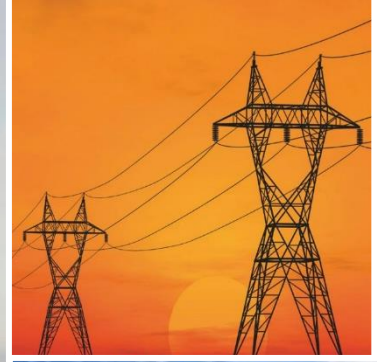





Energy Sector in the Philippines

Director Michael O. Sinocruz

Energy Policy and Planning Bureau, Department of Energy

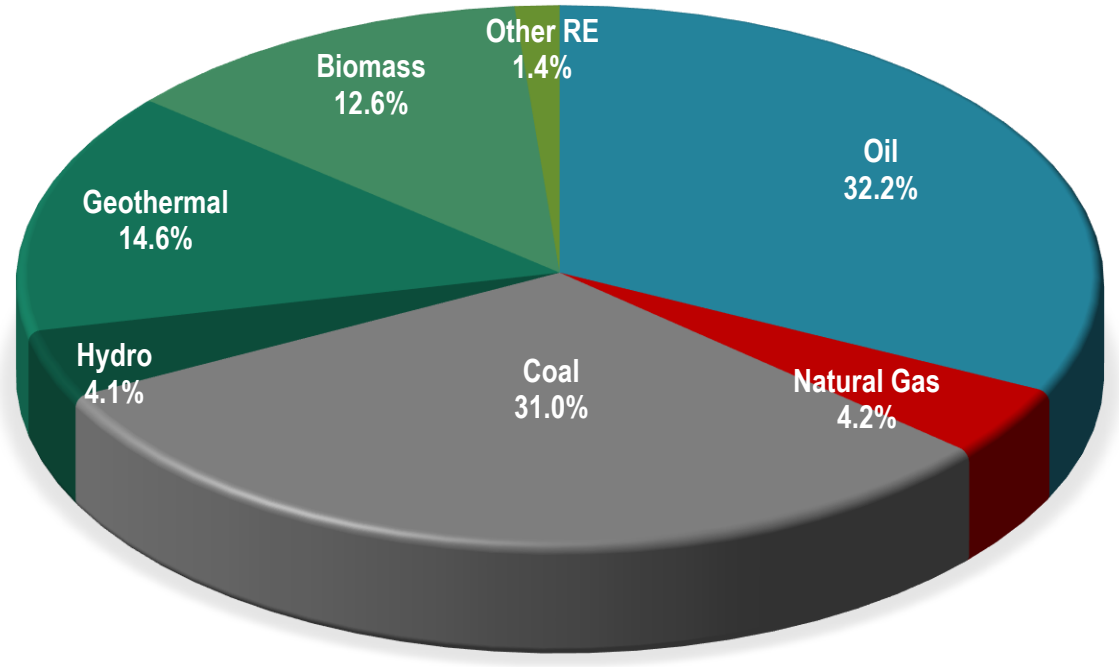
Training on 2006 IPCC Guidelines for preparing National GHG Inventory:
Energy, IPPU and Waste Sector

BAGONG PILIPINAS

Energy Situationer

TOTAL PRIMARY ENERGY SUPPLY 2022

More than half of PH energy requirements are imported, making it vulnerable to geopolitical conflicts



