



2022

POWER SITUATION REPORT



2021-2022 POWER DEMAND AND SUPPLY HIGHLIGHTS

GROSS
GENERATION

2022 - 111,516 GWh
2021 - 106,114 GWh
G.R. - 5.1%

ELECTRICITY
CONSUMPTION

PEAK
DEMAND

2022 - 16,596 MW
2021 - 16,036 MW
G.R. - 3.5%

CAPACITY

2022
INSTALLED: 28,258 MW
DEPENDABLE: 23,598 MW
2021
INSTALLED: 26,882 MW
DEPENDABLE: 23,855 MW

NEWLY OPERATIONAL
INSTALLED CAPACITY

2022 - 1,881 MW
2021 - 1,187 MW
DIFF. - 694 MW

POWER PROJECT
CAPACITY

2022
COMMITTED: 10,210 MW
INDICATIVE: 54,855 MW
2021
COMMITTED: 9,024 MW
INDICATIVE: 34,911 MW

TRANSMISSION

2022
SUBSTATION: 48,800 MVA
LINE LENGTH: 21,027 ckt-km
2021
SUBSTATION: 41,333 MVA
LINE LENGTH: 20,779 ckt-km

DISTRIBUTION

2022
SUBSTATION: 21,670 MVA
LINE LENGTH: 35,702 ckt-km
2021
SUBSTATION: 21,340 MVA
LINE LENGTH: 47,969 ckt-km



PEAK DEMAND

In 2022, the Philippines' total non-coincidental peak demand¹ reached 16,596 MW, which is 560 MW or 3.5% higher than the peak demand in 2021. Taking off from the height of the pandemic in 2020, this increase in demand is attributed to the ease of Government restrictions in the whole country and the gradual return to normalcy of economic activities that allows the recovery of the economy.

The lifting of COVID-19 pandemic restrictions paved the way for the recovery of different businesses and services in the country. This recovery also required a higher demand for electricity which caused the gradual increase of the total energy consumption in the country in the previous two years. Additionally, the travel restrictions set by different Local Government Units were relaxed resulting in demand growth in 2021 and 2022. Figure 1 shows the comparison between the recorded peak demand in 2022 and 2021 for the Luzon, Visayas, and Mindanao grids. Among these three, Luzon had the highest increase in peak demand of 537 MW in 2021 and 473 MW in 2022 as Metro Manila, the country's center for economic activity, recovered from the effects of pandemic.

Peak Demand

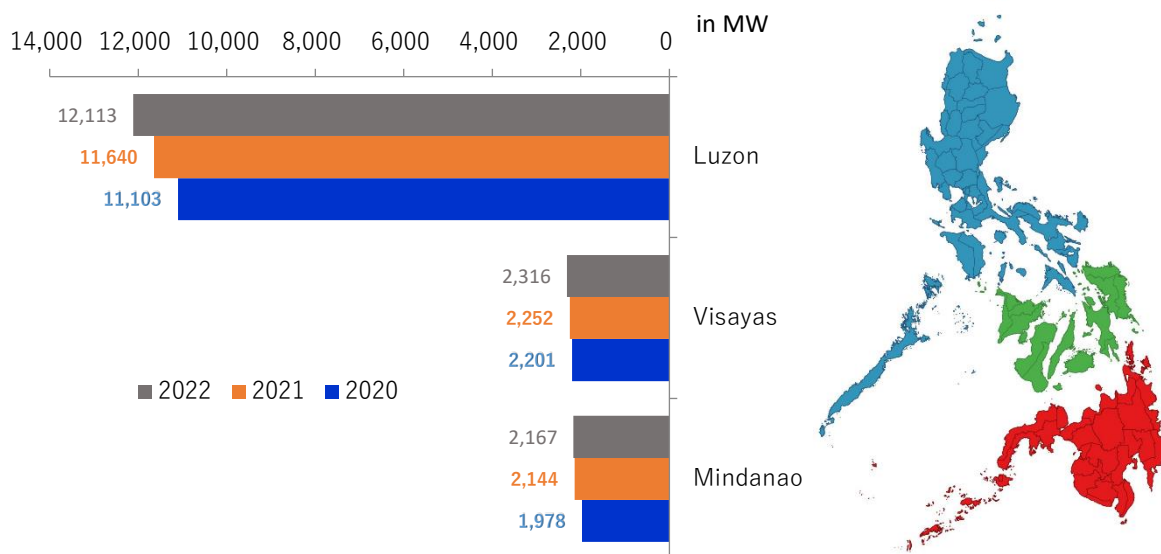


Figure 1. 2020-2022 Peak Demand Per Grid, in MW

The total non-coincidental Peak demand² was recorded and verified by the System Operator, showed that the Luzon grid contributed 12,113 MW or 72.98%, while Visayas and Mindanao contributed a share of 13.9% (2,316 MW) and 13.0% (2,167 MW) in 2022, respectively. Moreover, the Luzon Grid 11,640 MW peak demand shared 72.5%

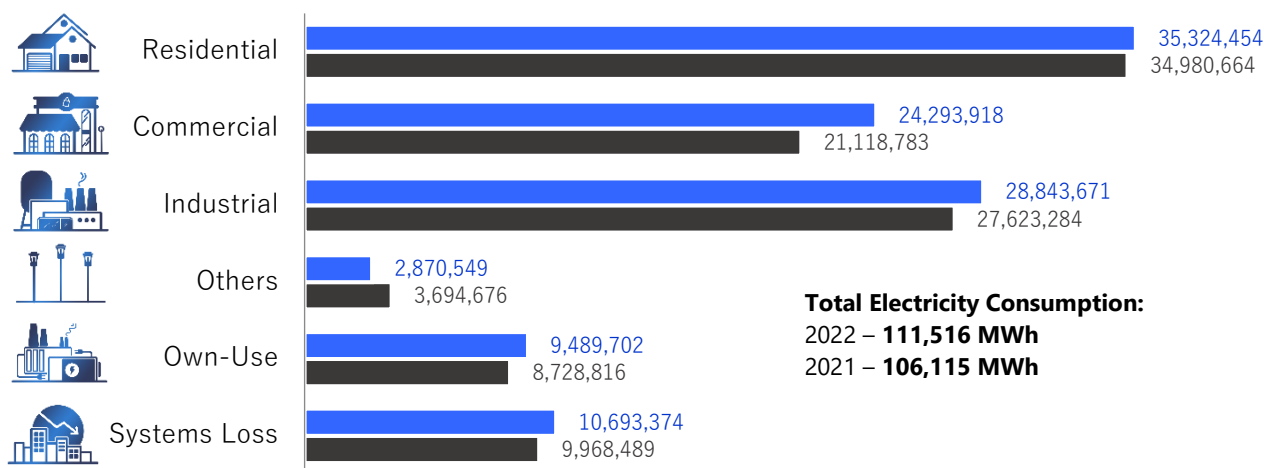
¹ Total non-coincidental peak demand of Luzon, Visayas and Mindanao grids

² Coincidental peak demand is defined as the peaking of each grid's demand at the same day/time, while the Non-coincidental peak demand is the peaking of each grid in a separate day/time.

of the total demand while Visayas and Mindanao have recorded a share of 14.0% (2,252 MW) and 13.3% (2,144 MW) in 2021, respectively.

ELECTRICITY SALES AND CONSUMPTION

The Philippines' Gross Domestic Product (GDP) reported an increase of 8.94% in 2021 following the year 2020 after the pandemic era and an increase of 7.6% in the full year of 2022. This is the result of the gradual opening of several businesses (small and large) in the country, especially in Metro Manila. Both the past two years' GDP met and exceeded the target economic growth of 5.6% in 2021 and 7.6% in 2022. Similarly, the country's total electricity consumption manifested an increase of 6.2% from 2021 to 2022. Figure 2 shows the increase in electricity consumption, especially by the commercial sector, following the impact of the pandemic which usually ranges from 4,000 MWh to 6,000 MWh over the last five years.



*Note: Numbers may not sum up to total due to rounding off
 "Others" refer to public buildings, streetlights, irrigation, agriculture, and "others not elsewhere classified."*

Figure 2. 2022 vs. 2021 Electricity Consumption by Sector, in MWh

Based on the figure above, there were significant changes in electricity consumption during these two consecutive years. The residential sector accounted for a smaller increase with a difference of 344 MWh in 2021, while the industrial sector recorded an increase of 1,220 MWh. However, the commercial sector leads in terms of increased consumption among all the sectors, moving up by 3,175 MWh as many establishments and buildings went back to normal operation from being forced to close down due to quarantine restrictions that lowered their energy consumption in the previous year significantly. The increase can be attributed to the use of high-voltage cooling equipment, lighting, elevators and escalators in malls and corporate offices, which spiked the total consumption.

Power Plant “Station Use” and “Systems Loss” comprising of transmission and distribution losses, also contributed to the upturn in electricity consumption by an increase of 8.7% and 7.2%, respectively. The other customers, with the accumulated consumption which compose of streetlights, irrigation, agriculture, public or government infrastructures and “others not elsewhere classified,” posted a decrease of 22.3% from 2021, which is attributed to the gradual closing of several public infrastructures and establishments used as quarantine and isolation facilities as the country recovers from the COVID pandemic. Likewise, the decrease also accounts to the declaration of alternative work arrangements such as skeletal workforce and work-from-home setups in either private companies or government agencies.

Table 1. 2022 Electricity Consumption of Distribution Utilities, in GWh

TYPE OF DISTRIBUTION UTILITIES	LUZON	VISAYAS	MINDANAO	PHILIPPINES
Private Investors Owned Utilities (PIOU's)				
Residential	18,706	1,483	1,486	21,675
Commercial	18,409	483	563	19,455
Industrial	14,767	2,723	2,649	20,139
Others	200	75	43	318
Total Sales	52,082	4,763	4,742	61,586
Own-Use	68	5	2	76
System Loss	3,148	358	378	3,885
Total	55,298	5,126	5,122	65,546
Electric Cooperatives (EC's)				
Residential	6,986	3,264	3,400	13,650
Commercial	2,542	1,219	1,078	4,839
Industrial	1,708	1,046	2,007	4,761
Others	948	549	480	1,977
Total Sales	12,184	6,079	6,964	25,227
Own-Use	27	13	15	55
System Loss	1,397	642	1,098	3,138
Total	13,608	6,734	8,077	28,419
Non-Utilities/ Directly Connected	3,088	942	192	4,222
Other Services	1,564	82	34	1,680
Plant Station Used	4,985	1,729	1,264	7,978
Transmission Losses	2,326	561	784	3,671
Total Electricity Sales & Consumption	80,868	15,175	15,473	111,516
Main Grid Electricity Sales & Consumption	79,492	15,060	15,274	109,826
Off-Grid Electricity Sales & Consumption	1,376	115	198	1,689

Note: Including Off-Grid Sales and Consumption

Source: 2022 Distribution Utilities Electricity Sales and Consumption

Table 2. 2022 and 2021 Comparative Electricity Consumption per Grid, Philippines (in GWh)

Grid	PHILIPPINES					
	2022		2021		Difference	
	GWh	% Share	GWh	% Share	GWh	% Growth Rate
Luzon	80,868	72.5%	76,753	72.3%	4,115	5.4%
Visayas	15,175	13.6%	14,757	13.9%	417	2.8%
Mindanao	15,473	13.9%	14,604	13.8%	868	5.9%
Philippines	111,516	100.0%	106,115	100.0%	5,401	5.1%

The country's total electricity consumption in 2022 continued to exhibit an upward trend to 111,516 GWh recording a 5.1% growth rate from 2021. Among the three regions, Luzon posted the highest electricity consumption at 72.5% share or 80,868 GWh while Mindanao, the second highest accounted for 15,473 GWh or 13.9% overall share, and lastly the Visayas with 15,175 GWh or 13.6% share. In line with the increasing trend in electricity demand, as the economy recovers after the pandemic, Luzon had the highest increase in electricity consumption among the three regions with a 4,115 GWh difference compared to 2021 level posting a growth rate of 5.4%. Also, Visayas and Mindanao's energy consumption boomed at a growth rate of 2.8% and 5.9% significantly higher than their previous growth rate from 2020. All these three regions experienced a growth rate which indicates that the economy is gradually moving towards the post-pandemic era. Electricity sales and consumption in off-grid areas also contributed a share of 1,376 GWh or 1.2% of the country's total production. The country's total sales and consumption in electricity continued to increase with 111,516 GWh or 5.1% growth rate from 2021.

