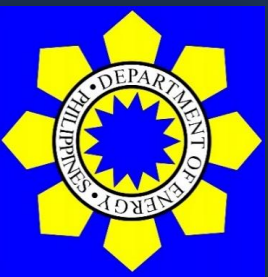




# Energy Transition and the Role of Industries



**DIRECTOR MICHAEL O. SINOCRUZ**  
Officer-In-Charge, Energy Policy and Planning Bureau

**PCO Summit 2022**  
14 October 2022 | Marriott Hotel Manila

# PRESENTATION OUTLINE

1

Where Are We Right Now?

2

Where Do We Want To Be In The Future?

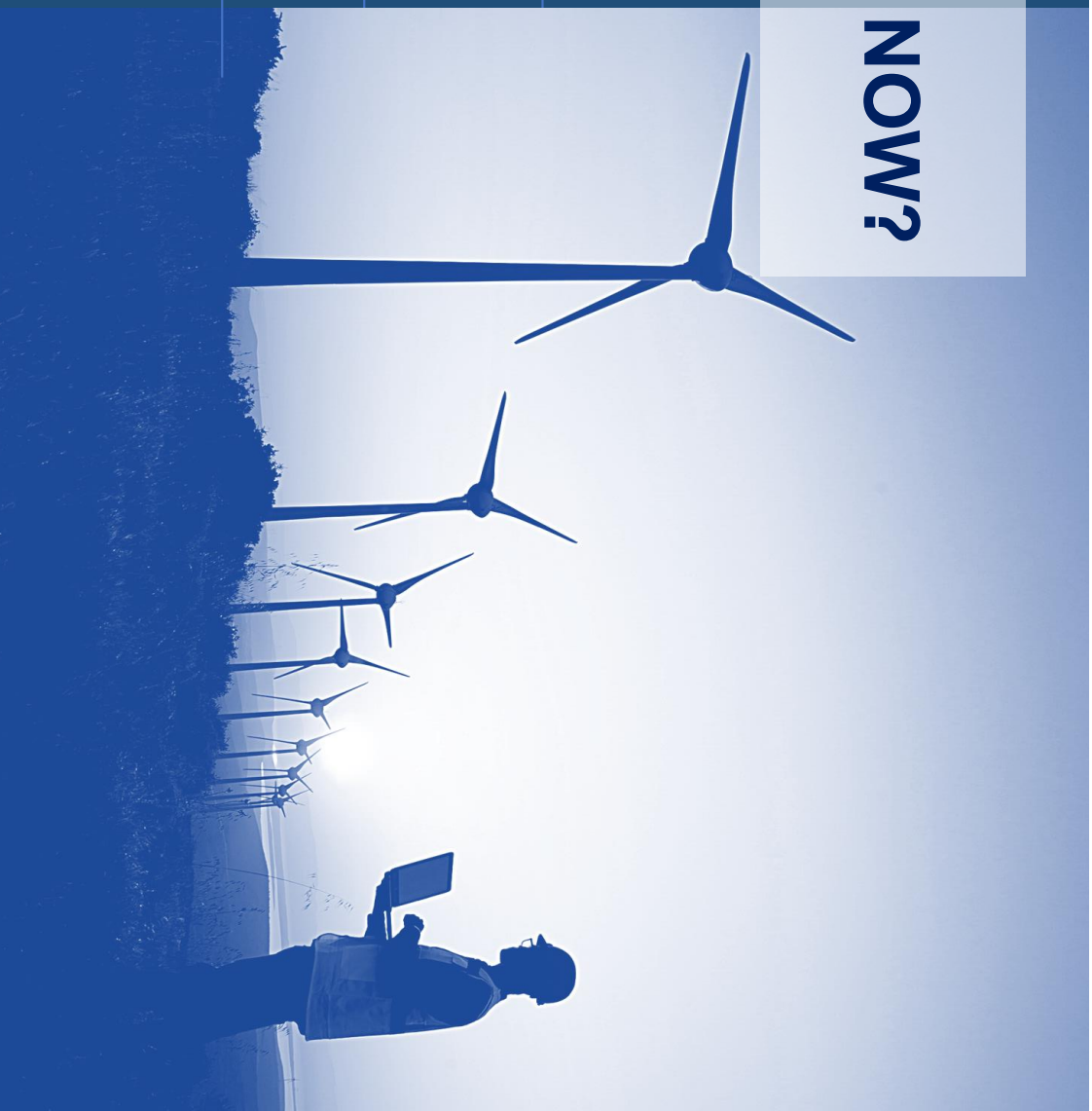
3

Role of Industries



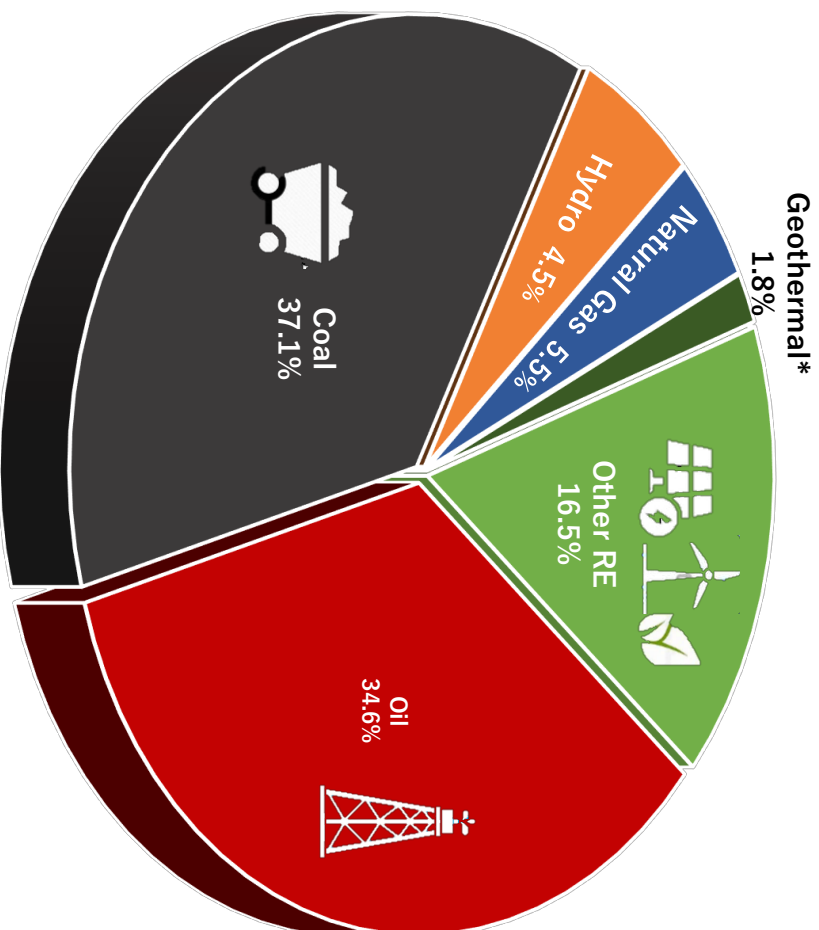
# WHERE ARE WE RIGHT NOW?

