



GHANA ENERGY STATISTICS HANDBOOK



2024
EDITION





Ghana Energy Statistics Handbook

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2024 Edition

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| Securing Ghana's Future Energy Today

FOREWORD

The Energy Commission was established in 1997 by an Act of Parliament (ACT 541) to regulate and manage the utilisation of energy resources in the Republic of Ghana, as well as coordinate related policies. Central to its mandate is the establishment of a robust energy database crucial for informed national decision-making regarding the development and utilisation of energy resources.

To fulfil this mandate, the collection, analysis and dissemination of energy statistics has always been and remain at the heart of the work of the Commission. The energy statistics serve as a cornerstone in providing a comprehensive overview of energy production, transformation, final consumption, and pricing. Widely recognised globally, the energy statistics publication by the Energy Commission stands as the authoritative source of energy data and information for Ghana.

The publication of key energy statistics is instrumental in monitoring shifts in energy production and consumption patterns, providing invaluable insights into the country's energy landscape. This publication highlights key facts and trends, facilitating deeper understanding among researchers, policymakers, and students. Additionally, the publication includes pertinent information on the 2024 energy outlook, energy efficiency, and its alignment with Sustainable Development Goal 7 (SDG 7).

I hope that the information in this document will not only inform but also help policymakers, researchers and others to make informed decisions to ensure that, energy is produced and used in a secure, affordable, efficient and sustainable manner in line with the achievement of SDG7.

We welcome feedback, comments, and suggestions from our readers and users of this document, as they are instrumental in our continuous efforts to enhance the quality and relevance of our work.

This publication is also available on our website at www.energycom.gov.gh

Ing. Oscar Amonoo-Neizer
Executive Secretary

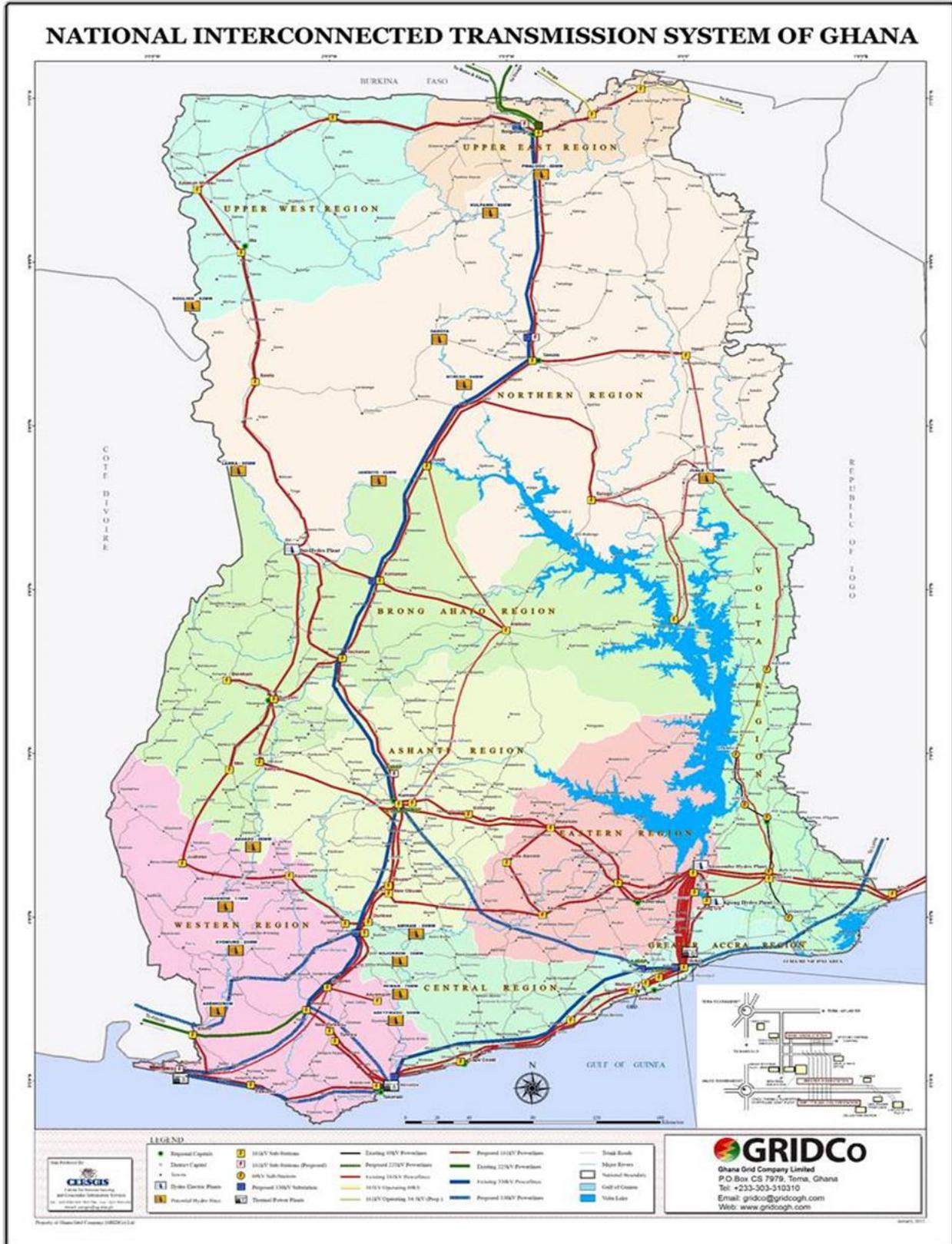
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ABBREVIATIONS AND ACRONYMS

Abbreviations	Definition
ATK	Aviation Turbine Kerosene
Bbls	Barrels
Dist. SPV	Distributed Solar PV
DPK	Dual Purpose Kerosene
ECG	Electricity Company of Ghana
EPC	Enclave Power Company Ltd
FEC	Final Energy Consumption
GNGC	Ghana National Gas Company
GNPC	National Petroleum Corporation
GRIDCo	Ghana Grid Company
GSS	Ghana Statistical Service
GWh	Gigawatt-hour
Kt	Kilotonnes
ktoe	thousand tonnes of oil equivalent
kWh	kilowatt-hour
LCO	Light Crude Oil
LPG	Liquefied Petroleum Gas
MMBtu	Million British thermal unit
MW	Megawatt
NEDCo	Northern Electricity Distribution Company
NPA	National Petroleum Authority
PURC	Public Utilities Regulatory Commission
RFO	Residual Fuel Oil
tBtu	Trillion British Thermal Units
tCO ₂	Tonnes of Carbon dioxide
TES	Total Energy Supply
TFC	Total final consumption
toe	Tonnes of oil equivalent
VALCO	Volta Aluminium Company
VRA	Volta River Authority
W	Watt
W2E	Waste-to-Energy
WAGP	West African Gas Pipeline
WAPCo	West African Gas Pipeline Company

NATIONAL INTERCONNECTED TRANSMISSION SYSTEM OF GHANA



2023 ELECTRICITY ACCESS MAPS OF GHANA

PROPORTION OF POPULATION WITH ACCESS TO ELECTRICITY



2023 National population electricity access rate: 88.85%

$$\text{Regional population access} = \frac{\text{Total number of persons with access to the grid in the region}}{\text{Total population of the region}} \times 100\%$$

PROPORTION OF HOUSEHOLDS WITH ACCESS TO ELECTRICITY



2023 National household electricity access rate: 87.49%

$$\text{Regional household access} = \frac{\text{Total number of households connected to the grid in the region}}{\text{Total number of households in the region}} \times 100\%$$

KEY HIGHLIGHTS

Indicator	Unit	2000	2005	2010	2015	2020	2021	2022	2023
Population	million	18.9	21.3	24.7	27.7	30.8	30.8	31.4	32.3
GDP current	million US\$	4,983.0	10,744.7	32,197.3	48,594.9	70,029.4	79,524.4	74,266.1	76,373.9
GDP, PPP (constant 2017 international \$)	million \$	54,122.7	69,199.8	94,866.8	133,286.1	169,382.4	178,455.3	184,236.8	192,673.6
Total Energy Supply	ktoe	6,146.5	5,765.8	6,989.6	9,668.6	12,030.0	11,822.4	12,342.1	13,218.3
Total Final Energy Consumed	ktoe	5,467.9	4,969.9	5,470.8	7,221.9	8,644.2	8,801.7	8,826.0	9,107.0
Total Electricity Generated	GWh	7,223.7	6,787.7	10,166.3	11,490.3	20,165.0	22,059.9	23,171.8	24,264.4
Total Electricity Consumed	GWh	6,869.0	5,967.0	7,759.9	9,640.2	15,936.1	17,464.6	18,171.7	18,848.8
Total Petroleum Products Consumed	ktoe	1,444.9	1,711.6	2,408.1	3,496.8	4,247.9	4,640.0	4,317.1	4,641.2
Total Biomass Consumed	ktoe	3,432.4	2,745.2	2,395.4	2,896.2	3,026.1	2,660.0	2,946.4	2,845.1
Energy Intensity (TES/GDP current million US\$)	toe/million US\$	1,233.5	536.6	217.1	199.0	171.8	148.7	166.2	173.1
Energy Intensity in PPP (TES/ GDP in PPP)	toe/million \$	113.6	83.3	73.7	72.5	71.0	66.2	67.0	68.6
Energy Intensity in PPP (FEC/ GDP in PPP)	toe/million \$	101.0	71.8	57.7	54.2	51.0	49.3	47.9	47.3
Total Primary Energy Supply/capita	toe/capita	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
Energy use per capita (TFC/persons)	toe/capita	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3
Total Electricity Generated/capita	kWh/capita	382.0	318.7	412.3	415.3	654.4	715.5	739.1	752.2
Total Electricity Consumed/capita	kWh/capita	363.2	280.1	314.7	348.4	517.1	566.4	579.6	584.3
Total Petroleum Products Consumed/capita	toe/capita	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1
Total Biomass Consumed/capita	toe/capita	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Electricity Consumed/GDP	KWh/US\$ 1,000 of GDP	1,378.5	555.3	241.0	198.4	227.6	219.6	244.7	246.8
Total Energy Supply/GDP	toe/US\$ 1,000 of GDP	1,233.5	536.6	217.1	199.0	171.8	148.7	166.2	173.1
Total Petroleum Products Consumed/GDP	toe/US\$ 1,000 of GDP	290.0	159.3	74.8	72.0	60.7	58.3	58.1	60.8
Grid Emission Factor (wind/solar projects)	tCO ₂ /MWh	-	-	0.4	0.3	0.3	0.4	0.3	
Grid Emission Factor (all other projects)	tCO ₂ /MWh	-	-	0.5	0.3	0.4	0.4	0.4	

**Estimated

¹GDP in current prices and Population data from Ghana Statistical Service

²GDP in PPP (constant 2017 international \$) from World bank database

SUSTAINABLE DEVELOPMENT GOALS 7 (SDG 7) INDICATORS

Target	Indicator	Indicator Definition	Disaggregation	Unit	2010	2015	2020	2021	2022	2023
7.1 Ensure universal access to affordable, reliable and modern energy services.	7.1.1 Proportion of population with access to electricity	Proportion of population with access to electricity	National	%	64.4	83.2	85.3	87.0	89.0	88.9
			Urban	%	83.9	93.6	100.0	100.0	100.0	100.0
			Rural	%	39.7	56.9	71.7	72.9	74.0	76.2
		Household with access to electricity	National	%	64.2	75.7	82.8	86.3	86.8	87.5
			Urban	%	83.8	90.7	93.0	95.2	95.8	96.6
			Rural	%	39.5	56.6	71.5	72.6	73.6	74.5
	7.1.2 Proportion of population with primary reliance on clean fuels and technology	Proportion of population using Electricity as primary source for cooking	National	%	0.5	0.3	0.3	0.4	0.4	0.5
			Urban	%	0.8	0.4	0.4	0.5	0.5	0.6
			Rural	%	0.3	0.1	0.3	0.2	0.2	0.2
		Proportion of population using LPG as the primary source for cooking	National	%	18.2	23.9	25.3	36.9	40.2	44.1
			Urban	%	28.9	35.3	34.1	51.3	56.1	60.3
			Rural	%	4.8	6.8	12.8	14.8	16.5	18.7
7.2 Increase substantially the share of renewable energy in the global energy mix.	7.2.1 Renewable energy share in the total final energy consumption	National	%	0.5	0.5	0.4	0.4	0.4	0.4	
		National (excluding woodfuel)	%	0.1	0.1	0.1	0.1	0.1	0.1	
7.3. Double the global rate of improvement in energy efficiency.	Energy intensity measured in terms of total energy supply and GDP, PPP (constant 2017 international \$)		National	TOE/million US\$	73.7	72.5	71.0	66.2	67.0	68.6
	Energy intensity measured in terms of final energy consumption and GDP, PPP (constant 2017 international \$)		National	TOE/million US\$	57.7	54.2	51.0	49.3	47.9	47.3

¹Includes woodfuel

²Excludes woodfuel (electricity consumed from solar, biogas and hydro only)

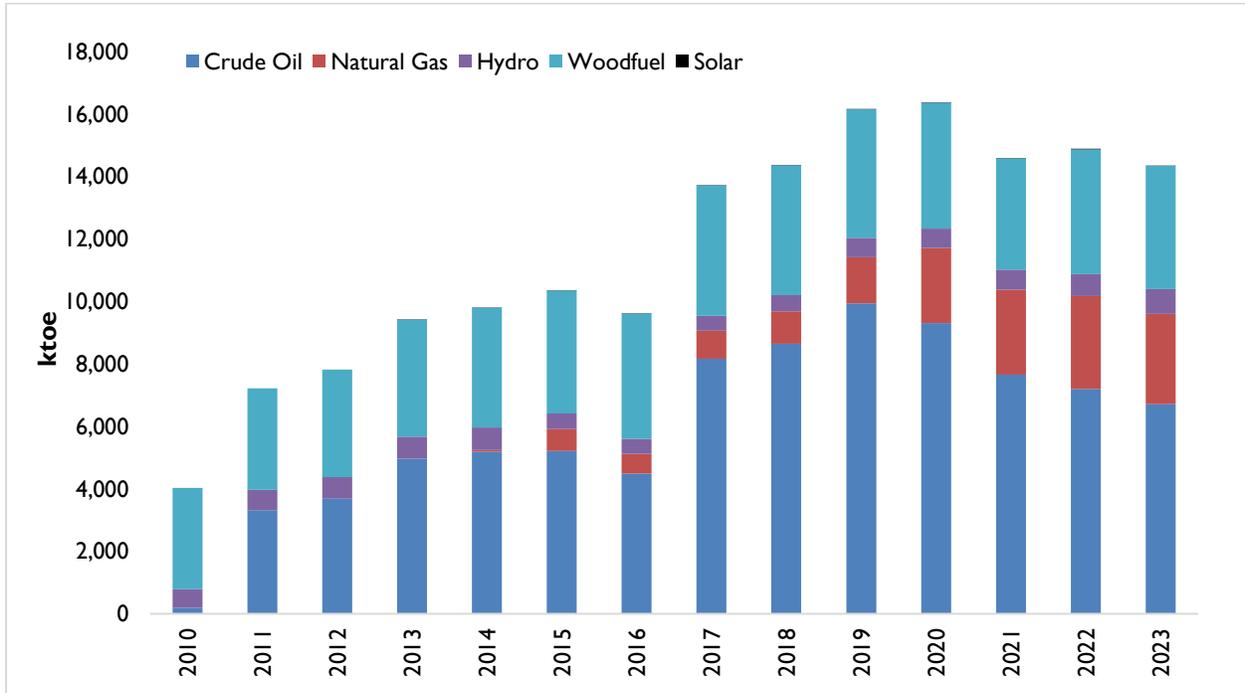
Sources: Ghana Statistical Service, Ministry of Energy & Energy Commission



