



Updates on the Philippine Energy Sector

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2022 Virtual Energy Investment Forum

28 October 2022

PRESENTATION OUTLINE

1 Where Are We Right Now?

2 Where Do We Want To Be In The Future?

3 How Do We Get There?



WHERE ARE WE RIGHT NOW?

Energy Mix



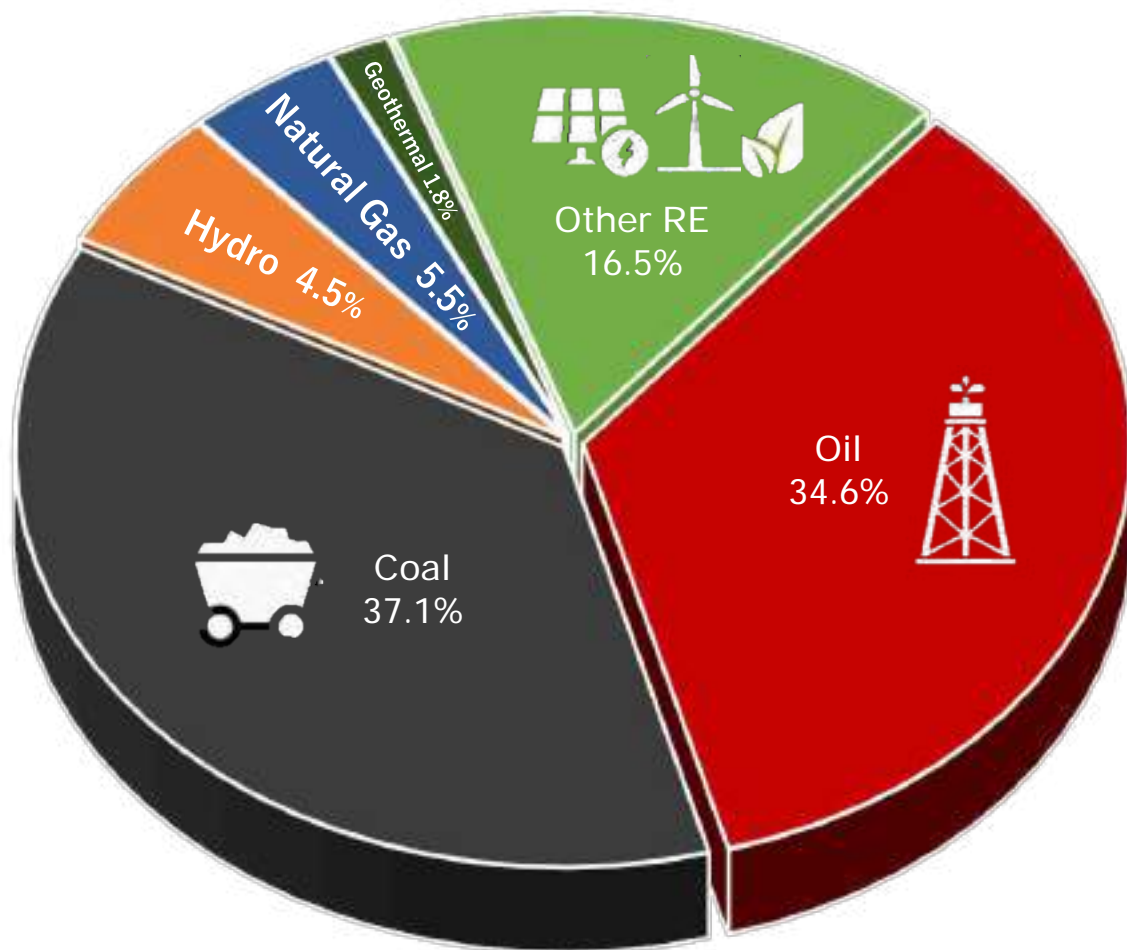
Total Final Energy
Consumption



Power Capacity and
Generation Mix



TOTAL PRIMARY ENERGY SUPPLY 2021



50.9 MTOE

2021 TOTAL PRIMARY ENERGY SUPPLY

43.2%

(22.0 MTOE)
INDIGENOUS

56.8%

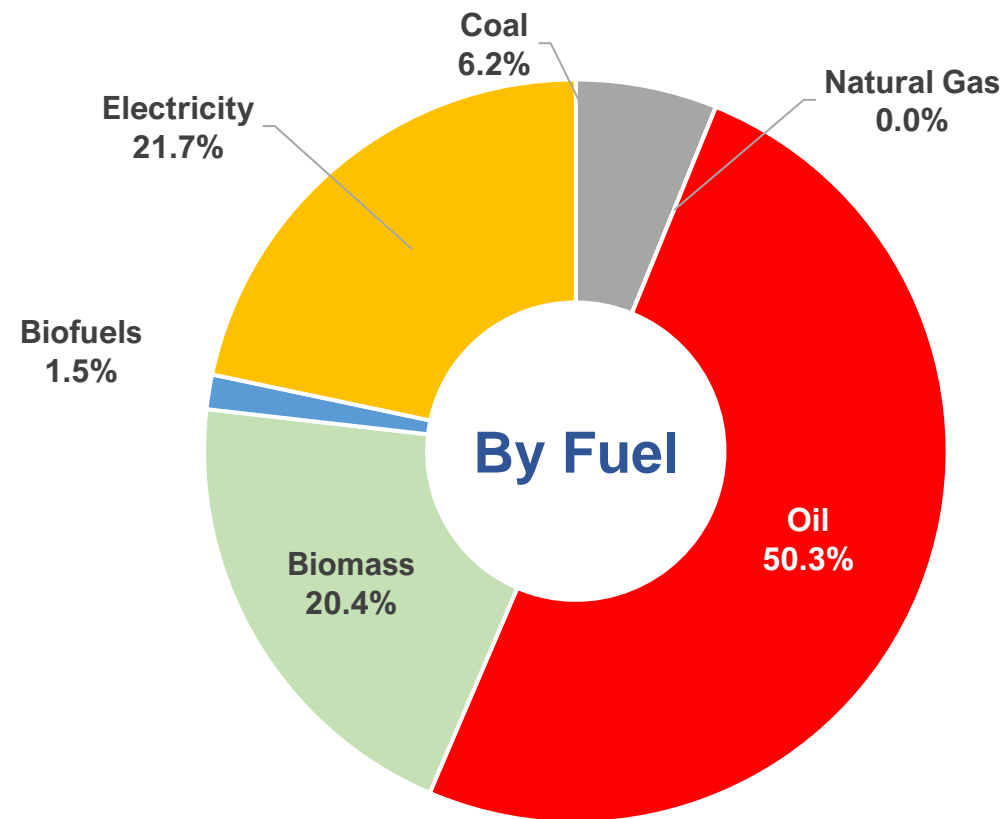
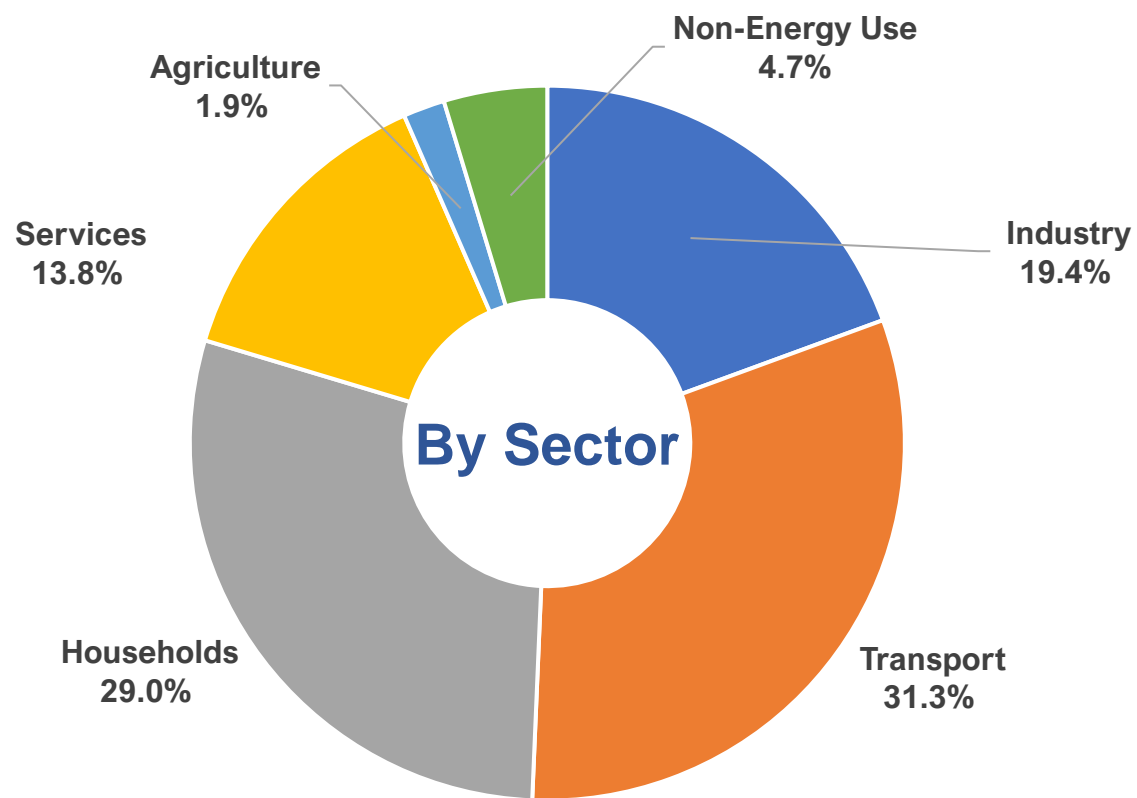
(28.9 MTOE)
NET IMPORTED

