



Renewable Energy At A Glance



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Renewable Energy or RE is any energy source generated from natural resources which are naturally regenerative or replenished such as solar, wind, ocean, geothermal, hydro and biomass. On December 16, 2008, the Philippines enacted Republic Act No. 9513 or the Renewable Energy Act of 2008 to accelerate the exploration, development and utilization of renewable energy resources in order to enhance the country's energy security, thereby lessening its heavy dependence on fossil fuels and reducing electricity rates.

Renewable Energy Supply. The Philippines could be considered one of the world leaders in renewable energy because of its abundant renewable energy sources such as solar, wind, biomass, ocean, small hydro and geothermal (World Resources Institute). According to the Department of Energy (DOE), the Philippines is the world's second largest generator of geothermal energy next to the United States of America. It is also the first among the members of the Association of Southeast Asian Nations (ASEAN) to invest in large-scale solar and wind technologies.

The Philippines registered an average renewable energy supply of 16.47 million tons of oil equivalent (MTOE) from 2000 to 2012, with an average share of 43.21 percent to the total energy supply¹ (Table 1). Based on the latest data of the International Energy Agency (IEA), the Philippines ranked first in terms of the contribution of renewable energy to total energy supply among the ASEAN countries (Figure 1).

With the country's untapped renewable energy potential, the Philippines envisions to be the world leader in geothermal energy, the largest producer of wind power, and the solar manufacturing hub in Southeast Asia (Philippine Development Plan 2011-2016).

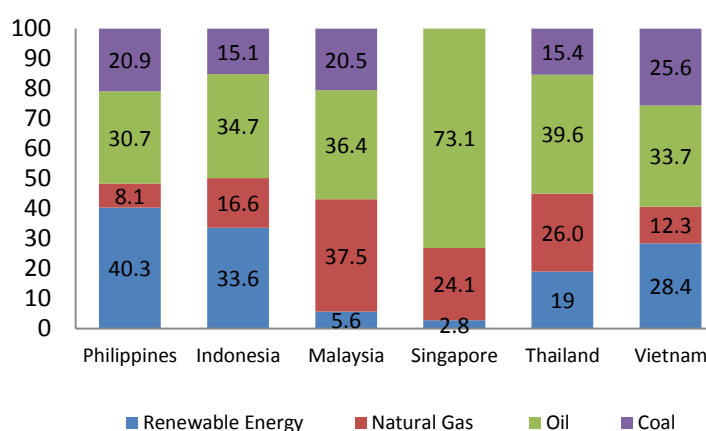
Renewable Energy Composition. On the average, geothermal energy accounted for the biggest share of 53.89 percent of the total renewable energy supply from 2000-2012, followed by biomass with 32.99 percent and hydro with 13.10 percent. The remaining shares were divided between solar and wind energies (Figure 2). At present, the country is

Table 1. Renewable Energy Supply, Total Energy Supply and Share of Renewable Energy in the Philippines, 2000-2012

Year	Renewable Energy Supply (MTOE)	Total Energy Supply (MTOE)	% share of RE to Total
2000	18.32	38.47	47.63
2001	16.94	36.95	45.85
2002	16.56	36.95	44.82
2003	16.22	37.17	43.64
2004	16.61	37.41	44.39
2005	16.02	37.40	42.84
2006	16.77	35.33	47.46
2007	16.10	37.52	42.92
2008	16.76	39.22	42.73
2009	16.30	38.25	42.61
2010	15.41	39.29	39.23
2011	15.86	39.80	39.85
2012	16.22	42.90	37.81
Average	16.47	38.20	43.21

Source of basic data: DOE

Figure 1. Percentage Distribution of Energy Supply in the ASEAN-6 in 2011 (%)



Source: IEA, 2010

¹ Total energy supply refers to the total amount of energy generated domestically and imported abroad by the country while renewable energy supply is the total amount of renewable energy generated by the country from its natural resources such as solar, wind, geothermal, hydro, ocean and biomass.

not generating energy from the ocean. According to the DOE, while the country is endowed with vast ocean resource potential, there have been very limited activities in this sector primarily because of the high investment cost for its development. The DOE, however, expects the Philippines' first ocean energy facility to start commercial operations by 2018.²

Contribution of Renewable Energy to Electricity Generation. Renewable energy resources are tapped for motor fuels, water/space heating, rural (off-grid) energy services, and more importantly, electricity generation. Renewable energy constitutes a significant share of electricity generation in the Philippines. In 2012, its installed capacity³ from renewable energy stood at 5,521.20 megawatts (MW) from 61 plants/facilities located nationwide. Of the total renewable energy plants, hydropower (large and small) contributed the biggest share (63.77% of total renewable energy capacity mix) with installed capacity of 3,520.80 MW, followed by geothermal (33.46%) with 1,847.70 MW. Total dependable capacity from renewable energy resources stood at 4,539.50 MW (Table 2).