ENERGY SUPPLY

PRODUCTION OF PRIMARY FUELS

Production of Primary Fuels, 2010 - 2023



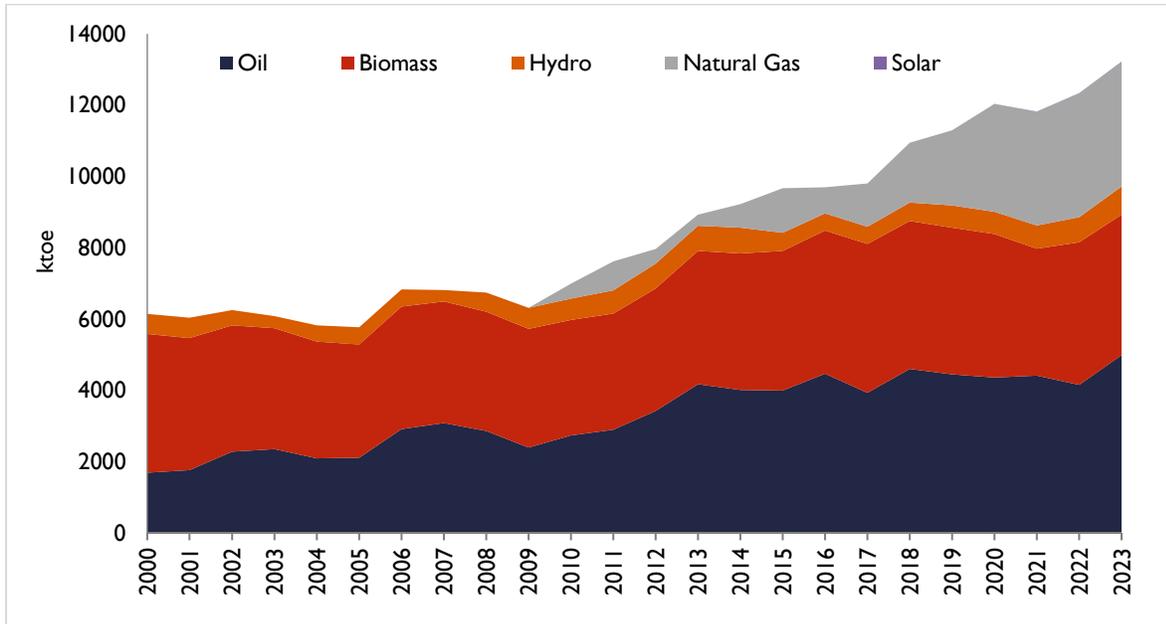
Trends in the Production of Primary Fuels (ktOE)

Fuels	2010	2015	2020	2021	2022	2023
Crude Oil	190	5,212	9,313	7,660	7,202	6,714
Natural Gas	0	703	2,398	2,717	2,970	2,895
Solar	0	0	5	11	14	13
Hydro	601	503	627	647	704	790
Biomass	3,237	3,925	4,029	3,562	3,999	3,944
Total	4,029	10,343	16,372	14,597	14,890	14,355

Production of primary fuels increased at an average annual growth rate of approximately 10.3%, from 4,029 ktOE in 2010 to 14,355 ktOE in 2023. This growth was largely driven by crude oil production, which increased at an average annual growth rate of about 31.6%, reaching 6,714 ktOE in 2023.

TOTAL ENERGY SUPPLY

Total Energy Supply by Fuel, 2000 - 2023



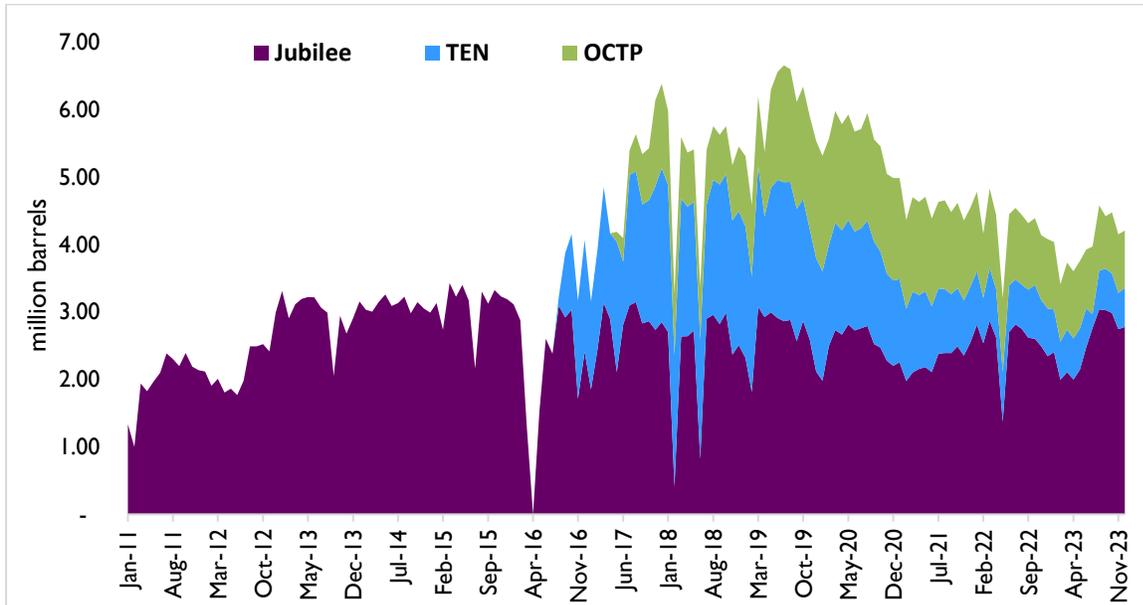
Total Energy Supply (ktoe)

Fuels	2000	2010	2015	2020	2021	2022	2023
Oil	1,688	2,735	3,988	4,355	4,414	4,152	4,984
Natural Gas	0	416	1,253	3,014	3,189	3,472	3,487
Hydro	568	601	503	627	647	704	790
Solar	0	0	0	5	11	14	13
Biomass	3,891	3,237	3,925	4,029	3,562	3,999	3,944
Total	6,146	6,990	9,669	12,030	11,822	12,342	13,218

The country's total energy supply in 2023 was 13,218 ktoe, with an average annual growth rate of about 3.4% from 2000 to 2023. While biomass was the largest energy source until 2013, oil has since become dominant, making up approximately 37.7% of the total energy supply in 2023.

CRUDE OIL PRODUCTION

Crude Oil Production, Jan 2011 – Dec 2023



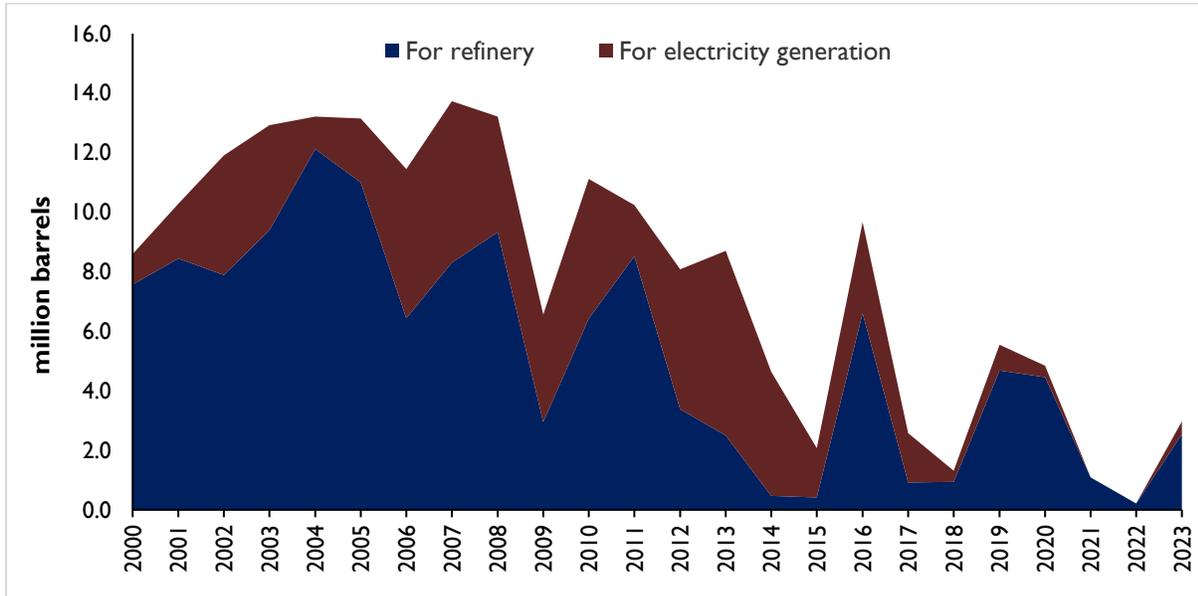
Crude Oil Production by Field (MMbbls)

Year	Saltpond	Jubilee	TEN	OCTP	Total
2011	0.1	23.8	-	-	23.8
2015	0.0	37.4	-	-	37.5
2020	-	30.4	17.8	18.7	66.9
2021	-	27.3	12.0	15.7	55.1
2022	-	30.5	8.6	12.6	51.8
2023	-	30.4	6.7	11.1	48.2

Ghana's crude oil production grew at an average annual rate of 6.1% from 2011 to 2023, peaking at 66.9 million barrels in 2020 before declining to 48.2 million in 2023. In 2023, the combined output from Ghana's three main offshore fields totalled 48.2 million barrels, reflecting a slight decrease compared to the previous year.

CRUDE OIL IMPORT

Crude Oil Import, 2000 - 2023



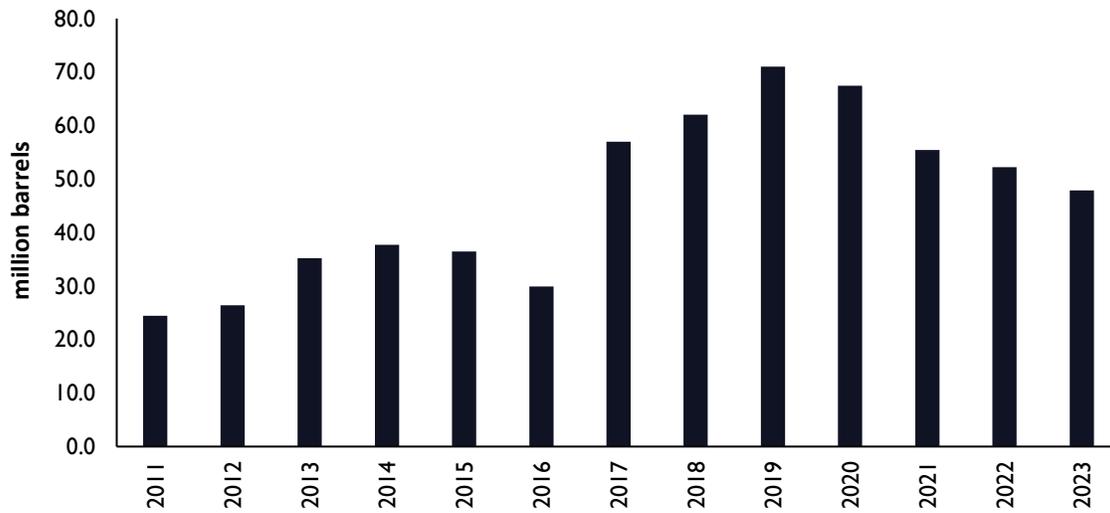
Crude Oil Import (MMbbl)

Use	2000	2010	2015	2020	2021	2022	2023
For refinery	7.9	6.7	0.4	4.7	1.1	0.2	2.7
For electricity	1.1	4.9	1.7	0.4	0.0	0.0	0.4
Total	9.0	11.6	2.2	5.1	1.1	0.2	3.1

Total crude oil import decreased from 9.0 ktoe in 2000 to 3.1 ktoe in 2023, at an average annual rate of 4.5%. The reduction is primarily due to reduced demand for both refinery and electricity.

