

ENERGY
CATALYST

Country Guide: Philippines

June 2020



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The Philippines is an archipelagic country in Southeast Asia. Situated along the Western Pacific Ocean, it consists of some 7,100 islands and islets lying about 500 miles (800 km) off the coast of Vietnam. Manila is the capital, but nearby Quezon City is the country's most populous city. Both are part of the National Capital Region (Metro Manila), located on Luzon, the largest island. The second largest island of the Philippines is Mindanao, in the southeast. The country's climate is tropical and strongly monsoonal (i.e., wet-dry). In general, rain-bearing winds blow from the southwest from approximately May to October, and drier winds come from the northeast from November to February. Average temperatures in the Philippines usually range between 21 °C (70 °F) and 32 °C (90 °F).

The majority of Filipinos (80%) are Roman Catholic, although other major religions are practiced. These include Islam, Buddhism, Hinduism and Evangelical Christianity. The Philippines is governed as a unitary state under a presidential representative and democratic and a constitutional republic, where the President functions as both the head of the state and the head of the government of the country.



Figure 1 Map of the Philippines. Source: d-maps

Economy

The Philippines is one of the emerging markets and the sixth richest country in Southeast Asia by GDP per capita values, after Singapore, Brunei, Malaysia, Thailand, and Indonesia. It is considered a newly industrialised country, which has an economy in transition from one based on agriculture to one based more on services and manufacturing. 57% of the country's GDP comes from the service sector, 31% from the industrial sector and the remaining 12% from the agriculture sector.

The Philippines jumped 29 notches in the World Bank's annual Doing Business Report, ranking 95th from 124th last year with a score of 62.8 and 57.68 respectively. Starting a business was made easier by abolishing the minimum capital requirement for domestic companies. Furthermore, streamlining the process for obtaining an occupancy certificate was improved in securing construction permits.



Figure 2: The ease of doing business scores and rankings of ASEAN countries in The World Bank's Doing Business 2020 report. Data from: World Bank Group, 2020

The energy sector in the Philippines

The Philippines Electricity Sector is divided into three electrical grids, one each for Luzon, Visayas and Mindanao. As per the Department of Energy's Power Demand and Supply Highlights of 2018, a total of 99,765 GWh was produced where 52% came from coal, 23% from renewable sources (mostly geothermal and hydro), and the remaining from natural gas.

The Philippine Energy Plan (PEP) 2017–2040 is the DOE's blueprint to secure the country's energy future. It was created after a thorough review of the current energy agenda and the inclusion of inputs from regional consultations and IECs conducted by the department. The formulation of the PEP paved the way for the identification of sectoral energy road maps vital to increased energy access and security.

By 2040, the PEP sectoral road maps intend to:

- Increase the renewable energy installed capacity to at least 20 000 MW
- Increase reserves and production of local oil, gas, and coal
- Provide nationwide electricity access
- Deliver quality, reliable, affordable and secure power supply, expanded access to electricity, and a transparent and fair power sector playing field
- Improve downstream oil industry policies for the continuous supply of high quality and quantity petroleum products
- Establish a world-class and investment-driven natural gas industry in the Philippines
- Secure a stable energy supply through a technologically responsive energy sector
- Reduce energy intensity and consumption

Table 1: The Philippines at a glance

Capital	Manila
Area	300,000 km ²
Population	107,948,000
Official languages	Filipino, English
Rural Population	53.1%
GDP	US \$356.814 B (2019)
GDP Per Capita	US \$3,294 (2019)
Currency	Philippine Peso
Exchange rate 2020	1 GBP = 65.3291 PHP
Exchange rate 2018	1 GBP = 73.0256 PHP
Access to Electricity	90.7% (2017)
On grid electricity access	20.59M Households
Off grid electricity access	2.11M Households

Table 2: Overview of the main stakeholders in the energy sector in the Philippines