61.6 MTOE
2022 Total Primary Energy Supply

49.4%
(30.4 MTOE)
INDIGENOUS

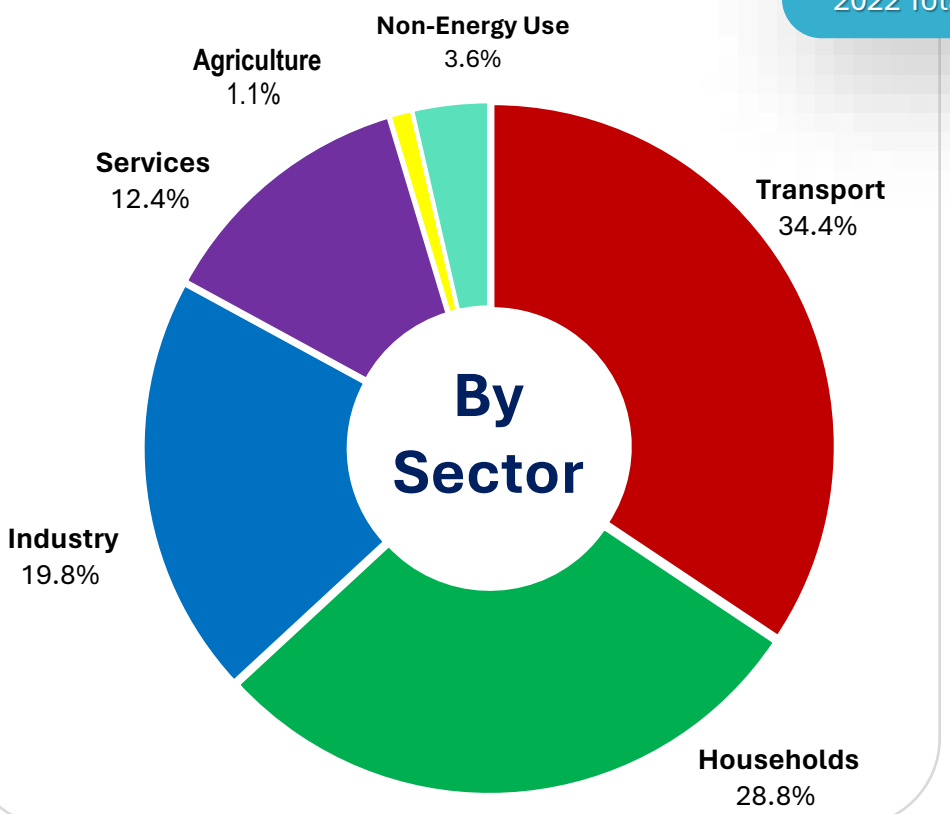
50.6%
(31.1 MTOE)
NET IMPORTED

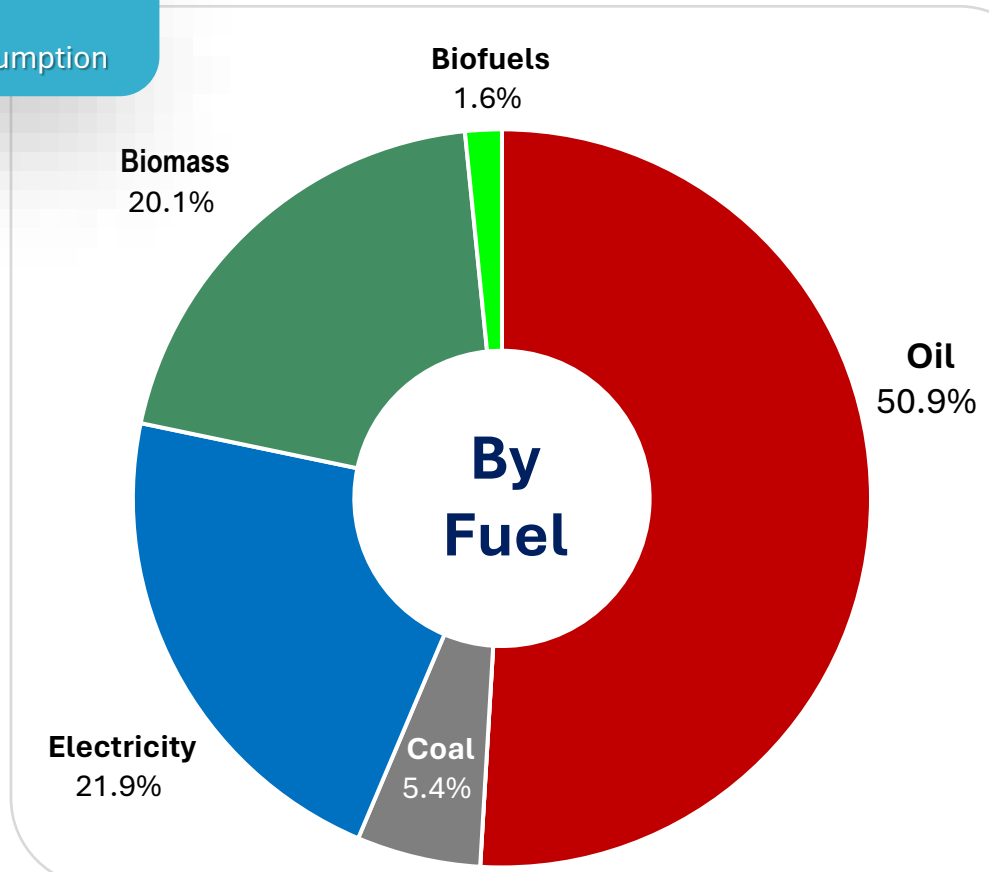
32.6%
(20.0 MTOE)
RE SHARE

Energy Situationer

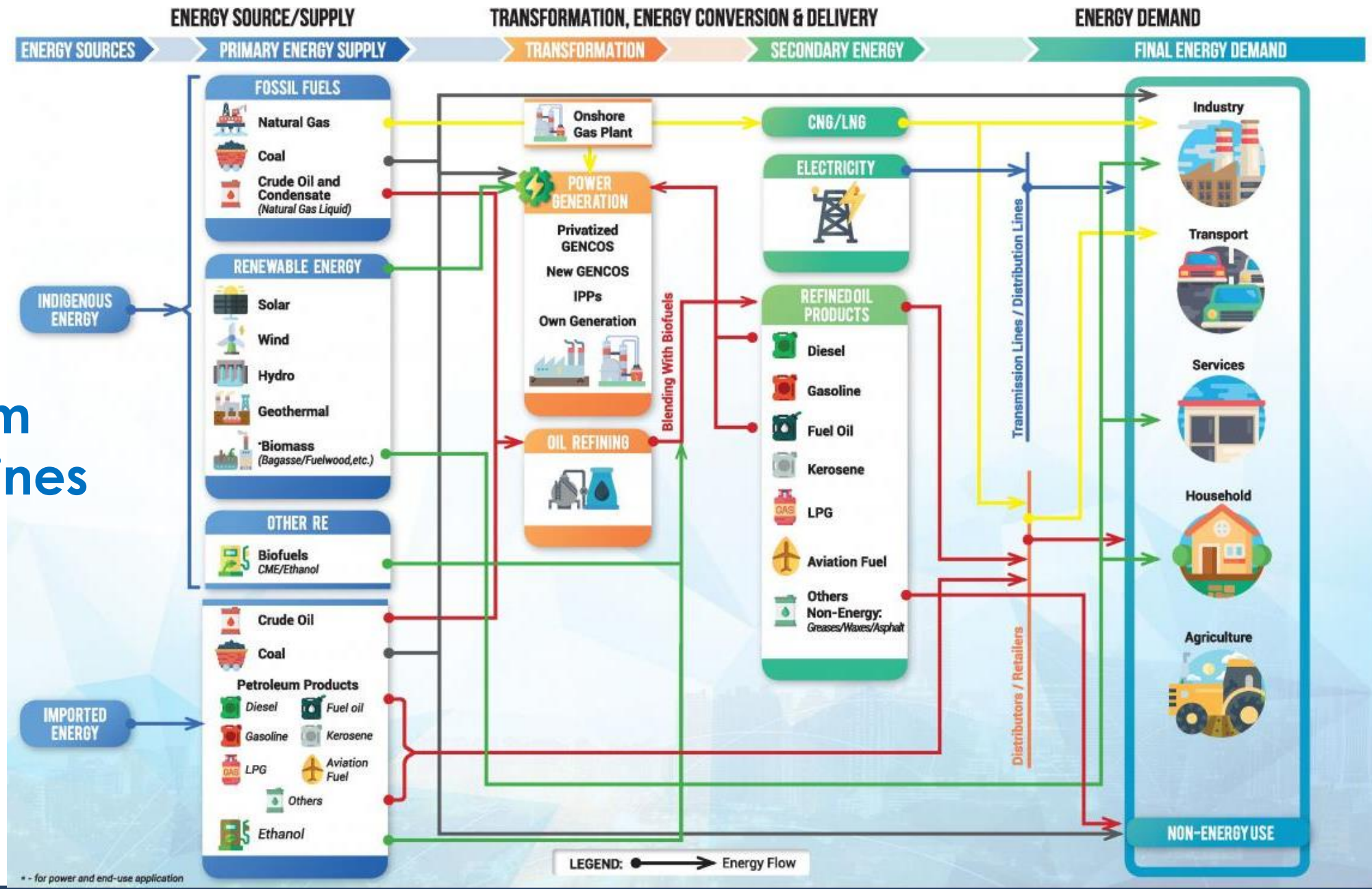
TOTAL FINAL ENERGY CONSUMPTION 2022

35.9 MTOE
2022 Total Final Energy Consumption





Reference Energy System of the Philippines



Energy Balance Table of the Philippines

ENERGY FORMS → / FLOWS ↓	Coal	Natural Gas	Oil & Oil Products	Hydro	Geothermal	Solar	Wind	Biomass	Biodiesel	Bioethanol	Electricity	Total
Indigeneous	6,204	3,601	594	2,336	8,973	107	99	7,668	168	170	0	29,920
Imports (+)	13,882	0	23,720	0	0	0	0	0	0	145	0	37,747
Exports (-)	-2,668	0	-2,205	0	0	0	0	0	0	0	0	-4,872
International Marine Bunkers (-)	0	0	-83	0	0	0	0	0	0	0	0	-83
International Civil Aviation (-)	0	0	-1,625	0	0	0	0	0	0	0	0	-1,625
Stock Change (+/-)	-1,069	0	-408	0	0	0	0	0	14	35	0	-1,427
Total Primary Energy Supply	16,349	3,601	19,994	2,336	8,973	107	99	7,668	182	350	0	59,660
Refinery (Crude Run)	0	0	-632	0	0	0	0	0	0	0	0	-632
Power Generation (Fuel Input)	-13,776	-3,324	-728	-2,336	-8,973	-107	-99	-373	-8	0	8,578	-21,147
Transmission/Dist. Loss (-)	0	0	0	0	0	0	0	0	0	0	-774	-774
Energy Sector Use & Loss (-)	0	-218	-80	0	0	0	0	0	0	0	-700	-998
Net Domestic Supply	2,573	59	18,554	0	0	0	0	7,295	174	350	7,104	36,109
Statistical Difference												386
