

A nighttime cityscape featuring a complex highway interchange with light trails from traffic. In the background, several tall skyscrapers are illuminated against a dark sky. The overall scene conveys a sense of modern urban progress and activity.

# PunoLaw

## Progress Through Excellence



2021 • Manila, Philippines

# MARKET FUNDAMENTALS: KEY ISSUES AND CHALLENGES UNDERLYING POWER INDUSTRY

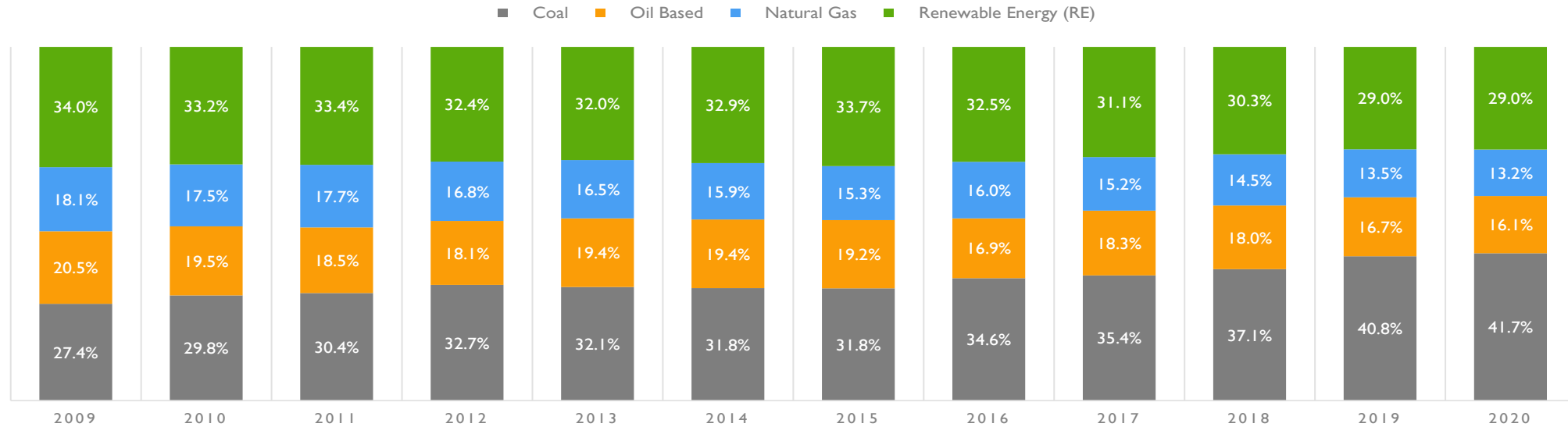
*Atty. Jose M. Layug, Jr.  
Senior Partner, Puno Law*

