



DEPARTMENT OF ENERGY
REPUBLIC OF THE PHILIPPINES

ENERGY INVESTMENT KIT

2024

OVERVIEW

The Philippines is actively transitioning towards a sustainable and self-reliant energy sector. There have been increased efforts to incorporate more renewable energy sources, intensify endeavors to find new local sources of natural gas and alternative sources of energy, and improve energy efficiency. These have been supported by modernizing the electricity grid and the transportation system.

To further strengthen this initiative, the government has been implementing supportive policies, regulations, and programs, as well as encouraging the active involvement of energy stakeholders, and fostering local and international collaboration. Overall, these initiatives are geared to build an energy landscape that is resilient, sustainable, and adaptable to fulfill the country's growing energy requirements and guarantee a stable supply of clean, sustainable energy.

We recognize that creating a collaborative and competitive energy resource market environment that is accessible, favorable, and effective for investors and stakeholders is essential to the successful implementation of this transition. With a plethora of opportunities in the short-, medium-, and long-term implementation of the Philippine Energy Plan 2023-2050, the DOE is advocating an investor-friendly environment. Our plans and programs aim to bring in investment and entice stakeholders to join us on this journey providing not only with financial gains but also with the opportunity to make a positive impact on environmental preservation, energy sustainability, and CO₂ emission reduction.



CONVENTIONAL ENERGY

The Department of Energy (DOE) acknowledges the country's indigenous conventional fuels as a solution to the increasing demand for energy. Developing the upstream energy sector addresses the Philippines' vulnerability to oil price fluctuations, supply disruptions, geopolitical tensions, and currency fluctuations in the global market. While the country is transitioning towards cleaner fuels, fossil fuels will continue to be a stable supply in driving economic growth and ensuring a reliable energy supply.

DOE recognizes the importance of an aggressive and sustained campaign to search for new oil and gas fields to ensure energy security and contribute to continued wealth generation and job creation for a resilient energy system. Despite the capital-intensive nature of exploration programs and the volatility of fossil fuel prices, DOE is actively pursuing this effort to mitigate the risks associated with relying on imported energy sources.

PETROLEUM

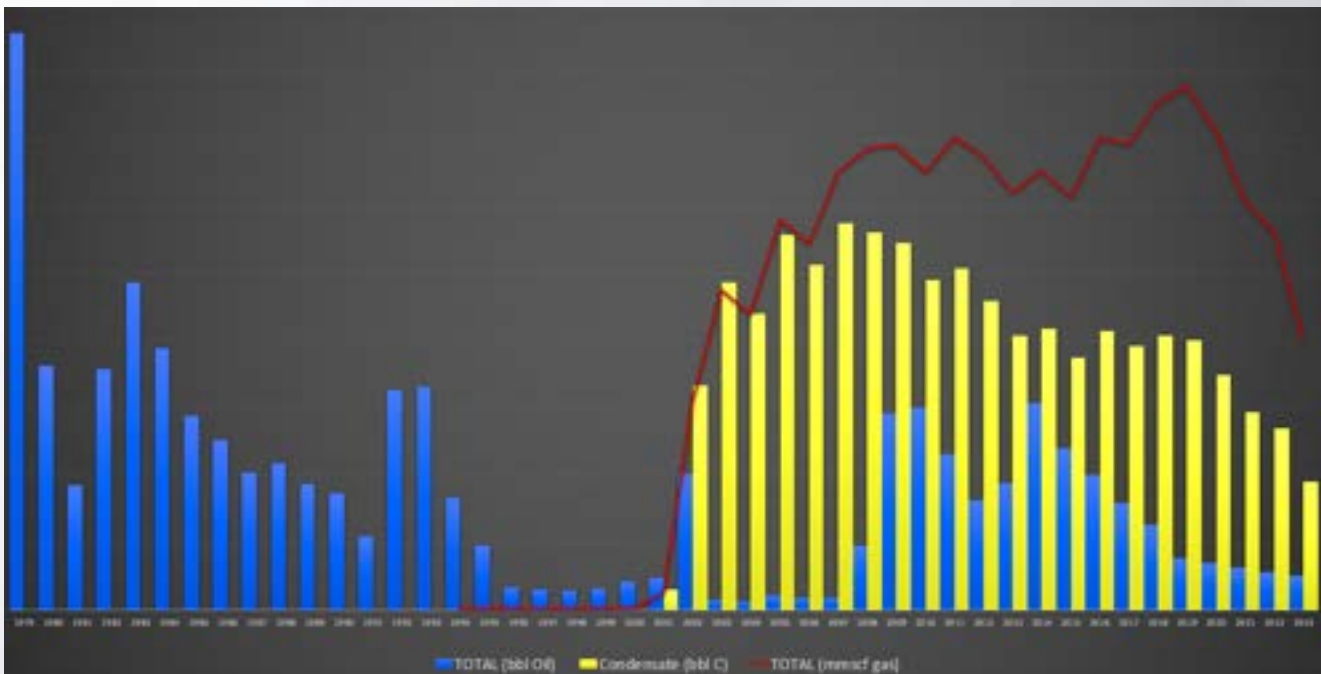
INDUSTRY PROFILE

The first commercial production of indigenous oil in the Philippines was in 1979, producing about 8.57 million barrels (MMB) of oil from the Nido oil field in Northwest Palawan. Since then, 13 production fields have produced 81.10 MMB of crude oil, 93.86 MMB of condensate, and 2.69 trillion scf of gas. Figure 1 shows the country's petroleum production since 1979.

As of 31 December 2023, the country has a total crude oil production of 81.18 MMB, with major producers being the following:

- Galoc oil field with a total production of 24.84 MMB;
- Nido oil field with 19.35 MMB;
- Matinloc oil field with 12.63 MMB, and
- North Matinloc oil field with 2.28 MMB.

Figure 1. Historical Petroleum Production (1979-2023)



Source: DOE-Energy Resource Development Bureau, as of 31 December 2023

PETROLEUM SERVICE CONTRACTS

The Philippine Government, under Section 4 of Presidential Decree (PD) No. 87, also known as the “Oil Exploration and Development Act of 1972,” is mandated through the DOE to promote and undertake exploration, development, and production of the country’s indigenous petroleum resources through the awarding of Petroleum Service Contracts (PSCs).

DOE currently supervises and monitors 16 active PSCs (as shown in Table 1) to ensure that the respective work commitments under the exploration and production stages of the PSCs are fully implemented. As of 31 December 2024, four (4) out of 16 PSCs are in the production stage of the PSCs, while 12 PSCs are in the exploration phase.

Table 1. List of Active Petroleum Service Contracts

No.	Operator	PSC No.	Location	Area (Has)
Production Phase				
1	NPG Pty. Ltd.	14C1	Northwest Palawan	16,300.95
	The Philodrill Corporation	14C2	Northwest Palawan	17,649.54
2	PNOC - Exploration Corporation	37	Cagayan	36,000
3	Prime Energy Resources Development B.V.	38	Northwest Palawan	83,000
4	Forum Exploration, Inc.	40	Northern Cebu (Visayan)	340,000
Exploration Phase				
5	The Philodrill Corporation	53	Mindoro - Cuyo	724,000
6	Nido Petroleum Philippines Pty. Ltd.	54	Northwest Palawan	43,515
7	Palawan 55 Exploration & Production Corp.	55	Southwest Palawan	988,000
8	PNOC - Exploration Corporation	57	Northwest Palawan	712,000
9	Nido Petroleum Philippines Pty. Ltd.	58	Northwest Palawan	1,344,000
10	PNOC - Exploration Corporation	59	Southwest Palawan	1,476,000
11	Forum (GSEC 101) Ltd.	72	Reed Bank	880,000
12	PXP Energy Corporation	74	Northwest Palawan	318,800
13	PXP Energy Corporation	75	Northwest Palawan	616,000
14	Ratio Petroleum Limited	76	East Palawan	648,000
15	SK Liguasan Oil and Gas Corporation	77	Cotabato	72,000
16	PNOC - Exploration Corporation	79	East Palawan	932,000

Source: DOE-Energy Resource Development Bureau, as of 08 March 2024

PETROLEUM INDUSTRY

Petroleum Industry Developments

In March 2024, Ratio Petroleum Ltd., operator of SC 76, contracted the Shearwater Geoservices company to deploy its “SW Thuridur” seismic survey vessel, and acquired 3D seismic data over an area in the SC 76 block located about 150 kilometers east of Puerto Princesa, Palawan. This deployment shall then proceed with the seismic survey for SC 57, operated by PNOC Exploration Corporation, in offshore Northwest Palawan.

The Philippines has been experiencing a significant gap in seismic survey activity over the past eight (8) years. Commitments from Ratio Petroleum Ltd. and PNOC Exploration Corporation to conduct the seismic survey align with the current administration’s aim to bolster the nation’s energy security, unlock the basin’s untapped resources, and stimulate the exploration and development of oil and gas in the country.

Figure 2. Platform Scale Model handed to President Ferdinand Marcos, Jr.



Table 2. Petroleum Reserves, Resources, and Production

Classification	Oil (MMB)	Gas (BCF)	Condensate (MMB)
Reserves	3.74	273	6.27 ³
Contingent Resources/ Reserves ¹	195	4,268.00	65
Undiscovered Resources ²	11,104.00	54,532.00	291
Cumulative Production	80.67	2,623.53	92.26

¹ Values are in-place volumes based on available information/data from PSCs; Estimates (2C-best estimates of contingent resources) of volumes drilled and discovered with no current plan of development.

² Estimates of volumes (2U-best estimates of prospective resources) of mapped prospects and leads that have not yet been drilled or discovered.

³ Based on 23 barrels/million standard cubic feet (MMSCF) condensate to gas ratio
Source: DOE-Energy Resource Development Bureau, as of June 2023

Table 3. Upstream Oil and Gas Roadmap

Oil & Gas	Short Term 2023 - 2024	Medium Term 2025 - 2028	Long Term 2029 - 2050
Reserves	Increase potential resources with an additional 4.5 MMB ¹ - 15 MMB ³ of oil and gas to 217 BCF ³	Increase potential resources with an additional 8.77 MMB ² - 1,923 MMB ⁴ of oil and 2.6 TCF ² and 5 TCF ⁴ of gas fields/prospects	Increase potential resources with an additional 1,436.5 MMB ³ 4,039 MMB ⁴ of oil and 11.7 TCF ³ - 24.3 TCF ⁴ of gas fields/prospects
Additional Discovery	Drill at least 2 oil and 1 gas fields/prospects	Drill at least 2 oil and 4 gas fields/prospects	Drill at least 6 oil and 6 gas fields/prospects
Production	Produce 1.2 MMB crude oil and 220 BCF of natural gas	Produce 15.9 MMB crude oil and 522.4 BCF of natural gas	Produce 42.14 MMB crude oil and 4.6 BCF of natural gas

DOE is steadfast in implementing its upstream oil and gas sector strategy, which aligns with the United Nations Sustainable Development Goals and the energy trilemma.

The DOE's aims to increase potential resources by up to 15 MMB³ of oil and 217 BCF³ of gas between 2023 - 2024, up to 1,923 MMB⁴ for oil and 5,035 BCF⁴ for gas for the medium term 2025- 2028, and up to 4,039 MMB⁴ of oil and 24,271 BCF⁴ of gas between 2029 and 2050.

Production targets are estimated at 1.2 MMB of crude oil and 220 BCF of natural gas for the short term period 2023-2024, 15.9 MMB of crude oil and 522 BCF of natural gas between 2025 - 2028, and 42.1 MMB of crude oil and 4,582.4 BCF of natural gas between 2029-2050.

¹1C – Low estimate of contingent resources in-place

²2C – Best estimate of contingent resources in-place

³1U – Low estimate of prospective resources in-place

⁴2U – Best estimate of prospective resources in-place

Plans and Programs

In support of the global energy sector's shift towards energy transition, fossil fuels remain a reliable energy source, and the petroleum sector is steadfast in developing domestic reserves through exploration, development, and utilization of indigenous petroleum resources.

Philippine Conventional Energy Contracting Program (PCECP)

In line with its mandate and SONA Directive NPBBM-2023-04, DOE is persistent in pursuing additional oil and gas explorations in other parts of the country aside from the Malampaya Project through:

1. Continuous petroleum exploration activities of its service contractors;
2. Continuous investment promotion and licensing efforts;
3. Implementation of Republic Act No. 11054 or the "Organic Law for the Bangsamoro Autonomous Region in Muslim Mindanao";
4. Executive issuances that will assist in revitalizing petroleum exploration; and
5. Proposing projects that will enhance the attractiveness of the country for investments.

The PCECP is a transparent and competitive licensing scheme for awarding PSCs to the most qualified operators. The PCECP for Petroleum is governed by PD No. 87: Oil Exploration and Development Act of 1972, Republic Act No. 7638: Department of Energy Act of 1992, and DOE Department Circular No. DC2017-12-0017: PCECP Circular.

Under the PCECP, applicants can apply for an area within the Philippine jurisdiction in two modes:

- Pre-Determined Areas (PDAs) - The DOE identifies the prospect areas for petroleum and offers them, alongside its corresponding data packages, to applicants through a time-bound bid or contracting round.
- Nominated Areas - Applicants are free to nominate any petroleum area within the Philippine jurisdiction (excluding areas within the Bangsamoro Autonomous Region in Muslim Mindanao (BARMM)) for exploration, development, and utilization at any time of the year. Once the area nomination has been approved by the DOE, a bid round for the area is published and challengers are invited to participate.

Applications for a PSC received under the PCECP are evaluated by the PCECP Review and Evaluation Committee (REC) and its Technical Working Group (REC-TWG).

Opening of Petroleum and Coal Exploration in the Bangsamoro Autonomous Region in Muslim Mindanao

To further the development of the country's natural gas industry, the Intergovernmental Energy Board (IEB) Circular on the Joint Award of Petroleum Service Contracts and Coal Operating Contracts (COCs) in the BARMM between DOE and the Ministry of Environment, Natural Resource and Energy (MENRE) was signed on 06 July 2023 and made effective on 04 August 2023. Adopting the PCECP scheme, the IEB Circular also offers 2 modes of application: through PDAs, and via Nominated Areas.

Following the issuance of the IEB Circular on the Joint Award of PSCs and COCs in BARMM on 06 July 2023, which became effective on 04 August 2023, interested parties may apply for a PSC within BARMM. Adopting the PCECP, the IEB Circular also offers two modes of applications: through PDAs and Nominated Areas

Applications for a PSC received under the IEB Circular are jointly evaluated by the Joint REC and the Joint TWG, composed of members from DOE for the National Government and from the Ministry of Environment, Natural Resources and Energy (MENRE) for the Bangsamoro Government.

The 1st BARMM Conventional Energy Bid Round and the 2024 Philippine Bid Round

On 26 February 2024, DOE and MENRE jointly launched the National and Bangsamoro Government's latest bid rounds: the First BARMM Conventional Energy Bid Round, and the 2024 Philippine Bid Round.

Under the First BARMM Conventional Energy Bid Round, three (3) PDAs for petroleum and one (1) PDA for coal are being offered. On the other hand, the 2024 Philippine Bid Round offers two (2) PDAs with proven petroleum reserves for development and production, and two (2) PDAs for the native hydrogen exploration to local and foreign investors.

Table 4. Pre-Determined Areas (PDAs) Offered in the First BARMM Conventional Energy Bid Round and the 2024 Philippine Bid Round

Area No.	Location	Resource
1st BARMM Conventional Energy Bid Round		
PDA - BC - 1	Lanao del Sur	Coal
PDA - BP - 1	Onshore Cotabato Basin	Petroleum
PDA - BP - 2	Offshore Sulu Sea Basin	Petroleum
PDA - BP - 3	Offshore Sulu Sea Basin	Petroleum
2024 Philippine Bid Round		
PDA - PD - 1	Offshore Northwest Palawan	Petroleum for Development and Production
PDA - PD - 2	Onshore Visayan Basin	Petroleum for Development and Production
PDA - PH - 1	Onshore Central Luzon	Native Hydrogen
PDA - PH - 1	Onshore Central Luzon	Native Hydrogen

Further information on the PDA's location, data listing, procedures for data requests, and application requirements and timeline can be found online through this link: <https://www.doe.gov.ph/pcecp>.

DOE is still accepting applications through area nominations for the Exploration, Development, and Production (EDP) of petroleum in the country. Aside from natural gas and oil, DOE has recently started looking into native hydrogen, a mineral gas that naturally occurs in ophiolitic formations, as another resource that can potentially fuel our path towards sustainable energy transition.

Policies

As a policy-making body, DOE is implementing policies to expedite indigenous petroleum exploration, streamline service contract applications, and facilitate investments in oil and gas and native hydrogen exploration. The proposed policies in the short term are as follows:

- DC Providing Guidelines on Petroleum Data Declassification and Free Data Access;
- DC Providing Guidelines for Additional Incentives to Promote Oil and Gas Exploration Activities¹;
- DC Providing Guidelines on the Awarding of New Petroleum Service Contracts (PSCs) through Direct Negotiation;
- Amendment of DC 2014-08-0013 Providing Guidelines in the Registration of all Contracts; and Amendment of DC 2014-08-0013 Providing Guidelines in the Registration of all Contracts and Agreements entered into by Petroleum Service Contractors and Coal Operating Contractors;
- Agreements Entered into by the Petroleum Service Contractors and Coal Operating Contract Operators;
- Amendment of DC 2018-03-0006 or the Omnibus Rules and Regulations Governing Tax-Exempt Importations for Petroleum Operations and Coal Operations to cover the validity of the Tax-Exempt Certificate (TEC); and
- Amendment of DC 2007-04-0003 providing clarity on the DC for all transfers that may potentially affect the implementation of the SC.

To further stimulate the exploration and development of oil and gas resources, DOE proposed the "Philippine Gradiometry and Seismic Geophysical Survey Project." This aims to acquire new geophysical data that will help provide a comprehensive and in-depth analysis of the country's underexplored sedimentary basins.

DOE and the upstream investors can use this information to understand petroleum prospectivity and geologic features, potentially identifying new oil and gas fields in the country.

The upstream sector plans to explore naturally-occurring gases, such as hydrogen gas and utilize the skills and knowledge on petroleum reservoir in the Carbon Capture and Storage (CCS) studies for energy transition.

¹An Act Granting New Incentives to Petroleum Service Contractors, and for This Purpose Amending Certain Sections of PD 87, As Amended, Otherwise Known as "The Oil Exploration and Development Act of 1972."

Table 5. Projected Investments from Oil and Gas Development and Production

Term	Oil		Gas	
	Additional Production (MMB)	Investment (PhP Million)	Additional Production (BCF)	Investment (PhP Million)
Short Term	1.2	2,941	220	90,059
Medium Term	15.9	38,975	522	213,684
Long Term	42.14	103,295	4,582	1,875,674
Total	59.24	145,211	5,324	2,179,417

Assumed offshore gas production at PhP 0.41/cft (development and production), which is adjusted based on inflation.
 Source: Wall Street - <http://graphics.wsj.com/oil-barrel-breakdown/>

Investment and Employment Opportunities

DOE intends to conduct local and international roadshows to help strengthen the petroleum industry. As a part of this initiative, PCECP was showcased at the South East Asia Petroleum Exploration Society (SEAPEX) in Singapore last March 2023. Additionally, two (2) roadshows were conducted in Calgary, Canada, during the World Petroleum Congress last September 2023, and in Madrid, Spain during the AAPG-International Conference and Exhibition last November 2023.

DOE is optimistic that the awarding of new PSCs will result in more drilling activities to augment domestic reserves and produce indigenous oil and gas in the country. Table 5 shows the additional production targets in the sector’s roadmap. The anticipated cumulative investment at the end of the planning horizon is PhP 145.2 billion for oil, and PhP 2.18 trillion for gas.

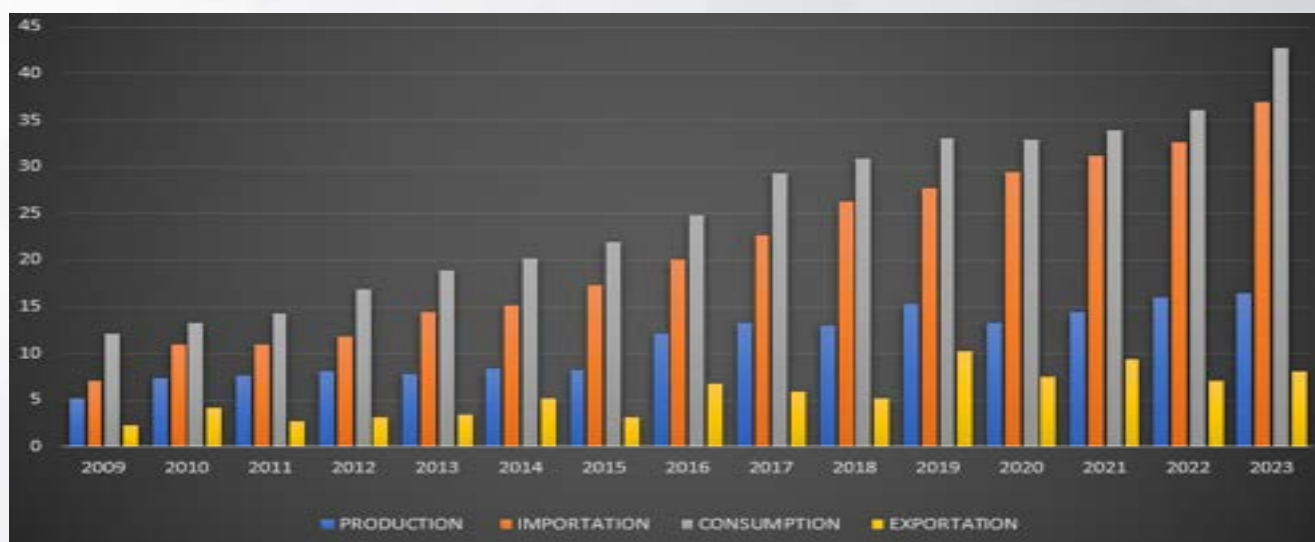
COAL

INDUSTRY PROFILE

Coal Consumption

The country’s coal consumption from 2009 to 2023 had steadily grown from 12.06 million metric tons (MMT) to 42.77 MMT, as shown in Figure 4. The increase in coal consumption during the period was attributed to the commissioning of several coal-fired thermal power plants in strategic locations in the country. Further, other industries (food, beverage, metals, paper, etc.) with small boilers shifted from oil-fired to coal-fired due to the increasing cost and volatility of oil prices.

Figure 4. Coal Statistics (in Million Metric Tons)



Source: DOE-Energy Resource Development Bureau, as of December 2023

Table 6. Coal Consumption by Sector

Industry	Consumption (MT)	% Share
Power Plants	39,009,539.34	91.2
Cement Manufacturing	1,637,834.98	3.83
Other Industries	2,126,248.07	4.97
Total	42,773,622.39	100

Figures presented are based on the submitted Quarterly Coal Purchases and Utilization Reports (CPURs) to the CERCD and CNMD (Subject to change)
 Source: DOE-Energy Resource Development Bureau, as of December 2023

In 2023, the total coal consumption was reported at 42.77 MMT, which was higher than the 2022 consumption of 36.14 MMT. Table 6 shows that the power generation sector had the highest share of the coal consumption at 91.20%, cement manufacturing shared 3.83%, while other industries shared 4.97%.

Table 7. Coal Importation

Country	Volume (MT)	(% Share)
Indonesia	36,522,579.78	98.8
Australia	193,667.00	0.52
Russia	153,572.00	0.42
Other Countries	95,011.82	0.26
Total	36,964,830.60	100

Figures presented are based on issued COC-CIs and submitted PIDs subject to change
Source: DOE-Energy Resource Development Bureau, as of December 2023

The country's coal production in 2023 reached 16.51 MMT, while the coal importation increased from 7.03 MMT in 2009 to 37.12 MMT in 2023. Coal exports reached 8.06 MMT in 2023, from 7.12 MT in 2022. The excess production from Semirara Mining and Power Corporation (SMPC) in 2023 was exported to China, the country's top export market for coal, followed by South Korea and Brunei.

With power plants having the most significant share in the coal consumption, the Philippines has been importing coal from other countries. This is because most of the coal power plants in the country require high-grade coal as fuel. Table 7 shows the country sources of our coal imports. Indonesia remains the top coal provider with a 98.80% share, while Australia, Vietnam, and other countries contribute the remaining 1.20%.

INVESTMENT OPPORTUNITIES

Coal Resources

The country's total coal resource potential is estimated at 2,370 MMT as of 31 December 2023. From this resource potential, the estimated total in-situ reserves and total mineable reserves are 315.08 MMT and 386.58 MMT respectively. These coal resources are located throughout the country. Of the total in-situ reserves, about 46.5% is located in Semirara Island, Antique; 14.07% in Cagayan Valley (Cagayan and Isabela); 13.9% in South Cotabato; and the remaining 25.53% is distributed among various provinces in the country.

In terms of quality, the majority of Philippine coal resources are sub-bituminous, with heating values ranging from 7,000 to 9,400 BTU/lb, based on the Evaluation Report by Robertson in 1977 and updated by Wardell-Armstrong in 1985.

Bituminous coal reserves at 10,700-12,100 BTU/b are found in Zamboanga Sibugay, Quezon, Catanduanes, Masbate, and Southern Cebu. Moreover, vast lignite reserves with an average of 4,600 BTU/b are located in Cagayan and Isabela.

Typically, Philippine coal is soft to dense, mostly formed during the Miocene age (23-25 million years ago). It occurs in moderately to severely in disturbed areas, swells and pinches, and developed in lagoon to shallow marine environments. Figure 5 shows the various coal resources in the country.

Plans and Programs

The DOE targets to increase the indigenous coal resources at the end of the planning period from 2030-2050. The coal sector intends to achieve the discovery of additional resources by 110 MMT coming from COCs and small-scale coal mining permits (SSCMPs).