% Statistical Difference												1
Total Final Energy Consumption	2,573	59	18,168	0	0	0	0	7,295	174	350	7,104	35,723
Industry	2,411	59	1,469	0	0	0	0	1,199	13	0	2,372	7,523
Transport	0	0	11,753	0	0	0	0	0	127	350	9	12,238
Households	0	0	1,255	0	0	0	0	5,746	0	0	2,430	9,431
Services	0	0	2,223	0	0	0	0	350	30	0	2,065	4,668
Agriculture	0	0	208	0	0	0	0	0	4	0	228	440
Others, Non-Energy Use	162	0	1,261	0	0	0	0	0	0	0	0	1,423

Energy Balance Table of the Philippines

The **Top Block** or Primary Supply block includes the **flows** representing energy entering and leaving the national territory, as well as stock changes to provide information on supply of energy on the national territory during the reference period[2]. It includes **(a) indigen**
change and (5) marine and ci

	Coal	Natural Gas	Oil & Oil Products
Indigeneous	6,204	3,601	59
Imports (+)	13,882	0	23,72
Exports (-)	-2,668	0	-2,20
International Marine Bunkers (-)	0		
International Civil Aviation (-)	0	0	-1,62
Stock Change (+/-)	-1,069	0	-40
Total Primary Energy Supply	16,349	3,601	19,99

Top

The **Middle Block** or Transformation refers to the flows showing how energy is transformed, transferred, used by energy industries for own use and lost in distribution and transmission[3]. **Tra**
processes of changing a primary fuel
energy commodity which is better s
to electricity generation. Losses can
loss as well as energy sector own us