# PART 1

## THE MARKET

# 2009-2020 INSTALLED CAPACITY

INSTALLED GENERATING CAPACITY BY SOURCE IN % SHARE, TOTAL PHILIPPINES

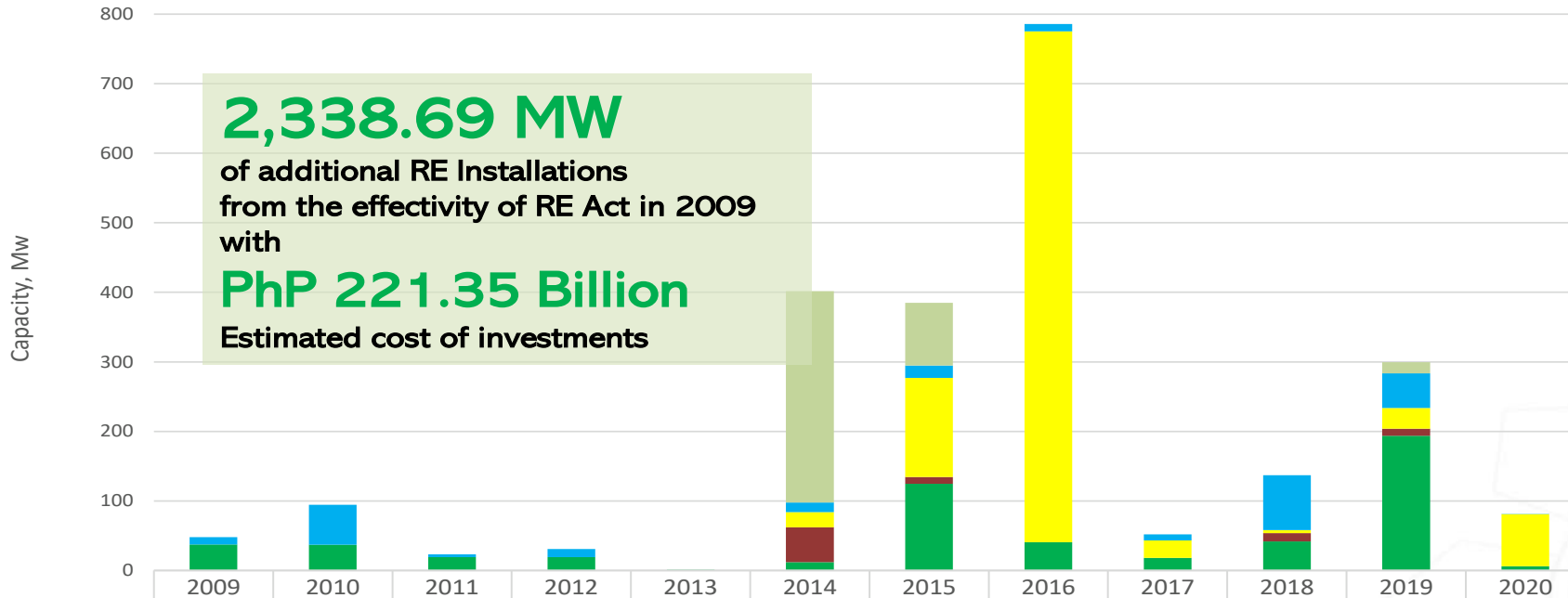


Installed Capacity (MW)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<b>Renewable Energy (RE)</b>	<b>5,308.59</b>	<b>5,437.38</b>	<b>5,390.75</b>	<b>5,521.18</b>	<b>5,541.18</b>	<b>5,897.52</b>	<b>6,329.89</b>	<b>6,957.56</b>	<b>7,079.09</b>	<b>7,226.56</b>	<b>7,399.29</b>	<b>7,617.00</b>
Geothermal	1,953.24	1,965.83	1,783.25	1,847.69	1,867.69	1,917.69	1,917.19	1,915.56	1,915.83	1,943.96	1,928.07	1,928.00
Hydro	3,291.35	3,399.55	3,490.73	3,520.81	3,520.81	3,543.26	3,600.46	3,617.54	3,627.25	3,701.07	3,759.82	3,779.00
Biomass	30.00	38.00	82.76	118.67	118.67	130.67	220.67	232.67	223.72	258.48	363.39	447.00
Solar	1.00	1.00	1.00	1.00	1.00	23.00	164.67	764.89	885.40	896.16	921.12	1,019.00
Wind	33.00	33.00	33.00	33.00	33.00	282.90	426.90	426.90	426.90	426.90	426.90	443.00
<b>Natural Gas</b>	<b>2,831.00</b>	<b>2,861.00</b>	<b>2,861.00</b>	<b>2,862.00</b>	<b>2,862.02</b>	<b>2,862.02</b>	<b>2,862.02</b>	<b>3,431.12</b>	<b>3,446.52</b>	<b>3,452.50</b>	<b>3,452.54</b>	<b>3,453.00</b>
<b>Oil Based</b>	<b>3,193.33</b>	<b>3,193.33</b>	<b>2,994.11</b>	<b>3,073.58</b>	<b>3,353.48</b>	<b>3,476.32</b>	<b>3,610.29</b>	<b>3,615.66</b>	<b>4,153.21</b>	<b>4,291.97</b>	<b>4,262.42</b>	<b>4,237.00</b>
<b>Coal</b>	<b>4,276.60</b>	<b>4,866.60</b>	<b>4,916.60</b>	<b>5,568.20</b>	<b>5,568.20</b>	<b>5,708.20</b>	<b>5,962.95</b>	<b>7,418.65</b>	<b>8,048.95</b>	<b>8,843.65</b>	<b>10,417.15</b>	<b>10,944.00</b>










# RE Capacity Additions (2009-2020)

900



**2,338.69 MW**  
of additional RE Installations  
from the effectivity of RE Act in 2009  
with  
**PhP 221.35 Billion**  
Estimated cost of investments

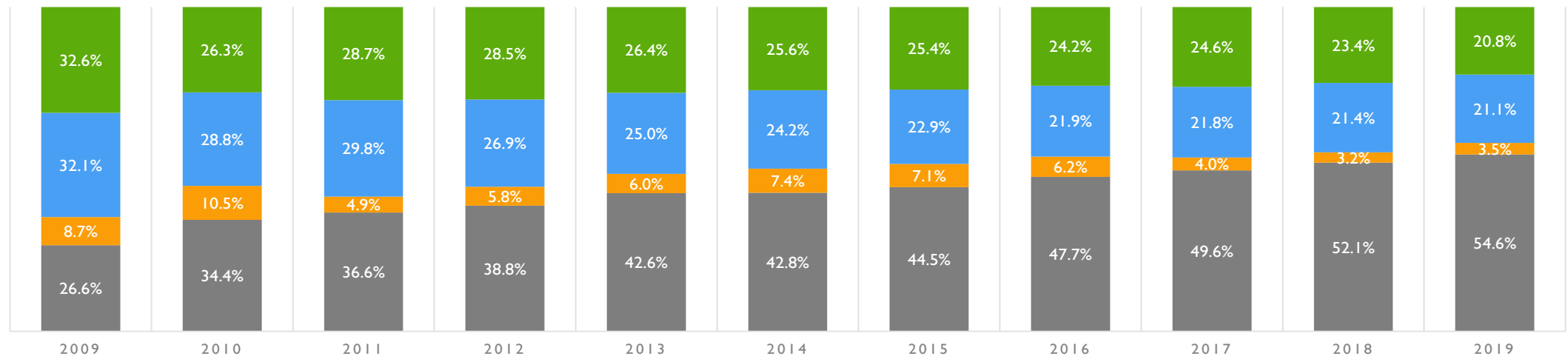
-  **Total Capacity Additions**
-  **Cost of Investment**
-  **1,033.13 MW**  
PhP 86.8 Billion
-  **550.04 MW**  
PhP 33.1 Billion
-  **409.90 MW**  
PhP 52.9 Billion
-  **263.13 MW**  
PhP 37.9 Billion
-  **82.5 MW**  
PhP 10.5 Billion