Philippine Conventional Energy Contracting Program (PCECP)

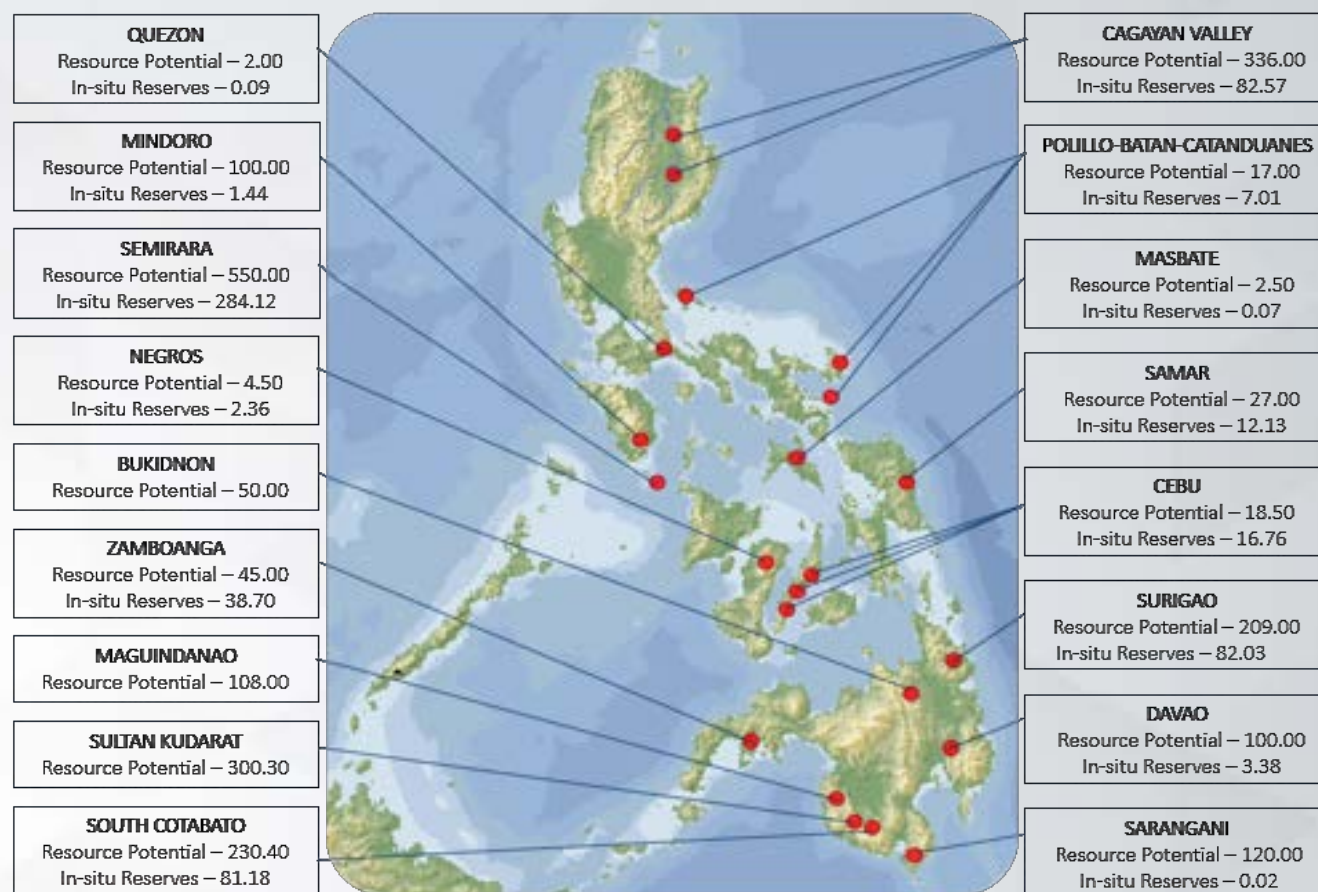
DOE embarked on a new contracting regime for coal, which aims to attain optimal exploration and development of the country's indigenous coal resources by adopting a more flexible contracting/licensing system, known as the "Philippine Conventional Energy Contracting Program (PCECP)". Anchored on PD No. 972 or "The Coal Development Act of 1976" and Republic Act (RA) No. 7638 or the "The Department of Energy Act of 1992", the program will provide a more transparent and more competitive evaluation and awarding of COCs.

The PCECP for Coal was issued through DC 2017-09-0010 on 13 September 2017. This new scheme enables prospective investors to apply for an area anywhere in the country at any given time.

Further, the program promotes transparency as investors have the option to determine their preferred area through either of the following mode:

1. Nomination and Publication - where applicants shall formally nominate through written communication the area/s of their interest addressed to the Review and Evaluation Committee (REC) or
2. Offering of Pre-Determined Areas (PDAs) - where applicants may apply for coal areas not covered by any application for nomination.

Figure 5. Summary of Regional Coal Reserves



Source: DOE-Energy Resource Development Bureau, as of December 2023

Policies

DOE will continue implementing policies to mitigate the environmental impact of coal mining, trading, transport, distribution, and utilization to ensure a reliable and resilient energy system. These policies include:

- **Guidelines on Coal Trading, Transport, Distribution, and Utilization in the Philippines** to strengthen the monitoring of coal trading, transport, distribution, and utilization of coal, and to address the current situation and conditions in the small scale coal mining industry.
- **Guidelines and Procedures allowing Small-Scale Coal Mining (SSCM)** to address the current situation and conditions in the small scale coal industry.
- **Amendment of Omnibus Rules and Regulations Governing Tax Exempt Importations for Petroleum and Coal Operations** (DC 2018-03-0006) to cover the validity of the Tax Exempt Certificate (TEC).
- **Guidelines on the Registration of all Contracts and Agreements** entered into by the COC Operators with the Service Providers

Coal Operating Contracts

As of 31 December 2023, there are 28 Coal Operating Contracts (COC) being monitored by DOE. 19 COCs are under the Development and Production Phase, and nine (9) COCs are under the Exploration Phase as shown in the Table 8.

Table 8. List of Active Coal Operating Contracts

No.	Operator	COC No.	Location	Area (Has)
Development/Production Phase				
1	Semrara Mining and Power Corporation	5*	Antique	13,000
2	Adlaon Energy Development Corporation	9*	Cebu	2,770
3	PNOC-Exploration Corporation	41	Zamboanga Sibugay	6,000
4	Filipinas (Prefab) Systems, Inc.	68	Oriental Mindoro	8,000
5	Filipinas (Prefab) Systems, Inc.	78	Zamboanga Sibugay	4,000
6	A Blackstone Energy Corp.	93	Zamboanga Sibugay	1,000
7	D.M. Wenceslao and Associates, Inc.	116	Cagayan Valley	3,000
8	D.M. Wenceslao and Associates, Inc.	123	Cagayan Valley	1,000
9	Lima Coal Development Corporation	125	Albay	1,542
10	Daguma Agro Minerals Inc.	126	South Cotabato & Sultan Kudarat	10,000
11	Samaju Corporation	128	Albay	1,400
12	Samaju Corporation	129	Albay	547
13	Sultan Energy Phil. Corp.	134	South Cotabato & Sultan Kudarat	7,000
14	Great Wall Mining and Power Corporation	145	Surigao del Sur	5,000
15	Abacus Coal Exploration and Development Corp.	148	Surigao del Sur	7,000
16	Guidance Management Corp.	151	Negros Occidental	3,000
17	Lima Coal Development Corp.	153	Sorsogon	3,000
18	Titan Mining and Exploration Corp.	159	Davao Oriental	7,000
19	BBB Mining and Energy Corp.	173	Cebu	4,000
Exploration Phase				
20	Titan Mining and Exploration Corp.	166**	Zamboanga Sibugay	4,000
21	Blackgem Resources & Energy Inc.	169**	Davao Oriental	6,000
22	Dell Equipment & Construction Corp.	170**	Saranggani & South Cotabato	10,000
23	MEGA Philippines Inc.	188	Sultan Kudarat & Saranggani	3,000
24	PNOC-Exploration Corporation	204	Zamboanga Sibugay	2,000
25	EFH Energy Tribe Corporation	205	Cebu	9,000
26	Sunwest Oil & Gas Incorporated	206	Albay	3,960
27	Grand Thermal Power Corporation	207	Agusan del Sur	7,000
28	Vintage - 21 Coal Mining Corporation	208	Davao Oriental	4,000

* Producing

** With application for conversion to development/production contracts

Source: DOE-Energy Resource Development Bureau, as of December 2023

Investment and Employment Opportunities

DOE estimates the projected investment requirement for the exploration of coal at PhP 5.62 billion, which could provide additional 110 MMT. On the other hand, the investment requirement for the development and production of coal will entail PhP 428.63 billion. These could contribute additional 175 MMT of coal resources.

Table 9. Projected Investments in Coal

Term	Exploration		Development and Production	
	Additional Production (MMT)	Investment (in PhP Million)	Additional Production (BCF)	Investment (in PhP Million)
Short Term	60.00	3,066	30.00	73,479
Medium Term	5.00	256	80.00	195,944
Long Term	45.00	2,300	65.00	159,205
Total	110.00	5,622	175.00	428,628

(a) Investment for exploration ranges from PhP 43.42 to PhP 45.85 per ton
 (b) In estimating investment requirements, the average (PhP 44.63) is used
 (c) The unit investment cost is adjusted based on inflation
 Source: APEC Energy Demand and Supply Outlook 6th Edition

RENEWABLE ENERGY

The Philippines has been actively pursuing renewable energy development. One of its most significant leaps is the implementation of the Renewable Energy (RE) Act of 2008. The National Renewable Energy Program (NREP) was formulated to support the RE Act's goal of significantly increasing RE's share in the country's power generation mix by 2040 and reducing greenhouse gas emissions (GHG). The Department of Energy has implemented various policy reforms and offered enticing incentives to promote RE development in the country, fostering a sustainable energy future.

As of 31 December 2023, the Department has been monitoring 1,270 RE projects with a total potential capacity of 134,822.07 MW and an installed capacity of 5,776.23 MW. This includes 18 Biomass own-use projects with a potential capacity of 182.87 MW, and SESC/SEOC for own use.

Table 10. Summary of Renewable Energy (RE) Projects under the RE Act of 2008

Resources	No. of RE Projects	Potential Capacity (MW)	Installed Capacity (MW)
Hydropower	429	18,902.96	1,189.24
Ocean Energy	9	34.00	-
Geothermal	39	1,063.20	1,951.74
Wind	252	85,692.96	442.90
Solar**	465	28,922.07	1,427.69
Biomass*	76	206.88	764.67
Total	1,270	134,822.07	5,776.23

*Includes 4 Non-Power facilities (Steam, refuse derived fuel, and briquette fuel production)

**Includes 18 Own-use Projects with a total installed capacity of 182.87 MW

**Includes Solar Projects with Awarded SESC/SEOC and Projects for Own-Use

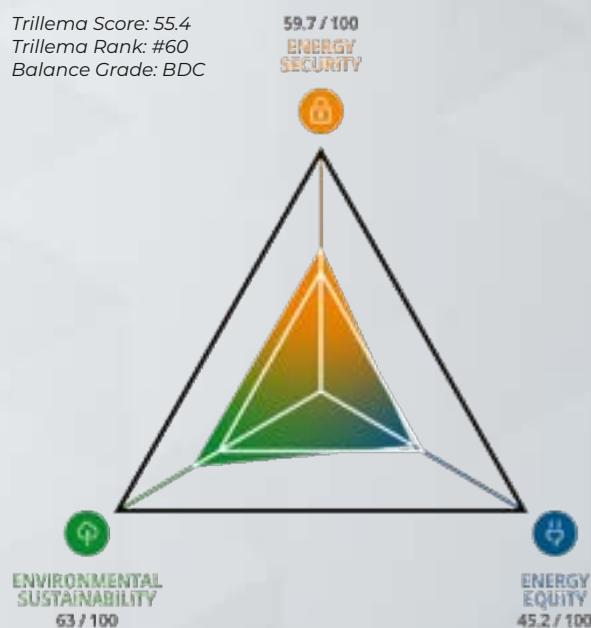
Source: DOE-Renewable Energy Management Bureau, as of 31 December 2023

Compared with the RE projects in December 2022, there is a total of 271 additional projects or 27%, with a corresponding increase in the potential capacity of 54,423 MW or 68% and the installed capacity of 209 MW or 4%. These increases brought about a 0.1 increase in the Trilemma score from 55.3 in 2021 to 55.4 in 2022, generating ten ranks higher from rank #70 in 2021 to rank #60 in 2022. This means the country has increased renewable generation but with low carbon and energy intensity, resulting in lower emissions. The World Energy Trilemma Index presents a comparative ranking of the energy systems of 127 countries, providing an assessment of a country's energy system performance, reflecting balance and robustness in the three Trilemma dimensions, namely, energy security, environmental sustainability, and energy equity.

The Philippines is aligning with the Global Energy Transition by actively leveraging its renewable energy resources. This ignited the push to restructure the energy framework, revisit roadmaps, and reformulate energy targets.

Thus, the Philippine Energy Plan 2023-2050 set an ambitious target of RE share in the power generation mix of 35% by 2030, 50% by 2040, and more than 50% by 2050.

Figure 6. Philippine Energy Trilemma Index, 2022



The PEP identified and simulated three (3) scenarios for the energy outlook over the planning horizon:

Table 11. Philippine Energy Plan 2023 – 2050 Scenarios

REFERENCE (REF)	HIGH RE WITH LOW OSW + NUCLEAR + COAL REPURPOSING (CES1)	HIGH RE WITH LOW OSW + NUCLEAR + COAL REPURPOSING (CES2)
<ul style="list-style-type: none"> 35% RE Share in the Power Generation Mix by 2030 50% RE Share by 2050 	<ul style="list-style-type: none"> 35% RE Share in the Power Generation Mix by 2030, 50% by 2040, more than 50% by 2050 Coal repurposing Nuclear 1,200 MW by 2032, 2,400 MW by 2035, 4,800 MW by 2050 19 GW OSW by 2050 	<ul style="list-style-type: none"> 35% RE Share in the Power Generation Mix by 2030, 50% by 2040, more than 50% by 2050 Coal repurposing Nuclear 1,200 MW by 2032, 2,400 MW by 2035, 4,800 MW by 2050 50 GW OSW by 2050

INVESTMENT OPPORTUNITIES

One of the strategies identified in the Strategic Energy Framework 2023-2050 is achieving clean and sustainable energy. The country will need additional capacities by 2050 to achieve the target RE shares.

Table 12 shows that between 2023 and 2050, a total of 98,502 MW is required under the reference scenario. This will be shared among the following: Biomass with 92 MW, Geothermal with 1,355 MW, Hydropower with 10,265 MW, Wind with 31,842 MW, and Solar with the biggest share of 54,948 MW. By 2050, the total installed capacity for RE is expected to reach 106,772 MW.

Table 12. Additional RE Capacity Requirement (2023 to 2050)

Resources	Target Capacity Addition (MW)				Target Installed Capacity (MW), 2050		
	2022	2023 - 2050			REF	CES1	CES2
	Baseline	REF	CES1	CES2			
Biomass	610	92	138	138	702	748	748
Geothermal	1,950	1,355	1,005	1,005	3,305	2,955	2,955
Solar	1,530	54,948	53,165	34,121	56,478	54,695	35,651
Hydro	3,750	10,265	6,800	6,180	14,015	10,550	9,930
Wind	430	31,842	45,460	65,508	32,272	45,890	65,938
Onshore Wind	430	25,042	25,960	15,408	25,472	26,390	15,838
Offshore Wind		6,800	19,500	50,100	6,800	19,500	50,100
Total	8,270	98,502	106,568	106,952	106,772	114,838	115,222

Source: PEP 2023-2050

Under CES 1, a total additional capacity of 106,568 MW is needed to reach the target share of RE in the power generation mix by 2050. The total target RE capacity of 114,383 MW by 2050 is expected to contribute about 65% of the power generation. CES 2 targets would require an additional capacity of 106,952 MW by 2050. This will bring the total target installed capacity from RE in 2050 to 115,222 MW.

The Renewable Energy Roadmap identified enabling mechanisms to accelerate the country's renewable energy positioning. Several policies, plans, and programs are being implemented to attract more investors in the energy sector. The additional required RE capacity will entail considerable investment from 2023 to 2050. Using 2022 prices, the pre-development activities of the target additional RE capacity under the Reference Scenario will need a total investment of PhP 35.30 billion.

Table 13. Investment Requirement

Resources	Investment Requirement* (PhP Million) at 2022 Prices, 2023-2050		
	REF	CES1	CES2
Biomass			
Geothermal	16,570.03	12,289.95	12,289.95
Solar	3,059.55	2,960.22	1,899.85
Hydro	12,199.44	8,081.58	7,344.76
Wind	3,476.55	5,233.47	8,148.32
Onshore Wind	2,586.60	2,681.42	1,591.51
Offshore Wind	889.95	2,552.05	6,556.81
Total	35,305.57	28,565.22	29,682.88

*Average pre-development investment cost per technology based on the service contracts issued.
Source: PEP 2023-2050

Under CES 1, the target additional RE capacity by 2050 will need PhP 28.56 billion. For CES 2 scenario, the pre-development activities of the forecasted additional RE capacity will entail a total cost of PhP 29.68 billion.

ENABLING POLICIES AND MECHANISMS

With the implementation of the Renewable Energy Act of 2008, the government has been making considerable strides in fortifying domestic policy frameworks and initiatives for renewable energy development in the country. These policies, programs and mechanism create a massive window of opportunity that could satisfy the investors' appetite for RE investments while supporting the country's RE development advocacies.

National Renewable Energy Program (NREP) 2020-2040. NREP outlines the long-term program to accelerate RE development in the country, providing a unified strategy for energy security, sustainable development, and climate change mitigation. It aims to reach 35% of RE share in the power generation mix by 2030 and 50% by 2040. These targets open up enormous demand for RE developers with a guide on the target capacity addition per resource.

Renewable Portfolio Standards (RPS) for On-Grid. The RPS Rules for On-Grid Areas is a market-based policy that requires all mandated participants to source or produce a portion of their supply from eligible RE facilities. DOE issued Department Circular No. DC2022-09-3044, which effectively increased the minimum RPS annual percentage increment from 1.0% to 2.52% starting 2023.

The Mandated Participants are the following:

1. All Distribution Utilities (DUs) for their Captive Customers;
2. All Suppliers of Electricity for the Contestable Market; and
3. Generating Companies only to the extent of their actual supply to their directly connected customers.

On 23 May 2023, DOE issued DC No. DC2023-05-0015 titled, "Prescribing the Amendments to the Renewable Portfolio Standards (RPS) for On-Grid Areas." This mandates the Energy Regulatory Commission (ERC) to issue a Regulatory Framework on the cost recovery mechanisms of the Mandated Participants as a result of their compliance under the RPS On-Grid Rules. On 07 December 2023, DC No. DC2023-12-3246 was promulgated to govern the procedure in all matters relating to the inquiry, investigation, and all other proceedings on administrative actions for violations of the RPS Rules for both on-grid and off-grid areas.

The Renewable Energy Certificates (RECs) shall be surrendered to the RE Registrar annually following the mandated participants' annual RPS requirement. One (1) REC is equivalent to 1 MWh and has a validity of three (3) years from the date of issuance. In 2020, all mandated participants were required to start complying with their RPS obligation based on their Net Electricity Sales for the baseline year 2018. This translates to additional fixed and long-term demand for RE capacities regardless of the type of RE resource, thus creating more market opportunities for RE developers.

Renewable Portfolio Standards (RPS) for Off-Grid. On 29 September 2018, the RPS Rules for Off-Grid Areas issued through DC No. DC2018-08-0024 was implemented. It promotes the efficient use of the universal charge for missionary electrification (UCME) and improvement of efficiency in power generation by integrating RE in the supply mix in off-grid and missionary areas. On 23 May 2023, DOE issued DC No. DC2023-05-0014 or the Revised Rules and Guidelines Governing the Operationalization of the RPS Off-Grid, defining Framework for RPS Compliance, among others.

Green Energy Auction Program (GEAP). The Green Energy Auction Program is a flagship program that intends to provide a robust and additional market for RE through transparent and competitive electronic bidding of RE capacities. The salient features of GEAP are:

- GEAP will be conducted annually or as necessary
- Adopt the FIT-All payment system except for the FIT rates
- Considered as an acceptance form of compliance with the CSP policy, including the Opt-In Mechanism for DUs
- The volume of RE generated and its corresponding RE Certificates shall be allocated pro-rata to RPS Mandated Participants

Potential or Qualified Suppliers under the GEAP are as follows:

1. RE Developers or Generators registered with the DOE.
2. RE facilities built after the RE Act with no legal impediment, i.e., PPA/PSA with DU at the time of the agreed delivery date/s.
3. Legacy RE facilities cover the capacities resulting from expansion or upgrading, provided such capacities have their own metering facility.

Geothermal and Impounding Hydro facilities shall be governed by a specific auction policy and guidelines or a separate remuneration package under the GEA.

Table 14. GEA-1 Winning Bids Capacity

Technology	Capacity (MW)		Total
	2024	2025	
Hydro		99.15	99.15
Biomass	3.40		3.40
Solar		1,490.38	1,490.38
Wind		273.2	273.2
Total	3.40	1,862.73	1,866.13

Source: DOE-Renewable Energy Management Bureau

Table 15. GEA-1 GEAR Price

Technology	GEAR Price (PhP/kWh)
Solar	3.6779
Wind	6.0584
Biomass	5.0797
Run-of-River Hydro	5.4913

Source: DOE-Renewable Energy Management Bureau

To encourage broader participation and foster greater competition in the GEA-2, DOE eased the requirements on registration and expanded the participation of RE developers in the GEAP by allowing developers with Letter of Intent to participate and allowing RE Developers of roof-mounted Solar projects to participate in the GEA-2 without having to submit proof of filing an LOI for an RE contract.

In addition, the provision of the indivisibility rule for marginal offers was enhanced, removing the qualification criteria on the excess capacity offered.

Table 16. GEA-2 Winning Bids Capacity

Technology	Capacity (MW)			Total
	2024	2025	2026	
Ground-Mounted Solar	507.757	515.36	855.86	1,878.98
Floating Solar	1.15	8.24	0	9.39
Roof-Mounted Solar	0	0	90	90.00
Onshore Wind	0	230.4	1,231.984	1,462.38
Total	508.91	754.00	2,177.84	3,440.75

Source: DOE-Renewable Energy Management Bureau

Biomass and Waste-to-Energy resources did not receive any bids for this auction round. Shown in Table 17 are the GEAR Prices set by the ERC for each resource that served as the price cap for every bid. Bids with offers higher than the GEAR Price are automatically disqualified. The results of the GEA-2 successfully contracting 3,440.756 MW out of 11,600 MW target capacity shows only 29.7% contracting capacity. This is very low compared to the 93.3% contracting capacity of GEA-1, with 1,866.13 MW contracted capacity out of the 2,000 MW capacity requirement. DOE is considering conducting another auction round in the 4th quarter of 2024 for the unsubscribed capacity of around 8,000 MW from GEA-2.

Table 17. GEA-2 GEAR Price

Technology	GEAR Price (PhP/kWh)
Roof-Mounted Solar	4.8738
Ground-Mounted Solar	4.4043
Floating Solar	5.3948
Onshore Wind	5.8481
Biomass	5.4024
Waste-to-Energy	6.2683

Source: DOE-Renewable Energy Management Bureau

The Green Energy Auction 1 (GEA-1) was conducted on 17 June 2022 for 2,000 MW capacity requirement. Twenty-four qualified bidders joined through an electronic bidding platform, and came up with eight (8) bids for Solar, eight (8) for Wind, seven (7) for Run-of-River (ROR) Hydro, and one (1) for Biomass. As a result, the first auction round of GEA awarded 18 winning bidders, wherein a total capacity of 1,866.13 MW was committed to be delivered from 2024 to 2025.

Of this capacity, 3.4 MW will come from Biomass and is committed to be delivered in 2024, while the Hydro projects with a total capacity of 99.15 MW, Solar projects with a total capacity of 1,490.38 MW, and Wind projects with a total capacity of 273.20 MW have been committed to be delivered by 2025.

The Green Energy Auction Reserve (GEAR) Prices for GEA-1 are shown in Table 15. The GEAR price per resource serves as a guide for the bidders in setting their Green Energy Tariff (GET). The GET for each bid must not be more than the GEAR Price set by the ERC.

GEA-2 was conducted on 03 July 2023 and offered ground-mounted and floating Solar, Onshore Wind, Biomass, and Waste-to-Energy capacities. A total of 109 participating Qualified Bidders joined and competed for the 11,600 MW capacity requirement. Of this capacity, 105 out of 109 qualified bids won the auction from 40 RE Developers with a total offered capacity of 3,440.756 MW.

Ground-mounted Solar has 34 winning bids for a total capacity of 1,878.98 MW, Roof-mounted Solar has 58 winning bidders with a capacity of 9.39 MW, Floating Solar has one (1) winning bid for a 90 MW capacity, and Onshore Wind has 12 winning bids with a total capacity of 1,462.38 MW.

On 12 December 2023, DOE issued DC No. DC2023-10-0029 titled, "Providing Specific Auction Policy Guidelines for Non-FIT-Eligible Renewable Energy Technologies in the Green Energy Auction Program." This is in preparation for the third round of the Green Energy Auction that will cover non-FIT eligible technologies such as Geothermal, Pumped Storage Hydro, and Impounding Hydro plus Run-of-River (ROR) Hydro, a FIT-eligible technology to mitigate the impact of increasing variable renewables in the grid as well as to encourage more investments in power generation under

GEAP. The issuance of a Notice of Auction (NOA) for the conduct of GEA- 3, auction design, Terms of References (TOR), target capacity for ROR, Price Determination Methodology (PDM) for non-FIT eligible RE technologies, as well as the legal and technical requirements are expected to come out in the 2nd quarter of 2024.

Open and Competitive Selection Process (OCSP). In a quest to stimulate a vibrant and competitive landscape for Renewable Energy (RE) advancement, the Department of Energy (DOE) is steadfast in its commitment to reach the target share of RE in the power generation mix of 35% by 2030 and 50% by 2040. The OCSP is designed with transparency and fairness in determining the most suitable developers across various RE technologies. DOE is actively engaged in the regular conduct of the OCSP to foster a dynamic and competitive environment for RE development. A series of public consultations was conducted in preparation of the next rounds of OCSP. Various factors, such as resource availability, infrastructure accessibility, and environmental impacts, were considered in the determination of the PDAs. The available technical data on the PDAs will serve as an initial reference for interested bidders.

The 4th OCSP was launched on 11 July 2023, where 20 PDAs with three (3) areas for Geothermal and a total potential capacity of 160 MW, fourteen (14) areas for Hydropower with a combined capacity of 87.96 MW, and three (3) areas for Wind resources whose total potential capacity is to be determined. DOE issued DC2023-06-0019, or "The Guidelines that outline the requirements and procedures governing the OCSP4 to provide a clear framework to ensure a fair, standardized, and transparent selection process. Four (4) applications, covering two (2) Geothermal and two (2) Wind PDAs, were determined to meet the evaluation criteria and were declared as winning bidders.

PDAs with no RE applications and no qualified RE applicants were declared "Failure of OCSP" for the said PDAs under Item 7 of the OCSP4 Guidelines. These PDAs were consequently opened for Direct Application, following the procedures and requirements outlined in Department Circular No. DC2019-10-0013, also known as the "Omnibus Guidelines Governing the Award and Administration of Renewable Energy Contracts and the Registration of the Renewable Energy Developers."

Competitive RE Zones (CREZ). On 13 September 2018, DOE Circular No. DC2018-09-0027, entitled "Establishment and Development of Competitive Renewable Energy Zones in the Country" was issued. The CREZ process strategically directs renewable energy (RE) development to the most cost-effective locations.

Figure 7. Competitive Renewable Energy Zones (CREZ) (Location Within 50 KM Radius)



These zones are selected based on the quality of available renewable energy resources and transmission network facilities with high-voltage lines. It is a tool the government utilizes to cost-effectively accelerate the deployment of large-scale RE projects in the country.

PDAs with no RE applications and no qualified RE applicants were declared "Failure of OCSP" for the said PDAs under Item 7 of the OCSP4 Guidelines. These PDAs were consequently opened for Direct Application, following the procedures and requirements outlined in Department Circular No. DC2019-10-0013, also known as the "Omnibus Guidelines Governing the Award and Administration of Renewable Energy Contracts and the Registration of the Renewable Energy Developers."