	Coal	Natural Gas	Oil & Oil Products	Hydro
Refinery (Crude Run)	0	0	-632	
Power Generation (Fuel Input)	-13,776	-3,324	-728	-2,3
Transmission/Dist. Loss (-)	0			
Energy Sector Use & Loss (-)	0	-218	-80	
Net Domestic Supply	2,573	59	18,554	

Middle Bloc

Lastly, the **Bottom Block** or Final Use refers to the flows reflecting final energy consumption and non-energy use of energy products.[5] It covers energy consumption of major economic sectors such as (1) industry - with subsectors for manufacturing (18 industries), mining and construction, (2) transport (with subsectors for rail, road, water, and air transport), (3) households, (4) services; and (5) agriculture. It also reports consumption of fuels not exclusively used for fuel (energy) purposes, but as raw material in different sectors (i.e. feedstocks, etc.) as non-energy use.

	Coal	Natural Gas	Oil & Oil Products	Hydro	Geothermal	Solar	Wind	Biomass	Biodiesel	Bioethanol	Electricity	Total
Total Final Energy Consumption	2,573	59	18,168	0	0	0	0	7,295	174	350	7,104	35,723
Industry	2,411	59	1,469	0	0	0	0	1,199	13	0	2,372	7,523
Transport	0	0	11,753	0	0	0	0	0	127	350	9	12,238
Households	0							5,746	0	0	2,430	9,431
Services	0	0	2,223	0	0	0	0	350	30	0	2,065	4,668
Agriculture	0	0	208	0	0	0	0	0	4	0	228	440
Others, Non-Energy Use	162	0	1,261	0	0	0	0	0	0	0	0	1,423

Bottom Block = Final Use

Energy Sector GHG Inventory

1.A Fuel combustion activities:

Stationary Sources

Mobile Sources

1.A.1
Energy Industries

1.A.2
Manufacturing Industries

1.A.4
Other Sectors

1.A.3
Transportation

Energy Sector GHG Inventory

1.B Fugitive emissions

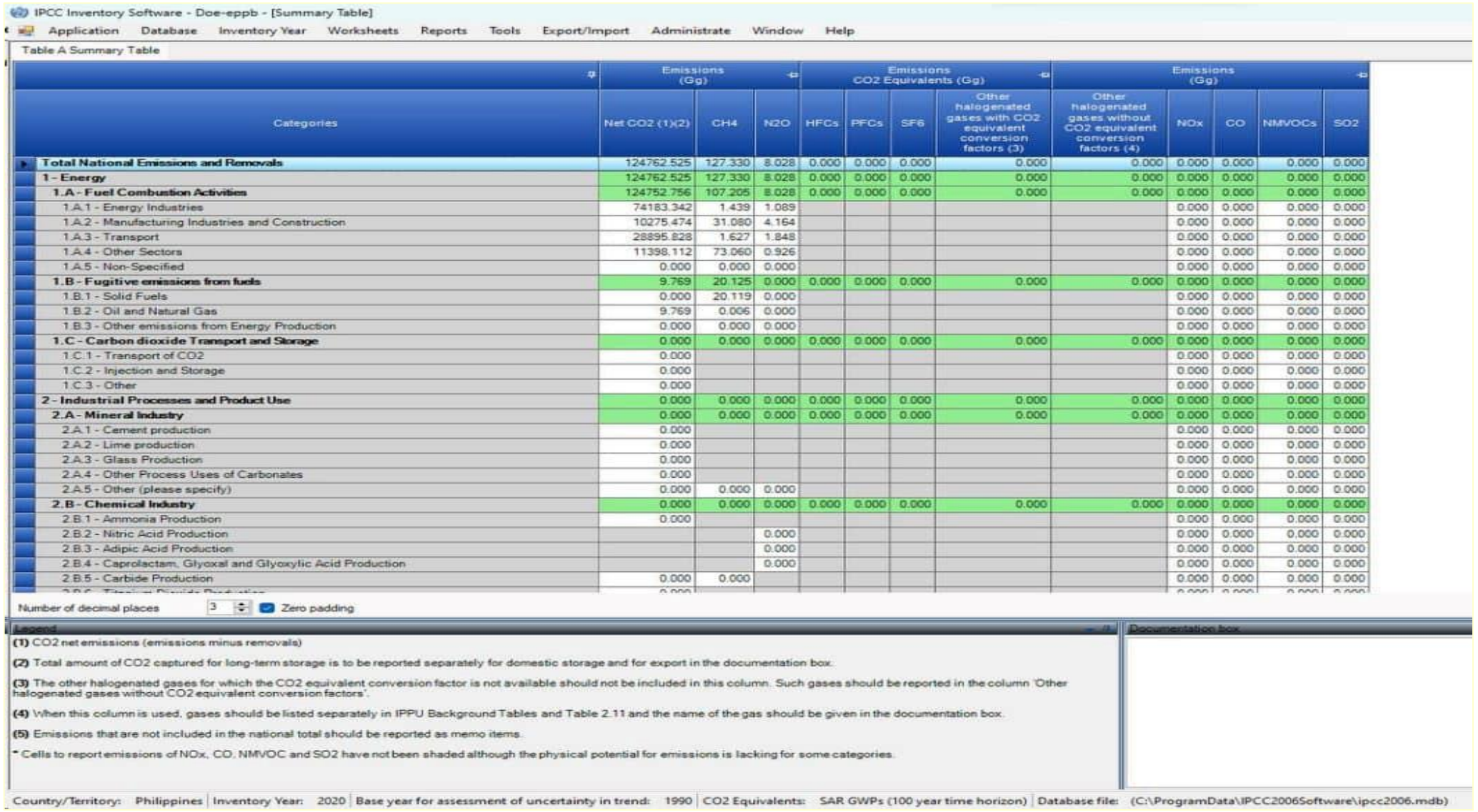
Solid fuels, e.g. coal mining and handling

Oil and Natural Cas

1.C Carbon capture and storage

No existing carbon capture and storage technologies so far in the Philippines

2020 National GHG Inventory



IPCC Inventory Software - Doe-eppb - [Summary Table]

Application Database Inventory Year Worksheets Reports Tools Export/Import Administrate Window Help