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



TOTAL FINAL ENERGY CONSUMPTION 2021

35.1 MTOE*
2021 TFE C



*Preliminary data for 2021



ON-GRID POWER CAPACITY AND GENERATION MIX 2021

COAL



43%

11,669 MW
INSTALLED CAPACITY

46%

10,913 MW
DEPENDABLE CAPACITY

58%

62,052 GWh
POWER GENERATION

RENEWABLE ENERGY



29%

7,914 MW
INSTALLED CAPACITY

29%

7,005 MW
DEPENDABLE CAPACITY

22%

23,771 GWh
POWER GENERATION

OIL-BASED



14%

3,847 MW
INSTALLED CAPACITY

11%

2,650 MW
DEPENDABLE CAPACITY

2%

1,616 GWh
POWER GENERATION

NATURAL GAS



13%

3,453 MW
INSTALLED CAPACITY

14%

3,286 MW
DEPENDABLE CAPACITY

18%

18,675 GWh
POWER GENERATION

PEAK DEMAND

16,036 MW

LUZON : 11,640 MW

VISAYAS : 2,252 MW

MINDANAO : 2,144 MW

TOTAL: **106,114** GWh

Indigenous: 45.1%

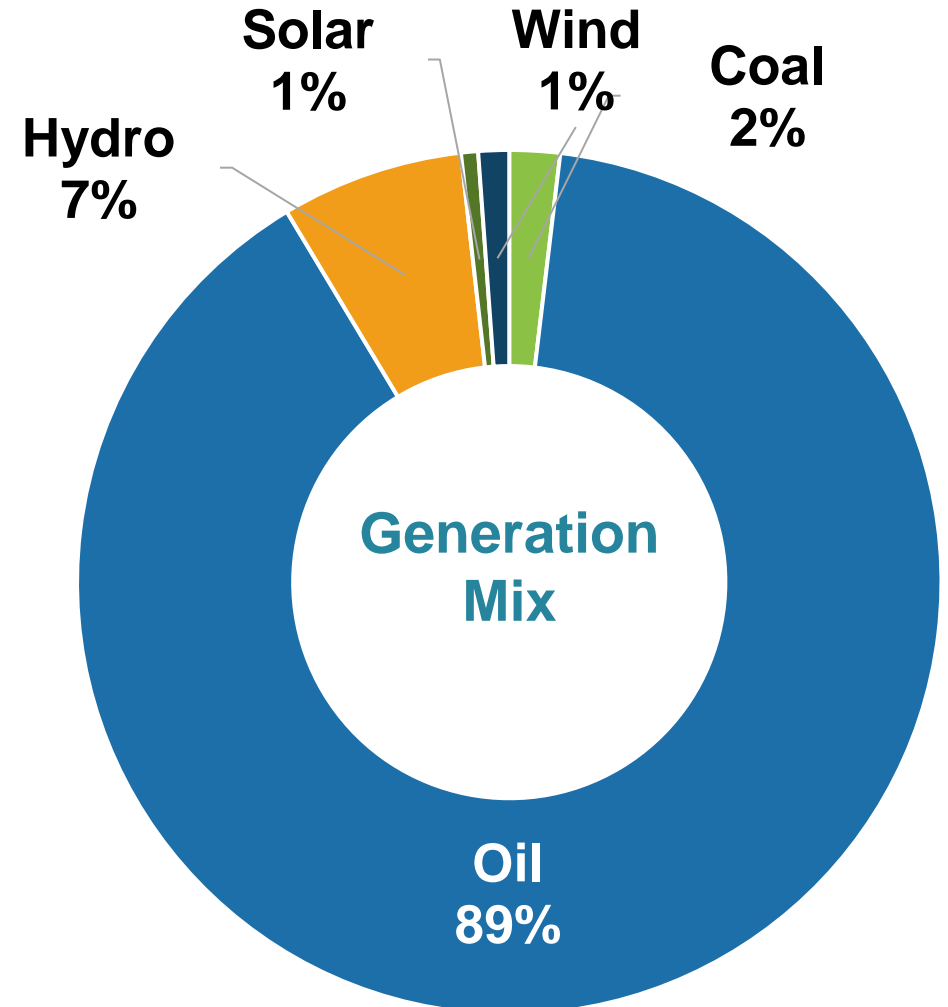
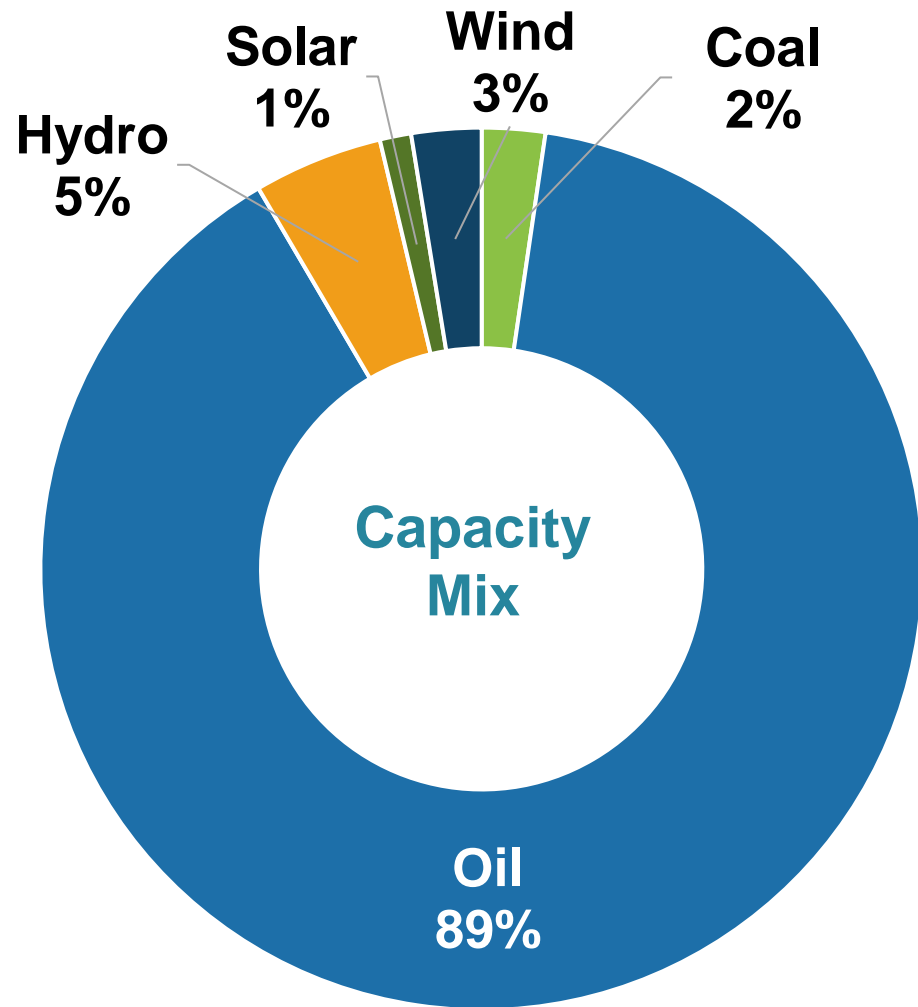
Imported: 54.9%

RE Share: 22%

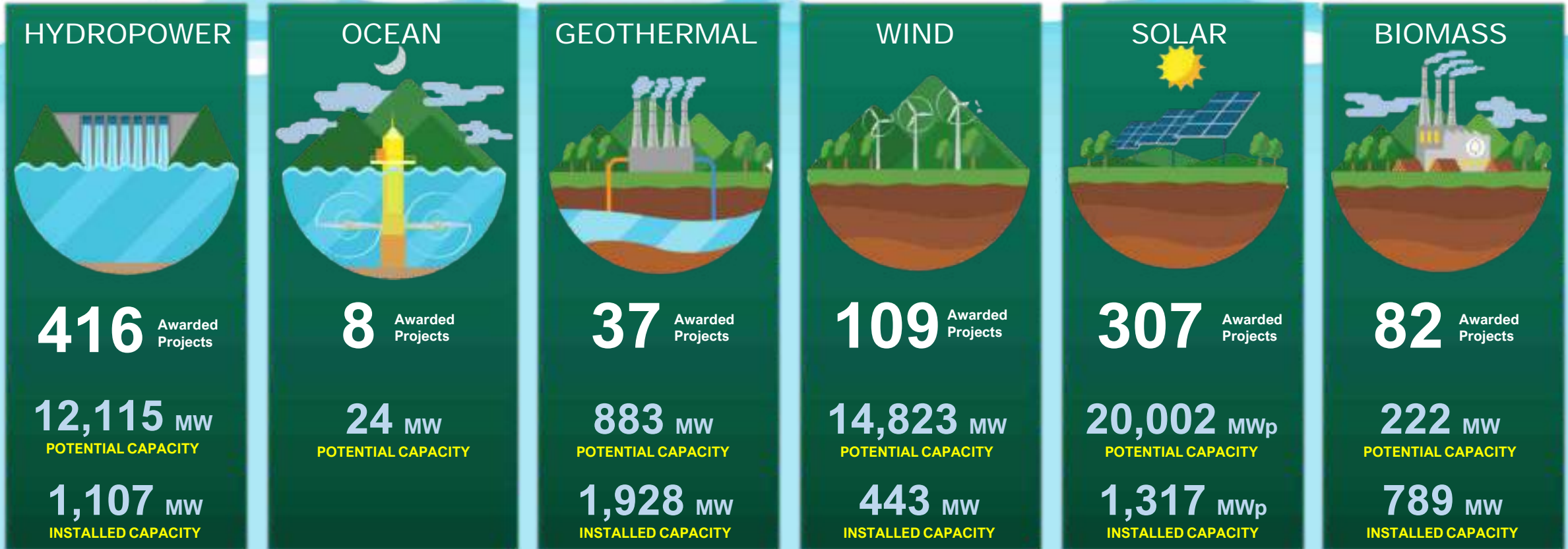
Fossil Share: 78%



OFF-GRID POWER CAPACITY AND GENERATION MIX 2020



AWARDED RENEWABLE ENERGY CONTRACTS



959

TOTAL RE CONTRACTS AWARDED
(DECEMBER 2021)

48 GW

TOTAL POTENTIAL CAPACITY

5.6 GW

TOTAL INSTALLED CAPACITY

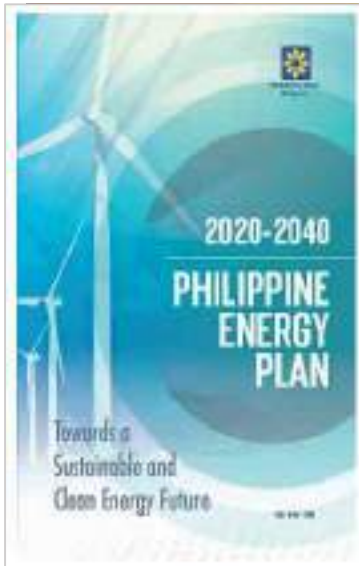


An aerial photograph of a city at sunset. The left side shows a dense residential area with many small houses and trees. The right side shows a modern skyscraper with a glass facade and many lit windows. The sky is a mix of orange, yellow, and blue. A semi-transparent white box with a grid pattern is overlaid on the center of the image, containing the text.