CRUDE OIL EXPORT

Crude Oil Export, 2011 - 2023



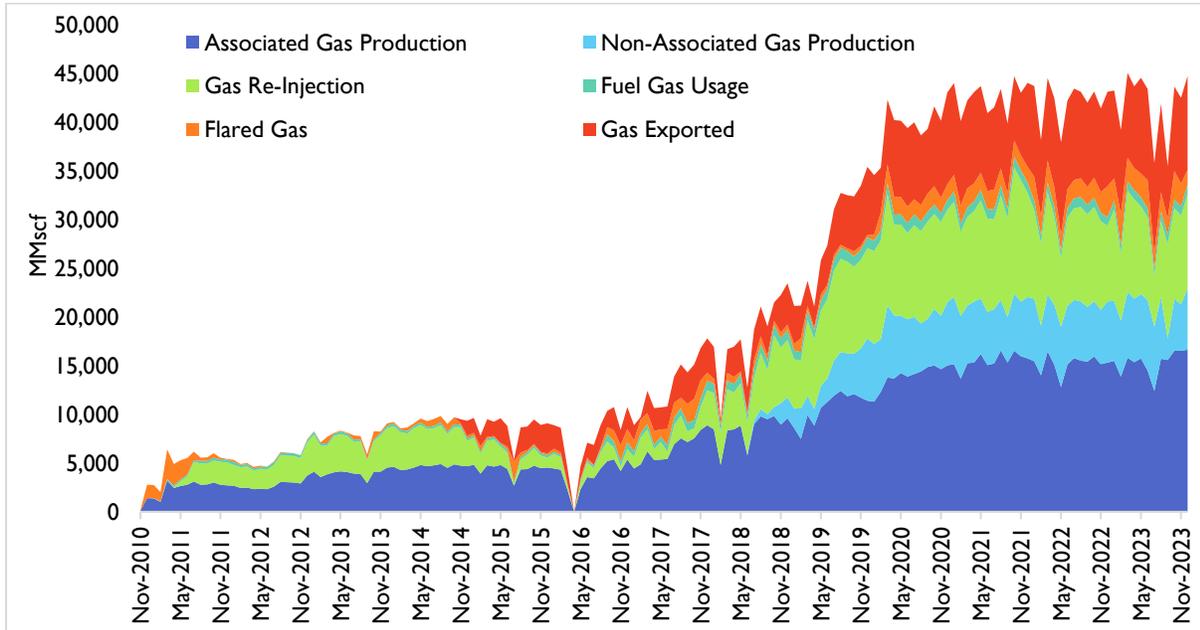
Crude Oil Export

Year	Export (Million barrels)	Total Merchandise Export (Million US\$)	Crude oil export as % of total merchandise export
2011	24.5	12,785.4	21.7
2015	36.5	10,356.7	18.6
2020	67.5	14,471.5	20.1
2021	55.4	14,727.5	26.8
2022	52.2	17,494.4	31.0
2023	47.9	16,657.7	23.0

The commencement of commercial crude oil production in 2011 led to a significant increase in crude oil exports. The export volume rose from 24.5 million in 2011 to a peak of 67.5 million in 2020, before decreasing to 47.87 million barrels in 2023. However, there was a decline of 8.2% in crude oil exports in 2023 compared to the previous year, 2022.

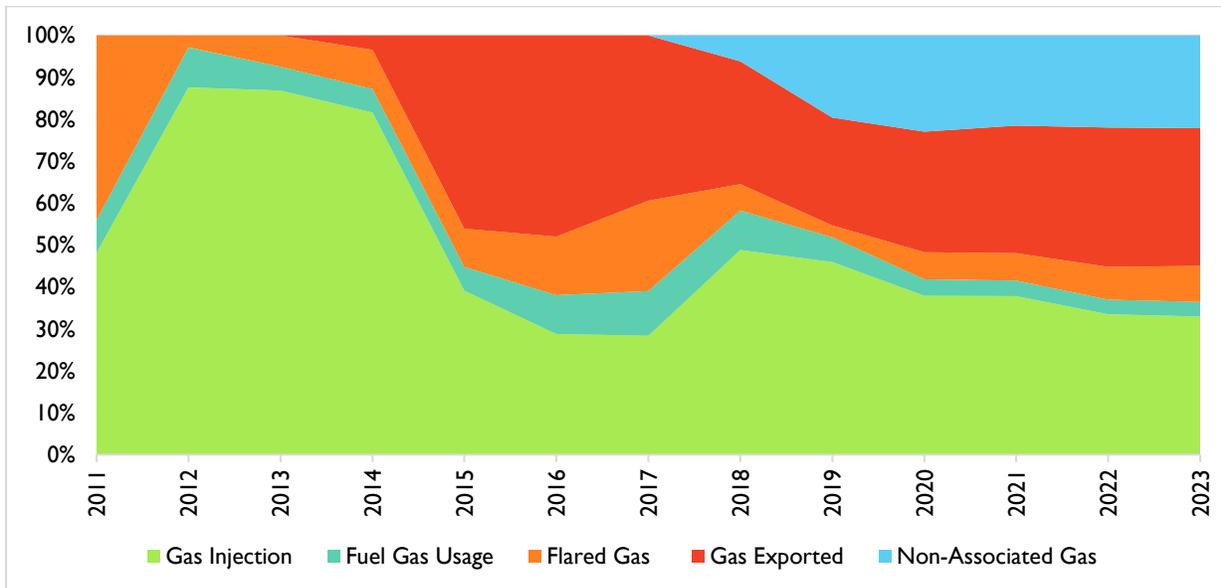
NATURAL GAS PRODUCTION

Natural Gas Extracted and Utilisation, Nov 2010 – Dec 2023



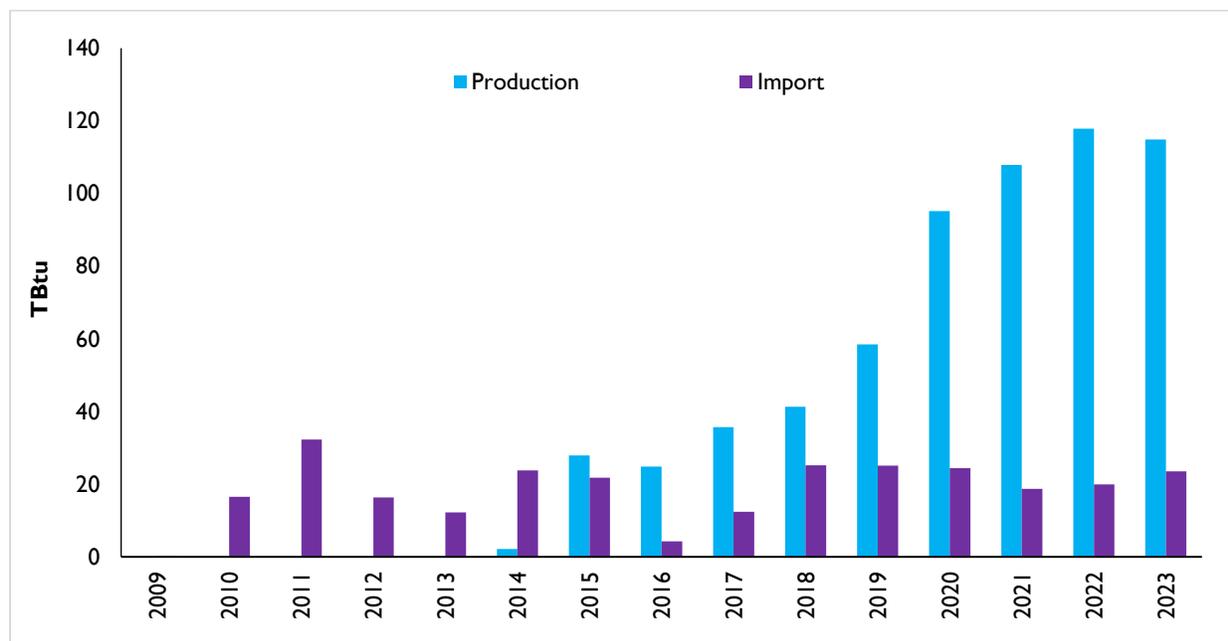
NB: All raw natural gas produced before November 2014 was used on the FPSO. It was injected, flared or used as fuel on the FPSO. Gas exported is the quantity transported through pipelines from the FPSO to the Gas processing plant.

Share in Annual Natural Gas Utilization



NATURAL GAS SUPPLY

Natural Gas Supply, 2009 - 2023



NB: Production includes natural gas production from GNGC and non-associated gas. Import is from Nigeria through the West Africa Gas pipelines.

Natural Gas Supply by Source

	Share (%) of total Supply					
	2010	2015	2020	2021	2022	2023
Production	0.0	56.1	79.6	85.2	85.5	83.0
Import	100.0	43.9	20.4	14.8	14.5	17.0

Natural gas supply in Ghana has shifted significantly from reliance on imports via the West African Gas Pipeline (WAGP) from Nigeria in 2010 to primarily relying on domestically produced gas from indigenous sources. As of 2023, domestic production accounted for 83.0% of the supply, with imports taking the remaining 17.0%. This shift underscores Ghana's substantial increase in domestic natural gas production over the years.

INSTALLED ELECTRICITY GENERATION CAPACITY

Installed Generation Capacities as of the end of December 2023 (MW)

Plant	Installed Capacity	Dependable Capacity
Hydro Power Plants		
Akosombo	1,020	900
Kpong	160	140
Bui	404	371
Tsatsadu	0.045	0.045
Sub-Total	1,584	1,411
Thermal Power Plants		
Takoradi Power Company (TAPCO)	330	315
Takoradi International Company (TICO)	340	330
Tema Thermal 1 Power Plant (TT1PP)	110	100
Tema Thermal 2 Power Plant (TT2PP)	80	70
Takoradi T3	132	120
Cenit Energy Ltd	110	100
Kpone Thermal Power Plant	220	200
Ameri Plant	250	230
Sunon Asogli Power (Ghana) Ltd	560	530
Karpowership	470	450
Amandi	210	201
AKSA	370	330
Cenpower	360	340
Early Power / Bridge ¹	200	190
Genser ²	181	158
Sub-Total	3,923	3,664
Other Renewables		
On-grid		
VRA Solar (Navrongo) ²	2.5	2.0
VRA Solar (Lawra) ²	6.5	5.2
VRA Solar (Kaleo) ²	28	22
BXC Solar ²	20	16
Meinergy ²	20	16
Bui Solar ²	55	44
Safisana Biogas ²	0.1	0.1
Sub-Total	132	106
Total	5,639	5,180

¹Currently undergoing testing and preparations before its commercial operation date

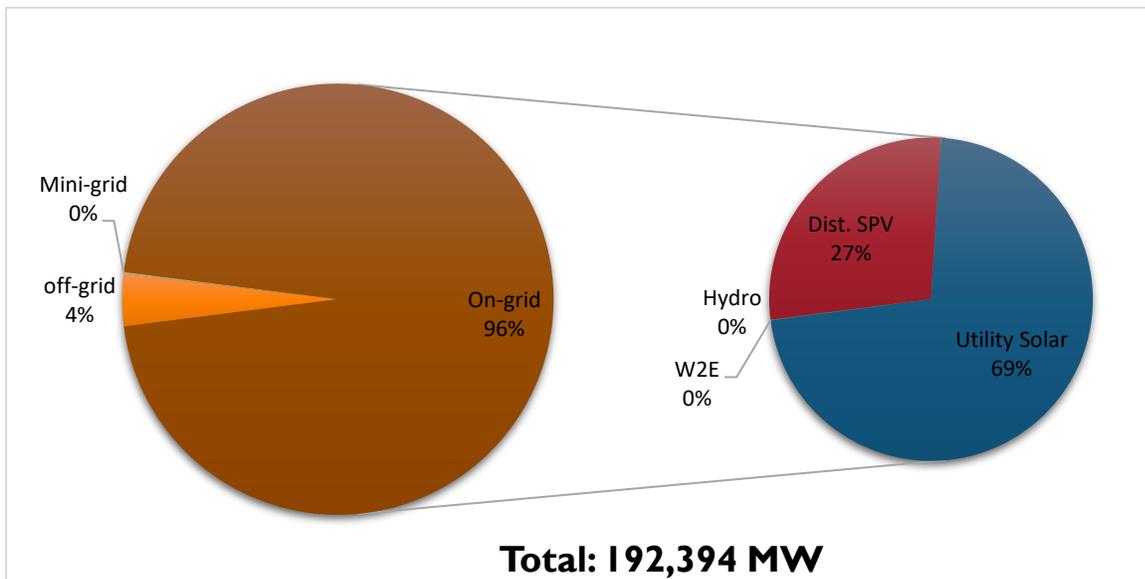
²Connected at the sub-transmission level (embedded generation)

Renewable Energy Installed Generation Capacity (KW)

Year	Off-grid		On-grid					Mini-Grid		Installed
	Solar	Wind	Dist. SPV	Utility Solar	W2E	Hydro	Wind	Solar	Wind	
2013	-	-	495	2,500	-	-	-	-	-	2,995
2014	1,350	-	443	-	-	-	-	-	-	1,793
2015	4,003	20	700	20,000	100	-	-	256	11	25,090
2016	1,238	-	2,626	-	-	-	-	-	-	3,865
2017	678	-	4,266	-	-	-	-	58.3	-	5,003
2018	155	-	9,441	20,000	-	-	-	-	-	29,596
2019	-	-	9,924	-	-	45	-	-	-	9,969
2020	-	-	9,626	6,540	-	-	-	-	-	16,166
2021	-	-	7,367	63,000	-	-	-	-	-	70,367
2022*	-	-	4,392	1,000	-	-	-	-	-	5,392
2023*	-	-	2,410	19,750	-	-	-	-	-	22,160
Total	7,424	20	51,689	132,790	100	45	-	314	11	192,394

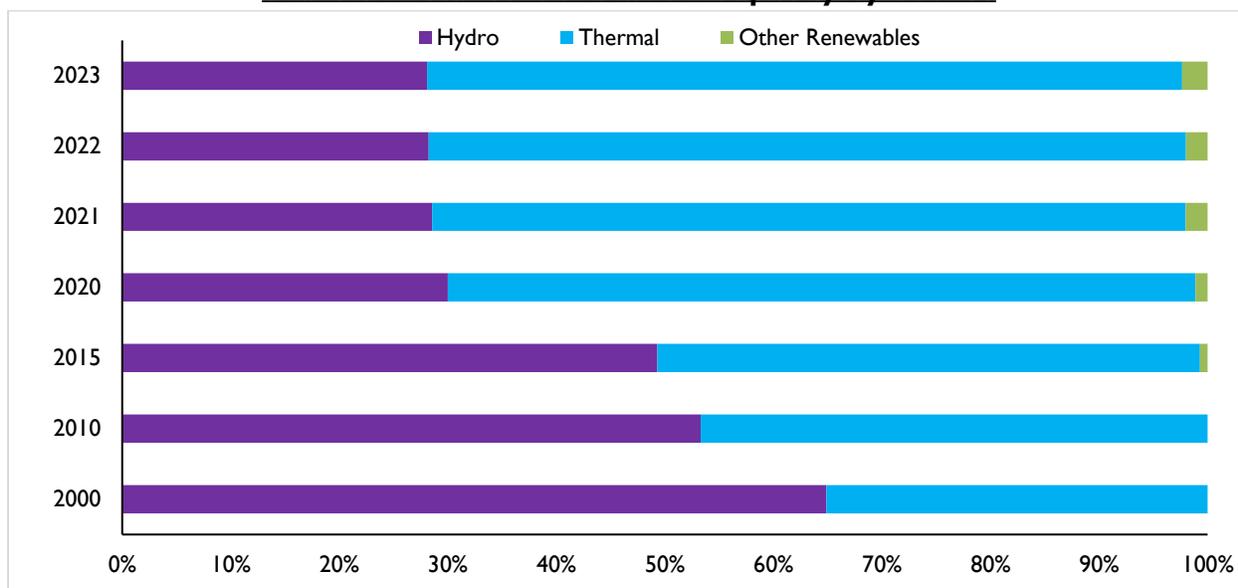
Note: This excludes large hydro (Akosombo, Kpong and Bui); *Provisional