There were 25 CREZs identified with high-quality solar and wind resources across the country, with an estimated total capacity of 152,097 MW. It likewise covers the potential for other RE sources, such as Geothermal, Hydro, and Biomass, with a total potential capacity of 655,773 MW.

Table 18. Potential RE Capacities under CREZ

System	Solar PV	Wind	Geothermal	Hydropower	Biomass	Total
Luzon	35,031	54,115	285	270,603	210	360,244
Visayas	11,876	25,429	40	1,917	71	39,333
Mindanao	11,203	14,443	40	382,514	93	408,293
Philippines	58,110	93,987	365	655,034	374	807,870

Source: CREZ Report

Renewable Energy Market (REM). The establishment of the RE Market provides a venue for trading Renewable Energy Certificates (RECs) between and among REM Trading Participants. The REM shall serve as a platform for RPS Mandated Participants to comply with their minimum RPS requirements both for on-grid and off-grid. As of March 2023, there are 262 registered REM participants.

Preferential Dispatch in the Wholesale Electricity Spot Market (WESM). On 05 October 2022, DOE issued DC2022-10-0031 declaring all RE resources as preferential dispatch generating units in the Wholesale Electricity Spot Market. This circular amended DC No. DC2015-03-0001 granting all RE-generating units preferential dispatch in the WESM (i.e., must or priority dispatch) to ensure their maximum output injection in the grid.

Green Energy Option Program (GEOP). GEOP is a voluntary policy mechanism that allows electricity end-users with 100 kW and above demand to source their electricity from renewable energy sources through RE Suppliers. GEOP allows the end-users to choose RE resources as their energy source. It is a non-regulated activity that provides options to end users to contribute to developing and utilizing RE resources in a sustainable and low-cost manner. As of 31 December 2023, there are 19 RE suppliers under GEOP. In Luzon and Visayas, 286 customers have already switched to GEOP, equivalent to 96.37 MW non-coincidental peak demand.

Feed-in-Tariff System. The Feed-in-Tariff (FIT) system offers RE developers a guaranteed fixed price for the electricity they generate for a specific period. This fixed price is set at a higher rate than the prevailing market rate. To qualify for the FIT scheme, RE developers must meet specific eligibility criteria and obtain a certificate of eligibility from the DOE and a Certificate of Compliance for Feed-in-Tariff from the ERC. As of January 2024, a total capacity of 1,369.945 MW for 82 projects was issued Certificate of Endorsement for FIT Eligibility (COE-FIT). The installation target for Hydropower technology was undersubscribed due to permitting and licensing issues. Hence, the application for FIT Eligibility for the remaining installation target balance for run-of-river (ROR) Hydropower is extended until full subscription of 350 MW.

Net Metering. Net Metering is a consumer-based RE incentive scheme wherein power generated by an end-user (such as a house or commercial establishment with a Solar photovoltaic system) can partly satisfy their electricity demand by themselves. This allows end-users to be prosumers (both a consumer and producer), but not net power generators, generating electricity from RE-based systems up to 100 kW for their own use and selling their excess to the grid. As of 31 December 2023, a total of 11,707 qualified end-users, covering 79 DUs, were registered in the program, with a total rated capacity of 101.469 MWp. Luzon Grid has the highest rated capacity of 70%, Visayas has a 25% rated capacity, and Mindanao has a 5% rated capacity.

RE Trust Fund (RETF). RETF aims to provide financial support to projects of qualified entities further promoting and increasing the utilization of RE. RETF will be coming from government institutions, one and a half percent (1.5%) of the government share collected from the development and use of indigenous non-renewable energy resources, and DOE collection from contributions, grants, and donations in the form of cash, any revenues generated from the utilization of the RETF, and proceeds from fines and penalties imposed under the RE

Figure 8. Signing of MOA on RETF by DOE Secretary Raphael P.M. Lotilla and DOST Secretary Renato U. Solidum, Jr. on the RETF MOA Signing between DOE and DOST



law will be transferred to the respective RETF Trust Accounts. DOE and the Department of Science and Technology (DOST) signed a Memorandum of Agreement (MOA) on 03 April 2024. Under the MOA, DOE and DOST, through the Philippine Council for Industry, Energy and Emerging Technology Research and Development (PCIEERD), will collaborate on research projects aimed at enhancing the efficiency, affordability and scalability of RE technologies, including solar, wind, hydro, biomass, ocean, geothermal energy and other emerging technologies.

Easing Foreign Ownership Limit. November 2022, DOE issued DC No. DC2022- 11-0034 "Prescribing Amendments to Section 19 of Department Circular No. DC2009-02-0008 Titled, Rules and Regulations

Implementing Republic Act No. 9513, Otherwise known as the RE Act of 2008". It removes foreign ownership restrictions in the exploration, development, and utilization of Solar, Wind, Hydro, and Ocean or Tidal projects, excluding water resources directly harvested from the source, which the Water Code of the Philippines shall govern.

RESOURCE POTENTIALS

Offshore Wind Development

The Philippine Offshore Wind Development Roadmap, jointly developed by DOE and the World Bank (WB) in 2019, revealed that the Philippines has vast offshore Wind (OSW) resources in six prospective zones: Northwest Luzon, Manila, Northern Mindoro, Southern Mindoro, Guimaras Strait, and Negros/Panay West.

The study identified a total estimated technical potential of 178 GW, 160 GW of which is in deep water applicable for floating Wind turbines, while the remaining 18 GW is in shallow water appropriate for fixed bottom Wind turbines. Aside from the Offshore Wind potential, the study also unveiled the following: Scenarios for Development, Challenges and Opportunities for Developing Offshore Wind, and Recommendations for the Philippines.

Figure 9. OSW Prospective Development Zones (OSW Roadmap)



Source: DOE-Renewable Energy Management Bureau

Table 19. Awarded OSW Energy Service

Development Zones	No. of RE Contracts	Contract Area (Has.)	Potential Capacity (MW)
Northwest Luzon	11	220,896	8,609
Manila	9	120,771	6,642
Northern Mindoro	9	188,839	9,288
Negros / Panay West	10	186,589	5,032
Southern Mindoro	10	325,662	10,117
Guimaras Strait	10	174,879	6,424
Other Areas	22	343,641	16,427
Total	81	1,561,277	62,539

Source: DOE-Renewable Energy Management Bureau, as of December 2023

As of 31 December 2023, DOE has awarded 81 Offshore Wind Energy Service Contracts with a total potential capacity of 62,539 MW. This is more than the target RE capacity addition by 2040. These projects are spread mainly in North Luzon, West of Metro Manila, North and South of Mindoro, and Panay and Guimaras Straits.

On 19 April 2023, President Ferdinand Marcos, Jr. issued Executive Order (EO) No. 21, directing the establishment of a Policy and Administrative Framework for the efficient and optimal development of OSW resources in the country to hasten the rollout

of OSW development. It is a whole-of-government approach to streamline and expedite the approval process for issuing permits, licenses, and clearances for OSW projects. It also includes integrating applicable permits into the Energy Virtual One-Stop Shop (EVOSS) platform.

In addition, the Policy and Administrative Framework for the Efficient and Optimal Development of the Country's Offshore Wind Resources (OPAF) was issued on 16 June 2023. This covers all the Permitting Agencies, Departments, Bureaus, Offices, agencies, government-owned and controlled corporations, local government units, and other entities involved in the permitting process of OSW projects.

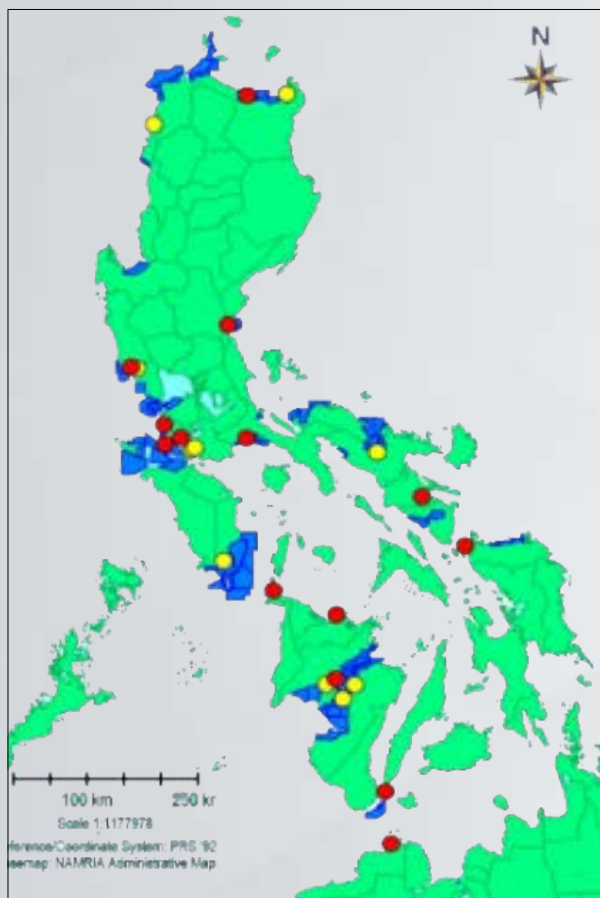
The DOE is also examining the OSW value chain to support the country's fast-phase development of OSW. Port readiness is a critical factor in the successful development of OSW projects. It encompasses the state of readiness and appropriateness of ports to facilitate the diverse activities associated with installing, operating, and maintaining offshore wind farms.

Drawing insights from the experiences of other countries, it is notable that we do not have ports inherently prepared for OSW development. The existing ports often need repurposing to align with OSW development's specific requirements and demands. This process involves adapting and enhancing port facilities to support the OSW industry's unique logistics, assembly, and deployment needs.

The Asian Development Bank's (ADB's) Technical Assistance Program entitled "Supporting Offshore Wind Port Development Planning" allocated USD 400,000.00 from ADB's Climate Change Fund. The Technical Assistance is set to support the Philippines' OSW development through the preparation of pre-feasibility studies for offshore Wind ports, a list of priority ports for OSW development, and a time-bound action plan for OSW development starting 2028.

To support the Philippines' OSW development through the preparation of pre-feasibility studies for offshore Wind ports, a list of priority ports for OSW development, and a time-bound action plan for OSW development starting 2028.

Figure 10. Ports Identified to Support OSW Development



Source: DOE-Renewable Energy Management Bureau

Identified Ports for Asian Development Bank (ADB) Technical Assistance

1. Port of Irene
2. Port of Currimao
3. Port Subic
4. Bauan International Port, Inc.
5. PNOC Energy Supply Base Port (ESB)
6. Tabacco Port
7. Bulalacao Port
8. Iloilo Commercial Port Complex (ICPC)
9. Banago Port
10. Pulupandan Port

Identified Ports of OSW RE Developers

1. Hanjin Shipyard
2. Wawa Port
3. Port of Calatagan
4. Calaca Port
5. Caticlan Port
6. Culasi Port
7. Dumangas Port
8. Aparri Port
9. Dingalan Port
10. Lucena Port
11. Legazpi Port
12. Allen Port
13. Dumaguete
14. Port Dapitan Port

Onshore Wind Development

The CREZ initiative highlights potential avenues for RE development and mitigates investment hurdles by using CREZ locations which are pre-evaluated for superior resources, appropriate topography, potential land-use limitations, and evident private developer engagement, thereby diminishing the overall cost of feasibility assessment. In addition, it provides high- capacity factors and a lower cost per megawatt hour (PhP/MWh) and transmission.

The CREZ report identified a total onshore Wind potential capacity of 93,987 MW. This is thrice more than the target capacity addition by 2050 under the reference scenario. Luzon was identified to have a total potential capacity of 54,115 MW, while Visayas and Mindanao have a total potential of 25,429 MW and 14,443 MW, respectively. On a per-grid basis, zones in Mindanao have the highest potential capacities. On the other hand, zones in Luzon have the lowest LCOE, and zones in Visayas have the highest capacity factor from 32% to 36%.

The report also presented the technical and financial assumptions to estimate the technical potential and the Levelized Cost of Energy (LCOE) for RE generation technologies. The variable operation and maintenance costs and fuel costs are assumed to be zero for RE generation. The capital cost for onshore Wind projects at 56 PhP/USD conversion rate is PhP 139.99 million/MW. The fixed operation and maintenance cost is estimated at PhP 1.4 million/MW/year, while the grid connection cost is estimated at PhP 86,128/ km/MW.

Figure 11. Distribution of Optimized CREZ for Wind



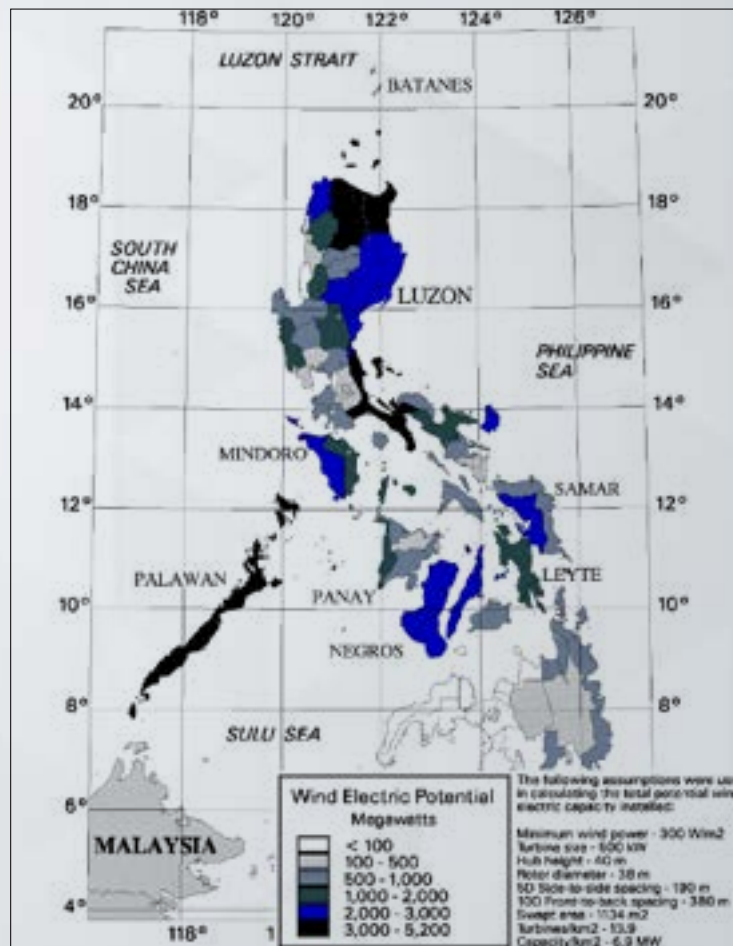
Table 20. Grid comparison of Optimized CREZ for Wind

Wind	Potential Capacity	LCOE	Capacity Factor
Luzon	324 MW to 1,239 MW	81 USD/MWh to 105 USD/MWh	27% to 36%
Visayas	551 MW to 708 MW	90 USD/MWh to 111 USD/MWh	32% to 36%
Mindanao	560 MW to 1,472 MW	109 USD/MWh to 111 USD/MWh	22% to 26%

Source: CREZ Report

Further, in 2000, the Philippines Wind Resource Atlas Development of NREL identified a total of 76.6 GW of Wind energy potential from areas with good to excellent Wind resources. The areas with the highest concentration of Wind are Ilocos Norte, Cagayan, Quezon, Camarines Norte, and Palawan.

Figure 12. Wind Electric Potential from areas with good to excellent wind resource



Solar Energy Development

The total installed capacity for Solar, as of 31 December 2022, is 1,530 MW. DOE is expecting to have a total capacity addition of 54,948 MW by 2050 under the REF scenario, 53,165 MW under CES 1, and 34,121 MW under CES 2. This could bring the total installed capacity for Solar to 56,478 MW by 2050 under the REF scenario, 54,695 MW under CES 1, and 35,651 MW under CES 2.

The government has estimated a total investment requirement of PhP 3.06 billion for the target additional capacity by 2050 under the REF scenario, PhP 2.96 billion under CES 1, and PhP 1.89 billion under CES 2. This considerable investment requirement calls for collaboration between RE investors and financing institutions on some projects to contribute to achieving the country’s target Solar energy capacity.

The total Solar energy potential under CREZ is estimated at 58,110 MW, with 35,031 MW coming from Luzon, 11,876 MW from Visayas, and 11,203 MW from Mindanao.

Figure 13. Distribution of Optimized CREZ for Solar



According to the CREZ Report, the capital cost per MW for Solar PV projects with the above specification is around PhP 83.99 million at 56 PhP/USD conversion rate. The fixed operations and maintenance cost would reach PhP 840,000/MW/year, while the grid connection cost is PhP 86.128 million/km/MW for a substation tie-in, 69 kV, steel tower, and single circuit line.

Taking a closer look at the optimized CREZ for Solar, Luzon zones have the highest potential capacities, lowest LCOE, and the highest capacity factor, reaching up to 18%.

Table 21. Grid Comparison of Optimized CREZ for Solar

Solar	Potential Capacity	LCOE	Capacity Factor
Luzon	130 MW to 1,109 MW	81 USD/MWh to 103 USD/MWh	16% to 18%
Visayas	355 MW to 908 MW	90 USD/MWh to 111 USD/MWh	16%
Mindanao	1 MW to 969 MW	109 USD/MWh to 111 USD/MWh	15% to 17%

Source: CREZ Report

Figure 14. Maibarara Geothermal Power Facility in Sto. Tomas, Batangas

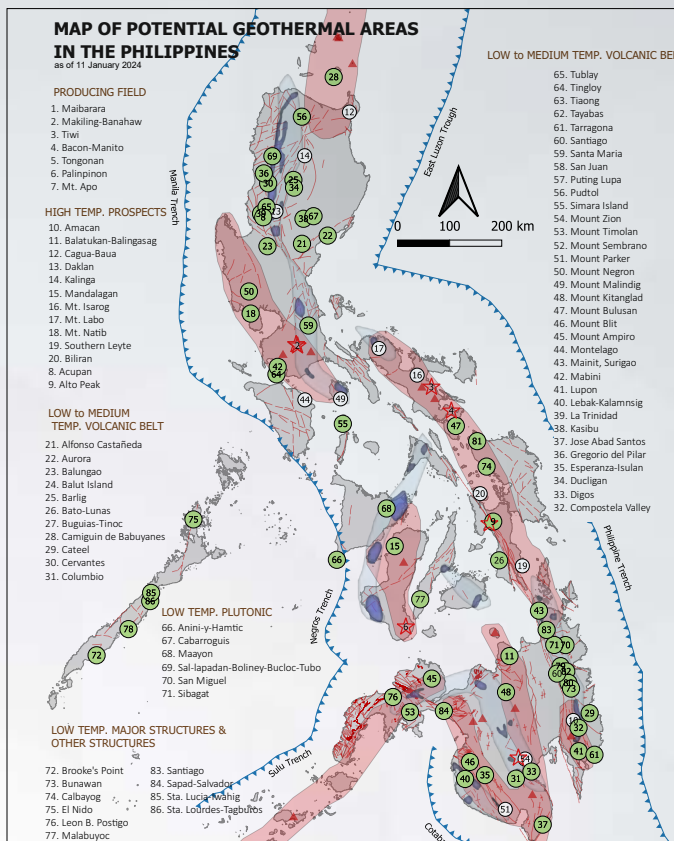


Geothermal Energy Development

As of 31 December 2023, there are 39 Geothermal Service Contracts (GSCs) with a total installed capacity of 1,951 MW. To reach the 2050 targets outlined in the 2023-2050 PEP, Geothermal energy is expected to share 1,355 MW under the REF scenario and 1,005 MW under CES 1 and CES 2. The additional capacity will entail a total investment cost of PhP 16.57 billion for the REF scenario and PhP 12.29 billion for CES 1 and CES 2.

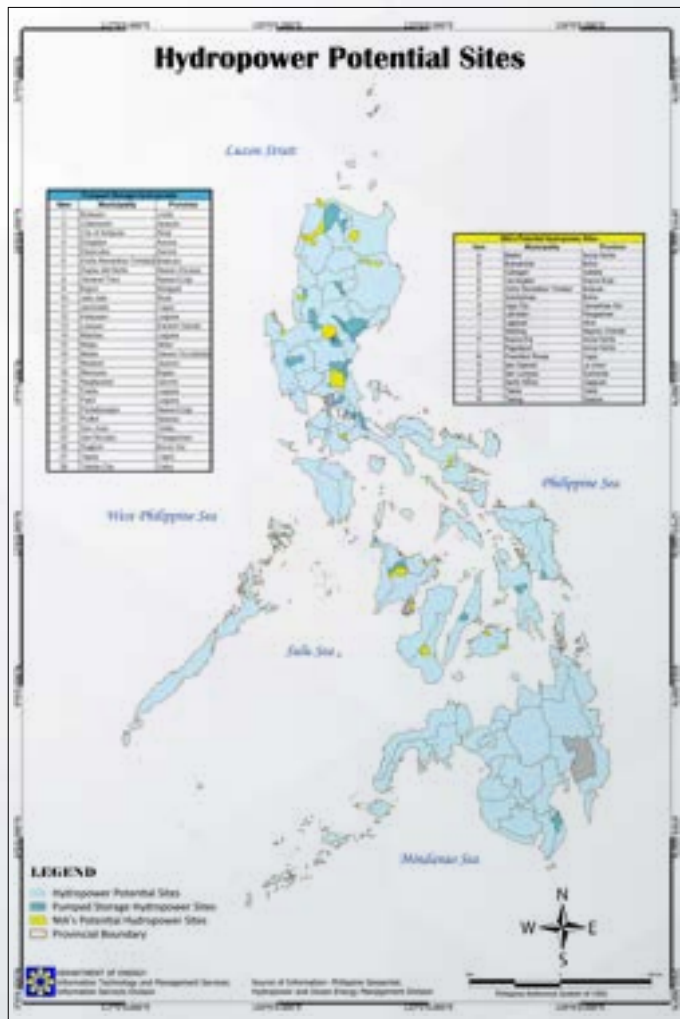
In addition to Solar and Wind energy potentials, the CREZ Report also identified potentials for Geothermal energy development of around 365 MW. Capital cost for the CREZ areas amount to PhP 335.99 million/MW

Figure 15. Map of Potential Geothermal Areas



Source: DOE-Renewable Energy Management Bureau

Figure 16. Map of Potential Hydropower Areas



while the fixed operation and maintenance cost amount to PhP 1.12 million/MW/year, and the grid connection cost for substation tie-in, 69 kV, steel tower, or single circuit line amount to PhP 86,128/km/MW.

Further, in the Proceedings World Geothermal Congress 2020, Halcon et. al, presented “An Update on the Philippine Geothermal Resource Estimates”. This presents the current Geothermal resource potential sites in the country with a total estimated capacity of 4,160 MW. Figure 15 shows the potential Geothermal areas, showing that the Philippines still has vast Geothermal potential across the country. The resource assessment shows a few unexplored high-temperature opportunities, and most intermediate-temperature opportunities are found along the country’s active volcanic belt.

On 12 February 2024, DOE announced the conduct of GEA-3 for 2024. The target capacity for geothermal power is 380 MW, and the target delivery commencement period (DCP) is between 2024 and 2030.

Hydropower Development

As of 31 December 2023, the country has a total of 433 Hydropower projects, with 429 commercial projects awarded with Hydropower Energy Service Contracts (HESCs) and four (4) own-use projects issued with Certificate of Registration (COR). The total installed capacity of commercial projects is 1,187.91 MW, while the total installed capacity of own-use projects is 5.02 MW.

The target capacity installation by 2050 for Hydropower under the PEP 2023 to 2050 is 10,265 MW under REF scenario, 6,800 MW under CES 2, and 6,180 MW under 2. This would require a total investment cost of PhP 12.199 billion under the REF scenario, PhP 8.081 billion under CES 1, and PhP 7.344 billion under CES 2.

Various resource assessments for Hydropower potential unveil a total potential capacity of 23,375 MW. Of this capacity, 17,366 MW is from Luzon, 2,448 MW in Visayas, and 3,569 MW in Mindanao, as shown in Figure 16.

In addition, the CREZ Report has identified a massive potential for Hydropower development of around 655,034 MW, with 270,603 MW from

Figure 17. National Irrigation Administration- Magat River Integrated Irrigation System (NIA - MARIIS) Re-regulating Dam in Alfonso Lista, Ifugao / Ramon, Isabela



Luzon, 1,917 MW from Visayas, and 382,514 MW from Mindanao. The capital cost of a small Hydropower project with a capacity of less than 50 MW PhP 158.47 million per MW. The fixed operating and maintenance cost is PhP 4.75 million/MW/year, while the grid connection cost is PhP 86,128/km/MW.

The archipelagic nature of the country offers abundant resources for Hydropower development. Hydropower projects in the country include run-of-river Hydropower, impounding, pump-storage, and mini/micro Hydropower projects.

Generally, ROR hydro plants are used to meet peak demands. However, ROR with large reservoirs or very consistent river flows that can

generate power at near-constant levels throughout the year can be used as baseload power. Impounding or dam-type hydro can be used as baseload power and peak load power. Pump-storage Hydro can be used as peak load power, and it can act as an Energy Storage System (ESS) to support variable RE (VRE) Technologies. Being the most resilient power plant, Hydropower plants have a long operating life of 30 to 80 years. The average ROI of Hydropower projects is between 8-10 years. This means that income after the ROI is considered purely revenue from investments that can reach up to 2 to 6 times over the capital investment.

There are 18 potential sites in the existing NIA irrigation canal system that can be converted to multi-use facilities. DOE and NIA signed a Memorandum of Agreement (MOA) for the development, utilization, and commercialization of Hydropower within the NIA irrigation facilities. The OCSP 4 was conducted in 2023, which offered 14 Hydropower pre-determined areas. Following the OCSP 4 guidelines, four applications have met the minimum evaluation criteria, declaring four winning bidders for two Geothermal PDAs and two Wind PDAs.

Meanwhile, six (6) PDAs for Hydropower with a total potential capacity of 22.56 MW will have a change of mode of award from OCSP to Direct Application.

The GEA-3 to be conducted this year will auction non-FIT RE Technologies, including impounding hydro, pumped-storage hydro, and a FIT-eligible technology, such as a run of river hydro. It is estimated that a total of 699 MW will be auctioned for impounding hydro, while 3,120 MW will be auctioned for pump-storage. For the run of river hydro, an estimated capacity of 200 MW will be auctioned with a target DCP starting 2026 to 2028. The DCP for impounding and pumped storage hydro will be from 2028 to 2030.

Biomass and Waste to Energy (WTE) Development

The Philippines has a large agricultural economy, accounting for 8.9% of the country's gross domestic product. Globally, the country ranks 2nd in coconut production and 11th for sugarcane production. These provide the Philippines with an abundant supply of biomass resources composed mainly of agricultural and fishery, agro-industrial, and forest residues and/ or wastes. As the price of fossil fuels continues to rise, the Philippines is seeing an increase in the usage of commercially produced agricultural residues for power generation and biofuel production.