SUPPLY

The country's total installed capacity had increased by 5.1% from 26,882 MW in 2021 to 28,258 MW in 2022 while the total dependable capacity decreased by 1.1% from 23,855 MW to 23,598 MW in 2022. The renewable energy power plants led the expansion of installed capacity, mostly of which were solar and biomass, located across the country. Likewise, the coal-fired power plants contributed largely to the installed capacity at a share of 44.0%, followed by renewable energy with 29.2% share, oil-based with 13.6% share, and natural gas with a lesser 13.2% share on the coverage years. As the year 2022 ended, a total of 1,376 MW of installed capacity was added to the nation's power supply which was mainly composed of coal (759 MW), solar (213 MW), biomass (122 MW), and geothermal (24 MW). The off-grid areas added a total of 31 MW installed capacity that came from diesel power plants.

Newly operational power plants, uprating and derating, mothballed power plants and own-use power plants contributed to the changes in the total installed and dependable capacity annually.

Table 3. 2022 Total Installed and Dependable Capacity per Technology, Philippines (in MW)

Fuel Type	Installed		Dependable	
	2022	2021	2022	2021
Coal	12,428	11,669	11,504	10,913
Oil Based	3,834	3,847	2,860	2,650
Natural Gas	3,732*	3,453	2,081**	3,286
Renewable Energy (RE)	8,264	7,914	7,151	7,005
<i>Geothermal</i>	1,952	1,928	1,763	1,753
<i>Hydro</i>	3,745	3,752	3,444	3,500
<i>Biomass</i>	611	489	382	291
<i>Solar</i>	1,530	1,317	1,150	1,034
<i>Wind</i>	427	427	412	427
TOTAL	28,258	26,882	23,598	23,855
BESS	145	10	145	10

NOTE: Includes Off-Grid generators

*2022 Installed Capacity for Natural Gas was adjusted based on the nameplate rating of power plants

**2022 Dependable Capacity for Natural Gas was reduced due to the end of the cooperation period of 1,200 MW Ilijan NGPP in June 2022.

Table 4. 2022 Total Installed and Dependable Capacity per Grid and Off-Grid, Philippines (in MW)

GRID	Installed			Dependable		
	Grid	Off-grid	Total	Grid	Off-grid	Total
Luzon	19,744	516	20,260	16,320	419	16,739
Visayas	3,972	66	4,038	3,340	58	3,398
Mindanao	4,542	91	4,633	3,938	71	4,009
TOTAL	28,258	673	28,931	23,598	548	24,146

Table 5. 2022 and 2021 Summary of Newly Operational Capacities per Technology, Philippines (in MW)

Fuel Type	2022		2021	
	Installed	Dependable	Installed	Dependable
Coal	759	591	725	668
Oil Based	0	210	0	0
Natural Gas	279	0	0	0
Renewable Energy (RE)	350	147	297	180
<i>Geothermal</i>	24	9	0	0
<i>Hydro</i>	0	0	0	0
<i>Biomass</i>	122	92	42	5
<i>Solar</i>	213	116	298	217
<i>Wind</i>	0	0	0	0
TOTAL	1,746	1,165	1,362	1,070
BESS	135	135	0	0

*31 MW and 28 MW installed and dependable capacity, respectively, from off-grid.

Note: Numbers may not sum up to the total due to rounding off.

GENERATION

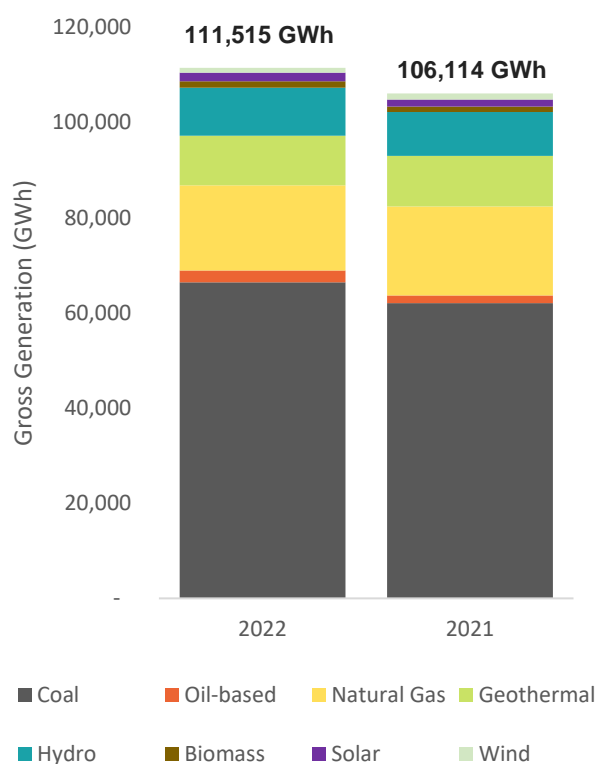


Figure 3. 2022 vs. 2021 Gross Generation, in GWh

As a result of the declining severity of the COVID-19 pandemic, easing up of travel restrictions and economic activities, an immediate increase in electricity generation was significantly recorded. The country's gross power generation escalated from 106,114 GWh in 2021 to 111,515 GWh in 2022, which is equivalent to 5,401 GWh or a 5.0% growth rate. The Luzon grid contributed the largest part of generation at 79,820 GWh (on-grid) and 1,430 GWh (off-grid). as it is the most restored region in the country. On the other hand, Visayas and Mindanao Grid each recorded 14.5% and 13.87%, respectively. Coal-generated facilities, as usual, became the most dominant technology among others by increasing its share to 59.6% in 2022. Natural gas generation decreased by 791 GWh or 4.2% due to

the end of cooperation of the 1,200 MW Ilijan Natural Gas-Fired Power Plant's in mid-2022 and the declining supply of domestic natural gas, while hydro increased by 9.8%. Biomass and Solar both climbed the energy mix by 13.5% and 23.9% each from 2021. No additional power generation in terms of Geothermal and Wind technology as shown in Figure 3 were registered.

POWER PROJECTS

Table 6. Committed and Indicative Capacities, Philippines, as of 31 December 2022 (in MW)

Fuel Type	Committed			Indicative		
	No. of Proponents	Capacity (MW)	% Share	No. of Proponents	Capacity (MW)	% Share
Coal	6	3,685	36.0	3	1,520	2.8
Oil-Based	3	42	0.4	5	335	0.6
Natural Gas	3	3,500	34.3	8	9,090	16.6

Fuel Type	Committed			Indicative		
	No. of Proponents	Capacity (MW)	% Share	No. of Proponents	Capacity (MW)	% Share
Renewable Energy (RE)	53	2,983	29.2	165	43,910	80.0
<i>Geothermal</i>	3	74	0.7	4	316	0.6
<i>Hydro</i>	24	270	2.6	52	7,959	14.5
<i>Biomass</i>	7	49	0.5	4	79	0.1
<i>Solar</i>	15	2,317	22.7	71	13,391	24.4
<i>Wind</i>	4	273	2.7	34	22,164	40.4
TOTAL	65	10,210	100.0	165	54,855	100.0
BESS	5	2,080		12	1,781	

NOTE: Numbers may not sum up to total due to rounding off.

As the country's economy began recovering after the pandemic, private sector investments in power generation projects also showed an upward trend.

As shown in Table 6, committed power project capacities reached 10,210 MW by the end of 2022. About 70% of these total capacities will be supplied by coal and natural gas which serves as the baseload capacity of the system. The remaining 30% is from renewable energy and oil-based power projects.

Meanwhile, the indicative power projects stood at 54,855 MW by the end of 2022, largely composed of renewable energy (80%) with contributions of natural gas (16.6%), coal (2.8%), and oil-based power projects (0.6%). On top of that, the Energy Storage System (ESS) reached a committed capacity of 2,080 MW and a 1,781 MW capacity that will come from indicative power projects.

The term 'Committed Power Projects' refers to projects that have already secured its firm financial closing, already in construction stage, or Green Energy Auction (GEA) - awarded projects. Whereas the term 'Indicative Power Projects' refers to projects that are in the pre-development stage, secured its Clearance to Undertake System Impact Study (SIS) to the NGCP and are consistently submitting its Monthly Accomplishment Report (MAR) to the DOE.



SIGNIFICANT INCIDENTS


Aside from the natural calamities and other local issues that affect the power situation in the Philippines, international events also have its cascading effects on the power sector specifically on imported fuels such as coal, liquid fuel and liquified natural gas (LNG). In January 2022, Indonesia banned coal exports for a month due to the non-compliance with the Domestic Market Obligation (DMO) policy whereby coal miners are required to supply 25% of annual production to domestic power plants. This resulted in an impending fuel shortage in the country, which was resolved after the lifting of the ban. However, it caused inventory shortfall and increased cost of coal importation.

There was also the Russia's invasion of Ukraine which began on the morning of 24 February 2022. The invasion was internationally condemned and many countries imposed sanctions against Russia and increased existing sanctions. The sanctions are aimed to hit Russia's financial, energy, and transport sectors, and include export controls and trade financing bans. The sanction of fuel exports affected the value chain and disrupted the supply and demand balance which also resulted in higher costs of fuel such as liquid fuel and LNG that added to the already increasing cost of coal that the Philippine power plants were importing from other countries. Thus, the higher cost of fuel also increased the electricity prices in the country.

LUZON

In 2021, the Luzon grid experienced eight (8) yellow alerts in the months of May, June, July and October while there were three (3) red alerts for the months of May and June. Most of the alerts were mainly attributed to the higher system demand in the summer months, series of unplanned outages, and output derating of power plants due to the Malampaya gas restriction and other technical issues. Further, the delays in commercial operation of committed power projects, caused by the community quarantine restrictions, have attributed to the tight power/supply situation in Luzon. The 20-day scheduled maintenance shutdown of the Malampaya facility—which was extended for three (3) days because of delayed repair works at its onshore platform's flare tip last October 2021—also affected the supply and cost of electricity since it supplies fuel to around 40 percent of gas-fired plants in Luzon. The delay was caused by the Tropical Storm Maring. The affected power plants were operated using more expensive liquid fuel during the shutdown.

In 2022, the Luzon grid experienced an increase in the number of yellow alerts to fifteen (15) as compared to 2021, meanwhile, three (3) red alerts were declared in the months of June, September, and November for 2022—same number as in the year 2021. These alerts were triggered by transmission line tripping that caused the shutting down of several large power plants connected to these transmission lines in addition



to the ongoing unplanned outages and deratings of other large power plants. Even though the transmission lines were already restored immediately, the thermal power plants were not capable of instantly synchronizing to the grid. There were also problems encountered during the start-up of these power plants which were possibly caused by the emergency shutdown, thereby extending the alert status of the grid for several days.