**WHERE DO WE WANT TO BE
IN THE FUTURE?**

PHILIPPINE ENERGY PLAN 2020-2040 TARGETS

“Sustainable Path Towards Clean Energy”



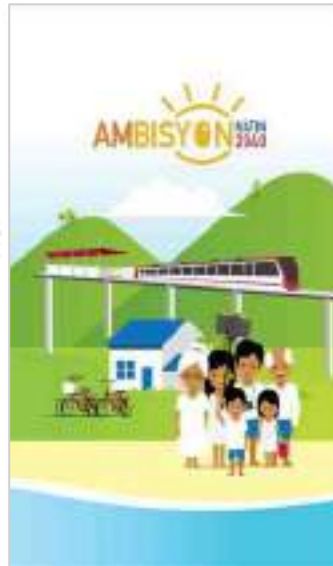
Reference Scenario

- + RE
- + EE and C
- + Other Energy Technologies
- + ICT
- + Resiliency



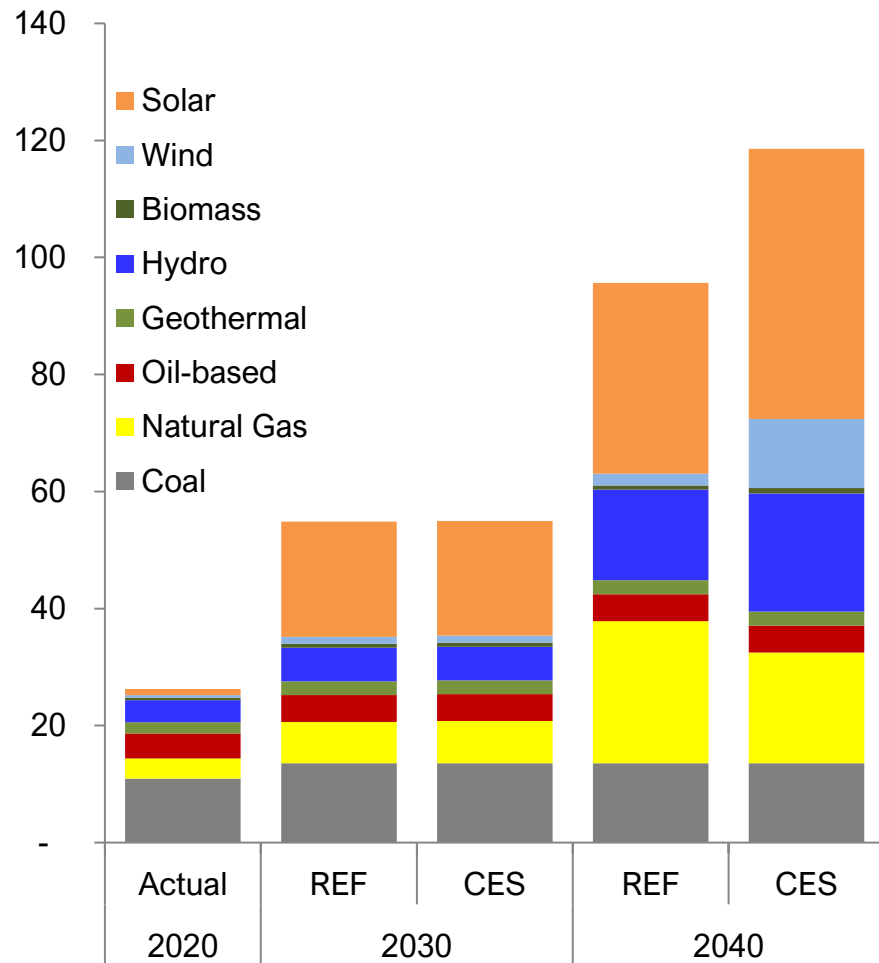
Clean Energy Scenario

- Energy Security
- Sustainable Energy
- Resilient Infrastructure
- Competitive Energy Sector
- Smart Homes and Cities
- Empowered Consumers



INSTALLED GENERATING CAPACITY

In GW



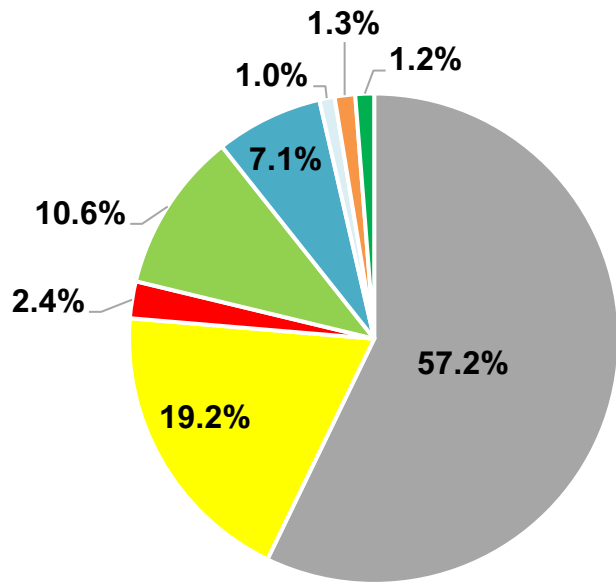
Capacities by Source: 2020, 2030 and 2040

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
Renewable	7,617	29.0	53,205	55.6	81,485	68.7	45,588	73,868
<i>Geothermal</i>	1,928	7.3	2,408	2.5	2,408	2.0	480	480
<i>Hydro</i>	3,779	14.4	15,426	16.1	20,176	17.0	11,647	16,397
<i>Wind</i>	443	1.7	2,027	2.1	11,830	10.0	1,584	11,387
<i>Solar</i>	1,019	3.9	32,590	34.1	46,137	38.9	31,571	45,118
<i>Biomass</i>	447	1.7	753	0.8	933	0.8	306	486
TOTAL	26,250	100.0	95,670	100.0	118,570	100.0	69,420	92,320