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Wind						303.9	90				16	
Ocean Energy												
Hydropower	10.4	57.3	4.2	11.8		13.645	17.82	10.45	8.5	78.923	49.79	0.3
Solar						22	142.47	734.715	25.197	4.196	29.548	75
Geothermal						50	10			12	10.5	
Biomass	37.325	37.15	19	19	0.876	12	124.5	40.8	18.124	41.735	193.53	6
<b>TOTAL</b>	<b>47.73</b>	<b>94.45</b>	<b>23.2</b>	<b>30.8</b>	<b>0.88</b>	<b>401.55</b>	<b>384.79</b>	<b>785.97</b>	<b>51.82</b>	<b>136.85</b>	<b>299.37</b>	<b>81.3</b>

# 2009-2019 POWER GENERATION

## POWER GENERATION BY SOURCE IN % SHARE, TOTAL PHILIPPINES

■ Coal ■ Oil-Based ■ Natural Gas ■ Renewable Energy



Power Generation (GWh)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>Renewable Energy</b>	<b>20,191</b>	<b>17,823</b>	<b>19,845</b>	<b>20,762</b>	<b>19,903</b>	<b>19,810</b>	<b>20,963</b>	<b>21,979</b>	<b>23,189</b>	<b>23,326</b>	<b>22,044</b>
Geothermal	10,324	9,929	9,942	10,250	9,605	10,308	11,044	11,070	10,270	10,435	10,691
Hydro	9,788	7,803	9,698	10,252	10,019	9,137	8,665	8,111	9,611	9,384	8,025
Biomass	14	27	115	183	212	196	367	726	1,013	1,105	1,040
Solar	1	1	1	1	1	17	139	1,097	1,201	1,249	1,246
Wind	64	62	88	75	66	152	748	975	1,094	1,153	1,042
<b>Natural Gas</b>	<b>19,887</b>	<b>19,518</b>	<b>20,591</b>	<b>19,642</b>	<b>18,791</b>	<b>18,690</b>	<b>18,878</b>	<b>19,854</b>	<b>20,547</b>	<b>21,334</b>	<b>22,354</b>
<b>Oil-Based</b>	<b>5,381</b>	<b>7,101</b>	<b>3,398</b>	<b>4,254</b>	<b>4,491</b>	<b>5,708</b>	<b>5,886</b>	<b>5,661</b>	<b>3,787</b>	<b>3,173</b>	<b>3,752</b>
<b>Coal</b>	<b>16,476</b>	<b>23,301</b>	<b>25,342</b>	<b>28,265</b>	<b>32,081</b>	<b>33,054</b>	<b>36,686</b>	<b>43,303</b>	<b>46,847</b>	<b>51,932</b>	<b>57,890</b>



# DECLINING LEVELS of SELF-SUFFICIENCY

## Power Generation by Source in % Share, Total Philippines

Resource	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Coal	25.9%	26.6%	34.4%	36.6%	38.8%	42.6%	42.8%	44.5%	47.7%	49.6%	52.1%	54.6%
Oil-Based	8.0%	8.7%	10.5%	4.9%	5.8%	6.0%	7.4%	7.1%	6.2%	4.0%	3.2%	3.5%
Natural Gas	32.2%	32.1%	28.8%	29.8%	26.9%	25.0%	24.2%	22.9%	21.9%	21.8%	21.4%	21.1%
Renewable Energy	33.9%	32.6%	26.3%	28.7%	28.5%	26.4%	25.6%	25.4%	24.2%	24.6%	23.4%	20.8%
Geothermal	17.6%	16.7%	14.7%	14.4%	14.1%	12.8%	13.3%	13.4%	12.2%	10.9%	10.5%	10.1%
Hydro	16.2%	15.8%	11.5%	14.0%	14.1%	13.3%	11.8%	10.5%	8.9%	10.2%	9.4%	7.6%
Biomass	0.0%	0.0%	0.0%	0.2%	0.3%	0.3%	0.3%	0.4%	0.8%	1.1%	1.1%	1.0%
Solar	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	1.2%	1.3%	1.3%	1.2%
Wind	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.9%	1.1%	1.2%	1.2%	1.0%
<b>Total in GWh</b>	<b>60,821</b>	<b>61,934</b>	<b>67,743</b>	<b>69,176</b>	<b>72,922</b>	<b>75,266</b>	<b>77,261</b>	<b>82,413</b>	<b>90,798</b>	<b>94,370</b>	<b>99,765</b>	<b>106,041</b>
<b>Self-Sufficiency</b>	<b>67.09</b>	<b>65.81</b>	<b>57.49</b>	<b>61.14</b>	<b>58.78</b>	<b>56.24</b>	<b>53.47</b>	<b>53.15</b>	<b>51.02</b>	<b>53.85</b>	<b>51.04</b>	<b>46.85</b>

