DEPARTMENT OF ENERGY

2022

PHILIPPINE ENERGY SITUATIONER

2022 Philippine Energy Situationer

This issue presents an analysis of energy supply and demand situation in the Philippines for 2022 vis-à-vis 2021. The energy data used herein are based on the Energy Balance Table (EBT) *(as of 07 July 2023)* as generated by the Policy Formulation and Research Division (PFRD) of the Energy Policy and Planning Bureau (EPPB), unless otherwise stated. Kindly note that *Non-Energy Use* is included in the discussion for Total Final Energy Consumption (TFEC) per sector in this report.

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Abbreviations and Acronyms Used

BBL	Barrels
DOTr	Department of Transportation
GDP	Gross Domestic Product
GHG	Greenhouse gas
GVA	Gross-value added
GWh	Gigawatt-Hour
GWP	Global Warming Potential
$ktCO_2e$	Thousand tons of carbon dioxide equivalent
kTOE	Thousand tons of oil equivalent
kWh	Kilowatt-hour
LRT	Light Rail Transit
MB	Thousand Barrels
MMB	Million Barrels
MMMT	Million Metric Tons
MMSCF	Million Standard Cubic Feet
MMT	Thousand Metric Tons
MRT	Metro Rail Transit
$MtCO_2e$	Million tons of carbon dioxide equivalent
MTOE	Million tons of oil equivalent
MW	Megawatt
MWh	Megawatt-hour
ROM	Run of Mine
tCO_2e	Tons of carbon dioxide equivalent
TFEC	Total Final Energy Consumption
TOE	Tons of oil equivalent
TPES	Total Primary Energy Supply
TWh	Terra-watt Hour

I. TOTAL FINAL ENERGY CONSUMPTION (TFEC)

The Philippine economy exceeded the government targets with a 7.6 percent expansion in 2022 – the fastest recorded in more than four (4) decades[1] driven by the removal of remaining restrictions on mobility and business activities. Despite a stellar economic performance, the country's total final energy consumption (TFEC) grew moderately by 2.4 percent to 35.9 million tons of oil equivalent (MTOE) from its 2021 level of 35.0 MTOE.

Major economic sectors such as transport, residential and industry registered increments in their energy utilization during the year ***(Figure 1)***. The transport sector's energy use remained on the uptrend with a 12.2 percent hike in 2022 as all transport operations returned to their full capacity. It contributed a bulk share of 34.4 percent to the TFEC ***(Figure 2)***. Household energy demand at 28.8 percent share to the TFEC slightly increased by 1.3 percent due to the resumption of onsite reporting for majority of the country's workforce, including academic institutions. The energy utilized for industrial purposes, with a share of 19.8 percent, went up by 4.2 percent buoyed by the manufacturing sector's sustained post-pandemic recovery.

On the other hand, the services sector's energy consumption fell by 8.2 percent because of the decline in diesel demand. The agriculture sector's energy use decreased by 32.0 percent as weakened agriculture activities led to contractions in its electricity and diesel consumption during the period. Energy products, particularly naphtha and other petroleum products that are used as raw materials and feedstocks in various industrial processes, plummeted by 21.5 percent in 2022.

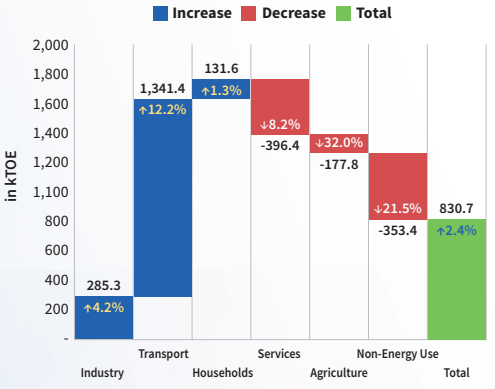

Figure 1. Changes in Energy Consumption, by Sector in kTOE, 2022

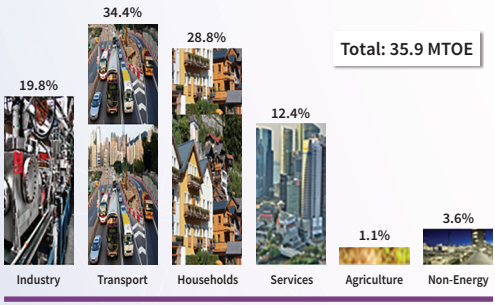

Figure 2. Sectoral Shares to TFEC, 2022: in Percent

[1] https://www.dof.gov.ph/ph-economy-grows-by-7-6-in-2022-surpasses-dbcc-target/

A. Total Final Energy Consumption, by Fuel

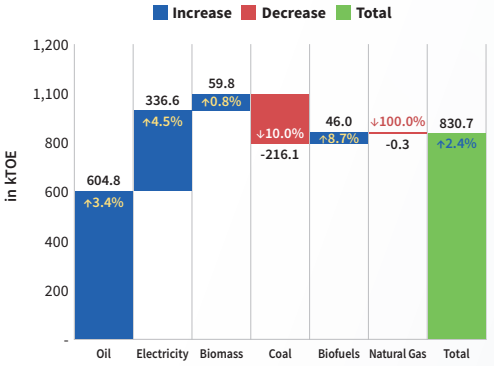

Figure 3. Changes in Energy Consumption, by Fuel in kTOE, 2022

The country's continued reliance on oil and petroleum products was evident as their aggregate levels reached 18.3 MTOE or 50.9 percent of the TFEC in 2022, an increase of 3.4 percent from 17.7 MTOE in 2021 ***(Figure 3)***. Gasoline and diesel, with a combined share of 75.4 percent to total oil consumption, remained the most used oil products. Gasoline consumption accelerated by 10.1 percent vis-à-vis diesel's gradual growth of 0.4 percent growth as domestic pump prices of the former became relatively cheaper compared to the latter during the year. Meanwhile, the resurgence of domestic tourism pushed the utilization of aviation fuels to a double-digit hike of 76.6 percent during the same period.

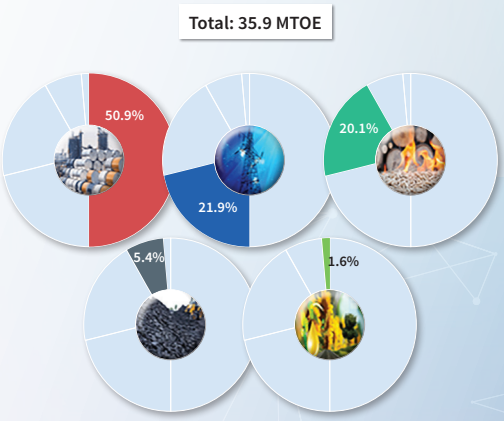

Figure 4. Fuel Shares to TFEC, 2022: in Percent

Electricity maintained its position as the second most-consumed fuel in 2022. It contributed a 21.9 percent share to TFEC ***(Figure 4)***, as demand levels posted an increase of 4.5 percent to 7.9 MTOE in 2022 from its 7.5 MTOE level in 2021. As business services and establishments reverted to their pre-pandemic operational capacities, electricity consumption in the services sector increased the fastest at 15.0 percent in 2022. The easing of travel restrictions also contributed to the 9.3 percent growth in the transport sector's electricity demand. The industry and household sectors, with a combined share of 70.3 percent to total electricity consumption, registered increments of 4.4 percent and 1.0 percent, respectively. However, electricity use in the agriculture sector declined by 23.3 percent in 2022.

Increased preference on the use of modern equipment and appliances contributed to the waning popularity of biomass (fuelwood, charcoal and other biomass residues)

for end-use applications. Its utilization slightly increased by 0.8 percent to 7.22 MTOE in 2022, from its 2021 level of 7.16 MTOE. Household consumption of biomass posted a modest growth of 1.0 percent, albeit an 82.6 percent share to total biomass demand in 2022. Demand for biomass as fuel in the food manufacturing industry and service establishments registered minimal growth of less than 1.0 percent each.

Coal consumption declined by 10.0 percent to 1.9 MTOE in 2022 vis-à-vis its year-ago level of 2.2 MTOE. It contributed 5.4 percent share to TFEC during the same year. Reduction in coal utilization was reported in the basic metal and other chemicals industry due to rising coal import prices in 2022, as well as the shift towards diesel and electricity as primary fuels in their production processes.

Biofuels consumption (biodiesel and bioethanol) grew at 8.7 percent to 575.2 kTOE in 2022 from its year-ago level of 529.3 attributed to the strict compliance with the blending schedule mandated under the Biofuels Law, coupled with the effective campaign of the government to use cleaner and alternative fuels.

B. Total Final Energy Consumption, by Sector

1. Transport

Lifting of stringent mobility restrictions served as a major catalyst for the 12.2 percent upsurge in the transport sector's energy consumption in 2022. Public transit ridership which was initially hampered due to social distancing requirements has returned to 100% seating capacities, while the phase-out of restrictive quarantine and health protocols liberalized travel by air, land, and water. These developments contributed to the uptrend in the transport sector's post-pandemic energy consumption and resulted in double-digit increments in its road, rail, air, and water subsectors.

Energy consumption for road transport accelerated by 11.0 percent in 2022 from its year-ago level of 9.9 MTOE and maintained its substantial share to total transport demand at 89.5 percent ***(Figure 5)***. All public transport routes across the country have returned to their pre-pandemic operational capacities during the year, as well as resumption of interregional provincial bus routes that traversed Metro Manila and nearby provinces contributed to the accelerated growth in road transport energy demand.

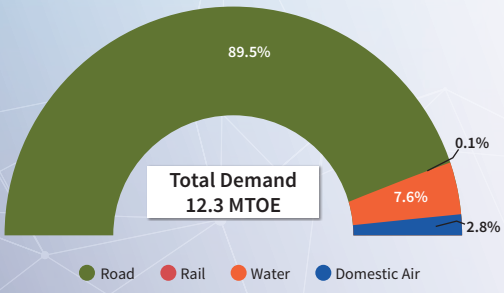

Figure 5. Transport Demand, by Sub-sector Shares (in Percent): 2022

Domestic maritime traffic improved further in 2022 with the resumption of tourism, trade, and regular travel activities. The Philippine Ports Authority (PPA)[2] reported significant boosts in the volume of shipcalls, cargo, and container throughput, as well as roll-on roll-off (RoRo) traffic, while passenger traffic surged by more than twice its 2021 level[3]. Consistent with these gains, energy demand for in-land water transport in 2022 went up to 940.0 kTOE, or 11.7 percent higher than its 841.9 kTOE level in the previous year.

Domestic aviation's astounding performance brought about a 76.6 percent increment in its energy consumption from last year's 194.1 kTOE level to 342.9 kTOE in 2022. As health requirements for air travel were dropped across the country, many people viewed this as an opportunity to take revenge travel[4] after being confined to their homes due to the COVID-19 pandemic. Major airlines likewise brought back fare promotions that supported the comeback of the domestic tourism industry and contributed to the four-fold increase in air passenger movement based on the data from the Civil Aeronautics Board (CAB)[5].

The massive rehabilitation of the Metro Rail Transit (MRT) 3 significantly improved its operations in 2022, with trains that ran at a maximum speed of 60 kilometers per hour and resulted in a record breaking 98.3 million ridership during the year – more than twice the reported volume in 2021. Other mass railway systems – Light Rail Transit (LRT) 1 and 2 and Philippine National Railways (PNR), also reported upsurges in passenger volumes during the year[6]. As the rail lines ran at full capacities, their aggregate energy consumption increased by 10.0 percent and reached 11.2 kTOE in 2022 vis-à-vis 10.1 kTOE in the previous year.

All transport fuels registered an increase in their consumption levels during the year, except LPG whose demand fell by 91.9 percent vis-à-vis its year-ago level caused by its declining relevance as fuel for taxis. Utilization of aviation fuels (aviation gasoline and jet fuel) and fuel oil in water transport grew by 76.6 percent and 68.8 percent, respectively, given the intensified demand for air and maritime travel. Gasoline and diesel, with a combined share of 90.3 percent to total transport demand ***(Figure 6)***, went up by 10.1 percent and 9.9 percent, respectively, attributed to increased road traffic across the country. Consistent with the mandated blending schedule, bioethanol and biodiesel likewise

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[2&3] Summary Port Statistics 2018-2022 https://www.ppa.com.ph/?q=content/statistics-1

[4] Revenge travel is a slang term for leisure travel that follows a period of being unable to travel. Specifically, the term originated as a way to refer to vacationing following the lessening of COVID-19 restrictions (which had greatly reduced travel) (www.dictionary.com/e/pop-culture/revenge-travel/)

[5] Aircraft, Passenger, and Cargo Movements,2021 & 2022 https://caap.gov.ph/aircraft-passenger-and-cargo-movements/

[6] Department of Transportation (DOTr) MRT-3, LRTA and PNR reports

registered increments of 10.2 percent and 16.1 percent, respectively. The growing number of electric vehicles (EVs), coupled with the peak performance of the MRT and LRT during the year, paved the way for the 9.3 percent growth in electricity consumption in the transport sector during the year.

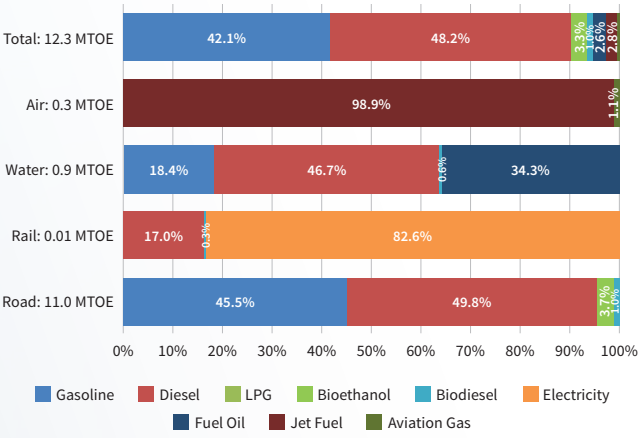

Figure 6: Transport Final Energy Consumption, By Fuel per Sector and Total (in percent), 2022

2. Households

The household sector remained the country's second major consumer of energy in 2022 and garnered a 28.8 percent share of the country's total energy consumption.

As the country emerged from lockdowns and restrictions imposed during the last two (2) years of the COVID-19 pandemic, a greater proportion of the working population returned to onsite reporting, while schools implemented hybrid and blended learning modalities, albeit with strict compliance to mandatory health requirements. Notwithstanding the return to office (RTO) orders issued by the government, flexible and alternative work arrangements continued to be implemented by companies as part of their business continuity strategies citing gains from improved productivity and work-life balance[7] of their employees. These developments contributed to the slowdown of household energy consumption as levels slightly improved by 1.3 percent to 10.3 MTOE in 2022 from 10.2 MTOE in 2021.

Households remained dependent on biomass as it accounted for more than half (57.8 percent share) of the sector's energy consumption ***(Figure 7)***. Biomass consumption levels moderately increased by 1.0 percent to 6.0 MTOE in 2022 compared to the previous year, the bulk of which were fuelwood (69.5 percent share) and charcoal (22.1 percent share) used primarily as fuel for cooking and heating. Electricity contributed close to one-third (29.5 percent) of household's

[7] https://ebooks.cisco.com/story/workforce-of-the-future/page/1?ccid=cc001980&oid=ebkco023467

energy demand mix in 2022 at 3.0 MTOE or 1.0 percent more than its year-ago level. The increase in household electricity consumption is mirrored by the 0.8 percentage point improvement in the proportion of the household population with access to electricity recorded at 96.2 percent as of December 2022.

Despite the upward trend in average prices of LPG in 2022, its utilization as cooking fuel among households gained traction and increased the fastest by 4.1 percent to 1.3 MTOE, equivalent to a 12.3 percent share in the sector's demand mix. Households' preference for modern equipment for cooking and other activities drove kerosene consumption to decline by 10.8 percent to 45.8 KTOE during the year.

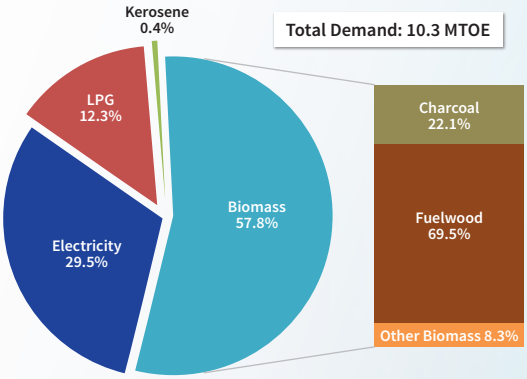

Figure 7: Energy Consumption of the Residential Sector, By Fuel (in Percent), 2022

3. Industry

The country's industry sector grew steadily at 6.5 percent in 2022 vis-à-vis 2021 and remained resilient despite inflationary pressures on the cost of goods and intermediate inputs. In response to strong domestic demand, there was an increase in the proportion of industries that operated at full capacities which resulted in higher average capacity utilization during the year.[8] This propelled the 4.2 percent expansion in the sector's aggregate energy consumption to 7.1 MTOE from the 2021 level of 6.8 MTOE.

The Monthly Integrated Survey of Selected Industries (MISSI) volume of production index increased by 15.1% in 2022, indicating that factory production output was still increasing, but at a slower rate than the 52.6 percent growth seen in 2021. As such, energy consumption in the manufacturing sub-sector, albeit accounting for the biggest share to total industry at 80.5 percent ***(Figure 8)***, grew marginally by 0.9 percent from last year's 5.7 MTOE. The consumption of energy-intensive manufacturing sub-sectors stood at 4.8 MTOE in 2022, up by 3.3 percent from its previous year's level, with positive contributions from food processing (4.7 percent increase with 21.9 percent share), machinery and equipment

[8] Monthly Integrated Survey of Selected Industries (https://psa.gov.ph/manufacturing/missi-table)

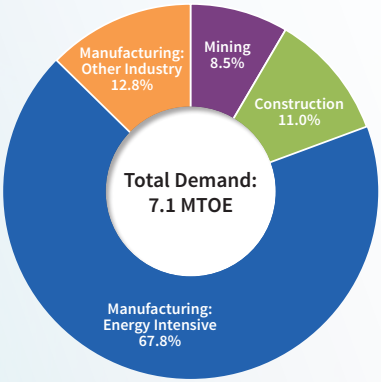

Figure 8: Energy Consumption of the Industrial Sector, By Sub-sector (in percent), 2022

(31.1 percent increase with 7.1 percent share) and cement (0.2 percent increase with 14.5 percent share) that offset contractions in other sub-sectors level of energy consumption. On the other hand, combined energy utilization of other industries dropped by 10.3 percent during the year, led by other manufacturing (declined by 27.5 percent with a 4.0 percent share).

Construction activities remained on the uptrend with a 12.1 percent acceleration in the sector's gross value added (GVA) in 2022, buoyed by the easing of health restrictions and higher workforce capacities as the economy fully opened two (2) years after the COVID-19 pandemic. With the resumption of both private and public construction projects, the sector's energy demand escalated by 15.9 percent to 778.4 kTOE from last year's 671.7 kTOE. Construction starts, measured by the number of building permits based on the data from the Philippine Statistics Authority (PSA)[9], also rose by 16.4 percent with 26,687 new permits issued in 2022.