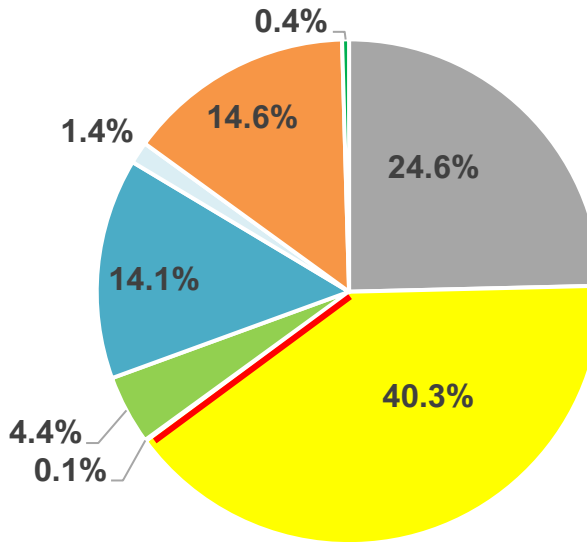


POWER GENERATION, BY FUEL

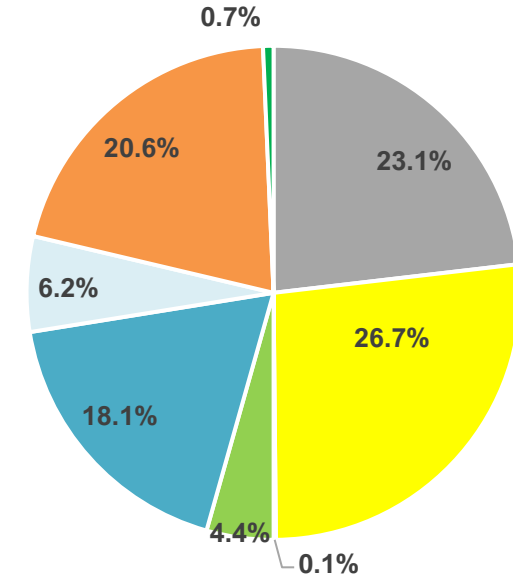
■ Coal ■ Natural Gas ■ Oil-based ■ Geothermal ■ Hydro ■ Wind ■ Solar ■ Biomass



2020: 101.8 TWh
RE Share: 21.2%



2040 REF: 364.4 TWh
RE Share: 35.0%



2040 CES: 350.1 TWh
RE Share: 50.0%

Fuel Type (TWh)	2020		2040				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%



HOW DO WE GET THERE?

