

PHILIPPINES



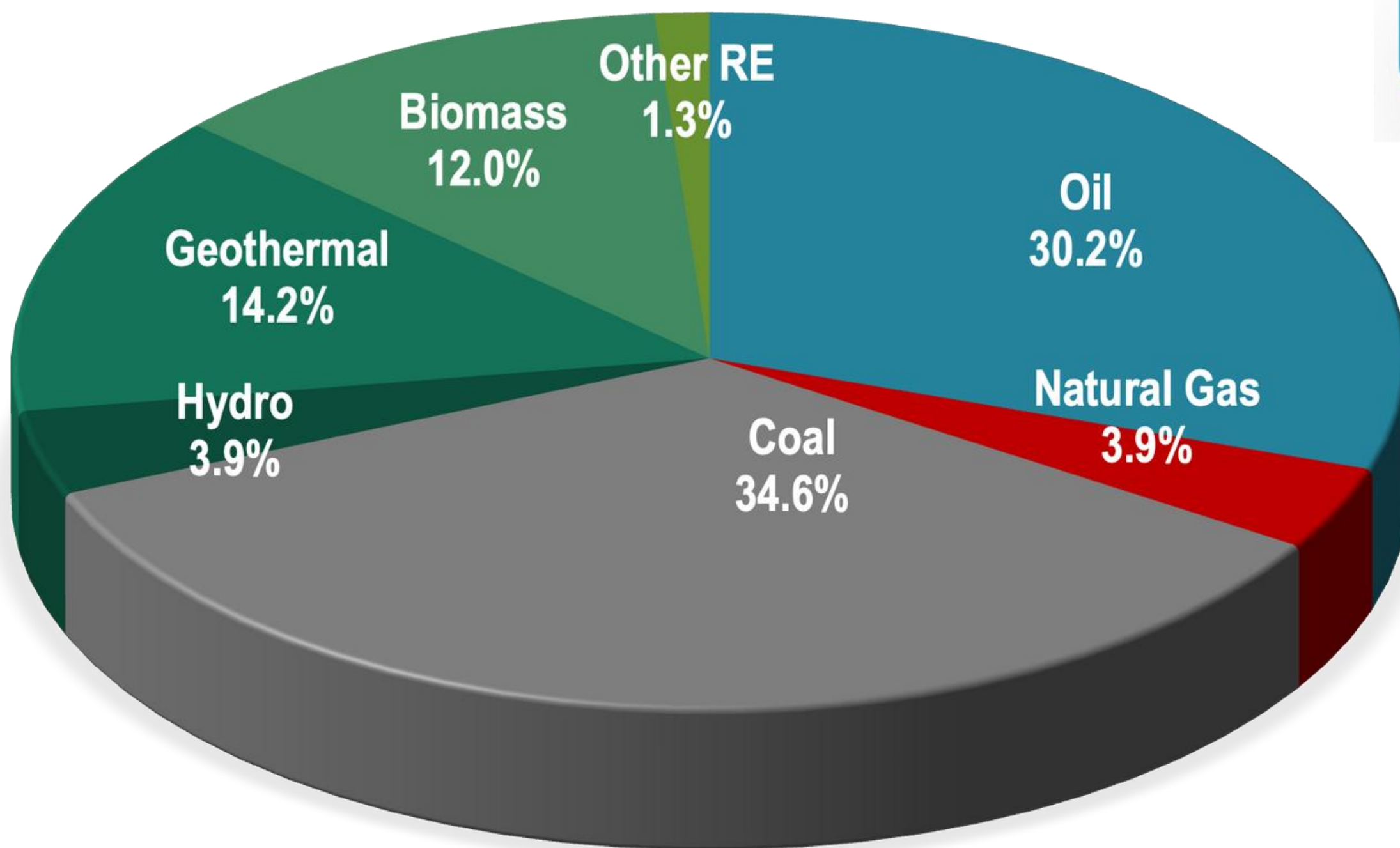
Utilizing Carbon-Free Energy Technologies to Expand Clean Electricity in APEC

PH Delegation to the 1st Joint Meeting of Four Expert Groups of the APEC Energy Working Group

09-11 April 2025 | Kowloon Shangri-La, Hongkong SAR



2023 Primary Energy Mix



65.34 MTOE
2023 Total Primary Energy Supply

46.3%
(30.3 MTOE)

INDIGENOUS

53.7%
(35.1 MTOE)

NET IMPORTED

31.5%
(20.6 MTOE)