The mining sub-sector remained positive in 2022 as high metal prices and robust production output contributed to the 35.0 percent growth in the aggregate value of metal production compared to the previous year[10]. Increased metal demand from export partners like China helped to support mining activity, and the adoption of long-overdue government regulations attracted new players who were given permission to operate during the year. These developments pushed the sector's energy consumption to 604.2 kTOE, up by 26.8 percent compared to the previous year's 476.4 kTOE.

Electricity acquired more than one-third (34.9 percent share) of the industry sector's energy demand mix during the year and was utilized in almost all industrial processes, particularly in food processing, iron and steel, and machinery and equipment industries. Its consumption reached 2.5 MTOE ***(Figure 9)*** or 4.4 percent more than its year-ago level of 2.4. MTOE. Coal accounted for more than a fourth (26.1 percent share) of total industry TFEC, but its utilization fell by 4.8 percent to 1.9 MTOE in 2022. Despite the cement

[9] Construction Statistics from Approved Building Permits, https://psa.gov.ph/construction/pcs-table
[10] Mines and Geosciences Bureau (MGB) Mineral Statistics 2021-2022

sub-sector's increased consumption, higher coal prices gripped the iron and steel and other manufacturing sub-sectors resulting in 18.1 percent and 27.5 percent reductions in coal demand, respectively. Consumption of oil products went up by 17.1 percent to 1.8 MTOE in 2022, translated to an aggregate share of 25.7 percent of the industry's TFEC. Diesel consumption escalated by 35.1 percent due to increased utilization in assembly lines for machineries and equipment for mining and construction. On the other hand, LPG use went up by 1.4 percent. These offset the registered 8.7 percent and 44.2 percent downtrend consumption of fuel oil and kerosene, respectively, during the year. Biomass consumption remained at 924 kTOE, while biodiesel consumption increased significantly by 53.7 percent to 23.7 kTOE in 2022, consistent with the mandated blending schedule.

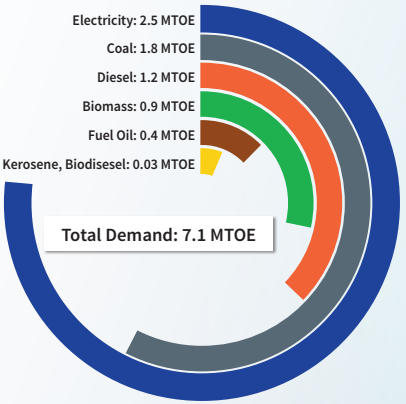

Figure 9. Industry Energy Demand, by Fuel (In MTOE): 2022

4. Services[11]

The services sector continued to propel the country's post-pandemic and was the main driver of economic growth for 2022 with a 9.2 percent acceleration in aggregate gross-value added (GVA) during the year. More relaxed COVID-19 protocols and requirements that prevailed throughout the year put business activities back on track, with notable performances from domestic trade, business process outsourcing (BPO), real estate, finance, and tourism. However, the significant shift in the energy demand mix for the sector, characterized by reduced dependence on diesel, moved down its energy consumption levels to 4.5 MTOE in 2022 or 8.2 percent less than the 4.8 MTOE recorded in the previous year.

The volume of diesel utilized for back-up power generators fell sharply by 35.0 percent to 1.3 MTOE compared to its year-ago level of 2.0 MTOE in 2022 that put on a 12.2 percentage points reduction in its share to the sector's TFEC to 29.6 percent share ***(Figure 10)***. This was attributed to the shift towards solar PV systems as back-up power for an increasing number of service establishments particularly shopping malls and large-scale buildings across the country. The reduction in the diesel demand also pulled down biodiesel consumption to 26.0 kTOE in 2022 vis-à-vis 40.0 kTOE in 2021. Consequently, the services

[11] Trade and services, excluding Transport

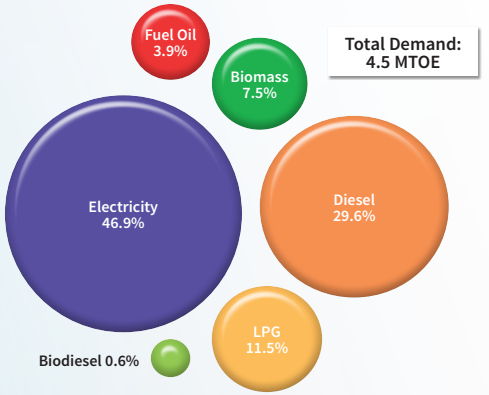

Figure 10: Energy Consumption of the Services Sector, By Fuel Shares (in percent), 2022

sector's total electricity consumption jumped to 2.1 MTOE in 2022, or 15.0 percent more than the 1.8 MTOE recorded in 2021. Return to onsite reporting and higher occupancy rates allowed in offices and buildings, including meeting, incentives, conferences, and exhibitions (MICE) activities among hotels and tourism establishments[12] lifted electricity's share to the sector's demand mix by 9.5 percentage points to 46.9 percent share and made it the most dominant energy source of the sector. Aside from electricity, consumption of LPG and fuel oil, with a 15.4 percent combined share, also increased by 7.0 percent and 12.0 percent, respectively. Biomass completed the demand mix with the share of 7.5 percent for an equivalent utilization of 331.8 kTOE during the year.

5. Agriculture

The agriculture sector, with the least contribution to GDP growth, lagged other output-producing sectors with a 0.5 percent increase in its GVA, albeit an improvement compared to its 0.3 percent contraction posted a year ago. However, its energy consumption lessened by 32.0 percent as all sub-sectors registered lower utilization in 2022 vis-à-vis 2021.

Farm output from the agri-industry decreased by 1.1 percent in 2022, pulled down by the adverse impact of successive weather disturbances[13] in the fourth quarter, as well as price hikes in production inputs (fertilizer, fuel and others). Because of these factors, farmers either reduced their hectarage or scrimped on inputs which both resulted in lower crop yields. This is evident in the 34.5 percent drop in energy use for agri-crop production from last year's 349.9 kTOE to 229.1 kTOE in 2022 ***(Figure 11)***. Despite the gains in the livestock and poultry sub-sector during the year from negative growth registered in 2021, its energy consumption declined by 56.8 percent to 73.1 kTOE due to hampered repopulation of hogs and a limited number of operating livestock farms and facilities amidst

[12] https://www.colliers.com/en-ph/research/colliers-quarterly-property-market-report-hotel-q4-2022-philippines
[13] Typhoons Karding (international name: Noru) and Paeng (international name: Nalgae) caused agricultural damage worth P3.12 billion and P6.4 billion in the harvesting months of Q4 2022.

the lingering impact of African Swine Fever (ASF). Higher production costs for farmers led to depressed agriculture activities as energy demand for agricultural support services also fell by 23.3 percent. Energy consumption in the forestry and fishery subsectors dropped by 20.5 percent and 27.7 percent, respectively, attributed to the weakened production volume output in 2022.

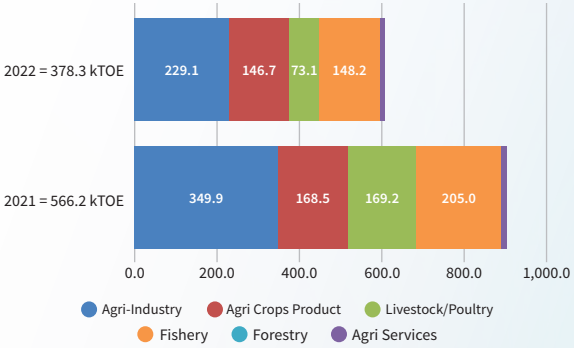

Figure 11: Energy Consumption of the Agriculture & Forestry, By Sub-Sector (in kTOE), 2021 vs 2022

Except for gasoline, all fuels for agriculture and its related activities registered reduced consumption during the year. Electricity, with its 62.6 percent share to agriculture's TFEC, dropped by 23.3 percent due to depressed demand from the agri-industry sub-sector. Diesel use for farm equipment fell by almost half (46.6 percent) to 120.6 kTOE in 2022, it accounted for 31.9 percent of the sector's demand mix, while biodiesel consumption mirrored its level of utilization reduction in the sector. Consumption of fuel and kerosene, with an aggregate share of 0.3 percent to the sector's TFEC, decreased by 45.6 percent. Gasoline completed the sector's demand mix, the only fuel in the sector that registered positive utilization level at 13.5 percent, from 15.4 kTOE in 2021 to 17.5 kTOE in 2022 ***(Figure 12)***.

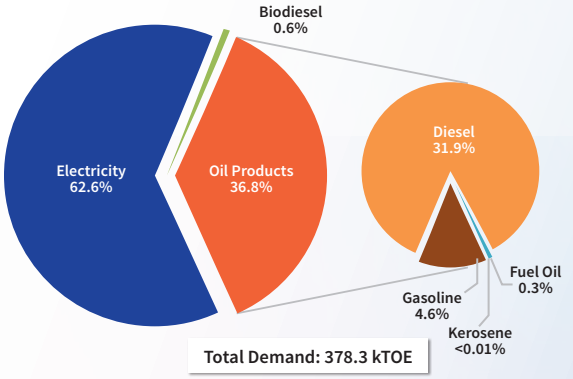

Figure 12: Energy Consumption of the Agriculture & Forestry Sector, By Fuel Shares (in percent), 2022

II. TRANSFORMATION

A. Oil Refining

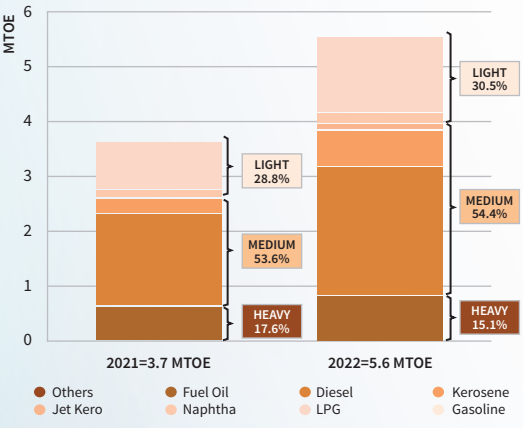

Figure 13: Refinery Production, by Fuel (in MTOE), 2021 vs 2022

Aggregate refinery production output from Petron's Bataan Refinery surged by 52.0 percent to 5.6 MTOE (43.8 million barrels (MMB)) compared to its year-ago level of 3.7 MTOE (28.8 MMB) ***(Figure 13)***. The significant uptrend is associated with high demand for Petron's finished petroleum products due to the resumption of economic activities and improved mobility that came with the easing of stringent travel restrictions. The country's lone refinery in Limay, Bataan, capable of supplying around 40.0 percent of total fuel requirements with its 180,000 barrel-per-day (bpd) capacity was able to avoid maintenance downtime in 2022 due to enhancements and optimizations implemented by the Petron Corporation. It took advantage of favorable refining cracks[14] and boosted its over-all net income for the same period.

All marketable products registered higher volumes during the year, except for fuel oil which posted a steep decline of 75.5 percent. Diesel dominated total marketable products with its 41.9 percent share, as its volume increased significantly by 39.3 percent to 2.3 MTOE compared to 1.7 MTOE in 2021. Gasoline, which accounted for 25.2 percent share also escalated to 1.4 MTOE or 56.6 percent more than its 2021 level of 893.5 kTOE. Notable increases were likewise recorded in other petroleum products such as jet fuel (152.7 percent), LPG (37.6 percent), kerosene (13.4 percent) and other petroleum products (47.5 percent) due to growing demand from the industry and aviation sectors.

[14] https://www.petron.com/news/petron-marks-two-straight-years-of-growth-reports-p6-7b-net-income-in-2022/

B. Power Generation and Fuel Input

Total generation output from all power plants in 2022 exhibited a 5.1 percent gain and reached 111.5 tera-watt (TWh) from the previous year's 106.1 TWh. This is consistent with the hike in electricity demand as economic activities returned to their pre-pandemic trajectories. Coal-fired power plants supplied the bulk of the total power generation at 59.6 percent (66.4 TWh), followed by natural gas at 16.0 percent (17.9 TWh). Generation output from geothermal and hydro recorded at 9.3 percent (10.4 TWh) and 9.0 percent share (10.1 TWh), respectively. On the other hand, combined shares of solar, wind, and biomass contributed a 3.7 percent share (4.2 TWh), while at least 2.3 percent (2.5 TWh) came from oil to complete the country's generation mix for 2022.

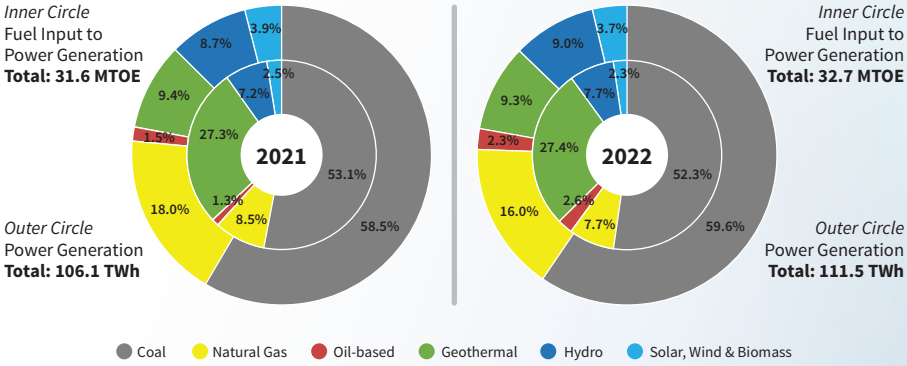

Figure 14: Generation and Fuel Input Mix, by Shares (%) 2021 vs 2022

Total fuel consumption of power plants went up by 3.7 percent to 32.7 MTOE in 2022 compared to 31.6 MTOE in the previous year. Fossil fuels owned close to two-thirds (62.6 percent) of the fuel input mix due to their reliability and baseload characteristics. The volume of coal input grew marginally by 2.3 percent from its year-ago level of 16.8 MTOE to 17.1 MTOE in 2022 credited to additional capacity from the GNPower Dinginin Unit 2 that went online in October 2022. Utilization of natural gas for power generation descended further by 6.3 percent to 2.5 MTOE compared to its 2021 level of 2.7 MTOE, due to the termination of the Malampaya and Ilijan cooperation period on 04 June 2022.

Combined fuel input of renewable energy sources remained at a level of 12.2 MTOE in 2022 from the previous year. Geothermal dipped by 2.4 percent from 9.2 MTOE in 2021, while hydro input went up by 9.8 percent from 2.3 MTOE in 2021 to 2.5 MTOE in 2022. Aggregate inputs from solar, wind and biomass stood at 0.8 MTOE, 10.1 percent more than their previous year's level. This is attributed to the 24.0 percent and 13.3 percent leap in solar and biomass, respectively, for power generation during the period.

III. TOTAL PRIMARY ENERGY SUPPLY

The aggregate volume of all primary energy sources for 2022 grew faster at 4.7 percent vis-à-vis the 2.4 percent growth in energy demand during the year. Of the 61.6 MTOE level of total primary energy supply (TPES), net imported energy reached 31.1 MTOE and maintained its ascent for two (2) consecutive years with a 7.6 percent increase vis-à-vis 2021. The level of indigenous energy resources slightly improved by 2.0 percent to 30.4 MTOE. With the fast-paced rise in net imported energy, energy self-sufficiency decreased further by 1.3 percentage points to 49.4 percent in 2022 from 50.8 percent in 2021 ***(Figure 15)***.

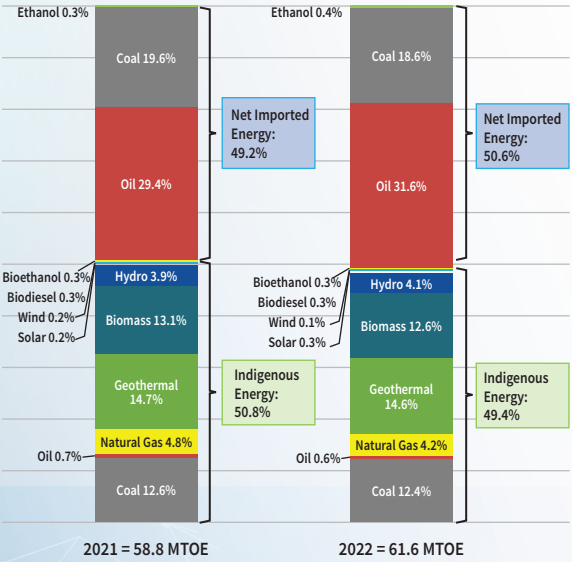

Figure 15. Total Primary Energy Mix, by Fuel (% Shares), 2021 vs 2022

Oil returned to the top spot as the country's major energy source with its 32.2 percent share to the TPES in 2022, its level increased by 12.3 percent to 19.8 MTOE driven by the hike in net oil importation given limited domestic production. Coal's aggregate supply level increased by 0.9 percent to 19.1 MTOE from its previous year's level of 18.9 MTOE, although this growth was held down by rising import prices. While coal maintained its 31.0 percent share to the TPES, natural gas posted a minimal contribution at 4.2 percent share due to its 6.2 percent reduction as fuel input for power generation in 2022. The aggregate supply of geothermal, hydro, solar, wind and biomass (including biofuels) reflected a share of 32.6 percent in the energy mix, grew by 3.3 percent from the previous year's level of 19.4 MTOE to reach 20.0 MTOE in 2022.

A. Indigenous Energy

The share of total indigenous energy production to the energy mix remained on the downtrend at 49.4 percent vis-à-vis 51.1 percent in 2021. Gains achieved in the increased production of coal (2.9 percent), hydro (9.8 percent), solar (24.0 percent), biomass (1.6 percent), and biofuels (4.1 percent), were surpassed by the reduction of oil (8.7 percent), natural gas (7.4 percent), geothermal (2.4 percent) and wind (18.9 percent).

Fossil Fuels

i. Oil

The nation's total oil production, including condensate, decreased by 8.7 from its 2021 level to 357.6 kTOE in 2022 (1.2 percent of the overall indigenous energy supply) from last year's 391.5 kTOE. The remaining active oil fields in the nation, Galoc, and Alegria, declined their crude oil production at 11.6 percent and 32.7 percent, respectively. Similarly, condensate output continued to weaken in 2022, registered a reduction of 7.8 percent, as a result of the Malampaya gas field's declining viability.

ii. Coal

Domestic coal production, with an 8.6 percent share to aggregate indigenous energy production, improved by 2.9 percent to 7.6 MTOE (14,457.3 million metric tons (MMT)) from its 2021 level of 7.4 MTOE (14,047.7 MMT). The entirety (99.5 percent) of local coal was sourced from Semirara Mining, the country's primary coal mine located in Antique province, which reported a 3.1 percent increase in its coal volume in 2022. This is brought about by the strong domestic sales[15] of SMPC during the period. Coal mines in Cebu and Negros also reported a significant increase in production that compensated for the curtailed output from small-scale mines (19.7 percent) and in the Bicol region (71.2 percent).

iii. Natural Gas

Natural gas production remained on the downtrend, reduced further by 7.4 percent in 2022 to 2.6 MTOE (112.2 billion standard cubic feet (BSCF), which represented 4.2 percent share to total domestic energy production. Implementation of Malampaya gas supply restrictions on Ilijan and San Gabriel Power plant from January to May of 2022, with the expiration of Ilijan Power plant's Gas Sales and Purchase Agreement (GSPA) on 5 June 2022, resulted in diminished supply levels during the year.