Common feedstock for biomass power generation are rice husk and bagasse, while sugarcane molasses and coconut oil are used for biofuels. Biomass technologies include direct combustion, anaerobic digestion, and gasification for power generation; oven/kilns, and cookstoves for drying and cooking purposes; fermentation

Table 22. Estimated Investment Cost of Biomass Projects per Technology

Technology	Investment in USD/MW
Combustion	2 - 2.5 Million
Gasification	1.2 - 1.3 Million
Anaerobic Digestion	1.3 - 1.4 Million
WTE	5 - 7 Million
Landfill Gas Extraction	2 - 2.5 Million

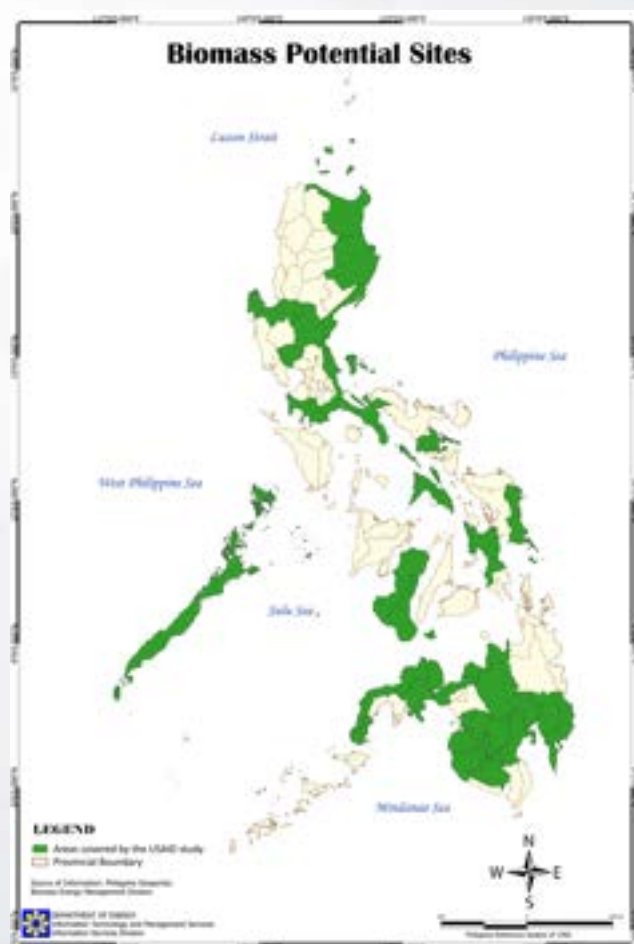
Source: DOE-Renewable Energy Management Bureau

commercialization of WTE. During the 1st year, waste streams and power generation from the 33 highly urbanized cities (HUCs) and 246 existing sanitary landfill sites (SLFs) were evaluated, and suitable technologies and financing models were identified. The 2nd year aims to identify three (3) potential sites for pilot projects, conduct viability and impact assessments, and develop guidelines for project implementation.

As of 31 December 2023, there are 58 projects awarded with BREOCs/BEOCs with a total installed capacity of 581.799 MW and a total potential capacity of 206.879 MW. The target additional capacity for Biomass under the PEP 2023-2050 is 92 MW under the REF scenario and 138 MW under CES 1 and CES 2. Figure 15 shows the potential sites for Biomass development covered by the USAID Study that can fulfill part of the target capacity additions.

In addition, the Biomass potential capacity identified under CREZ is 210 MW in Luzon, 71 MW in Visayas, and 93 MW in Mindanao. These capacities can further bring us closer to achieving our target capacity additions by 2050. The capital cost for Biomass projects under the CREZ Report is PhP 105.839 million/MW, while the fixed operations and maintenance cost is PhP 98.559 million/MW/year, and the grid connection cost for substation tie-in, 69 kV, steel tower or single circuit line is PhP 86,128/km/MW.

Figure 18. Map of Potential Biomass Sites



and transesterification for biofuel production. Table 22 shows the estimated investment cost per Biomass technology.

Waste-to-Energy (WTE) plants in the Philippines employ landfill methane recovery, refuse-derived fuel production, and anaerobic digestion. A two-year study by the DOE is assessing the potential of these technologies for the promotion and

Biomass technology is a key factor in attaining net-zero emissions by 2050 in support of the United Nations sustainable development agenda. This technology significantly reduces dependence on fossil fuels and lowers our carbon footprint by preventing methane gas emissions from decomposing wastes. It also adds value to previously unusable agricultural residues, providing additional income for farmers.

Biofuels

Bioethanol refers to ethanol produced from feedstock and other biomass. Bioethanol fuel is the Hydrous or Anhydrous bioethanol suitably denatured for use as motor fuel, with quality specifications in accordance with the Philippine National Standards (PNS).

Biodiesel refers to Fatty Acid Methyl Ester (FAME) or mono-alkyl esters derived from vegetable oils or animal fats and other Biomass-derived oils that shall be technically proven and approved by the DOE for use in diesel engines, with quality specifications in accordance with the PNS.

Table 23. Feedstock Sources for Bioethanol Production in the Philippines

Types of Biofuel	Feedstock for Bioethanol Production
1 st Generation	Sugarcane*, Molasses*, Cassava, Sweet Sorghum, Nipa Sap**
2 nd Generation	Cellulosic Materials**, Grass**, Agricultural Waste Material, Forest Waste and Residues
3 rd Generation	Macroalgae

*existing; **under study

Source: DOE-Renewable Energy Management Bureau

Table 24. Feedstock Sources for Bioethanol Production in the Philippines

Types	Feedstock
1 st Generation	Coconut*
2 nd Generation	Jatropha, Used Vegetable Oil
3 rd Generation	Microalgae

*existing

Source: DOE-Renewable Energy Management Bureau

As of 29 February 2024, there are 14 accredited bioethanol production plants with a total annual rated capacity of 508 million liters per year (MLPY) and 13 accredited biodiesel production plants with 639.33 MLPY. These are equivalent to about 62% of the E10 mandate and 263% of the B2 mandate.

Republic Act No. 9367 or the Biofuels Act of 2006 was implemented to increase the contribution of biofuels in the country's energy mix, reduce dependence on imported fossil-based fuels, enhance the quality of the environment, and create opportunities for countryside socio-economic development. The issuance of Department Circular Nos. DC 2011-02-0001 and DC 2009-02-0002 mandated the 10% bioethanol blend (E10) and the 2% biodiesel blend (B2) in 2011 and 2009, respectively.

Table 25. 2024-2026 Bioethanol Volume Supply Requirement

Year	Gasoline Demand (million liters)*	Bioethanol Blend Target	Bioethanol Supply Requirement (ML)
2024	8,200	10%	820
		20%**	-
2025	8,818	10%	882
		20%**	-
2026	9,483	10%	948
		20%**	-

*Based on DOE-OIMB Actual Data (Average Growth Rate @ 7.5% for Gasoline)

The National Biofuel Board (NBB) has approved Resolution Nos. 2023-03 and 2023-04 series of 2023 last 28 November 2023 to address the inflationary pressures on the rising petroleum prices. The mandated E10 ethanol blend will be supported by a voluntary E20 blend, while the B2 biodiesel blend will be gradually increased from B2 to B3 in 2024, B4 in 2025, and B5 in 2026. Table 25 shows the Biodiesel and Bioethanol Supply requirements. These translate to a guaranteed market for our ethanol and biodiesel producers in the country.

For 2024, the current production capacity of our bioethanol plants is only 508 MLPY, while the bioethanol requirement for the mandatory blend is 820 MLPY. We need an additional 302 MLPY to comply with the minimum required blend and more than that to cater to our voluntary E20 blend participants.

For biodiesel, the current production capacity is 639.33 MLPY. This can cater to the mandatory and voluntary blend requirements until 2026. However, a new biodiesel plant is needed to comply with the biodiesel blend requirements starting 2027 with new issuances being reviewed for the integration of higher blends.

Table 26. 2024-2026 Biodiesel Volume Supply

Year	Diesel Demand (million liters)*	Biodiesel Blend Target	Biodiesel Supply Requirement (ML)
2024	12,149	2%	243
		3%**	364
2025	12,813	4%	513
2026	13,514	5%**	676

*Based on DOE-OIMB Actual Data (Average Growth Rate @ 5.5% for Diesel)

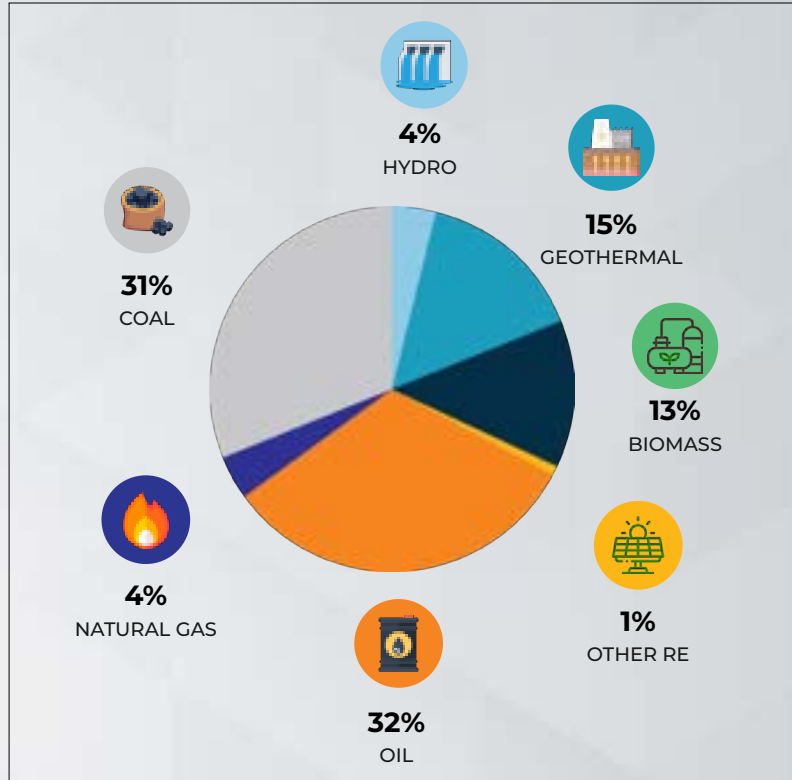
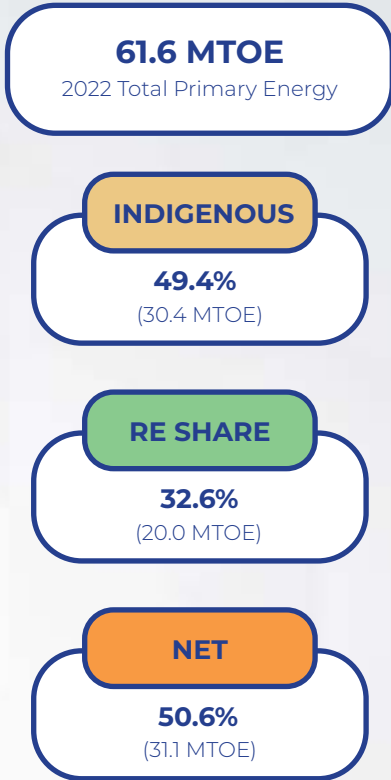
**Mandatory

Sustainable Aviation Fuel

DOE is considering the use of alternative fuels in the transport sector, particularly in the aviation industry. Thus, the Department is collaborating closely with the country's aviation sector and international partners to decarbonize the commercial aviation industry with sustainable aviation fuel (SAF). The DOE acknowledges international initiatives such as the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), established by the International Civil Aviation Organization (ICAO), that offers a harmonized way to reduce emissions from international aviation. CORSIA allows using SAF derived from biomass or waste resources to minimize the carbon-offsetting requirements of airlines.

POWER DEVELOPMENT

ENERGY MIX 2022



Source: PEP 2023 - 2050

The country's Total Primary Energy Supply (TPES) breaks down the Energy Mix by Fuel Type. In 2022, the overall energy supply amounted to 61.6 million tons of oil equivalent (MTOE). Notably, slightly over 49% (30.4 MTOE) of the TPES emanated from domestic sources, underlining the country's commitment to indigenous energy production; while the remaining 51% (31.1 MTOE) was sourced from imports. The aggregate renewable energy (RE) supply, including biofuels, reflected a share of 32.6% in the energy mix.

ON-GRID POWER CAPACITY

In 2023, the country recorded a total installed capacity of 28,291 MW and a dependable capacity of 24,654 MW, or 87% of the installed capacity. As indicated in Table 27, coal comprises 43.85% of the energy mix, followed by renewable energy with 29.75% share. Oil-based and natural gas contribute significantly, accounting for 13.21% and 13.19% shares respectively. The aggregate installed capacity from natural gas and renewable energy resources amounts to 12,051 MW. The Energy Storage System has also increased from 156 MW in 2022 to 436 MW in 2023, a significant growth of 179% on its 2022 level.

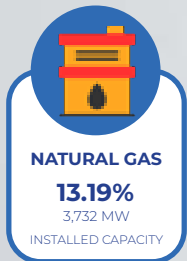
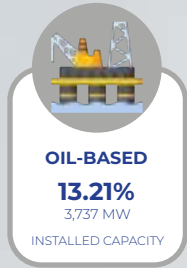
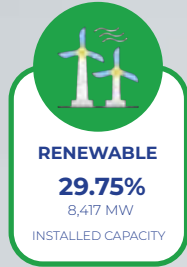
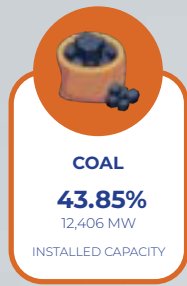


Table 27. 2023 Grid-Connected Installed Capacity (MW)

Fuel Type	Capacity (MW)		Percent Share (%)	
	Installed	Dependable	Installed	Dependable
Coal	12,406	11,335	43.9	46.0
Oil Based	3,737	2,796	13.2	11.3
Diesel	2,320	1,951	8.2	7.9
Oil Thermal	650	305	2.3	1.2
Gas Turbine	767	540	2.7	2.2
Natural Gas	3,732	3,281	13.2	13.3
Renewable Energy	8,417	7,242	29.7	29.4
Biomass	585	374	2.1	1.5
Biomass	577	371	2.0	1.5
Waste to Energy (WTE)	8	3	0.0	0.0
Geothermal	1,952	1,708	6.9	6.9
Solar	1,653	1,249	5.8	5.1
Behind-the-Meter (BTM)	46	37	0.2	0.1
Ground-mounted	1,608	1,212	5.7	4.9
Hydro	3,799	3,499	13.4	14.2
Impounding Hydro	2,164	1,985	7.7	8.0
Pumped Hydro	736	720	2.6	2.9
Run-of-River (ROR)	899	794	3.2	3.2
Wind	427	412	1.5	1.7
Onshore Wind	427	412	1.5	1.7
Off-shore Wind (OSW)	0	0	0.0	0.0
TOTAL	28,291	24,654	100.0	100.0
Energy Storage System (ESS)	436	436		
Battery ESS	387	387		
Hybrid (Diesel-Battery System)	49	49		

Figures may vary slightly due to rounding off of decimal numbers
Source: DOE-Electric Power Industry Management Bureau, as of December 2023

WESM Registration

The country's transmission system is consisting of three (3) main grids: Luzon, Visayas, and Mindanao. These grids are closely monitored by the National Transmission Company (TransCo) and operated and maintained by the National Grid Corporation of the Philippines (NGCP) under a 25-year concessionaire arrangement. This ensures seamless power flow across regions and provides a conducive environment for power investments.

Table 28. Summary of WESM Registration

CATEGORY	Luzon	Visayas	Mindanao	Luz/Vis/Min	Total
Generation Companies	114	49	42	4	209
Customers	91	42	43	1	177
Private Distribution Utilities	15	8	4	0	25
Electric Cooperatives	43	28	28	0	99
Directly Connected Customers	33	8	11	1	53
Ancillary Service Providers	18	15	7	2	42
Ancillary Service Buyers	0	0	0	1	1
Metering Service Providers	6	1	12	0	19
Total Participants	229	107	104	8	448

Source: Independent Electricity Market Operator of the Philippines (IEMOP), as of February 2024

The Wholesale Electricity Spot Market (WESM) serves as a centralized platform for buyers and sellers to engage in the trading of electricity as a commodity. Prices within this market are determined by the actual demand and supply of electricity. The establishment of WESM was mandated by Republic Act 9136, also known as the “Electric Power Industry Reform Act (EPIRA) of 2001.”

Operated by the Independent Electricity Market Operator of the Philippines (IEMOP), under the governance of the Electricity Market Corporation (PEMC), WESM facilitates transparent and efficient electricity trading. As of February 2024, there have been 448 registered participants, as outlined in Table 29.

Table 29 . RCOA Registered Participants in the Retail Market

Summary of RCOA Registration				
Membership Category		Registered Participants in the Retail Market		
		Jun-13	Q4 2022	Jun 2013 vs Q4 2023
Contestable Customers	D ≥ 1 MW	892	1,258	41.03%
	750 kW ≥ D > 1 MW		429	
	500 kW ≥ D > 750 MW		304	
Total		892	1,991	123.21%
Supplier	RES	19	40	110.53%
	LRES	13	15	15.38%
Total		32	55	71.88%
SOLAR		9	26	188.89%
RMSP		29	65	124.14%
Total		962	2,137	122.14%

Source: Philippine Electricity Market Corporation (PEMC), as of 31 December 2023

Retail competition and open access (RCOA) has seen significant participation since its inception in 2013. Initially, the threshold was set at a monthly average peak demand of 1 MW but was later adjusted to 750 kW and 500 kW, aligning with the EPIRA vision of customer choice.

As of 31 December 2023, the total number of registered participants increased to 2,137, marking a 122% increase compared to June 2013. This comprised 1,991 Contestable Customers (CCs), 55 suppliers, 26 Suppliers of Last Resort (SOLR), and 65 Retail Market Service Providers (RMSP). Among the CCs, 1,258 fall within the 1 MW threshold level, while 304 fall within the 500 kW to 1 MW range, and 429 fall within the 750 kW to 1 MW range. Regarding the suppliers, 40 are Renewable Energy Suppliers (RES) and 15 are Large Renewable Energy Suppliers (LRES).

POWER SUPPLY AND DEMAND OUTLOOK

Using the Philippine Energy Plan (PEP) and Power Development Plan (PDP) 2023-2050, the DOE has developed the Philippine Capacity Expansion Model (CEM) through the PLEXOS® software.

The PLEXOS® software is the DOE’s planning and simulation tool to determine the optimal capacity addition and generation expansion for the power supply and demand outlook on the prescribed planning period.

The DOE has simulated three (3) scenario assumptions, outlining the future generation capacity expansion plan to ensure a reliable, cost-effective, and sustainable power supply in the country, namely: Reference Scenario (REF), Clean Energy Scenario 1 (CES 1) and Clean Energy Scenario 2 (CES2).

The resulting simulations are discussed as follows:

1. Reference Scenario:

a. **Luzon.** Under the Reference Scenario, the Luzon grid will be requiring 61,035 MW additional capacity by 2050 based on the 2023-2050 forecast in Figure 19. Further, 5,236 MW will be required from baseload^[1] plants, 9,957 MW from mid-merit^[2] plants, and 45,842 MW from peaking^[3] plants.

Figure 19. Ref-Luzon Demand and Supply Outlook (2023-2050)

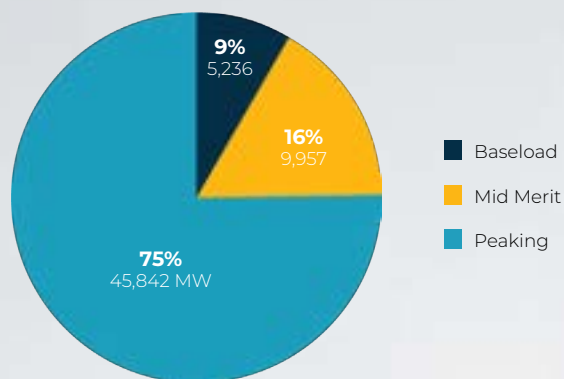
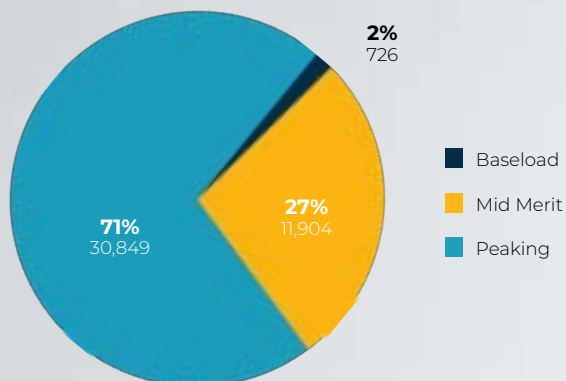


Figure 20. Ref-Visayas Demand and Supply Outlook (2023-2050)



b. **Visayas.** The Visayas grid will be requiring 43,479 MW additional capacity by 2050 based on the 2023-2050 forecast in Figure 20. Further, 726 MW will be required from baseload plants, 11,904 MW from mid-merit plants, and 30,849 MW from peaking plants.

c. **Mindanao.** Lastly, the Mindanao grid will be requiring 18,194 MW additional capacity by 2050 based on the 2023-2050 forecast in Figure 21. Further, 4,055 MW will be required from baseload plants, 20 MW from mid-merit plants, and 14,119 MW from peaking plants.

Figure 21. Ref-Mindanao Demand and Supply Outlook (2023-2050)

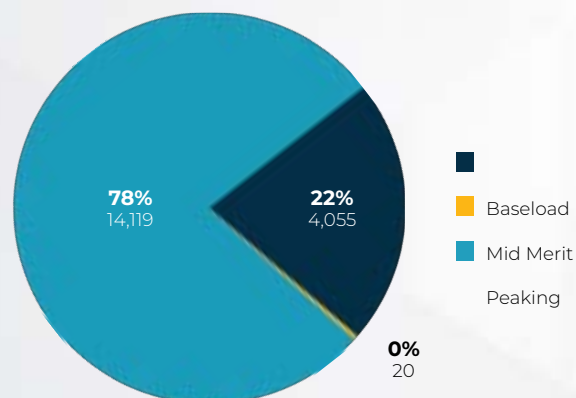
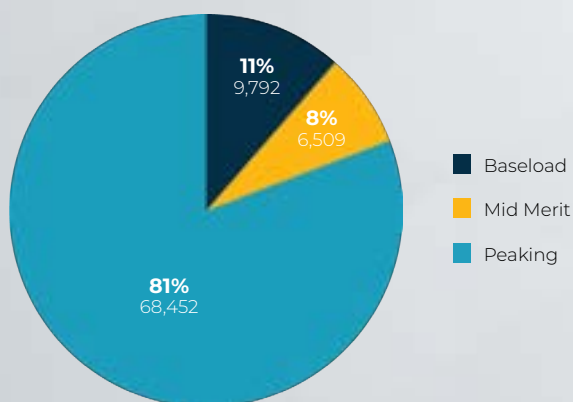


Figure 22. CES 1 - Luzon Demand and Supply Outlook (2023-2050)



2. Clean Energy Scenario (CES) 1:

a. **Luzon.** Under CES 1, the Luzon grid will be requiring 84,753 MW additional capacity by 2050 based on the 2023-2050 forecast in Figure 22. Further, 9,792 MW will be required from baseload plants, 6,509 MW from mid-merit plants, and 68,452 MW from peaking plants. Coal power plants due for repurposing are at 3,287 MW.

[1] Baseload Capacity Additions are derived from the total capacity of Coal, Biomass, Geothermal, and Run-of-River Plants. Nuclear is also included under the Clean Energy Scenario Simulations.

[2] Mid-Merit Capacity Additions are derived from the total capacity of Natural Gas Power Plants

[3] Peaking Capacity Addition

b. **Visayas.** The Visayas grid will be requiring 32,299 MW additional capacity by 2050 based on the 2023-2050 forecast in Figure 23. Further, 1,096 MW will be required from baseload plants, 8,720 MW from mid-merit plants, and 22,483 MW from peaking plants. Coal power plants due for repurposing are at 103 MW.

Figure 23. CES 1 - Visayas Demand and Supply Outlook (2023-2050)

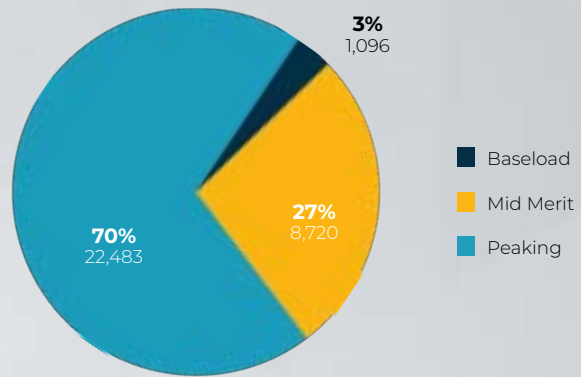
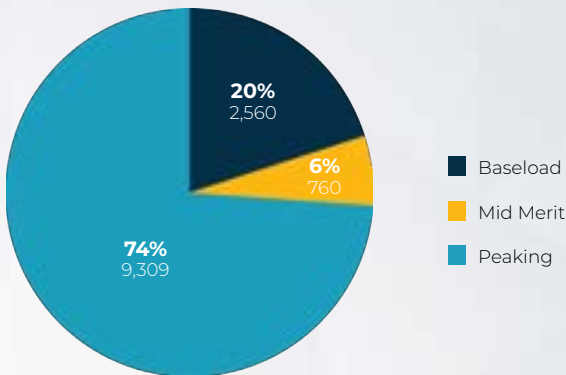
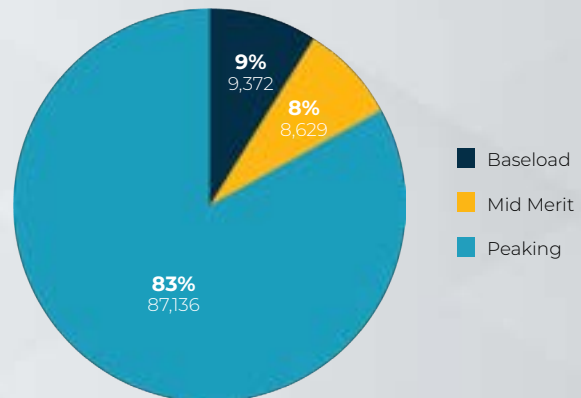


Figure 24. CES 1 - Mindanao Demand and Supply Outlook (2023-2050)



c. **Mindanao.** Lastly, the Mindanao grid will be requiring 12,629 MW additional capacity by 2050 based on the 2023-2050 forecast in Figure 24. Further, 2,560 MW will be required from baseload plants, 760 MW from mid-merit plants and 9,309 MW from peaking plants. Coal power plants due for repurposing are at 232 MW.