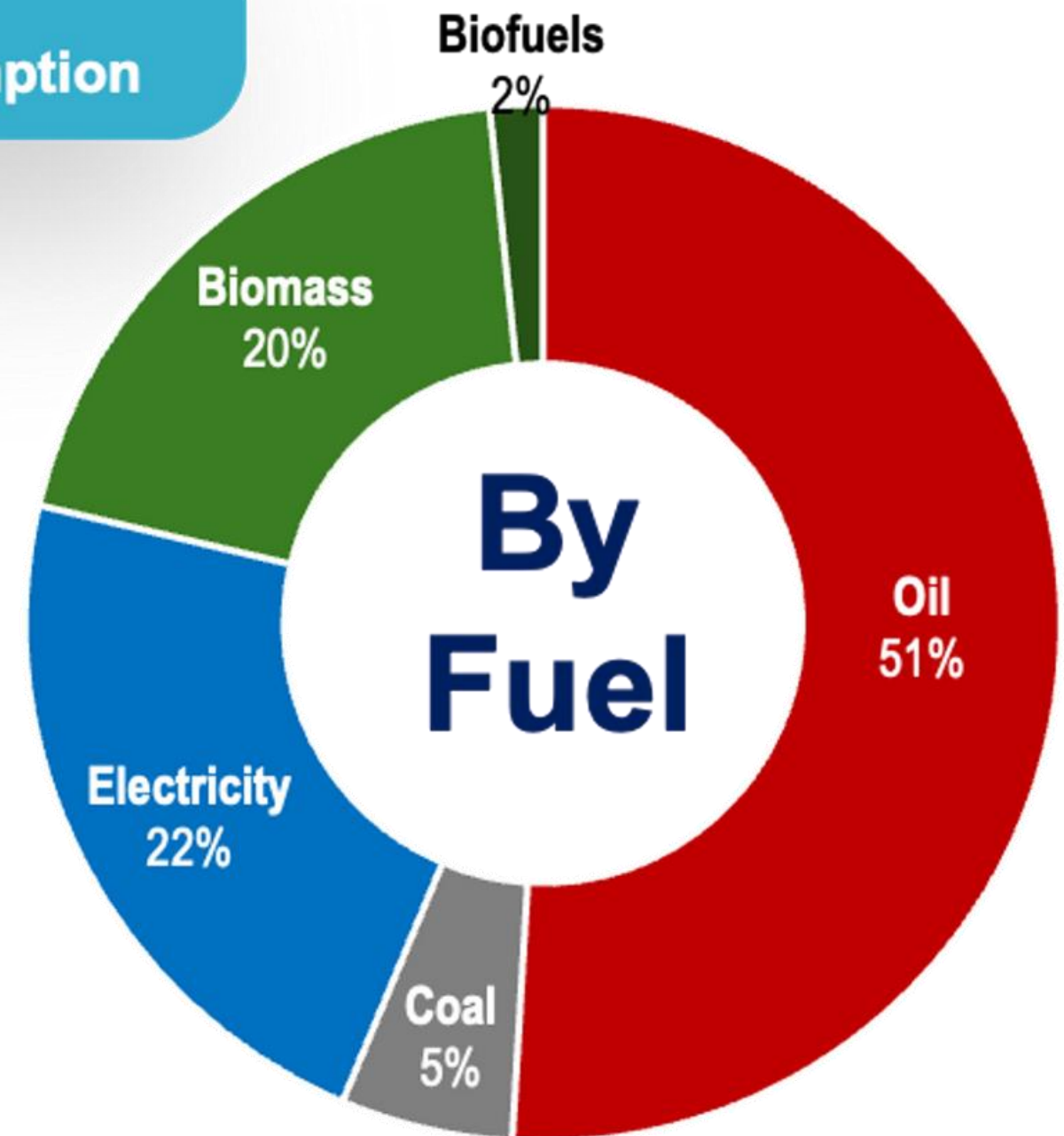
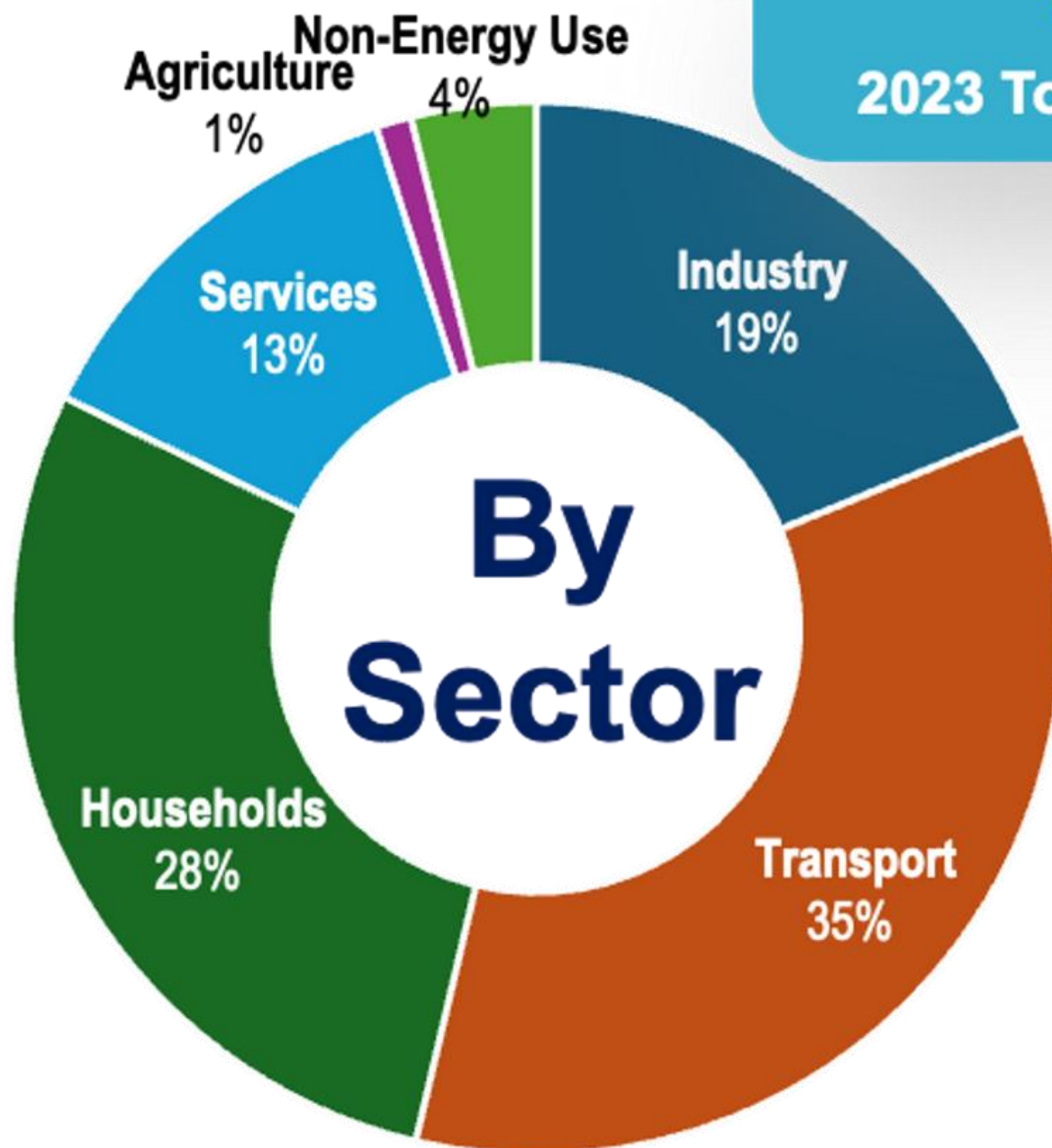
RE SHARE