Gross power generation⁴ from these plants in 2012 amounted to 20,761 gigawatt-hours (GWh), which contributed 28 percent to the country's total power generation. Coal-powered plants remained the top producer of electricity since 2010, accounting for 39 percent. On the hand, natural gas had a contribution of 27 percent of the total power generation while oil-based generation only accounted 6 percent (Figure 3).

Philippines' Renewable Energy Plan. On June 14, 2011, the government through the DOE launched the National Renewable Energy Program (NREP) to steer the country in achieving the goals laid down under the Renewable Energy Act of 2008. The NREP sets targets for each renewable energy source including solar, wind, geothermal, hydro and ocean technologies within the timeframe 2011 to 2030. It targets to more than triple the country's renewable energy-based installed capacity to 15,234.30 MW by 2030 from 5,439 MW in 2010 (Table 3). Moreover, it contains a framework for action, existing and future measures, and instruments and policies for the promotion of renewable energy. It also includes a roadmap that will guide efforts towards actualizing the market penetration targets of each renewable energy source as well as the feed-in-tariffs (FIT)⁵ for sustainable energy generation.

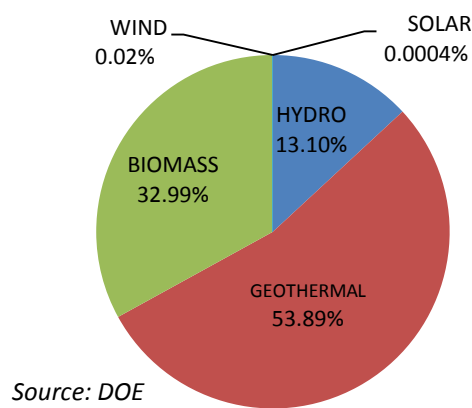
² Accordingly, the first project to go into operation will be the 10-MW Cabangan Ocean Energy Thermal Conversion (OTEC) Project in Zambales.

³ Installed capacity is the maximum capacity that a given plant/facility can generate while dependable capacity is the capacity of a plant/facility that can be relied upon to carry system load for a specified time interval and period.

⁴ Power generation is the amount of electricity a generator produces over a specific period of time. Many generators do not operate at their full capacity all the time, hence they may produce little. They may vary their output according to conditions at the power plant, fuel costs, or as instructed from the electric power grid operator.

⁵ FIT refers to a renewable energy policy that offers guaranteed payments on a fixed rate per kilowatt-hour (kWh) for renewable energy generation, excluding any generation for own use. The Energy Regulatory Commission (ERC) approved the initial FITs on July 27, 2012 which shall apply to generation from renewable energy sources, particularly to run-of-river hydro (PhP5.90/kWh), biomass (PhP6.63/kWh), wind (PhP8.53), and solar (PhP9.68/kWh) renewable energy projects.

Figure 2. Average Percentage Distribution of Renewable Energy in the Philippines, 2000-2012



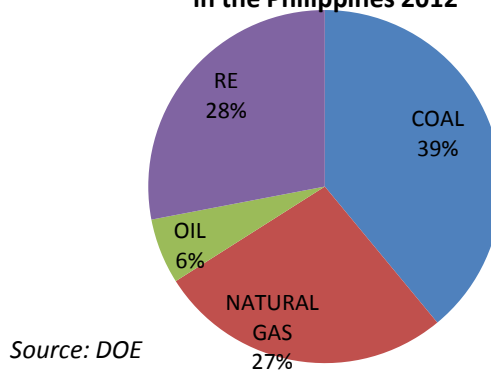
Source: DOE

Table 2. Renewable Energy Installed Capacity, 2012

Plant Type	No. of Plants	Installed (MW)	Dependable (MW)	Share (%) (Installed)
Large Hydro	20	3,469.50	2,941.20	63.77
Small Hydro	20	51.30	42.30	
Geothermal	10	1,847.70	1,461.90	33.46
Biomass	9	118.70	76.40	2.15
Wind	1	33.00	17.40	0.60
Solar	1	1.00	0.30	0.02
Total RE	61	5,521.20	4,539.50	100.00