Renewable Energy Installed Generation Capacity (KW)



Installed Electricity Generation Capacity

Share of Installed Generation Capacity by Source



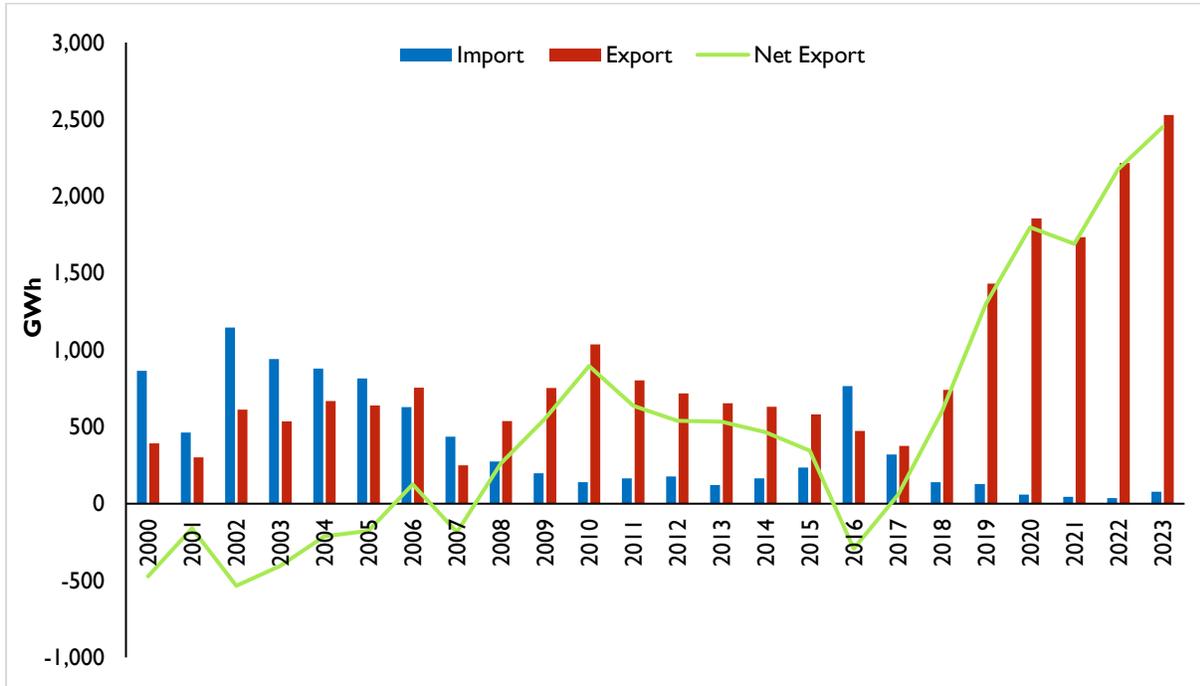
Share of Installed Electricity Generation Capacity

Generation Source	Shares (%)						
	2000	2010	2015	2020	2021	2022	2023
Hydro	64.9	53.3	49.3	30.0	28.6	28.2	28.1
Thermal	35.1	46.7	50.0	68.9	69.4	69.8	69.6
Other Renewables	-	-	0.7	1.1	2.0	2.0	2.4
Total	100						

Total installed grid electricity generation capacity, excluding off-grid and mini-grid renewable facilities, has increased by 5.5% from 1,652 MW in 2000 reaching 5,639 MW in 2023. As of 2023, hydro plants contributed 28.1% of the total installed capacity, with thermal plants and renewable sources contributing 69.6% and 2.4% respectively.

ELECTRICITY IMPORT AND EXPORT

Electricity Import and Export, 2000 - 2023



NB: negative net export means net import

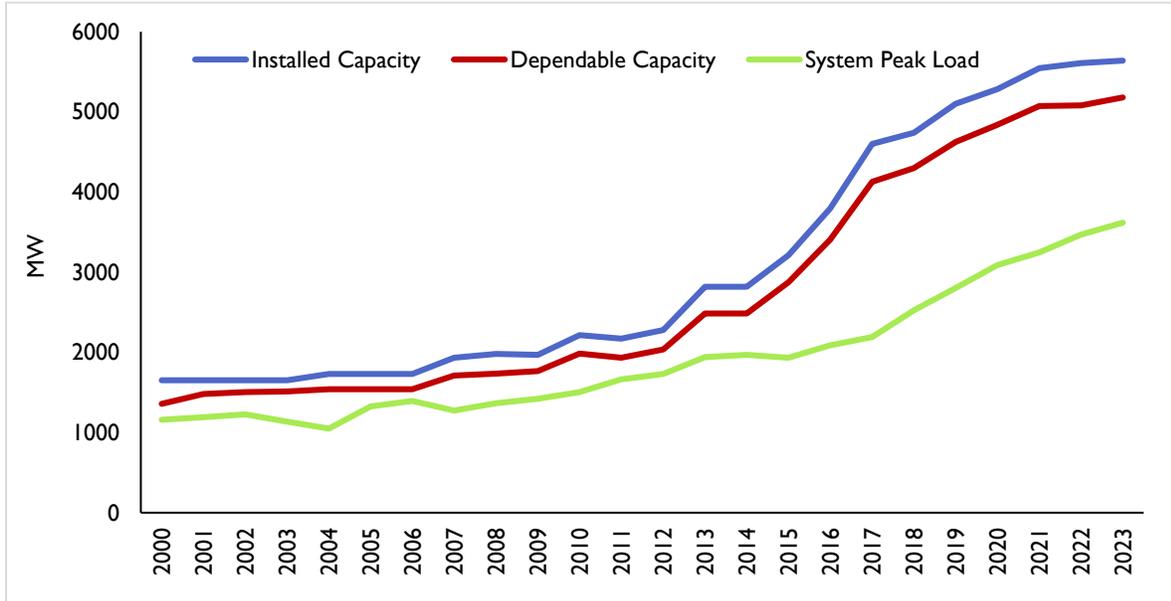
Electricity Import and Export (GWh)

	2000	2010	2015	2020	2021	2022	2023
Import	864	141	236	58	44	37.37	79
Export	392	1,036	581	1,855	1,734	2,215	2,528
Net Export	-472	896	346	1,797	1,690	2,177	2,449

Electricity imports decreased significantly from 864 GWh in 2000 to 37.4 GWh in 2022, with a slight increase to 79 GWh in 2023. In contrast, electricity exports showed an upward trend, rising from 392 GWh in 2000 to 2,528 GWh in 2023. As a result, net exports increased steadily over the years, reaching 2,449 GWh in 2023.

GENERATION CAPACITY AND PEAK LOAD

Installed Capacity, Dependable Capacity and Peak Load, 2000 - 2023



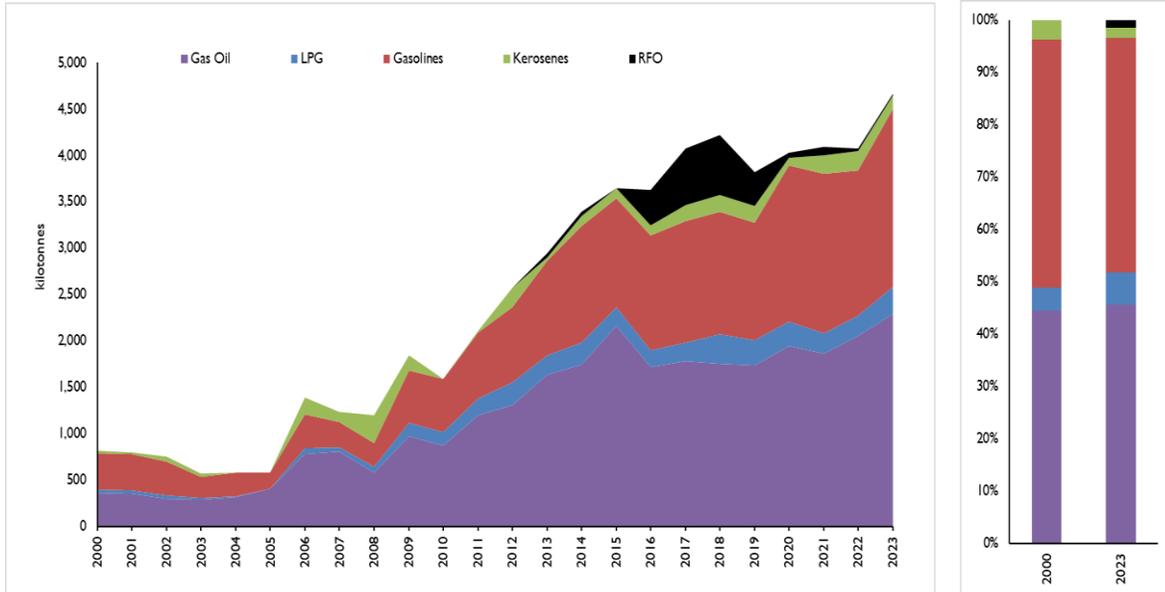
Generation Capacity and Peak Load (MW)

	2000	2010	2015	2020	2021	2022	2023
Installed Capacity	1,652	2,215	3,213	5,282	5,545	5,610	5,639
Dependable Capacity	1,358	1,985	2,873	4,841	5,073	5,081	5,180
Peak Load	1,161	1,506	1,933	3,090	3,246	3,469	3,618

Installed capacity grew from 1,652 MW to 5,639 MW, while dependable capacity increased from 1,358 MW to 5,180 MW over the same period. The System Peak (Ghana Load at Peak + VALCO load + export load), tripled over this timeframe. In 2023, the System Peak recorded was 3,618 MW, marking a 4.3% increase compared to 2022.

PETROLEUM PRODUCT IMPORT

Trend in Petroleum Product Import, 2000 - 2023



Kerosenes = ATK + DPK + Kerosene

Fuel Oils = RFO + HFO

Petroleum Product Import (kilotonnes)

Fuel	2000	2010	2015	2020	2021	2022	2023
LPG	35	148	198	262	221	221	297
Gasolines	387	570	1,182	1,682	1,717	1,564	1,917
Kerosenes ¹	30	0	109	80	203	209	143
Gas Oil	363	872	2,161	1,947	1,864	2,055	2,288
Fuel Oil ²	-	0	0	63	85	26	22
Total	816	1,590	3,650	4,033	4,090	4,075	4,667

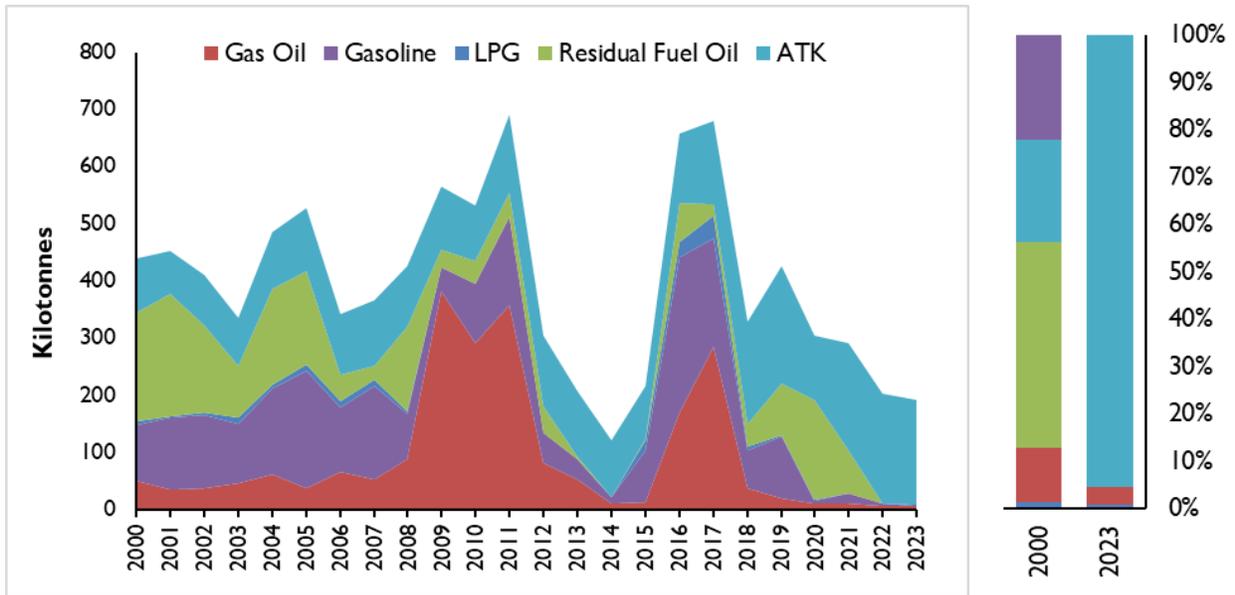
Imports of gasoline and gasoil saw average annual growth rates of 7.2% and 8.3%, respectively, from 2000 to 2023. Conversely, kerosenes, encompassing ATK, DPK, and kerosene, decreased by approximately 46.2% in 2023 compared to 2022. Meanwhile, fuel oil imports declined by around 70% in 2022 and experienced further decreases in 2023.