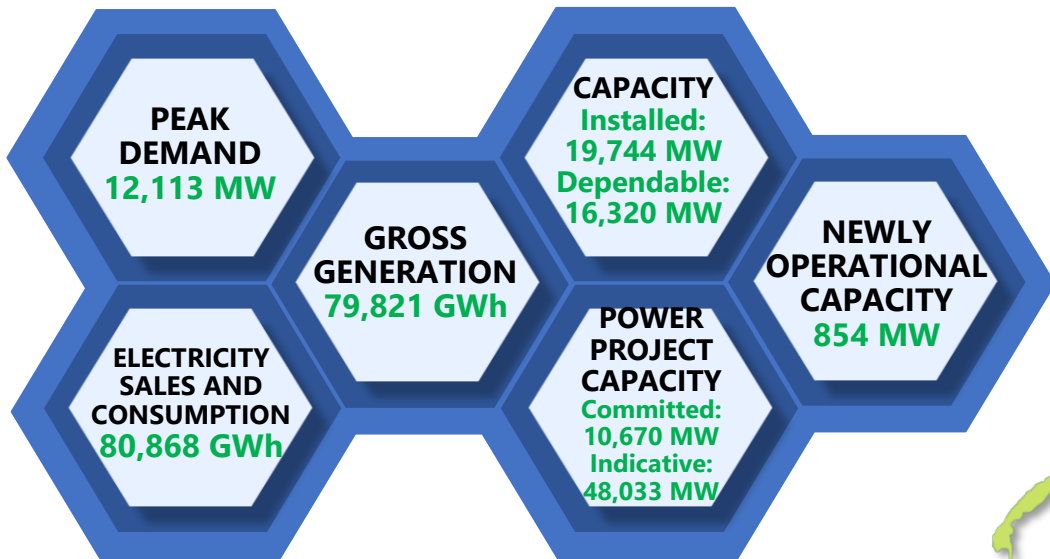
VISAYAS

A total of five (5) yellow alerts were recorded in the Visayas grid for the years 2021 and 2022. There was one (1) yellow alert for 2021 on 18 June 2021 while there were four (4) yellow alerts for 2022 on the following dates: 26 March 2022, 5 December 2022, 6 December 2022, and 7 December 2022. These were triggered by capacity reserves being below the system reserve requirement due to forced outages of power plants. The yellow alerts for 2022 in the Visayas also coincide with the occurrence of yellow alert in Luzon affecting the power supply transferred to Visayas through the HVDC Luzon-Visayas Interconnection. Moreover, one (1) red alert occurred on 5 October 2021 when a massive power outage transpired in Negros and Panay Islands due to the tripping of multiple power plants which caused the Under Frequency Relay (UFR) and System Integrity Protection Scheme (SIPS) activation. On 31 March 2022, a red alert status was also issued due to the overloading of Cebu-Negros Submarine Line 2. Several grid disturbances were still experienced because of power plant and line tripping which resulted in load-dropping incidents and momentary power interruptions.

MINDANAO

Several natural calamities, such as earthquakes and typhoons, as well as man-made disasters affected various generation, transmission and distribution facilities in Mindanao. However, there were still no recorded yellow and red alert occurrences for three consecutive years (2020-2022) due to the current oversupply situation in the region. The COVID-19 pandemic and local community quarantine restrictions still brought significant demand reduction and numerous power plants remained on reserve shutdown. The extension of the pandemic caused additional delays in the Mindanao-Visayas Interconnection Project and commercial operation of the Wholesale Electricity Spot Market – Mindanao. These key projects were envisioned to address the current oversupply situation and frequent manual load-dropping incidents caused by the over/under the nomination of customers operating the current bilateral dispatch protocol in Mindanao.

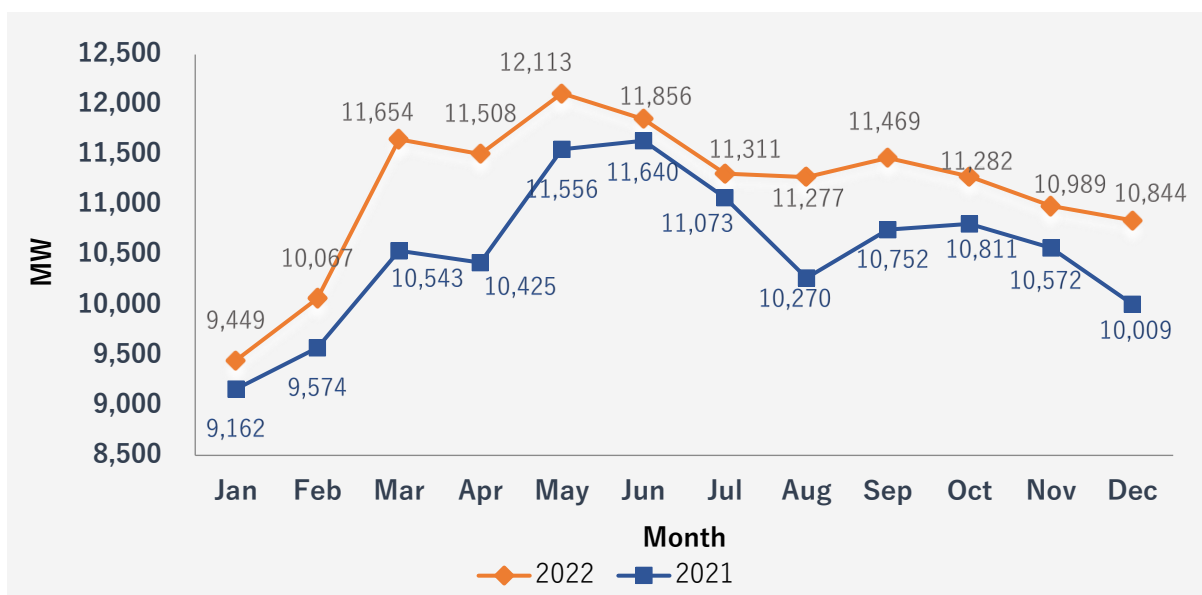
LUZON



*excluding off-grid generators

Peak Demand and Electricity Consumption

Due to the lifting of quarantine restrictions, the peak demand in the Luzon grid, increased in the past two years brought by the gradual opening of several businesses that were forcedly closed by the pandemic. The peak demand in Luzon increased to 12,113 MW for 2022 or equivalent to 4.1% growth rate from the 2021 peak demand of 11,640 MW. These levels, however, are still below the Power Development Plan (PDP) Forecasts. As indicated in Figure 4, it is highly recognizable that the highest peak demand was recorded in the month May for 2022 and June for 2021. The graph shows that the peak demand began to recover in these years as the economy in the country resumed.



Source: NGCP

Figure 4. 2022 vs. 2021 Peak Demand, Luzon (in MW)

2022 and 2021 Electricity Sales and Consumption (in GWh)

In terms of electricity consumption, the Luzon grid had the highest surge in electricity sales and consumption at 3,248 GWh or 4.4% growth rate from 2020 to 2021 and a substantial increase of 4,115 GWh or 5.4% growth rate from 2021 to 2022. These growth rates are considered normal because of the significant increase of demand in commercial and industrial sectors, in which they obtained a growth of 2.1% and 10.7% in 2021, and a growth of 15.3% and 1.5% in 2022, respectively.

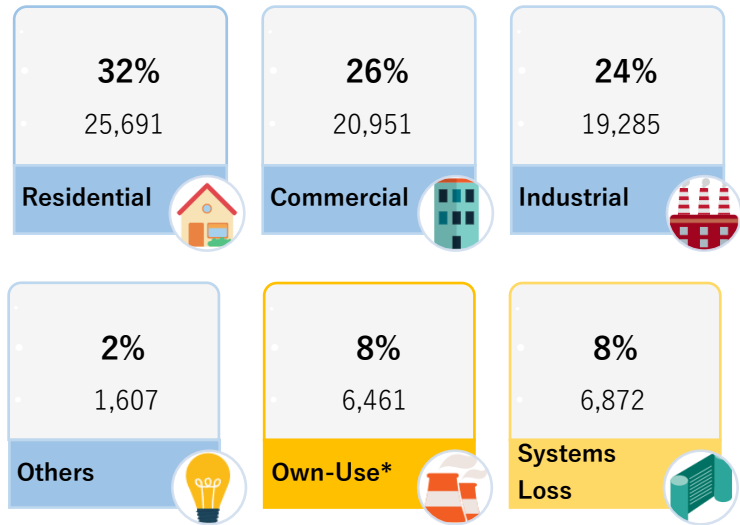


Figure 5. 2022 Electricity Consumption, Luzon (in Percent Share and GWh)

The sector specified as Others which includes streetlights, public buildings, etc., had an increase of 724 GWh or 62.0% growth rate in 2021 and a decrease of 288 GWh or -15.2% in 2022. Also, in terms of Systems Losses, increases of 123 GWh in 2021 and 80 GWh in 2022 were recorded for electricity sales and consumption. Additionally, the Own-use sector decreased consumption by 212 GWh or 3.7% in 2021 and had an increase of 920 GWh or 16.6% growth rate in the following year.

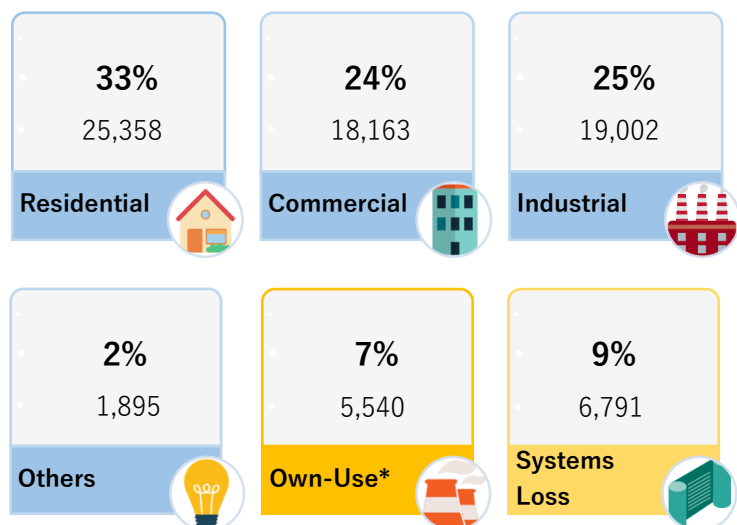


Figure 6. 2021 Electricity Consumption, Luzon (in Percent Share and GWh)

These numbers are based on the accounted electricity sales of DUs and ECs throughout the country. Meanwhile, Systems Loss and Own-use are included as these were also taking a significant number in the overall electricity consumption for both 2021 and 2022.

Installed and Dependable Capacity

Installed capacity in the Luzon Grid recorded a growth of 6.4% or 1,187 MW from 18,557 MW in 2021 to 19,744 MW in 2022, as indicated in Table 7.

Table 7. Existing Installed and Dependable Capacity, as of 31 December 2022 (in MW)

Fuel Type	Installed		Dependable	
	MW	Percent Share (%)	MW	Percent Share (%)
Coal	8,748	44.3	8,170	50.1
Oil Based	2,357	11.9	1,639	10.0
Natural Gas	3,731	18.9	2,081	12.8
Renewable Energy	4,909	24.9	4,429	27.1
<i>Geothermal</i>	<i>865</i>	<i>4.4</i>	<i>769</i>	<i>4.7</i>
<i>Hydro</i>	<i>2,542</i>	<i>12.9</i>	<i>2,416</i>	<i>14.8</i>
<i>Biomass</i>	<i>206</i>	<i>1.0</i>	<i>141</i>	<i>0.9</i>
<i>Solar</i>	<i>959</i>	<i>4.9</i>	<i>767</i>	<i>4.7</i>
<i>Wind</i>	<i>337</i>	<i>1.7</i>	<i>337</i>	<i>2.1</i>
2022 TOTAL	19,744	100.0	16,320	100.0
BESS	73		73	
2021 TOTAL	18,557		16,541	

Note: Excluding off-grid generators

Source: DOE 2022 Annual Power Statistics

Summarized below are the power plants that commercially operated in 2021 and 2022.

Table 8. 2022 and 2021 Newly Operational Power Plants, Luzon

POWER PLANT		CAPACITY, MW		LOCATION	OPERATOR
Facility Name	Subtype	Installed	Dependable	Municipality/Province	
DINGININ U1	Super Critical Coal	725.0	668.0	Mariveles, Bataan	GNPower Dinginin Ltd. Co.
DINGININ U2	Super Critical Coal	725.0	668.0	Mariveles, Bataan	GNPower Dinginin Ltd. Co.