Table A Summary Table

Categories	Emissions (Gg) Net CO2 (1)(2)	CH4	N2O	Emissions CO2 Equivalents (Gg) HFCs	PFCs	SF6	Other halogenated gases with CO2 equivalent conversion factors (3)	Other halogenated gases without CO2 equivalent conversion factors (4)	Emissions (Gg) NOx	CO	NMVOCs	SO2
Total National Emissions and Removals	124762.525	127.330	8.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1 - Energy	124762.525	127.330	8.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.A - Fuel Combustion Activities	124752.756	107.205	8.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.A.1 - Energy Industries	74183.342	1.439	1.089						0.000	0.000	0.000	0.000
1.A.2 - Manufacturing Industries and Construction	10275.474	31.080	4.164						0.000	0.000	0.000	0.000
1.A.3 - Transport	28895.828	1.627	1.848						0.000	0.000	0.000	0.000
1.A.4 - Other Sectors	11398.112	73.060	0.926						0.000	0.000	0.000	0.000
1.A.5 - Non-Specified	0.000	0.000	0.000						0.000	0.000	0.000	0.000
1.B - Fugitive emissions from fuels	9.769	20.125	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.B.1 - Solid Fuels	0.000	20.119	0.000						0.000	0.000	0.000	0.000
1.B.2 - Oil and Natural Gas	9.769	0.006	0.000						0.000	0.000	0.000	0.000
1.B.3 - Other emissions from Energy Production	0.000	0.000	0.000						0.000	0.000	0.000	0.000
1.C - Carbon dioxide Transport and Storage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.C.1 - Transport of CO2	0.000								0.000	0.000	0.000	0.000
1.C.2 - Injection and Storage	0.000								0.000	0.000	0.000	0.000
1.C.3 - Other	0.000								0.000	0.000	0.000	0.000
2 - Industrial Processes and Product Use	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.A - Mineral Industry	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.A.1 - Cement production	0.000								0.000	0.000	0.000	0.000
2.A.2 - Lime production	0.000								0.000	0.000	0.000	0.000
2.A.3 - Glass Production	0.000								0.000	0.000	0.000	0.000
2.A.4 - Other Process Uses of Carbonates	0.000								0.000	0.000	0.000	0.000
2.A.5 - Other (please specify)	0.000	0.000	0.000						0.000	0.000	0.000	0.000
2.B - Chemical Industry	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2.B.1 - Ammonia Production	0.000								0.000	0.000	0.000	0.000
2.B.2 - Nitric Acid Production			0.000						0.000	0.000	0.000	0.000
2.B.3 - Adipic Acid Production			0.000						0.000	0.000	0.000	0.000
2.B.4 - Caprolactam, Glyoxal and Glyoxylic Acid Production			0.000						0.000	0.000	0.000	0.000
2.B.5 - Carbide Production	0.000	0.000							0.000	0.000	0.000	0.000

Number of decimal places 3 Zero padding

Legend

(1) CO2 net emissions (emissions minus removals)

(2) Total amount of CO2 captured for long-term storage is to be reported separately for domestic storage and for export in the documentation box.

(3) The other halogenated gases for which the CO2 equivalent conversion factor is not available should not be included in this column. Such gases should be reported in the column 'Other halogenated gases without CO2 equivalent conversion factors'.

(4) When this column is used, gases should be listed separately in IPPU Background Tables and Table 2.11 and the name of the gas should be given in the documentation box.

(5) Emissions that are not included in the national total should be reported as memo items.

* Cells to report emissions of NOx, CO, NMVOC and SO2 have not been shaded although the physical potential for emissions is lacking for some categories.

Documentation box

Country/Territory: Philippines | Inventory Year: 2020 | Base year for assessment of uncertainty in trend: 1990 | CO2 Equivalents: SAR GWPs (100 year time horizon) | Database file: (C:\ProgramData\IPCC2006Software\ipcc2006.mdb)

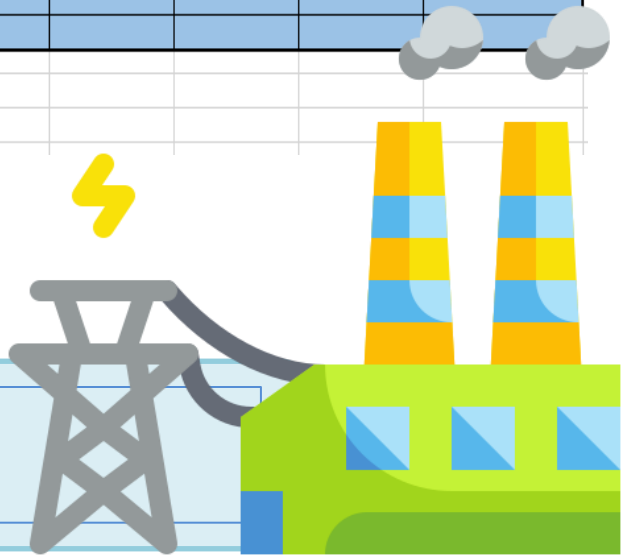
2020 Energy Sector GHG Inventory – Sectoral Approach AD