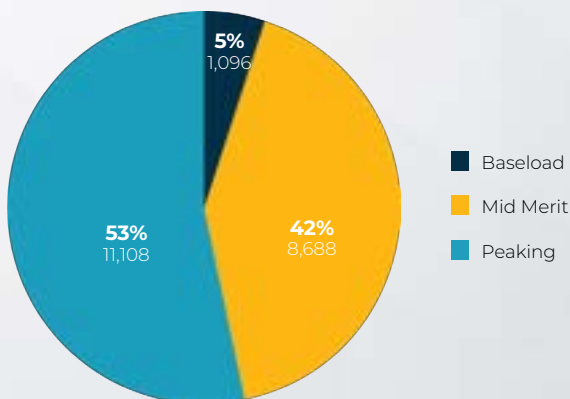
Figure 25. CES 2 - Luzon Demand and Supply Outlook (2023-2050)



3. Clean Energy Scenario (CES) 2:

a. **Luzon.** Under CES 2, the Luzon grid will be requiring 105,137 MW additional capacity by 2050 based on the 2023-2050 forecast in Figure 25. Further, 9,372 MW will be required from baseload plants, 8,629 MW from mid-merit plants, and 87,136 MW from peaking plants. Coal power plants due for repurposing are at 4,059 MW.

Figure 26. CES 2 - Visayas Demand and Supply Outlook (2023-2050)

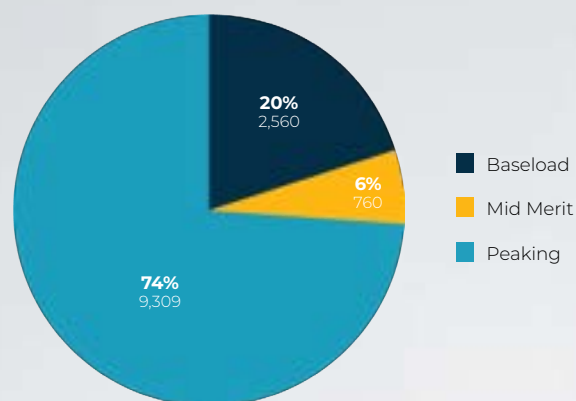


b. **Visayas.** The Visayas grid will be requiring 20,892 MW additional capacity by 2050 based on the 2023-2050 forecast in Figure 26. Further, 1,096 MW will be required from baseload plants, 8,688 MW from mid-merit plants, and 11,108 MW from peaking plants. Coal power plants due for repurposing are at 513 MW.

[1] Baseload Capacity Additions are derived from the total capacity of Coal, Biomass, Geothermal, and Run-of-River Plants. Nuclear is also included under the Clean Energy Scenario Simulations.
 [2] Mid-Merit Capacity Additions are derived from the total capacity of Natural Gas Power Plants
 [3] Peaking Capacity Addition

- c. **Mindanao.** Lastly, the Mindanao grid will be requiring 6,904 MW additional capacity by 2050 based on the 2023-2050 forecast in Figure 27. Further, 2,560 MW will be required from baseload plants, 1,540 MW from mid-merit plants and 2,804 MW from peaking plants. Coal power plants due for repurposing are at 232 MW.

Figure 27. CES 2 - Mindanao Demand and Supply Outlook (2023-2050)



[1] Baseload Capacity Additions are derived from the total capacity of Coal, Biomass, Geothermal, and Run-of-River Plants. Nuclear is also included under the Clean Energy Scenario Simulations.

[2] Mid-Merit Capacity Additions are derived from the total capacity of Natural Gas Power Plants

[3] Peaking Capacity Addition

PRIVATE SECTOR INITIATED PROJECTS

COMMITTED POWER PROJECTS

The DOE publishes monthly on the DOE website the list of committed and indicative^[4] power projects in Luzon, Visayas, and Mindanao grids based on the monthly accomplishment report (MAR) submission of the power generators. Given the total number of additional capacities required by the Philippines by 2050 and considering the various scenarios discussed in the preceding section, the consolidated information provides a comprehensive overview of the current line-up of power projects that are essential to the development of the generation sector, aimed to meet the increasing demand for electricity of the country.

As of 31 December 2023 (see Table 30), a total of 15,890 MW committed power projects^[5] and an additional 1,984 MW BESS projects are expected to be operational from 2024 to 2030, including those with commercial operation dates that are yet to be determined by the power generators.

With the coal moratorium advisory^[6] enforced by the DOE effective on 27 October 2020, the number of combined committed and indicative coal power projects has dropped by 63.7% from 11,289 MW in October 2020 to 4,094 MW in December 2023.

Renewable Energy's (RE) contribution is expected at 45.5% (7,233 MW), followed by natural gas at 38.2% (6,070 MW), and oil-fired power plants' share of 1.1% (182 MW) of the total expected capacity.

Table 30: Annual Summary of Committed Power Projects in the Philippines

Annual Summary of Target Commercial Operation (MW)								
Plant Type	2024	2025	2026	2027	2028	2030	TBD	TOTAL
COAL	600.00	350.00	485.00	270.00	700.00	-	-	2,405.00
OIL-BASED	181.91	-	-	-	-	-	-	181.91
NATURAL GAS	1,320.00	-	-	-	1,100.00	-	3,650.00	6,070.00
RENEWABLE ENERGY	2,167.135	2,614.84	1,838.65	102.00	-	500.00	10.23	7,232.85
GEOTHERMAL	81.22	-	-	42.00	-	-	-	123.22
HYDROPOWER	102.92	75.30	-	60.00	-	500.00	10.23	748.45
BIOMASS	75.28	-	-	-	-	-	-	75.28
SOLAR	1,747.71	2,265.94	1,038.66	-	-	-	-	5,052.32
WIND	160.00	273.60	799.98	-	-	-	-	1,233.58
TOTAL	4,269.05	2,964.84	2,323.65	372.00	1,800.00	500.00	3,660.23	15,889.77
ENERGY STORAGE SYSTEM (ESS)	614.00	30.00	-	-	-	-	1,340.00	1,984.00
BATTERY ESS	614.00	30.00	-	-	-	-	1,340.00	1,984.00

Figures may vary slightly due to rounding off of decimal numbers

Source: DOE's Posting of the List of Private Sector Initiated Power Projects, as of 31 December 2023

Retrieved through: <https://www.doe.gov.ph/private-sector-initiated-power-projects>

INDICATIVE POWER PROJECTS

Meanwhile, the indicative projects are projected to provide 69,455 MW and 1,950 MW BESS additional capacity for the country from 2024 to 2037, including those with no definite target commercial operation dates. About 2.4% (1,689 MW) will come from the coal power projects while natural gas projects are expected to contribute 12.5% (8,648 MW) and oil-based projects at 0.1% (60 MW) of the total share.

In pursuit of cleaner fuel in the energy mix, the RE projects will have the highest contribution at 85% (59,058MW) of the total installed capacity by 2037, as depicted in Table 31. Among the RE technologies, wind technology is expected to dominate the indicative projects with 61.3% (42,547MW), followed by solar at 12.5% (8,706MW), hydroelectric at 10.5% (7,316MW), geothermal at 0.6% (413MW) and biomass at 0.1% (76MW).

Table 31. Annual Summary of Indicative Power Projects in the Philippines

Annual Summary of Target Commercial Operation (MW)													
Plant Type	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	TBD	TOTAL
COAL	-	-	-	-	639.00	-	-	-	-	-	-	1,050.00	1,689.00
OIL-BASED	-	60.00	-	-	-	-	-	-	-	-	-	-	60.00
NATURAL GAS	-	-	-	1,650.00	-	2,810.00	1,800.00	1,128.00	-	-	-	1,260.00	8,648.00
RENEWABLE ENERGY	14.40	3,733.02	3,433.48	4,293.94	8,506.17	4,667.60	9,619.00	15,817.50	5,103.00	2,025.50	1,794.76	50.00	59,058.38
GEOTHERMAL	-	-	68.00	-	105.00	70.00	-	-	-	120.00	-	50.00	413.00
HYDROPOWER	-	-	-	123.50	2,823.86	310.00	1,164.00	2,850.00	30.00	-	14.76	-	7,316.12
BIOMASS	14.40	12.00	-	50.00	-	-	-	-	-	-	-	-	76.40
SOLAR	-	3,047.67	2,881.98	2,272.44	400.96	103.00	-	-	-	-	-	-	8,706.06
WIND	-	673.35	483.50	1,848.00	5,176.35	4,184.60	8,455.00	12,967.50	5,073.00	1,905.50	1,780.00	-	42,546.80
TOTAL	14.40	3,793.02	3,433.48	5,943.94	9,145.17	7,477.60	11,419.00	16,945.50	5,103.00	2,025.50	1,794.76	2,360.00	69,455.38
ENERGY STORAGE SYSTEM (ESS)	-	600.00	516.00	404.00	147.50	-	-	-	-	-	-	282.00	1,949.50
BATTERY ESS	-	600.00	516.00	404.00	147.50	-	-	-	-	-	-	282.00	1,949.50

Indicative Projects refers to projects that are in the pre-development stage, secured its Clearance to Undertake a System Impact Study with the NGCP and are consistently submitting their Monthly Accomplishment Report to the DOE

TBD - To Be Determined

Figures may vary slightly due to rounding off of decimal numbers

Source: DOE-Electric Power Industry Management Bureau, as of 31 December 2023

PRIORITY AREAS

Transmission is vital for the electricity system, connecting power generation to distribution, much like a main highway transporting high-voltage electricity. However, in recent years, the country's electricity grid faced perennial challenges that affected the efficiency and overall performance of the transmission system such as various right-of-way (ROW) acquisitions, prolonged delays in conducting System Impact Study (SIS), which considerably deferred the implementation and completion of critical transmission projects.

To address these challenges, the government is implementing policy reforms to improve transmission system planning, strengthening, and regulatory support.

Supporting government initiatives, the NGCP, as the Transmission Network Provider (TNP) and System Operator (SO) of the nation's main electrical grid, is tasked with annually updating the Transmission Development Plan (TDP) in accordance with Rule 6, Section 10 of the Implementing Rules and Regulations (IRR) of RA 9136, or the EPIRA of 2001.

On December 29, 2022, the Department of Energy (DOE) approved and adopted the NGCP's TDP 2022- 2040. This plan serves as the primary guide for transmission development, addressing the growing electricity demands to support new power generation facilities. The TDP is aimed at achieving the Clean Energy Scenario (CES) outlined in the Philippine Energy Plan (PEP) 2020-2040. It aligns with the broader objectives of the power sector's transmission roadmap.

Instituting due diligence on power grid operations through performance assessment and audit

The DOE issued Department Order No. DO2023-06-0018, titled "Creation of the Performance Assessment and Audit Team for the Operations of the Transmission Network Provider and System Operator (PAAT-TNPSO) and Defining its Responsibilities," on 08 June 2023. This order aims to evaluate the overall performance and compliance of the NGCP with its obligations under the Philippine Grid Code.

Additionally, this initiative will facilitate the assessment of the NGCP's performance according to its obligations under the concession agreement. By conducting performance assessments and audits (PAA) transparently and

promptly, this initiative will provide a basis for improving operations and ensuring compliance with the TDP. Furthermore, this effort will align with industry best practices and support the Energy Regulatory Commission (ERC) in enforcing an incentive and penalty system to hold the NGCP accountable for ensuring grid security and reliability.

Advocating higher policy support through a proposed Executive Order (EO governing the Philippine Transmission Sector)

Alongside efforts to integrate power grids and connect off-grid areas, DOE is pursuing another initiative to address current challenges. This initiative involves proposing two executive orders (EOs) aimed at ensuring the timely implementation of transmission projects and promoting efficient operation of the transmission system.

The first EO will focus on establishing transparency of NGCP in the implementation of projects of the generation companies. It will also encourage the interconnection of power plants with distribution systems in cases where transmission facilities are lacking or insufficient.

The second EO aims to expedite critical and priority transmission projects by facilitating their implementation through TransCo or other designated agencies. This measure will streamline coordination and cooperation among stakeholders, ultimately ensuring a secure, reliable, and efficient transmission system throughout the country.

Smart and Green Grid Plan (SGGP)

The Philippines is poised to significantly transform its energy landscape with ambitious Renewable Energy (RE) targets set for 2024 to 2040. To facilitate the integration and efficient management of the anticipated surge in RE capacity, the Smart and Green Grid Plan (SGGP) was conceived. This plan is strategically designed to establish a robust policy framework and mechanisms for the timely implementation of transmission projects and efficient transmission system operation.

The SGGP aims to achieve the following objectives:

- Establish a policy and mechanism to address the timely implementation of transmission projects and efficient operation of the transmission system.
- Create a framework to determine the level of completion of Transmission Development Plan projects and the overall performance of electric power industry stakeholders toward a holistic and comprehensive development of the country's power system.

Investors are encouraged to explore opportunities in smart grid technologies, transmission infrastructure, and advanced monitoring solutions to actively contribute to the realization of the SGGP objectives.

Overall, the Average Annual Compounded Growth Rate (AACGR) is at 3.91% from 2006 to 2020.

Luzon Grid demonstrated resilience and adaptability from 2006 to 2020 with its AACGR at 3.66%. The year 2020 presented unique challenges as Luzon's System Peak Demand (SPD) declined 2.12% (241 MW). This can be attributed to the implementation of community quarantine measures from March 2020, which affected load centers such as Metro Manila, Central Luzon, and CALABARZON. It led to limited operations of establishments and temporary closure of significant commercial, manufacturing, and industrial entities. It also occurred during summer which traditionally had peak electricity demand over the past decade.

Meanwhile, the aggregate demand in Visayas Grid posted an AACGR of 5.64% for 2006-2020. Similarly, a decrease of 1.03% (23 MW) was recorded during the onset of COVID-19 pandemic. Load centers in Cebu, Iloilo, and Bacolod City faced longer periods of ECQ compared to other areas. This prolonged ban impacted demand from large distribution companies within the region from April to December 2020, compared to the levels recorded in the same period in 2019.

Mindanao had an impressive AACGR of 6.06%, but faced similar demand challenges in 2020 with a 1.76% (35 MW) decrease in SPD. Davao, the largest load center in Mindanao, underwent ECQ and GCQ in the end of 2020. As a result, distribution utilities in Mindanao had a decreased demand from April to December 2020 compared to the same period in 2019.

Recommended Power Plant Connection Points

As a guide for prospective energy investors, small areas are identified to connect new power plants not needing significant connectivity reinforcement. However, these recommended connectivity points should be viewed from a transmission system perspective and based on existing communication capabilities. Other factors for non-site-specific plants were not considered such as fuel availability, site topography and geology, resource accessibility, land availability, water supply for cooling and other purposes, security considerations, and environmental and social impacts.

However, in some areas where generation is possible, existing transmission centers may lack the capacity to accommodate large-scale generation additions. In such cases, the development of new transmission infrastructure becomes imperative to facilitate the integration of new, high-capacity power plants.

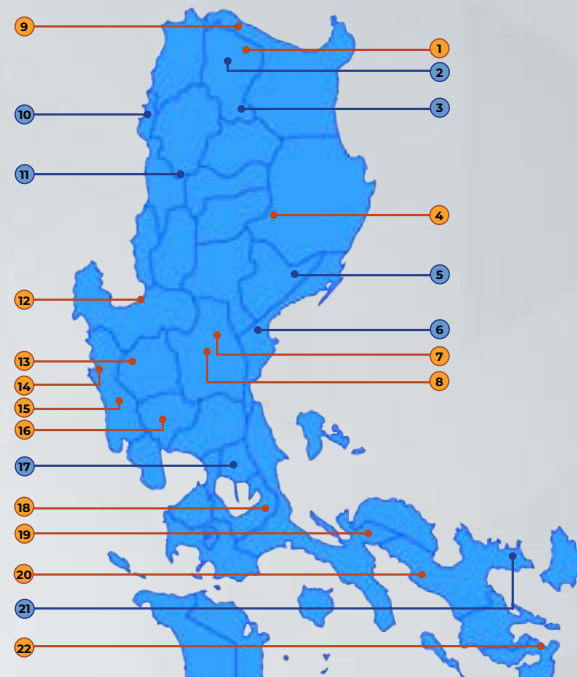
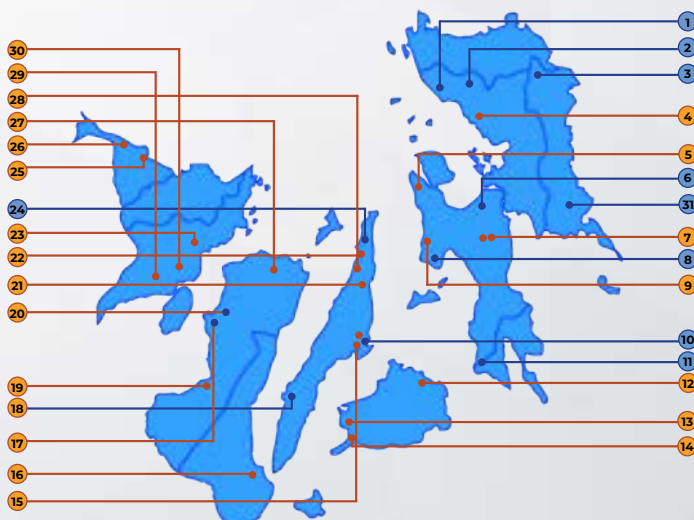


Figure 28. Recommended Power Plant Connection Points (Luzon)

1. Pudtol 230 kV (100 MW)	6. Baler 230 kV (200 MW)	11. Sagada 230 kV (300 MW)	16. Porac 230 kV (200 MW)	20. Iriga 230 kV (100 MW)
2. Kabugao 230 kV (500 MW)	7. Cabanatuan 230 kV (100 MW)	12. Kadampat 230 kV (300 MW)	17. Baras 500 kV (1,000 MW)	21. Prentacion 230 kV (300 MW)
3. Kalinga 230kV (500 MW)	8. San Antonio 230 kV (600 MW)	13. Capas 230 kV (100 MW)	18. Lumban 230 kV (300 MW)	22. Abuyog 230 kV (100 MW)
4. Santiago 230 kV (300 MW)	9. Sanchez Mira 230 kV (100 MW)	14. Palauig 230 kV (1,200 MW)	19. Tagkawayan 230 kV (1,200 MW)	
5. Dinadiawan 230 kV (200 MW)	10. San Esteban 230 kV (300 MW)	15. Castillejos 230 kV (600 MW)		
				● 2020-2030
				● 2031-2040

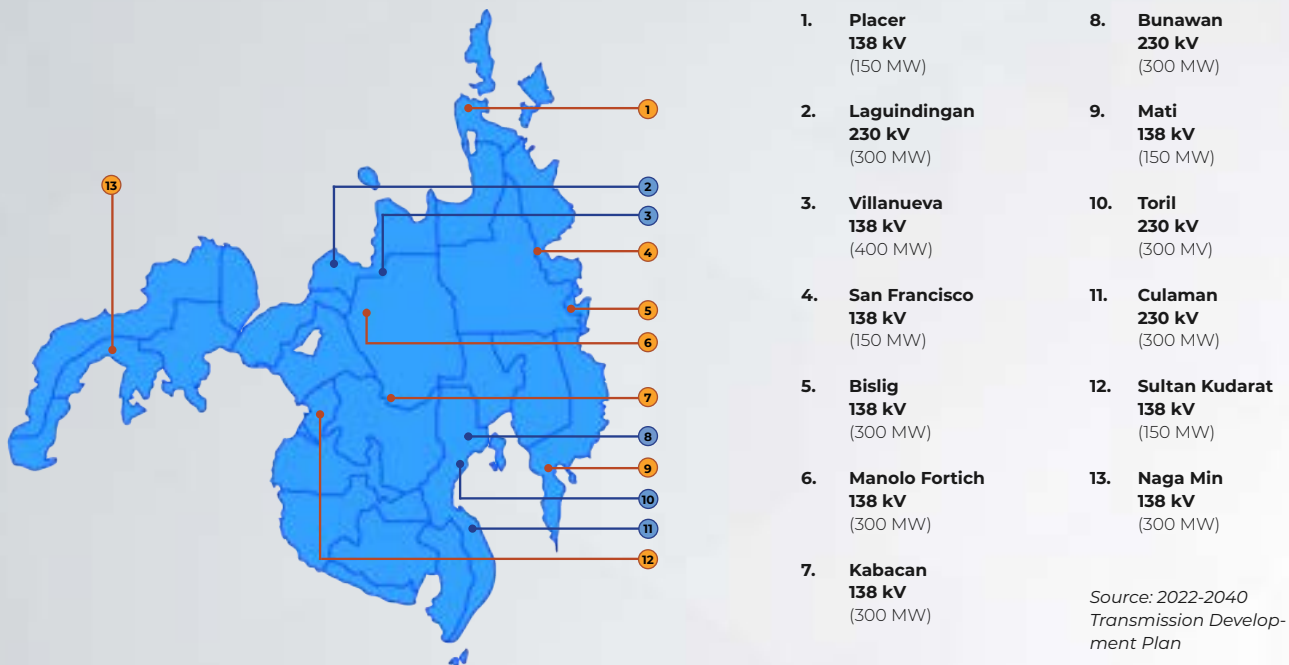
Figure 29. Recommended Power Plant Connection Points (Visayas)



1. Calbayog 138 kV (300 MW)	Palo 230 kV (300 MW)	15. Pusok 230 kV (600 MW)
2. San Isidro 138 kV (100 MW)	8. Isabel 138 kV (200 MW)	16. Dumaguete 230 kV (200 MW)
3. Catarman 138 kV (200 MW)	9. Ormoc 138 kV (100 MW)	17. Bacolod 230 kV (600 MW)
4. Paranas 138 kV (200 MW)	10. Cordova 230 kV (300 MW)	18. Dumanjug 230 kV (300 MW) *orange
5. Tabango 230 kV (300 MW)	11. Maasin 138 kV (100 MW)	Dumanjug 138 kV (300 MW)
6. Babatngon 230 kV (300 MW)	12. Ubay (100 MW)	19. Kabankalan 138 kV (100 MW)
7. Palo 138 kV (100 MW)	13. Corella (100 MW)	20. Granada 230 kV (900 MW)
	14. Bool 138 kV (300 MW)	

21. Compostela 230 kV (300 MW)	Laray 138kV (100 MW)	24. Daanbantyan 230 kV (300 MW)	27. Cadiz 230 kV (300 MW)	30. Jaro 230 kV (600 MW)
Compostela 138 kV (100 MW)	22. Magdugo 230 kV (300 MW)	25. Unidos 230 kV (600 MW)	28. Nivel Hills 230 kV (600 MW)	31. Borongan 138kV (100 MW)
Laray 138 kV (300 MW)	23. Iloilo 138 kV (300 MW)	26. Kalibo 138 kV (300 MW)	29. Tigbauan 138 kV (100 MW)	● 2020-2030 ● 2031-2040

Figure 30. Recommended Power Plant Connection Points (Mindanao)



Battery Energy Storage System

In August 2019, the Department of Energy (DOE) issued Department Circular No. DC2019-08-0012, titled, "Providing a Framework for Energy Storage System in the Electric Power Industry." This circular established a policy on the operation, connection, and application of Energy Storage Systems (ESS), with a keen focus on their role in enhancing the reliability and efficiency of the electric power industry.

Battery Energy Storage System (BESS) takes center stage as a pioneering technology in the country with versatile applications in the transmission system. BESS not only provides ancillary services, but also facilitates transmission facility upgrades deferment and alleviates transmission congestion.

As Variable Renewable Energy (VRE) sources become integral to the transmission system, ESS emerges as a crucial technology for managing the intermittent operation of VRE-generating plants, ensuring system stability. In line with the proposed Smart Grid Roadmap, ESS stands out as a key element in the journey towards comprehensive power system modernization.

Strategically connecting BESS to appropriate nodes in the system offers a unique advantage—the potential to defer the need for additional transmission facility upgrades. By supplying peak demand through BESS, it becomes a powerful tool in mitigating or eliminating transmission congestion, ensuring thermal and voltage stability even during periods of heightened power demand.

In conclusion, the integration of Battery Energy Storage System (BESS) marks a paradigm shift in power system dynamics. BESS emerges as a cornerstone technology in the pursuit of a resilient, modernized power system. Thus, the power of BESS must be embraced to unlock a future where stability, sustainability, and efficiency coexist harmoniously in the energy landscape.

NGCP's recommended BESS capacities and sites

Embarking on a path toward a more resilient and efficient power system, the recommended BESS capacities and sites have been determined through a comprehensive methodology. Rooted in load flow analyses, the focus was on establishing the maximum capacity each site can seamlessly accommodate during the charging and discharging states of BESS, while maintaining a unity power factor.

The system simulations considered various scenarios, with a spotlight on the base case peak demand and worst-generation dispatch. These simulations were instrumental in gauging the total power flowing to connection points and testing the available capacity of NGCP substations/facilities.

Table 32. NGCP's Recommended BESS Capacities & Sites

Substations	Voltage Level	Recommended BESS Capacity (MW)
Luzon Grid		
Masinloc	69kV	20
Daraga	69kV	40
Laoag	69kV	40
San Rafael	69kV	20
Labo	69kV	20
Mexico	69kV	20
San Manuel	69kV	20
Bay	69kV	20
Labrador	69kV	20
Lamao	230kV	30
Lumban	69kV	40
Total Capacity		290

Source: 2022-2040 Transmission development Plan

Substations	Voltage Level	Recommended BESS Capacity (MW)
Visayas Grid		
Kabankalan	138kV	10
Ormoc	69kV	20
Samabaon	69kV	10
Sta. Barbara	138kV	10
Compostela	230kV	20
Total Capacity		70

Substations	Voltage Level	Recommended BESS Capacity (MW)
Mindanao Grid		
Villanueva	138kV	10
Davao	69kV	20
Maco	69kV	20
Kibawe	69kV	20
Butuan	69kV	20
Total Capacity		90

ENERGY INVESTMENT REQUIREMENTS

Table 33. Total Investment Requirements for Power Generation Projects

Technology	Capacity Addition, in MW						Investment Cost (Php Billion @2022 Prices)					
	2023-2028			2029-2050			2023-2028			2029-2050		
	REF	CES 1	CES 2	REF	CES 1	CES 2	REF	CES 1	CES 2	REF	CES 1	CES 2
Coal	2,305	2,305	2,305	-	-	-	350.55	334.38	334.38	-	-	-
Natural Gas	2,413	2,413	2,413	19,468	13,576	16,444	253.42	253.42	253.42	1,447.04	977.32	1,201.88
Oil-based	20	20	20	-	-	-	2.18	2.18	2.18	-	-	-
Other Technologies	-	-	-	-	4,800	4,800	-	-	-	-	1,738.60	1,738.60
Renewables	13,791	13,458	14,919	84,712	93,110	92,033	928.13	1,197.25	1,291.68	5,526.23	6,392.23	9,441.83
<i>Biomass</i>	42	122	122	50	16	16	5.27	20.37	20.37	2.33	4.88	4.88
<i>Geothermal</i>	425	425	425	930	580	580	143.62	143.62	143.62	271.85	172.56	169.08
<i>Solar</i>	9,328	6,231	6,231	45,620	46,934	27,890	500.80	340.59	340.59	1,790.70	1,834.40	1,101.05
<i>Hydro-power</i>	295	770	770	9,970	6,030	5,410	41.82	111.05	111.05	1,473.08	849.67	759.85
<i>Onshore Wind</i>	3,700	3,910	5,371	21,342	22,050	10,037	236.62	252.26	346.69	1,023.49	1,047.54	482.91
<i>Offshore Wind</i>	-	2,000	2,000	6,800	17,500	48,100	-	329.37	329.37	964.78	2,483.18	6,924.06
BESS*	2,080	2,080	2,080	1,544	19,779	22,426	63.60	63.60	63.60	56.35	744.05	899.88
Total	18,528	18,195	19,656	104,180	111,486	113,277	1,597.87	1,850.82	1,945.26	7,029.62	9,852.20	13,282.18

*For accounting purposes, BESS are not included in the total capacity additions.
Source: PEP 2023-2050

Investment and Employment Opportunities

The energy sector transition outlined in the CES aims for a strong power system driven by clean, low-carbon technologies. Achieving this goal requires significant investments in the electric power industry to expand and make the power supply more eco-friendly.