Institution	Role
Department of Energy (DOE)	The mission of DOE is to improve the quality of life for Filipinos by formulating and implementing policies and programmes to ensure sustainable, stable, secure, sufficient, accessible and reasonably-priced energy.
National Electrification Administration (NEA)	The National Electrification Administration is a government-owned and controlled corporation that works with electric cooperatives, committed to the ideals of the Rural Electrification Program. NEA is the prime mover in the rural electrification sector, by providing quality financial, institutional, and technical services to the electric cooperatives and promoting competence enhancement in a deregulated environment aiming towards a strong republic.
National Power Corporation (NPC)	The NPC performs the missionary electrification function of the country through the Small Power Utilities Group (SPUG) and is responsible for providing power generation and its associated power delivery systems in areas that are not connected to the transmission system. NPC is also responsible for the operation and maintenance of transmission systems of some island provinces in the country.
Energy Regulatory Commission (ERC)	The ERC is an independent, quasi-judicial regulatory body, tasked with promoting competition, encouraging market development, ensuring customer choice and penalizing abuse of market power in the electricity industry. To carry this out, the ERC promulgates necessary rules and regulations, and impose fines or penalties for any non-compliance with or breach of the EPIRA.

As of 2017, the Philippines has a 90.7% Household Electrification Rate, which is estimated to be around 20.59 million households, with almost 2.11 million households remaining unelectrified (more common in rural areas). The Department of Energy (DOE) aims to reach a 100% electrification rate by 2022. To achieve this, the following strategies and programs are being implemented:

1. **Nationwide Intensification of Household Electrification (NIHE) SCHEME:** Provision of house-wiring subsidy including at least two bulbs and one convenience outlet, kWh Meter and Service Drop
2. **Enhanced NIHE SCHEME:** Aside from house wiring, subsidies include the provision of funding for additional poles to households situated close to distribution facilities of the DUs
3. **Sitio Electrification Program (SEP):** Provision of assistance in funding grid extension projects
4. **Barangay Line Enhancement Program (BLEP):** Provision of assistance in funding grid extension projects including: overhead lines, submarine cables, and the enhancement/ upgrading of distribution
5. **PV MAINSTREAMING SCHEME:** Provision of individual PVSHS to households that can provide lighting and charger capabilities
 - PVM- EU funded 2017- 2019
 - Continue the program Budget 2019
6. **MINI-GRID/Qualified Third Party (QTP) SCHEME:** Provision funding for generation and distribution components for mini grids. Entry of the Private Sector in the form of QTP
7. **NPC-SPUG MINI-GRID SCHEME:** Provision funding for generation and distribution components by NPC-SPUG

Hydropower

Hydropower plays an important role in the country's generation mix, providing 9.4% of the country's total electricity generation in 2018. The total installed capacity across the Philippines was 3,473 MW as of 2018. The majority of hydropower capacity in the Philippines is owned and operated by independent power producers. However, among the remaining assets for the Power Sector Assets and Liabilities Management Corporation to privatise are two large hydropower complexes in Mindanao, Agus and Pulangi, with a combined installed capacity of 9821 MW.

The NPC continues to operate these generating assets, which are subject to political challenges due to the power facilities (or their ultimate water sources) being in the Bangsamoro area of Mindanao, with some rights to the output being given locally as part of the peace process. Historically, the optimal mode of operating these hydropower assets has been unclear, due to historical supply shortages and curtailments. With the new coal-fired capacity that has come online during 2015–2016, it is likely that the operating regime for these hydropower assets will be more flexible and peaking-oriented. If so, it may be beneficial to study the system to identify optimal future water management and hydro-generation practices.

Solar power

The total installed generating capacity for solar power in the Philippines is at 740 MW in 2018, more than 40 times the capacity in 2014 (17 MW). This represents 3.4% of the electricity mix in 2018. Further, gross power generation in 2018 was at 1,249 GWh, corresponding to 1.3% of the country's gross power generation. Under the supply outlook of the Philippine Energy Plan 2017-2040, the combined solar and wind supply will reach 4,652 GWh by 2040, which translates to a 3.5% average yearly increase. The DOE also expects to put in additional solar and wind capacity of about 5,100 MW between 2016 and 2040. To achieve this, the DOE plans to strengthen RE policy mechanisms under the Renewable Energy Act of 2008 to attract new investments in the RE sector. The National Renewable Energy Laboratory's solar resource assessment for the Philippines shows that the country's annual average potential is 5.1 kWh/m²/day.



Figure 3: PV solar potential for the Philippines. (2019) The World Bank, Source: Global Solar Atlas 2.0, Solar resource data: Solargis)

Biomass

The Philippines was the first country in Southeast Asia to enact biofuels legislation, offering tax exemptions for biofuel production and use under the Biofuels Act of 2006. The Biofuels Act set bioethanol blending targets for the transport sector at 10% and 5% for biodiesel with sugarcane and coconut oil set as the preferred feedstock. This was followed by a DOE-issued mandate in 2011 for a minimum 10% blend of bioethanol in all gasoline distributed and sold in-country to be increased to a 20% blend by 2020.