Renewable Energy

i. Geothermal

Geothermal's share to the total indigenous energy supply stood at 29.5 percent in 2022 while its equivalent volume increased by 4.1 percent to 9.0 MTOE from previous year's 8.6 MTOE. The country remains to be one with the largest installed generating capacity globally with 1,952 megawatts (MW).[16] Meanwhile,

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[15] Semirara Mining and Power Corporation (SMPC) 2022 Annual Report (https://www.semiraramining.com/company_disclosures)

[16] https://www.doe.gov.ph/sites/default/files/pdf/electric_power/04_LVM%20Grid%20Summary_Rev1_0.pdf

a total of 24 geothermal projects with a combined potential capacity of 870.6 MW[17] were awarded as of end year 2022.

ii. Biomass

Total biomass[18] supply reached 7.73 MTOE in 2022 or 0.1 percent more than its 7.72 MTOE registered in the previous year. It contributed 25.4 percent to the total indigenous energy supply for the same period. The bulk of the increase in biomass supply is attributed to its higher utilization in power generation which was supported by 611 MW[19] of installed capacity. On the other hand, additional capacity of 186.2 MW is expected from around 28 biomass projects as of 2022.[20]

iii. Hydro

Hydropower production went up 9.8 percent from previous year's level of 2.3 MTOE to 2.5 MTOE in 2022, boosted by the above-normal rainfall conditions due to the La Niña phenomenon that persisted until the end of 2022. Hydropower contributed an 8.3 percent share to the total indigenous energy supply, supported by its aggregate capacities capacities of 3,745 MW[21]. A total of 12,272.5 MW[22] potential capacity from 362 hydropower projects were awarded by the end of 2022.

iv. Solar

Preference for solar as a viable energy source has grown rapidly in recent years consistent with the government's push for sustainability. For 2022, solar supply levels posted an outstanding increase of 24.0 percent from its year-ago level of 126.4 kTOE to 156.7 kTOE, albeit a minimal share of 0.3 percent to TPES for the same period. In 2022, solar installed capacity reached 1,530 MW[23] and its potential capacity of 21,413.6 MW[24] from 156 solar projects were awarded during the period.

v. Wind

Wind energy supply posted a sizable decline of 18.9 percent from its previous year's level of 109.2 kTOE due to derating in its dependable capacity for 2022. While its share of the country's energy mix for 2022 was marginal at 0.1 percent, interest in wind energy development has been revitalized due to its colossal potential resources, which is aligned with the country's effort on energy

[17] https://www.doe.gov.ph/sites/default/files/pdf/renewable_energy/awarded_geothermal_2022-12-31.pdf
[18] Includes charcoal, fuelwood, rice hull bagasse, agriculture, animal and municipal wastes
[19] https://www.doe.gov.ph/sites/default/files/pdf/electric_power/04_LVM%20Grid%20Summary_Rev1_0.pdf
[20] https://www.doe.gov.ph/sites/default/files/pdf/renewable_energy/awarded_biomass_2022-12-31_own-use.pdf
[21] https://www.doe.gov.ph/sites/default/files/pdf/electric_power/04_LVM%20Grid%20Summary_Rev1_0.pdf
[22] https://www.doe.gov.ph/sites/default/files/pdf/renewable_energy/awarded_hydropower_2022-12-31.pdf
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[23] https://www.doe.gov.ph/sites/default/files/pdf/electric_power/04_LVM%20Grid%20Summary_Rev1_0.pdf
[24] https://www.doe.gov.ph/sites/default/files/pdf/renewable_energy/awarded_solar_2022-12-31.pdf

transition goal. The total installed wind capacity reached 427 MW[25] with a potential capacity of 45,631.2 MW[26] from 21 energy projects awarded as of 2022.

vi. Biofuels

Biofuels supply mirrored the uptrend in demand for gasoline and diesel consistent with the implementation of the mandated blending schedule. As such, the domestic supply of biodiesel and bioethanol climbed by 5.7 percent and 2.9 percent, respectively. In 2022, the country has 12 biodiesel producers with combined capacities of 677.9[27] million liters/ year (MLPY) and 13 bioethanol facilities with 466.0 MLPY in operation. Four (4) biodiesel and two (2) bioethanol producers were also accredited for the construction of production plant projects.

B. Net Energy Imports[28]

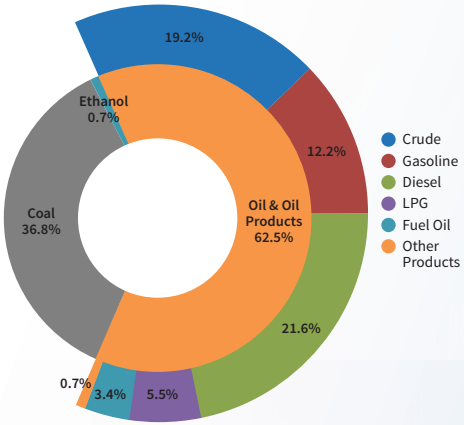

Figure 16. Net Energy Imports, by Fuel (% Shares), 2022

The volume of net imported energy reached 31.1 MTOE in 2022, 7.6 percent higher than its year-ago level of 28.9 MTOE. It served as a buffer against the reduced domestic energy production to meet increased energy requirements from renewed economic activities amidst the diminishing impact of the COVID-19 pandemic. Of the total volume of net energy imports, oil and oil products accounted for more than half (62.5 percent share), while coal and ethanol contributed 36.8 percent and 0.7 percent shares, respectively ***(Figure 16)***.

Volatile international prices due to lingering tension between Russia and Ukraine failed to prevent the country's import propensity since heightened economic activities created a strong domestic demand for oil products. This situation pushed the aggregate volume of oil imports by 13.8 percent to 21.3 MTOE in 2022 from the previous year's 18.7 MTOE. Crude oil, with a 27.4 percent share of total oil import volume for 2022, exhibited a marked increase of 46.0 percent to 5.8 MTOE vis-à-vis 4.0 MTOE in 2021 encouraged by the enhanced operation of Petron's Bataan refinery. The relatively slower increase in the international

[25] https://www.doe.gov.ph/sites/default/files/pdf/electric_power/04_LVM%20Grid%20Summary_Rev1_0.pdf
[26] https://www.doe.gov.ph/sites/default/files/pdf/renewable_energy/awarded_wind_2022-12-31.pdf
[27] https://www.doe.gov.ph/renewable-energy/biodiesel?page=1
[28] This is derived as total primary energy supply (TPES) less indigenous production. Alternatively, it can also be calculated as the sum of imports and stock change (+/-) less exports and international bunkers (aviation and marine)

price of gasoline prices vis-à-vis diesel[29], coupled with increased demand from the aviation industry, served as the impetus for the 5.1 percent upturn in imports of finished petroleum products to 15.4 MTOE in 2022 from its previous year's level of 14.7 MTOE. The import market for the Philippines remained unchanged with South Korea, Singapore, and China as top sources of finished oil products, while the Middle East supplied all of the country's requirements for imported crude ***(Figure 17)***.

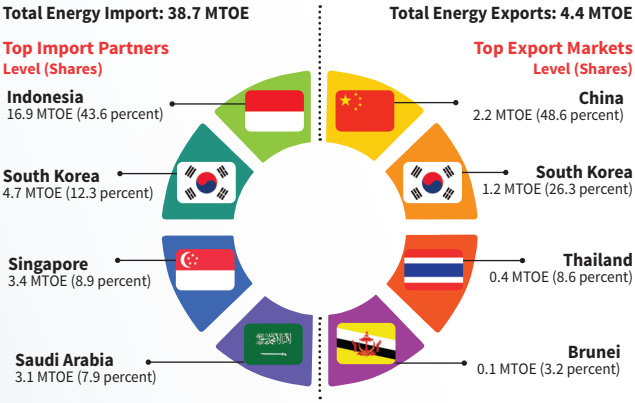

Figure 17. Top 4 Countries as Import Source and Export Destinations for 2022

Total oil exports went down by 28.4 percent to 457.3 kTOE compared to the previous year's level of 638.9 kTOE. Exports of finished oil products decreased by 29.1 percent as volume was directed to meet domestic consumption. Reduction in oil output of the Galoc oil field led to a 24.1 percent decline in crude exports, while the downtrend in Malampaya condensate also declined further by 7.8 percent during the year. The top export markets with almost a quarter of each share were China (22.7 percent), Brunei (22.3 percent), and Thailand (22.2 percent).

Amplified demand for coal as a fuel for power generation necessitated the 4.7 percent increase in coal imports to 17.3 MTOE in 2022 from its previous year's volume of 16.5 MTOE. Indonesia continued to contribute most of the country's coal imports with its 97.7 percent share, while Australia, Vietnam, Russia, and Thailand shared the remaining 2.3 percent. Coal exports decreased by 23.7 percent to 3.7 MTOE from its 2021 volume of 4.9 MTOE due to moderate movement in domestic coal production and slower demand from China, the country's top export destination, as it curbed its coal importation to encourage local production[30]. South Korea has emerged as a strong export market for Philippine coal with a 30.5 percent share, next to China's 55.8 percent share of total export.

The uptrend in the country's transport sector demand for petroleum products contributed to the 22.9 percent increase in bioethanol imports from its 2021 level of 125.9 kTOE to 154.7 in 2022.

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[29] Mean of Platts Singapore (MOPS) for gasoline per barrel was US$78.3 (2021) and US$111.1, while for diesel it was US$77.3 (2021) and US$134.5 (2022)

[30] China's hunger for coal sparks debate on self-sufficiency and imports (https://www.spglobal.com/commodityinsights/en/market-insights/blogs/coal/032723-blog-chinas-hunger-for-coal-sparks-debate-on-self-sufficiency-and-imports#:~:text=China%20imported%20293.20%20million%20mt,its%20requirements%20through%20domestic%20production)

IV. ENVIRONMENTAL IMPACT

Total greenhouse gas (GHG) emissions for 2022 increased by 4.0 percent to 135.7 million tons of CO_2 equivalent ($MtCO_2e$) or 4.0 percent more than previous year's 130.4 $MtCO_2e$. The gradual removal of COVID-19 restrictions throughout the year encouraged the rebound in economic activities and returned GHG emissions to their pre-pandemic levels ***(Table 1)***.

Table 1: GHG Emission, by Sector: 2021 vs 2022

Sector	CO_2 Emission ($MtCO_2e$)		Total NonCO_2 Emission ($MtCO_2e$)		Total GHG Emission*** ($MtCO_2e$)		Total GHG Emission (% Change)
	2021	2022	2021	2022	2021	2022	2021-2022
Electricity	73.59	75.98	0.29	0.30	73. 88	76.28	3.25
Transport	31.32	35.18	0.22	0.24	31.53	35.42	12.32
Industry	12.44	12.88	0.07	0.07	12.50	12.94	3.52
Other Sectors*	12.05	9.81	0.08	0.06	12.13	9.88	(18.55)
Energy**	0.40	1.15	0.00	0.00	0.40	1.16	186.59
Total	**129.80**	**135.00**	**0.65**	**0.68**	**130.45**	**135.68**	**4.01**
% Distribution							**Change in Distribution**
Electricity	56.70	56.28	44.56	44.39	56.64	56.22	(0.41)
Transport	24.13	26.06	33.24	35.82	24.17	26.10	1.93
Industry	9.58	9.54	10.32	9.90	9.58	9.54	(0.05)
Other	9.28	7.27	11.78	9.39	9.30	7.28	(2.02)
Energy	0.31	0.85	0.10	0.50	0.31	0.85	0.54
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	

**includes emissions from the services, households, and agriculture*
***includes losses incurred in oil refining*
**** Updated using GWP Values, Fifth Assessment Report(AR5), and EF based on 2006 IPCC Guidelines (Tier 1)*

Power generation accounted for more than half (56.2 percent share) of the total GHG emissions during the year. Increased output from coal-fired power plants resulted in a 3.3 percent increase in GHG emissions to 76.3 $MTCO_2e$ compared to the 73.9 $MTCO_2e$ recorded in 2021. Among end-use economic sectors, transport remained the biggest GHG emitter with a 26.1 percent share to total GHG emissions. Full seating capacities implemented for public transport, as well as eased mobility restrictions, pushed the sector's GHG emission to a double-digit hike of 12.3 percent to 35.4 $MTCO_2e$ in 2022 from its year-ago level of 31.5 $MTCO_2e$. Amplified industrial production raised the sector's GHG emission by 3.5 percent to 12.9 $MTCO_2e$ in 2022 (9.5 percent share) from its 2021 level of 12.5 $MTCO_2e$. On the other hand, the decline in energy consumption of the agriculture, services, and household sectors weighed down their aggregate GHG emission (7.3 percent share), as it

drastically fell by 18.6 percent from 12.1 $MTCO_2e$ in 2021 to 9.9 $MTCO_2e$ in 2022. Emissions from refinery production and own use of energy tripled from 0.4 $MTCO_2e$ in 2021 to 1.2 $MTCO_2e$ in 2022.

Table 2: GHG Emission, by Fuel: 2021 vs 2022

Sector	CO_2 Emission ($MtCO_2e$)		Total NonCO_2 Emission ($MtCO_2e$)		Total GHG Emission*** ($MtCO_2e$)		Total GHG Emission (% Change)
	2021	2022	2021	2022	2021	2022	2021-2022
Oil	49. 49	54.07	0.31	0.33	49.81	54.40	9.22
Coal	73.71	74.83	0.33	0.34	74.05	75.17	1.52
Gas	6.59	6.11	0.01	0.01	6.60	6.11	(7.36)
Total	**129.80**	**135.00**	**0.65**	**0.68**	**130.45**	**135.68**	**4.01**
% Distribution							**Change in Distribution**
Oil	38.13	40.05	47.85	49.33	38.18	40.09	1.91
Coal	56.79	55.43	51.17	49.78	56.76	55.40	(1.36)
Gas	5.08	4.52	0.99	0.88	5.06	4.50	(0.55)
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	

**** GWP Values and EF based on Fifth Assessment Report (AR5) and 2006 IPCC Guidelines (Tier 1), respectively*

By type of fuel, coal remained the major source of GHG emissions with its 55.4 percent share of the total GHG emission in 2022. Steady demand for coal as fuel input in power generation led to a 1.5 percent increment in GHG emission from coal as it reached 75.2 $MTCO_2e$ in 2022 from its year-ago level of 74.0 $MTCO_2e$ ***(Table 2)***. Aggregate consumption of oil and oil products resulted in 54.4 $MTCO_2e$ or 40.1 percent of total GHG emissions in 2022. Intensified utilization of gasoline, fuel, and aviation fuels contributed to the 9.2 percent increase year-on-year in GHG emission from oil. The downward trend in the use of natural gas for both power and non-power applications reduced the fuel's GHG emissions by 7.4 percent during the year.

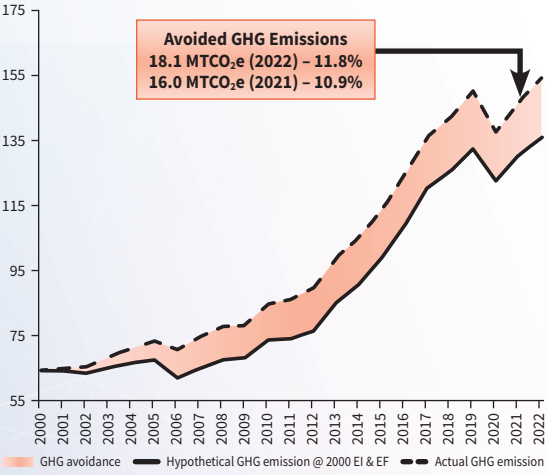

Figure 17. Actual GHG Emission, Hypothetical GHG Emission and GHG Avoidance: 2000 – 2021

Consistent with the commitment of the country to its Nationally Determined Contributions (NDC)[31], different mitigation measures pursued in the energy sector resulted in the avoidance of 18.1 $MtCO_2e$ or 11.8 percent of the total hypothetical[32] GHG emission in 2022 as shown in ***Figure 17*** and ***Table 3***. Combined increments in generation output from geothermal, hydro, biomass, and variable RE (wind and solar) pushed avoided GHG emission from the power generation sector by 5.1 percent to 4.5 $MtCO_2e$ (2.9 percent of total GHG avoidance) vis-à-vis 4.3 $MtCO_2e$ from the previous year. On the other hand, demand-side management measures succeeded as GHG avoidance went up by 16.5 percent to 13.6 $MTCO_2e$ (8.9 percent share to total avoidance), with marked improvements from efficiency in electricity and fossil fuel consumption, as well as in biofuel blending. These developments contributed to a 13.4 percent increase in overall avoided GHG emissions for the year.

Table 3. CO_2 Avoidance from the Mitigation Measures (in $ktCO_2e$)

Sector	2021	Reduction impact %	2022	Reduction impact %	% Change
Demand side	11,703.05	7.99	13,629.80	8.86	16.46
Efficiency in Electricity Consumption (EEC)	3,372.92	2.30	3, 866.53	2.51	14.63
Efficiency in Fossil Fuel Consumption (EEF)	6,381.16	4.36	7,397.03	4.81	15.92
Biofuel	1,948.97	1.33	2,366.24	1.54	22.41
CNG/NG	0.00	0.00	0.00	0.00	11.46
Supply side					
Fuel Diversification in Power Generation @ 2018 GDP & EF**	4,252.64	2.90	4,468.24	2.91	5.07
Total Avoidance (Demand + Supply - EEC)	**15,955.70**	**10.90**	**18,098.04**	**11.77**	**13.43**
Actual GHG Emission	**130,449.12**		**135,679.36**		**4.01**
Hypothetical GHG Emission (Actual + Total Avoidance)	**146,404.82**		**153,777.39**		**5.04**

**Refers to the percent reduced emission (Total Avoidance / Hypothetical GHG Emission x 100)*
*** Includes efficiency in Power Generation and EEC*

[31] Philippines | Climate Promise (undp.org)
[32] Refers to actual GHG emission plus total avoidance; or the level of GHG emission if there were no mitigation measures being adopted.

V. ENERGY – ECONOMY AND ENVIRONMENTAL INDICATORS[33]

The Philippine economy has effectively returned to its pre-pandemic trajectory signaled by the robust 7.6 percent expansion in gross domestic product (GDP) for 2022 – the fastest among the emerging economies in the ASEAN region and its best performance in almost four decades.

The government's effective pandemic risk management and removal of restrictions resulted in strong domestic demand, which was met by expansions of 9.2 percent and 6.5 percent in the aggregate GVA in the services and industry sectors, respectively, and represented the bulk of GDP at 91.1 percent share. Domestic trade, manufacturing, and construction each posted notable growth contributions of 8.7 percent, 4.9 percent, and 12.1 percent, respectively, which offset the minimal decrease of 0.5 percent registered in the agriculture, fishery, and forestry (AFF) sectors for the year. On the demand side, household consumption and investment lifted the economy, as each posted sizeable increments of 8.3 percent and 13.8 percent during the year.

Intensity. Energy intensity serves as an indicator of how much energy is used to produce one unit of economic output such that the rate of improvement in energy intensity is used as an indicator for improvements in energy efficiency.

For 2022, the country's economy-wide energy intensity stood at 3.1 tons of oil equivalent per million pesos of real GDP (TOE/MPhP) or 2.6 percent less than its year-ago level of 3.2 TOE/MPhP. Electricity intensity fell by 2.3 percent to 5.6 watt-hours per peso (Wh/PhP), while oil intensity increased by 3.4 percent to 8.1 barrels/PhP (bbl/PhP) attributed to its increased utilization in the transport sector ***(Table 4)***.