- Energy Mix
- Total Final Energy Consumption
- Power Generation Mix





# TOTAL PRIMARY ENERGY SUPPLY 2021



**50.9 MTOE**

2021 TOTAL PRIMARY ENERGY SUPPLY

**43.2%** **56.8%**  
(22.0 MTOE) (28.9 MTOE)  
INDIGENOUS NET IMPORTED

*\*Considering the actual output of geothermal for power generation*



Department of Energy



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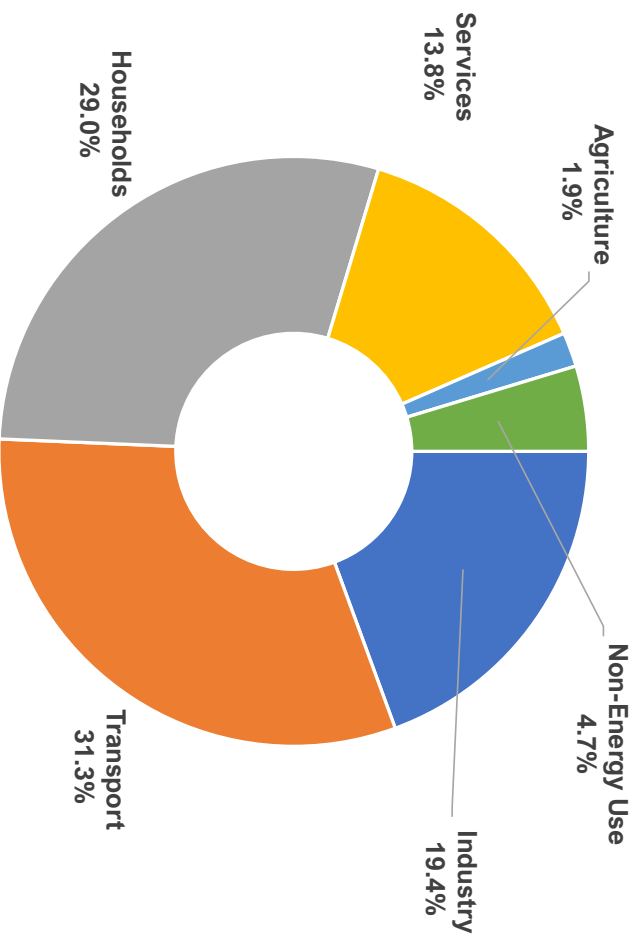


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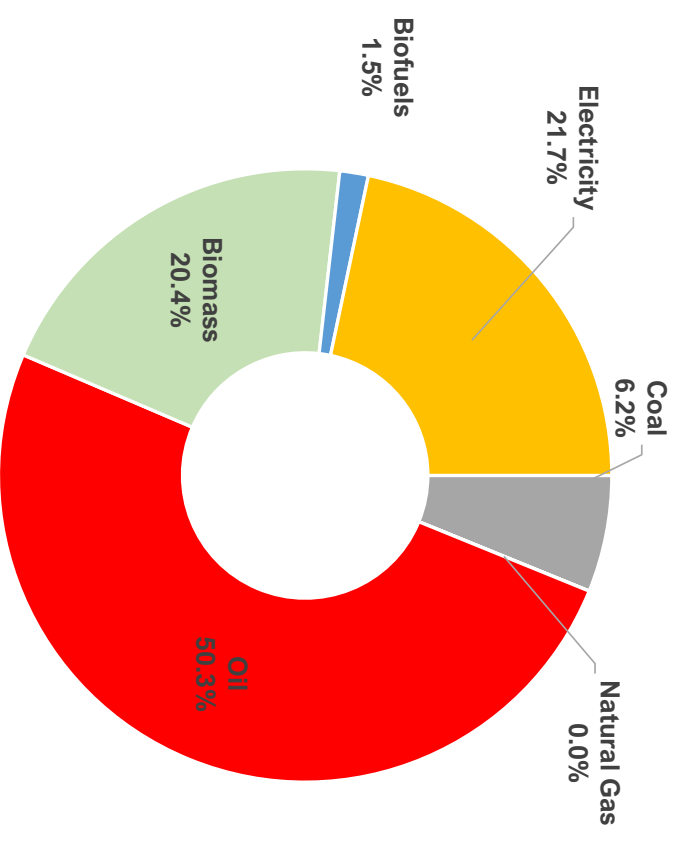
# TOTAL FINAL ENERGY CONSUMPTION 2021

**35.1 MTOE\***  
2021 TFEC

## By Sector



## By Fuel



\*Preliminary data for 2021



Department of Energy



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# On-Grid Power Capacity and Generation Mix **2021**