Increasing power generation capacity to ensure a stable and sustainable supply requires adding more capacity, as shown in the outlook scenarios. During the Marcos, Jr. Administration, it expects to add 18.5 GW, 18.2 GW and 19.7 GW in REF, CES 1, and CES 2, respectively. These projects will require investments of PhP 1.6 trillion for REF, PhP 1.9 trillion for CES 1, and PhP 2.0 trillion for CES 2.

Looking ahead to 2050, REF aims to add a total capacity of 104.2 GW, needing PhP 7.0 trillion in private investments. Meanwhile, CES 1 and CES 2, focusing on renewables, aim for capacity additions of 111.5 GW and 113.3 GW, respectively. These ambitious targets, especially driven by offshore wind potential, require investments of PhP 9.9 trillion for CES 1 and PhP 13.3 trillion for CES 2. Compared to REF, investments in CES 1 and CES 2 are significantly higher, mainly due to their focus on renewable energy technologies.

DOWNSTREAM OIL AND NATURAL GAS

DOWNSTREAM OIL INDUSTRY

As the Philippines remains oil import dependent, it is the Department of Energy's (DOE) mandate to secure the supply of sufficient oil and petroleum products, ensure the product's quality in accordance with the Philippine National Standards (PNS), and oversee a fair and competitive market for oil industry players.

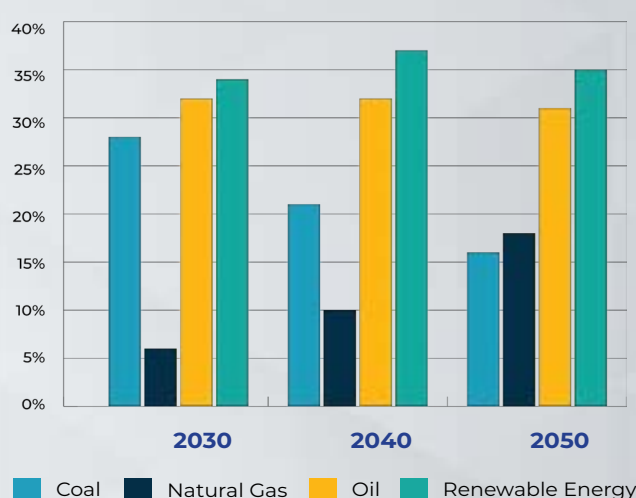
The passage of Republic Act (R.A.) 8479, known as the "Downstream Oil Industry Deregulation Act of 1998", liberated and deregulated the country's downstream oil industry to ensure a truly competitive market and an adequate and continuous supply of clean and high-quality petroleum products. To attain these goals, the government continues to encourage the entry of new investors in the downstream oil industry.

Projections from the Philippine Energy Plan 2023-2050 Energy Outlook under the Reference (REF) Scenario are showing that oil remains the country's main energy source as it continues to sustain a robust demand from various end-use sectors, particularly transportation.

Oil and renewable energy are projected to contribute above 30% in the energy mix during the three milestone years. Specifically, it is projected that oil will contribute 32% by 2030 and 2040, and 31% by 2050. Renewable energy is expected to have a significant contribution of 34% by 2030, 37% by 2040, and 35% by 2050.

Coal is seen to have a declining fuel share from 2030 to 2050. The projection is that it will have a share of 28% by 2030, gradually declining to 21% by 2040, and down to 16% by 2050. Meanwhile, natural gas is projected to have an opposite trend, with an upward contribution from 6% by 2030, 10% by 2040, and up to 18% by 2050.

Figure 31. PEP 2023-2050 Energy Outlook under the Reference Scenario (REF)



Retail Marketing Business

The number of operating liquid fuel retail outlets (LFROs) or gasoline stations increased by 10.4% from 10,802 in 2021 to 11,923 in 2022. The constant growth in retail facilities can be attributed to the government's modernization policy including the services as prescribed under Department Circular (DC) No. 2017-11-0011 or the "Revised Retail Rules."

Among the country's major islands, Luzon remains with the greatest share in the number of LFROs in 2022 with 53% (6,282 LFROs). Mindanao continued to set the second highest share in LFROs with 24% (2,861), while Visayas followed closely with 23% (2,780).

As of December 2022, the country has a total of 12,014 LPG establishments. Luzon remains to have the greatest number of liquefied petroleum gas (LPG) establishments in 2022. The total LPG establishments increased from 9,722 in 2021 to 12,014 LPG establishments in 2022 posting a 23.58% increase.

Table 34. Number of LFROs

Region	2021	2022	% Increase
Luzon	5,802	6,282	8.027%
NCR	1,032	1,056	2.33%
Visayas	2,423	2,780	14.73%
Mindanao	2,577	2,861	11.02%
Total	10,802	11,923	10.38%

Table 35. Number of LPG Establishments

Region	2021	2022	% Increase
Luzon	4,583	6,864	49.77%
NCR	1,237	1,910	54.41%
Visayas	2,746	2,751	0.18%
Mindanao	2,393	2,399	0.25%
Total	9,722	12,014	23.58%

Republic Act 11592, also called the “LPG Industry Regulation Act”, together with its implementing guidelines DOE Department Circular No. 2022-11-0037 titled, “Guidelines on the Registration and Issuance of License to Operate to Qualified DOE-Regulated LPG Industry Participants and Penalizing Certain Prohibited Acts”, requires LPG Industry participants to register and acquire a License to Operate (LTO) prior to commercial operation.

The LTO replaced the Standards Compliance Certificate (SCC), while the Certificate of Registration (COR) shall be issued prior to construction of LPG facilities, registration of trademark or trade name, and other activities requiring registration as:

- LPG Refiner
- Importer
- Bulk Distributor
- Terminal or Depot Owner/Operator
- Independent Hauler for Bulk LPG
- Trademark Owner or Marketer and their respective establishments or facilities
- Refiller
- Dealer
- Retailer
- Independent Hauler of LPG in cylinder and/or cartridge
- Auto-LPG dispensing station owner/operator
- Centralized LPG piping system owner/operator
- Bulk Consumer

Storage Facility

Supply security entails having adequate storage facilities that will maintain the supply inventory needed for various economic activities.

The aggregated oil facilities in 2022 (e.g., depots, import terminals and refinery) provides a total storage capacity of 41,634 thousand barrels (MB). The sole remaining refinery, Petron’s Bataan Refinery, has a storage capacity of 9,609 MB, which includes crude, intermediate stocks, and finished petroleum products. The 92 oil depots are distribution facilities comprise the nation’s existing downstream oil storage facilities. The aggregated storage capacity of depots, import terminals, and refinery in 2022 is 41,634 thousand barrels (MB). The sole remaining refinery, Petron’s Bataan Refinery, has a storage capacity of 9,609 MB, whose production output includes gasoline, diesel oil, kerosene, AV Turbo, fuel oil, and other products. The 92 oil depots are distribution facilities that comprise the nation’s existing downstream oil storage facilities.

Figure 32. Liquid Petroleum Depot (Phoenix Petroleum’s Depot in Calaca, Batangas)



Table 36. Existing Downstream Oil Facilities

Facility Type	No. of Facilities	Capacities, MB	Percent Share
Depots	92	5,422	13.02
Major	34	2,928	7.03
Others	56	2,177	5.23
End-User	2	317	0.76
Import Terminals	58	26,602	63.90
Major	9	8,986	21.58
Others	48	15,723	37.77
End-User	1	1,893	4.55
Refinery	1	9,609	23.08
Petron - Limay, Bataan	1	9,609	23.08
Grand Total	151	41,634	100.00

Source: DOE-Oil Industry Management Bureau, as of December 2022

The storage capacity and sales in Visayas is led by Region VII (Central Visayas) which can be correlated to the various economic development-related activities present in the provinces of Cebu, Bohol, and Negros Oriental.

On 22 March 2024, Seoil opened its 13th Bulk Terminal in Zamboanga del Sur with maximum storage capacity of 30.5 million liters of fuel. It is strategically located along with three other terminals in Mindanao at Santa Cruz, Davao del Sur, General Santos, South Cotabato, and Irasan, Zamboanga.

Table 37. Depot/Storage Facility and Sales per Region

Region	Storage Capacity, MB	Storage Capacity Share (%)	Sales, MB	Share by Region (%)
I. Refinery				
Region III	9,610.14	23.17		
Total	9,610.14			
II. Bulk Plants				
NCR	584.10	1.41	36,824.72	23.85
Region I	1,070.41	2.58	5,566.59	3.60
Region II	-	-	3,955.62	2.56
Region III	7,638.77	18.41	26,430.49	17.12
Region IV-A	12,923.25	31.15	28,850.87	18.68
Region IV-B	262.70	0.63	2,152.88	1.40
Region V	297.43	0.72	4,603.91	2.98
CAR	0.25	0.00	1,128.59	0.73
Total Luzon	22,776.91		109,513.67	
Region VI	1,132.0	2.73	7,090.37	4.60
Region VII	1,709.77	4.12	9,678.62	6.27
Region VIII	519.38	1.25	3,063.64	1.98
Total Visayas	3,361.15		19,832.63	
Region IX	641.21	1.55	4,265.33	2.76
Region X	2,746.41	6.62	7,593.77	4.92
Region XI	1,804.65	4.35	7,011.44	4.54
Region XII	393.99	0.95	3,538.11	2.29
CARAGA	127.09	0.31	1,998.28	1.29
ARMM	22.41	0.05	669.01	0.43
Total Mindanao	5,735.76		25,075.94	
Total Bulk Plants	31,873.82			
Grand Total	41,483.96	100	154,422.24	100

Source: DOE-Oil Industry Management Bureau, as of December 2022

Base Oils and Lubricating Products

The lubricating product industry in the Philippines is a very competitive business that has continuously grown. DOE provided Department Circular 2021-09-0029 titled, "Guidelines on Notices and Reportorial Requirements Pursuant to the Downstream Oil Industry Deregulation Act" which applies to players currently limited to three categories:

- **Marketers** - entities that import lubricating oils and greases and sell finished products locally. They are direct importers and distributors of finished lubricating products.
- **Blenders** - mostly oil companies that import base oil and blend it with additives to produce lubricating oils and greases locally.
- **Own Users** - entities such as private industrial/manufacturing plants that import lubricating oils and greases for their own use/consumption.

Unfortunately, business in lubricating products still depend on importation of either raw materials or finished products. Base oils, especially the major types were previously produced locally but for decades, all types of base oils are imported. Few blenders exist but independent marketers and own users comprise majority of the industry players operating in different parts of the Philippines.

Oil Refining

In recent years, the refining subsector saw a decline in the number of industry participants. Prior to the promulgation of the Oil Deregulation Law, the country had three refineries owned by Petron, Shell, and Caltex. To date, only Petron's refinery stands as both Caltex and Shell converted and transformed their refineries into import terminals. On the other hand, Pilipinas Shell, a subsidiary of Royal Dutch Shell, permanently shut down its Tabangao Refinery in Batangas City, Philippines, and converted it to a full import terminal. The company said that the decision will help to streamline its asset portfolio and boost its cost and supply chain competitiveness.

Figure 33. Petron Refinery in Limay, Bataan



Aggregate refinery production output from Petron's Bataan Refinery increased by 52.0% equivalent to 5.6 MTOE (43.8 million barrels (MMB)) in 2022 compared to 2021 which was at 3.7 MTOE (28.8 MMB). The significant uptrend is associated with high demand for Petron's finished petroleum products due to the resumption of economic activities and improved mobility after stringent travel restrictions were eased.

The country's lone refinery located in Limay, Bataan is supplying around 40% of total fuel requirements with its 180,000 barrel-per-day (bpd) capacity. The refinery was able to avoid maintenance downtime in 2022 due to enhancements and optimizations implemented by Petron. It took advantage of favorable refining cracks and boosted its over-all net income for the same period.

PETROLEUM PRODUCTS AND FACILITIES STANDARDS

Standards Development. Anchored on the Philippine Clean Air Act of 1999, the Biofuels Act of 2006, and the Downstream Oil Industry Deregulation Act of 1998, the Philippine National Standards (PNS) for petroleum products and facilities guarantees consumer welfare and protection by ensuring that public transport sector, and manufacturers are provided access to products and facilities with the highest quality and safety.

Supervision and Monitoring. DOE is carefully monitoring the compliance of all downstream oil participants through sampling of liquid petroleum products (LPP) in terminals/depots and LFROs and various inspections nationwide. Onsite inspection activities are consistently performed to confirm compliance of industry participants with the PNS.

In 2022, DOE together with Department of Trade and Industry (DTI) issued Joint Department Circular (JDC) 2022-11-0002 on the LPG Cylinder Exchange, Swapping, and Improvement Programs. The circular aims to ensure that only safe cylinders are circulated among the consuming public to prevent the occurrence of LPG-related accidents.

Communication Initiatives. The DOE consistently conducts information, education, and communication (IEC) activities which cover topics concerning the safe handling of petroleum products, the role of Local Government Units, and investment opportunities for prospective DOI Players and other government agencies.

Figure 34. On site screening of petroleum samples using DOE's portable testing equipment



Policy Advocacy. The DOE crafted several circulars to support the passage of RA 11592 or the “LPG Industry Regulation Act of 2021” and regulate the domestic LPG industry and ensure consumer protection against malpractices. From 2021 to 2023, DOE promulgated the following policies:

- **DC 2022-11-003728** – Guidelines on the Registration and Issuance of License to Operate to Qualified DOE-Regulated LPG Industry Participants and Penalizing Certain Prohibited Act
- **DC 2022-11-003329** – Rules of Procedure for Administrative Cases in the Downstream Oil Industry
- Implementing Rules and Regulations (IRR) of Republic Act No. 11592.
- **JDC 2022-11-000231** – LPG Cylinder Exchange, Swapping, and Improvement Programs.
- **DC 2021-10-003532** – Revised Circular for Impounding & Disposal of Philippine Downstream Oil Industry Confiscated Items.
- **DC 2023-08-002533** – Guidelines on the Recognition of Training Organizations for Qualified Service Persons Of DOE-Regulated Liquefied Petroleum Gas (LPG) Industry Participants.

Information Exchange and Data Reconciliation Initiatives. Memorandum of Agreement (MOA) was executed and signed between the DOE, the Bureau of Customs (BOC), and the Bureau of Internal Revenue (BIR) on 27 May 2021 to enhance information exchange among the three agencies regarding importation of petroleum products. Inspection activities will be conducted by the DOE and BOC for LFROs as part of the coordinated efforts to eradicate petroleum products smuggling and encourage proper tax payments.

LEGISLATIVE AGENDA, PROJECTS, AND PROGRAMS

Voluntary 20% ethanol blend for gasoline products. This is a price mitigation measure because ethanol is cheaper than the price of gasoline. Additionally, DOE plans to increase the CME blend in diesel from 2% blend to 3% in 2024, 4% in 2025, and B5 in 2026 to promote cleaner air and increase the benefits provided to coconut farmers.

Fuel Subsidy Project. To mitigate the adverse effects of increasing oil prices to vulnerable sectors, particularly public transport and agriculture, the government allotted PhP 4 billion for fuel subsidies. About PhP 3 billion will be allotted for the public transport sector (Pantawid Pasada), while the remaining PhP 1 billion will be for farmers and fisherfolks (as fuel discount). The guidelines for implementation of the fuel subsidy program will be based on the conditions set by the Department of Budget and Management (DBM), Department of Transportation (DOTr), and Department of Agriculture (DA).

Gasoline Station Lending and Financial Assistance Program (GSLFAP). This is in line with the deregulated market environment that aims to encourage the entry of new industry participants. It provides credit assistance to prospective participants whose owners have completed a two-fold program on management and skills training in the retailing of petroleum products including LPG. The DOE also plans to issue updated guidelines on the Gasoline Station Training and Loan Fund (GSTLF) to further enhance GSLFAP.

LPG Cylinder Improvement Program (LCIP). The LCIP aims to establish the regulatory framework for the safe operations of the entire LPG industry, including all LPG facilities, and the residential, commercial, industrial and automotive use of LPG. It is a system that aims to ensure the quality of all cylinders in circulation to protect the end-consumers. DOE, together with partner agencies and LGUs conducted a series of IEC campaigns nationwide that covered oil supply-demand outlook, downstream oil industry rules and regulations, and Safe LPG Project, among others with focus on the safe handling and use of LPG and liquid fuels.

ENERGY CONSUMPTION FOR OIL AND PETROLEUM PRODUCTS

Transport

The relaxation of strict mobility restrictions played a significant role in a 12.2% increase in energy consumption in the transport sector in 2022. Despite this, the transport sector continues to be the most oil intensive sector. Energy consumption for road transport specifically saw an 11% growth in 2022, reaching 9.9 MTOE from the previous year. It maintained its dominant position, accounting for 89.5% of the total transport demand.

Domestic maritime traffic saw further improvement as tourism, trade, and regular travel activities resumed. As a result, the energy demand for in-land water transport increased to 940.0 kTOE, marking an 11.7% growth compared to its 2021 level of 841.9 kTOE.

The exceptional performance of domestic aviation resulted in a remarkable 76.6% increase in the utilization of aviation fuels (aviation gasoline and jet fuel) compared to the 194.1 kTOE level in 2021. This growth can be attributed to the rising demand for air and maritime travel. Additionally, major airlines reintroduced fare promotions, which not only supported the recovery of the domestic tourism industry but also contributed to a four-fold increase in air passenger movement, as reported by the Civil Aeronautics Board (CAB).

The extensive rehabilitation of the Metro Rail Transit (MRT) 3 in 2022 had a significant impact on its operation, allowing the rail lines to operate at full capacity. As a result, there was a notable 10% increase in aggregate energy consumption, reaching 11.2 kTOE in 2022 compared to 10.1 kTOE in 2021.

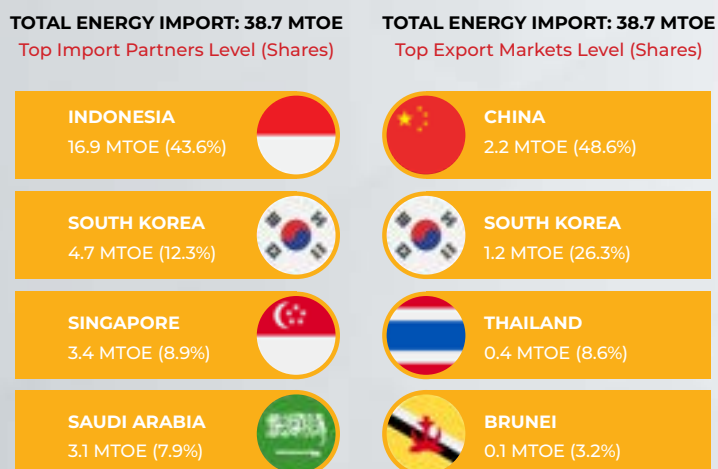
With the exception of LPG, the consumption levels of all transport fuels experienced an increase which can be attributed to the diminishing relevance of LPG as a fuel for taxis.

Gasoline and diesel, which together account for 90.3% of the total transport demand, experienced an increase in consumption. This can be attributed to the rise in road traffic in the country. In line with the mandated blending schedule, bioethanol and biodiesel also saw increments of 10.2% and 16.1% respectively in 2022. The growing presence of electric vehicles (EVs), along with the improved performance of the MRT and LRT systems, contributed to a 9.3% growth in electricity consumption within the transport sector.

Total Final Energy Consumption (TFEC) for Oil

For the year 2022, the consumption of oil products saw a significant increase of 17.1%, reaching 1.8 MTOE. This accounted for a 25.7% aggregate share in the industry's total final energy consumption (TFEC). The consumption of diesel experienced a substantial escalation of 35.1%, primarily driven by its increased use in assembly lines for machinery and equipment in mining and construction sectors. LPG consumption also saw a slight increase of 1.4%. Biomass consumption remained steady at 924 kTOE, while biodiesel consumption witnessed a significant growth of 53.7%, reaching 23.7 kTOE in 2022, in accordance with the mandated blending schedule.

Figure 35. Top 4 Countries as Import Source and Export Destinations for 2022



Total Primary Energy Supply (TPES) for Oil

In 2022, there was a rapid increase in net imported energy, resulting in a decrease in energy self-sufficiency by 1.3 percentage points to 49.4% from 50.8% in 2021. Oil reclaimed its position as the primary energy source for the country, accounting for 32.2% of the Total Primary Energy Supply (TPES) in 2022. Its level increased by 12.3% to 19.8 MTOE, primarily driven by the surge in net oil imports due to limited domestic production.

The import market for the Philippines remained steady with South Korea, Singapore, and China

continuing to be the top sources of finished oil products. On the other hand, the Middle East supplied all of the country's needs for imported crude oil.

On the other hand, China, Brunei, and Thailand were the top export markets, each accounting for nearly a quarter share. Specifically, China held a 22.7% share, Brunei had a 22.3% share, and Thailand had a 22.2% share.

INVESTMENT OPPORTUNITIES

The anticipated growth in oil demand during the planning horizon highlights the need for investments in additional storage capacity. Establishing these facilities requires implementing measures to attract and incentivize investments, which will contribute to ensuring the security of the oil supply.

Table 38. Additional Storage Capacity Requirement

	2050 Targets under the Reference Scenario	2050 Targets under the Clean Energy Scenario
Total Depot Capacity	27,268 MB	22,408 MB
Additional Import Terminals Needed (at 80% utilization rate, 30-day inventory)	+ 6,913 MB	Existing Capacity is Sufficient

Source: PEP 2030-2050

Depot and Import Terminals

Based on projections, it is anticipated that the country's oil demand will significantly increase in the coming years. Under the Reference Scenario (REF), the demand is expected to reach 442,649 thousand barrels (MB) by 2050, while in the Clean Energy Scenario (CES), it is projected to be 384,491 MB. These figures include the demand for jet fuel and marine bunker fuel for international passage.

Given this projected growth in oil requirements, it becomes imperative to establish additional facilities such as depots and import terminals. These infrastructure investments will play a crucial role in accommodating the surge in demand and ensuring a reliable and secure oil supply for the country's energy needs. By proactively developing these facilities, the nation can effectively meet the rising demand and maintain a robust energy infrastructure for the future.

To meet the growing demand for oil storage, it is estimated that an investment of PhP 98.6 billion (REF) and PhP 81.1 billion (CES) will be required by 2050. This investment will be allocated towards the establishment of depots, which will prIn contrast, additional oil import terminals are only necessary under the Reference Scenario (REF), as the existing total capacity is already capable of meeting the requirements of the Clean Energy Scenario (CES). Therefore, it is only in the REF that there is a need for further investment and expansion of import terminals.

Figure 36. Tank truck loading rack in a liquid petroleum depot



In contrast, additional oil import terminals are only necessary under the Reference Scenario (REF), as the existing total capacity is already capable of meeting the requirements of the Clean Energy Scenario (CES). Therefore, it is only in the REF that there is a need for further investment and expansion of import terminals.

Under the Reference Scenario (REF), the establishment of an additional oil import terminal with a capacity of 6,913 MB by 2049 will increase the total import terminal capacity to 344,281 MB. This expansion requires an estimated investment of PhP 25 billion by 2050 and will create 1,312 additional job opportunities for Filipinos. This investment will enhance the country's import capabilities, ensuring a reliable and efficient supply of oil to meet the growing demand.

Oil Storage Capacity Requirement

The Department of Energy (DOE) is actively involved in promoting and overseeing various activities within the downstream oil industry, including supply, logistics, marketing, distribution, and pricing. The additional investments in facilities planned for the future will play a crucial role in safeguarding the country against potential disruptions in oil supply during times of disaster, such as typhoons or volcanic eruptions, as well as geopolitical tensions like the Russia-Ukraine War. By ensuring a robust and resilient infrastructure, the country can mitigate the impact of such events and maintain a stable and secure oil supply.

Figure 37. Petron Depot



It is important to consider international aircraft and marine vehicles that refuel in the Philippines when calculating the need for additional depots in both the short and long term. These vehicles contribute to the overall demand for oil and should be taken into account when planning for the establishment of new depots.

The additional depots in the Philippines should consider the refueling needs of international aircraft and marine vehicles. Table 39 showcases the total oil requirement, total depot capacity requirement, cumulative investment requirement, and cumulative job generation from 2025 to 2050. Assumptions include a 30-day inventory level for petroleum products, 15 days for LPG, and an 80% capacity utilization rate for storage facilities. However, if the Maximum Import Reserve (MIR) is considered, only half of the depot capacity requirement shown in the table is necessary over the planning horizon, taking into account strategic oil reserves and emergency stockpiles.

Table 39. Depot Capacity Requirement and Investment

Year	Total Oil Requirement (MB)		Total Depot Capacity Requirement (MB)		Cumulative Investment (Million PHP)		Cumulative Jobs Generation	
	REF	CES	REF	CES	REF	CES	REF	CES
2023	219,269	217,832	-	-	-	-	-	-
2025	230,243	224,331	10,582	9,597	38,274	34,711	7,169	6,502
2028	253,527	240,001	14,030	11,708	50,748	42,347	9,505	7,932
2030	268,307	249,403	14,030	11,708	50,748	42,347	9,505	7,932
2035	307,567	277,455	17,399	13,895	62,933	50,260	11,788	9,414
2040	352,144	307,842	20,493	16,448	74,123	59,492	13,884	11,143
2045	393,886	342,982	23,786	19,370	86,037	70,063	16,115	13,123
2050	442,525	384,389	27,268	22,408	98,629	81,050	18,474	15,181

Source: PEP 2030-2050

Under the REF scenario, the annual growth rate of domestic oil demand is expected to decline gradually. From 5.1% in 2023 to 2.7% in 2050, resulting in an average annual growth rate (AAGR) of 3.2%. This decline can be attributed to the implementation of energy efficiency measures in the transport sector and the projected penetration of electric vehicles (EVs) reaching 10% in road transport. These factors contribute to a more sustainable and efficient use of oil resources in the country.

The CES does not require any additional capacity over the planning period. This is due to the lower oil demand growth rate of 2.6% AAGR, which is influenced by the significant impacts of higher energy efficiency measures in the transport sector and a higher penetration rate of electric vehicles (EVs) at 50%. These factors contribute to a reduced reliance on oil and a more sustainable energy landscape in the CES.

In contrast, additional oil import terminals are only necessary under the Reference Scenario (REF), as the existing total capacity is already capable of meeting the requirements of the Clean Energy Scenario (CES). Therefore, further investment and expansion of import terminals are only needed in the REF.

