTIVES IT GETS
AT A RATIO OF 1.24:1**



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