**PEAK DEMAND**  
**16,036 MW**

LUZON : 11,640 MW  
VISAYAS : 2,252 MW  
MINDANAO : 2,144 MW

**TOTAL: 106,114 GWh**

Indigenous: 45.1%  
Imported: 54.9%

**RE Share: 22%**  
**Fossil Share: 78%**









# WHERE DO WE WANT TO BE IN THE FUTURE?



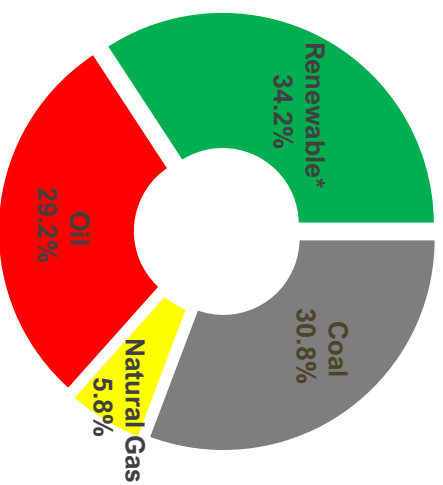
# 2040 OBJECTIVES

“Sustainable, stable, secure, sufficient, accessible and reasonably-priced energy”

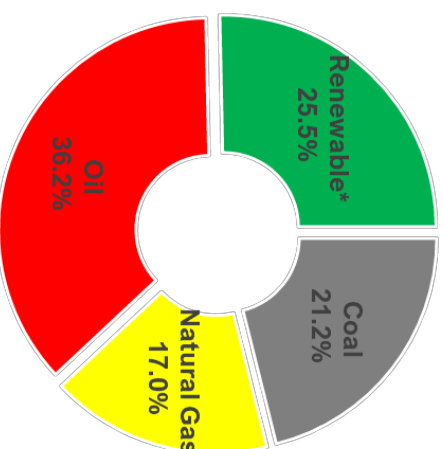
	<b>Upstream Sector</b>	Increased indigenous petroleum and coal reserve and production
	<b>Downstream Sector</b>	Improved policies governing the downstream oil industry and establishment of a world-class, investment driven, and efficient natural gas industry
	<b>Renewable Energy</b>	Attain the target of at least 35% RE share in the power generation mix by 2030 and 50% by 2040
	<b>Power Sector</b>	<ul style="list-style-type: none"><li>▪ Energy Security, Resiliency, Affordability, and Sustainability</li><li>▪ Transparent and Fair Playing Field in the Power Industry</li><li>▪ Electricity Access for All</li></ul>
	<b>Energy Efficiency</b>	Measurable reduction in energy intensity and consumption per year versus Business-As-Usual
	<b>Alternative Fuels and Emerging Technologies</b>	Secured and Stable supply of energy through Technology Responsive Energy Sector



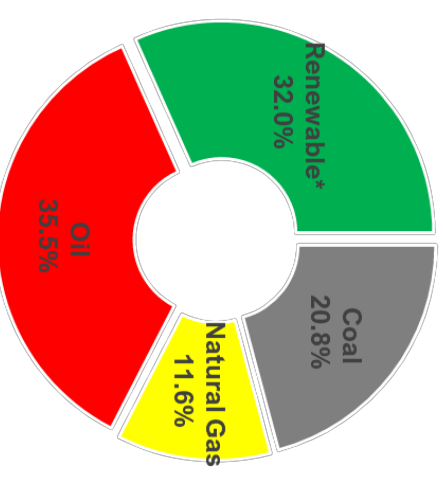
# TOTAL PRIMARY ENERGY SUPPLY, BY FUEL



**2020 Actual: 56.4 MTOE**  
Self-Sufficiency: 52.6%



**2040 REF: 155.6 MTOE**  
Self-Sufficiency: 51.1%



**2040 CES: 144.8 MTOE**  
Self-Sufficiency: 59.9%

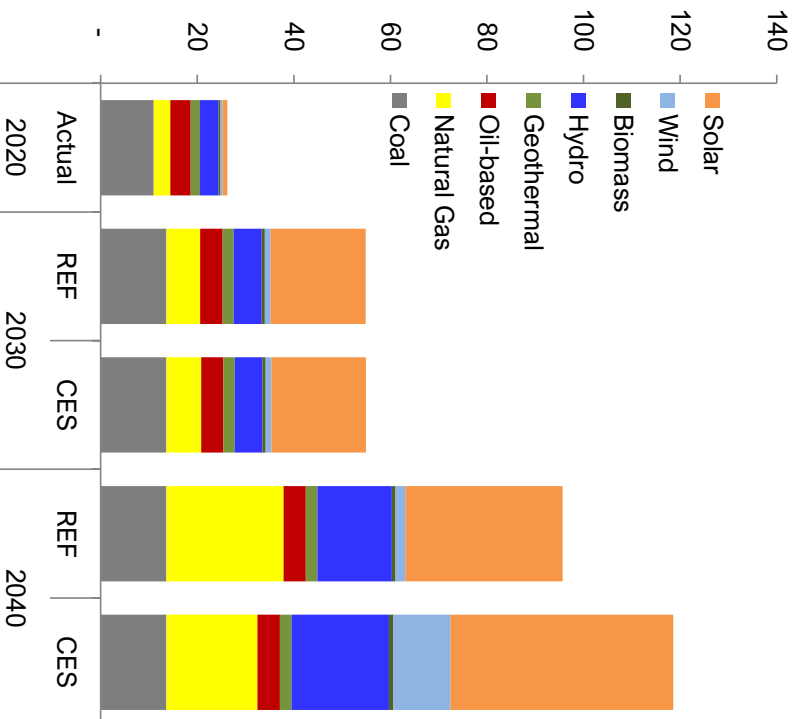
Fuel Type (TWh)	2020		2040				AAGR 2020-2040	
	Actual	% Shares	REF	% Shares	CES	% Shares	REF	CES
Coal	17.3	30.8	33.1	21.2	30.1	20.8	3.3%	2.8%
Natural Gas	3.3	5.8	26.5	17.0	16.8	11.6	11.0%	8.5%
Oil-based	16.5	29.2	56.4	36.2	51.5	35.5	6.4%	5.9%
Renewable*	19.3	34.2	39.7	25.5	46.4	32.0	3.7%	4.5%
<b>Total</b>	<b>56.4</b>	<b>100.0</b>	<b>155.6</b>	<b>100.0</b>	<b>144.8</b>	<b>100.0</b>	<b>5.2%</b>	<b>4.8%</b>