POWER PLANT		CAPACITY, MW		LOCATION	OPERATOR
Facility Name	Subtype	Installed	Dependable	Municipality/ Province	
HYPERGREEN RICE HUSK-FIRED	Rice Husk-fired Cogeneration Plant	12.0	10.0	Bocau, Bulacan	Hypergreen Energy Corporation
STA.RITA SOLAR (Phase 3B)	Ground Mounted Solar PVs	34.4	27.5	Subic Bay, Zambales	Jobin-Sqm Inc. (JOBIN)
PETROSOLAR 2	Ground Mounted Solar PVs	20.0	16.5	Tarlac City, Tarlac	PetroSolar Corporation
STA ROSA SOLAR	Ground Mounted Solar PVs	60.1	48.1	Concepcion, Tarlac	Terasu Energy Inc.
BATAAN SOLAR ENERGY PROJECT	Ground Mounted Solar PVs	4.4	3.7	Mariveles, Bataan	Bataan Solar Energy, Inc. (BSEI)
ARAYAT-MEXICO SOLAR POWER PLANT	Ground Mounted Solar PVs	72.0	51.0	Arayat, Pampanga	Grencore Power Solutions 3, Inc.
BUTAO IRRIGATION DROP	Run-of-River type HEPP	1.4	1.2	San Manuel, Pangasinan	Mindoro Grid Corporation
MAN-ASOK	Run-of-River type HEPP	3.24	3.24	Buguias, Benguet	Benguet Electric Cooperative, Inc.
INARIHAN	Run-of-River type HEPP	1.6	1.6	Naga City, Camarines Sur	Bicol Hydropower Corp.
ALAMINOS BESS	BESS	60.0	60.0	Alaminos, Laguna	Giga Ace 4, Inc. (GA4I)
TOTAL		1,719.1	1,558.8		

Note: Excluding off-grid generators

Source: DOE List of Existing Power Plants as of 31 December 2022

Gross Generation

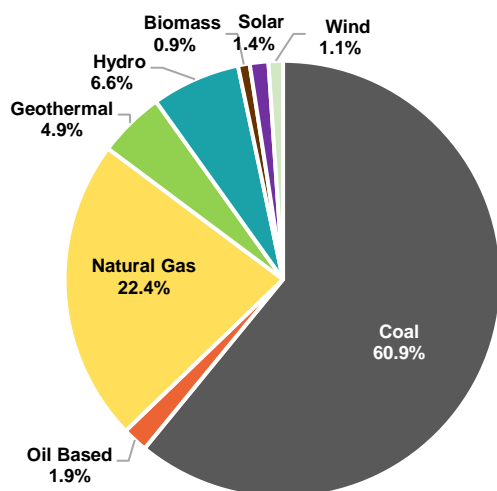


Figure 7. 2022 Gross Generation, Luzon

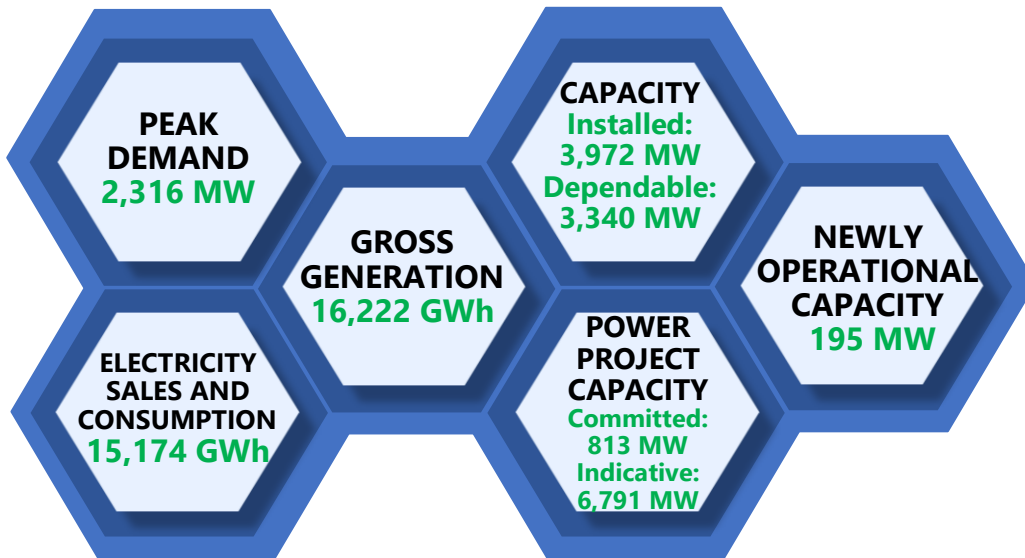
The 2022 Luzon Grid's gross generation reached 79,821 GWh, which indicated a growth rate of 6.1% from the previous year. With coal-fired power plants having a 60.9% share in the generation mix, it is still the most dominant among all other technologies with an increase of 6.3% in 2021 and 12.7% in 2022. Oil-based power generation has also significantly increased by 51.3% from 996 GWh in 2021 to 1,507 GWh in 2022. On the other hand, natural gas generating facilities share decreased by 4.2% from 2021's generation. Still, the power generation mix in the Luzon Grid was dominated by coal and natural gas in previous years.

Table 9. Summary of Committed and Indicative Power Projects in Luzon, as of 31 December 2022 (in MW)

Type of Power Plant	Committed Capacity (MW)	% Share	Indicative Capacity (MW)	% Share	No. of Commenced Projects
Coal	3,280	35.8	1,400	3.0	1
Oil-Based	11	0.1	210	0.4	0
Natural Gas	3,500	38.2	8,490	18.0	0
Renewable Energy	2,379	25.9	37,153	79.0	9
Geothermal	66	0.7	190	0.4	0
Hydro	147	1.6	6,817	14.4	3
Biomass	9	0.1	17	0.04	1
Solar	1,897	20.7	12,575	26.6	5
Wind	260	2.8	17,554	37.1	0
2022 TOTAL	9,170	100.0	47,253	100.0	10
BESS	1,500		780		1
2021 TOTAL	8,303		30,049		

Note: Numbers may not sum to total due to rounding off.

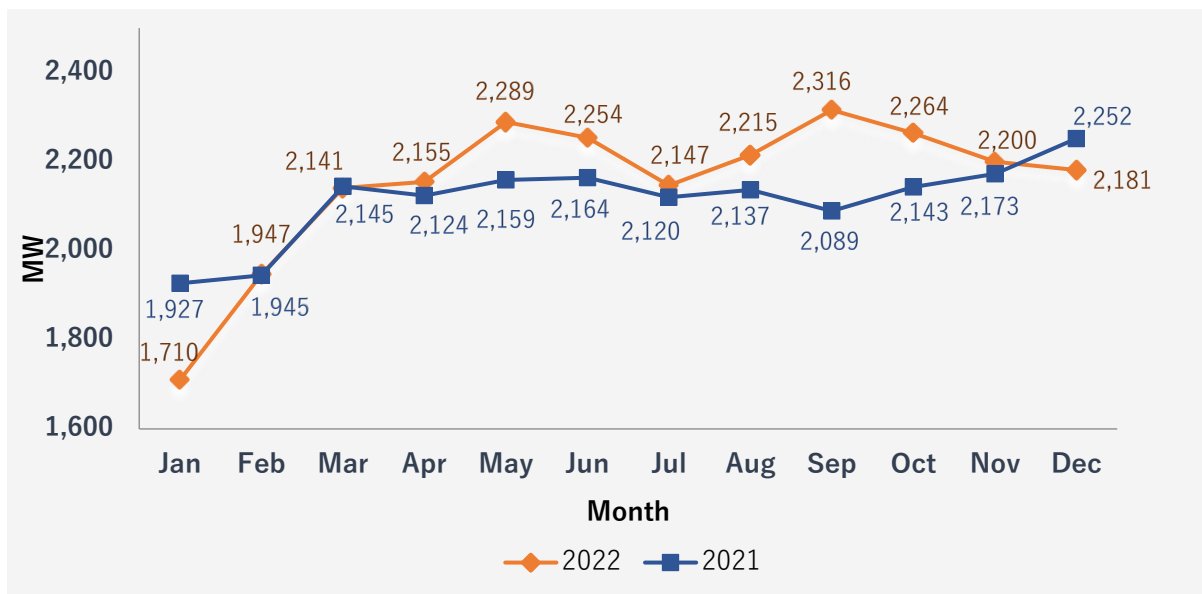
VISAYAS



*excluding off-grid generators

Peak Demand and Electricity Consumption

The Visayas' 2022 peak demand also started to rise as several areas were already recovering from the widespread pandemic. The peak demand in the Visayas Grid for 2022 was recorded at 2,316 MW that occurred on 14 September 2022.



Source: NGCP

Figure 8. 2022 vs. 2021 Peak Demand, Visayas (in MW)

2022 and 2021 Electricity Sales and Consumption (in GWh)

In 2022, the Visayas electricity consumption significantly increased by 417 GWh or 2.8% higher than the previous consumption in 2021. Commercial and Industrial end-users were the most intensified sector in the electricity sales and consumption after the occurrence of the COVID-19 pandemic in the region accounting for a growth of 23.7% and 12.2%, respectively.

Still, the main consumer of electricity in Visayas remains the residential sector with an accumulated 4,746 GWh or equivalent to 31.3% of the total electricity consumption in 2022 and 4,708 GWh or 32% of the total consumption in 2021. Own-use in Visayas decreased by 4.9% in 2022 as shown in Figure 9 while the Systems Loss rose by 14.5% or a total of 1,561 GWh.

With regard to the 2021 consumption of the region, there was a 39.2% change in 'Others' sector which comprised of public buildings, streetlights, etc. from 2020 to 2021. This is considered as the lowest energy-consuming sector among others with a total of 1,274 GWh of consumption. Systems Loss posted a modest 0.6% growth rate from its previous year level. Residential increased 1.7% from 4,630 GWh to 4,708 GWh which indicates that amid the improving situation of health restrictions, people are more likely to stay at home, especially those who have work-from-home setup in order to prevent contracting the widespread disease.

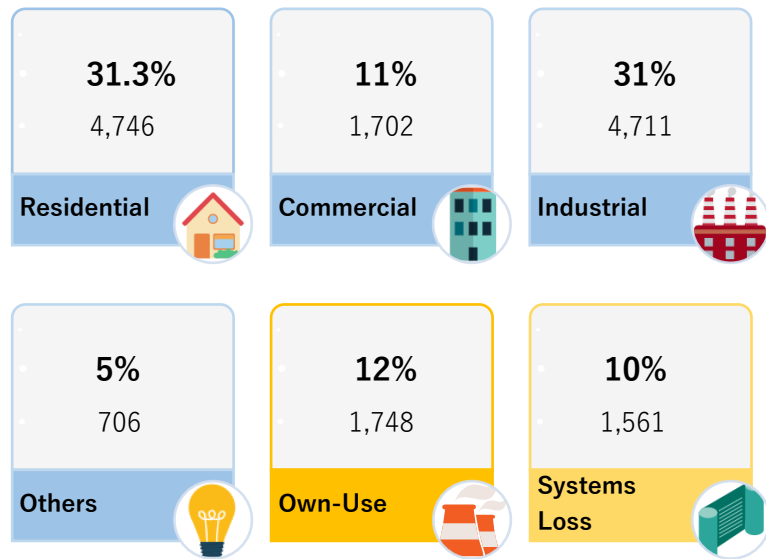


Figure 9. 2022 Electricity Sales and Consumption, Visayas (in Percent Share and GWh)

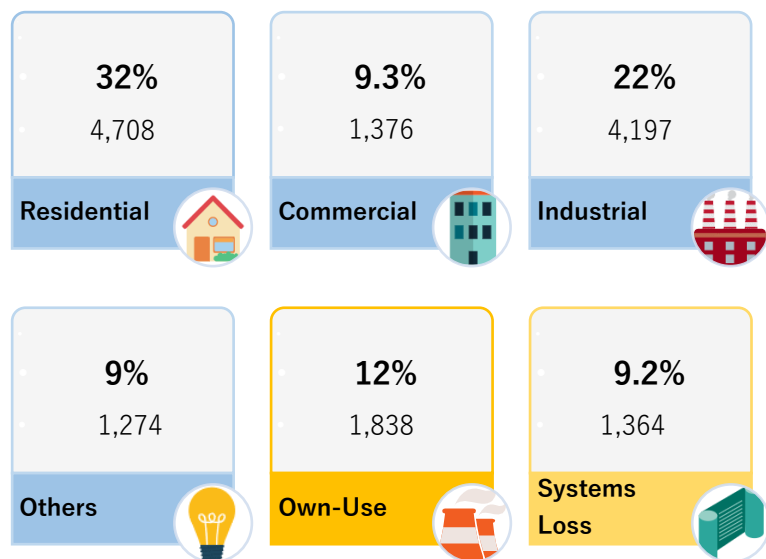


Figure 10. 2021 Electricity Sales and Consumption, Visayas (in Percent Share and GWh)

Installed and Dependable Capacity

The Visayas has a relatively slow capacity growth for the previous years of 2021 and 2022 because of its minimal increase from 2020 as the entry of investments for power generation is rare in the region. Installed capacity from 2020 to 2021 has a negative growth of 1.3% that is equivalent to 49 MW difference due to the decrease in capacity in Oil-based power plants due to the delisting of the TVI's Cebu Land Based GT on the List of Existing Power Plants prior the Decommissioning/Mothballing Policy publication. While in 2022, there is a 4.1% rise of installed capacity accounting to the commercial operation of both RE plants and coal-fired power plants with a total capacity of 158 MW.