Policies, Plans
and Programs



Opportunities in
the Philippine
Energy Sector









Investment
Requirements

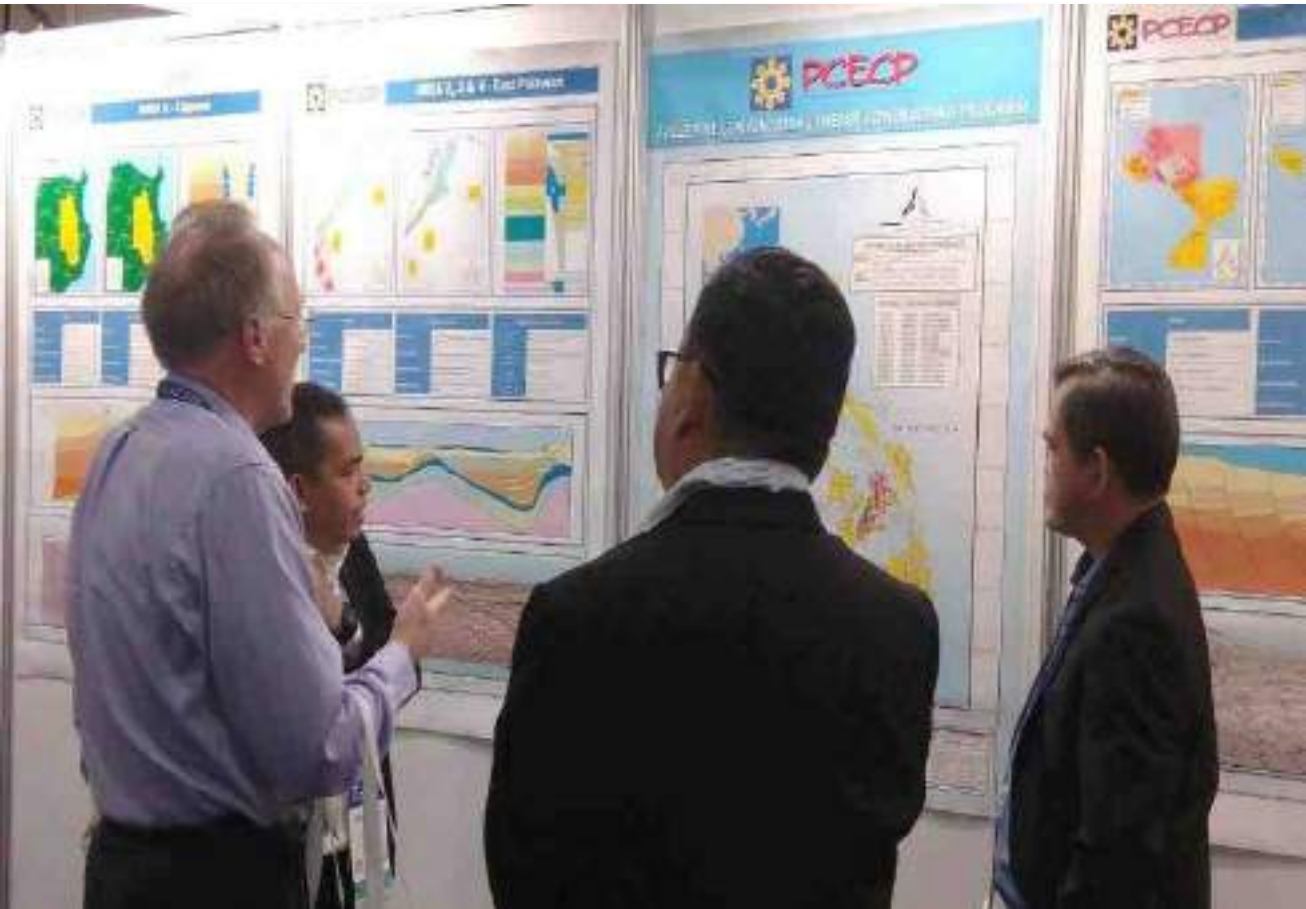


2040 OBJECTIVES

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

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

PHILIPPINE CONVENTIONAL ENERGY CONTRACTING PROGRAM

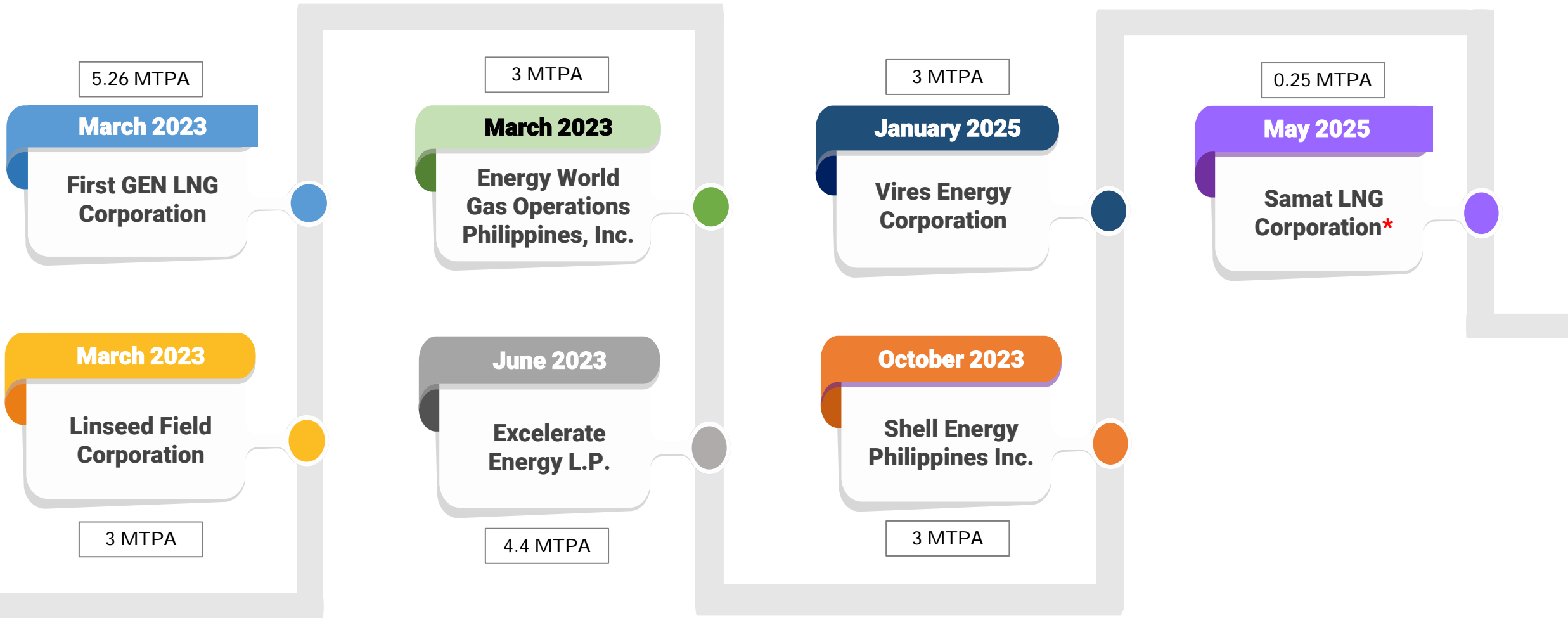


Boost petroleum exploration in the country by allowing *flexible modes of licensing*

15 applications
potential revenues/investment to reach
up to **PHP 86 million**

6 applications
recommended to the President
for award of service contracts

PROPOSED LNG PROJECTS



MTPA = million tonnes per annum

* For Downstream Natural Gas-Review and Evaluation Committee (DNG-REC) endorsement to the Secretary (Issuance of NTP)



LPG INDUSTRY

Republic Act No. 11592

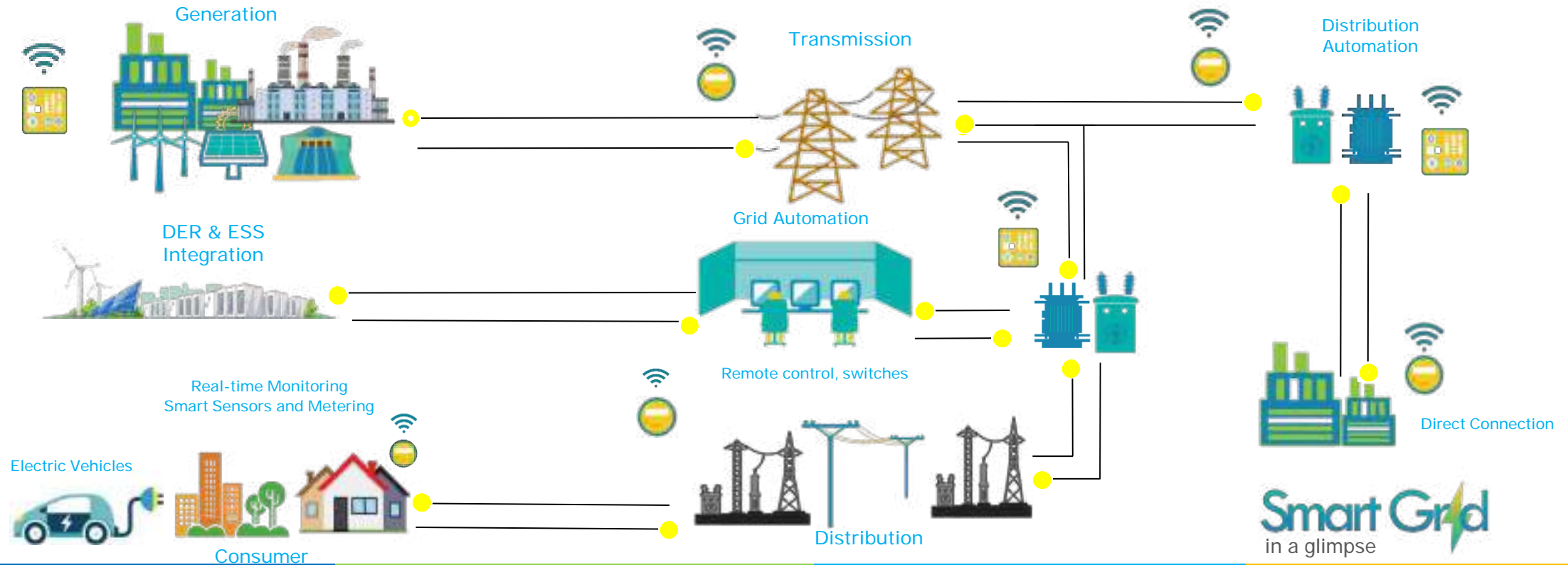
LPG INDUSTRY REGULATION ACT

Aims to regulate the domestic liquefied petroleum gas industry and ensure consumer protection against malpractices

Establishes an **LPG Cylinder Improvement Program** to ensure the quality of all cylinders in circulation with the goal of protecting the end-consumers



POWER SECTOR PLANS AND PROGRAMS



Smart Grid

The National Smart Grid Policy Framework and Roadmap for Distribution Utilities established in 2020 shall be fully implemented.

Increase Flexibility in Power Generation

Increasing flexibility in power generation enables the system to synchronously adapt and adjust to dynamic conditions at any given time, resulting to an optimized electricity demand and supply flow.

Interconnection of Major Island Grids

Having an interconnected grid system, which allows optimization of the country's indigenous energy resources and infrastructure, is one of the visions for the Philippines' electric power industry.

Total Electrification

The government shall continually improve its existing electrification strategies, utilize advanced technologies, and adopt innovative solutions to achieve 100% electrification rate in the country.