Table 4. Energy Indicators: 2021 vs 2022

Indicators	Energy	Electricity	Oil
Intensity	2021: 3.17 TOE/MPhp 2022: 3.09 TOE/MPhp	2021: 5.72 Wh/Php 2022: 5.59 Wh/Php	2021: 7.80 bbl/Php 2022: 8.07 bbl/Php
Elasticity	2021: 0.68 2022: 0.62	2021: 0.75 2022: 0.67	2021: 1.36 2022: 1.49
Per Capita	2021: 0.53 TOE 2022: 0.55 TOE	2021: 962.9 kWh 2022: 999.5 kWh	2021: 1.31 bbl 2022: 1.44 bbl

Major economic sectors likewise exhibited reductions in their respective energy intensity. The services sector, which includes the transport subsector, went down by 3.4 percent to 1.5 TOE/MPhP. Industry, household, and agriculture sectors

[33] GDP figures as based on the PSA National Accounts of the Philippines (NAP), as of April 2022 (rebased 2018)

also reported cutbacks of 2.4 percent, 6.5 percent, and 32.3 percent in energy use per million pesos, respectively. These improvements in energy intensity meant significant achievements in programs and policies implemented under Republic Act 11285 or the Energy Efficiency and Conservation Act of 2019, as well as continued compliance under the Sustainable Development Goal (SDG) 7.3.[34]

Elasticity. As the country's rate of economic expansion outpaced its energy requirement, economy-wide energy-to-GDP elasticity declined to 0.6 units in 2022 vis-à-vis 0.7 units from the previous year, while electricity-to-GDP was slightly lower at 0.7 units. These low elasticity values showed that the quantity of energy (overall) and electricity is less responsive to changes in economic output. On the other hand, oil-to-GDP stood at 1.5 units because of the strong domestic demand for oil and oil products that prevailed during the year ***(Table 4)***.

Per Capita: Per capita levels of energy, electricity, and oil improved as pandemic restrictions were lifted during the year. Energy use per person rose by 3.4 percent to 0.6 TOE, while electricity (1.0 MWh/person) and oil (1.4 BBL/person) were higher by 3.8 percent and 9.9 percent, respectively than their 2021 levels ***(Table 4)***. Progress in per capita levels would imply that a greater proportion of the Filipino population had improved access to energy, including oil and electricity, during the year.

GHG Emission Indicators

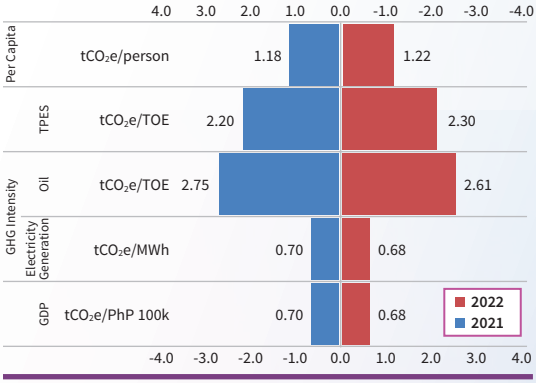

Figure 18. Environmental Emission Indicators: 2021 vs 2022

Carbon intensity of energy supply, measured as the ratio of total GHG emission over total energy supply, remained constant at 2.2 tCO_2e/TOE, while the GHG emission per capita increased by 2.7 percent to 1.2 tCO_2e/person during the year attributed to the increase in energy per capita ***(Figure 18)***. Consumption of oil products with a lesser carbon footprint contributed to the 4.9 percent decline in GHG intensity of oil consumption to 2.6 tCO_2e/TOE, while GHG intensity of power generation was lower by 1.8 percent at 0.68 tCO_2e/MWh vis-à-vis the previous year given the higher generation output from aggregate RE sources. Lastly, GHG emission per unit of economic output went down by 3.3 percent to 0.68 tCO_2e/PhP100k which indicated advances in the country's transition towards cleaner energy resources.

[34] Sustainable Development Goal 7.3 target calls for global progress on energy efficiency by doubling the rate of improvement in energy efficiency globally by 2030 (https://www.seforall.org/goal-7-targets/energy-efficiency)

2021 Energy Balance Table

In thousand tons of oil equivalent (kTOE)

	Coal	Natgas	Oil & Oil Products	Hydro	Geothermal	Solar	Wind	Biomass	Biodiesel	Bioethanol	Electricity	Total
Indigeneous	7,414.4	2,820.2	391.5	2,286.6	8,612.6	126.4	109.2	7,720.7	156.6	200.0	-	29,838.1
Imports (+)	16,487.9	-	18,667.3	-	-	-	-	-	-	125.9	-	35,281.1
Exports (-)	(4,907.5)	-	(945.5)	-	-	-	-	-	-	-	-	(5,853.0)
International Marine Bunkers (-)	-	-	(70.8)	-	-	-	-	-	-	-	-	(70.8)
International Civil Aviation (-)	-	-	(534.9)	-	-	-	-	-	-	-	-	(534.9)
Stock Change (+/-)	(81.3)	-	145.3	-	-	-	-	-	14.0	42.6	-	120.6
Total Primary Energy Supply	**18,913.4**	**2,820.2**	**17,652.8**	**2,286.6**	**8,612.6**	**126.4**	**109.2**	**7,720.7**	**170.6**	**368.5**	**-**	**58,781.0**
Refinery (Crude Run)	-	-	(211.3)	-	-	-	-	-	-	-	-	(211.3)
Power Generation (Fuel Input)	(16,751.2)	(2,698.3)	(402.1)	(2,286.6)	(8,612.6)	(126.4)	(109.2)	(563.4)	(9.9)	-	9,124.2	(22,435.4)
Transmission/Dist Loss (-)	-	-	-	-	-	-	-	-	-	-	(857.1)	(857.1)
Energy Sector Use & Loss (-)	-	(121.5)	(39.1)	-	-	-	-	-	-	-	(750.5)	(911.2)
Net Domestic Supply	**2,162.2**	**0.3**	**17,000.3**	**-**	-	-	-	**7,157.3**	**160.7**	**368.5**	**7,516.5**	**34,366.0**
Statistical Difference % Statistical Difference												(662.0) (1.9)
Total Final Energy Consumption	**2,162.2**	**0.3**	**17,662.3**	-	-	-	-	**7,157.3**	**160.7**	**368.5**	**7,516.5**	**35,028.0**
Industry	1,949.6	0.3	1,557.5	-	-	-	-	923.3	15.4	-	2,375.2	6,821.4
Transport	-	-	10,503.0	-	-	-	-	-	100.9	368.5	9.3	10,987.6
Households	-	-	1,266.4	-	-	-	-	5,904.4	-	-	3,007.8	10,178.6
Services	-	-	2,662.4	-	-	-	-	329.6	40.0	-	1,815.9	4,847.9
Agriculture	-	-	243.3	-	-	-	-	-	4.5	-	308.4	556.2
Non- Energy Use	212.6	-	1,429.7	-	-	-	-	-	-	-	-	1,642.4
											Self-Sufficiency (%)	**50.76**

2022 Energy Balance Table

In thousand tons of oil equivalent (kTOE)

	Coal	Natgas	Oil & Oil Products	Hydro	Geothermal	Solar	Wind	Biomass	Biodiesel	Bioethanol	Electricity	Total
Indigeneous	7,630.5	2,612.5	357.6	2,510.5	8,963.5	156.7	88.6	7,731.3	165.6	205.7	-	30,422.4
Imports (+)	17,256.9	-	21,250.9	-	-	-	-	-	-	154.7	-	38,662.5
Exports (-)	(3,744.4)	-	(739.8)	-	-	-	-	-	-	-	-	(4,484.2)
International Marine Bunkers (-)	-	-	(107.4)	-	-	-	-	-	-	-	-	(107.4)
International Civil Aviation (-)	-	-	(1,206.2)	-	-	-	-	-	-	-	-	(1,206.2)
Stock Change (+/-)	(2,067.8)	-	277.4	-	-	-	-	-	15.8	45.6	-	(1,729.0)
Total Primary Energy Supply	**19,075.3**	**2,612.5**	**19,832.4**	**2,510.5**	**8,963.5**	**156.7**	**88.6**	**7,731.3**	**181.3**	**406.1**	**-**	**61,558.2**
Refinery (Crude Run)	-	-	(329.1)	-	-	-	-	-	-	-	-	(329.1)
Power Generation (Fuel Input)	(17,129.2)	(2,528.5)	(823.9)	(2,510.5)	(8,963.5)	(156.7)	(88.6)	(514.3)	(12.2)	-	9,588.6	(23,138.6)
Transmission/Dist Loss (-)	-	-	-	-	-	-	-	-	-	-	(919.5)	(919.5)
Energy Sector Use & Loss (-)	-	(84.0)	(314.9)	-	-	-	-	-	-	-	(816.0)	(1,214.8)
Net Domestic Supply	**1,946.1**	**-**	**18,364.6**	**-**	-	-	-	**7,217.0**	**169.2**	**406.1**	**7,853.2**	**35,953.1**
Statistical Difference % Statistical Difference												97.5 0.3
Total Final Energy Consumption	**1,946.1**	**0.3**	**18,267.0**	-	-	-	-	**7,217.0**	**169.2**	**406.1**	**7,853.2**	**35,858.6**
Industry	1,855.3	-	1,824.0	-	-	-	-	923.6	23.7	-	2,480.1	7,106.7
Transport	-	-	11,789.7	-	-	-	-	-	117.1	406.1	10.1	12,323.0
Households	-	-	1,311.1	-	-	-	-	5,961.6	-	-	3,037.4	10,310.1
Services	-	-	2,004.9	-	-	-	-	331.8	26.0	-	2,088.9	4,451.5
Agriculture	-	-	139.3	-	-	-	-	-	2.4	-	236.7	378.3
Non- Energy Use	90.8	-	1,198.1	-	-	-	-	-	-	-	-	1,288.9
											Self-Sufficiency (%)	**49.42**

DEPARTMENT OF ENERGY

KEY ENERGY STATISTICS

2022








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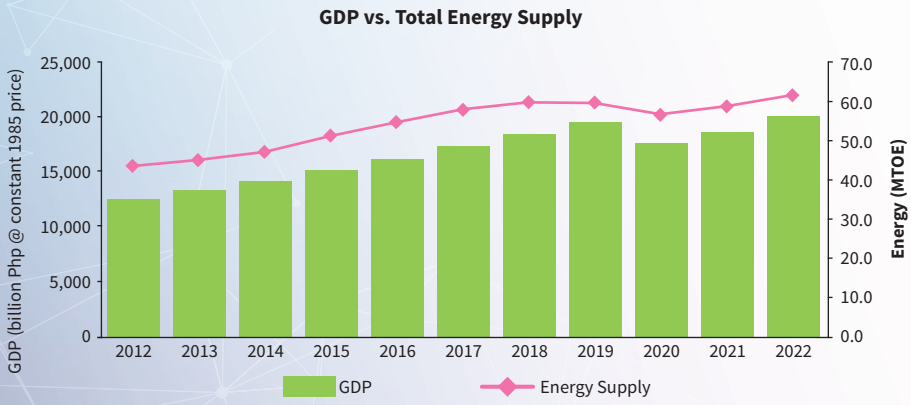
Energy and Economy

Energy and Economic Indicators

	2012	2013	2014	2015	2016	2017
GDP (in billion pesos: at constant 2018 prices)	12,416.5	13,254.6	14,096.0	14,990.9	16,062.7	17,176.0
Total Final Energy Consumption (in MTOE)	25.8	27.3	28.5	31.0	33.5	35.5
Total Primary Energy Supply (in MTOE)	43.5	45.0	47.0	51.3	54.6	58.0
Population (in million)	96.5	98.2	99.9	101.6	103.2	104.9
Forex (in Pesos/USD)	41.2	44.4	44.6	47.2	49.8	49.9
Average Crude Price (in USD / barrel)	109.0	105.0	97.0	50.9	42.2	54.2

	2018	2019	2020	2021	2022	AAGR*
GDP (in billion pesos: at constant 2018 prices)	18,265.2	19,382.8	17,537.8	18,540.1	19,943.6	4.9%
Total Final Energy Consumption (in MTOE)	35.7	36.3	32.6	35.0	35.9	3.4%
Total Primary Energy Supply (in MTOE)	59.7	59.9	56.6	58.8	61.6	3.5%
Population (in million)	106.6	108.3	109.0	110.2	111.6	1.5%
Forex (in Pesos/USD)	52.7	50.7	48.0	50.8	56.1	3.1%
Average Crude Price (in USD / barrel)	69.4	66.8	49.8	69.2	70.2	-4.3%

**AAGR - Average Annual Growth Rate*

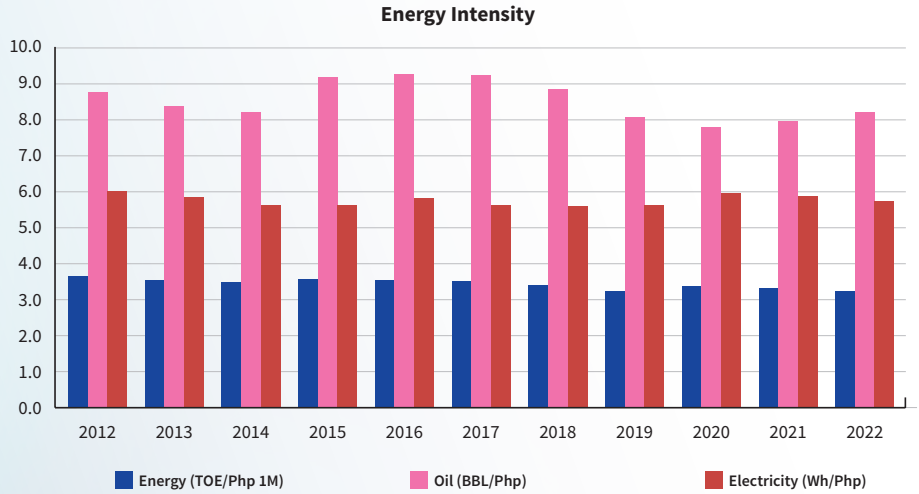


Sources:
Gross Domestic Product (GDP), Population - National Accounts, Philippine Statistical Authority (Rebased 2018)
Foreign Exchange Rate - *Bangko Sentral ng Pilipinas (BSP)*
Energy Supply - Policy Formulation and Research Division (PFRD), DOE
Crude Oil Price - *Oil Industry Management Bureau (OIMB), DOE*

Indicator	2012	2013	2014	2015	2016	2017
Intensity						
Energy to GDP** (TOE/Php 1M)	3.51	3.39	3.33	3.42	3.40	3.37
Oil to GDP (BBL/Php)	8.63	8.25	8.09	9.03	9.14	9.11
Electricity to GDP (Wh/Php)	5.87	5.68	5.48	5.50	5.65	5.49
Elasticity						
Energy to GDP	0.58	0.50	0.70	1.44	0.90	0.89
Oil to GDP	0.97	0.31	0.68	2.95	1.17	0.96
Electricity to GDP	0.79	0.48	0.42	1.05	1.42	0.57
Energy Per Capita (TOE/person)	0.45	0.46	0.47	0.50	0.53	0.55

Indicator	2018	2019	2020	2021	2022	AAGR*
Intensity						
Energy to GDP** (TOE/Php 1M)	3.27	3.09	3.23	3.17	3.09	-1.3%
Oil to GDP (BBL/Php)	8.73	7.93	7.66	7.80	8.07	-0.7%
Electricity to GDP (Wh/Php)	5.46	5.47	5.80	5.72	5.59	-0.5%
Elasticity						
Energy to GDP	0.48	0.04	0.57	0.68	0.62	0.7%
Oil to GDP	0.29	0.59	1.32	1.36	1.49	4.4%
Electricity to GDP	0.90	1.03	0.42	0.75	0.67	-1.5%
Energy Per Capita (TOE/person)	0.56	0.55	0.52	0.53	0.55	2.0%

* average annual growth rate
** GDP Rebased 2018 @ constant price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2018
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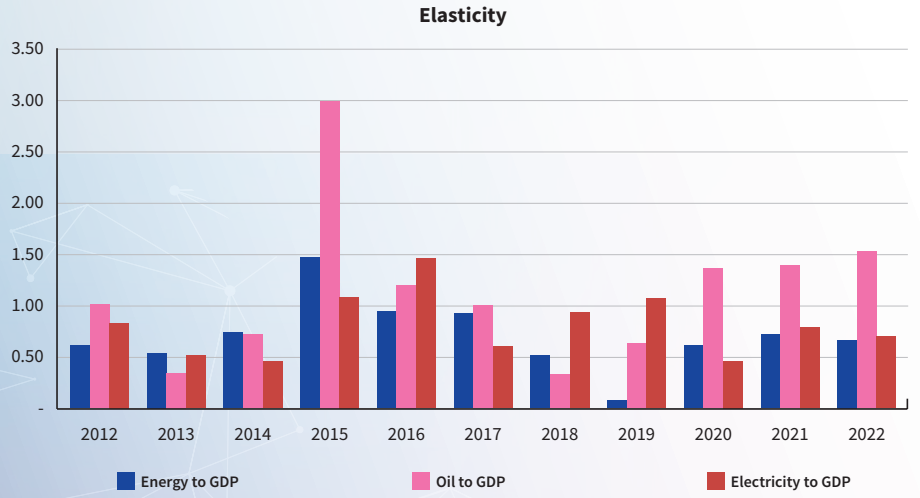
2021
2022
Energy (TOE/Php 1M)
Oil (BBL/Php)
Electricity (Wh/Php)


Elasticity
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2016
2017
2018
2019
2020
2021
2022
Energy to GDP
Oil to GDP
Electricity to GDP

Energy and Environment

GHG Emission by Sector and Activity

$MtCO_2e$ [1]

Sector and Activity	2012	2013	2014	2015	2016	2017
Industry	10.71	12.36	12.88	13.20	15.29	16.63
Transport	24.38	25.48	26.45	30.60	33.11	34.19
Others [2]	5.87	6.31	7.15	7.06	8.59	10.16
Electricity Generation	35.00	40.69	43.63	47.49	51.61	59.00
Energy [3]	1.10	0.94	1.11	0.96	0.66	0.71
Total	**77.07**	**85.78**	**91.22**	**99.30**	**109.25**	**120.69**

Sector and Activity	2018	2019	2020	2021	2022	AAGR*
Industry	14.22	13.18	11.32	12.50	12.94	1.9%
Transport	35.38	36.63	28.16	31.53	35.42	3.8%
Others [2]	10.63	11.27	11.35	12.13	9.88	5.3%
Electricity Generation	64.60	70.32	70.95	73.88	76.28	8.1%
Energy [3]	0.75	1.05	0.79	0.40	1.16	0.5%
Total	**125.58**	**132.45**	**122.58**	**130.45**	**135.68**	**5.8%**

Notes:
(1) Million tons of CO_2 Equivalent ($MTCO_2e$)
(2) includes Household, Services and Agriculture Sectors
(3) includes Oil refining, Electricity and other Energy sector own use and losses