¹ Kerosenes include ATK, DPK and Kerosene

² Fuel Oils include RFO and HFO

PETROLEUM PRODUCT EXPORT

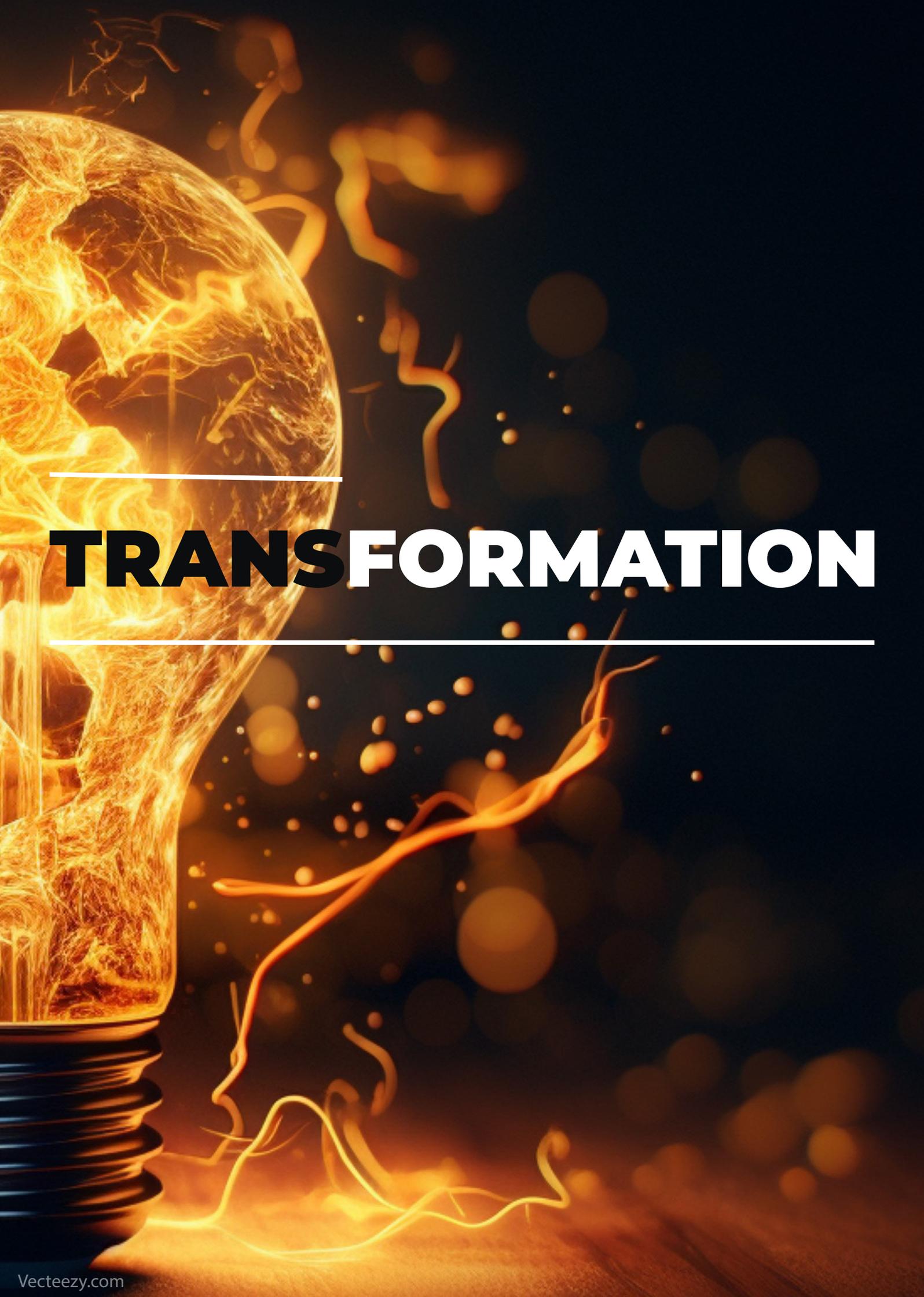
Petroleum Product Export, 2000 - 2023



Petroleum Product Export (kilotonnes)

	2000	2010	2015	2020	2021	2022	2023
LPG	6	-	18	3	0.04	0.4	2
Gas Oil	51	291	13	10	10	7	7
Residual Fuel Oil	191	41	3	173	75	-	-
ATK	95	97	92	113	188	194	183
Gasoline	97	104	90	5	18	3	-
Total	440	532	215	305	292	204	192

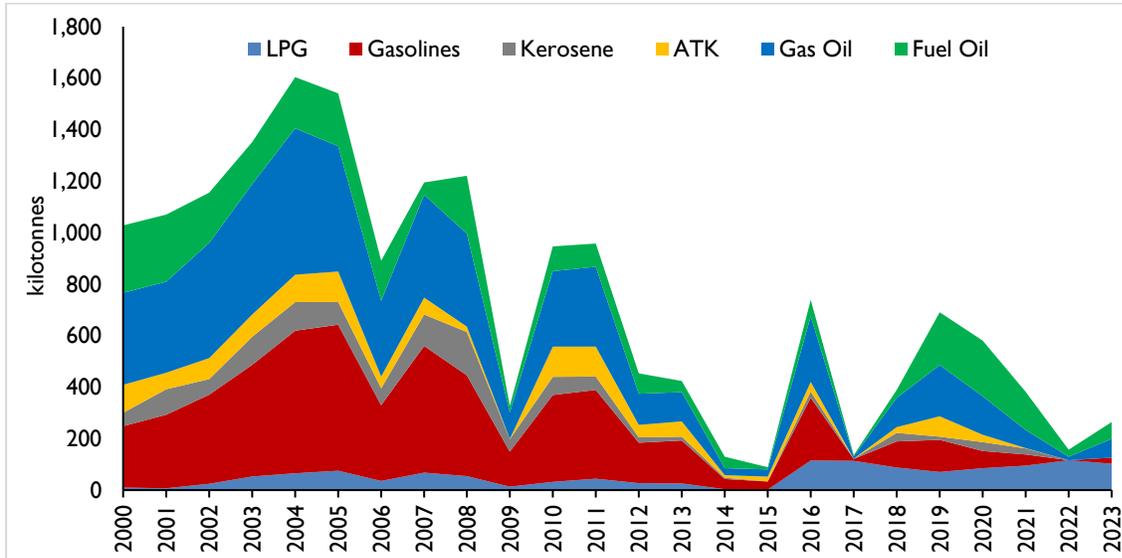
LPG exports decreased at an average annual rate of 4.7%, from 6 kt in 2000 to 2 kt in 2023. ATK exports, including volumes transferred to aircraft engaged in international aviation bunkering, increased from 95 kt in 2000 to 183 kt in 2023, with an average annual growth rate of 2.9%. However, ATK exports in 2023 saw a 5.7% reduction compared to the previous year. In recent years, especially from 2020 to 2023, there is a general decline in exports, particularly for Residual Fuel Oil and Gasoline, which show minimal or no exports.



TRANSFORMATION

REFINERY PRODUCTION

Refinery Production by Product (2000-2023)



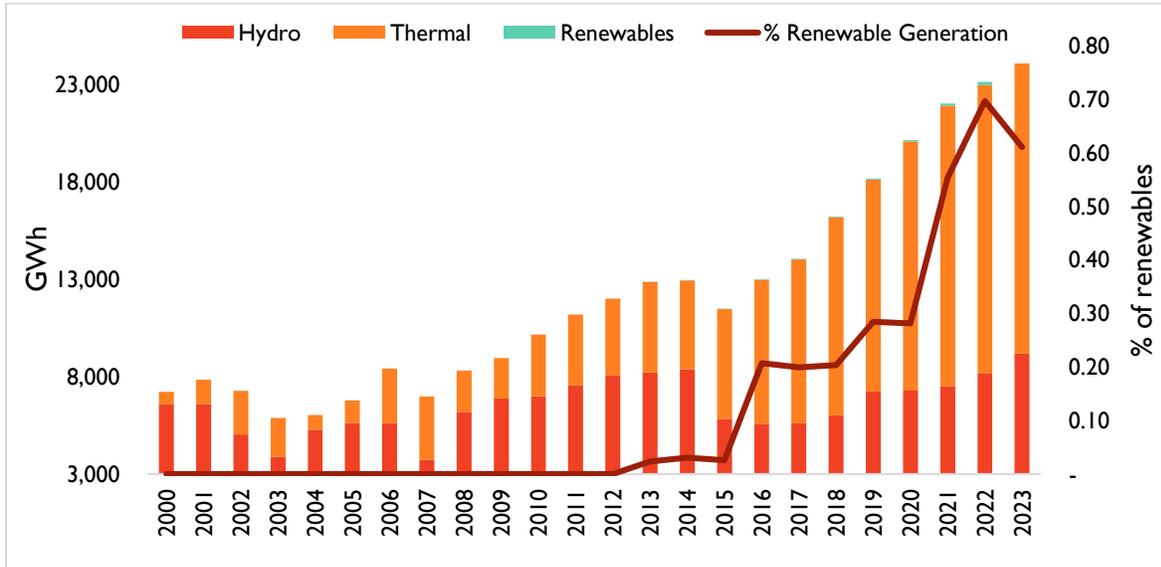
Refinery Production by Product (kilotonnes)

Fuel	2000	2010	2015	2020	2021	2022	2023
LPG	10	32	2	85	95	116	103
Gasolines	239	338	32	66	43	-	23
Kerosene	52	71	0.2	35	24	-	-
ATK	108	117	18	28	1	-	-
Gas Oil	358	293	28	150	71	14	73
RFO	262	97	9	216	147	27	65
Total	1,028	946	89	580	381	157	264

Petroleum product production experienced a significant decline, dropping from 1,028 kt in 2000 to 264 kt in 2023, at an average annual rate of 5.7%. However, LPG production increased substantially in recent years, with the highest production of 116 kt recorded in 2022. In 2023, there was a notable increase in the production of gasoil and RFO.

ELECTRICITY PRODUCTION

Electricity Production, 2000 - 2023



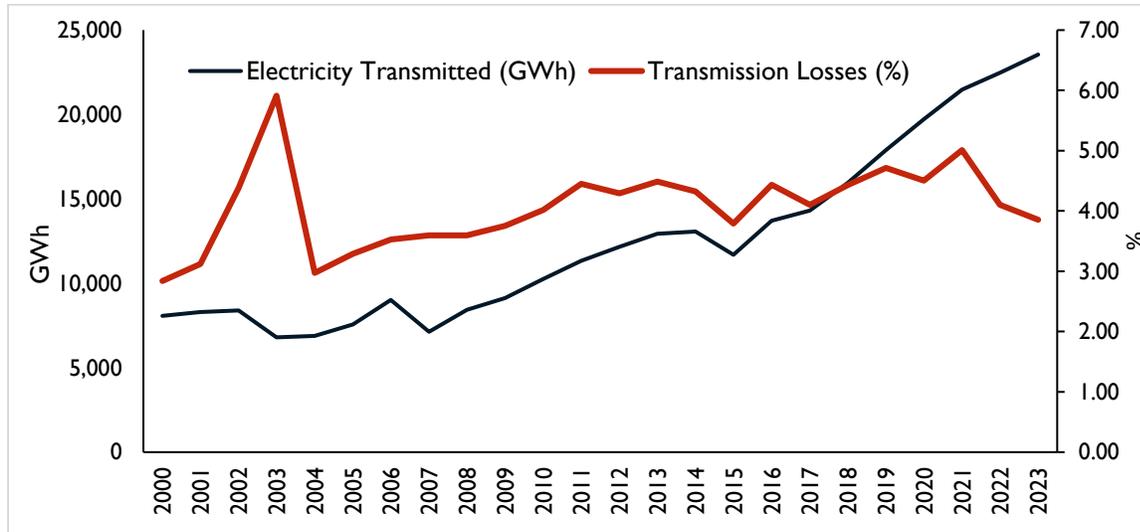
Share (%) of Electricity Production

	2000	2010	2015	2020	2021	2022	2023
Hydro	92	69	51	36	34	35	38
Thermal	8	31	49	64	65	64	62
Renewables	-	-	0.03	0.3	0.6	0.7	0.6
Total	100						

The total electricity generation experienced a slightly more than threefold increase, rising from 7,224 GWh in 2000 to 24,264 GWh in 2023, with an annual average growth rate of 5.4%. In 2023, hydropower and thermal plants generated 9,187 GWh (38%) and 14,930 GWh (62%) of the total electricity respectively. The remaining 148 GWh, representing 0.61%, came from other renewables operating at the sub-transmission level.

ELECTRICITY TRANSMISSION

Electricity Transmission and Losses, 2000 - 2023



Electricity Transmitted and Transmission Losses

	2000	2010	2015	2020	2021	2022	2023
Electricity Transmitted (GWh)	8,067	10,267	11,692	19,717	21,466	22,478	23,551
Transmission Losses (GWh)	229	413	443	888	1,076	922	908
Transmission Losses (%)	2.84	4.02	3.79	4.50	5.01	4.10	3.86

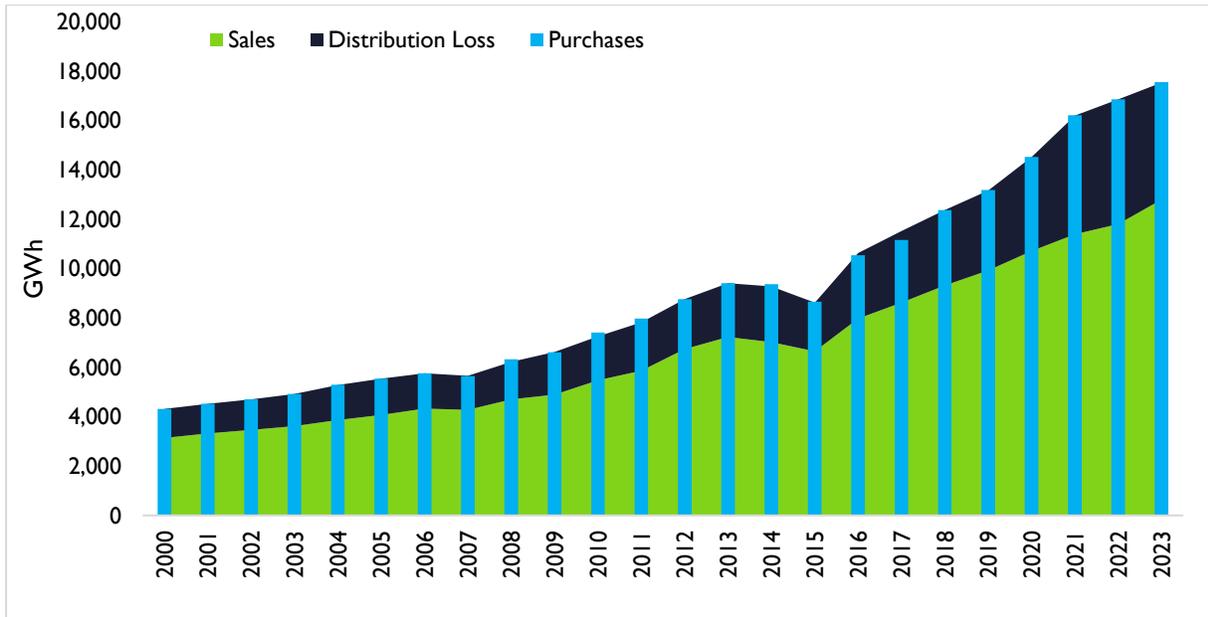
The total electricity transmitted in 2023 was 23,551 GWh, representing a 4.8% increase over the electricity transmitted in 2022. This was made up of 9,187 GWh (39%) from hydro generation, 14,199 GWh (60.3%) from thermal generation³, 87 GWh (0.37%) from Solar (directly connected to the NITs) and 78.8 GWh (0.3%) import.

The total transmission loss recorded in 2023 was about 908 GWh which is 3.86% of the total energy transmitted in 2023 (23,551 GWh).