# PART 1

## **SUPPLY AND DEMAND OUTLOOK (DOE)**



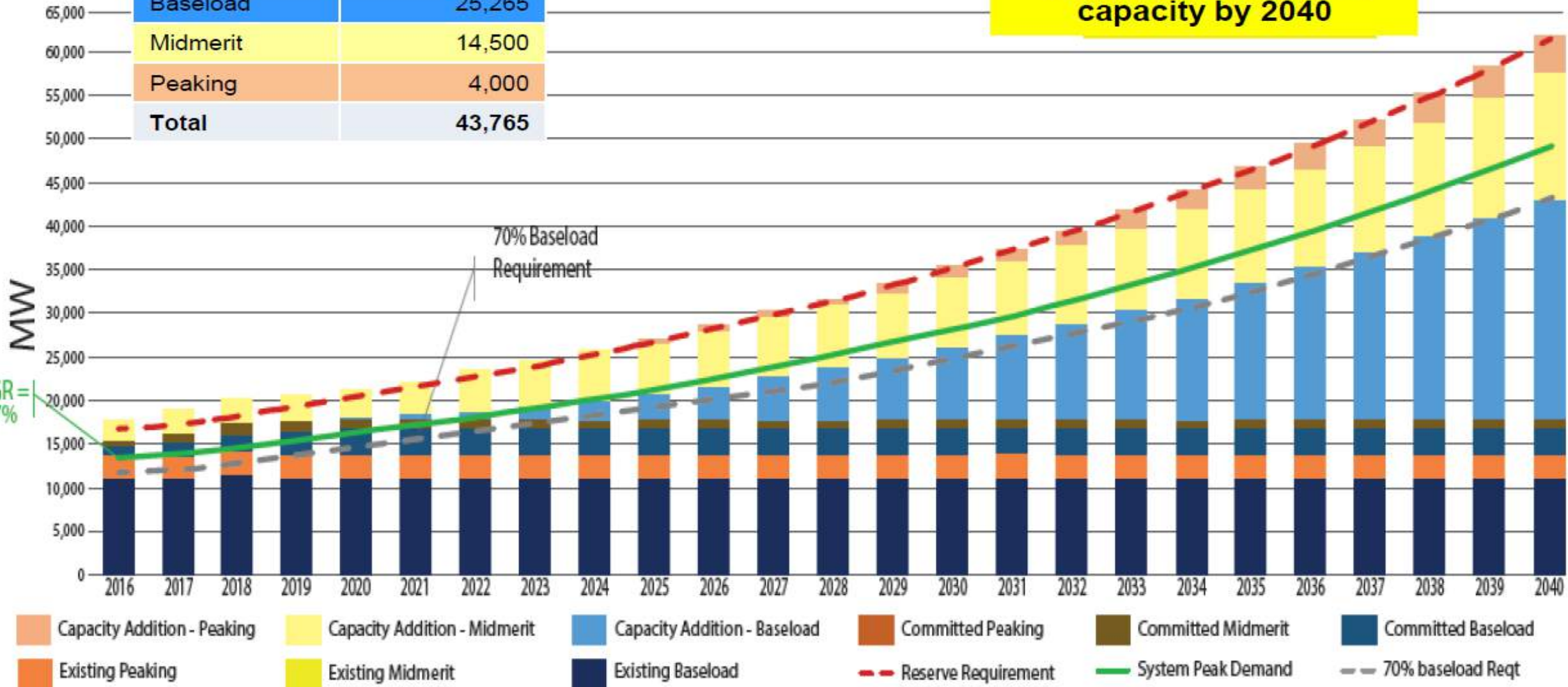
# PART 1

- Effect of Pandemic - General Observations:
  - ECQ resulted in **21.1%** drop in demand or 2,187 MW from March 16–April 15, 2020
  - From March 15–May 15, 2020, spot prices also went down and averaged at **P1.58/kWh (from pre-ECQ price of P3.09/kWh)**
  - In July 2020, the average demand hit 8,559 MW for Luzon and 1,576 for Visayas or a total of **10,135 MW** (coal 56.7%, natural gas 23.1%, geothermal 11.5%, hydro 5%)
  - In March 2021, average demand hit 8,408 MW for Luzon and 1,662 MW for Visayas or total of **10,070 MW** (coal 53.9%, NG 23.5%, G 10.5%, H 5.9%, S 1.76%, W 1.58%, B 1.24%). Average spot price at **P4.16/kWh**
  - **On May 14, 2021, actual peak demand hit 15,043 MW at 2:00 p.m.**
  - **Demand for electricity goes up when restrictions are relaxed**