2023 Total Final Energy Consumption



36.9 MTOE

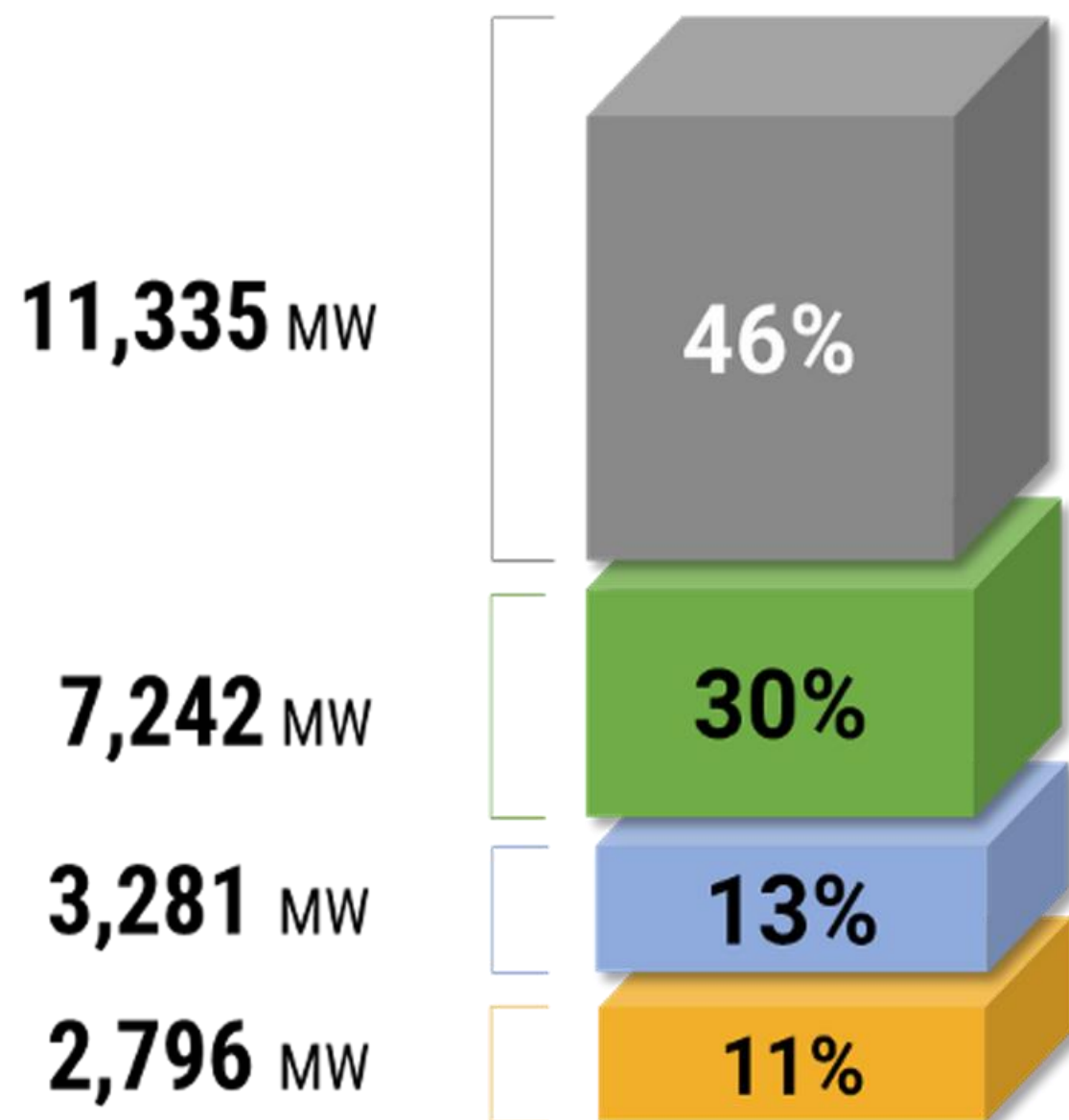
2023 Total Final Energy Consumption



2023 Generation and Capacity Mix



DEPENDABLE CAPACITY

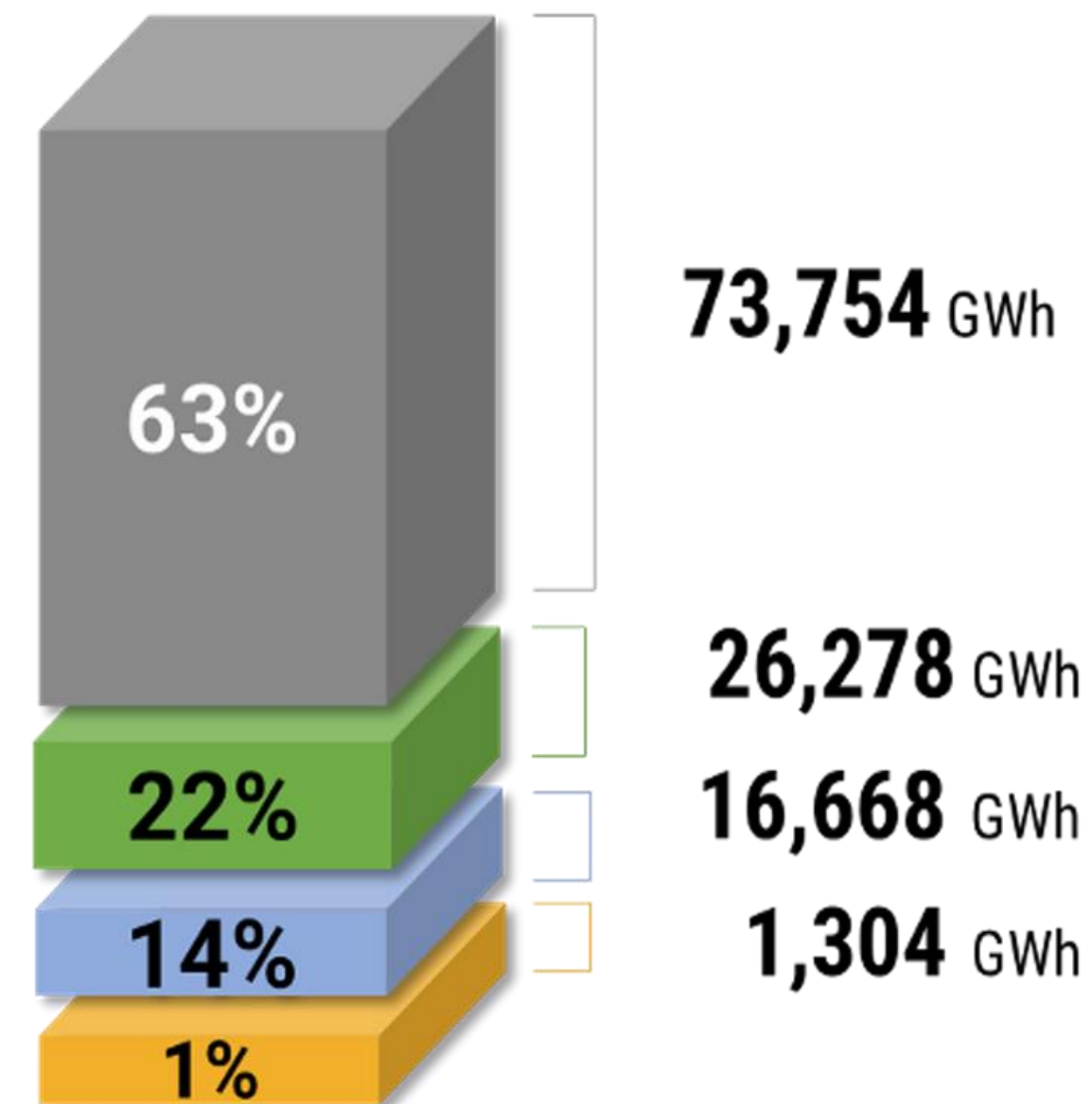


24,654 MW



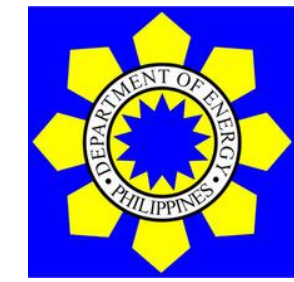
TOTAL

POWER GENERATION

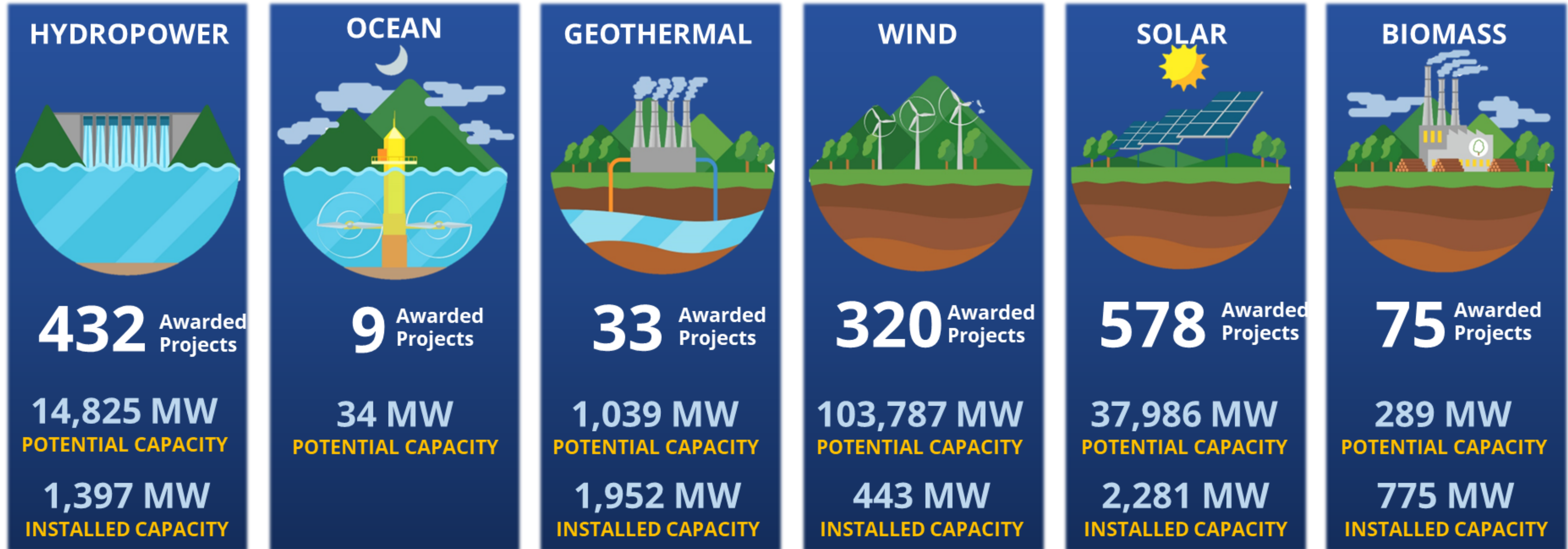


118,004 GWh

RA 9513 RE Projects with Existing Contracts



As of December 2024



1,447

TOTAL RE CONTRACTS AWARDED

158 GW

EQUIVALENT TOTAL POTENTIAL CAPACITY

6.8 GW

TOTAL INSTALLED CAPACITY

2023-2050 Philippine Energy Plan (PEP): Major Targets



EEC

10% energy savings on oil products and electricity by 2040 up to 2050



RE

35% of power generation mix by 2030, 50% by 2040, and more than 50% by 2050



EMERGING TECHNOLOGIES

50% EV penetration rate in road transport by 2040; Explore alternative technologies (e.g., nuclear, hydrogen, ammonia)



ICT

Adopt advanced and smart grid technologies

ENERGY RESILIENCY

Resilient and climate-proof energy infrastructure