Supply Policy and Market Development Mechanisms

Prosumer	Customer Contracting Options	Grid & Generation Maintenance	DU Contracting	SO Contracting	DOE Support for RE Development
<ul style="list-style-type: none">• Own use• Net metering	<ul style="list-style-type: none">• Interruptible Load Program (ILP)• Green Energy Option Program• Retail Competition and Open Access• Directly-Connected Customers	<ul style="list-style-type: none">• Grid Operation and Maintenance Program	<ul style="list-style-type: none">• Embedded Generation (RE 10-5-5 CSP Exempt)• DU Contracting (in accordance with the CSP)	<ul style="list-style-type: none">• Ancillary Services	<ul style="list-style-type: none">• Green Energy Auction Program

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

INCREASED ENERGY ACCESS FOR ALL



95.56%

Electrification Level
(as of March 2022)

Republic Act No. 11646

MICROGRID SYSTEMS ACT

Aims to accelerate total electrification and ensure the provision of quality, reliable, and secure electricity service at reasonable rates in unserved and underserved areas through the installation of microgrid systems by accredited Microgrid Service Providers.



1.02 Million
Target Unserved
Households



25.21 Million
Total Energized



Luzon
98.7 %

Visayas
96.9 %

Mindanao
86.4 %

Based on 2015 Census



STRENGTHENED COLLABORATION AMONG GOVERNMENT AGENCIES



Republic Act No. 11234 Energy Virtual One-Stop Shop (EVOSS) Act

Prospective energy companies can apply, monitor, and receive all the necessary permits, and pay for charges and fees, through the EVOSS' online platform

3,167

Total Accepted Applications
(as of 12 August 2022)

2,686

DOE Approved Applications
and Endorsements

97 Ongoing
Evaluation

384 Disapproved
Applications



RENEWABLE ENERGY PLANS AND PROGRAMS



Energy Security

Accelerate exploration and development of RE resources to achieve energy self-reliance and reduce dependence on fossil fuels.



Sustainable Development

- Contribute to the SGD Goals
- Balance economic growth with protection of health and environment.



Climate Change Mitigation

Reduce Greenhouse Gas and other harmful emissions.



Capacity Building

Institutionalize the development of capabilities in the use of RE systems.



Inclusive Growth

Catalyze solutions to cross-cutting social issues including poverty, gender, and access to basic needs.

National Renewable Energy Program (NREP) 2020 – 2040

NREP sets a target of at least

35% RE Share

in the power generation mix (MWh) by 2030

NREP works to drive

RE share to greater than 50% by 2040,

dominating the mix

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

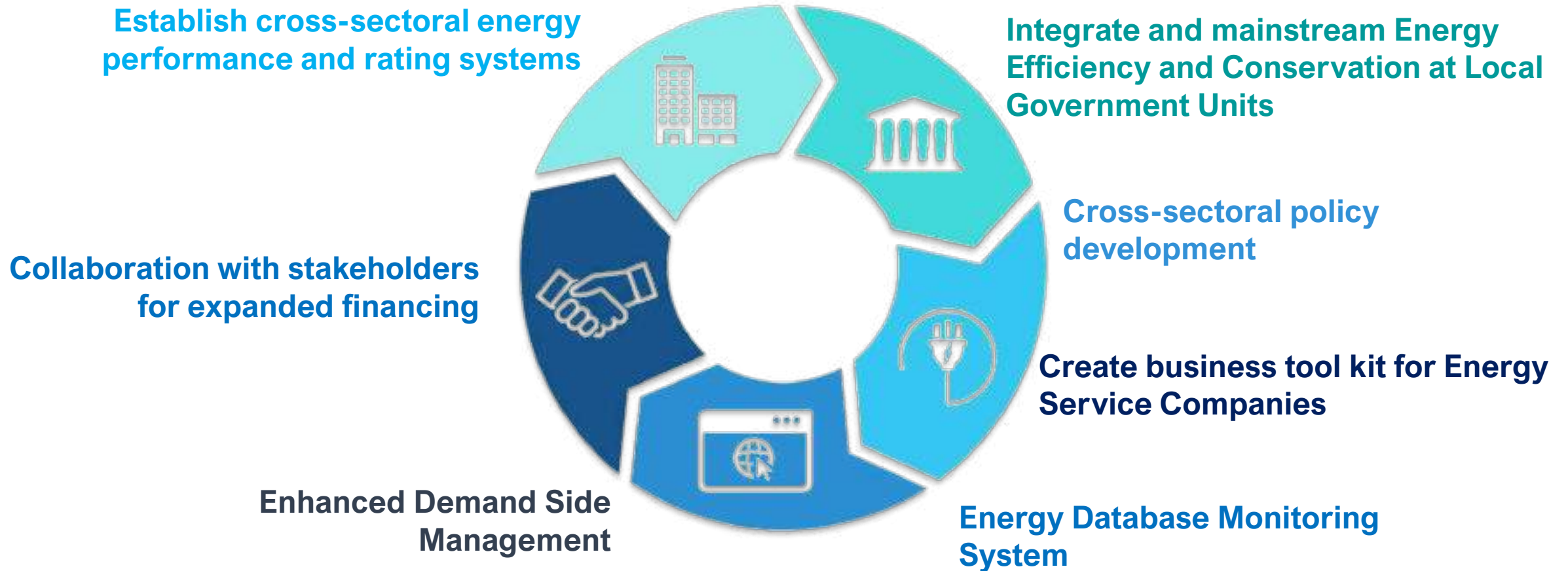
8 COMPETITIVE RE ZONES

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



ENERGY EFFICIENCY AND CONSERVATION PLANS AND PROGRAMS

Republic Act No. 11285: Energy Efficiency and Conservation Act



ALTERNATIVE FUELS & EMERGING TECHNOLOGIES PLANS AND PROGRAMS



Deployment of Alternative Fuels and Technologies for Transport

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

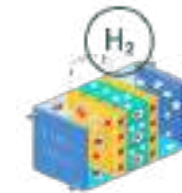


Establish Necessary Infrastructure and Regulatory Support

- EV Charging Stations
- Adoption of single EV charging protocol
- R&D on EV parts and components
- Establishment of testing laboratories, service shops, and training modules
- Household / home solar storage batteries