*average annual growth rate

GHG Emission by Fuel Type

$MtCO_2e$

Fuel Type	2012	2013	2014	2015	2016	2017
Liquid Fossils (Oil)	38.15	39.85	42.56	47.15	50.47	52.47
Solid Fossils (Coal)	31.58	39.18	41.56	45.48	51.13	60.67
Gaseous Fossil (Natural Gas)	7.33	6.75	7.10	6.68	7.65	7.55
Total	**77.07**	**85.78**	**91.22**	**99.30**	**109.25**	**120.69**

Fuel Type	2018	2019	2020	2021	2022	AAGR*
Liquid Fossils (Oil)	53.06	55.31	46.26	49.81	54.40	3.6%
Solid Fossils (Coal)	64.10	68.66	68.63	74.05	75.17	9.1%
Gaseous Fossil (Natural Gas)	8.42	8.48	7.69	6.60	6.11	-1.8%
Total	**125.58**	**132.45**	**122.58**	**130.45**	**135.68**	**5.8%**

*average annual growth rate

Environmental Emission Indicators

GHG emission is expressed in carbon dioxide equivalent (CO_2e) which accounts for the global warming potential (GWP) of CH_4 and N_2O, as prescribed by the Intergovernmental Panel on Climate Change (IPCC). GWP is the ratio of the warming resulting from the emission of one kilogram of a greenhouse gas to that of one kilogram emission of CO_2 over a fixed period of time (i.e. CH_4 and N_2O GWP is 21 times and 310 times the CO_2 emission, respectively)

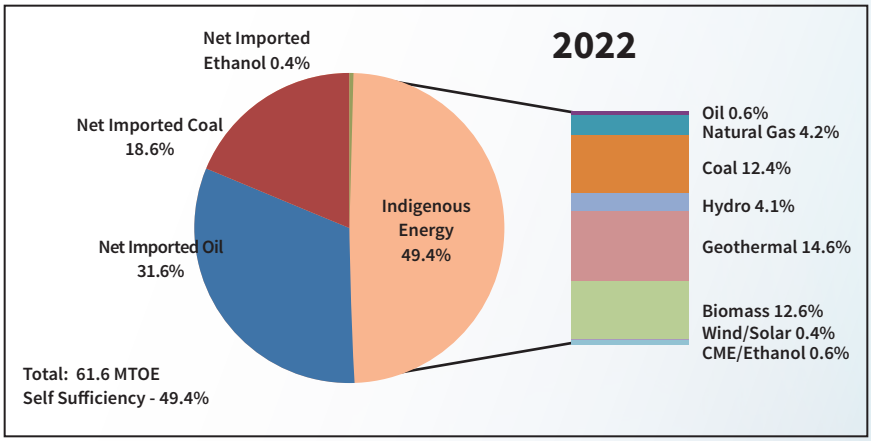
Indicator	2012	2013	2014	2015	2016	2017
GHG emission-to-GDP ratio (tCO_2e/PhP 100K, 2000=100)	0.62	0.65	0.65	0.66	0.68	0.70
GHG emission per capita (tCO_2e/person)	0.80	0.87	0.91	0.98	1.06	1.15
GHG emission per Electricity Generation (tCO_2e/MWh)	0.48	0.54	0.56	0.58	0.57	0.63
GHG emission per Oil consumption (tCO_2e/TOE)	2.58	2.65	2.65	2.48	2.51	2.51
GHG emission per TPES (tCO_2e/TOE)	1.77	1.91	1.94	1.94	2.00	2.08

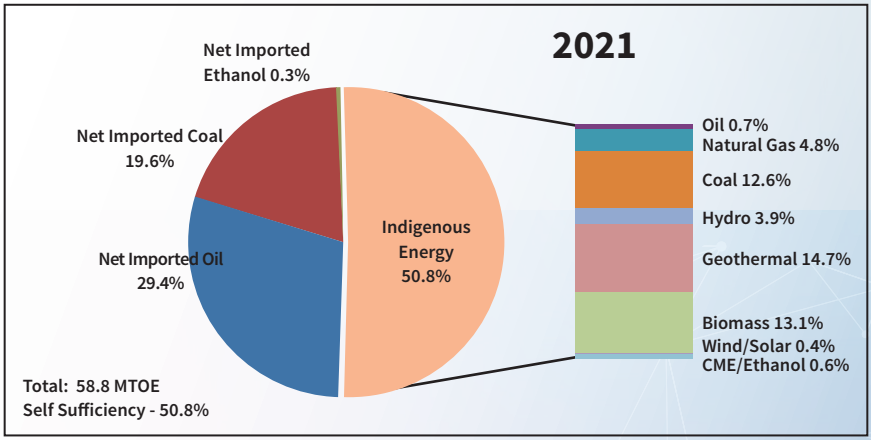
Indicator	2018	2019	2020	2021	2022	AAGR*
GHG emission-to-GDP ratio (tCO_2e/PhP 100K, 2000=100)	0.69	0.68	0.70	0.70	0.68	0.9%
GHG emission per capita (tCO_2e/person)	1.18	1.22	1.12	1.18	1.22	4.3%
GHG emission per Electricity Generation (tCO_2e/MWh)	0.65	0.66	0.70	0.70	0.68	3.6%
GHG emission per Oil consumption (tCO_2e/TOE)	2.54	2.77	2.71	2.75	2.61	0.1%
GHG emission per TPES (tCO_2e/TOE)	2.10	2.21	2.17	2.20	2.20	2.2%

*average annual growth rate

Energy Mix

Total Primary Energy Supply Mix





Total Energy and Self-Sufficiency Level

In kTOE

	2012	2013	2014	2015	2016	2017
Indigenous Energy	**26,248**	**25,469**	**26,606**	**26,881**	**29,405**	**29,515**
Oil	700	680	849	715	702	622
Natural Gas	3,134	2,887	3,036	2,854	3,270	3,226
Coal	3,874	3,747	4,012	3,894	5,917	6,298
Hydro	2,552	2,494	2,275	2,157	2,019	2,393
Geothermal	8,813	8,258	8,863	9,496	9,519	8,831
Biomass	7,035	7,237	7,356	7,431	7,494	7,651
Wind	6	6	13	64	84	94
Solar[a]	0	0	1	12	94	103
Biodiesel	113	125	134	164	178	167
Bioethanol	21	35	66	94	127	131
Net Imported Energy	**17,275**	**19,520**	**20,384**	**24,393**	**25,185**	**28,444**
Oil	12,906	13,075	13,571	16,496	17,844	19,048
Coal	4,210	6,255	6,630	7,721	7,169	9,177
Bioethanol	159	190	182	176	172	219
Total Energy	**43,524**	**44,989**	**46,990**	**51,274**	**54,590**	**57,958**
Rnewable Energy (RE)	18,700	18,345	18,891	19,594	19,687	19,588
RE Share (%)	43	41	40	38	36	34
Self Sufficiency (%)	**60**	**57**	**57**	**52**	**54**	**51**

	2018	2019	2020	2021	2022	AAGR*
Indigenous Energy	**29,977**	**30,906**	**29,676**	**29,838**	**30,422**	**1.5%**
Oil	594	523	456	392	358	-6.5%
Natural Gas	3,601	3,626	3,288	2,820	2,612	-1.8%
Coal	6,204	7,258	6,836	7,414	7,631	7.0%
Hydro	2,336	1,998	1,790	2,287	2,510	-0.2%
Geothermal	8,973	9,192	9,249	8,613	8,963	0.2%
Biomass	7,725	7,736	7,563	7,721	7,731	0.9%
Wind	99	90	88	109	89	29.9%
Solar[a]	107	107	118	126	157	44.5%
Biodiesel	168	178	131	157	166	3.9%
Bioethanol	170	199	155	200	206	25.4%
Net Imported Energy	**29,739**	**28,946**	**26,902**	**28,943**	**31,136**	**6.1%**
Oil	19,400	18,532	15,997	17,261	19,475	4.2%
Coal	10,145	10,224	10,710	11,499	11,445	10.5%
Bioethanol	194	190	194	183	216	3.1%
Total Energy	**59,717**	**59,852**	**56,577**	**58,781**	**61,558**	**3.5%**
Rnewable Energy (RE)	19,772	19,690	19,290	19,395	20,038	0.7%
RE Share (%)	33	33	34	33	33	
Self Sufficiency (%)	**50**	**52**	**52**	**51**	**49**	

*average annual growth rate
a) AAGR from 2015 to 2022

Energy Consumption

Total Final Energy Consumption, by Sector and Fuel Type*

In kTOE

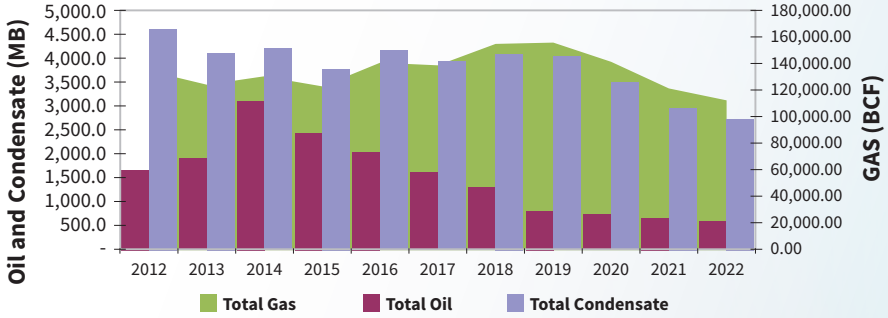
	2012	2013	2014	2015	2016	2017
Industry	**5,806**	**6,312**	**6,529**	**6,750**	**7,449**	**7,925**
Coal	1,671	2,082	2,261	2,218	2,677	3,008
Natural Gas[(a)]	58	62	77	50	65	53
Oil	1,273	1,278	1,206	1,382	1,458	1,470
Biomass[(b)]	1,067	1,099	1,131	1,152	1,164	1,181
Biodiesel	12	13	11	12	13	14
Electricity	1,726	1,778	1,843	1,936	2,074	2,199
Transport	**8,364**	**8,784**	**9,133**	**10,557**	**11,425**	**11,824**
Natural Gas***	1.2	0.8	0.1	-	-	-
Oil	8,092	8,460	8,782	10,151	10,986	11,352
Biodiesel	89	92	96	116	121	123
Bioethanol	172	222	246	281	309	339
Electricity	10	10	10	8	9	10
Households	**8,171**	**8,386**	**8,488**	**8,731**	**9,035**	**9,192**
Oil	901	880	862	973	1,122	1,159
Biomass[(c)]	5,577	5,733	5,823	5,802	5,709	5,731
Electricity	1,693	1,772	1,803	1,956	2,204	2,303
Services	**2,830**	**3,038**	**3,397**	**3,370**	**3,865**	**4,404**
Oil	965	1,121	1,432	1,292	1,632	2,074
Biomass[(d)]	323	327	332	337	340	345
Biodiesel	13	15	20	14	21	28
Electricity	1,529	1,574	1,613	1,727	1,872	1,958
Agriculture	**318**	**352**	**354**	**401**	**450**	**515**
Oil	181	189	172	194	229	290
Biodiesel	3	4	3	4	4	5
Electricity	133	160	178	203	218	220
Non-Energy Use	**285**	**428**	**605**	**1,179**	**1,306**	**1,613**
Oil	172	314	450	1,047	1,129	1,458
Coal	113	114	154	132	177	155
Total	**25,774**	**27,299**	**28,506**	**30,988**	**33,530**	**35,474**

	2018	2019	2020	2021	2022	AAGR**
Industry	**7,523**	**7,306**	**6,341**	**6,821**	**7,107**	**2.0%**
Coal	2,411	2,217	1,629	1,950	1,855	1.1%
Natural Gas[(a)]	59	62	37	0.35	-	-43.3%
Oil	1,469	1,381	1,557	1,558	1,824	3.7%
Biomass[(b)]	1,199	1,207	905	923	924	-1.4%
Biodiesel	13	15	13	15	24	7.1%
Electricity	2,372	2,424	2,198	2,375	2,480	3.7%
Transport	**12,239**	**12,698**	**9,805**	**10,982**	**12,323**	**0.1%**
Natural Gas***	-	-	-	-	-	-73.8%
Oil	11,753	12,181	9,376	10,503	11,790	3.8%
Biodiesel	127	127	97	101	117	2.7%
Bioethanol	350	380	324	369	406	9.0%
Electricity	10	10	7	9	10	0.1%
Households	**9,431**	**9,711**	**10,028**	**10,179**	**10,310**	**2.4%**
Oil	1,255	1,312	1,238	1,266	1,311	3.8%
Biomass[(c)]	5,746	5,772	5,842	5,904	5,962	0.7%
Electricity	2,430	2,627	2,949	3,008	3,037	6.0%
Services	**4,668**	**4,936**	**4,611**	**4,848**	**4,452**	**4.6%**
Oil	2,223	2,360	2,467	2,662	2,005	7.6%
Biomass[(d)]	350	353	325	330	332	0.3%
Biodiesel	30	33	37	40	26	7.6%
Electricity	2,065	2,191	1,782	1,816	2,089	3.2%
Agriculture	**439**	**473**	**436**	**556**	**378**	**1.7%**
Oil	208	229	211	243	139	-2.6%
Biodiesel	4	4	4	4	2	-3.3%
Electricity	227	239	221	308	237	5.9%
Non-Energy Use	**1,423**	**1,137**	**1,372**	**1,642**	**1,289**	**16.3%**
Oil	1,261	996	1,160	1,430	1,198	21.4%
Coal	162	141	212	213	91	-2.2%
Total	**35,723**	**36,260**	**32,593**	**35,028**	**35,859**	**3.4%**

* does not include energy for power application
**average annual growth rate
*** AAGR from 2012-2014
(a) AAGR from 2012 to 2021
(b) includes ricehull, fuelwood, bagasse, agriwaste and animal waste
(c) includes charcoal, fuelwood, and agriwaste
(d) includes ricehull, charcoal, and fuelwood

Oil and Gas

Oil and Gas Production, by Source

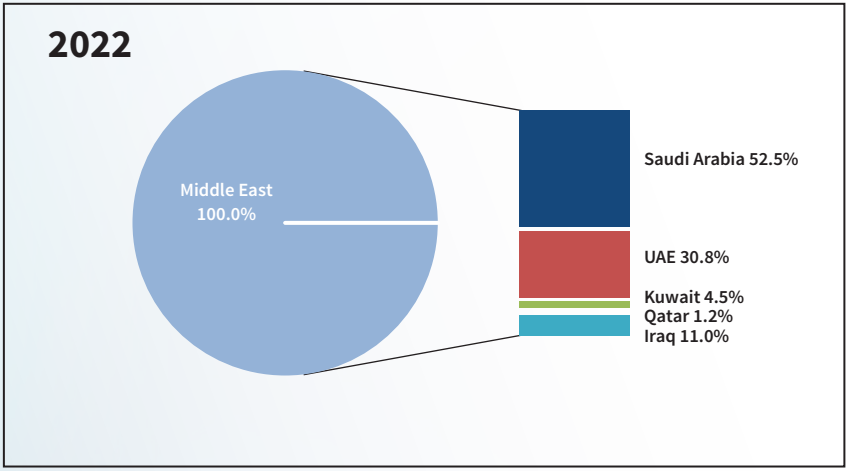


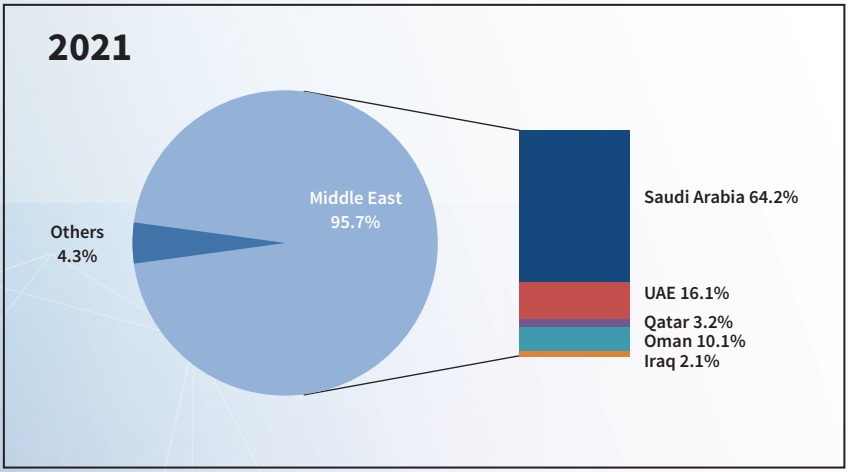
	2012	2013	2014	2015	2016	2017
In MB						
Total Oil	**1,637.55**	**1,883.83**	**3,078.68**	**2,409.75**	**2,013.56**	**1,586.61**
Nido[a]	73.72	84.46	79.11	71.15	53.65	56.16
Matinloc[b]	70.63	66.28	69.83	70.72	72.75	67.49
North Matinloc[c]	10.53	10.03	8.87	8.36	9.12	2.10
Galoc	1,482.66	1,723.06	2,920.88	2,259.52	1,878.04	1,460.85
Alegria[d]	-	-	-	-	-	-
Total Condensate	**4,594.12**	**4,083.71**	**4,172.73**	**3,746.41**	**4,136.17**	**3,913.67**
Malampaya Condensate	4,594.12	4,083.71	4,172.73	3,746.41	4,136.17	3,913.67
in MMSCF						
Total Gas	**134,563**	**123,944**	**130,351**	**122,541**	**140,398**	**138,497**
Libertad[e]	72	79	35	15	-	-
Malampaya Gas	134,491	123,866	130,316	122,527	140,398	138,497

	2018	2019	2020	2021	2022	AAGR*
In MB						
Total Oil	**1,263.53**	**776.09**	**700.12**	**632.29**	**558.28**	**-10.2%**
Nido[a]	51.74	20.63	-	-		-16.6%
Matinloc[b]	43.05	1.54	-	-		-42.1%
North Matinloc[c]	-	-	-	-		-27.6%
Galoc	1,166.76	744.45	695.25	630.25	556.90	-9.3%
Alegria[d]	1.98	9.47	4.87	2.04	1.37	-8.8%
Total Condensate	**4,061.46**	**4,006.24**	**3,469.45**	**2,936.44**	**2,706.11**	**-5.2%**
Malampaya Condensate	4,061.46	4,006.24	3,469.45	2,936.44	2,706.11	-5.2%
in MMSCF						
Total Gas	**154,622**	**155,690**	**141,191**	**121,089**	**112,172**	**-3.2%**
Libertad[e]	-	-	-	-	-	-41.2%
Malampaya Gas	154,622	155,690	141,191	121,089	112,172	-1.8%

*average annual growth rate
(a) average annual growth rate from 2012 to 2019
(b) average annual growth rate from 2012 to 2019
(c) average annual growth rate from 2012 to 2017
(d) average annual growth rate from 2018 to 2022
(e) average annual growth rate from 2012 to 2015