Source: DOE

Figure 3. Power Generation by Source in the Philippines 2012



Source: DOE

Table 3. National Renewable Energy Program (Installation Targets)

Renewable Energy Resource	Installed Capacity (MW as of 2010)	Target Capacity Addition				Total Capacity Addition 2011-2030 (MW)	Total Installed Capacity by 2030 (MW)
		2015	2020	2025	2030		
Hydro	3,400.0	341.3	3,161.0	1,891.8	-	5,394.1	8,724.1
Geothermal	1,966.0	220.0	1,100.0	95.0	80.0	1,495.0	3,461.0
Biomass	39.0	276.7	-	-	-	276.7	315.7
Wind	33.0	1,048.0	855.0	442.0	-	2,345.0	2,378.0
Solar	1.0	269.0	5.0	5.0	5.0	284.0	285.0
Ocean	-	-	35.5	35.0	-	70.5	70.5
TOTAL	5,439.0	2,155.0	5,156.5	2,468.8	85.0	9,865.3	15,234.3

Source: DOE

Moving Forward. Prospects for renewable energy development in the Philippines are promising. With a renewable energy law and programs already in place, massive stock of renewable energy resources, and support from the government, the country's renewable energy targets can be realistically achieved. However, challenges besetting the renewable energy sector have to be addressed to fully realize its potential. Among these include: 1) high cost of renewable energy development due to limited number of local manufacturers, fabricators and suppliers of renewable energy equipment and components which are mainly imported; 2) limited options to optimize the development of resources because of a lack of an up-to-date database on renewable energy resources; 3) lack of capacity-building and training opportunities to enhance technical capabilities of stakeholders and potential developers; 4) need for stronger research and development (R&D) on renewable energy; 5) limited infrastructure support (i.e., transmission lines and submarine cables); and 6) limited information and education campaign activities on renewable energy that includes advocacy on its benefits (PDP 2011-2016).

Moreover, there is a need to fast track the implementation of renewable energy policy mechanisms provided under RA No. 9513 so as to encourage generation of renewable energy resources. In the 2013 report jointly conducted by the World Wide Fund for Nature (WWF) and the World Resources Institute (WRI) entitled "Meeting Renewable Energy Targets: Global lessons from the road to implementation", it was stated that several details and rules pertaining to the policy mechanisms under RA No. 9513 have been delayed and un-clarified due to oppositions from concerned stakeholders. Of the non-fiscal incentive mechanisms (i.e., FIT, net metering,⁶ renewable portfolio standards, green energy option, and renewable energy mark) that are provided under the law, only the FIT and net-metering have been finalized and approved. According to the report, the delays in policy actions have put various potential renewable energy projects at a standstill and place the country at risk to losing over US\$2.5 billion in potential renewable energy investments.

To effect positive changes in the renewable energy sector, it is also imperative to institutionalize social mobilization. All stakeholders from the private and public sectors should be engaged in decision-making and planning processes relating to policies, programs and legislations. Scaling up development efforts can only be achieved through a broad network of stakeholders working for a common goal. The sector cannot entirely move on the strength of an existing legal and policy environment but it equally and importantly needs financial and technology resources, as well as well-designed programs and projects (2008 Philippine Energy Summit Program of Action).

On the legislative front, seven bills⁷ that aim to initiate and promote the use and development of renewable energy resources are currently filed in the Senate in the 16th Congress. Senate Bill Nos. 566 and 647 propose the creation of a Solar Initiative Commission/Development Authority while SBNs 645 and 646 seek for the establishment of an Ocean and Wind Energy Development Authorities, respectively. SBNs 977 and 1346 respectively intend to further utilize geothermal power and make use of renewable energies in the agricultural sector while SBN 1332 seeks to support R&D for the utilization of diverse sources of energy. The enactment of these legislative proposals will certainly address the growing energy demands of the country as well as promote consciousness among Filipinos to protect the environment.

⁶ Net-metering allows customers of distribution utilities to install an on-site renewable energy plant/facility not exceeding 100 kW in capacity so they can generate electricity for their own use. The Rules Enabling the Net-metering Program for Renewable Energy was promulgated by the ERC on July 1, 2013.

⁷ SBNs 566, 1332 and 1346 were filed by Senator Miriam Defensor Santiago; SBNs 645, 646 and 647 by Senator Antonio "Sonny" Trillanes IV; and SBN 977 by Senator Jinggoy Ejercito Estrada.