2020

1.A.1 Energy Industries	ACTIVITY DATA (TJ)												
	Liquid Fuels					Gaseous Fuel	Solid Fuel	Biomass					
	Diesel	RFG	Pet Coke	IFO	LPG	Nat Gas	Coal	Biodiesel	Landfill Gas	Other Biogas	Charcoal	Fuel wood	Other Primary Solid Biomass*
1.A.1 Energy Industries	12,581.48255	7530.996	10559.7242	11751.6957	1346.49341	135557.5179	657527.3009	239.49736	205.80780	203.77861	152.59053	459.40114	16222.20784
1.A.1.a Main Electricity and Heat Production	12,119.19527			9138.390566		128722.6907	645683.90170	239.49736	205.80780	203.77861	152.59053	459.40114	16222.20784
1.A.1.a.i Electricity Generation	12,119.19527			9138.390566		128722.6907	645683.90170	239.49736	205.80780	203.7786	152.5905	459.40114	16222.20784
Primary and Secondary Fuels	12,119.19527			9138.390566									
1.A.1.a.ii Combined Heat and Power Generation (CHP) **													
1.A.1.a.iii Heat Plants**													
1.A.1.b Petroleum Refining	15.05778	7530.996039	10559.7242	2613.305166	1346.493405	1557.386823	9094.902862						
Petroleum Refineries	15.05778	7530.996039	10559.7242	2613.305166	1346.493405	1557.386823	9094.902862						
Lube refineries*													
1.A.1.c Manufacture of Solid Fuels and Other Industries	447.22950					5277.440362	2748.496387						
1.A.c.i Manufacture of Solid Fuels**													
1.A.c.ii Other Energy Industries	447.22950					5277.440362	2748.496387						

*Ricehull+Bagasse+Agriwaste+Animal Waste

** 2020 data not available



1.A.1 Energy Industries

image: flaticon.com

2020 Energy Sector GHG Inventory – Sectoral Approach AD

INDUSTRY	ACTIVITY DATA (TJ)								
	DIESEL	KEROSENE	IFO	LPG	BIODIESEL	OTHER BIOGAS	COAL	OTHER PRIMARY SOLID BIOMASS*	FUELWOOD
1.A.2 Manufacturing Industries and Construction	**24,556.31234**	**736.59677**	**26,677.38112**	**5,898.77949**	**503.24515**	**147.40049**	**92,860.04261**	**89,784.32994**	**7,331.33369**
1.A.2.a Iron and steel	669.94488	33.05036	3,246.91345	700.49374	13.79280		9,108.03017		
1.A.2.b Non-ferrous metals**									
1.A.2.c Chemicals	1,622.28236	639.70568	5,775.50286	236.19881	33.39949	147.40049	434.18676	3,829.34629	144.05851
1.A.2.d Pulp, paper and print	80.19370	2.83921	136.32669	25.81081	1.65103		3,108.50215		
1.A.2.e Food, beverages and tobacco	2,828.05636	20.14362	4,784.12803	2,362.28704	58.13197		5,121.86975	85,379.77827	7,187.27519
1.A.2.f Non-metallic minerals	1,684.16935		6,019.41811	739.83780	39.39598		74,157.76045		
1.A.2.g Transport Equipment**									
1.A.2.h Machinery	2,218.32922	39.60525	3,158.32612	797.73830	45.67089				
1.A.2.i Mining (excluding fuels) and Quarrying	10,180.36741		2,285.71097	-	209.83761				
1.A.2.j Wood and wood products	177.93219		287.04452	159.40152	3.66326				
1.A.2.k Construction	5,042.53246	1.25266	290.45370	261.65764	96.62116				
1.A.2.l Textile and leather	27.99334		514.90096	35.91526	0.57633		385.87389		
1.k.2.m Not specified industry	24.51106		178.65570	579.43857	0.50463		543.81945	575.20538	

* Ricehull+Bagasse+Agriwaste+Animal Waste

** 2015 data is not available

image: flaticon.com

1.A.2 Manufacturing Industries and Construction

2020 Energy Sector GHG Inventory – Sectoral Approach AD

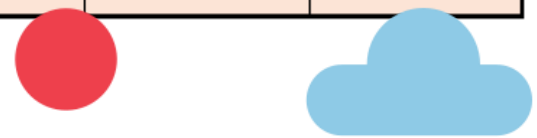
TRANSPORT	ACTIVITY DATA (TJ)							
	Liquid Fuels						Biomasss	
	Motorgasoline	Diesel	IFO	LPG	AVG	Jet A1	Biogasoline	Biodiesel
1.A.3 Transport	**173551.65228**	**213630.73286**	**8994.299883**	**183.6614008**	**120.42554**	**32780.13845**	**13555.52412**	**4061.12215**
1.A.3.a Civil Aviation	0	0	0	0	**120.42554**	**32780.13845**		
1.A.3.a.i International Aviation (International Bunkers)						23742.874		
1.A.3.a.ii Domestic Aviation					120.42554	9037.264455		
1.A.3.b Road Transportation	**167832.90216**	**190058.3093**		183.6614008			13555.52412	3792.732423
1.A.3.c Railways		**61.95102193**						1.222352767
1.A.3.d Water-borne Navigation	5718.75012	**21164.14977**	**8994.29988**					267.1673761
1A.3.d.i International Water-borne Navigation (Int'l bunkers)		832.0154842	3385.381987					
1.A.3.d.ii Domestic Water-borne Navigation	5718.75012	20332.13428	5608.917896					267.1673761
1.A.3.e Other Transportation	0	**2346.322737**	0					
1.A.3.e.i Pipeline Transport								
1.A.3.e.ii Off-road Transport	0	2346.322737	**0**					
Agriculture								
Forestry								
Industry		2346.322737						