\*Includes geothermal, hydro, wind, solar and biomass



# INSTALLED GENERATING CAPACITY

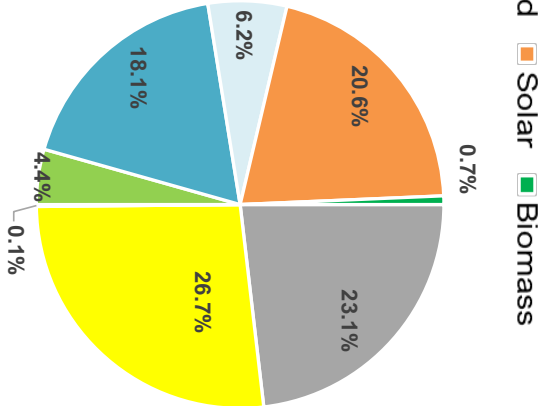
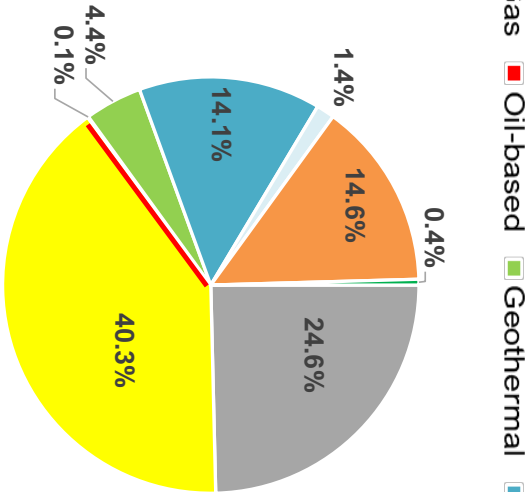
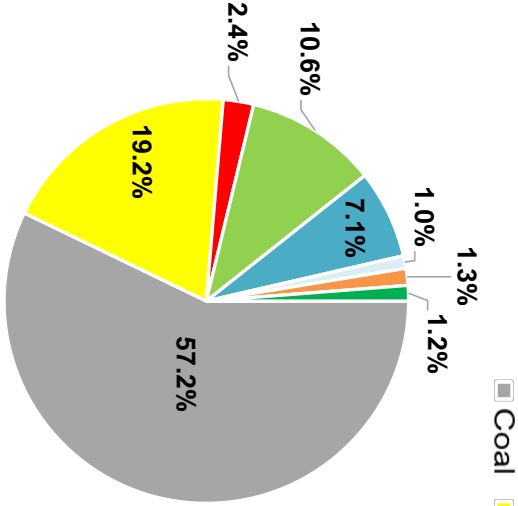
In GW



Capacities by Source: 2020, 2030 and 2040

Fuel Type (MW)	2020		2040				Total Additions by 2040	
	Actual	% Shares	REF	% Shares	CES	% Shares	REF	CES
Coal	10,944	41.7	13,585	14.2	13,585	11.5	2,641	2,641
Natural Gas	3,453	13.2	24,263	25.4	18,883	15.9	20,810	15,430
Oil-based	4,237	16.1	4,618	4.8	4,618	3.9	381	381
<b>Renewable</b>	<b>7,617</b>	<b>29.0</b>	<b>53,205</b>	<b>55.6</b>	<b>81,485</b>	<b>68.7</b>	<b>45,588</b>	<b>73,868</b>
Geothermal	1,928	7.3	2,408	2.5	2,408	2.0	480	480
Hydro	3,779	14.4	15,426	16.1	20,176	17.0	11,647	16,397
Wind	443	1.7	2,027	2.1	11,830	10.0	1,584	11,387
Solar	1,019	3.9	32,590	34.1	46,137	38.9	31,571	45,118
Biomass	447	1.7	753	0.8	933	0.8	306	486
<b>TOTAL</b>	<b>26,250</b>	<b>100.0</b>	<b>95,670</b>	<b>100.0</b>	<b>118,570</b>	<b>100.0</b>	<b>69,420</b>	<b>92,320</b>