³ Excluding Genser (distributed generation)

ELECTRICITY DISTRIBUTION

Electricity Purchases and Sales by Distribution Utilities, 2000 - 2023



Sales and Distribution Losses

Year	Purchases (GWh)	Sales (GWh)	Distribution Losses ¹	
			GWh	%
2000	4,319	3,142	1,176	27.2
2010	7,406	5,483	1,775	24.0
2015	8,659	6,646	1,980	22.9
2020	14,524	10,717	3,804	26.2
2021	16,219	11,394	4,809	29.6
2022	16,863	11,808	5,055	30.0
2023	17,559	12,805	4,735	27.0

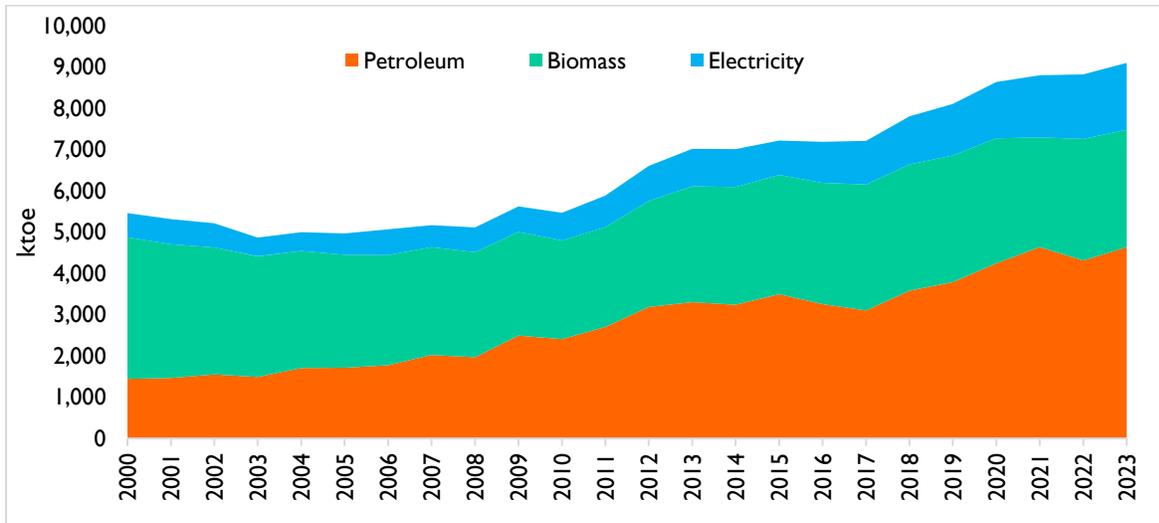
¹Distribution losses is made up of both technical and commercial losses

FINAL ENERGY CONSUMPTION

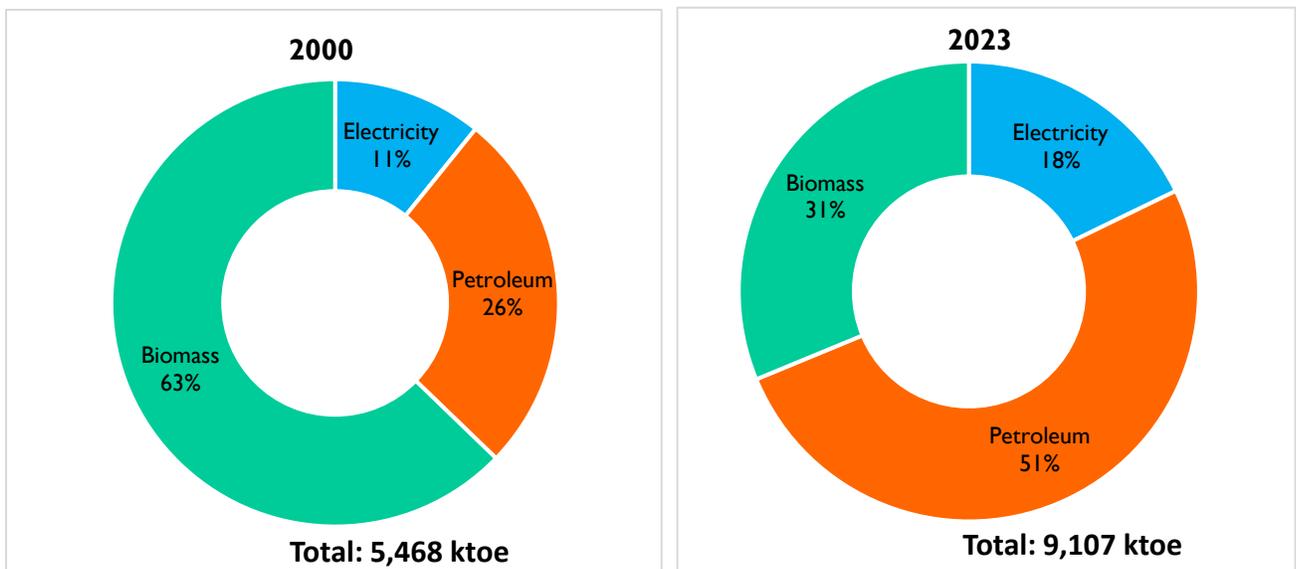


FINAL ENERGY CONSUMPTION

Final Energy Consumption by Fuel Type (2000-2023)



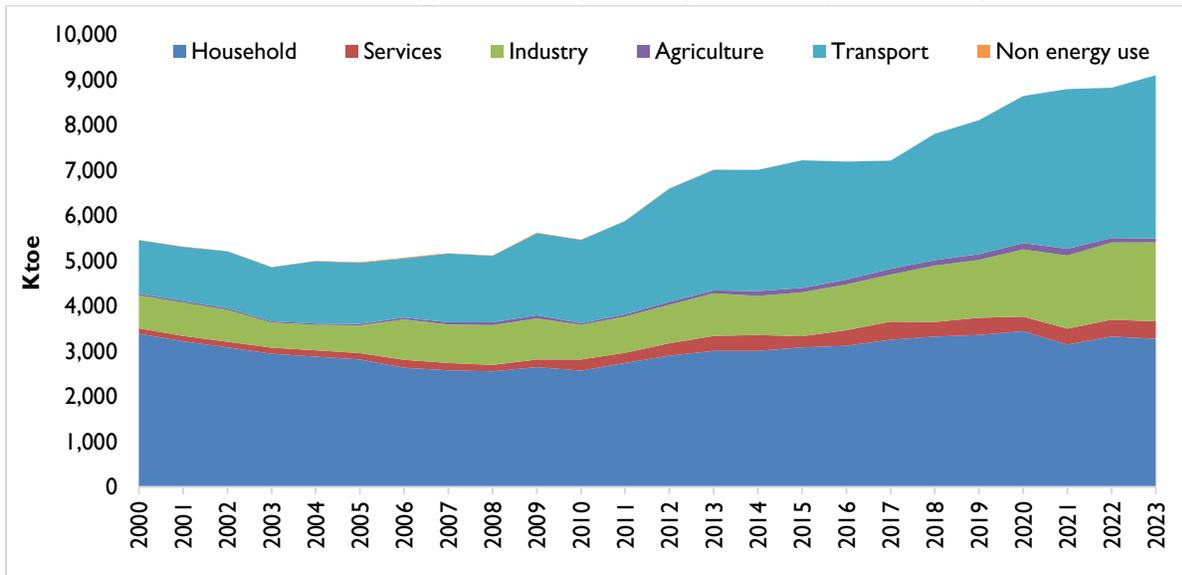
Comparison of 2000 and 2023 Final Energy Consumption by Fuel Type



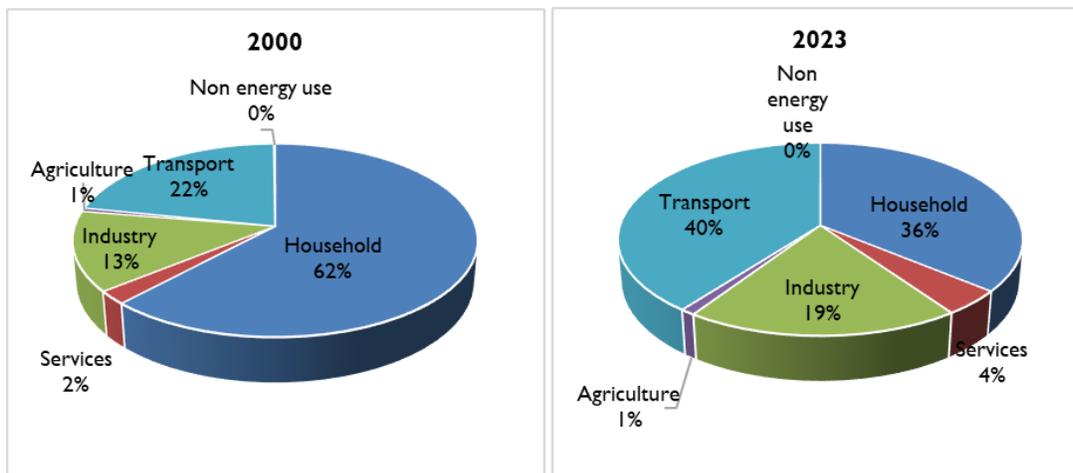
Final energy consumption grew at an average annual rate of 2.2%, increasing from 5,468 ktoe in 2000 to 9,107 ktoe in 2023. Meanwhile, the proportion of biomass in total final energy consumption decreased from 63% in 2000 to 31% in 2023.

Final Energy Consumption by Sector

Final Energy Consumption by Sector (2000-2023)



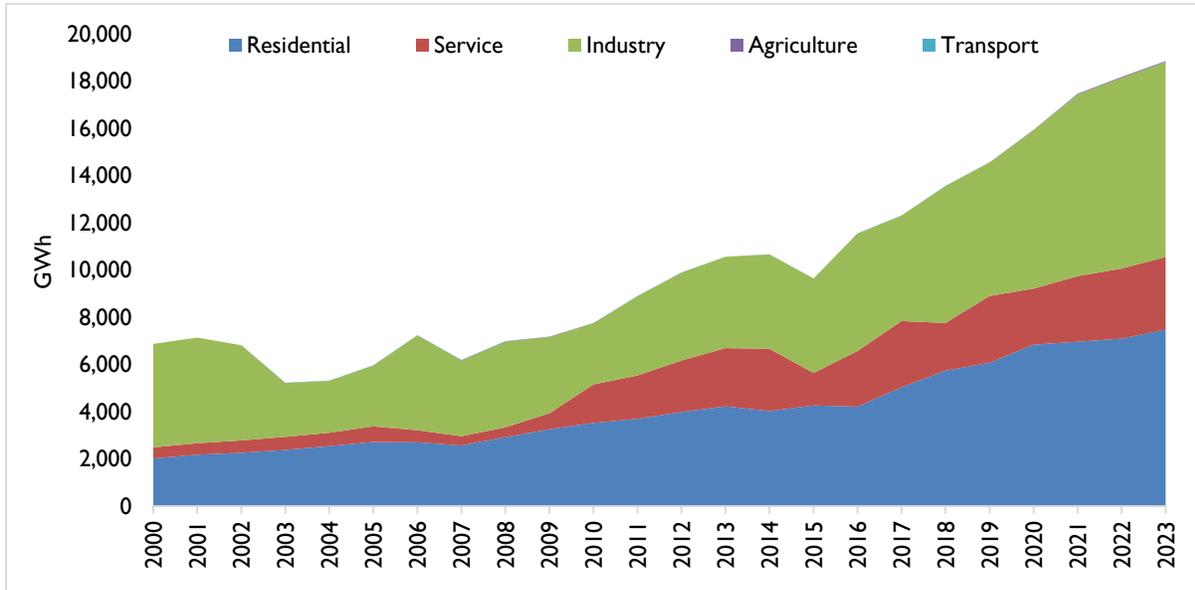
Comparison of 2000 and 2023 Final Energy Consumption by Sector



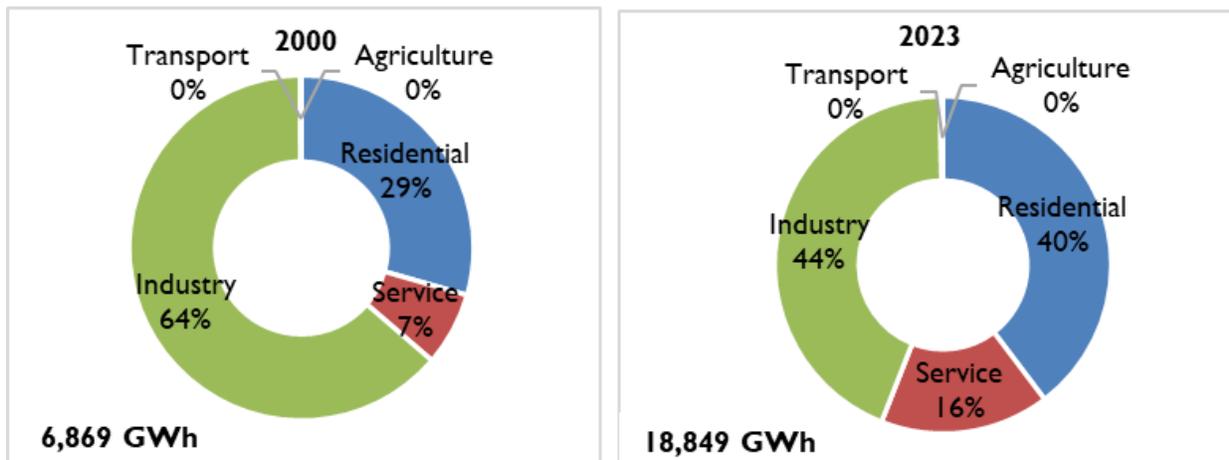
Final energy consumption grew at an average annual rate of 2.2%, rising from 5,468 ktoe in 2000 to 9,107 ktoe in 2023. In 2000, the household sector was the dominant energy consumer, accounting for over 60% of Total Final Consumption (TFC). However, this dominance gradually declined as the transport sector's energy consumption increased, surpassing that of households around 2021. The services sector also saw significant growth, with its energy consumption more than doubling, rising from just over 2% of TFC in 2000 to nearly 4.3% by 2023. In contrast, the agricultural sector's energy use has remained relatively stagnant, showing only minimal increases over the period.