PH Contribution to Global Energy Transition:

Offshore Wind Development and Support Port Infrastructure | Marine-based Energy Resource Development | Rightskilling of Filipino Workforce & International Accreditation Initiative | Mining and Manufacturing of Green Materials | Voluntary Retirement and Repurposing of CFPPs

Accelerating Renewable Energy Development



RA 9513: Renewable Energy Act of 2008

RE Policy Mechanisms

A

Accelerate the Exploration and Development of RE resources

Provide Fiscal and Non-Fiscal incentives to promote RE's efficient and cost-effective commercial application. Institutionalize the development of national and local capabilities in the use of RE systems.

B

Achieve Energy Self-Reliance

Adoption of sustainable energy development strategies to reduce dependence on fossil fuels, hence, minimize exposure to price fluctuations in the international markets

C

Mitigate the Effect of Climate Change

Effectively prevent or reduce harmful emissions to balance the goals of economic growth and development with the protection of health and the environment.

Renewable Energy Market

Serves as the venue for the transparent and fair trading of RE Certificates

Renewable Portfolio Standards

Requires all load-serving entities, both in on-grid and off-grid areas, to source or produce a specified portion of their supply from eligible RE facilities

Net-Metering Program

Allows end-users to generate electricity from RE-based systems up to 100 kW for own use and sell their excess to the grid

Green Energy Option Program

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

Green Energy Auction Program

Provides additional market for RE through a competitive electronic bidding of RE capacities

Expanded Roof-Mounted Solar

Open to all roof-mounted solar energy generating facilities with a capacity of above 100 kWp, intended for own-use and/or export of energy.

RE Resource Development

Geothermal Energy, Offshore Wind, Waste-to-Energy, Ocean and Tidal Energy, and Expanded Roof-mounted Solar