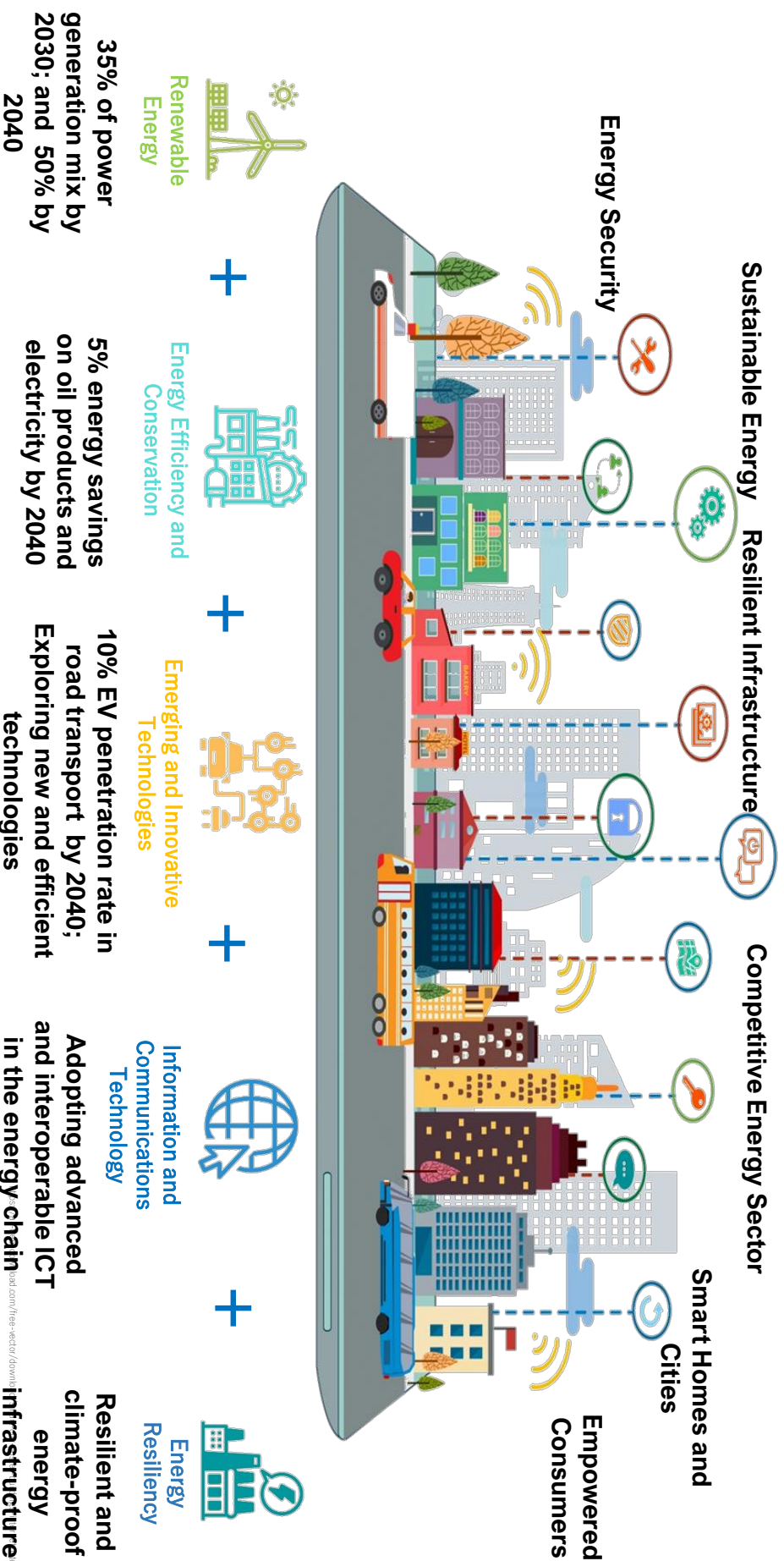
# POWER GENERATION, BY FUEL



Fuel Type (TWh)	2020		2040		2040 CES		AAGR 2020-2040	
	Actual	% Shares	REF	% Shares	CES	% Shares	REF	CES
Coal	58.2	57.2	89.7	24.6	80.8	23.1	2.2%	1.7%
Natural Gas	19.5	19.2	146.9	40.3	93.2	26.6	10.6%	8.1%
Oil-based	2.5	2.4	0.3	0.1	0.5	0.1	-10.4%	-7.5%
Renewable	21.6	21.2	127.5	35.0	175.5	50.1	9.3%	11.0%
Total	101.8	100.0	364.4	100.0	350.1	100.0	6.6%	6.4%

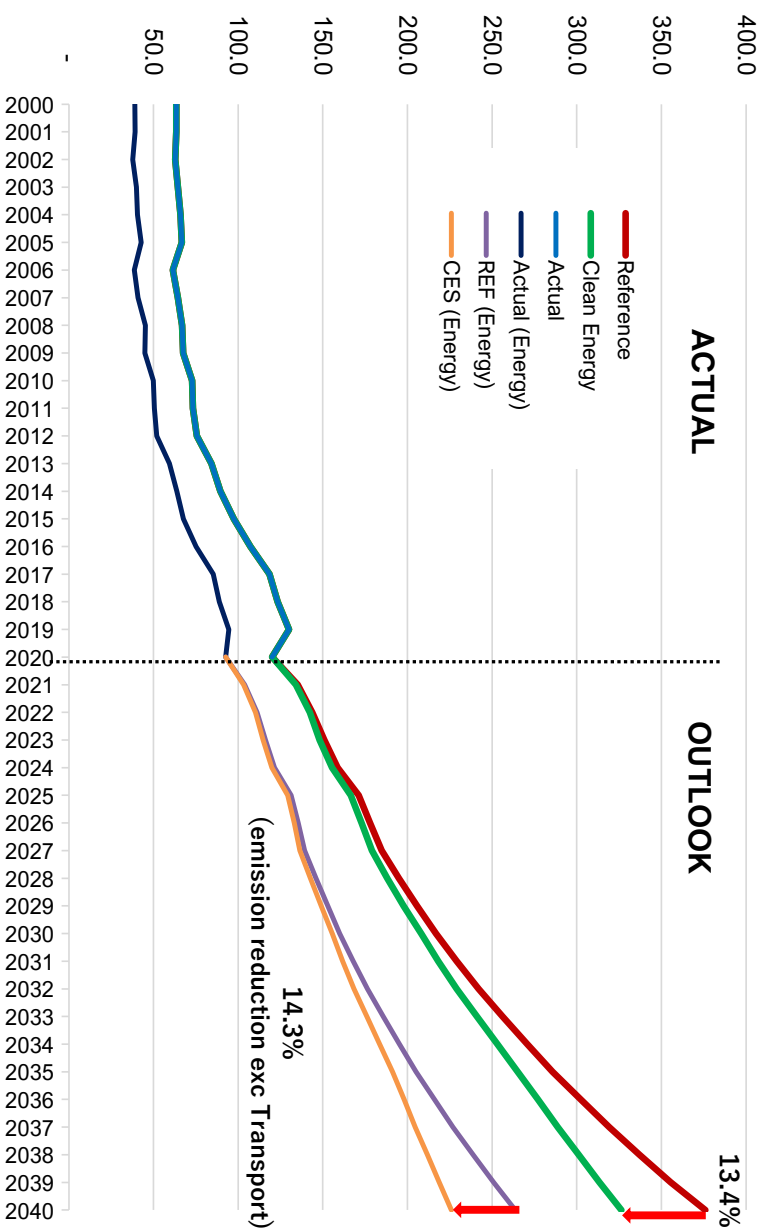


# FUTURE ENERGY SCENARIO IN CAPSULE



# GHG EMISSION, BY SECTOR AND BY FUEL

GHG Emission, in MTCO<sub>2</sub>e



Sector	2020	2040		AAGR 2020-2040	
	Actual	REF	CES	REF	CES
Transformation	70.8	156.9	124.6	4.1%	2.9%
Industry	10.6	47.5	45.1	7.8%	7.5%
Transport	27.4	112.3	100.5	7.3%	6.7%
Others	11.2	54.2	51.1	8.2%	7.9%
Total	120.0	370.9	321.2	5.8%	5.0%
Less Transport	92.6	258.6	220.8	5.3%	4.4%