DOWNSTREAM NATURAL GAS SECTOR

The downstream natural gas industry in the Philippines is still considered a developing industry, essentially a “single-project” stage, whose birth was marked by the successful launching of the Malampaya Deep Water Gas-to-Power Project on 16 October 2001.

On 15 May 2023, the Philippine Government and representatives of the Malampaya Consortium signed for a renewal of the contract for another 15 years or until 22 February 2039 allowing the operator to drill new wells as it seeks to boost output and ensure a stable supply of clean energy. The consortium has committed to investing about \$600 million for further exploration and drilling activities beyond the existing production area within SC 38.

Currently, the demand for natural gas is solely from the power generating sector, about 2,306.2 MW gas-fired power plants in view that the Gas Sales Purchase Agreement (GSPA) between National Oil Corporation/PSALM with the SC 38 Consortium already expired on 05 June 2022, coupled with the Build-Operate-Transfer (BOT) Contract of the Ilijan Power Plant with NPC/PSALM and Ilijan KEPCO. Likewise, the remaining GSPAs of the respective natural gas-fired power plants will expire in 2024.

Table 40. Natural Gas Production and Consumption from 2019 – 2022

Year	Production (MMSCF)	Consumption (MMSCF)
2019	155,495	146,365
2020	141,732	132,009
2021	121,089	115,703
2022	113,611	108,567

Source: DOE-Oil Industry Management Bureau

The Philippines has a potential domestic source of natural gas supply estimated at 19 tcf from its sixteen (16) petroleum basins, namely Northwest Palawan, Southwest Palawan, Central Luzon, Visayan, Mindoro-Cuyo, Cagayan, East Palawan, Southeast Luzon, Reed Bank, Cotabato, Agusan-Davao, Sulu Sea, West Luzon, Ilocos, Bicol Shelf and Iloilo-West Masbate. The government is promoting the development of indigenous petroleum resources through the Philippine Conventional Energy Contracting Program (PCECP).

IMPORT OPTION

DOE promotes the balanced development of LNG importation in parallel with the exploration of indigenous gas resources. However, for the Philippines to be ready to import LNG, the necessary infrastructure, such as the LNG Import Receiving Terminal and Regasification facilities, must be implemented. To materialize the construction of the critical natural gas facilities, private investment is required to kick off the construction of the LNG Terminals. To date, a total of seven (7) LNG Terminal Projects have been issued permits to potential investors, with commercial operations expected from 2023 onwards. Table 41 shows the details of ongoing LNG projects. LNG importation will take place in 2023, given the expected commercial operation of the two (2) proposed terminals in Batangas in 2024 to be operated by Linseed Field Corporation and FGEN LNG Corporation. The Philippines has imported 1,312,521 cubic meters worth of LNG between April and December 2023, sourced from various countries such as the United Arab Emirates, Malaysia, Australia, Algeria, Oman, and USA.

Table 41. Status of LNG Projects

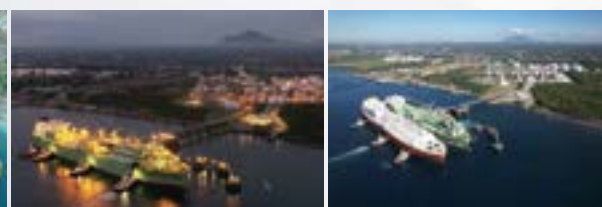
Proponent	Project	Estimated COD	Location	Capacity	Anchor Market	Status
Samat LNG Corporation – 100% Foreign	Small – Scale LNG Terminal Project Floating Storage and Regasification Unit (FSRU) Terminal	Phase 1: Jun 2005 Phase 2: Aug 2025 Phase 3: Nov 2025 Phase 4: Feb 2026	Barangay Sisiman, Mariveles, Bataan	0.32 MTPA	(Indicative) 40 MW conversion from diesel to natural gas & manufacturing industries, small IPPs	Approved 6-month NTP extension valid until 09 Jul 2024
Shell Energy Philippines (Filipino)	Floating Storage Unit (FSU) and Onshore Regasification	September 2025	Tabangao, Batangas City	3.00 MTPA	(Indicative) 1,100 MW AC Energy & BCE Power Plant & a Third-Party Access – JG Summit	NTP Extension of 10 months issued on 22 Oct 2021
Vires Energy Corporation (Filipino)	Floating Storage Unit (FSU) and Onshore Regasification	1Q 2028	Barangay Simlong, Batangas City	3.00 MTPA	(Indicative) Proposed 500 MW Floating Power Plant	NTP Extension under evaluation
FGEN LNG Corporation (Filipino)	Interim Floating Storage and Regasification Unit (FSRU) Liquefied Natural Gas Terminal	LNG Terminal COD: Dependent upon securing of LGU Permits	Barangays Sta. Clara, Sta. Rita Aplaya, and Bolbok in Batangas City	5.26 MTPA	1,000 MW Sta. Rita, 500 MW San Lorenzo, 414 MW San Gabriel, and 97 MW Avion	Submitted POM application last 9 May 2023 Awaiting compliance of FGEN on the POM documentation
Linseed Field Corporation (Filipino)	Floating Storage Unit (FSU) and Onshore Regasification and 60.00 cbm buffer LNG Storage Tank	Terminal COD: Dependent upon completion of remaining works and securing of Certificate of Completion	Barangay Ilijan and Dela Paz, Batangas City	3.00 MTPA	1,200 MW Ilijan Power Plant	Permit to construct issued on Dec, 2021 Linseed to submit lacking documents for POM Application
Energy World Gas Operations Philippines Inc. (Filipino)	LNG Storage and Regasification Terminal	June 2025	Barangay Ibabang Polo, Pagbilao Grande Island, Quezon Province	3.00 MTPA	650 MW Self - owned Gas - fired power plant	PTC extension under evaluation
Luzon LNG Terminal Inc. (LLTI)	Floating Storage and Regasification Unit (FSRU) Liquefied Natural Gas Terminal	December 2025	Bay of Batangas within the Municipal Waters of Mabini and San Pascual, and City Water of Batangas City, Batangas	4.40 MTPA	EGCO Group (small – scale LNG break bulk capacity) & Third-Party Access	Transfer of Interest of Operatorship to Luzon LNG Terminal Inc. and Permit to Construct issued on 19 December 2022

Source: DOE-Oil Industry Management Bureau, as of 22 April 2024

Figure 38. Linseed Field Corporation’s PHLNG Import and Regasification Terminal 2



Figure 39. FGen LNG Corporation’s Interim Offshore Terminal



REGULATORY FRAMEWORK

The PDNGR, which was issued on 28 November 2017, has provided the regulatory framework of the downstream natural gas industry in the Philippines, covering industry compliance to policies, rules, standards, and best practices in areas of siting, design, construction, expansion, modification, operation and maintenance of any project necessary to the development of the Philippine Downstream Natural Gas Industry (PDNGI). The regulatory framework also covers industry compliance with policies, rules, and best practices on the importation of LNG, indigenous natural gas, and the supply and transport activities of natural gas to the customers. In addition, the framework includes third-party access to gas facilities and the development of the country as an LNG trading and transshipment hub for the Asia-Pacific region.

INVESTMENT OPPORTUNITIES

Investment in natural gas facilities is vital for the industry's growth and securing the country's energy supply during the energy transition. The DOE has taken a positive step by approving five new LNG projects with a total investment cost of USD 865.4 million (PhP 43.3 billion) presented in Table 42. LNG has the potential to support the grid's demand from baseload to mid-merit and peaking, while also aiding the development of intermittent renewable energy technologies.

Moreover, the REF scenario requires an additional capacity of 3.98 MPTA of LNG facilities to meet the projected supply requirements by 2050. We have two options: an Onshore LNG Terminal, which requires a total investment of PhP 47.3 billion, or an FSRU, which requires a lower investment cost of PhP 11.1 billion.

Table 42. Investment Cost of LNG Projects

Proponent	Project	Target Operation	Location	Total Construction Cost (USD Million)	Total Construction Cost (PhP Million)
Energy World Gas Operations Philippines Inc.	LNG Storage and Regasification Terminal	December 2023	Pagbilao, Quezon	145	7,250
Luzon LNG Terminal Inc. (LLTI)	Floating Storage and Regasification Unit (FSRU)	December 2025	Batangas City	480	24,000
Vires Energy Corporation	Floating Storage and Regasification Unit (FSRU)	April 2026	Batangas City	123	6,150
Shell Energy Philippines, Inc	Floating Storage Unit (FSU) and Onshore Regasification	September 2025	Batangas City	49.40	2470
Samat LNG Corporation	Small – Scale LNG Terminal Project	Phase 1: March 2024 Phase 2: May 2025	Mariveles, Bataan	68	3,400

Source: DOE-Oil Industry Management Bureau

Table 43. Additional Capacity Investment Requirement (2023-2050)

LNG Facility Type	Capacity Addition (MPTA)	Aggregate Investment (PhP Million)
On-shore LNG Terminal with Storage	3.98	47,322
FSRU with Storage		11,135
Total	3.98	58,457

Source: DOE-Oil Industry Management Bureau

In addition to investments in infrastructure facilities, Liquefied Natural Gas (LNG) presents a significant opportunity to transition away from oil-based power plants, offering ancillary services in off-grid and remote areas. In 2022, the Philippines' off-grid oil-based power plants boast a total installed capacity of 601.373 MW, with a dependable capacity of 482,305 MW, as detailed in Table 44. This transition doesn't just reduce reliance on fossil fuels, it also lays the groundwork for a future powered by cleaner, more sustainable, and reliable energy sources.

Table 44. Natural Gas Market Potential from Off-Grid Islands Oil-Based Power Plants

Region	2021	2022
Philippines	601.373	482.305
Luzon	444.387	353.352
Visayas	66.341	58.461
Mindanao	90.645	70.492
Total	9,722	12,014

Source: DOE-Electric Power Industry Management Bureau, as of December 2022

ENERGY UTILIZATION

ENERGY EFFICIENCY AND CONSERVATION

INDUSTRY PROFILE

The country places importance in promoting judicious and efficient use of energy across all sectors through the Republic Act No. (RA) 11285, otherwise known as the Energy Efficiency and Conservation (EEC) Act. It recognizes that Energy Efficiency (EE) opportunities abound in various sectors, such as the commercial, industrial, transport, and government sectors in the country.

Government Energy Management Program (GEMP)

GEMP governs EE in the public sector. It is a government-wide program to reduce the government's monthly consumption of electricity and petroleum products and improve its efficiency. Government entities (GEs) submit their monthly electricity and fuel consumption reports, as well as designated EEC officers and/or focal persons, building descriptions, and inventories through the GEMP online system.

The following are required from all GEs:

- Designation of Energy Efficiency and Conservation Officer (EEC Officer)
- Submission of reportorial requirements, including monthly electricity and fuel consumption reports,
- inventory of ACUs, lighting, and other office equipment and vehicles
- Formulation of Energy Efficiency and Conservation Program or Local Energy Efficiency and Conservation Plan (LEECP)
- Implementation of energy conservation measures such as but not limited to: setting ACU thermostats to not lower than 24°C, limiting the use of ACUs to six (6) hours, turning off the lights and computers during lunch break except in offices where there is "No Noon Break" policy
- Implementation of fuel conservation measures including but not limited to: avoidance of idling; scheduling of trips; and limiting use of government vehicles for official business only.

Further, on 16 January 2024, Administrative Order No. 15 titled, "Directing the Accelerated Implementation of the Government Energy Management Program (GEMP)" was issued to strengthen the implementation of GEMP. This is to address the need for intensified efficient utilization and conservation efforts of electricity and fuel as well as to mitigate the power demand amidst the ongoing El Niño phenomenon.

In 2023, the government shelled out PhP 55 million to implement programs under GEMP. These projects generated 336 jobs from the solar PV demo project, 555 from the energy audit, and 30 from the EVCS demo. For 2024, there is a proposal to conduct energy audits and solar PV demonstrations with a total budget of PhP 35 million. These include:

- a. Demonstration project on promoting solar PV technology for offices (PhP 12 million);
- b. Conduct of third-party energy audit of buildings of government entities (PhP 25 million);
- c. EVCS demonstration (PhP 18 million).

The country has a total of 7,850 government offices that will be covered by the program. As of 31 March 2024, a total of 1,118 spot checks and 1,176 energy audits have been conducted, resulting in a cumulative electricity savings of 30.56 GWh and 528,392.39 liters of fuel savings.

Figure 40. Demonstration Project on Promoting Solar PV Technology at the DOE Luzon Field Office in Pangasinan



On 16 January 2024, the Administrative Order No. 15, titled, “Directing the Accelerated Implementation of the Government Energy Management Program (GEMP)” was issued to strengthen the GEMP implementation to address the need to intensify the efficient utilization and conservation efforts of electricity and fuel as well as to mitigate power demand amidst the ongoing El Niño phenomenon.

Targets under the NEECP and Roadmap 2023-2050 indicate that emission avoidance from 2023 to 2024 is expected to reach 1.87 Mt CO₂e or 16.15%, 3.31 Mt CO₂e or 15.81% between 2025 to 2028, and 25.06 Mt CO₂e or 14.48% between 2029 to 2050. The investment requirement to support the GEMP programs under the PEP indicates that a total of PhP 147.57 million will be needed from 2023 to 2050.

Designated Establishments (DEs)

Under the EEC Act, DOE will monitor both the government and private sector. DOE monitors the energy consumption of the Designated Establishments (DEs) or private entities in the commercial, industrial, transport, power, agriculture, public works, and other sectors identified as energy-intensive industries. As of 31 December 2023, there are 4,956 DEs: 3,385 from the commercial, 1,540 from the industrial, and 31 from the transportation sectors that have submitted their annual consumption reports. The total investment cost of the completed energy efficiency projects is PhP 6.78 billion, with a total energy savings of around 466 Gigawatt-hours. Submission of annual reports is done online through <https://de.doe.gov.ph/>.

DEs are obliged to have EE Practitioners, particularly a Certified Energy Manager (CEM) or Certified Energy Conservation Officer (CECO), according to their annual energy consumption. They are also required to undergo an energy audit once every three years through the services of a Certified Energy Auditor (CEA) or Energy Service Company (ESCO). CEA, CECO, and CEM are individual EE Practitioners who have undergone the training as prescribed by DOE through the Recognized Training Institutions (RTIs). As of 31 December 2023, we have 886 registered EE Practitioners composed of 488 CEMs, 171 CECOs, and 227 CEAs.

Energy Service Companies (ESCOs)

ESCOs are juridical entities that offer multi-technology services and goods for developing and designing EE projects, delivering, and guaranteeing energy savings, and ensuring cost-effective and optimal performance. Promoting ESCOs in the country can create accurate and achievable energy- savings projects from various stakeholders, reducing the financial and technical burden of retrofitting/ improving EE.

Registered ESCOs meet the minimum technical, financial, and legal requirements to operate. Certified ESCOs are Registered ESCOs with proven results in EE project implementation. As of 31 December 2023, we have twelve (12) Certified ESCOs and 44 Registered ESCOs. Eight (8) Registered ESCOs have undergone independent verification by DOE.

ESCOs differ from Architectural and Engineering (A&E) firms since they offer a full range of services required for a comprehensive energy efficiency project, including:

- Energy audits
- Construction management services, including preparation of performance specifications, project design, and project commissioning
- Providing and arranging financing
- Project monitoring and guarantee of energy savings
- Equipment maintenance and operations

As of 31 December 2023, ESCOs have invested approximately PhP 6.38 billion in various projects. These projects yielded total savings of 610.61 GWh.

Figure 41. Energy Service Company (ESCO) Validation



Table 45. Targets under the NEECP and Roadmap 2023-2050

Sector	Programs	Emissions Avoidance		
		Short-Term (2023-2024)	Medium-Term (2025-2028)	Long-Term (2029-2050)
Commercial	PELP/Minimum Energy Performance for Products (MEPP)	7.51 Mt CO ₂ e 16.15%	13.28 Mt CO ₂ e 15.81%	100.50 Mt CO ₂ e 14.48%
Residential	PELP/MEPPs	18.56 Mt CO ₂ e 34.65%	32.79 Mt CO ₂ e 31.66%	248.21 Mt CO ₂ e 23.17%
Industrial	PELP/MEPPs	17.43 Mt CO ₂ e 19.38%	30.81 Mt CO ₂ e 19.17%	233.18 Mt CO ₂ e 18.35%

Source: DOE-Energy Utilization Management Bureau, as of April 2024

Philippine Energy Labeling Program (PELP)

The PELP Guidelines, following Department Circular (DC) 2020-06-0015, states that all manufacturers, importers, distributors, and dealers of energy-consuming products (ECP) must register their products to secure an energy label.

As of 31 March 2024, a total of 147 companies and 7,329 product models were registered. Furthermore, 7,543 energy labels have been issued for 2,734 models of air conditioners, 2,066 lighting products, 1,307 models of refrigerating appliances, and 1,436 TV sets. The schedule of fees and processing time for registration applications are shown in Table 46.

Table 46. PELP Registration

Service	Fee (PhP)	Processing Time
Company Registration	1,600.00	3 WD
Product Registration	300.00	7 WD
Issuance of Energy Label	300.00	3 WD
Certificate of Exemption	300.00	3 WD

Source: DOE-Energy Utilization Management Bureau, as of April 2024

The NEECP targets and 2023-2050 Roadmap indicate that the emission avoidance in the Commercial Sector per period are as follows: 7.51 Mt CO₂e or 16.15% in the short-term, 13.28 Mt CO₂e or 15.81% in the medium term, and 100.50 Mt CO₂e or 14.48% in the long-term.

Meanwhile, the residential sector is targeting up to 18.56 Mt CO₂e or 34.65% in the short-term 32.79 Mt CO₂e or 31.66% in the medium-term, and 248.21 Mt CO₂e or 23.17% in the long-term.

The Industrial Sector is expecting to have emission avoidance of 17.43 Mt CO₂e or 19.38% in the short-term, 30.81 Mt CO₂e or 19.17% in the medium-term, and 233.18 Mt CO₂e or 18.35% in the long-term. The investment requirement for PELP under PEP 2023 to 2050 is PhP 74.46 million for the Government Sector, and PhP 184.55 million for the Private Sector.

Recognition of Testing Laboratories

Laboratory facilities conducting performance testing of energy-consuming products are essential infrastructure to support verification activities under PELP. Samples drawn during the monitoring will be subject to verification testing by the DOE LATL or a DOE-recognized testing laboratory. The application fee for recognition is PhP 20,000.00 per product type/facility, and the certificate is valid for three (3) years. On the other hand, the renewal of recognition costs PhP 4,800.00. As of 31 March 2024, DOE has recognized four (4) testing facilities from two (2) laboratories that cater to energy performance testing of air conditioners, refrigerating appliances, television sets, and lighting products.

Table 47. Recognized Testing Laboratory

Testing Laboratory	Location	Scope	Date of Recognition
Omni Solid Services Inc. - Solid Testing Calibration Laboratory	Parañaque City	Air conditioners	27 January 2023
		Refrigerating Appliances	23 June 2023
		Television Sets	23 June 2023
IIEE Foundation Inc. Testing Facility	Quezon City	Lighting products	24 August 2023

Source: DOE-Energy Utilization Management Bureau, as of April 2024

Figure 42. DMT's Market Monitoring Activity



Enforcement, Monitoring, and Verification

To ensure compliance with PELP guidelines and requirements, the DOE Monitoring Team (DMT) conducts enforcement, monitoring, and verification activities nationwide through validation of documents from PELP-registered companies, monitoring of retail stores, conduct of sampling and verification and enforcement of PELP guidelines. As of 05 April 2024, 13 PELP-registered companies have been visited by the DMT, where they validated the company's location, concerned personnel relative to PELP and products, and submitted documentary requirements. Likewise, a total of 63 ECP retail stores have been monitored for the presence of energy labels, accuracy of information, and validity of labels.

Energy Practitioners

DOE issued Department Circular No. DC2021-01-0001 for the certification and training of energy efficiency practitioners, including Energy Managers, Energy Conservation Officers, and Energy Auditors. In 2022, the DOE issued DC2022-03-0006, DC2022-03-0007, and DC2022-03-0008 to further provide guidelines in the assessment and certification of Energy Efficiency Practitioners. Since the implementation of the guidelines, 1,062 practitioners have been registered, comprising 634 Energy Managers, 183 Energy Conservation Officers, and 245 Energy Auditors. The training is conducted by the Registry of Recognized Training Institutions, a partner of the DOE in implementing the Energy Efficiency and Conservation Act. The DOE has nine (9) RTIs for Certified EM, and seven (7) RTIs for Certified EA.

Table 48. DOE Certified and Recognized Training Institutions (RTIs)

Energy Managers	Energy Auditors
MERALCO Power Academy	MERALCO Power Academy
PAMAV Training Institute and Technology Center, Inc.	PAMAV Training Institute and Technology Center, Inc.
Philippine Institute of Energy Management Professionals, Inc.	Advance I&P Solutions, Inc.
ENPAP 4.0 INC	TUV Rheinland Philippines, Inc.
Philippine Energy Professionals International Inc.	J3 Trainers and Consultants, Inc.
Advance I&P Solutions, Inc.	PEP-G Electrical Supplies
TUV Rheinland Philippines, Inc.	ENPAP 4.0 INC
J3 Trainers and Consultants, Inc.	
PEP-G Electrical Supplies	

Source: DOE-Energy Utilization Management Bureau, as of April 2024

Energy Labeling Program and Fuel Economy Performance for Transport Vehicles

In 2023, DOE issued policies for labeling and fuel economy ratings of transport vehicles. These policies empower consumers to validate information provided by vehicle stakeholders, facilitating the selection of fuel-efficient vehicles, fuel savings, and reducing greenhouse gas emissions. Below are the policies:

- DC2023-05-0017 titled, "Prescribing the Guidelines on the Philippine Transport Vehicles Fuel Economy Labeling Program (VFELP) for Compliance of Vehicle Manufacturers, Importers, Distributors, Dealers, and Rebuilders" - mandatory labeling of all transport vehicles; and

- DC2023-05-0016 titled, “Prescribing the Fuel Economy Performance Rating (FEPR) Guidelines on Road Transport Vehicles under the Philippine Transport Vehicles Fuel Economy Labeling Program (VFELP) for Compliance of Vehicle Manufactures, Importers, Distributors, Dealers, and Rebuilders” - minimum fuel economy performance rating for transport vehicles set.

To expedite the implementation of the VFELP and FEPR, DOE plans to create a web-based application and online database system. This system will assist in generating information and statistics for future policy development, working in conjunction with the National Energy Efficiency and Conservation Database (NEECD). In addition, DOE is looking at the feasibility of establishing a Vehicle Performance Assessment (VPAF) necessary for testing, verifying, validating, and gathering first-hand data on the fuel economy of transport vehicles.

ELECTRIC VEHICLES AND ALTERNATIVE FUELS

Figure 43. Inauguration of Battery Electric Vehicles and EVCs at the Energy Center, BGC, Taguig City (06 June 2023)



Electric Vehicle Industry

The transport industry in the Philippines is responsible for roughly a third of the country’s final energy usage and almost a quarter of its greenhouse gas emissions (GHG). Given the increasing global oil costs, the use of electric vehicles could notably diminish GHG emissions and mitigate the effects of steep oil prices, thereby helping the country meet its environmental goals.

On 15 April 2022, the Electric Vehicle Industry Development Act (EVIDA) lapsed into law. Its IRR was jointly issued by DOE and the Department of Transportation (DOTr) on 05 September 2022, and it took effect on 20 September 2022. EVIDA aims to ensure the country’s energy security by reducing reliance on imported fuel for transportation.

The EVIDA sets the national objectives to increase the penetration of electric vehicles for road transport by requiring government and private fleets to have at least a five percent (5%) share, the building owners and establishments to allot parking spaces with charging stations for EVs, and to construct charging stations in gasoline stations. DUs are also required to provide charging station requirements, include the same in the development plan, and deploy vehicles for transport and non-transport by 2040, respectively.

The EVIDA Technical Working Group (TWG) was convened to ensure harmonized policies and consistent and streamlined standards and regulations in the EV industry. The TWG includes DOE, DOTr, DTI, DOST, Department of Environment and Natural Resources (DENR), Department of Public Works and Highways (DPWH), Department of the Interior and Local Government (DILG), and the National Economic and Development Authority (NEDA).

Policies

After a series of consultations with the stakeholders, the following policies were issued to support the implementation of EVIDA:

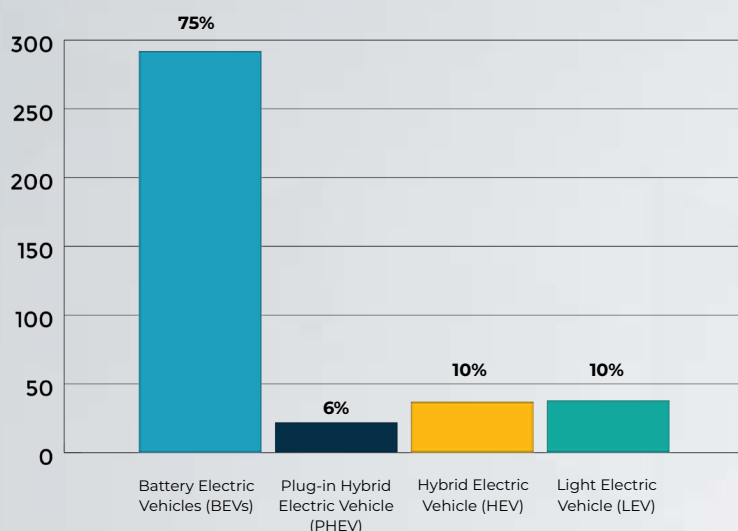
- DC2023-05-0010 Guidelines for the Unbundling of Electric Vehicle Charging Station Charging Fee pursuant to Electric Vehicle Industry Development Act (EVIDA)

- DC2023-05-0011 Guidelines for the Accreditation of Electric Vehicle Charging Providers and Registration of Electric Vehicle Charging Station pursuant to EVIDA
- DC2023-05-0012 Guidelines for the Electric Vehicle (EV) Recognition and Adoption of EV Standard Classification for Road Transport Incentives Eligibility pursuant to EVIDA

EV and EV Charging Stations Deployment

DC2023-05-0012, or the EV Recognition Guidelines, allows the harmonized adoption and classification of EV variants permitted to ply the roads in the country. Recognized variants of EVs are entitled to tariff exemption under Executive Order (EO) No. 12. EO 12 temporarily cuts the MFN tariff rates to zero percent on completely built-up units of EVs except for Hybrid Electric Vehicles (HEVs) for five (5) years. This brings down the acquisition cost of EVs, making them more competitive to consumers.

Figure 44. Recognized EVs per Variants



Currently, EVs in the country have four (4) variants: Battery Electric Vehicles (BEVs), Plug-in Hybrid Electric Vehicle (PHEV), Hybrid Electric Vehicle (HEV), and Light Electric Vehicle (LEV). Figure 44 shows the number of recognized EVs per variant. As of March 2024, we have 292 BEVs. This takes up 75% of the total number of recognized EVs. HEV (37 units) and LEV (38 units) share 10% apiece, while the PHEV takes up the smallest share of 22 units or 6%.