Table 10. Existing Installed and Dependable Capacity, as of 31 December 2022 (in MW)

Fuel Type	Installed		Dependable	
	MW	Percent Share (%)	MW	Percent Share (%)
Coal	1,412	35.6	1,293	38.7
Oil Based	644	16.2	514	15.4
Natural Gas	1	0.0	0	0.0
Renewable Energy	48.2	24.9	1,532	45.9
<i>Geothermal</i>	975	24.5	888	26.6
<i>Hydro</i>	36	0.9	26	0.8
<i>Biomass</i>	326	8.2	213	6.4
<i>Solar</i>	487	12.3	331	9.9
<i>Wind</i>	90	2.3	75	2.2
2022 TOTAL	3,972	100.0	3,340	100.0
BESS	22		22	
2021 TOTAL	3,814		3,333	

Note: Excluding off-grid generators

Source: DOE 2022 Annual Power Statistics

Table 11. 2022 and 2021 Newly Operational Power Plants, Visayas

POWER PLANT		CAPACITY, MW		LOCATION	OPERATOR
Facility Name	Subtype	Installed	Dependable	Municipality/ Province	
ISABEL MODULAR DIESEL ANCILLARY SERVICE POWER PLANT	Modular Diesel	86.3	70.7	Isabel, Leyte	Isabel Ancillary Services Co. Ltd. (IASCO)
TUBIG HEPP	Run-of- River type HEPP	15.9	15.9	Taft, Eastern Samar & Hinabangan, Samar	Taft Hydroenergy Corporation
SAN CARLOS BIOPOWER (SCBP)	Biomass- fired power station	20.0	18.0	San Carlos City, Negros Occidental	San Carlos Biopower, Inc.
SOUTH NEGROS BIOPOWER	Biomass- fired power station	25.0	22.4	La Carlota City, Negros Occidental	South Negros Biopower, Inc.
NORTH NEGROS BIOPOWER	Biomass- fired power station	25.0	22.4	Manapla, Negros Occidental	North Negros Biopower, Inc.
KABANKALAN BESS	Lithium-Ion Battery Energy Storage System	22.5	22.5	Kabankalan, Negros Occidental	SMCGP Philippines Energy Storage Co. Ltd.
TOTAL		194.7	171.9		

Note: Excluding off-grid generators

Source: DOE List of Existing Power Plants as of 31 December 2022

Gross Generation

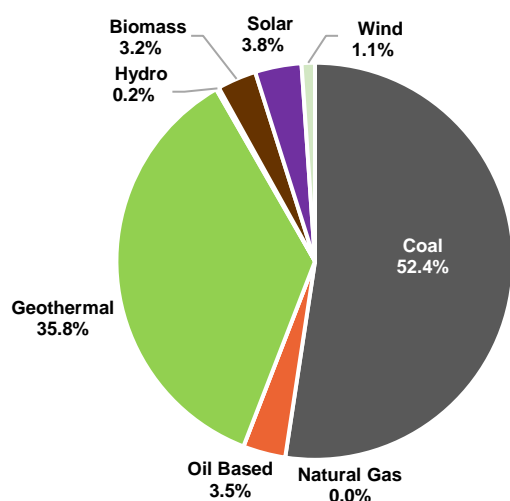


Figure 11. 2022 Gross Generation, Visayas

As shown in Fig. 11, power plants in Visayas generated a total of 16,267 GWh of electricity in 2021, which is much lower than the previous year in 2020. A large portion of the electricity generation from coal-fired power plants accounted for 8,999 GWh of electricity. Oil-based power plants showed a significant 57.0% increase from 2020 to 2021 that is equivalent to 467,659 MWh and a 20.3% increase from 2021 to 2022 that is equivalent to 562,561 MWh, comprised solely of Diesel power plants. Electricity generated by natural gas power plants remained at zero as of this writing. In terms of RE, hydro and wind are the only power plants that have increased

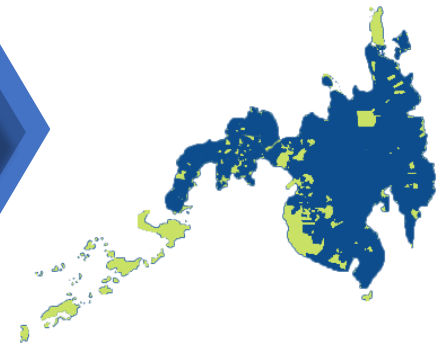
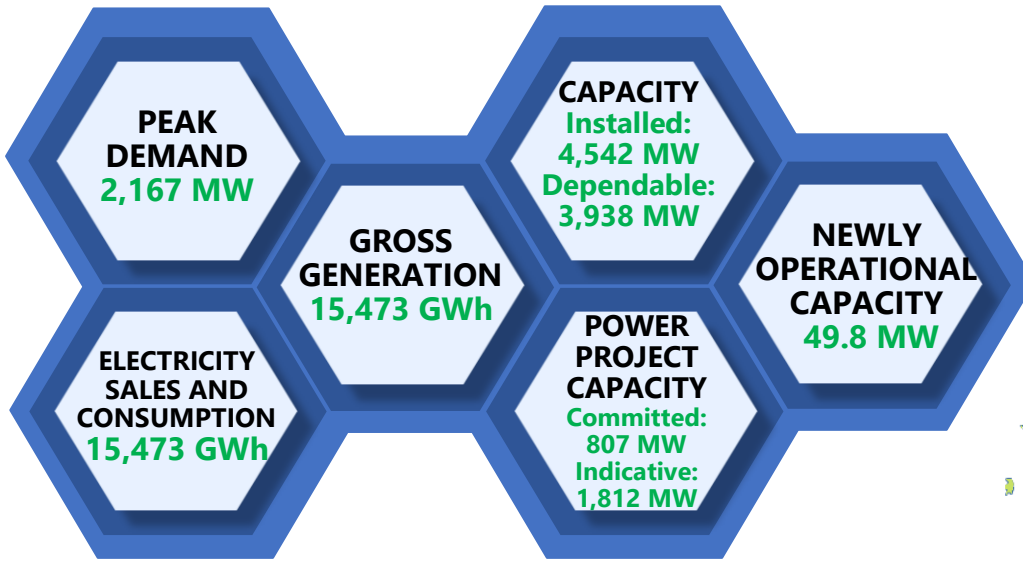
generation from 2020 to 2021 which corresponds to 24,566 MWh and 3,531 MWh respectively. While, other RE such as geothermal, biomass and solar have a downward change by 10.8%, 6.4% and 3.5%, respectively.

In 2022, the Visayas generated electricity with a total of 16,222 GWh which is much lower by 45,356 MWh in 2021. Coal, having the largest share of 52.4% has decreased significantly by 498,053 MWh or 5.9%. Oil-based still increased in terms of generation equivalent to 20.3% or an additional 94,901 MWh of electricity. Solar and hydro are the only power plants that have dropped in their generation with 6.0% and 56.3% respectively from their previous data. Lastly, geothermal rose by 5.0% or 277,851 MWh, biomass also increased by 47.8% or 167,103 MWh, and wind also grew by 1.0% or 1,733 MWh.

Table 12. Summary of Committed and Indicative Power Projects in Visayas, as of 31 December 2022 (in MW)

Type of Power Plant	Committed Capacity (MW)	% Share	Indicative Capacity (MW)	% Share	No. of Commenced Projects
Coal	135	26.3	0	0	0
Oil-Based	20	3.9	125	2.1	1
Natural Gas	0	0	0	0	0
Renewable Energy	358	69.8	5,783	97.9	4
<i>Geothermal</i>	8	1.6	126	2.1	0
<i>Hydro</i>	23	4.5	396	6.7	1
<i>Biomass</i>	14	2.7	0	0	3
<i>Solar</i>	300	58.5	686	11.6	0
<i>Wind</i>	13	2.5	4,575	77.4	0
2022 TOTAL	513	100.0	5,908	100.0	5
BESS	300		883		2
2021 TOTAL	326		3,632		

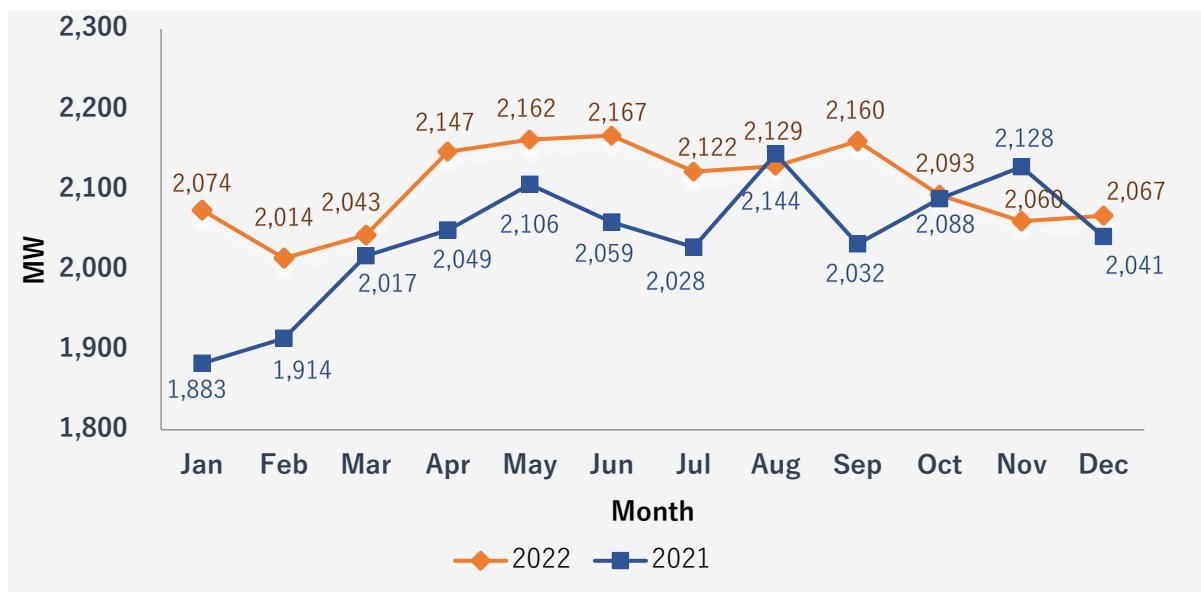
MINDANAO



*excluding off-grid generators

Peak Demand and Electricity Consumption

The Mindanao grid registered a peak demand of 2,167 MW on 01 June 2022 at 1442H which is 1.1% higher than the system peak demand of 2,144 MW in 2021, which occurred on 04 August 2021 as the pandemic restrictions were lifted at that time. The lowest demand in 2022 happened on 16th of February that is equivalent to 2,014 MW while in 2021, the recorded lowest demand is 1,883 MW that occurred on 25 January 2021.