Crude Oil Importation, by Country of Source





In MB

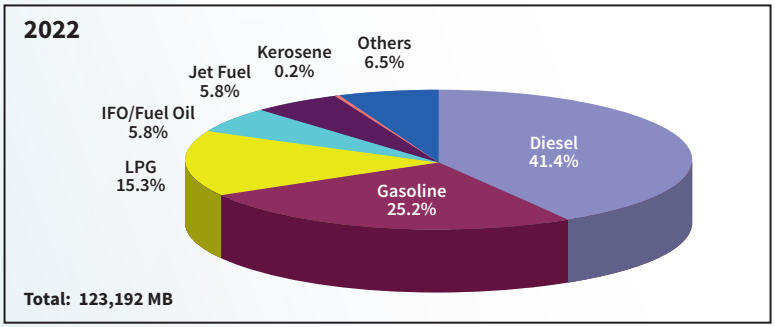
Source	2012	2013	2014	2015	2016	2017
Middle East	51,032	42,727	49,086	67,855	68,537	69,345
Saudi Arabia	29,784	23,500	37,103	34,427	28,438	27,097
Kuwait [b]	-	-	-	16,877	26,448	24,475
UAE	16,230	10,737	6,403	9,087	10,507	13,549
Qatar	5,018	7,439	5,579	7,464	2,618	2,999
Oman [c]	-	-	-	-	524	1,225
Yemen [d]	-	1,050	-	-	-	-
Indonesia [e]	191	162	-	-	396	-
Malaysia [f]	2,410	1,023	3,583	5,025	4,160	916
Others**	9,930	12,273	12,194	5,031	5,544	7,255
Total	**63,562**	**56,186**	**64,862**	**77,911**	**78,637**	**77,516**

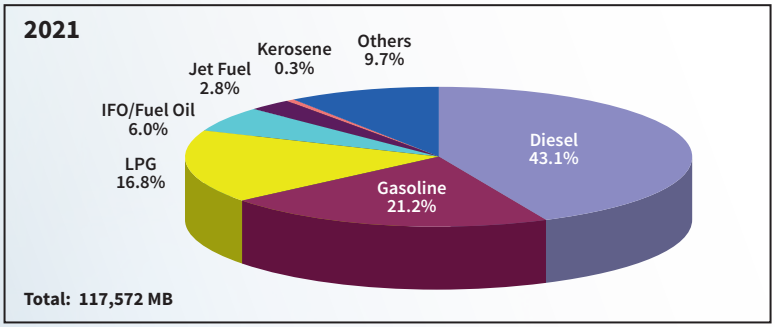
Source	2018	2019	2020	2021	2022	AAGR*
Middle East	74,555	41,521	24,040	28,411	43,343	-1.6%
Saudi Arabia	28,880	15,498	15,044	19,059	22,760	-2.7%
Iraq [a]	-	-	-	630	4,760	655.6%
Kuwait [b]	22,589	15,925	7,991	-	1,952	-26.5%
UAE	17,759	9,136	506	4,769	13,368	-1.9%
Qatar	4,235	-	498	952	502	-20.6%
Oman [c]	1,091	961	-	3,002	-	41.8%
Indonesia [e]	221	-	-	-	-	2.5%
Malaysia [f]	3,215	4,085	629	-	-	-15.5%
Others**	7,669	15,061	8,273	1,277	-	-20.4%
Total	**85,660**	**60,666**	**32,942**	**29,689**	**43,343**	**-3.8%**

*average annual growth rate (AAGR)
(a) AAGR from 2021 to 2022
(b) AAGR from 2015 to 2022
(c) AAGR from 2016 to 2021
(d) only one (1) entry (2013)
(e) AAGR from 2012 to 2018
(f) AAGR from 2012 to 2020

**AAGR from 2012 to 2021 and includes Singapore, Brunei, Russia, Vietnam, Korea, Australia and other Asia and Pacific Region

Petroleum Products Importation, by Fuel Type





In MB

Fuel	2012	2013	2014	2015	2016	2017
Diesel	24,941	26,464	30,343	28,375	35,345	40,105
Gasoline	12,378	14,599	14,828	15,148	15,705	17,162
LPG	8,218	9,074	9,299	9,691	11,613	13,910
IFO/Fuel Oil	1,876	2,685	4,901	10,129	7,162	6,921
Jet Fuel	5,928	6,449	6,579	5,722	6,837	8,928
Kerosene	228	1,490	430	199	252	317
Others**	1,211	1,756	3,279	8,670	9,194	10,073
Total	**54,780**	**62,517**	**69,658**	**77,934**	**86,108**	**97,415**

Fuel	2018	2019	2020	2021	2022	AAGR*
Diesel	38,784	49,462	41,977	50,655	50,976	7.4%
Gasoline	19,004	18,726	25,038	24,927	31,002	9.6%
LPG	15,224	15,957	17,109	19,723	18,797	8.6%
IFO/Fuel Oil	5,244	5,061	6,481	7,097	7,128	14.3%
Jet Fuel	9,331	11,708	3,408	3,331	7,128	1.9%
Kerosene	265	134	304	398	197	-1.4%
Others**	9,721	7,889	8,791	11,442	7,965	20.7%
Total	**97,573**	**108,936**	**103,108**	**117,572**	**123,192**	**8.4%**

*average annual growth rate
**others include asphalt, solvents, naptha/reformate, condensate

Petroleum Products Importation, by Country of Source

In MB

Source	2012	2013	2014	2015	2016	2017
Middle East	**1,597**	**2,449**	**1,966**	**1,678**	**6,280**	**5,272**
Bahrain	319	86	-	-	-	-
Iran	0	-	-	-	1	3
Iraq	-	-	-	-	-	-
KSA	251	843	551	1,085	1,402	1,081
Kuwait	340	504	406	228	692	1,150
Oman	-	251	-	135	-	90
Qatar	48	276	450	-	1,490	1,263
UAE	639	489	559	231	2,695	1,684
ASEAN	**14,275**	**17,535**	**20,816**	**25,638**	**23,801**	**19,732**
Brunei	-	-	-	-	-	-
Indonesia	548	97	697	228	1,610	1,186
Malaysia	884	1,835	1,758	7,523	4,572	7,557
Philippines	3,025	4,427	805	-	-	-
Singapore	6,011	7,547	9,982	10,323	12,147	10,273
Thailand	3,767	3,148	2,473	1,272	36	377
Vietnam	41	258	808	633	1,192	340
OTHER ASIA	**38,613**	**42,531**	**50,335**	**53,160**	**58,342**	**67,305**
China	5,561	8,117	10,504	10,938	24,997	32,460
Hong Kong	266	64	1	-	51	158
India	-	31	1,064	3,258	2,763	4,686
Japan	687	299	368	1,824	4,701	4,261
Russia	-	-	-	605	-	-
South Korea	13,893	14,875	21,229	17,886	16,233	22,521
Sri Lanka	-	-	-	-	-	-
Taiwan	18,206	19,145	16,993	17,674	9,204	2,216
Pakistan	-	-	177	975	393	1,002
OTHERS**	**295**	**224**	**834**	**3,117**	**1,930**	**5,106**
Total	**54,780**	**62,740**	**73,951**	**83,594**	**90,353**	**97,415**

Source	2018	2019	2020	2021	2022	AAGR*
Middle East	**11,521**	**8,436**	**8,492**	**7,695**	**3,727**	**8.8%**
Bahrain	-	-	-	4	-	
Iran	1	5	-	-	-	
Iraq	163	-	-	-	-	
KSA	1,204	1,242	1,407	2,438	116	
Kuwait	443	1,323	1,384	1,001	490	
Oman	3	176	-	-	-	
Qatar	1,265	657	1,868	1,202	2,293	
UAE	8,442	5,033	3,833	3,049	828	
ASEAN	**18,321**	**24,697**	**34,651**	**43,833**	**44,630**	**12.1%**
Brunei	-	222	4,293	5,660	4,245	
Indonesia	539	590	1,738	-	-	
Malaysia	7,661	9,161	9,338	13,429	11,723	
Philippines	-	-	-	-	-	
Singapore	7,910	12,551	18,188	20,361	27,437	
Thailand	930	266	409	3,647	1,110	
Vietnam	1,281	1,907	685	736	116	
OTHER ASIA	**64,491**	**73,156**	**55,327**	**61,344**	**72,837**	**6.6%**
China	29,421	45,472	32,247	35,279	18,974	
Hong Kong	-	0	20	0	-	
India	2,682	3,219	4,409	4,950	1,009	
Japan	2,673	1,373	518	2,323	7,722	
Russia	-	-	512	-	1,320	
South Korea	28,083	22,701	16,045	15,267	37,835	
Sri Lanka	271	-	-	-	-	
Taiwan	1,028	391	1,575	3,525	5,978	
Pakistan	333	-	-	-	-	
OTHERS**	**3,240**	**2,646**	**4,638**	**4,701**	**1,998**	**21.1%**
Total	**97,573**	**108,936**	**103,108**	**117,572**	**123,192**	**8.4%**

*average annual growth rate
**Others include countries from Africa, Asia and Pacific, Europe and North America

Petroleum Products Exportation, by Country of Destination

In MB

Destination	2012	2013	2014	2015	2016	2017
Middle East	**-**	**-**	**-**	**-**	**-**	**122**
UAE	-	-	-	-	-	122
ASEAN	**2,870**	**4,000**	**5,916**	**6,691**	**6,027**	**7,525**
Bangladesh	-	-	-	-	-	36
Indonesia	19	433	21	98	67	119
Malaysia	667	944	679	2,416	1,259	2,131
Singapore	1,737	2,279	3,704	3,066	2,711	2,849
Thailand	446	344	1,513	919	1,683	2,333
Vietnam	-	-	-	192	308	93
OTHER ASIA	**6,524**	**4,619**	**3,643**	**6,433**	**7,727**	**6,899**
China	315	473	717	1,441	1,897	2,670
Hong Kong	678	629	-	-	-	-
India	-	-	-	-	-	-
Japan	-	78	-	-	20	62
South Korea	4,284	2,806	2,284	3,453	3,385	2,645
Taiwan	1,249	632	643	1,539	2,424	1,523
OTHERS [a]	**0.76**	**1**	**2**	**864**	**18**	**48**
Total	**9,395**	**8,619**	**9,561**	**13,988**	**13,772**	**14,595**

Destination	2012	2013	2014	2015	2016	2017
Middle East	**-**	**-**	**-**	**298**	**-**	**25.0%**
UAE	-	-	-	-	-	
Iraq	-	-	-	298	-	
ASEAN	**9,552**	**8,572**	**5,911**	**3,729**	**3,698**	**2.6%**
Bangladesh	-	-	-	-	-	
Brunei	-	-	-	324	1,267	
Indonesia	252	19	-	95	90	
Malaysia	1,319	1,786	2,571	627	712	
Singapore	4,812	4,602	2,753	640	253	
Thailand	3,025	1,818	476	1,902	1,262	
Vietnam	144	347	111	141	113	
OTHER ASIA	**7,040**	**3,037**	**1,994**	**2,876**	**1,977**	**-11%**
China	3,986	1,802	903	1,259	1,287	
Hong Kong	-	-	306	-	-	
India	-	-	36	146	183	
Japan	60	-	130	-	11	
South Korea	1,911	907	21	789	246	
Taiwan	1,083	327	598	682	250	
OTHERS [a]	**160**	**67**	**0**	**77**	**-**	**72.7%**
Total	**16,752**	**11,676**	**7,905**	**6,980**	**5,675**	**-4.9%**

*average annual growth rate

(a) average annual growth rate from 2014 to 2021

Others include Australia, Belgium, Guam, Egypt, Saipan and USA

Petroleum Products Consumption, by Sector and Fuel Type

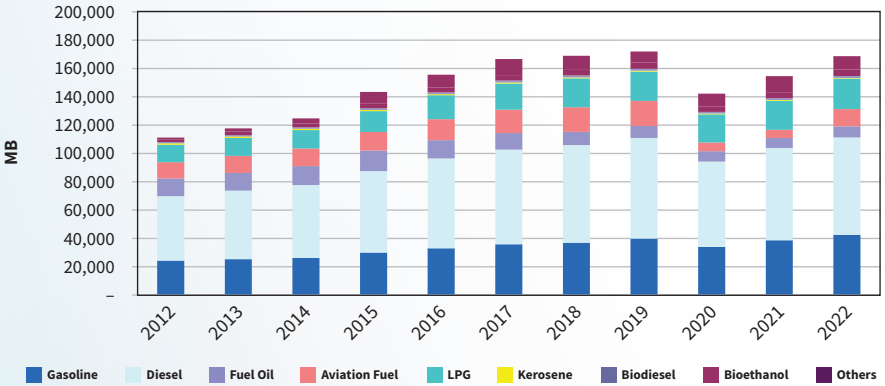
In MB

	2012	2013	2014	2015	2016	2017
Industry	**9,648**	**9,727**	**9,224**	**10,528**	**11,046**	**11,022**
Kerosene	138	120	126	139	148	170
LPG	1,169	1,203	1,387	1,528	1,412	924
Diesel	4,461	4,863	3,975	4,357	4,869	5,570
Fuel Oil	3,789	3,442	3,649	4,413	4,520	4,247
Biodiesel	91	99	86	92	97	111
Transport	**74,568**	**77,985**	**79,996**	**91,891**	**99,456**	**105,255**
Gasoline	23,882	24,940	25,795	29,601	32,568	35,411
Diesel	33,794	34,715	36,097	43,435	45,749	46,067
Fuel Oil	2,418	2,458	1,690	1,386	1,707	2,431
Aviation Fuel	11,432	12,049	12,463	13,086	14,879	16,474
LPG	420	621	453	321	146	112
Bioethanol	1,935	2,496	2,765	3,168	3,477	3,818
Biodiesel	686	705	734	893	929	942
Households	**9,461**	**9,233**	**9,074**	**10,301**	**11,938**	**12,342**
LPG	8,637	8,413	8,343	9,632	11,314	11,749
Kerosene	825	820	731	669	624	593
Services	**7,894**	**9,163**	**11,641**	**10,692**	**13,456**	**17,357**
LPG	2,209	2,477	2,890	3,360	4,054	5,767
Diesel	4,693	5,764	7,819	6,262	7,853	10,368
Fuel Oil	896	804	780	959	1,390	1,011
Biodiesel	96	118	151	111	158	212
Agriculture	**1,376**	**1,429**	**1,306**	**1,471**	**1,731**	**2,202**
Gasoline	56	17	37	66	61	98
Kerosene	9	7	3	3	5	3
Diesel	1,253	1,349	1,227	1,355	1,577	2,008
Fuel Oil	32	27	13	18	56	52
Biodiesel	26	28	26	29	32	41
Power Generation	**6,847**	**7,608**	**9,762**	**9,976**	**8,833**	**6,965**
Diesel	1,431	1,827	2,477	2,137	3,573	2,926
Fuel Oil	5,386	5,744	7,233	7,793	5,188	3,979
Biodiesel	29	37	52	45	72	60
Non-Energy Use	**1,198**	**2,345**	**3,501**	**8,368**	**8,954**	**11,397**
Total	**110,991**	**117,489**	**124,503**	**143,226**	**155,414**	**166,539**

	2018	2019	2020	2021	2022	AAGR*
Industry	**11,392**	**10,732**	**12,015**	**12,149**	**14,216**	**4.0%**
Kerosene	16	15	131	157	87	-4.4%
LPG	2,129	1,872	1,934	2,165	2,195	6.5%
Diesel	5,144	5,598	6,163	6,593	8,906	7.2%
Fuel Oil	4,000	3,136	3,686	3,115	2,845	-2.8%
Biodiesel	103	112	101	118	182	7.1%
Transport	**108,811**	**112,365**	**82,073**	**90,845**	**106,848**	**3.7%**
Gasoline	36,516	39,504	33,609	38,224	42,096	5.8%
Diesel	48,043	48,205	36,625	40,363	44,656	2.8%
Fuel Oil	1,845	1,637	1,215	1,565	2,426	0.0%
Aviation Fuel	17,390	17,674	6,188	5,741	12,199	0.7%
LPG	108	95	48	30	2	-40.2%
Bioethanol	3,936	4,276	3,643	4,147	4,569	9.0%
Biodiesel	972	974	745	775	899	2.7%
Households	**13,373**	**14,014**	**13,272**	**13,583**	**14,084**	**4.1%**
LPG	12,754	13,445	12,870	13,178	13,723	4.7%
Kerosene	620	569	402	405	361	-7.9%
Services	**18,393**	**19,386**	**20,121**	**21,638**	**16,756**	**7.8%**
LPG	5,495	5,370	5,028	5,208	5,574	9.7%
Diesel	11,641	12,668	13,934	15,052	9,782	7.6%
Fuel Oil	1,025	1,095	874	1,071	1,200	3.0%
Biodiesel	233	253	284	307	200	7.6%
Agriculture	**1,579**	**1,741**	**1,602**	**1,851**	**1,065**	**-2.5%**
Gasoline	58	74	80	126	143	9.8%
Kerosene	3	3	4	4	1	-18.4%
Diesel	1,484	1,615	1,473	1,676	895	-3.3%
Fuel Oil	5	17	15	12	7	-13.9%
Biodiesel	30	32	30	34	18	-3.3%
Power Generation	**5,292**	**5,728**	**3,704**	**2,969**	**6,106**	**-1.1%**
Diesel	2,770	3,015	2,149	1,610	4,579	12.3%
Fuel Oil	2,460	2,646	1,512	1,282	1,434	-12.4%
Biodiesel	62	67	44	76	93	12.3%
Non-Energy Use	**9,964**	**7,851**	**9,228**	**11,387**	**9,496**	**23.0%**
Total	**168,805**	**171,817**	**142,017**	**154,422**	**168,571**	**4.3%**

*average annual growth rate

Petroleum Products Consumption, by Sector and Fuel Type



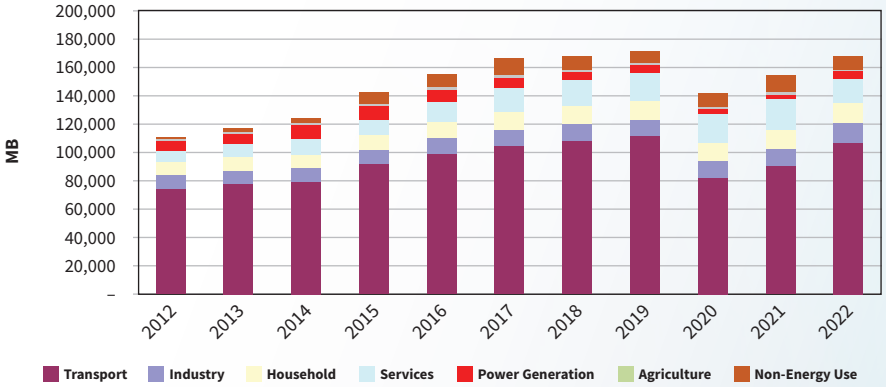
In MB

	2012	2013	2014	2015	2016	2017
Gasoline	23,938	24,957	25,833	29,667	32,630	35,509
Diesel	45,632	48,518	51,595	57,545	63,622	66,939
Fuel Oil	12,521	12,475	13,364	14,568	12,862	11,719
Aviation Fuel	11,432	12,049	12,463	13,086	14,879	16,474
LPG	12,434	12,714	13,073	14,842	16,926	18,552
Kerosene	971	947	860	811	777	767
Biodiesel	929	987	1,049	1,171	1,289	1,364
Bioethanol	1,935	2,496	2,765	3,168	3,477	3,818
Others**	1,198	2,345	3,501	8,368	8,954	11,397
Total	**110,991**	**117,489**	**124,503**	**143,226**	**155,414**	**166,539**