# 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**



# Net-Metering Program

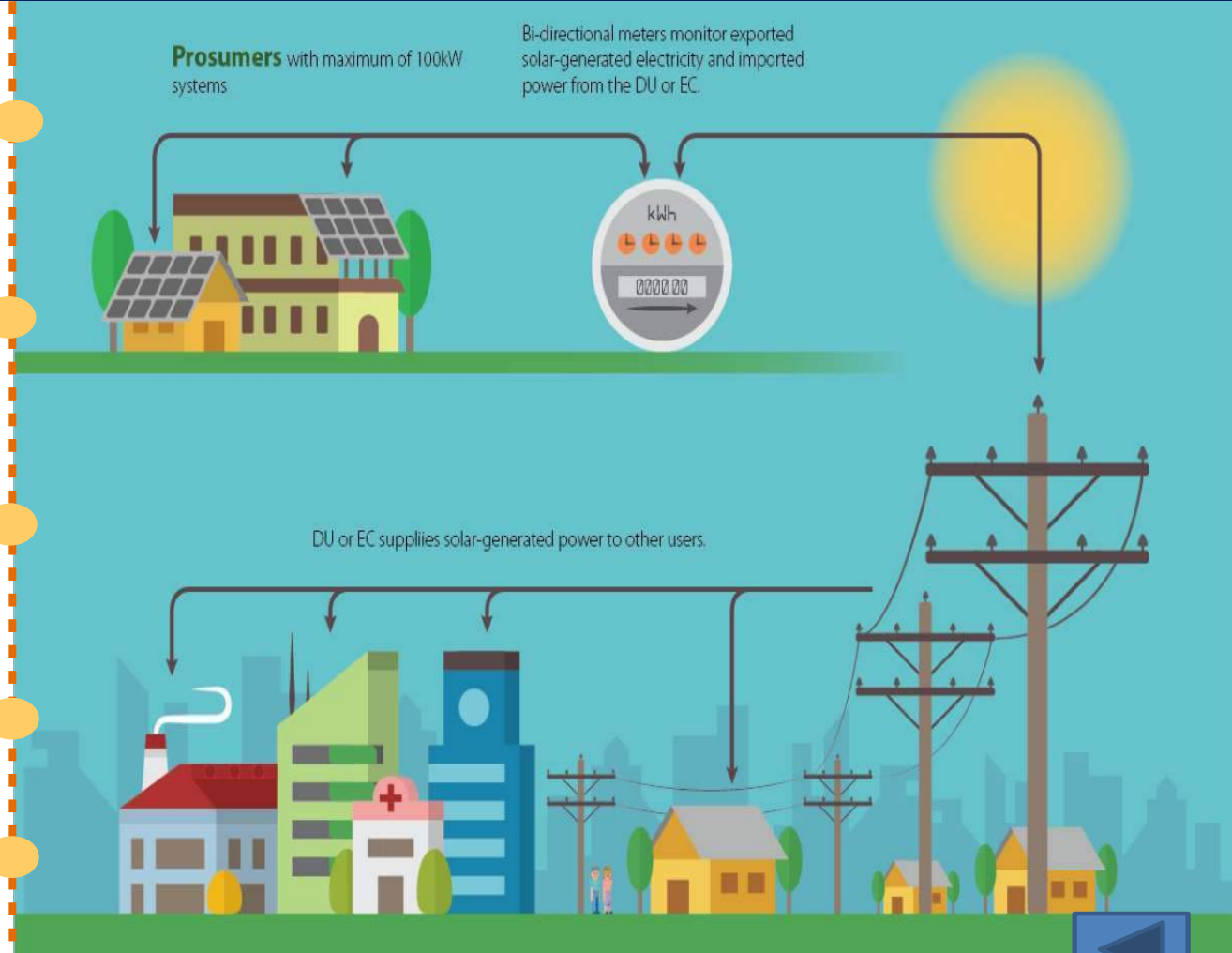
**Net-Metering empowers electricity end-users to produce electricity and sell excess to the grid transforming consumers to prosumers.**

**As of 31 Dec 2020, a total of 3,795 end-users were registered with a total rated capacity of 30.82 MWp.**

**Department Circular No. DC2020-10-0022, “Prescribing the Policies to Enhance the Net-Metering Program for Renewable Energy Systems” promulgated on 22 Oct 2020**