Source: NGCP

Figure 12. 2022 vs. 2021 Peak Demand, Mindanao (in MW)

2022 and 2021 Electricity Sales and Consumption (in GWh)

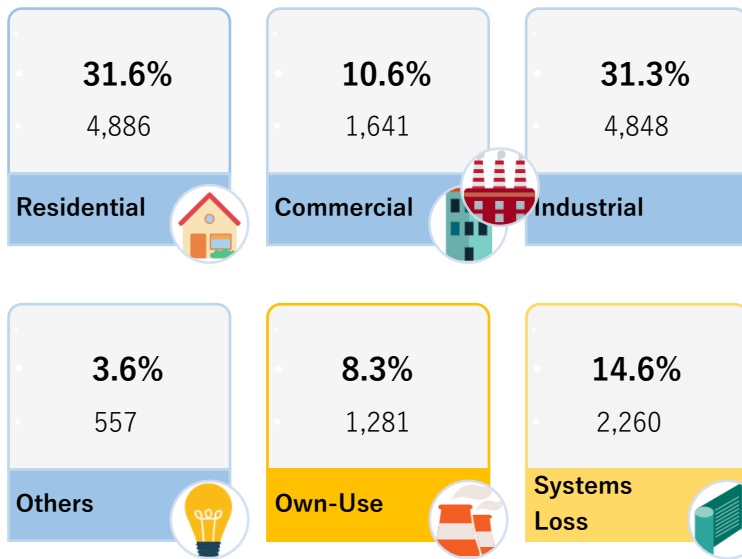


Figure 13. 2022 Electricity Sales and Consumption, Mindanao (in Percent Share and GWh)

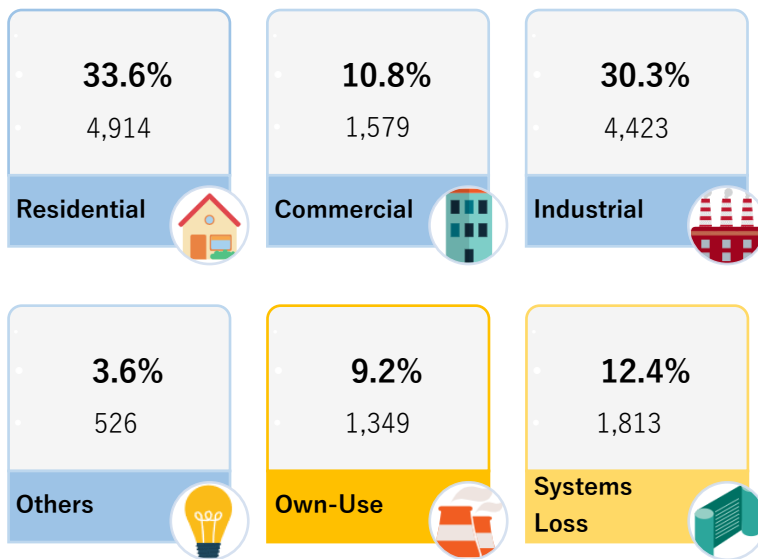


Figure 14. 2021 Electricity Sales and Consumption, Mindanao (in Percent Share and GWh)

A total of 15,473 GWh was accounted for the electricity consumption in the Mindanao grid in 2022. This consumption is much larger than the 2021 level of 14,604 GWh which has a difference of 869 GWh. The residential sector consumption of electricity dropped by -0.6% in contrast with the Commercial, Industrial and 'Others' sector showing growth of 3.9%, 8.7% and 9.6% respectively. Own-use increased by 2.7% as several power generating facilities that use their electricity offtake for their owned facilities also increased in numbers. Systems Loss has a significant rise in 2022, having a growth rate of 24.7% from 2021, equivalent to 448 GWh.

In 2021, the Mindanao grid recorded a 14,604 GWh sales and electricity consumption which is 5.4% higher than the previous year of 2020. The increase is attributed to the much lesser health

restrictions imposed by the government. Residential, commercial, and industrial were the sectors that grew in terms of consumption with an additional of 244 GWh (15.2%), 99 GWh (16.7%), and 354 GWh (18.7%) respectively. Own-use has an increase of 2.7% or 35 GWh from 2021, while Systems loss had a 3.6% GR or 65 GWh difference from the 2020 electricity sales and consumption.

Installed and Dependable Capacity

Table 13. Existing Installed and Dependable Capacity, as of 31 December 2022 (in MW)

Fuel Type	Installed		Dependable	
	MW	Percent Share (%)	MW	Percent Share (%)
Coal	2,268	49.9	2,041	51.8
Oil Based	833	18.3	707	17.9
Natural Gas	0	0.0	0	0.0
Renewable Energy	1,441	31.7	1,190	30.2
<i>Geothermal</i>	<i>112</i>	<i>2.5</i>	<i>106</i>	<i>2.7</i>
<i>Hydro</i>	<i>1,166</i>	<i>25.7</i>	<i>1,003</i>	<i>25.5</i>
<i>Biomass</i>	<i>79</i>	<i>1.7</i>	<i>29</i>	<i>0.7</i>
<i>Solar</i>	<i>84</i>	<i>1.8</i>	<i>52</i>	<i>1.3</i>
<i>Wind</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
2022 TOTAL	4,542	100.0	3,938	100.0
BESS	49		49	
2021 TOTAL	4,511		3,981	

Note: Excluding off-grid generators

Source: DOE 2022 Annual Power Statistics

Mindanao has a total of 4,542 MW of installed capacity which has a 31 MW difference in 2021 as coal took the largest share in the mix with 49.9% percent share. It is followed by hydro with 1,166 MW of capacity or 25.7% share in the region because of its abundant natural water resources. Oil-based power plants recorded a capacity of 833 MW or 18.3% share in the mix. Natural gas and wind technology are still undeveloped in terms of additional capacity in the grid.

The dependable capacity of Mindanao Grid is 3,938 MW that is equivalent to 86.7% of the total installed capacity. Coal is still the highest contributor in terms of the actual capacity in the region with a total share of 51.8% then followed also by hydro with 25.5 percent share. In terms of overall RE share, biomass, geothermal, solar, hydro and wind summed up to 1,441 MW in installed capacity and 1,190 MW in dependable capacity as the country aims to have an RE share of 35% by 2030 and 50% share by 2040.

Table 14. 2022 Newly Operational Power Plants, Mindanao

POWER PLANT		CAPACITY, MW		LOCATION	OPERATOR
Facility Name	Subtype	Installed	Dependable	Municipality/ Province	
MARBEL 1 HPP	Run-of-River type HEPP	0.8	0.8	Koronadal City, South Cotabato	Euro Hydro Power (Asia) Holdings, Inc.
TMI Hybrid Diesel-Battery System	Hybrid (Diesel-Battery System)	49.0	49.0	Maco, Davao de Oro	Therma Marine Inc.
TOTAL		49.8	49.8		

Note: Excluding off-grid generators

Source: DOE List of Existing Power Plants as of 31 December 2022

Gross Generation

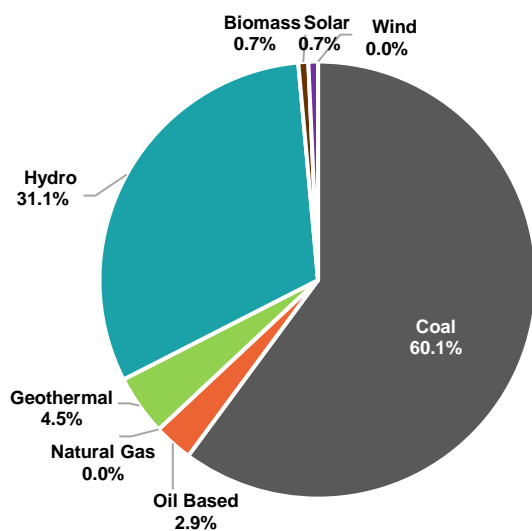


Figure 15. 2022 Gross Generation, Mindanao

The Mindanao gross generation is remarkably higher than the previous year amounting to 15,473 GWh or with a 6% growth rate from 14,604 GWh in 2021. The generation mix in the region is still dominated largely by coal-fired power plants with 9,303 GWh. Hydro, on the other hand, generated an amount of 4,807 GWh that makes it the second largest share. Geothermal power plants correspond to 690 GWh, oil-based, especially diesel-powered plants, recorded 449 GWh which has a difference of 296 GWh from 2021. Solar and biomass generated a total of 110 GWh and 114 GWh respectively, while wind power still remains at zero.

Table 15. Summary of Committed and Indicative Power Projects in Mindanao, as of 31 December 2022 (in MW)

Type of Power Plant	Committed Capacity (MW)	% Share	Indicative Capacity (MW)	% Share	No. of Commenced Projects
Coal	270	51.2	120	7.1	0
Oil-Based	11	2.1	0	0.0	1
Natural Gas	0	0.0	600	35.4	0
Renewable Energy	246	46.7	975	57.5	2
<i>Geothermal</i>	<i>0</i>	<i>0.0</i>	<i>0</i>	<i>0.0</i>	<i>1</i>
<i>Hydro</i>	<i>100</i>	<i>19</i>	<i>747</i>	<i>44.1</i>	<i>1</i>
<i>Biomass</i>	<i>26</i>	<i>4.9</i>	<i>62</i>	<i>3.7</i>	<i>0</i>
<i>Solar</i>	<i>120</i>	<i>22.8</i>	<i>130</i>	<i>8</i>	<i>0</i>
<i>Wind</i>	<i>0</i>	<i>0.0</i>	<i>36</i>	<i>2.1</i>	<i>0</i>
2022 TOTAL	527	100.0	1,695	100.0	3
BESS	280		118		1
2021 TOTAL	675		1,790		

Note: Numbers may not sum to total due to rounding off.

TRANSMISSION

GRID PROFILE

As of December 2022, a total of 48,801 MVA substation capacities and 21,027 circuit-kilometers (ckt-km) are accounted for in the transmission assets being managed by the NGCP. Table 16 below shows the summary of existing facilities.

Table 16. Summary of Existing Facilities, 2022 vs. 2021

Total Substation Capacity (MVA)		
	2022	2021
Philippines	48,800.5	41,333.5
• Luzon	35,641	29,955
• Visayas	5,848.5	5,287.5
• Mindanao	7,311	6,091
Total Transmission Line Length (ckt-km)		
	2022	2021
Philippines	21,027.0	20,779.5
• Luzon	9,631.9	9,617.4
• Visayas	5,393.5	5,298
• Mindanao	6,001.6	5,864.1

Source: 2022-2040 TDP and 2023-2040 TDP

To ensure that the voltages across the transmission network are compliant with the prescribed levels in the Philippine Grid Code (PGC), capacitor banks and shunt reactors have been installed in appropriate locations in Luzon, Visayas, and Mindanao. As of December 2022, the total Capacitor Banks and Shunt Reactors were recorded at 5,787 MVAR.

TRANSMISSION PROJECTS COMPLETED

The NGCP completed 31 transmission projects or portions of a project from January 2021 to December 2022 based on the December 2022 Transmission Project Status Report, which is classified into three types, namely substation capacity upgrading, transmission line extension, and voltage improvement. These projects are expected to support the increasing electricity demand, accommodate the upcoming power generation capacities, and enhance system reliability.