# ENERGY SECTOR GHG INVENTORY

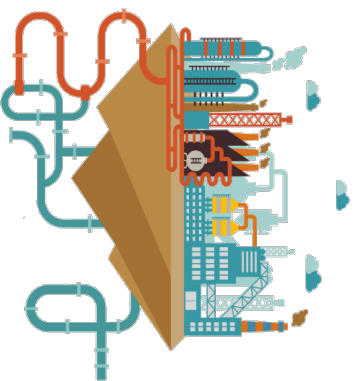
## 1.A Fuel combustion activities:

### Stationary Sources



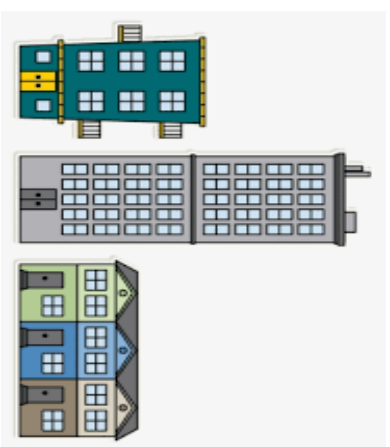
1.A.1

Energy  
Industries



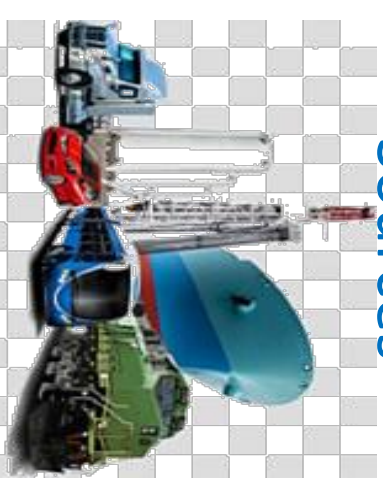
1.A.2

Manufacturing  
Industries



1.A.4

Other Sectors



1.A.3

Transportation

### Mobile

### Sources



# 2020 ENERGY SECTOR GHG INVENTORY – Sectoral Approach

Source Categories	Carbon Dioxide (CO <sub>2</sub> )	Methane (CH <sub>4</sub> )	Nitrous Oxide (N <sub>2</sub> O)	Total Emissions
	GgCO <sub>2</sub>	GgCO <sub>2</sub> -eq	GgCO <sub>2</sub> -eq	GgCO <sub>2</sub> -eq
<b>1. Energy</b>	<b>124,762.52</b>	<b>3,046.40</b>	<b>1476.73</b>	<b>129,285.65</b>
1.A. Fuel Combustion	124,752.76	2,486.03	1,476.70	128,715.49
1.A.1 Energy Industries	74,183.34	40.28	288.64	74,512.26
1.A.2 Manufacturing Industries and Construction	10,275.47	354.53	452.76	11,082.76
1.A.3 Transport	28,895.83	45.54	489.83	29,434.68
1.A.4 Other sectors	11,398.11	2,045.67	245.47	13,689.26
1B. Fugitive Emissions from Fuels	9.77	560.37	0.02	570.16



# ROLE OF INDUSTRIES

Energy  
Efficiency and  
Conservation

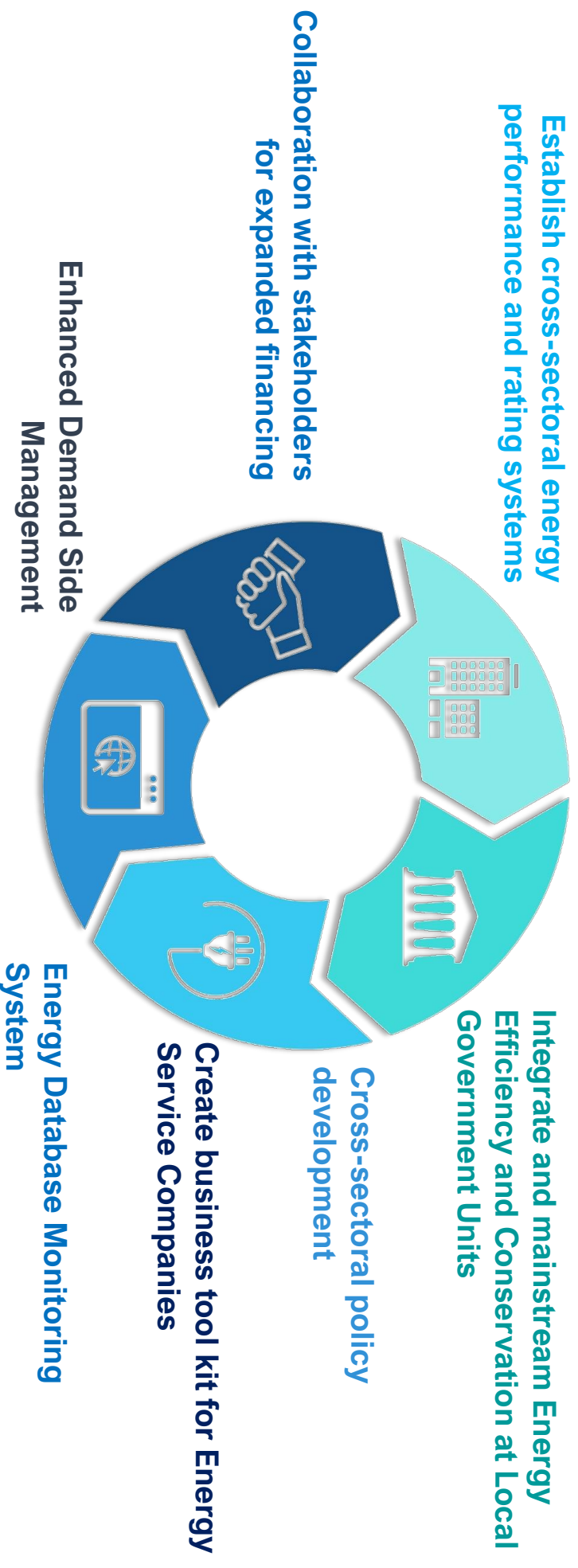


RE and  
Alternative Fuels



# ENERGY EFFICIENCY & CONSERVATION

Republic Act No. 11285: Energy Efficiency and Conservation Act





# RENEWABLE ENERGY PLANS AND PROGRAMS

1

## RENEWABLE PORTFOLIO STANDARDS

Requires electricity suppliers to source an agreed portion of their supply from eligible RE facilities