**Net-Metering will now be open to areas not connected to the national transmission lines**

**DOE to develop a Net Metering Guidebook v1 – posted in the DOE website**



# Renewable Portfolio Standards (RPS)

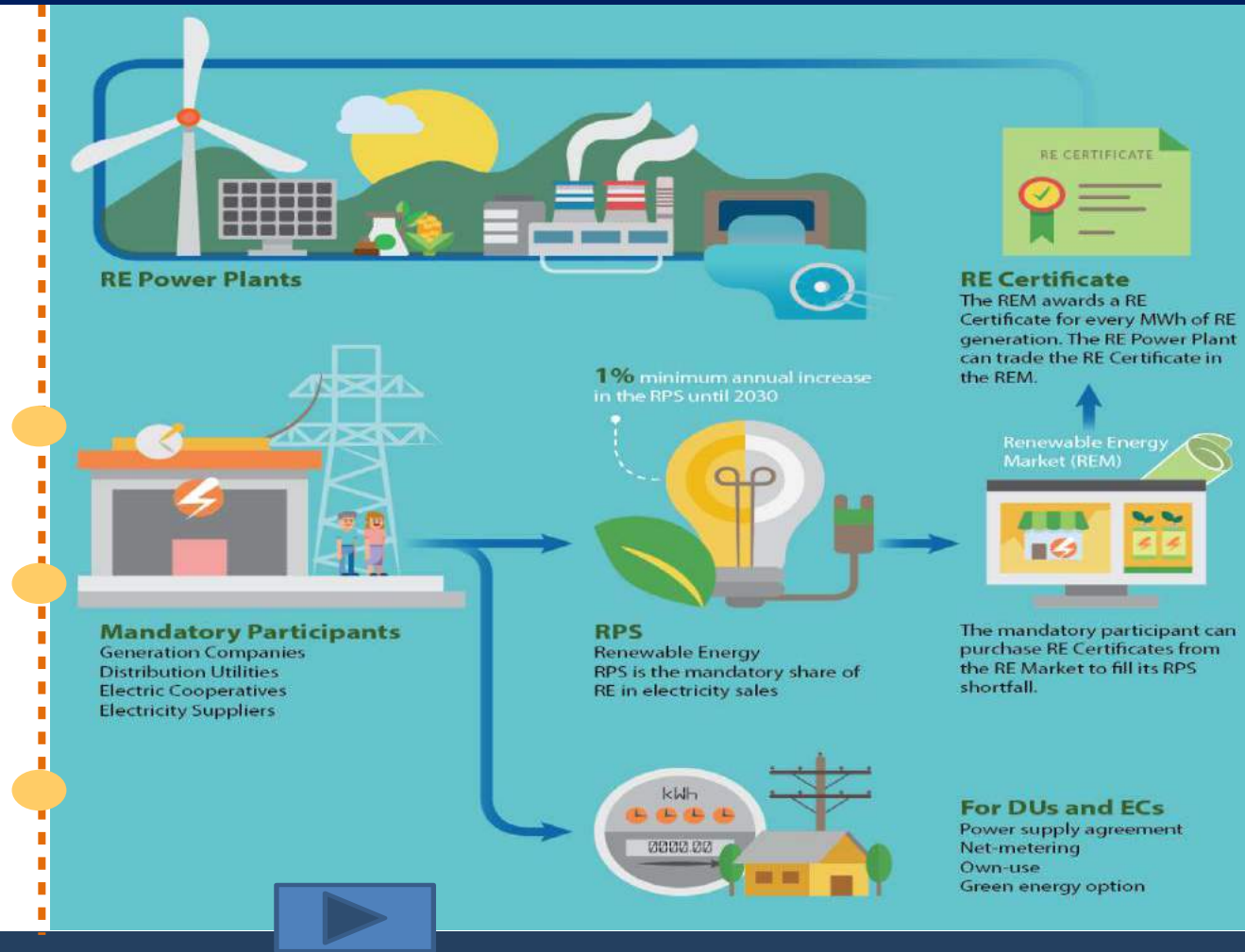
## On-Grid Areas

A mandatory policy requiring a minimum sourcing of RE generation to the total supply of electricity by Load Serving Entities operating in main grids.

The goal is to reach the 35% RE share in the generation mix by 2030.

Currently set at 1% annual increment. NREB has proposed to increase the min. annual increment to 2.53% to achieve the goal of 35% RE Share by 2030.

RPS Composite Team doing simulations including calibrated increases in the annual increments.



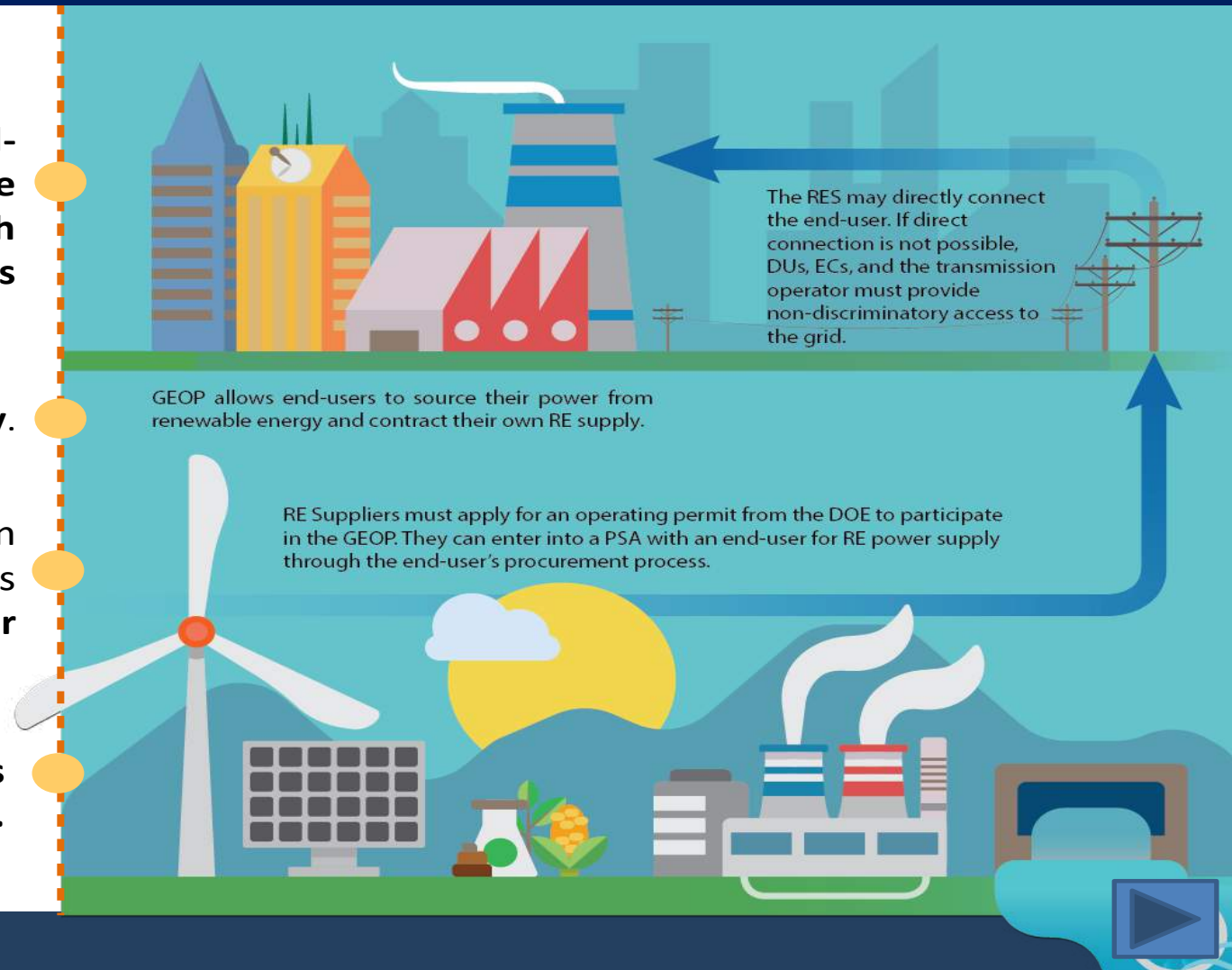
# Green Energy Option Program (GEOP)