While biomass makes a relatively small contribution to power production, it fuels a variety of other industrial and household needs including cooking and heating, crop-drying, and mechanical and electrical applications. Most households still rely on traditional biomass fuels for cooking. While there was a slight decrease in the use of fuelwood by households from 2004 to 2011, the use of charcoal increased by 5% and biomass residues by 4% in 2011. Based on the 2011 Household Energy Consumption Survey by the Philippine Statistics Authority and the DOE, 54% of the households were still using fuelwood, 35% were still using charcoal, and 20% were still using biomass residues.

Wind power

The country's total gross wind generation is 1,152 GWh in 2018, a 5.4% increase from the previous year's gross generation. Further, the dependable generating capacity for 2018 is 427 MW, an increase of more than four times the dependable capacity in 2014. Despite these increases in capacity and gross generation, wind energy only accounted for 1.2% of the total electricity generation mix in 2018.

To further increase wind energy contribution, the Department of Energy plans to have a total additional capacity of 1,039 MW from wind power until 2040.

In 1999, the National Renewable Energy Laboratory (NREL) released the Wind Resource Atlas of the Philippines, which details a national-scale wind-resource analysis and mapping results of the country. The study shows that the country has 11,065 km² of windy land, estimated to have good-to-excellent wind resource potential. The wind mapping shows many areas of good-to-excellent wind throughout the country, particularly in the northern and central region.

Geothermal

The Philippines is one of the world's top producers of geothermal power, as it is located along the Ring of Fire zone of Pacific volcanoes. However, in 2018, the country dropped in the global rankings for geothermal countries, just behind Indonesia. This prompted the Philippines to consider revamping its geothermal development again.

The country currently has seven geothermal fields that supply about 12% of the nation's energy, with a long-term plan to nearly double capacity by 2040. According to the Philippine Energy Plan 2016-2030 report by the DOE, the government is strengthening its push to mainstream renewable energy projects to diversify the country's energy sourcing and to boost power supply. The country is said to have 35 Geothermal Service Contracts (GSCs) currently being monitored and supervised by the DOE. Once these contracts commence operation, they will significantly boost the existing capacity of renewable energy to the grid.

Mini grid sector development

In the Philippines, rural electrification through the extension of the existing electricity grid to remote areas is often not viable, leaving microgrids, especially those using renewable energy sources, as an ideal solution. As of 2017, more than 2 million households still have no access to electricity.

To accelerate total electrification in areas with no electricity access, the Philippine Senate Committee on Energy filed the Microgrid Systems Act in 2019. The Act further aims to provide reliable electric services to every household in the country. It will mandate the Department of Energy to annually release the list of unserved and underserved areas for prospective accredited Microgrid Service Providers.

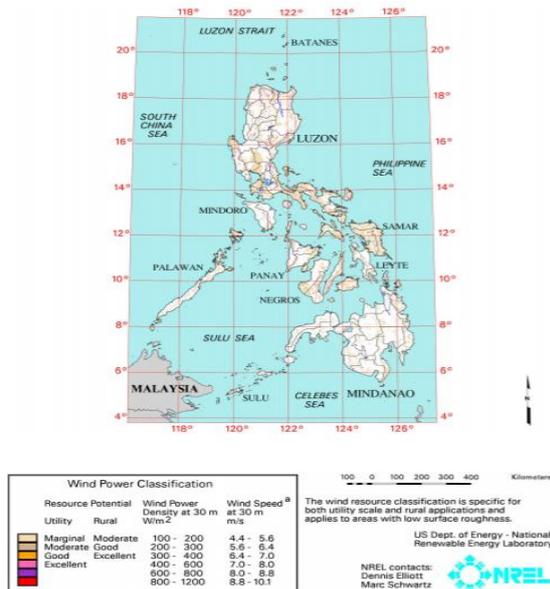


Figure 4: Wind energy resource assessment for the Philippines. Source: NREL, 1999

References and further reading

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Geothermal Energy Development in the Philippines

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The Philippines: Solar, Wind and Bioenergy Resource Assessment

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Official UK Government travel advice for Philippines

<https://www.gov.uk/foreign-travel-advice/philippines>

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Energy Regulatory Commission (ERC)

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