Electricity Consumption by Sector

Electricity Consumption by Sector (2000-2023)



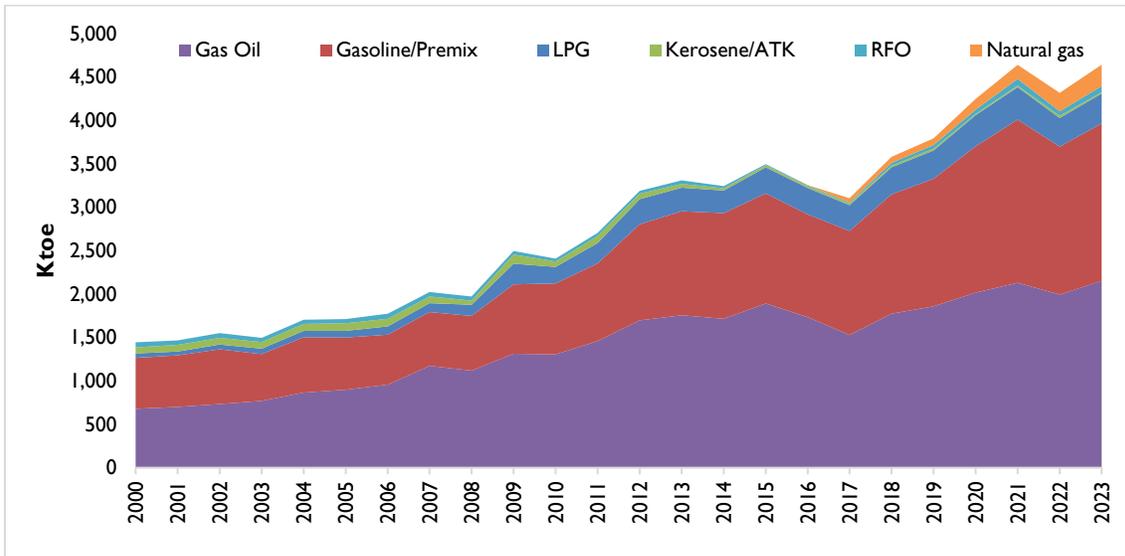
Comparison of 2000 and 2023 Electricity Consumption by Sector



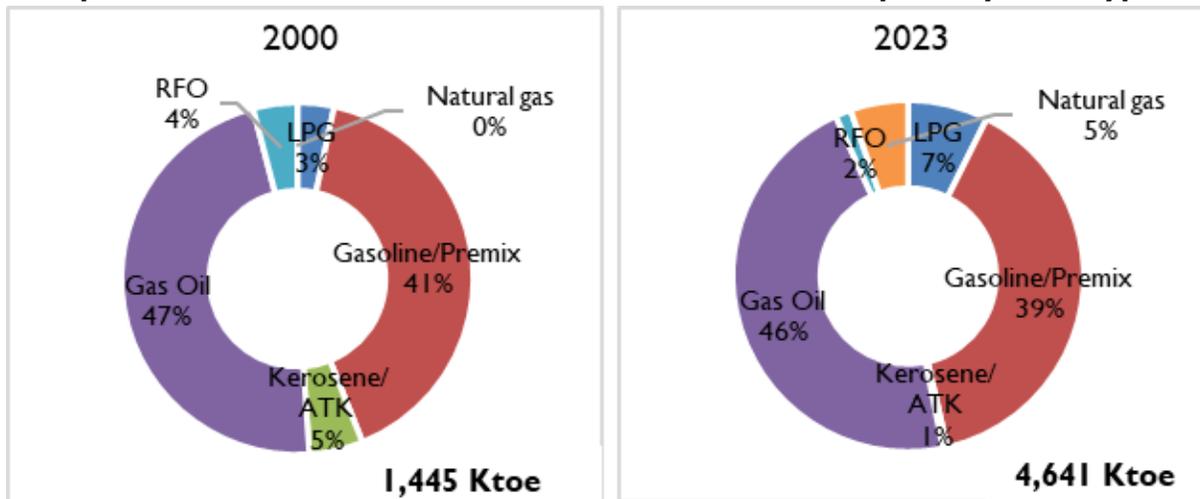
The residential sector's share of total electricity consumption grew significantly, rising from 29% in 2000 to 40% in 2023. Similarly, the service sector's share increased from 7% to 16% over the same period. In contrast, the industrial sector's share declined from 64% to 44%. Overall, total electricity consumption more than doubled, increasing from 6,869 GWh in 2000 to 18,849 GWh in 2023.

Petroleum Product Consumption by Fuel Type

Petroleum Product Consumption by Fuel Type (2000 to 2023)



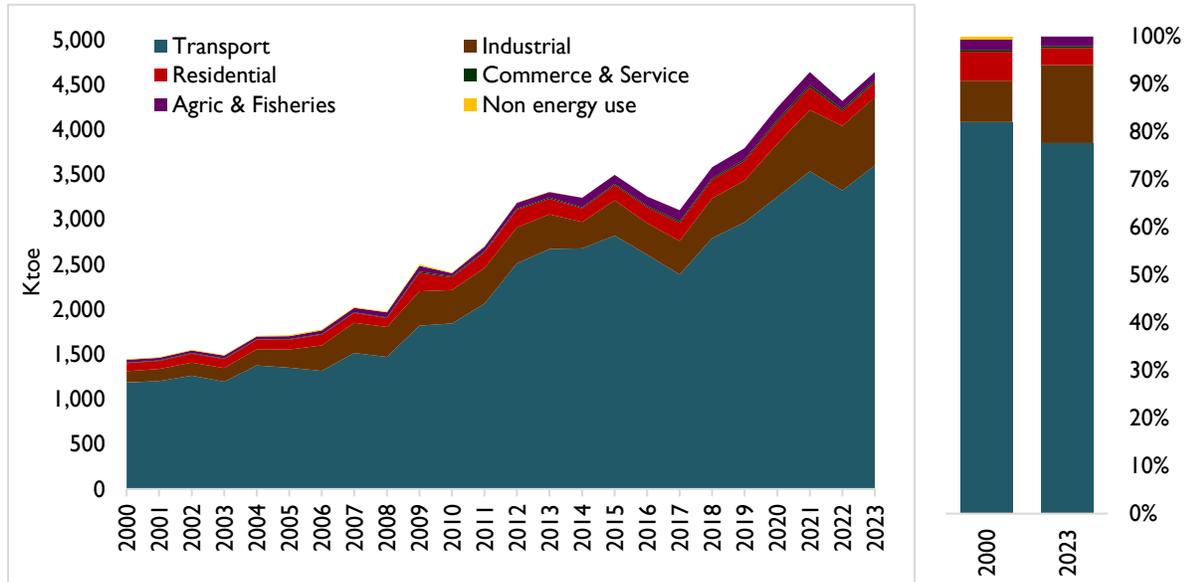
Comparison of 2000 and 2023 Petroleum Product Consumption by Fuel Type



Total petroleum products consumption grew at an average annual rate of 5.2%, increasing from 1,445 ktoe in 2000 to 4,641 ktoe in 2023. During this period, gas oil accounted for an average of approximately 51.1% of final petroleum product consumption, while the share of LPG rose from 3.4% in 2000 to 7.4% in 2023.

Petroleum Product Consumption by Sector

Petroleum Product Consumption by Sector (2000 to 2023)



Petroleum Product Consumption by Sector (Ktoe)

	2000	2010	2015	2020	2021	2022	2023
Residential	88	144	172	243	252	165	167
Industry	125	372	392	592	685	720	759
Service	5	8	13	23	25	21	22
Agriculture	33	35	100	137	144	89	91
Transport	1,186	1,842	2,819	3,252	3,534	3,322	3,603
Non-Energy Use	7	7	-	-	-	-	-
Total	1,445	2,408	3,497	4,248	4,640	4,317	4,641

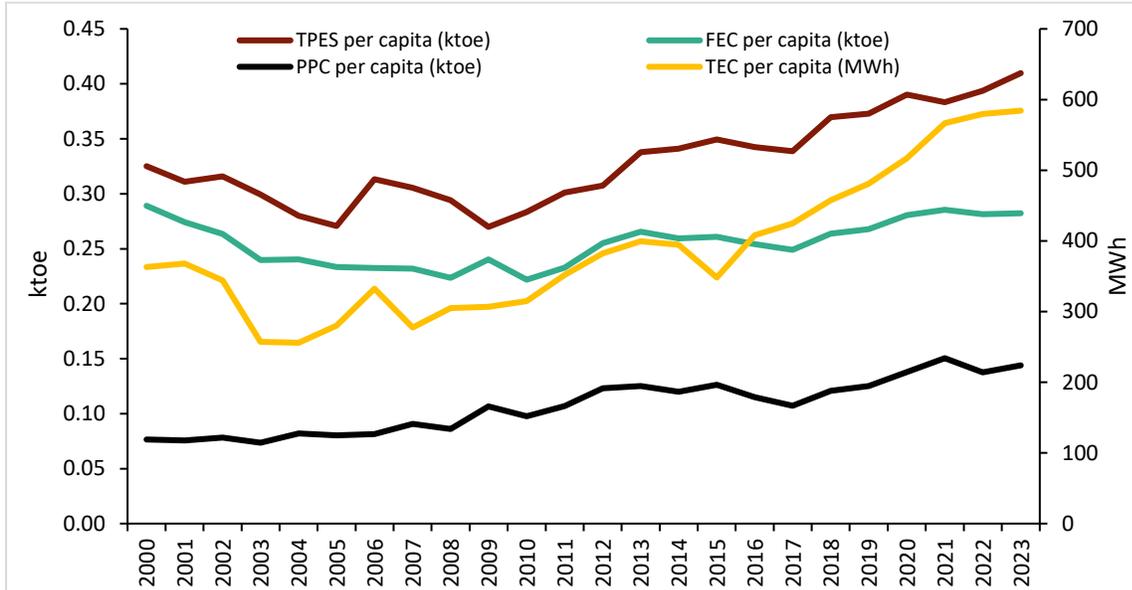
The transport sector experienced the highest growth in petroleum product consumption, tripling from 1,186 ktoe in 2000 to 3,603 ktoe in 2023. Similarly, the industrial sector experienced significant growth, with consumption increasing by fivefold to reach 759 ktoe within the same period. In contrast, both the residential, agricultural and service sectors have exhibited moderate increases over the years.

ENERGY INDICATOR

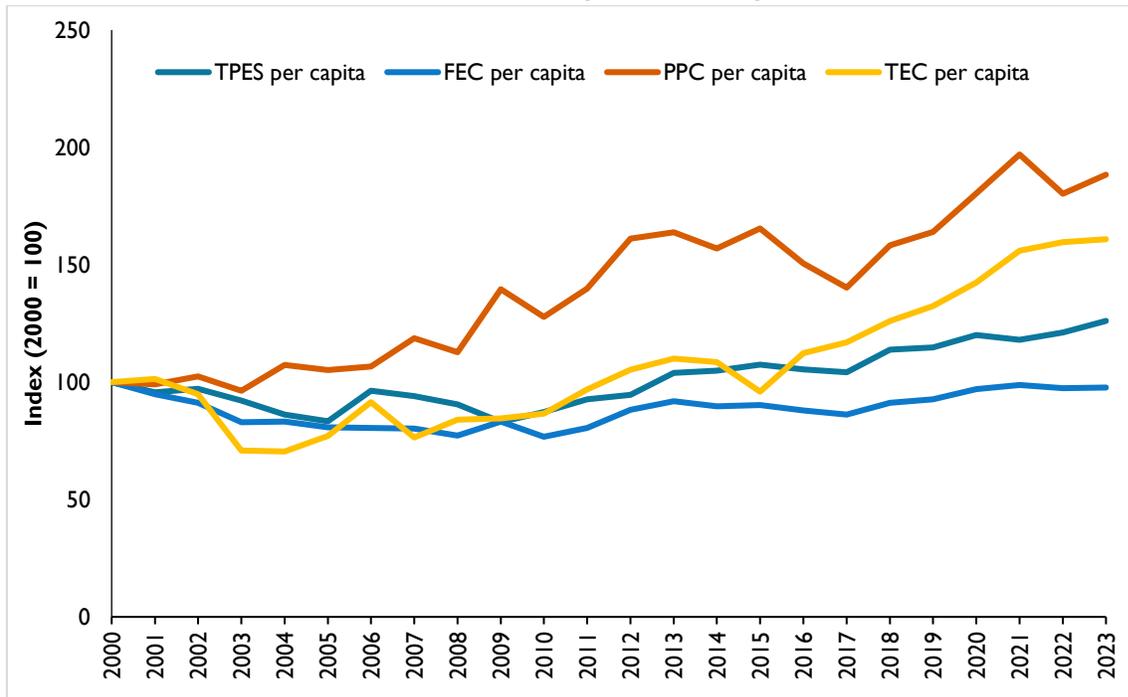


ENERGY SUPPLY AND CONSUMPTION PER CAPITA

Energy Supply and Consumption per capita, 2000 - 2023

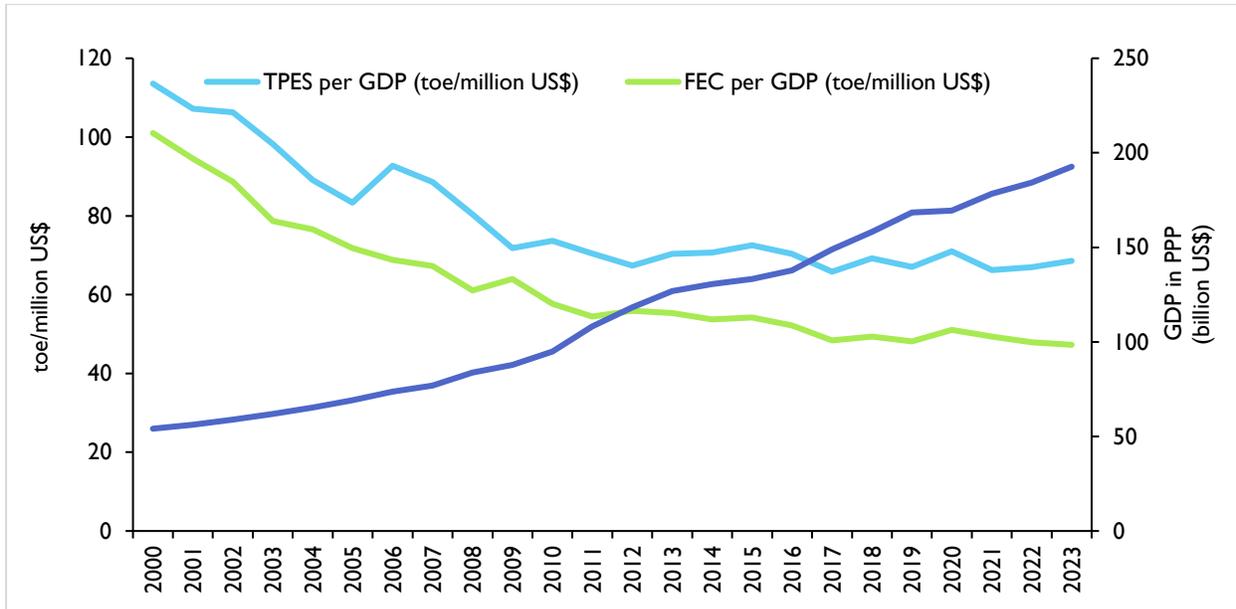


Energy Supply and Consumption per capita Index (2000=100)