A voluntary policy mechanism that allows end-users with 100kW and above demand to source their electricity supply from RE resources through RE Suppliers

It is a **non-regulated activity**.

An opportunity for end-users to contribute in the development and utilization of RE resources in a **least-cost and sustainable manner**

**Operating Permits issued to 6 RE Suppliers**  
Permit were issued as of 31 March 2021.





**IS THERE ROOM FOR  
IMPROVEMENT?**



**PUNOLAW**

- Generation: WE NEED MORE SUPPLY
- Transmission: WE NEED MORE INFRASTRUCTURE
- Distribution: WE NEED MORE INFRASTRUCTURE
- Supply: WE NEED MORE SUPPLY

# WHY WE NEED MORE SUPPLY

Figure 5. Hourly System LWAP and Hourly Supply Margin, 2018 to 2019

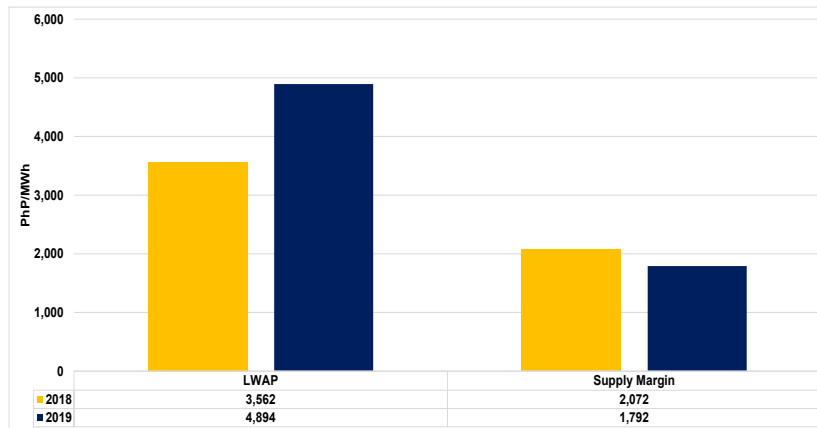
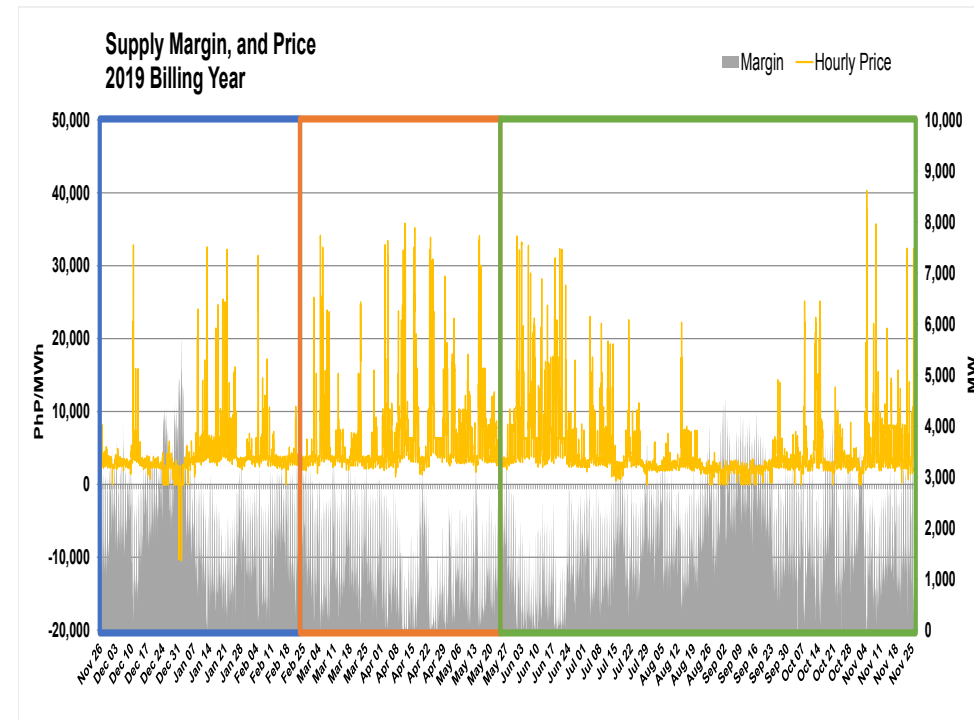


Figure 6. System LWAP and Average Supply Margin, 2018 to 2019

- The scatter plot of supply margin and price showed an inverse relationship wherein an increasing level of supply margin corresponded to a lower resulting price and vice versa.