2

## GREEN ENERGY AUCTION PROGRAM

Sets the framework for the facilitation of immediate and timely investment for new and additional RE capacities to ensure provision of adequate supply under a competitive process

3

## GREEN ENERGY OPTION PROGRAM

Provides end-users the option to choose RE resources as their source of energy

4

## RE MARKET RULES

Establishes the market for the trading of RE Certificates between and among trade participants

5

## OPEN AND COMPETITIVE SELECTION PROCESS

Facilitates project development by offering well-characterized RE sites to project developers

6

## RENEWABLE ENERGY TRUST FUND

To finance research, development, demonstration, and promotion of the widespread and productive use of RE systems

7

## NET-METERING PROGRAM

End-users can install up to 100-kW RE systems to reduce their electricity bills and sell the surplus to the grid

8

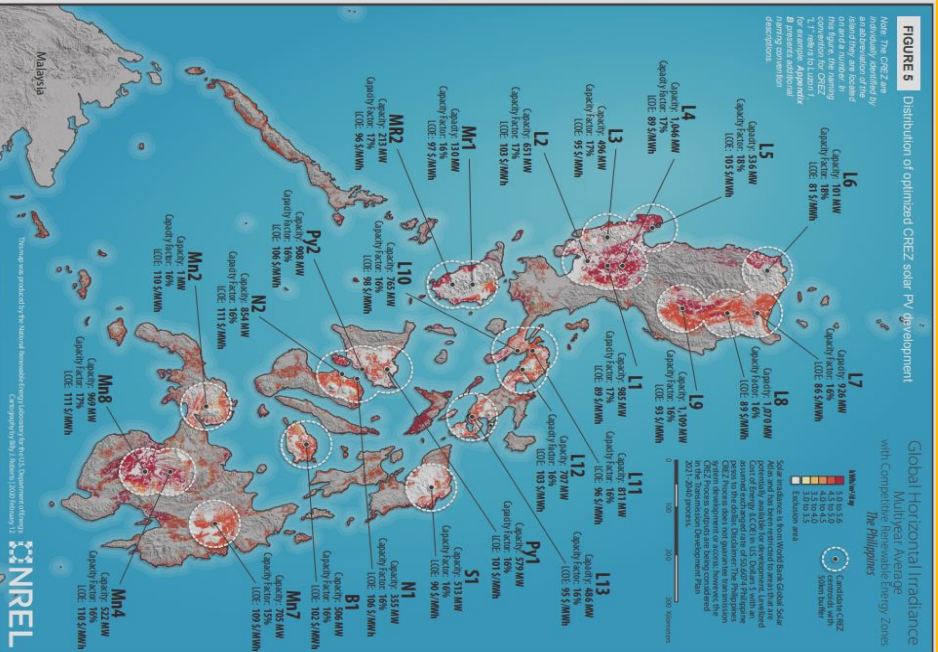
## COMPETITIVE RE ZONES

Covers the upgrade and expansion of transmission facilities through policy initiatives and activities that shall enable the optimal use of RE in the country