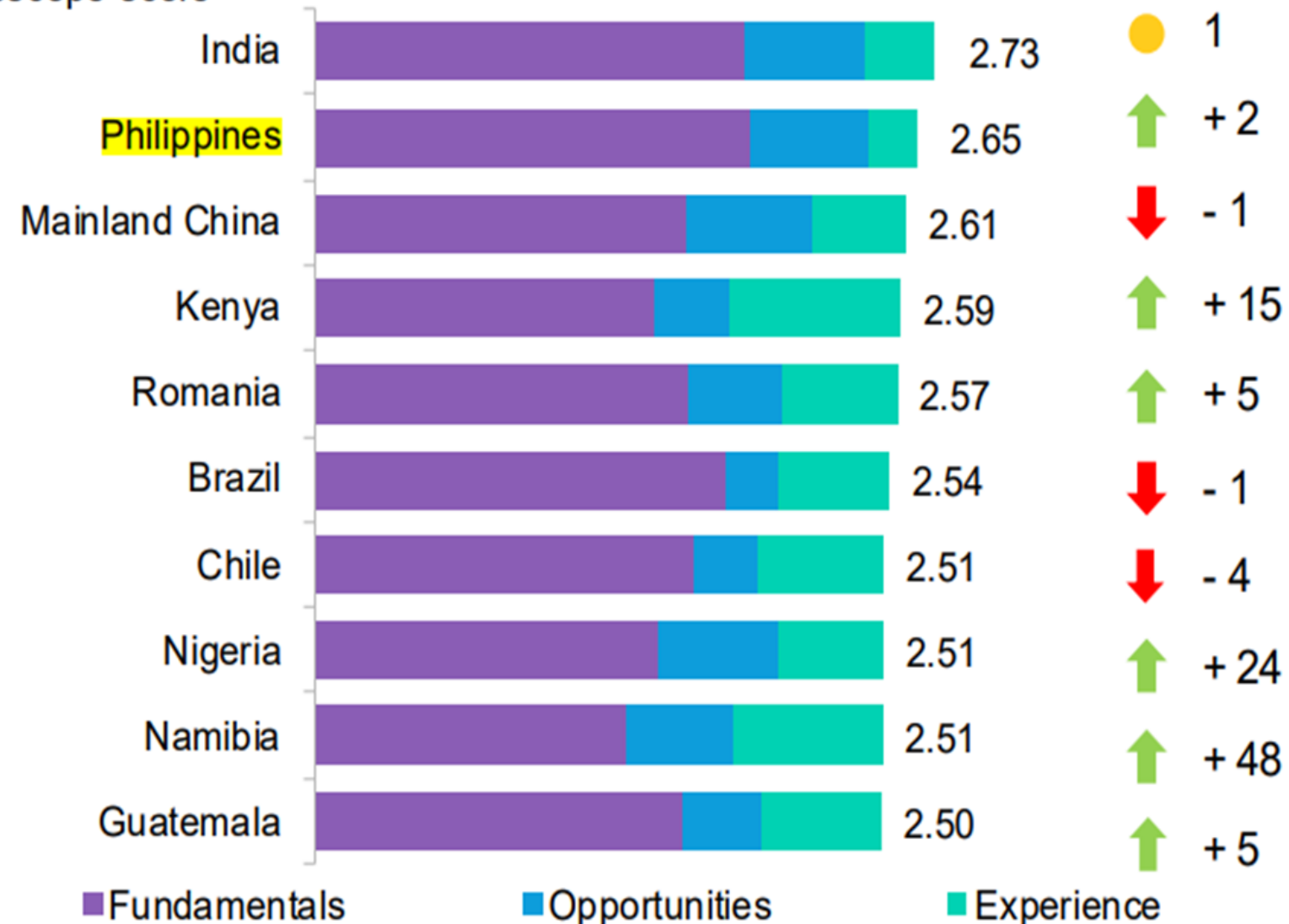
Enabling RE Investments in the Philippines



Philippines is World's 2nd most attractive emerging market for Renewable Energy investment*

Top 10 emerging markets in the power sector, by Climatescope score

Climatescope score



Easing Foreign Ownership Limit in RE Investments

The foreign ownership restriction that hampers the flow of RE-sector investments has been liberalized on 15 November 2022. Prior to this issuance, foreign companies were already allowed to participate in large-scale geothermal projects through Financial and Technical Assistance Agreements (FTAAs) and to operate biomass power plants in the Philippines.



Preferential Dispatch of All RE Resources in the WESM

On 05 October 2022, all RE generating units are given preference in the Wholesale Electricity Spot Market dispatch schedule to ensure its maximum output injection in the grid. This is to encourage additional investments because of guaranteed dispatch in the grid at their full available capacity, allowing recovery of investments.