# CAPACITY PROFILE BY AGE OF PLANTS

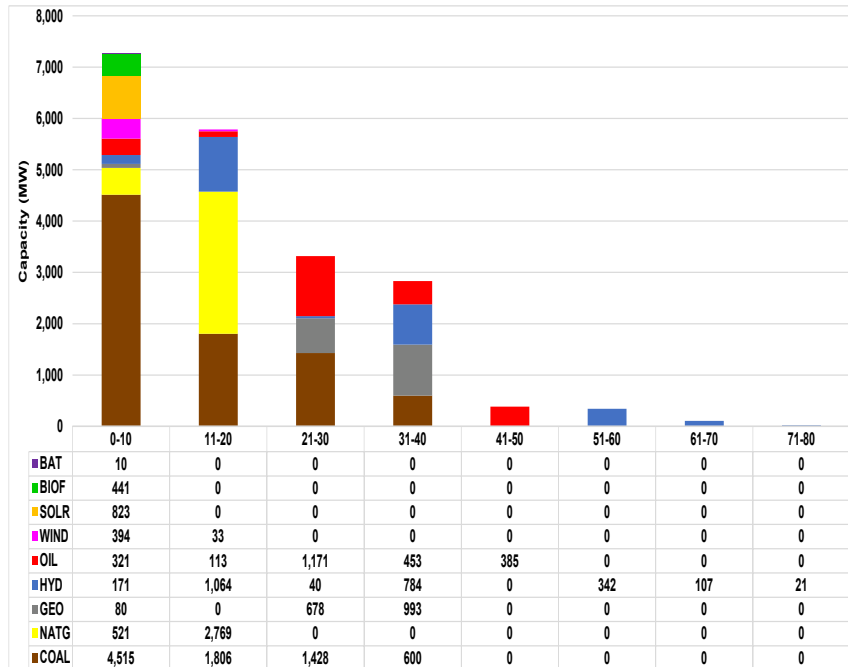


Figure 19. Capacity Profile by Age of Plants by Resource Type, 2019

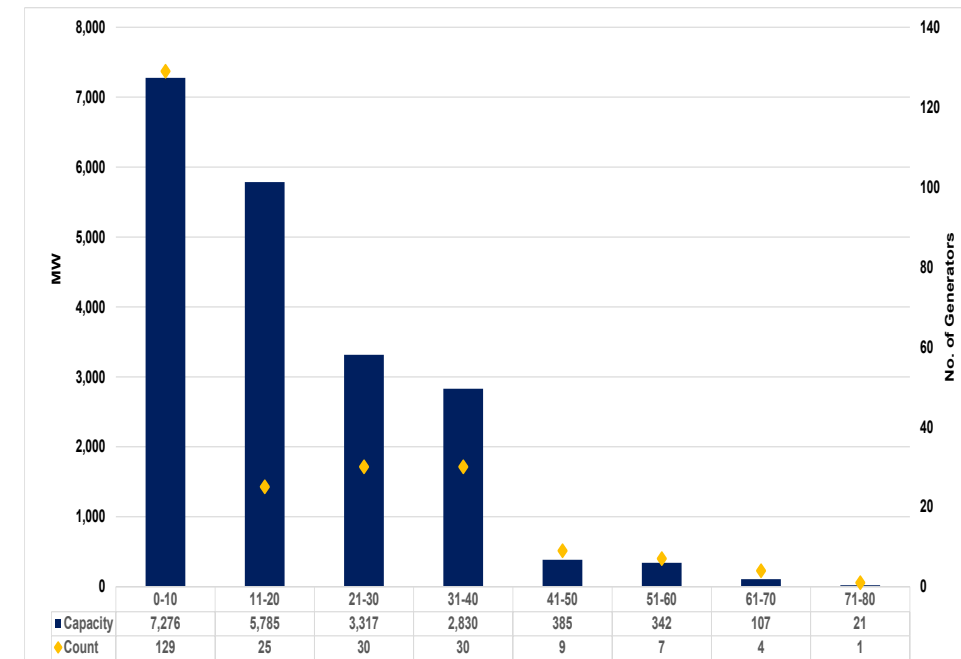


Figure 18. Capacity Profile by Age of Plants, 2019

## PART 3: KEY ISSUES AND CHALLENGES

- I. TOO RESTRICTIVE GOVERNMENT REGULATIONS
- II. TOO RIGID PROCESS FOR OFFTAKE AGREEMENTS
- III. TOO MANY PERMITS AND LICENSES
- IV. TOO LITTLE INTEGRATED GOVERNMENT SUPPORT

# WHAT CAN BE DONE

- I. PURSUE POLICY REFORM: DECLARE LNG/NATURAL GAS AND RENEWABLES AS PREFERRED ENERGY RESOURCE**
- II. MODIFY COMPETITIVE SELECTION PROCESS TO ALLOW CHOICE OF LNG/RE BY DISTRIBUTION UTILITIES WITH CALCULATED PRICE MONITORING**
- III. STRENGTHEN PUBLIC-PRIVATE PARTNERSHIPS**
- IV. CREATE ONE STOP SHOP FOR LNG/RE**
- V. SIMPLIFY RULES FOR DEPLOYMENT OF PERSONNEL, VESSELS, MACHINERY, EQUIPMENT, SPARE PARTS AND MATERIALS**
- VI. RESOLVE INTER-AGENCY ISSUES AND COORDINATION, FORM TASK FORCE**



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