1.A.3. Transport

image: flaticon.com

2020 Energy Sector GHG Inventory – Sectoral Approach AD

COMMERCIAL, RESIDENTIAL, AGRICULTURE	ACTIVITY DATA (TJ)								
	Liquid Fuels					Biomass			
	Motorgasoline	Diesel	Kerosene	IFO	LPG	BIODIESEL	OTHER PRIMARY SOLID BIOMASS*	FUELWOOD	CHARCOAL
1.A.4 Other Sectors	408.213	86891.45461	2158.188494	5377.65179	69092.907	1684.26	21628.53455	179,467.87285	57,101.14453
1.A.4.a Commercial/Institutional		78584.48456	0	5284.72231	19410.57315	1550.23669	209.3898264	6913.468932	6487.005124
1.A.4.b Residential		0	2136.218344	0	49682.33389	0	21419.14473	172,554.40391	50614.13941
1.A.4.c Agriculture/Forestry/Fishing/Fish Farms	408.21300	8306.970049	21.97015013	92.9294755		134.023013			
1.A.4.c.i Stationary	184.21920	1556.715515	0	3.65025763	0	0.62569339			
1.A.4.c.ii Off-road vehicles and Other Machinery	107.60076	956.4872664	14.94036284	0	0	18.9019298			
1.A.4.c.iii Fishing (mobile combustion)	116.39304	5793.767268	7.029787293	89.27921787	0	114.49539			

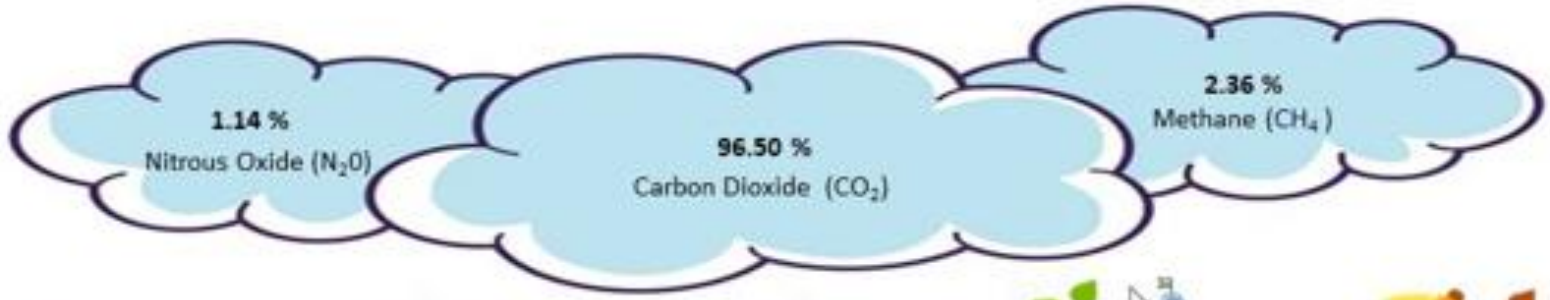


1.A.4. Other Sectors

image: flaticon.com

2020 Energy Sector GHG Inventory

Energy Sector GHG Emissions in 2020



Total Energy Sector GHG Emissions by Sector in 2020

74,512.26 Gg CO_2-eq **(57.63%)**	29,431.20 Gg CO_2-eq **(22.76%)**	11,082.71 Gg CO_2-eq **(8.57%)**	13,689.26 Gg CO_2-eq **(10.59%)**	570.16 Gg CO_2-eq **(0.44%)**
Energy Industries	Transport	Manufacturing Industries and Construction	Other Sectors (Commercial, residential, agriculture, forestry, fishing sector)	Fugitive (Methane emissions from coal mining/handling and Flaring from oil extraction)

Total Energy Sector GHG Emissions

2020			1994 to 2020
Total Emissions (Gg CO_2-eq)	CO_2 from Fuel Combustion (Gg CO_2-eq)	CO_2 Emissions from Fugitive (Gg CO_2-eq)	
129, 285.59	CO_2: 124,762.46 (96.50%) CH_4: 2,486.03 (1.92%) N_2O: 1,476.73 (1.14%)	570.16 (0.44%)	150% ⬆ Total Emissions 163.57% ⬆ Total CO_2 Emissions 73.19% ⬆ Total CH_4 105.96% ⬆ Total N_2O

image: flaticon.com








Thank You!

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