Table 17. Transmission Grid Projects Completed, 2021-2022

Grid	Project Name/Components	Date of Completion/ Energization
Luzon	Luzon Voltage Improvement Project 3	30 August 2021
Luzon	Luzon PCB Replacement	31 January 2021

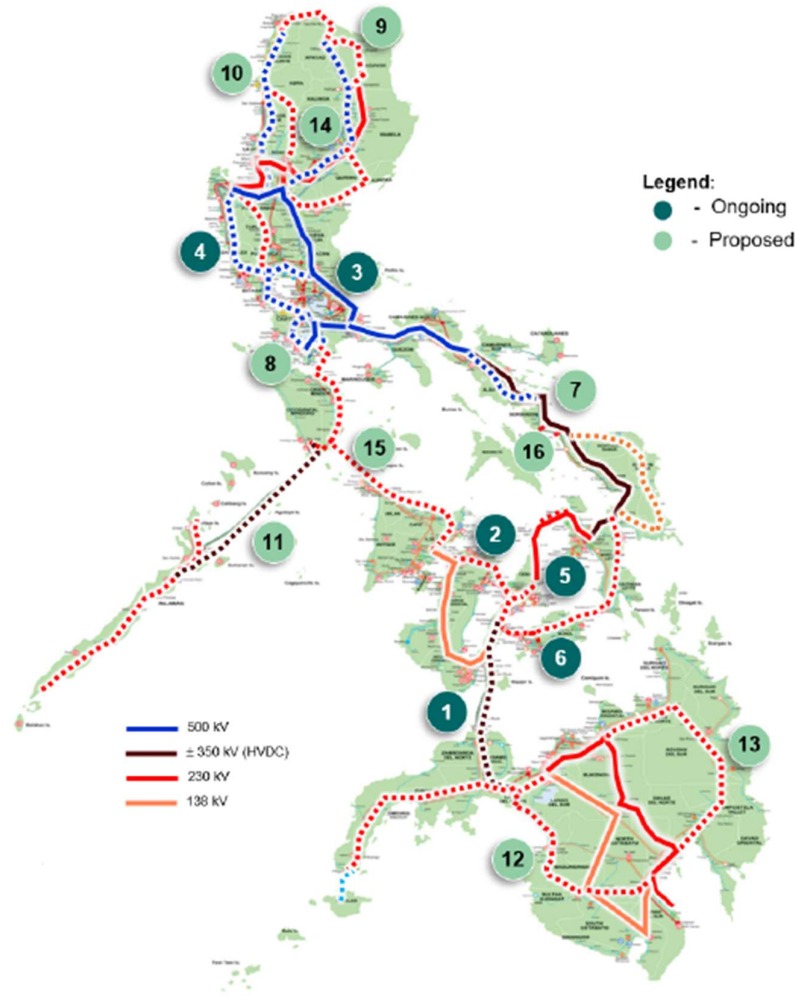
Grid	Project Name/Components	Date of Completion/ Energization
Luzon	Luzon Voltage Improvement Project 6	01 May 2021
Luzon	North Luzon S/S Upgrading Project	12 December 2021
Luzon	Calamba 230kV S/S	17 May 2021
Luzon	Luzon Voltage Improvement Project 4	30 May 2021
Luzon	Tower Resiliency of Bicol Transmission Facilities	05 October 2021
Luzon	Balsik (Hermosa) - San Jose 500 kV T/L	19 December 2022
Luzon	Mariveles – Balsik (Hermosa) 500kV T/L	09 April 2022
Luzon	San Jose – Angat 115kV T/L Upgrading	20 May 2022
Luzon	Luzon Voltage Improvement Project 3	13 October 2022
Luzon	Pagbilao 500kV S/S Project	26 October 2022
Luzon	South Luzon S/S Upgrading Project 2	14 December 2022
Luzon	Clark – Mabiga 69kV T/L Project	10 October 2022
Luzon	South Luzon S/S Upgrading Project	07 November 2022
Luzon	Ambuklao – Binga 230kV T/L Project	17 July 2022
Visayas	Sta. Rita-Quinapondan 69kV T/L Project	04 July 2021
Visayas	Permanent Restoration for the Panitan-Nabas 138kV T/L affected by Typhoon Ursula (14 Towers)	06 October 2021
Visayas	Cebu – Negros Panay 230kV Backbone, Stage 3	24 December 2022
Visayas	Panitan – Nabas Line 2 Stringing Project	28 April 2022
Visayas	Tagbilaran 69kV S/S Project	06 November 2022
Visayas	Mindanao-Visayas Interconnection Project	10 December 2022
Visayas	Cebu-Negros-Panay 230kV Backbone, Stage 2	15 December 2022
Mindanao	Zamboanga Peninsula Voltage Improvement	23 April 2022
Mindanao	Mindanao S/S Upgrading Project	22 November 2021
Mindanao	Mindanao S/S Upgrading Project	04 June 2022
Mindanao	Kauswagan-Lala 230kV T/L Project	23 February 2022
Mindanao	Polanco – Oroquieta 138kV T/L Project	11 April 2022
Mindanao	Eastern Mindanao Voltage Improvement Project	21 August 2022
Mindanao	Mindanao-Visayas Interconnection Project	09 December 2022
Mindanao	Agus 2 Switchyard Upgrading/Rehabilitation	11 September 2022

Source: NGCP's submitted Transmission Project Status Report as of December 2022

TRANSMISSION ONGOING PROJECTS

The list in Annex 1 shows the two hundred fifty-six (256) proposed projects of the NGCP based on the DOE-Approved 2022-2040 Transmission Development Plan (TDP). These projects aimed to ensure reliable electricity, decongest transmission facilities, improve grid security, and support future development. Most of these encountered implementation challenges, such as right-of-way workability issues, re-location requests and issuance of construction-related permits. To address the project delays, the DOE has taken several actions facilitating the resolution of permitting and Right-of-Way (ROW) concerns and the strict implementation of the Transmission Development Plan.

PROPOSED TRANSMISSION MASTER PLAN 2023-2040



- | | |
|--|---|
| <ul style="list-style-type: none"> 1 Mindanao-Visayas Interconnection (2023) 2 Cebu-Negros-Panay 230 kV Backbone (2022-2024) 3 Metro Manila 500 kV Backbone Loop (2024-2029) 4 Western Luzon 500 kV Backbone (2025) 5 Metro Cebu 230 kV Backbone Loop (2023-2040) 6 Cebu-Bohol-Leyte 230 kV Backbone (2024-2035) | <ul style="list-style-type: none"> 7 Luzon-Visayas HVDC Bipolar Operation (2026-2032) 8 Batangas-Mindoro Interconnection (2027) 9 Northern Luzon 230 kV Backbone Loop (2028) 10 Bolo-Laoag 500 kV Backbone (2028-2032) 11 Palawan-Mindoro Interconnection (2028-2033) 12 Western Mindanao 230 kV Backbone (2030) 13 Eastern Mindanao 230 kV Backbone (2031-2035) 14 Nagsaag to Kabugao 500 kV Backbone (2031-2035) 15 Mindoro-Panay 230 kV Interconnection Project (2036-2040) 16 Luzon-Visayas 230 kV AC Interconnection Project (2036-2040) |
|--|---|



SIGNIFICANT INCIDENTS

Significant outage incidents in the transmission facilities of the NGCP are typically caused by several factors like natural calamities that can damage transmission lines and substations, encroachments and obstructions within the line, aging infrastructure and equipment malfunctions, and sudden shutdowns of power plants that can cascade through the grid, causing widespread outages.

The average length of time for the restoration of NGCP transmission facilities can vary significantly depending on the extent of the damage and the specific circumstances. For example, after Typhoon Odette in December 2021, NGCP managed to restore most of the affected transmission lines within a few weeks. However, some lines took longer due to severe damage and right-of-way issues. In general, NGCP restore transmission services, often within days to weeks, depending on the severity of the incident and the accessibility of the affected areas. Summarized in Annex 2 are some of the significant incidents in 2022.

DISTRIBUTION

In 2022, there are 148 distribution utilities (DUs) in the country, which is comprised of 121 Electric Cooperatives, 24 Privately-Owned Distribution Utilities including entities duly authorized to operate within the economic zones, two (2) local government unit owned and operated utilities, and one (1) Multi-Purpose Cooperative.

The local government unit owned and operated utilities in the Province of Romblon namely, Municipality of Banton Electric System, Municipality of Concepcion Electric System, and Municipality of Corcuera Electric System were already operated by Romblon Electric Cooperative, Inc. Likewise, the Municipality of Bumbaran Electric System in the Province of Lanao del Sur was served by First Bukidnon Electric Cooperative, Inc.

In 2022, the total number of customers grew by 3.0%, increasing from 22.6 million in 2021 to 23.3 million. The industrial sector registered the highest growth rate of 7.2%, followed by commercial and residential sectors with 3.8% and 3.0%, respectively. On the other hand, other customers had the slowest growth of about 0.02%.

Table 18. 2022 Captive Customer Connections, in million

Category	Luzon	Visayas	Mindanao	Total
Residential	13.58	4.01	3.92	21.51
Commercial	0.94	0.20	0.25	1.38
Industrial	0.02	0.01	0.02	0.06
Others	0.18	0.08	0.09	0.35
Total	14.72	4.31	4.28	23.30

Source: 2023-2032 Distribution Development Plan

Note: Totals may not add up due to rounding-off.

Table 19. 2021 Captive Customer Connections, in million

Category	Luzon	Visayas	Mindanao	Total
Residential	13.17	3.87	3.85	20.88
Commercial	0.90	0.19	0.25	1.33
Industrial	0.02	0.01	0.02	0.05
Others	0.17	0.09	0.10	0.35
Total	14.25	4.15	4.21	22.62

Source: 2022-2031 Distribution Development Plan (DDP)

Note: Totals may not add up due to rounding-off.

To serve the projected growth in their respective franchise areas, the DUs have implemented various capital expenditure projects including electrification, network and non-network projects, among others. As of 2021, 21,340 MVA of substation capacities were installed while a total of 2,660 ckt-km of sub-transmission facilities and 48,509 ckt-km of distribution facilities were constructed. In 2022, a total of 2,339 ckt-

km of sub-transmission facilities, 35,702 ckt-km of distribution facilities, and 21,669 MVA of substation capacities were completed and added to the existing network.

Table 20. 2022 Capital Expenditure Projects

CAPITAL EXPENDITURE PROJECTS		
LUZON		
Sub-transmission Facilities	ckt-km	2,186
Distribution Facilities	ckt-km	32,532
Substation Capacities	MVA	21,401
VISAYAS		
Sub-transmission Facilities	ckt-km	139
Distribution Facilities	ckt-km	1,505
Substation Capacities	MVA	140
MINDANAO		
Sub-transmission Facilities	ckt-km	15
Distribution Facilities	ckt-km	1,665
Substation Capacities	MVA	129

Source: 2023-2032 Distribution Development Plan

Table 21. 2021 Capital Expenditure Projects

CAPITAL EXPENDITURE PROJECTS		
LUZON		
Sub-transmission Facilities	ckt-km	2,398
Distribution Facilities	ckt-km	36,253
Substation Capacities	MVA	20,995
VISAYAS		
Sub-transmission Facilities	ckt-km	216
Distribution Facilities	ckt-km	11,826
Substation Capacities	MVA	189
MINDANAO		
Sub-transmission Facilities	ckt-km	46
Distribution Facilities	ckt-km	430
Substation Capacities	MVA	156

Source: 2022-2031 Distribution Development Plan

Pursuant to the DOE Department Circular (DC) No. DC2018-03-0003, as amended and supplemented by DC No. DC2021-09-0030, thirteen (13) DUs have completed the conduct of Competitive Selection Process (CSP) in 2022, while five (5) are ongoing with the conduct of CSP, as shown in Table 22 and 23 below:

Table 22. DUs with CSP conducted in 2022

No.	DUs	Capacity	Period	Winning Genco	Technology Offered
1	AEC	35,697,000 kWh/year	10 years starting 26 March 2023,	Solar Philippines Nueva Ecija	Renewable Energy