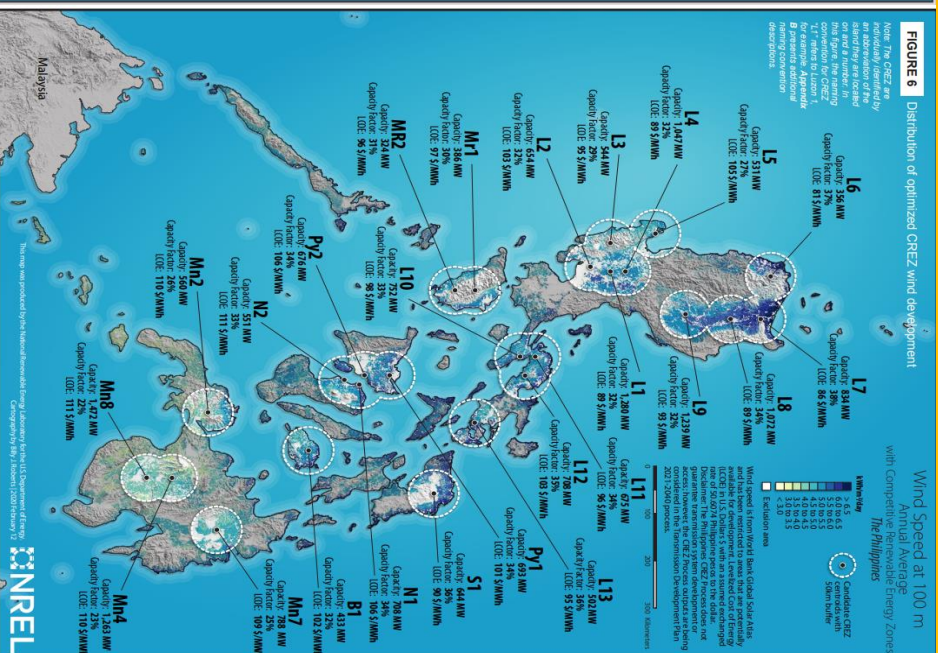


# CREZ SOLAR PV AND WIND POTENTIAL

**FIGURE 5** Distribution of optimized CREZ solar PV development



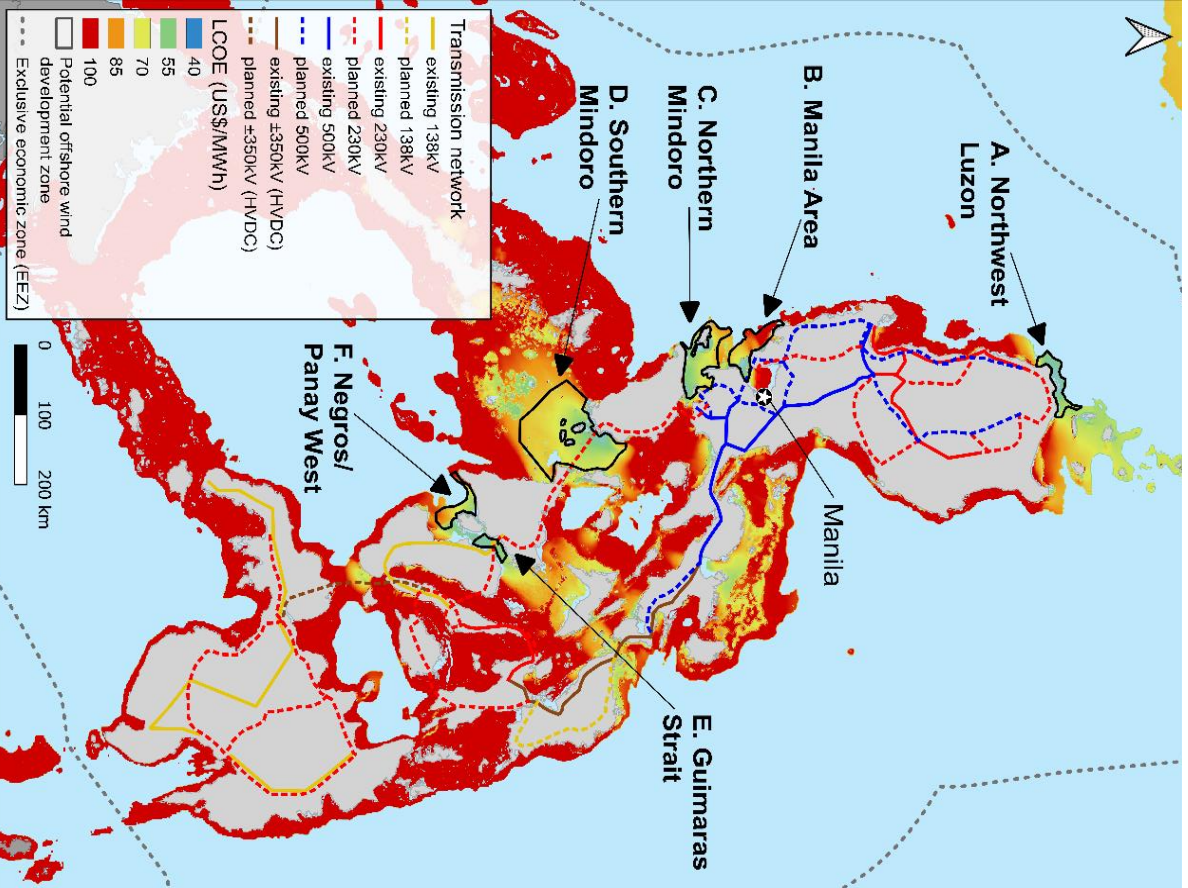
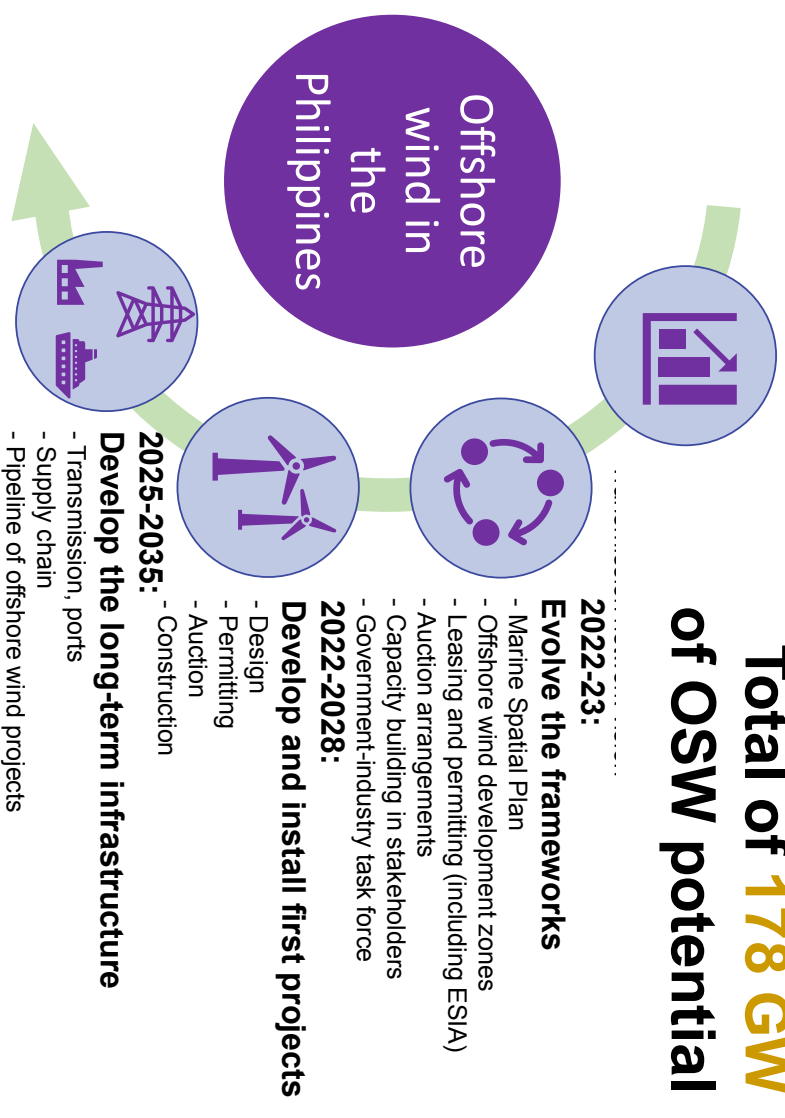
**FIGURE 6** Distribution of optimized CREZ wind development



- **DOE** initiated the Competitive Renewable Energy Zones (CREZ) Project in 2018
- Identified **25 Strategic Areas** with high concentration of **solar and wind resources** throughout the country
- **58,110 MW** Solar PV and **93,987 MW** Wind potential capacities

# OFFSHORE WIND ENERGY

Total of **178 GW**  
of OSW potential





# ALTERNATIVE FUELS & EMERGING TECHNOLOGIES



## Deployment of Alternative Fuels and Technologies for Transport

- Electric Vehicles (EVs)
- Hybrid Electric Vehicles (HEVs)
- Hydrogen Fuel Cells

Pursue Other Cleaner Source  
of Energy and Support  
Technologies





# Thank You!



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Bonifacio Global City  
Taguig City



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