Pursue Other Cleaner Source of Energy and Support Technologies

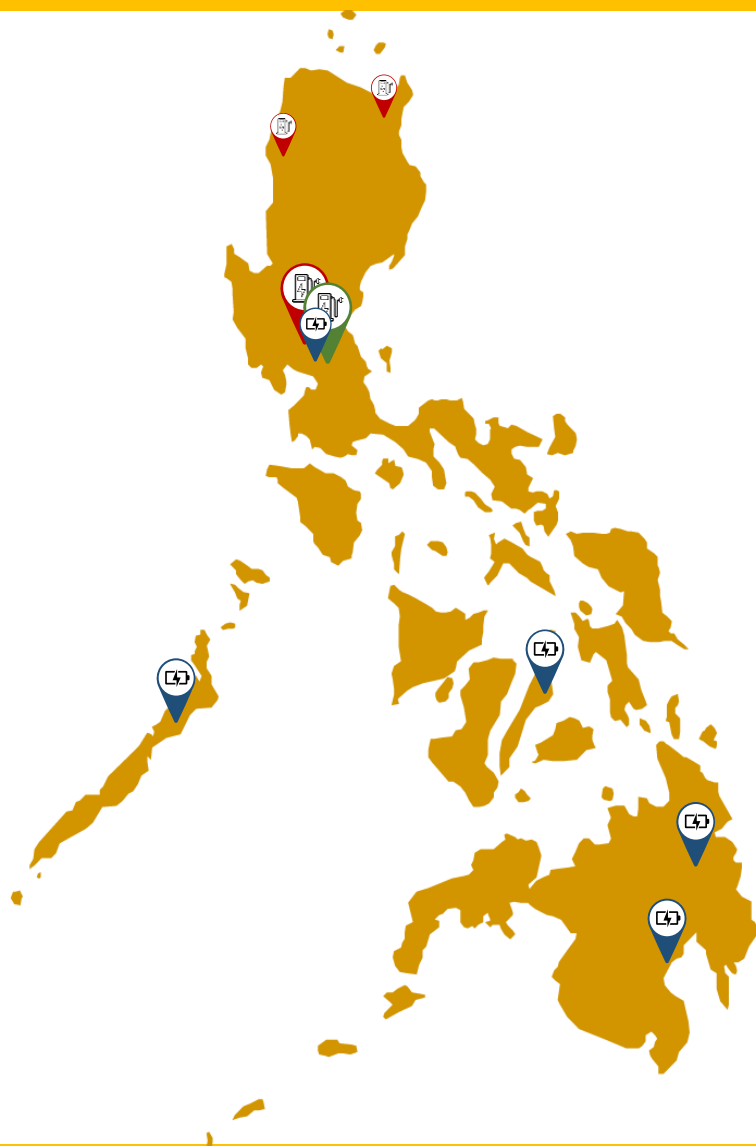


HYDROGEN



NUCLEAR

PUSHED THE DEVELOPMENT OF ALTERNATIVE FUELS



Charger Type	No. of Chargers as of 25 August 2022
AC (slow charge)	250
DC (fast charge)	15
Battery Swapping	18
TOTAL	283

* EVCS monitoring started on September 2021 through DOE DC2021-07-0023



Source: UP EEEI – (AC Charger) UP Diliman, Quezon City, Metro Manila



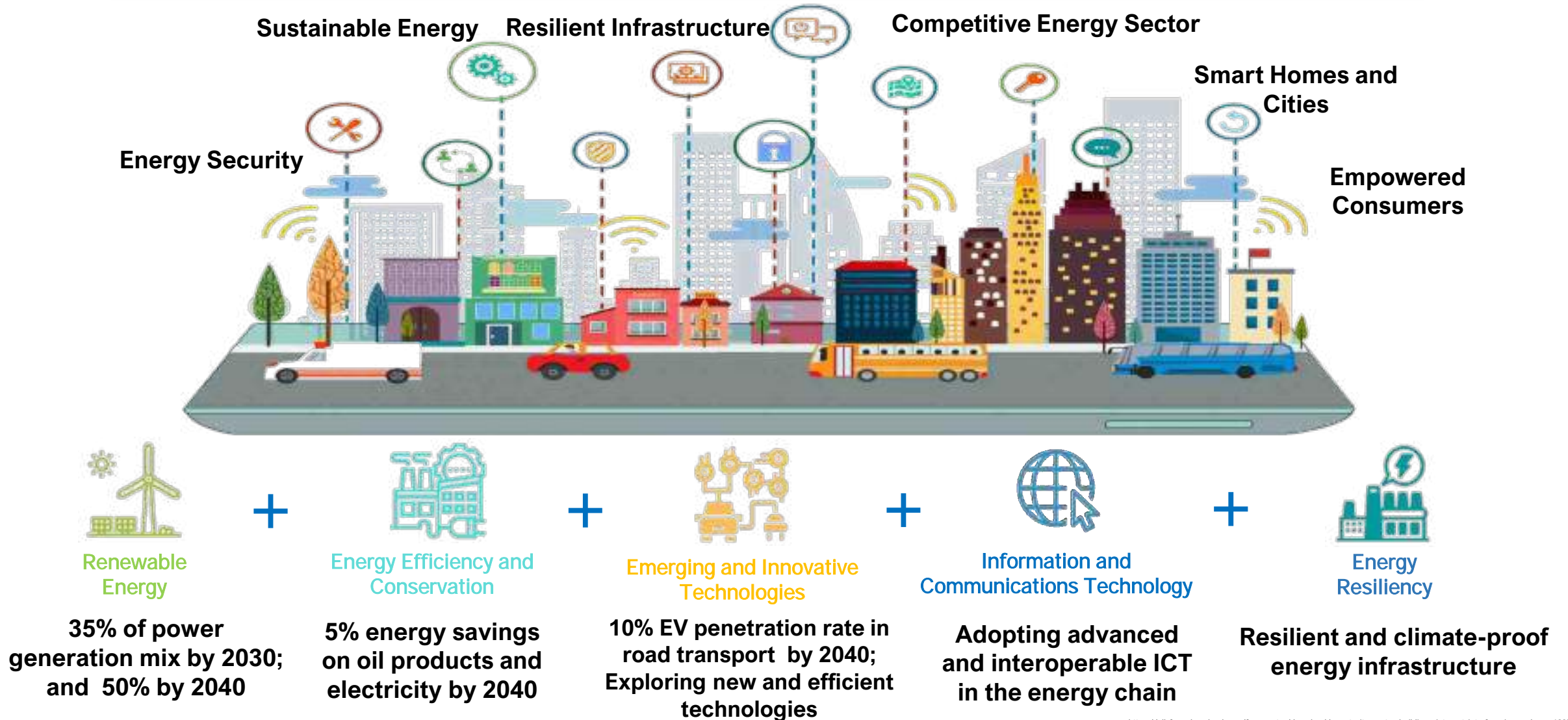
Source: Unioil EVCS – (DC Fast Charger) in Subic Bay Freeport Zone, Zambales



Source: Filinvest – (Battery Swapping Station) in Alabang, Muntinlupa



FUTURE ENERGY SCENARIO IN CAPSULE



https://all-free-download.com/free-vector/download/smart-city-poster-buildings-internet-interface-icons-decor_6835742.html



INVESTMENT REQUIREMENTS



USD 153 Billion
Total Required Energy Investments

UPSTREAM



USD 10.05 Billion
Oil and Gas Exploration
and Development



USD 13.12 Billion
Coal Exploration and Production



USD 510 Million
Renewable Energy
(Pre-Development Activities)

DOWNSTREAM



USD 2.94 Billion
Oil Distribution Depots and
Import Terminals



USD 1.78 Billion
Liquefied Natural Gas (LNG) Terminals



USD 2.38 Billion
Biofuels Production

POWER



USD 115.3 Billion
Construction of New Power
Plants

Conventional: **USD 21.0 Billion**
Renewable Energy: **USD 94.3 Billion**



USD 6.97 Billion
Transmission Projects



Thank You!



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