Policy Framework for Offshore Wind

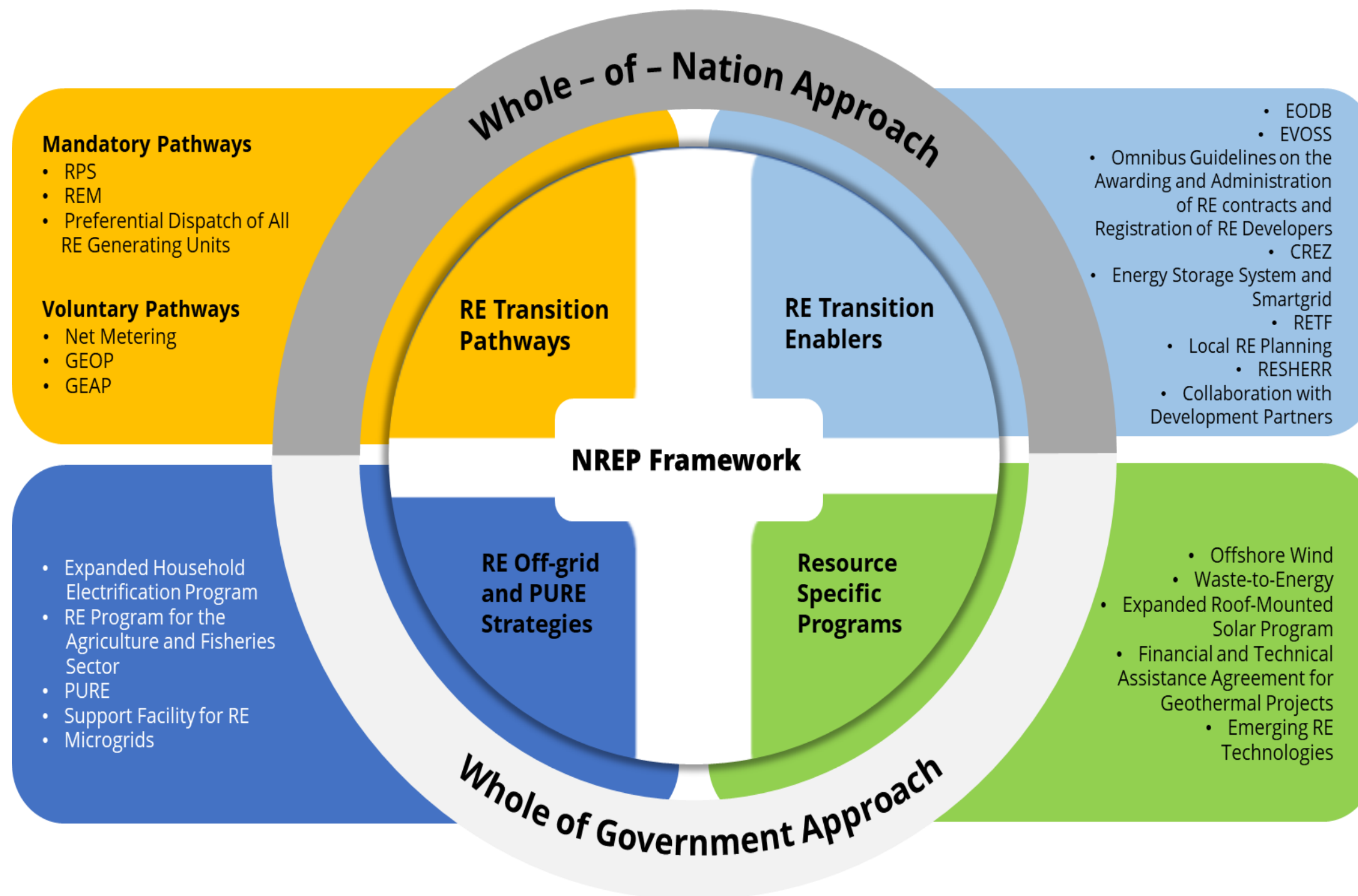
Following Executive Order No. 21 issued by the President, the DOE issued Department Circular No. DC2023-06-0020 titled "Policy and Administrative Framework for the Efficient and Optimal Development of the Country's Offshore Wind (OSW) Resources", in 16 June 2023. Studies such as Marine Spatial Planning, Grid Readiness, and Permitting and Consenting are being undertaken to hasten the development of OSW resources.

*Source: 2024 Climatescope Report by BloombergNEF

Enabling RE Investments in the Philippines



2023-2040 National Renewable Energy Program (NREP) Framework



Green Energy Auction Program

GEA-1 17 June 2022	1,866.13
Hydro	99.15
Biomass	3.40
Ground Mounted Solar	1,490.38
Onshore Wind	273.20
GEA-2 3 July 2023	3,440.76
Ground Mounted Solar	1,878.98
Roof Mounted Solar	9.39
Floating Solar	90.00
Onshore Wind	1,462.38
GEA-3 11 February 2025	7,530.89
Impounding Hydro	550
Pumped-Storage Hydro	6,950
Geothermal	30.887

Energy Efficiency and Emerging Clean Technologies



Republic Act No. 11285

Energy Efficiency and Conservation Act.



The **EEC Act** institutionalizes energy efficiency and conservation, enhance the efficient use of energy, and grant incentives to energy efficiency and conservation projects.



Republic Act No. 11697

Electric Vehicle Industry Development Act



Key Provisions

Comprehensive Roadmap for the Electric Vehicle Industry (CREVI)

Short Term: 2023-2028

Medium Term: 2029-2034

Long Term: 2035-2040



Mandatory EV Share in Corporate and Government Fleets



Dedicated Parking Slots for EVs in Private and Public Buildings and Establishments



Fiscal and Non-Fiscal Incentives

PHILIPPINE NUCLEAR ENERGY PROGRAM

2024 - 2050

A ROADMAP TOWARDS CLEAN ENERGY

The **Philippine Nuclear Energy Program (PNEP)** Roadmap the key targets that must be achieved for the successful commercial operations of a nuclear power plant in the country.

NUCLEAR ENERGY PROGRAM INTER-AGENCY COMMITTEE (NEP-IAC)



Republic of the Philippines
DEPARTMENT OF ENERGY
(Kagawaran ng Enerhiya)

DEPARTMENT CIRCULAR NO. 022024-01-0001
PROVIDING A NATIONAL POLICY AND GENERAL FRAMEWORK, ROADMAP, AND GUIDELINES FOR HYDROGEN IN THE ENERGY SECTOR

WHEREAS, Section 2 of Republic Act (RA) No. 7638, as amended, or the "Department of Energy (DOE) Act of 1992" declares it the policy of the State, among others, to ensure a continuous, adequate, and economic supply of energy with the end in view of ultimately achieving self-reliance in the country's energy requirements through the integrated and intensive exploration, production, management, and development of the country's indigenous energy sources;

WHEREAS, Section 4 of RA 7638, as amended, mandates the DOE to prepare, integrate, coordinate, supervise and control plans, programs, projects and activities of the Government related to energy exploration, development, utilization, distribution, and conservation;

WHEREAS, Section 5 of RA 7638, as amended by RA 9136 or the "Electric Power Industry Reform Act of 2001", provides that the DOE shall have the power to, among others, "(e)stablish and administer programs for the exploration, transportation, marketing, distribution, utilization, conservation, stockpiling and storage of energy resources of all forms, whether conventional or nonconventional"; and "(g)asses the requirements of, determine priorities for, provide direction to, and disseminate information resulting from energy research and development programs for the optimal development of various forms of energy production and utilization technologies";