	2018	2019	2020	2021	2022	AAGR*
Gasoline	36,574	39,578	33,688	38,349	42,238	5.8%
Diesel	69,082	71,101	60,345	65,294	68,819	4.2%
Fuel Oil	9,335	8,530	7,303	7,047	7,912	-4.5%
Aviation Fuel	17,390	17,674	6,188	5,741	12,199	0.7%
LPG	20,486	20,782	19,881	20,582	21,495	5.6%
Kerosene	638	587	537	565	450	-7.4%
Biodiesel	1,400	1,437	1,204	1,310	1,392	4.1%
Bioethanol	3,936	4,276	3,643	4,147	4,569	9.0%
Others**	9,964	7,851	9,228	11,387	9,496	23.0%
Total	**168,805**	**171,817**	**142,017**	**154,422**	**168,571**	**4.3%**

*average annual growth rate
**includes asphalts, solvents, naphtha/reformate, condensate

Petroleum Products Consumption, by Sector



In MB

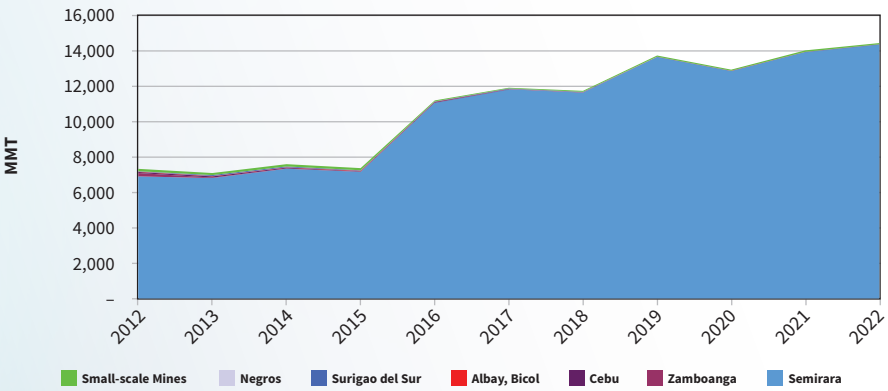
	2012	2013	2014	2015	2016	2017
Transport	74,568	77,985	79,996	91,891	99,456	105,255
Industry	9,648	9,727	9,224	10,528	11,046	11,022
Households	9,461	9,233	9,074	10,301	11,938	12,342
Services	7,894	9,163	11,641	10,692	13,456	17,357
Agriculture	1,376	1,429	1,306	1,471	1,731	2,202
Power Generation	6,847	7,608	9,762	9,976	8,833	6,965
Non-Energy Use	1,198	2,345	3,501	8,368	8,954	11,397
Total	**110,991**	**117,489**	**124,503**	**143,226**	**155,414**	**166,539**

	2018	2019	2020	2021	2022	AAGR*
Transport	108,811	112,365	82,073	90,845	106,848	3.7%
Industry	11,392	10,732	12,015	12,149	14,216	4.0%
Households	13,373	14,014	13,272	13,583	14,084	4.1%
Services	18,393	19,386	20,121	21,638	16,756	7.8%
Agriculture	1,579	1,741	1,602	1,851	1,065	-2.5%
Power Generation	5,292	5,728	3,704	2,969	6,106	-1.1%
Non-Energy Use	9,964	7,851	9,228	11,387	9,496	23.0%
Total	**168,805**	**171,817**	**142,017**	**154,422**	**168,571**	**4.3%**

*average annual growth rate

Coal

Coal Production, by Source



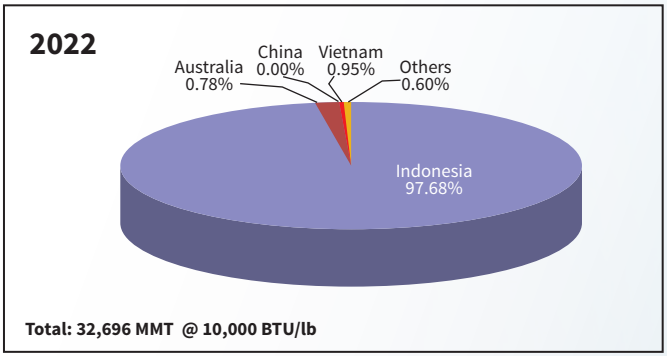
in MMT at 10,000 BTU/lb

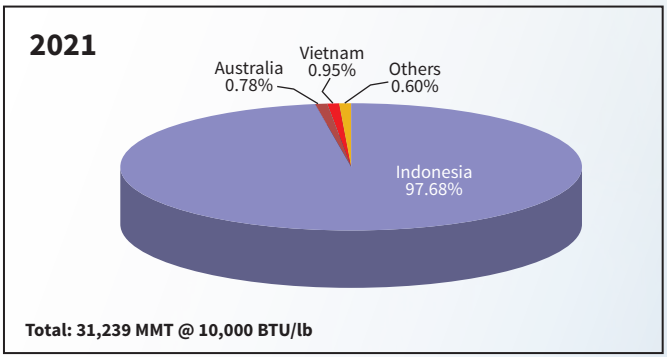
	2012	2013	2014	2015	2016	2017
Semirara	6,911	6,813	7,345	7,168	11,084	11,839
Zamboanga [a]	193	30	15	5	0	-
Cebu	60	66	44	29	35	13
Albay, Bicol	18	23	21	28	16	12
Surigao del Sur [b]	21	52	50	28	21	23
Negros	0.06	-	-	-	-	0
Small-scale Mines	138	116	127	119	54	44
Total Production	**7,340**	**7,100**	**7,601**	**7,378**	**11,211**	**11,932**
Run of Mine (MMT)	**8,083**	**7,859**	**8,419**	**8,173**	**12,087**	**13,264**

	2018	2019	2020	2021	2022	AAGR*
Semirara	11,654	13,670	12,880	13,957	14,387	7.6%
Zamboanga [a]	-	-	-	-	-	-78.3%
Cebu	7	6	2	1	2	-29.9%
Albay, Bicol	13	9	13	8	2	-18.5%
Surigao del Sur [b]	26	-	-	-	-	3.7%
Negros	0	1	0	0	0.34	19.4%
Small-scale Mines	55	65	57	82	66	-7.1%
Total Production	**11,755**	**13,751**	**12,951**	**14,048**	**14,457**	**7.0%**
Run of Mine (MMT)	**13,054**	**15,274**	**13,257**	**14,378**	**16,061**	**7.1%**

*average annual growth rate
(a) average annual growth rate from 2012 to 2016
(b) average annual growth rate from 2012 to 2018

Coal Importation, by Country of Source





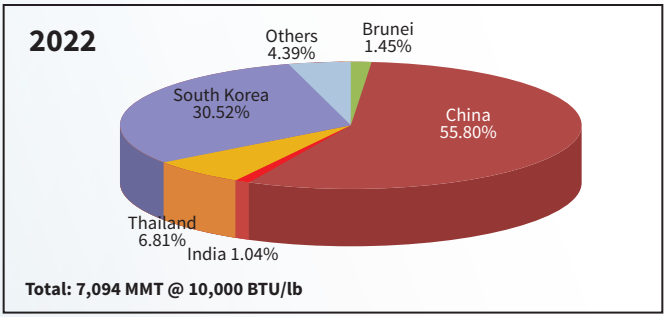
in MMT at 10,000 BTU/lb

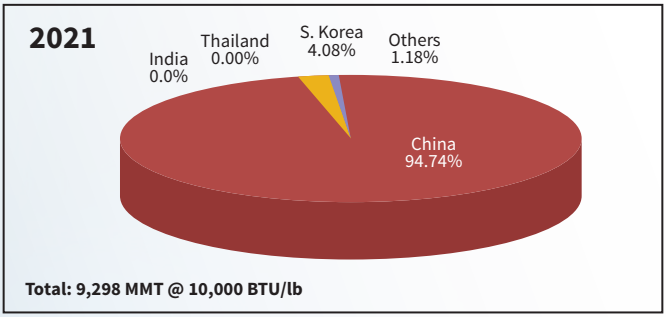
Country	2012	2013	2014	2015	2016	2017
Indonesia	11,700	13,964	14,975	16,673	17,988	19,663
Australia	195	201	-	306	1,310	1,401
Vietnam [b]	0.05	249	191	168	270	219
Others** [c]	-	-	15	132	462	984
Total	**11,895**	**14,415**	**15,182**	**17,279**	**20,030**	**22,268**

Country	2018	2019	2020	2021	2022	AAGR*
Indonesia	23,285	26,305	28,604	30,514	31,955	10.6%
Australia	1,249	711	538	242	433	8.3%
China [a]	96	1	-	0	0.11	-81.5%
Vietnam [b]	303	182	103	297	106	-9.0%
Others** [c]	1,368	494	279	186	202	6.2%
Total	**26,301**	**27,692**	**29,524**	**31,239**	**32,696**	**10.6%**

*average annual growth rate (AAGR)
(a) AAGR from 2018 to 2022
(b) AAGR from 2013 to 2022
(c) AAGR from 2015 to 2022
**Imports from India, Malaysia, Peru, Russia, Taiwan, South Korea, South Africa and USA

Coal Exportation, by Country of Destination





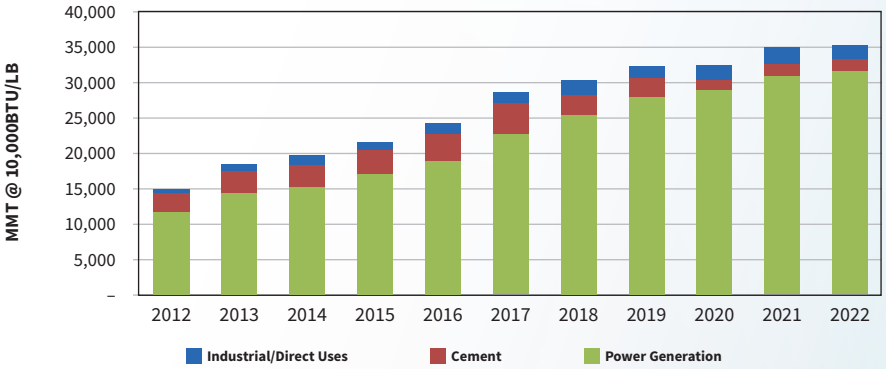
in MMT @ 10,000 BTU/lb

Country	2012	2013	2014	2015	2016	2017
China	2,931	2,975	4,613	2,750	6,540	5,697
India	57	-	55	-	47	158
Hongkong [a]	-	-	269	-	-	-
Thailand	163	217	307	321	222	104
Taiwan [b]	11	196	78	-	-	189
S. Korea [c]	-	-	207	-	-	-
Others*** [d]	-	-	217	23	-	-
Total	**3,161**	**3,388**	**5,745**	**3,094**	**6,809**	**6,149**

Country	2018	2019	2020	2021	2022	AAGR*
Brunei [e]	-	-	-	-	102.58	
China	4,926	9,629	7,247	8,809	3,959	3.1%
India	55	54	50	-	74	2.7%
Thailand	55	228	116	-	483	11.5%
Taiwan [b]	-	69	-	-	-	30.9%
S. Korea [c]	-	-	76	379	2,165	34.1%
Others*** [d]	-	-	36	110	311	4.6%
Total	**5,035**	**9,980**	**7,525**	**9,298**	**7,094**	**8.4%**

*average annual growth rate (AAGR)
(a) only one (1) entry (2014)
(b) AAGR from 2012 to 2019
(c) AAGR from 2014 to 2022
(d) AAGR from 2014 to 2022
(e) only one (1) entry 2022
**includes Cambodia, Papua New Guinea, and Vietnam

Coal Consumption, by Major Type of User



in MMT @ 10,000 BTU/lb

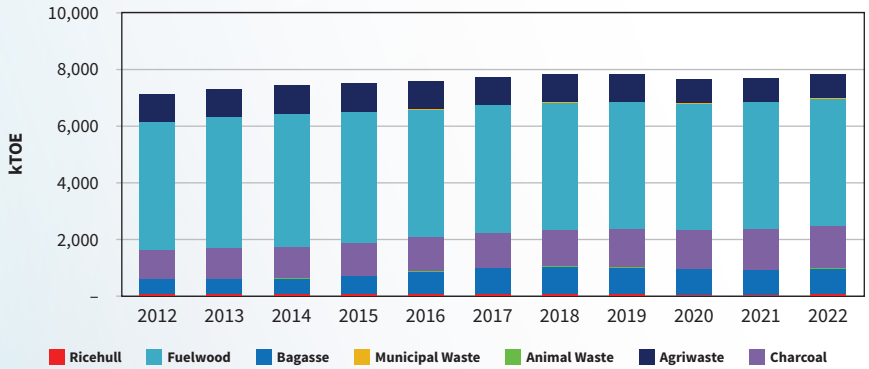
	2012	2013	2014	2015	2016	2017
Power Generation	11,937	14,791	15,587	17,554	19,386	23,327
Cement	2,799	3,156	3,203	3,348	3,893	4,423
Industrial/Direct Uses*	581	1,005	1,372	1,104	1,515	1,569
Total	**15,317**	**18,952**	**20,163**	**22,006**	**24,794**	**29,320**

	2018	2019	2020	2021	2022	AAGR**
Power Generation	26,101	28,654	29,755	31,738	32,454	10.5%
Cement	2,848	2,754	1,312	1,697	1,755	-4.6%
Industrial/Direct Uses*	2,027	1,714	2,177	2,400	1,932	12.8%
Total	**30,976**	**33,122**	**33,244**	**35,834**	**36,141**	**9.0%**

*non-energy use as raw materials
**average annual growth rate

Renewable Energy

Biomass Production, by Fuel Type



in kTOE

	2012	2013	2014	2015	2016	2017
Fuelwood	4,483	4,575	4,623	4,596	4,472	4,465
Charcoal	1,005	1,058	1,107	1,138	1,193	1,236
Agriwaste	949	980	992	982	967	968
Bagasse	515	533	540	627	780	899
Ricehull	52	54	55	55	56	57
Animal Waste	19	20	20	21	21	21
Municipal Waste	11	17	19	11	5	6
Total	**7,035**	**7,237**	**7,356**	**7,431**	**7,494**	**7,651**

	2018	2019	2020	2021	2022	AAGR*
Fuelwood	4,458	4,454	4,421	4,439	4,449	-0.1%
Charcoal	1,281	1,329	1,364	1,420	1,476	3.9%
Agriwaste	958	947	836	837	831	-1.3%
Bagasse	942	919	877	851	908	5.8%
Ricehull	58	58	43	44	44	-1.7%
Animal Waste	21	22	16	17	17	-1.3%
Municipal Waste	6	7	5	3	7	-4.1%
Total	**7,725**	**7,736**	**7,563**	**7,611**	**7,731**	**0.9%**

*average annual growth rate

Geothermal, Hydro, Wind, Solar and Biomass

Geothermal

	2011	2012	2013	2014	2015	2016
Installed Generating Capacity (MW)	1,783	1,848	1,868	1,918	1,917	1,916
Dependable Generating Capacity (MW)	1,434	1,462	1,482	1,607	1,601	1,689
Electricity Generation (GWh)	9,942	10,250	9,605	10,308	11,044	11,070

	2017	2018	2019	2020	2021	2022
Installed Generating Capacity (MW)	1,916	1,944	1,928	1,928	1,928	1,952
Dependable Generating Capacity (MW)	1,752	1,770	1,792	1,753	1,753	1,763
Electricity Generation (GWh)	10,270	10,435	10,691	10,757	10,016	10,425

Hydropower

	2011	2012	2013	2014	2015	2016
Installed Generating Capacity (MW)	3,491	3,521	3,521	3,543	3,600	3,618
Dependable Generating Capacity (MW)	2,963	2,983	2,983	2,982	3,073	3,181
Electricity Generation (GWh)	9,698	10,252	10,019	9,137	8,665	8,111

	2017	2018	2019	2020	2021	2022
Installed Generating Capacity (MW)	3,627	3,701	3,760	3,779	3,752	3,745
Dependable Generating Capacity (MW)	3,269	3,473	3,508	3,527	3,500	3,444
Electricity Generation (GWh)	9,611	9,384	8,025	7,192	9,185	10,085

Wind

	2011	2012	2013	2014	2015	2016
Installed Generating Capacity (MW)	33	33	33	283	427	427
Dependable Generating Capacity (MW)	33	17	17	103	379	383
Electricity Generation (GWh)	88	75	66	152	748	975

	2017	2018	2019	2020	2021	2022
Installed Generating Capacity (MW)	427	427	427	443	427	427
Dependable Generating Capacity (MW)	383	427	427	443	427	412
Electricity Generation (GWh)	1,094	1,153	1,042	1,026	1,270	1,030

Solar

	2011	2012	2013	2014	2015	2016
Installed Generating Capacity (MW)	1	1	1	23	165	765
Dependable Generating Capacity (MW)	1	0	0	17	125	594
Electricity Generation (GWh)	1	1	1	17	139	1,097

	2017	2018	2019	2020	2021	2022
Installed Generating Capacity (MW)	885	896	921	1,019	1,317	1,530
Dependable Generating Capacity (MW)	700	740	737	817	1,034	1,150
Electricity Generation (GWh)	1,201	1,249	1,246	1,373	1,470	1,822

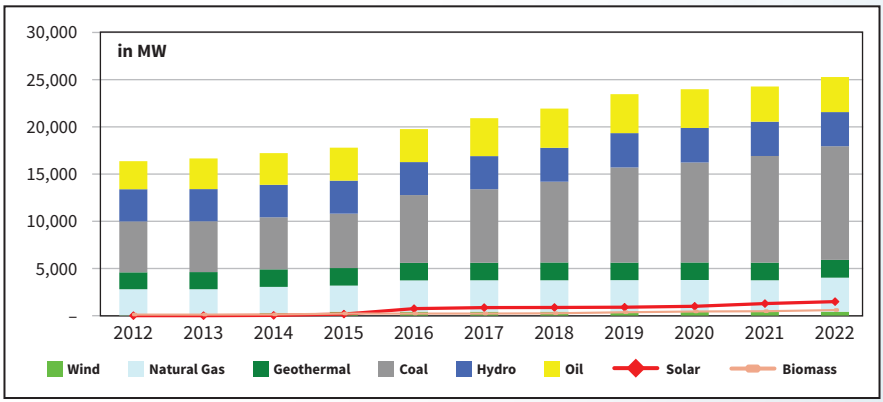
Biomass

	2011	2012	2013	2014	2015	2016
Installed Generating Capacity (MW)	83	119	119	131	221	233
Dependable Generating Capacity (MW)	46	76	76	81	146	157
Electricity Generation (GWh)	115	183	212	196	367	726

	2017	2018	2019	2020	2021	2022
Installed Generating Capacity (MW)	224	258	363	483	489	611
Dependable Generating Capacity (MW)	160	182	227	285	291	382
Electricity Generation (GWh)	1,013	1,105	1,040	1,261	1,445	1,322

Power

Installed Generating Capacity, by Source



in MW

	2012	2013	2014	2015	2016	2017
Total Installed Capacity	**17,025**	**17,325**	**17,944**	**18,765**	**21,423**	**22,728**
Coal	**5,568**	**5,568**	**5,708**	**5,963**	**7,419**	**8,049**
Oil	**3,074**	**3,353**	**3,476**	**3,610**	**3,616**	**4,153**
Natural Gas	**2,862**	**2,862**	**2,862**	**2,862**	**3,431**	**3,447**
Renewable Energy	**5,521**	**5,541**	**5,898**	**6,330**	**6,958**	**7,079**
Geothermal	1,848	1,868	1,918	1,917	1,916	1,916
Hydro	3,521	3,521	3,543	3,600	3,618	3,627
Wind	33	33	283	427	427	427
Solar[(a)]	1	1	23	165	765	885
Biomass	119	119	131	221	233	224