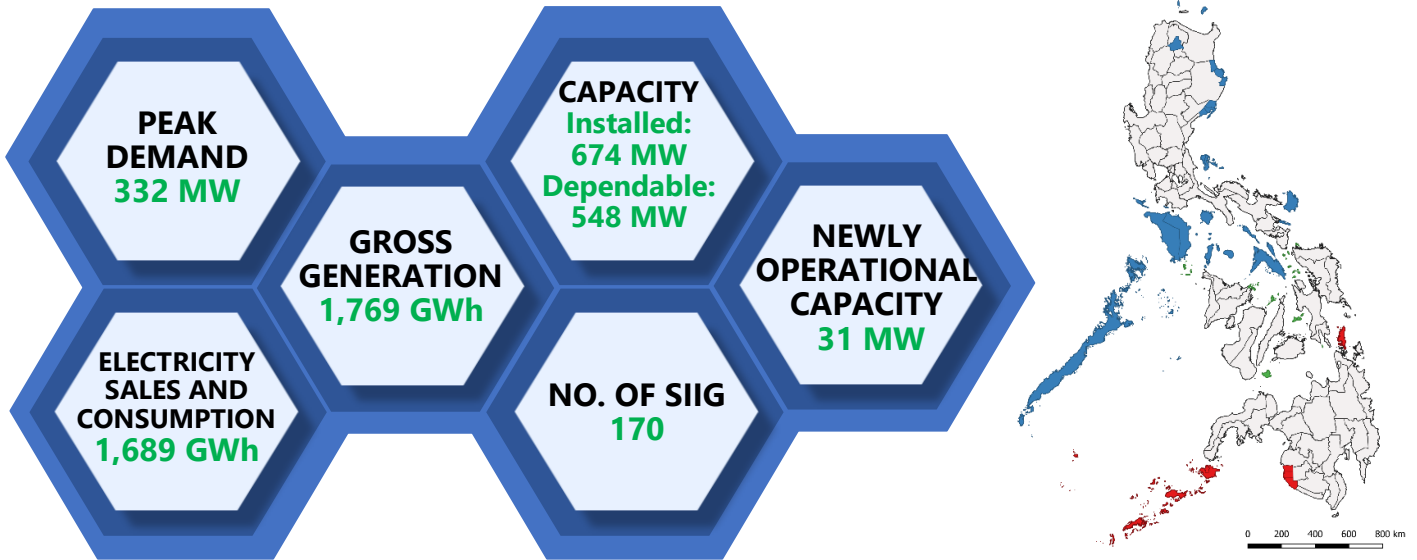
No.	DUs	Capacity	Period	Winning Genco	Technology Offered
			or upon ERC Approval, whichever comes later.	Corporation (SPNEC)	Solar
2	DECORP	20 MW (10 MW Baseload and 10 MW Load following)	10 years	Energy Development Corporation	Geothermal
3	PELCO I	36 MW Baseload, Firm, take and pay	10 years and 3 months	MPPCL	Coal
4	ISELCO I	19 MW	10 years	SPPC	Coal
5	CAGELCO II	Lot 1: 10MW Lot 2: 15 MW	Lot 1: 26 December 2020 - 25 December 2022 Lot 2: 26 December 2022 - 25 December 2037	Lot 1: SN Aboitiz Power-Magat (SNAP-MI) Lot 2: Bacman Geothermal Inc. (BGI)	Lot 1: Hydro Lot 2: Geotherma
6	MEPC	20 MW Mid-Merit	26 July 2022 to 25 July 2027	Energy Development Corporation	Geothermal
7	MERALCO	170 MW Peaking	26 February 2022 to 25 July 2025	South Premiere Power Corporation (SPPC)	Brownfield LNG
8	MERALCO	850 MW Mid-Merit	20 years starting from 26 February 2026	Terra Solar Philippines, Inc. (TSPI)	Renewable Energy
9	MERALCO	180 MW Baseload	5 months starting from 26 May 2022	SEM-Calaca Power Corporation	Conventional
10	TIELCO	13.7 MW	10 years 9 months	SUWECO Tablas Energy Corporation	Greenfield Diesel
11	DLPC	50 MW Firm Peaking	3 years	Therma Marine Inc. (TMI)	Bunker Diesel
12	DLPC	75 MW Non-Firm, Load Following and Back-up supply	5 years	Filinvest Development Corporation (FDC)	Coal
13	SOCOTECO II	at least 85,000 MWh of energy as	15 years	Siguil Hydro Power Corporation (through direct negotiation)	Renewable Energy (Hydro)

No.	DUs	Capacity	Period	Winning Genco	Technology Offered
		minimum energy /			

Table 23. DUs with on-going CSPs

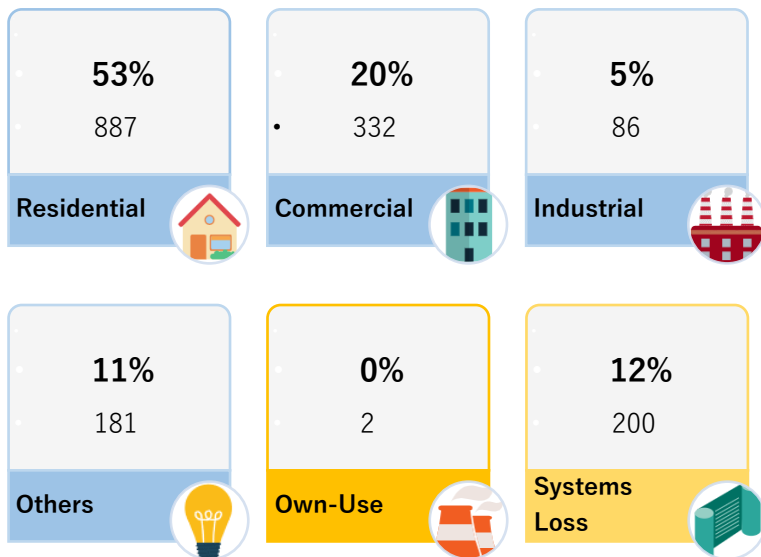
No.	DUs	Capacity	Period
1	CELCOR	39 MW Baseload 36 MW Intermediate 20 MW Peaking	10 years
2	BENECO	73 MW Baseload	4 years
3	PGECPCI	Lot 1: 21 MW- 38 MW (Baseload, Open Technology) Lot 2: 7.5 MW- 18.5 MW (Intermediate/ and Peaking for RPS) Lot 3: 1 MW – 18 MW (Baseload, for RPS)	9-10 years
4	FRECOR8	Lot 2: 8-58 MW for RPS	8 years
5	ESAMELCO	4 MW Mid-Merit for RPS	25 years

OFF-GRID AND MISSIONARY ELECTRIFICATION



*Subject to change based on the availability of data

Electricity Sales and Consumption



Off-grid areas in the Philippines recorded a total electricity sales and consumption of 1,689 GWh, an 8.4% increase from the previous year's consumption of 1,558 GWh. Meanwhile residential customers remained to have the highest percentage share of consumption with 53% or 887 GWh, equivalent to a 6.1% increase from 2021.

Figure 16. 2022 Electricity Sales and Consumption, Off-Grid, (in Percent Share and GWh)

Capacity and Generation

The total installed capacity in 294 off-grid and missionary areas increased by 6.0% from 636 MW in 2021 to 674 MW in 2022 mainly due to the additional capacities from existing New Power Providers (NPP) and the National Power Corporation (NPC) Small Power Utilities Group. On the other hand, off-grid generation also increased at 7.87% from 1,639 GWh in 2021 to 1,769 GWh in 2022.

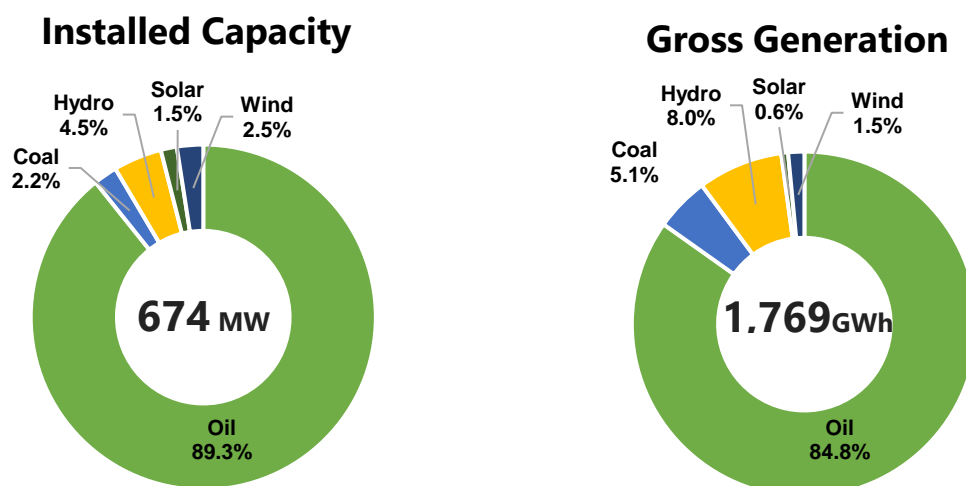


Figure 17. 2022 Off-Grid Installed Capacity and Generation

The year 2021 to 2022 showed a more diversified capacity and generation mix due to the commercial operation of hydro, wind, and solar power plants in Oriental Mindoro and Tablas Island, respectively.

As part of the program towards total electrification, the NPC provided power generation service to 16 new areas in 2022. Further, the NPC also increased its service level in various areas.

Table 24. SPUG Areas Average Service Hours, 2021 vs. 2022

Service Hours	2021	2022
	No. of SIIGs	No. of SIIGs
Less than 12	50	59
12-23	12	13
24	74	78
TOTAL	136	150

Note: Numbers may not sum up to total due to rounding off.

MAJOR POLICIES ISSUED IN 2021 AND 2022 RELATED TO GENERATION, TRANSMISSION AND DISTRIBUTION

In 2021 and 2022, the Department of Energy (DOE) issued several policy directives aimed at enhancing the efficiency, transparency, and responsiveness of the electric power industry. These policies were designed to streamline processes and ensure timely decision-making, such as the approval or denial of direct connection applications within fifty calendar days. Additionally, the DOE introduced a paperless and digital submission system for reportorial requirements via the DEPDMS Web Portal, promoting environmental sustainability and operational efficiency. The procurement of Ancillary Services by the System Operator was mandated to follow a Competitive Selection Process (CSP), ensuring fairness and competitiveness. Amendments to the rules governing Distribution Utilities (DUs) were also made to refine the conduct of CSP, further promoting transparency. Lastly, guidelines for the Distribution Development Plan were established to ensure that DUs and other mandated entities remain adaptive and responsive to ongoing developments in the electric power industry.

Table 25. List of Department Circulars and Advisory Issued in 2021 and 2022

DEPARTMENT CIRCULAR/ORDER NUMBER	TITLE	DATE OF ISSUANCE	OBJECTIVE
DC2022-05-0014	Amending Department Circular No. DC2020-01-0001 on Rules Governing the Review and Evaluation of Direct Connection Applications of Industrial, Commercial and Other Electricity End-Users	10 May 2022	Ensuring the approval and denial of direct connection applications within fifty (50) calendar days.
DC2022-02-0001	Providing Policies for the Systematic Management of the DOE Reportorial Requirements for the Electric Power Industry Participants	08 February 2022	Establishing the paperless and digital submission of DOE reportorial requirements through the DEPDMS Web Portal.
DC2021-10-0031	Prescribing the Policy for the Transparent and Efficient Procurement of Ancillary Services by the System Operator	04 October 2021	Establishing the procurement of Ancillary Services by the System Operator through Competitive Selection Process (CSP).

DEPARTMENT CIRCULAR/ORDER NUMBER	TITLE	DATE OF ISSUANCE	OBJECTIVE
DC2021-09-0030	Amending Certain Provisions of and Supplementing Department Circular No. DC2018-12-0003 on the Competitive Selection Process in the Procurement by the Distribution Utilities of Power Supply Agreement for the Captive Market	24 September 2021	Providing the amended rules/provisions of the DC related to Distribution Utilities pertaining to the conduct of CSP.
DC2021-03-0003	Prescribing the Policy and Guidelines for the Formulation of the Distribution Utilities Distribution Development Plan Integrating the Relevant Laws, Policy Issuances, Rules and Regulations	02 March 2021	Establishing the guidelines of Distribution Development Plan to ensure that Dus and other mandated entities is responsive to the electric power industry developments.

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