WHEREAS, Section 5 of RA 7638, as amended by RA 9136, further authorizes the DOE to formulate and implement programs, including a system of providing incentives and penalties, for the judicious and efficient use of energy in all energy consuming sectors of the economy;

WHEREAS, Section 2 of Presidential Decree (PD) No. 87, s. 1972, or the "Oil Exploration and Development Act of 1972", as amended, declares it to be the policy of the State "to hasten the discovery and production of indigenous petroleum through the utilization of government and/or private resources, local and foreign, under the arrangements embodied in this Act which are calculated to yield the maximum benefit to the Filipino people and the revenues to the Philippine Government for use in furtherance of national economic development, and to assure just returns to participating private enterprises, particularly those that will provide the necessary services, financing, and technology and fully assume all exploration risks";

WHEREAS, Section 37 of RA 9136 provides that the DOE, in addition to its existing powers, shall among others, "formulate policies for the planning and implementation of a comprehensive program for the efficient supply and economical use of energy consistent with the approved national economic plan and with policies on environmental protection and conservation and maintenance of ecological balance, and provide a mechanism for the integration, rationalization, and coordination of the

HYDROGEN ENERGY GUIDELINES



ENERGY SECURITY

- Diversify energy sources
- Increase use of indigenous resources
- Reduce dependence on imported oil



ENVIRONMENTAL SUSTAINABILITY

- Promote renewable energy (RE), alternative fuels, and emerging technologies
- Intensify EEC measures
- Support Paris Agreement commitments



RESEARCH AND TECHNOLOGICAL DEVELOPMENT

- Drive innovation through collaboration
- Implement technology demonstration and pilot projects
- Encourage technology transfer and adoption
- Strengthen capacity-building programs




ACCESS TO FINANCING AND INVESTMENTS

- Formulate sustainable financing programs
- Develop an investment roadmap
- Establish fiscal and non-fiscal incentives
- Institute government financial support mechanisms

Potential for Alternative Fuel: Native Hydrogen





Republic of the Philippines
DEPARTMENT OF ENERGY
(Kagawaran ng Enerhiya)

DEPARTMENT CIRCULAR (DC) NO. DC2023-11-0031

GUIDELINES ON THE AWARDING OF SERVICE CONTRACTS FOR THE EXPLORATION, DEVELOPMENT AND PRODUCTION OF NATIVE HYDROGEN

WHEREAS, Section 2, Article XII of the 1987 Constitution provides that “xxx The exploration, development, and utilization of natural resources shall be under the full control and supervision of the State. The State may directly undertake such activities, or it may enter into co-production, joint venture, or production-sharing agreements with Filipino citizens, or corporations or associations at least sixty per centum of whose capital is owned by such citizens. Such agreements may be for a period not exceeding twenty-five years, renewable for not more than twenty-five years, and under such terms and conditions as may be provided by law. xxx”;

WHEREAS, Section 2 of Presidential Decree (PD) No. 87 or the Oil Exploration and Development Act of 1972, as amended, was declared to be the policy of the State to hasten the discovery and production of indigenous petroleum through the utilization of government and/or private resources, local and foreign, under the arrangements embodied in this Act which are calculated to yield the maximum benefit to the Filipino people and the revenues to the Philippine Government for use in furtherance of national economic development, and to assure just returns to participating private enterprises, particularly those that will provide the necessary services, financing, and technology and fully assume all exploration risks;

WHEREAS, Section 4 of PD 87 provides that the Government may directly explore for and produce indigenous petroleum or indirectly undertake the same under service contracts;

WHEREAS, Section 3 of PD 87 provides that “petroleum shall include any mineral oil hydrocarbon gas, bitumen, asphalt, mineral gas and all other similar or naturally associated substances with the exception of coal, peat, bituminous shale and/or other stratified mineral fuel deposits”;

WHEREAS, native hydrogen refers to naturally occurring hydrogen gas in geologic formations which can be considered as a mineral gas¹;

WHEREAS, various studies² have documented several observations of seeps of native hydrogen, together with abiogenic methane on the seafloor and on the continents

¹ Abrajano et al. 1988. Methane-Hydrogen Gas Seeps, Zambales Ophiolite, Philippines: Deep Or Shallow Origin?. Chemical Geology. Issue No. 71. Pages. 211-222;

Etiopio et al. 2011. Abiogenic Methane Flux from the Chimaera Seep and Tekirova Ophiolites (Turkey): Understanding Gas Exhalation from Low Temperature Serpentinization and Implications For Mars. Earth and Planetary Science Letters. Issue No. 310. Pages 96-104;

Etiopio et al. 2017. Methane and Hydrogen in Hyperalkaline Groundwaters of the Serpentinized Dinaride Ophiolite Belt, Bosnia and Herzegovina. Applied Geochemistry. Issue No. 84. Pages 286-296;

Zhu et al. 2023. A Model to Predict the Thermodynamic Stability of Abiogenic Methane-Hydrogen Binary Hydrates in a Marine Serpentinization Environment. <https://doi.org/10.3389/fmars.2023.1140549>;

² Smith et al. 2005. Hydrogen Exploration: A Review of Global Hydrogen Accumulations and Implications for Prospective Areas in NW Europe. <http://pgc.lyellcollection.org>;

Etiopio and Schoell 2014. Abiogenic Gas: Atypical, But Not Rare. DOI: 10.2113/gselements.10.4.291;

Prinzhofer and Deville 2015;

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Pre-Determined Areas for Native Hydrogen Exploration

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Thank You!



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MORE INFORMATION
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