	2018	2019	2020	2021	2022	AAGR*
Total Installed Capacity	**23,815**	**25,531**	**26,250**	**26,882**	**28,258**	**5%**
Coal	**8,844**	**10,417**	**10,944**	**11,669**	**12,428**	**8%**
Oil	**4,292**	**4,262**	**4,237**	**3,847**	**3,834**	**2%**
Natural Gas	**3,453**	**3,453**	**3,453**	**3,453**	**3,732**	**3%**
Renewable Energy	**7,227**	**7,399**	**7,617**	**7,914**	**8,264**	**4%**
Geothermal	1,944	1,928	1,928	1,928	1,952	**1%**
Hydro	3,701	3,760	3,779	3,752	3,745	**1%**
Wind	427	427	443	427	427	**29%**
Solar[(a)]	896	921	1,019	1,317	1,530	**69%**
Biomass	258	363	447	489	611	**18%**

*average annual growth rate
(a) average annual growth rate from 2014 to 2022

Power Generation, by Source and Grid

in GWh

Luzon	2012	2013	2014	2015	2016	2017
Coal	21,878	25,756	27,346	29,680	33,143	33,953
Oil	1,800	1,601	2,342	1,845	2,562	2,379
Natural Gas	19,642	18,783	18,686	18,878	19,854	20,547
Renewable Energy	8,993	8,679	8,392	9,711	10,938	11,633
Geothermal	3,588	3,399	3,817	4,096	4,227	3,910
Hydro	5,292	5,156	4,357	4,769	5,011	5,730
Biomass	37	60	65	187	439	599
Solar [a]	-	-	-	66	495	496
Wind	75	66	152	592	767	899
Total	**52,312**	**54,820**	**56,766**	**60,113**	**66,498**	**68,512**

Luzon	2018	2019	2020	2021	2022	AAGR*
Coal	37,362	40,508	40,576	43,133	48,626	8%
Oil	2,188	2,674	1,804	996	1,507	-2%
Natural Gas	21,334	22,354	19,497	19,060	17,884	-1%
Renewable Energy	11,845	10,640	10,542	12,053	11,803	3%
Geothermal	3,871	3,647	3,808	3,838	3,921	1%
Hydro	5,945	5,084	4,510	5,412	5,239	-0.1%
Biomass	594	592	780	988	691	34%
Solar[a]	503	493	588	721	1,099	49%
Wind	931	824	855	1,095	854	27%
Total	**72,728**	**76,177**	**72,419**	**75,243**	**79,821**	**4%**

Visayas	2012	2013	2014	2015	2016	2017
Coal	4,701	4,690	4,449	4,968	5,270	6,624
Oil	734	796	766	672	637	541
Natural Gas [a]	-	8	4	-	-	-
Renewable Energy	6,047	5,606	5,794	6,530	7,047	6,889
Geothermal	5,930	5,463	5,627	6,105	5,974	5,564
Hydro	46	37	35	38	64	90
Biomass	71	106	117	159	276	414
Solar [b]	-	-	15	71	525	627
Wind [c]	-	-	-	157	209	194
Total	**11,483**	**11,100**	**11,014**	**12,170**	**12,955**	**14,054**

Visayas	2018	2019	2020	2021	2022	AAGR*
Coal	6,785	7,962	7,696	8,999	8,501	6%
Oil	353	524	298	468	563	-3%
Natural Gas[a]	-	-	-	-	-	-45%
Renewable Energy	7,129	7,573	7,491	6,801	7,159	2%
Geothermal	5,737	6,278	6,205	5,535	5,813	-0.2%
Hydro	73	57	65	89	39	-2%
Biomass	439	356	374	350	517	22%
Solar[b]	658	665	676	652	614	59%
Wind[c]	222	218	171	174	176	2%
Total	**14,266**	**16,060**	**15,485**	**16,268**	**16,222**	**4%**

Mindanao	2012	2013	2014	2015	2016	2017
Coal	1,686	1,635	1,258	2,038	4,890	6,271
Oil	1,720	2,094	2,599	3,369	2,462	867
Natural Gas	-	-	-	-	-	-
Renewable Energy	5,721	5,618	5,624	4,723	3,994	4,666
Geothermal	731	743	864	842	869	797
Hydro	4,913	4,827	4,745	3,858	3,036	3,791
Biomass	75	47	14	21	11	-
Solar[a]	1	1	1	2	77	78
Wind	-	-	-	-	-	-
Total	**9,127**	**9,347**	**9,481**	**10,130**	**11,345**	**11,804**

Mindanao	2018	2019	2020	2021	2022	AAGR*
Coal	7,785	9,420	9,904	9,920	9,303	19%
Oil	633	554	372	152	449	-13%
Natural Gas	-	-	-	-	-	-
Renewable Energy	4,352	3,831	3,576	4,532	5,721	0.0%
Geothermal	826	766	744	643	690	-0.6%
Hydro	3,366	2,885	2,617	3,684	4,807	-0.2%
Biomass	72	93	107	107	114	4%
Solar[a]	88	87	108	97	110	71%
Wind	-	-	-	-	-	-
Total	**12,770**	**13,805**	**13,852**	**14,604**	**15,473**	**5%**

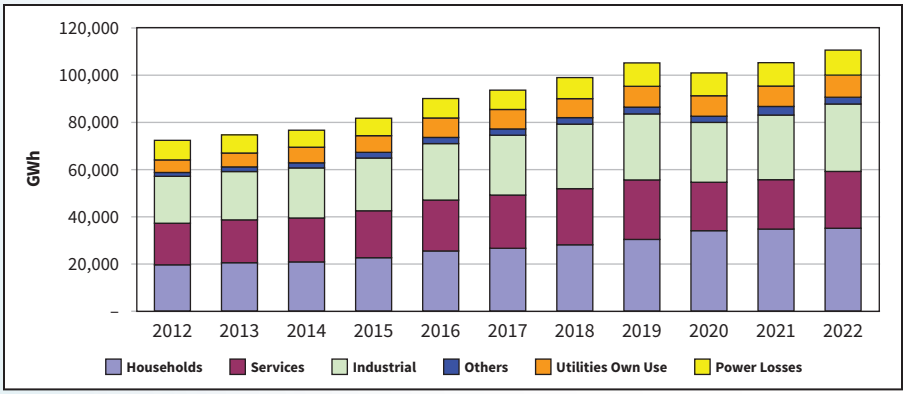
Philippines	2012	2013	2014	2015	2016	2017
Coal	28,265	32,081	33,054	36,686	43,303	46,847
Oil	4,254	4,491	5,708	5,886	5,661	3,787
Natural Gas	19,642	18,791	18,690	18,878	19,854	20,547
Renewable Energy	20,762	19,903	19,810	20,963	21,979	23,189
Geothermal	10,250	9,605	10,308	11,044	11,070	10,270
Hydro	10,252	10,019	9,137	8,665	8,111	9,611
Biomass	183	212	196	367	726	1,013
Solar[a]	1	1	17	139	1,097	1,201
Wind	75	66	152	748	975	1,094
Total	**72,922**	**75,266**	**77,261**	**82,413**	**90,798**	**94,370**
Self-sufficiency level (%)	**59**	**56**	**53**	**53**	**51**	**54**

Philippines	2018	2019	2020	2021	2022	AAGR*
Coal	51,932	57,890	58,176	62,052	66,430	9%
Oil	3,173	3,752	2,474	1,616	2,519	-5%
Natural Gas	21,334	22,354	19,497	19,060	17,884	-1%
Renewable Energy	23,326	22,044	21,609	23,386	24,684	2%
Geothermal	10,435	10,691	10,757	10,016	10,425	0.2%
Hydro	9,384	8,025	7,192	9,185	10,085	-0.2%
Biomass	1,105	1,040	1,261	1,445	1,322	22%
Solar[a]	1,249	1,246	1,373	1,470	1,822	45%
Wind	1,153	1,042	1,026	1,270	1,030	30%
Total	**99,765**	**106,041**	**101,756**	**106,115**	**111,516**	**4%**
Self-sufficiency level (%)	**51**	**47**	**47**	**45**	**43**	

*average annual growth rate

Luzon
(a) average annual growth rate from 2015 to 2022
Visayas
(a) average annual growth rate from 2013 to 2014
(b) average annual growth rate from 2014 to 2022
(c) average annual growth rate from 2015 to 2022
Mindanao
(a) average annual growth rate from 2014 to 2022
Philippines
(a) average annual growth rate from 2015 to 2022

Electricity Consumption, by Sector



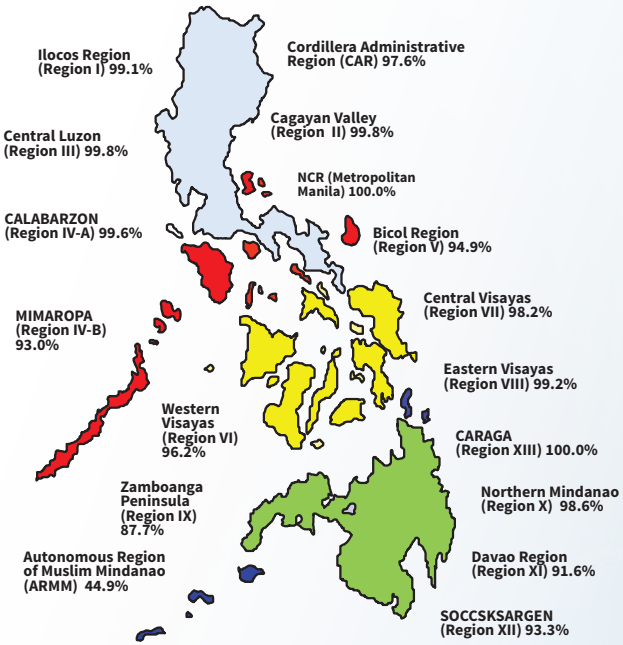
in GWh

	2012	2013	2014	2015	2016	2017
Households	19,695	20,614	20,969	22,747	25,631	26,782
Services	17,777	18,304	18,761	20,085	21,770	22,768
Industrial	20,071	20,677	21,429	22,514	24,117	25,573
Others*	1,668	1,971	2,186	2,462	2,634	2,670
Utilities Own Use	5,351	5,959	6,646	7,124	8,357	8,316
Power Losses	8,360	7,741	7,270	7,481	8,288	8,262
Total	**72,922**	**75,266**	**77,261**	**82,413**	**90,798**	**94,370**

	2018	2019	2020	2021	2022	AAGR**
Households	28,261	30,552	34,292	34,981	35,324	6.0%
Services	24,016	25,476	20,727	21,119	24,294	3.2%
Industrial	27,587	28,194	25,566	27,623	28,844	3.7%
Others*	2,753	2,897	2,658	3,695	2,871	5.6%
Utilities Own Use	8,141	8,929	8,771	8,729	9,490	5.9%
Power Losses	9,007	9,994	9,742	9,968	10,693	2.5%
Total	**99,765**	**106,041**	**101,756**	**106,115**	**111,516**	**4.3%**

* others include Transport and AFF
**average annual growth rate

Regional Household Electrification Level*



Region	Potential HH**	Served HH	Unserved HH (actual per DU)	Electrification Level (%)
CAR	395,881	444,842	9,442	97.6
I	1,151,629	1,344,032	10,380	99.1
II	804,380	943,585	1,606	99.8
III	2,566,558	3,273,636	4,901	99.8
IV-A	3,404,958	4,390,777	12,123	99.6
IV-B	682,668	737,715	47,513	93.0
V	1,216,421	1,254,915	62,470	94.9
NCR	3,095,766	3,702,957	-	100.0
LUZON	**13,318,261**	**16,092,459**	**148,435**	**98.9**
VI	1,716,637	1,849,027	65,892	96.2
VII	1,699,148	1,886,216	31,306	98.2
VIII	985,913	1,099,352	7,912	99.2
VISAYAS	**4,401,698**	**4,834,595**	**105,110**	**97.6**
IX	799,219	701,909	98,497	87.7
X	1,042,929	1,130,219	15,117	98.6
XI	1,177,461	1,106,772	99,181	91.6
XII	1,050,680	1,008,544	70,810	93.3
CARAGA	574,338	759,456	-	100.0
ARMM	620,385	280,119	342,082	44.9
MINDANAO	**5,265,012**	**4,987,019**	**625,687**	**88.1**
PHILIPPINES	**22,984,971**	**25,914,073**	**879,232**	**96.2**

* Dec 2022 electrification level report of REAMD-EPIMB as of 2023 April 18
**Based on the PSA 2015 Census of Population
Note:
A new formula was adopted for computing the electrification level which is (potential HH - unserved HH)/potential HH

Transmission Profile

Transmission Lines (Circuit-Kilometers)	2008	2009	2010	2011	2012*	2013*	2014
Luzon	9,527	9,568	9,638	9,529	9,374	9,439	9,370
Visayas	4,745	4,600	4,680	4,918	4,971	4,840	4,821
Mindanao	5,506	5,257	5,258	5,257	5,145	5,146	5,272
Total Philippines	**19,778**	**19,425**	**19,576**	**19,704**	**19,490**	**19,425**	**19,463**

Transmission Lines (Circuit-Kilometers)	2015	2016	2017	2018	2019	2020	2021
Luzon	9,428	9,602	9,795	9,447	9,227	9,396	9,499
Visayas	4,813	4,476	4,973	5,379	5,299	5,299	5,379
Mindanao	5,832	6,081	6,081	5,679	5,553	5,824	5,855
Total Philippines	**20,073**	**20,159**	**20,849**	**20,505**	**20,079**	**20,519**	**20,732**

*There was a decrease in total transmission line length in circuit-km due to modification and divestment of various sub-transmission assets.

Substation Capacity (In Million Volt-Amperes)	2008	2009	2010	2011	2012	2013	2014
Luzon	18,861	18,452	19,937	20,590	21,170	21,110	23,395
Visayas	3,154	3,161	3,263	3,414	3,414	3,504	3,734
Mindanao	2,200	2,260	2,643	2,793	3,142	3,318	3,478
Total Philippines	**24,215**	**23,873**	**25,843**	**26,796**	**27,726**	**27,932**	**30,607**

Substation Capacity (In Million Volt-Amperes)	2015	2016	2017	2018	2019	2020	2021
Luzon	23,785	25,900	25,887	26,598	28,021	27,955	29,976
Visayas	3,926	3,899	4,474	4,874	4,884	4,487	5,754
Mindanao	3,327	3,902	3,646	3,380	3,531	5,331	6,141
Total Philippines	**31,038**	**33,701**	**34,007**	**34,852**	**36,436**	**37,773**	**41,871**

Source: NGCP Transmission Development Plan 2022-2040 Consultation Draft Report as of March 2022

Glosarry

Condensate	Liquid hydrocarbons separated from gas production.
Dependable Capacity	The capacity that can be relied upon to carry system load for a specified time interval and period, provide assumed reserve, and/or meet firm power obligations.
Electirifcation	Electrification is either done through grid or off-grid connection. When a barangay is provided with electricity through grid connection, it means that the distribution line has reached the barangay proper. It may also mean that almost 50.0 percent of potential households in the barangay are connected to a distribution utility (DU) (i.e. MERALCO) or at least one is connected to other DUs. Off-grid connection pertains to a barangay having about 20 to 30 households availing the connection.
Energy Intensity	Calculated as units of energy (million tons of oil equivalent, MTOE) per unit of GDP (in billion pesos).
Energy Per Capita	Amount of energy used per person. It is calculated as total primary energy demand (in MTOE) over population (in millions).
Energy Self Sufficiency	The ratio of the country's domestic energy supply to total supply; measures the degree at which domestic energy forms can support total energy demand.
Energy to GDP Elasticity	The percentage change in energy supply to achieve one per cent change in national GDP. Calculated as the ratio of growth of primary energy demand over GDP growth.
Gas (or Natural Gas)	A naturally occurring mixture of hydrocarbon and non-hydrocarbon gases in porous formations beneath the earth's surface, often in association with petroleum. The principal constituent is methane.
Geothermal Energy	Energy generated by heat stored in the earth, or the collection of absorbed heat derived from underground in the atmosphere and oceans.

Gross Domestic Product (GDP)	Total market value of all final goods and services produced within the country in a given period of time (usually a calendar year), or the sum of value added of all final goods and services produced within a country in a given period of time.
Gross National Product (GNP)	The value of all (final) goods and services produced in a country in one year, plus income earned by its citizens abroad, minus income earned by foreigners in the country.
Hydropower	Also called hydraulic power or water power; derived from the force or energy of moving water, which may be harnessed for useful purposes.
Indigeneous Energy	Refers to all energy forms produced/sourced from within the country's natural resources.
Installed Capacity	The total of the capacities shown on the nameplates of the generating units in a powerplant.
Renewable Energy	Energy generated from natural resources which are naturally replenished. It includes solar power, wind power, hydroelectricity, micro hydro, biomass and biofuels.
Run of Mine	Coal directly coming from the mine
Total Final Energy Consumption (TFEC)	The sum of all energy forms consumed/used by different economic sectors
Total Primary Energy Demand (TPED)	The sum of total final consumption, power generation, other energy sector (own use and losses).
Total Primary Energy Supply (TPES)	The sum of all energy derived from domestic sources (indigeneous, renewable), imported from outside the country, stock change (+/-) and export (-)

Units of Measurement

BCF ..... Billion Cubic Feet

BTu ..... British Thermal Units

Ckt-Km ..... Circuit-Kilometer

GWh ..... Gigawatt-Hour

KWh ..... Kilowatt-hour

Ktoe ..... Thousand tonnes of oil equivalent

Lb ..... Pound

MB ..... Thousand Barrels

MMMT ..... Million Metric Tons

MMSCF ..... Million Standard Cubic Feet

MMT ..... Thousand Metric Tons

MVA ..... Megavolt Ampere

MW ..... Megawatt

Php ..... Philippine Peso

ROM ..... Run of Mine

USD ..... US Dollar

Conversion Table

Fuels	to KTOE
Coal (MT@10,000 btu/lb.)	0.000528
Natural Gas (MMSCF)	0.023290
Crude (MB)	0.134400
Condensate (NGL) (MB)	0.104400
Premium Gasoline (MB)	0.124500
Regular Gasoline (MB)	0.122300
Kerosene (MB)	0.127000
Diesel (MB)	0.134700
Fuel Oil (MB)	0.144400
LPG (MB)	0.092200
Jet (MB)	0.127000
Avgas (MB)	0.122400
Naphtha (MB)	0.123800
Asphalts (MB)	0.152100
Lubes & Greases (MB)	0.141200
Others (MB)	0.123300
Ricehull (MT)	0.000345
Charcoal (MT)	0.000600
Fuelwood (MT)	0.000329
Bagasse (MT)	0.000426
Agriwaste (MT)	0.000329
Animal Waste (MT)	0.000516
Ethanol (BBL)	0.000089
CME (BBL)	0.000130
Hydro (GWh)	0.086000
Geothermal (GWh)	0.860000
Wind (GWh)	0.860000
Solar (GWh)	0.860000

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