Source: DOE-Energy Utilization Management Bureau, as of 01 March 2024

EV Charging Stations and EVCS Providers

- Accredited EVCS providers are entities that sell, construct, install, maintain, own, or operate EVCS or its components for a fee. These are classified according to the scope of their operation as follows:
- EVCS Provider – Operator – Entities who collect fees from EV users in exchange for the use of EVCS facilities to charge their EVs. As of 01 March 2024, we have a total of twenty-seven (27) EVCS Providers – Operators. These generated 289 new jobs and a total investment cost of PhP 1.49 billion was infused for these activities.
- EVCS Provider – Service - Entities who collect fees for the construction, installation, data and payment management, and maintenance of EVCS. 01 March 2024 data on the EVCS registration shows that we have seventeen (17) EVCS Provider – Service nationwide.
- EVCS Provider – Supplier - Entities that sell EVCS or any part or component thereof for a fee. We have a total of fifteen (15) EVCS Provider – Suppliers as of 01 March 2024.

Figure 45. EVCS at the Department of Energy, BGC, Taguig City



Figure 46. Electric Buses at the Department of Energy, BGC, Taguig City



Comprehensive Roadmap on the Electric Vehicle Industry (CREVI)

CREVI is a National Development Plan for the EV industry to accelerate the development, commercialization, and utilization of EVs in the Philippines. It is an essential tool for the government’s high-level action plans in developing the EV industry in coordination with other government agency leads such as the Department of Trade and Industry (DTI), the Department of Transportation (DOTr), the Department of Science and Technology (DOST), and stakeholders. The CREVI consists of four (4) components:

- EVs and charging station component with DOE as lead in coordination with DOTr
- Manufacturing component with DTI as lead
- Research and development component with DOST as lead
- Human resource development component with DTI as lead

CREVI outlines the targets, strategies, and prevailing scenarios within the EV industry, as well as the challenges and individual roadmap for each of the four main components. Consistent with the EV industry goals, the CREVI sets forth a unified path toward attaining the government’s targets. Under the Reference (REF) scenario, CREVI sets a minimum target of EVs constituting at least ten percent (10%) of the total fleet across all sectors (except for electric trucks) by 2040 (onwards to 2050).

Table 49 shows the projected EV Fleet and EVCS by 2050 at a ten percent (10%) share under the REF and at 50% under the Clean Energy Scenario (CES). The REF scenario will result in an additional energy demand of 4,748 gigawatt-hours (GWh) which is equivalent to 0.54 GW of power requirement by 2050. The scenario also results in emission reduction in the transport sector by 55.37 million tons of carbon dioxide equivalent (MTCO2e) in 2050.

Table 49. EV Fleet and EVCS by 2050

EV /EVCS Targets		REF (10% EV Share)	CES (50% EV Share)
Vehicle Type	EV Type		
Cars (Sedan, SUV, UV)	HEV	448,899	1,985,893
	PHEV	204,595	862,050
	BEV	983,195	4,048,388
Tricycle	BEV	496,116	2,621,797
Motorcycle	BEV	2,667,941	10,751,740
Bus	BEV	8,584	19,149
Total EVs		4,809,330	20,289,017
EV Charging Stations		173,442	808,481

Source: PEP 2023 - 2050

The CES, on the other hand, is more aggressive for the industry, wherein the EV share of the total fleet by 2050 is at least 50% starting 2040. This will cover all sectors except for household, which has an indicated target of ten percent (10%) share of the total fleet by 2050. Motorcycles and tricycles are expected to drive EV adoption in the country as they are regarded as the primary mode of transport across all regions of the country. In addition, it has a lower upfront cost and is accessible to most EV consumers. The target per vehicle type of other covered vehicles is as follows:

- Tricycles/motorcycles – Fifty percent (50%) EV share in the total fleet by 2030 and increasing to 60% by 2040 (onwards to 2050);
- Cars / SUVs / UVs – Twenty-five percent (25%) EV share by 2030 and increasing to 50% by 2040 (onwards to 2050).
- Buses – Ten percent (10%) EV share by 2030 and increasing to 15% by 2040 (onwards to 2050).

The CES will have an additional energy demand of 19,377.98 GWh or 2.21 GW of power requirement by 2050. It is also estimated that emission reduction in the transport sector will reach 297.43 MCTO2e by 2050.

EVs and EVCS Component

To enhance EV utilization through a phased approach, the CREVI provides action plans to encourage EVs and EVCS use, accelerate the refueling mandates for EVs, encourage government and private sectors to transition to EVs, and facilitate the demonstration and deployment of EVs. The goal is to gradually and efficiently integrate EVs into our transportation system, leading to a decrease in carbon emissions and the promotion of sustainable transportation.

Figure 47. EV Parking and EVs at the DOE compound in BGC, Taguig City



Furthermore, the CREVI emphasizes the importance of integrating EVCS with clean energy sources. It also calls for the alignment of the EV Incentive Strategy (EVIS) with the goals set by the CREVI. The standardization of EVCS, EVs, and their installation/construction is another crucial aspect highlighted by CREVI. Additionally, CREVI advocates for the availability of open, public data on EVs and EVCS, the implementation of fiscal and non-fiscal incentives, and the promotion of electric vehicle utilization in local and tourism sectors. It also addresses concerns about waste management, recycling, and transitioning from internal combustion engine vehicles to EVs in shaping transport policies.

Manufacturing component

To strengthen the manufacturing capabilities of electric vehicles (EVs), CREVI emphasizes the implementation of pilot programs for local production of EVs and EVCS parts and components. It also highlights the importance of supporting mineral refining processes to purify local reserves of nickel and other minerals used in battery production. These initiatives aim to enhance the competitiveness of EV manufacturing and establish the country as a major player in the global EV and EVCS market.

Human Resource Development Component

The emphasis on HRD will be on developing skills and expertise in the manufacturing and maintenance of EVs and EVCS, as well as its parts and components. This includes promoting local businesses through entrepreneurial models within the local EV supply chain and enhancing knowledge in the deployment of EVs and EVCS at the local level. The goal is to ensure efficient and safe technical support services supported by strategic international partnerships.

Research and Development Component

CREVI strongly emphasizes research and development in key areas such as battery storage, battery manufacturing, and EV manufacturing. These areas are crucial for advancing and refining technologies within the local electric vehicle (EV) industry. The R&D efforts aim to optimize energy storage, enhance production processes, and improve the design and performance of EVs. These initiatives are essential for driving progress and innovation in the local EV sector.

Advantage of using EVs

The operational efficiency of EVs is influenced by various factors, including the driver's behavior, traffic conditions, vehicle auxiliary operations, and battery quality, among others. Compared to conventional vehicles, EVs are generally perceived to be more efficient in fuel consumption.

Table 50. Vehicle Average Fuel Consumption

	Internal Combustion Engine Vehicle (ICEV)	Hybrid Vehicle (HEV)	Battery/Pure Electric Vehicle (BEV/PEV)
Average Estimated fuel consumption	14 km/L	20 km/L	6 km/L
Equivalent Estimated pesos per kilometer	PhP 5.00/km*	PhP 3.50/km*	PhP 1.83/km**
Fuel consumption per 100 km	7.14 L/100 km	6.00 L/100 km	
Fuel avoided per 100 km	-	2.14 L/100 km	7.14 L/100 km

* Average gasoline price PhP 70.00 per liter

** Average electricity rate PhP 11.00 per kWh

Source: PEP 2023-2050

Table 50 shows that battery EV (BEV) or pure EV (PEV) is the most efficient vehicle variant compared to ICEV and HEV, with an average fuel consumption of 6 km/L. At an average electricity rate of PhP 11.00 per kWh, this can be translated to ~PhP 1.83 per km and avoided fuel consumption of 7.14 liters for every 100 km drive. On the other hand, ICEV has an average fuel consumption of ~14 km/L while an HEV has an average fuel consumption of 20 km/L. With an average gasoline price of PhP 70.00 per liter, this can be translated to ~PhP 5.00/km for ICEV and ~PhP 3.50/km for BEV, with an avoided fuel consumption of 2.14 liters per 100 km drive.

The estimated unit cost of an HEV is PhP 1.8 million, PHEV and BEV costs around PhP 2.5 million, E-Motorcycles cost around PhP 190,000, an E-Trike costs around PhP 350,000, and an E-Bus costs PhP 25 million. The estimated cost of an EVCS that can charge four-wheeled EVs, E-Trikes, and E-Motorcycles is PhP 0.5 million. An EVCS that can charge an E-Bus with 80 kWDC charger costs around PhP 4.5 million. On the average, an EVCS can charge 20 units of 4-wheeled EVs in a day or 30 units of E-Tricycle or E-Motorcycles.

Table 51. EV and EVCS Investment Requirement

EV/EVCS Targets		Investment Requirements (PhP Billion)			
Vehicle Type	EV Type	No. of EVs	REF	No. of EVs	CES
Cars (Sedan, SUV, UV)	HEV/PHEV/BEV	1,636,689	4,922.14	6,896,331	10,607.51
Tricycle	BEV	496,116	262.15	2,621,797	614.82
Motorcycle	BEV	2,667,941	625.19	10,751,740	1,236.81
Bus	BEV	8,584	316.67	19,149	330.73
Total EVs		4,809,330	6,126.15	20,289,017	12,789.87
EV Charging Stations		173,442	1,848.68	808,481	355.23

Investment cost incorporated a 3% annual increase to consider inflation rate

Source: PEP 2023-2050

The EVIDA will require a total of 1,636,689 units of 4-wheeled EVs under REF scenario by 2050. This will require a total investment cost of PhP 4.92 trillion. A total of 496,116 units of E-Trike will be needed by 2050, which will entail an investment cost of PhP 262.15 billion. Around 2.6 million E-Motorcycles will be needed for the EVIDA by 2050, and 8,584 E-Bus will be needed by 2050. This will require investment costs of PhP 625.19 billion and PhP 316.67 billion, respectively. This will require 173,442 EVCS to cater to these EVs, which will entail a total investment cost of PhP 1.84 trillion. The total number of jobs generated under the REF scenario will be 117,243 by 2050.

Under the CES, the program has estimated that 6,896,331 units of four-wheeled EVs will be needed by 2050, requiring an investment cost of PhP 10.6 trillion. About 2.62 million units of E-Trike will be needed by 2050, with a total investment cost of PhP 614.82 billion. A total of 10.75 million units of E-Motorcycles will be needed by 2050, which will require a total investment cost of PhP 1.23 trillion. For the 19,149 units of E-Bus requirement by 2050, a total investment cost of PhP 330.73 billion will be needed. The total required EVCS by 2050 is 808,481 that will entail a total investment cost of PhP 355.23 billion. It is estimated that a total of 431,681 by 2050. It is estimated that 431,681 total jobs will be created by 2050.

Alternative Fuels

DOE is committed to promoting the use of locally accessible and indigenous energy sources to enhance the country's energy security. One of the key objectives is to achieve efficient fuel diversification by harnessing new and emerging technologies as well as alternative fuels. To accomplish this, the DOE actively implements various policies, programs, and initiatives in research and development.

By leveraging the potential of locally accessible and indigenous energy sources, the DOE aims to reduce reliance on imported energy and enhance the country's energy self-sufficiency. This strengthens the energy sector and contributes to national development and resilience.

New And Emerging Technologies (NAET)

DOE implemented several projects which provided valuable information towards the development and mainstreaming of NAET. One of these is revolutionizing the marine transportation system through the continuous monitoring of the development of solar-assisted electric motorboats or the SESSY E-Boat (Safe, Efficient, and Sustainable Solar-Assisted Plug-In Electric Boat for Tourism and Transport) Project.

Forging partnerships through agreements provides opportunities to establish a framework and to jointly conduct innovative and cooperative research and development (R&D) activities for the review, evaluation, monitoring and implementation of programs under the Science and Technology for Energy Application (STEA) that focus on alternative and innovative energy technologies aligned with the government thrust of ensuring security and addressing air pollution, and to ensure effective and efficient utilization of government resources.

Figure 48. Safe, Efficient, and Sustainable Solar-Assisted Plug-In Electric Boat (SESSY E-Boat)



Hydrogen Utilization

Hydrogen utilization in the energy sector has emerged as a significant pathway for sustainable energy transition globally. The Philippines recognizes its role in decarbonizing hard-to-abate sectors such as transportation, industry, and electricity generation. By leveraging hydrogen as a clean energy carrier, the transition to a low-carbon economy can be accelerated, building a more resilient and sustainable energy future.

DOE issued Department Circular No. DC 2024-01-0001, called the "Hydrogen Energy Guidelines," which provides the national policy, general framework, roadmap, and guidelines for hydrogen in the energy sector. This aims to accelerate the development and investment in hydrogen production and utilization in the energy sector by consolidating and harmonizing all existing issuances for a safe, effective, and efficient system. This will include all activities related to research and development (R&D), establishments/construction, production, storage, transmission, distribution, utilization, operation, and maintenance of hydrogen projects or facilities.

Figure 49. Fuel Cell R&D and Testing Center at the DOST Compound, Taguig City



The DOE also partnered with the DOST Industrial Technology and Development Institute (ITDI) to establish the Fuel Cell R&D and Testing Facility under a Memorandum of Agreement (MOA). This focuses on the R&D of fuel cell technology, emphasizing development and innovation for specific cell components. The facility will also conduct performance and durability testing that will address the current limitations of fuel cells. DOE is inviting collaboration with science and technology institutions to accelerate industry development, while also seeking for partners on the prototyping and further R&D on fuel cell technology applications.

Philippine Transport Vehicles Fuel Economy Labeling Program (VFELP)

Under the EEC Act, DOE issued DC No. DC2023-05-0017 or the (VFELP) Guidelines and DC No. DC2023- 05-0016 or the Fuel Economy Performance Rating (FEPR) Guidelines for Road Transport Vehicles. This aims to gather and benchmark fuel economy performance data in the road transport sector. This will also lead to the empowerment of consumers to validate information provided by vehicle manufacturers, importers, and dealers, which will facilitate the selection of fuel-efficient transport vehicles by consumers, the realization of fuel savings, elimination of fuel-inefficient vehicles in the market, and reduction of GHG emissions.

To support VFELP, the establishment of a Vehicle Performance Assessment Facility (VPAF) is needed to test, verify, and gather first-hand data on the fuel economy of transport vehicles manufactured and assembled, including imported vehicles. This aims to have the feasibility of establishing a vehicle performance assessment facility for road transport vehicles.

DOE is looking for partners in developing engineering design and construction of facilities required to support the vehicle labeling and research activity. In addition, DOE is looking for partners in the conduct of Fuel Economy Run to determine the vehicle's energy performance in actual driving conditions.

Database Online Application System

DOE will establish a database online application system for the processing and approval of all related services that would provide real-time requests and monitoring of the status of the application, real-time upgrading of the database, and calculation of approximate fuel consumption and CO₂ emission of the transport vehicles. This includes applications for company registration, transport vehicle registration, and fuel economy label issuance for vehicle manufacturers, importers, distributors, dealers, and rebuilders.

Sustainable Aviation Fuel (SAF)

DOE is dedicated to working closely with relevant stakeholders in the aviation business and oil industry. All efforts are aimed at making SAF available in the market as soon as possible and integrating it into the aviation industry through cooperation, innovation, and information exchange. DOE will forge a memorandum of agreement with State Universities and Colleges (SUCs) for the conduct of R&D activities, specifically in the assessment of potential feedstock for SAF.

INCENTIVES IN THE ENERGY SECTOR

The Corporate Recovery and Tax Incentives for Enterprises (CREATE) Act was signed on 26 March 2021. It aims to lower corporate income tax rates and rationalize fiscal incentives to better attract local and foreign investments in the Philippines. It offered a new incentive regime for qualified projects. BOI will formulate the Strategic Investment Priorities Plan (SIPP), which contains the list of priority activities for investment promotion and facilitation. It categorizes activities into Industry Tiers I, II, and III.

Tier I includes activities listed in the 2020 Investment Priorities Plan (IPP), unless listed in Tier II or Tier III.

- a. **Preferred Activities** – Alternative Energy Vehicles Charging/Refueling stations; LNG Storage and Regasification Facility and Pipeline for Oil and Gas, and Energy (power generation plants utilizing conventional fuels; waste heat; and BESS)
- b. **Activities Governed by Special Laws** – Refining, Storage, Marketing, and Distribution of Petroleum Products; Power Generation using Renewable Energy; Energy Efficiency and Conservation Programs; Electric Vehicles Industry Development related activities

Tier II Energy projects are:

- a. **Industrial Value-Chain Gaps** – Copper and Nickel Production (Battery component)
- b. **Green ecosystems** – Electric Vehicle Assembly, manufacture of EV parts, components, and systems; establishments and operations of EV Infrastructure, i.e., charging stations; Renewable Energy; Energy Efficiency and conservation; Energy storage technologies

Energy activities governed by special laws can choose what set of incentives to avail.

Incentives under the CREATE Act of the above-mentioned activities are as follows:

Incentives:

- **Income tax holiday** - four (4) to seven (7) years, depending on the location and Tier category;
- **Duty-free importation;**
- **Five percent (5%) Special Corporate;** and
- **Income Tax (SCIT) after ITH** - five (5) or ten (10) years, depending on the location, activity, and Tier category

Additional Incentives or Enhanced Deductions five (5) years Domestic and Export ten (10) years ED/SCIT depending on the location, activity, and Tier category

- Additional Deduction on R&D;
- 50% additional deduction on labor expense;
- 100% Additional Deduction on training expenses (Filipino Employees);
- 50% Additional Deduction on domestic input expense;
- 50% Additional Deduction on power expense;
- Deduction for reinvestment allowance to the manufacturing industry;
- Depreciation allowance of the assets acquired for the entity's production of goods and services; and
- Enhanced NOLCO

SPECIAL LAWS GOVERNING ENERGY ACTIVITIES, PROGRAMS, PROJECTS, AND INITIATIVES

OIL, NATURAL GAS, NATIVE HYDROGEN

Presidential Decree (PD) No. 87, or the "Oil Exploration and Development Act of 1972", provides for the following incentives to petroleum service contractors:

- Exemption from payment of tariff duties and compensating tax on the importation of machinery and equipment, spare parts, and all materials required for petroleum operations;
- Reimbursement of operating expenses of up to 70% of gross proceeds from production with carry-forward of unrecovered costs;
- A service fee of up to 40% of net production income;
- FPIA of up to seven and a half percent (7.5 %) of the gross proceeds for service contracts with a minimum Filipino company participation of 15%;
- Exemption from all taxes except income tax;
- Easy repatriation of investments and profits;

- Income tax obligation paid out of the government's share;
- Special income tax of eight percent (8%) of gross Philippine income for subcontractors;
- Special income tax of 15% of Philippine income for foreign employees of service contractors and subcontractors; and
- Free market determination of crude oil prices, i.e., prices realized in a transaction between independent persons dealing at arms-length

COAL

P.D. 1174 amending P.D. 972, otherwise known as "The Coal Development Act of 1976" provides for the following incentives to coal operating contractors:

- Exemption from all taxes except income tax;
- Exemption from payment of tariff duties and compensating tax on the importation of machinery and equipment, spare parts, and all materials required for coal operations;
- Allow the entry of alien technical personnel;
- Right to ingress to and egress from the COC areas; and
- Recovery of operating expenses

RENEWABLE ENERGY LAW

R.A. 9513 or "An Act Promoting the Development, Utilization, and Commercialization of Renewable Energy Resources and for Other Purposes," provides for the following incentives both for power and non-power applications. Incentives will be in proportion to and to the extent of the RE component.

Fiscal Incentives:

- Income tax holiday for the first seven (7) years;
- Ten (10) years of duty-free importation of RE machinery, equipment, and materials;
- Special realty tax rates not exceeding one and a half percent (1.5%) on equipment and machinery, and other improvements;
- Net operating loss carryover (NOLCO) of the RE Developer during the first three (3) years for the next seven (7) consecutive taxable years;
- Ten Percent (10%) Corporate Tax Rate after ITH;
- Accelerated Depreciation of plant, machinery, and equipment;
- Zero Percent (0%) Value-Added Tax Rate on the sale of fuel or power generated from RE sources purchases of local supply of goods, properties, and services;
- Tax Exemption of Carbon Credits;
- Cash Incentive of Renewable Energy
- Developers for Missionary Electrification equivalent to 50% of the universal charge;
- 100% Tax Credit on Domestic Capital Equipment and Services of the value of the VAT and customs duties;
- Exemption from the Universal Charge on the sale of power and electricity;
- Payment of Transmission Charges on a per kWh basis equivalent to the average per kWh rate of all other electricity transmitted through the grid;
- Entitlement to RE incentives of the RE component of Hybrid and Cogeneration Systems; and
- Must dispatch and priority dispatch in the WESM

Incentives for RE Commercialization (Manufacturers, Fabricators, and Suppliers)

- Tax and Duty-free Importation of Components, Parts, and Materials;
- Tax Credit on Domestic Capital Components, Parts, and Materials equivalent to 100% of VAT;
- Zero-rated VAT transactions - all manufacturers, fabricators, and suppliers of the value of the VAT and customs duties; and
- ITH for seven (7) years

BIOFUELS

R.A. 9367 known as the "Biofuels Act of 2006" provides for the following incentives for activities involving the production, distribution, and use of locally-produced biofuels:

- Income Tax Holiday;
- Exemption from taxes and duties on imported spare parts;
- Exemption from wharfage dues and export tax, duty, impost, and fees;
- Modified Duty Rate for capital equipment under E.O. 528;

- Tax credits;
- Zero Percent (0%) Specific Tax on local or imported biofuels components per liter of volume;
- VAT Exemption on the sale of raw materials used in the production of biofuels;
- Exemption on wastewater charges under RA 9275 of all water effluents from the production of biofuels; and
- Financial Assistance from government financial institutions, such as Development Bank of the Philippines (DBP), Land Bank of the Philippines (LBP), and other government institutions providing financial services

DOWNSTREAM OIL INDUSTRY

R.A. 8479, or “An Act Deregulating The Downstream Oil Industry, and For Other Purposes” provides incentives for downstream oil industry participants.

Fiscal Incentives for a period of five (5) years:

- Income Tax Holiday;
- Additional deduction on labor expense;
- Three Percent (3%) Duty and Value-Added Tax (VAT) on imported capital equipment;
- Tax Credit on domestic capital equipment;
- Exemption from contractor’s tax;
- Unrestricted use of consigned equipment;
- Exemption from real property tax on production equipment or machineries; and
- Exemption from taxes and duties on imported spare parts

ENERGY EFFICIENCY AND CONSERVATION

RA 11285 known as the “Energy Efficiency and Conservation Act” an act institutionalizing Energy Efficiency and Conservation, Enhancing the Efficient use of Energy, and Granting Incentives to Energy Efficiency and Conservation Projects.

Fiscal Incentives under CREATE for ten (10) years

Non-fiscal incentives:

- Provision of awards and recognition for innovations in energy efficiency and conservation best practices, and successful energy efficiency projects; and
- Provision of Technical Assistance from government agencies in the development and promotion of energy-efficient technologies

ELECTRIC VEHICLES

RA 11697 known as the “Electric Vehicle Industry Act”, an act providing for the Development of the Electric Vehicle Industry involving manufacturing, importation, and utilization of EV and EVCS battery, parts and components.

Fiscal Incentives:

A. Manufacturing - Fiscal incentives and length of time of availment under CREATE

B. Importation

1. Importation of completely built units of EVs under RA No. 10963 or the “Tax Reform for Acceleration and Inclusion (TRAIN)”
2. Importation of completely built units of EVCS - Exemption from duties for eight (8) years from the effectivity of EVIDA.
3. Importation of capital equipment and components used in the manufacture or assembly of EVs and construction or installation of EVCS - Fiscal incentives and length of time of availment under CREATE

C. Utilization - 30% discount for Battery Electric Vehicles (BEVs) and 15% discount for Hybrid Electric Vehicles (HEVs) from the payment of the motor vehicle user’s charge imposed by LTO under RA No. 8794 or “Motor Vehicle User’s Charge Act” as well as vehicle inspection fees for eight (8) years from the effectivity of EVIDA.

Non-fiscal incentives:

- For EV Users: Priority registration and renewal of registration, and issuance of special plate; Provision of awards and recognition for innovations in energy efficiency and conservation best practices; and successful energy efficiency projects;

- Provision of Technical Assistance from Government Agencies in the development and promotion of energy-efficient technologies;
- Exemption from the mandatory vehicular volume reduction program;
- Expeditious processing of LTFRB applications for a franchise to operate and renewal for PUV operators exclusively utilizing EVs;
- Availment of TESDA Training on EV assembly, use, maintenance, and repair; and
- For EV manufacturers, allow the employment of expert foreign nationals under a technology transfer program

EXECUTIVE ORDER NO. 12 s. 2023 Customs Modernization and Tariff Act.

- Zero tariff rate on EVs except hybrid EV (HEV).

INCENTIVES FOR PEZA REGISTERED COMPANY

- Four (4) to eight (8) years income tax holiday (ITH);
- Special five percent (5%) tax rate on gross income after ITH;
- Tax and Duty Exemption on imported capital equipment;
- Exemption from 12% input VAT on allowable local purchase of goods and services;
- Exemption from wharfage dues; and
- Employment of foreign nationals



ENERGY VIRTUAL ONE-STOP SHOP (EVOSS) ACT

The Administration recognizes the vital role the energy industry plays in promoting economic growth. Initiatives that support business-friendly practices in the energy industry are being actively promoted by the Department of Energy (DOE). Republic Act No. 11234 also known as the “Energy Virtual One-Stop Shop (EVOSS) Act”, is an online portal created to streamline and speed up the processes associated with power generation, transmission, and distribution projects. By standardizing forms and procedures, it aims to lower transaction costs, increase accountability and transparency, and improve bureaucratic efficiency. Energy project developers and investors can now submit applications and the necessary documentation online, as well as track the status of their applications, through the EVOSS portal.

As of this writing, the EVOSS System includes 53 streamlined process of ten (10) national government agencies and entities, namely, Department of Energy (DOE), Energy Regulatory Commission (ERC), National Electrification Administration (NEA), National Power Corporation (NPC), National Transmission Corporation (TransCo), Department of Labor and Employment (DOLE), Department of Justice (DOJ), National Commission of Indigenous Peoples (NCIP), Independent Electricity Market Operator of the Philippines (IEMOP), and National Grid Corporation of the Philippines (NGCP) for the Exemption of System Impact Study. There are also five (5) local government units, namely, Bay, Burgos, Ilocos Norte, Cagayan de Oro City, Iloilo City, and Ormoc City, that incorporated their processes for the issuance of business permits. Efforts are in progress to include other government agencies and entities crucial to the implementation of energy projects.

The EVOSS System received 1,174 pre-applications for the RE Contract as of March 2024, 838 of these had already been completed, 78 are undergoing evaluations, and 258 are still incomplete, had been disapproved, withdrawn or are not qualified. A total of 9,993 applications across agencies were received, 6,064 were approved, 3,653 were either withdrawn, disapproved, incomplete, or duplicate submissions, and 276 applications are still under evaluation.



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