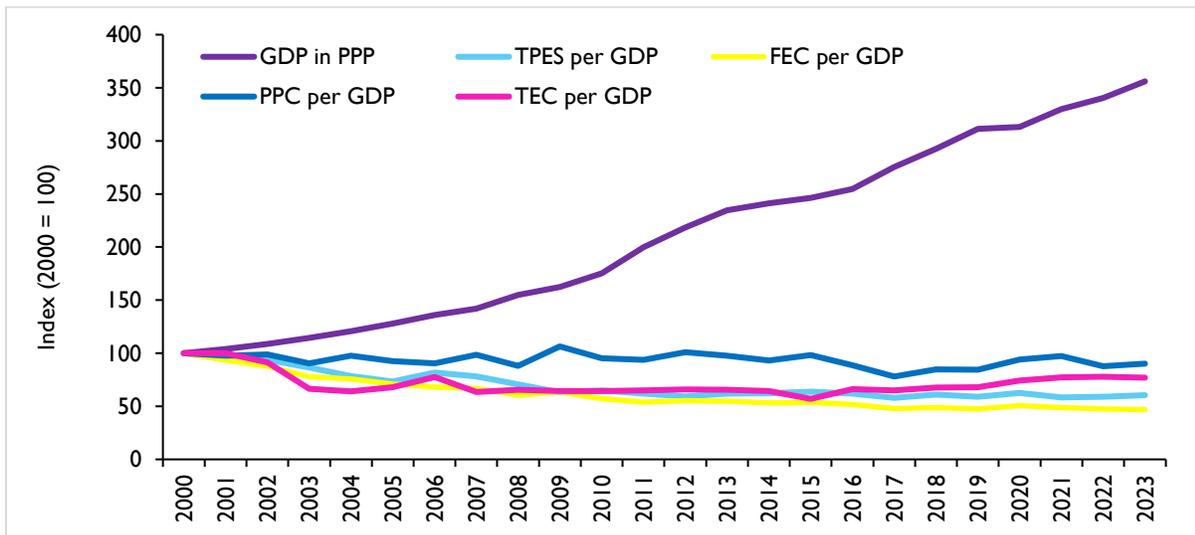


ENERGY SUPPLY AND CONSUMPTION PER GDP

Energy Supply and Consumption per GDP, 2000 - 2023

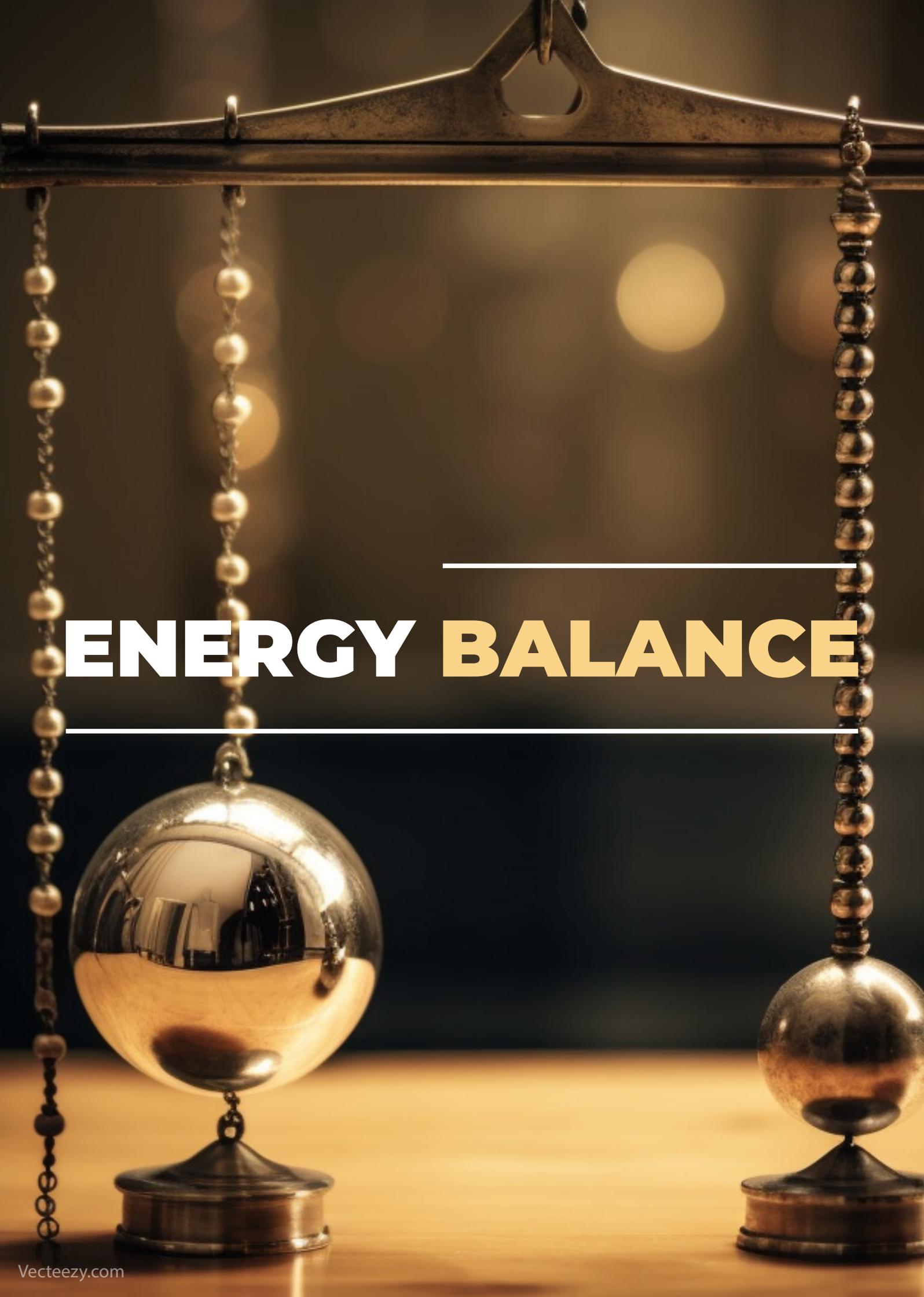


Energy Supply and Consumption per GDP, Index (2000 = 100)



NB: TPES = Total Primary Energy Supply;
PPC = Petroleum Product Consumption;
GDP in PPP = Gross Domestic Product in Purchasing Power parity

FEC = Final Energy Consumption
TEC = Total Electricity Consumption



ENERGY BALANCE

2023 Energy Balance, ktoe

Supply and Consumption	Crude Oil	Natural Gas	Petroleum Products	Wood	Charcoal	Solar	Hydro	Electricity	Total
Production	6,818	2,895	-	3,944	-	13	790	-	14,460
Imports	433	593	4,836	-	0.06	-	-	6.8	5,869
Exports	-6,661	-	-7	-	-0.7	-	-	-217	-6,886
Intl. Marine Bunkers	-	-	-4	-	-	-	-	-	-3.6
Intl. Aviation Bunkers	-	-	-188	-	-	-	-	-	-188
Stock changes	-223	-	-173.0	-	-	-	-	-	-396
TES	367	3,487	4,465	3,944	-0.7	13	790	-211	12,855
Transfers	-105	-	112	-	-	-	-	-	7.3
Statistical differences	1.7	12	245	-	-	-	-	-	255
Electricity plants	-64.55	-3,228	-56	-	-	-13	-790	2,086	-2,065
Oil refineries	-199	-	165.8	-	-	-	-	-	-33.5
Other transformation	-	-	-	-2,378	1,280	-	-	-	-1,098
Energy industry own use	-	-	49	-	-	-	-	20	69
Losses	-	-	-	-	-	-	-	235	235
TFC	-	247	4,394	1,566	1,279	-	-	1,621	9,107
Residential	-	-	167	1,270	1,196	-	-	643	3,276
Industry	-	247	511	276	0.48	-	-	709	1,745
Commerce & Service	-	-	22	20	83	-	-	264	389
Agriculture & Fisheries	-	-	91	-	-	-	-	3.4	94
Transport	-	-	3,603	-	-	-	-	1.0	3,604
Non-Energy Use	-	-	-	-	-	-	-	-	-

2022 Energy Balance, ktoe

Supply and Consumption	Crude Oil	Natural Gas	Petroleum Products	Wood	Charcoal	Solar	Hydro	Electricity	Total
Production	7,325	2,970	-	3,999	-	14	704	-	15,013
Imports	32	502	4,217	-	0.01	-	-	3.2	4,754
Exports	-7,269	-	-13	-	-0.5	-	-	-190	-7,473
Intl. Marine Bunkers	-	-	-2.4	-	-	-	-	-	-2.4
Intl. Aviation Bunkers	-	-	-194	-	-	-	-	-	-194
Stock changes	66.9	-	-9.7	-	-	-	-	-	57.3
TES	154	3,472	3,998	3,999	-1	14	704	-187	12,154
Transfers	-123	-	132	-	-	-	-	-	8.6
Statistical differences	33	32	64	-	-	-	-	-	62
Electricity plants	-21.89	-3,226	48	-	-	-14	-704	1,992	-1,926
Oil refineries	-43.0	-	39.9	-	-	-	-	-	-3.1
Other transformation	-	-	-	-2,279	1,226	-	-	-	-1,053
Energy industry own use	-	-	50	-	-	-	-	13	63
Losses	-	-	-	-	-	-	-	230	230
TFC	-	214	4,103	1,721	1,226	-	-	1,562	8,826
Residential	-	-	165	1,400	1,148	-	-	611	3,324
Industry	-	214	506	297	0.34	-	-	694	1,711
Commerce & Service	-	-	21	23	77	-	-	254	376
Agriculture & Fisheries	-	-	89	-	-	-	-	2.8	92
Transport	-	-	3,322	-	-	-	-	0.9	3,322
Non-Energy Use	-	-	-	-	-	-	-	-	-

ENERGY PRICE



CRUDE OIL PRICES

Average Crude Oil Prices (\$/bbls), Jan 2001 – Dec 2023



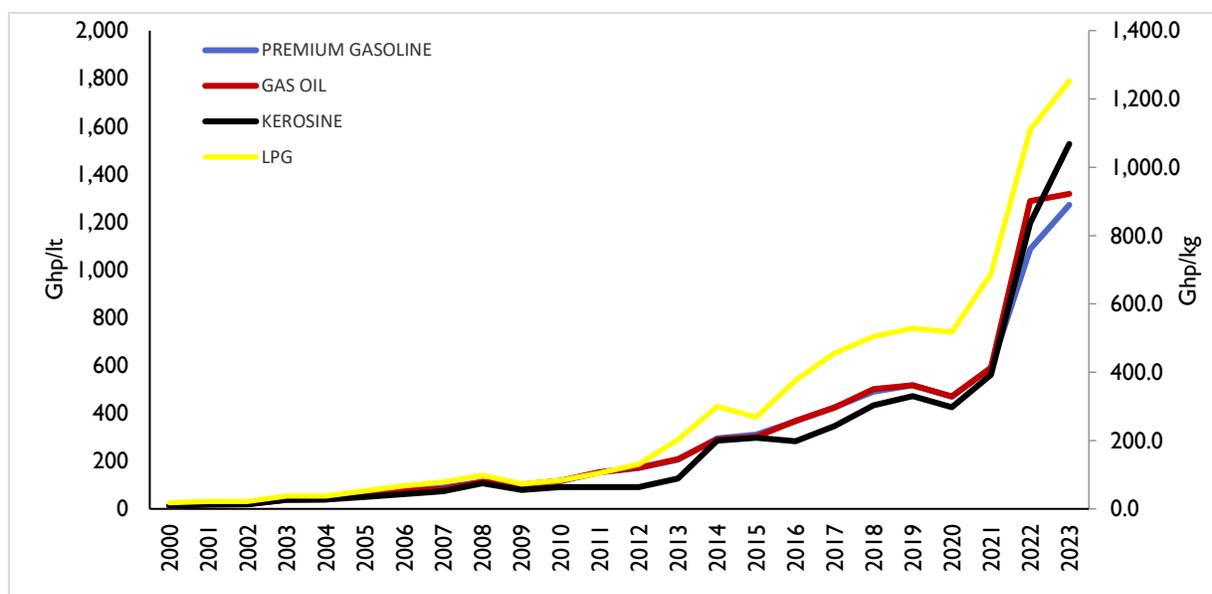
Monthly Average Crude Oil Prices (\$/bbl)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2001	25.8	27.7	25.7	25.4	25.4	26.7	25.7	25.8	26.1	21.5	19.2	19.3
2010	76.9	74.7	79.9	85.7	77	75.7	75.5	77.1	78.2	83.5	86.1	92.4
2015	49.7	58.7	57	60.9	65.6	63.8	56.8	48.2	48.6	48.1	44.4	37.7
2020	63.7	55.5	33.7	26.6	32.1	40.8	43.2	45	41.9	41.4	44	50.2
2021	55.3	62.3	65.8	65.3	68.3	73.4	74.3	70.5	74.9	83.8	80.8	74.8
2022	85.5	94.3	112.5	105.8	111.6	117.2	105.1	97.7	90.6	93.6	90.4	81.3
2023	83.9	83.9	79.7	82.7	75.7	75.0	80.2	84.6	92.6	88.7	82.0	77.3

The average crude oil price increased by 39.5% from US\$70.8/bbls in 2021 to US\$98.8/bbls in 2022. As of December 2023, the yearly average crude oil price was US\$82.2/bbls.

PETROLEUM PRODUCTS PRICES

Petroleum Products Prices, 2000 - 2023



NB: prices are in Ghp/litre except for LPG, which is in Ghp/kg

Average Ex-Pump Prices for Petroleum Products

Year	Premium Gasoline (Ghp/lt)	Gas Oil (Ghp/lt)	Kerosene (Ghp/lt)	LPG (Ghp/kg)
2000	13.7	12.8	12.8	18.2
2010	117.0	118.1	91.0	83.8
2015	310.1	301.9	296.9	268.3
2020	469.3	469.9	425.1	517.4
2021	589.9	589.8	561.0	687.8
2022	1,086.7	1,287.4	1,196.0	1,109.5
2023	1,271.4	1,317.3	1,526.0	1,252.3

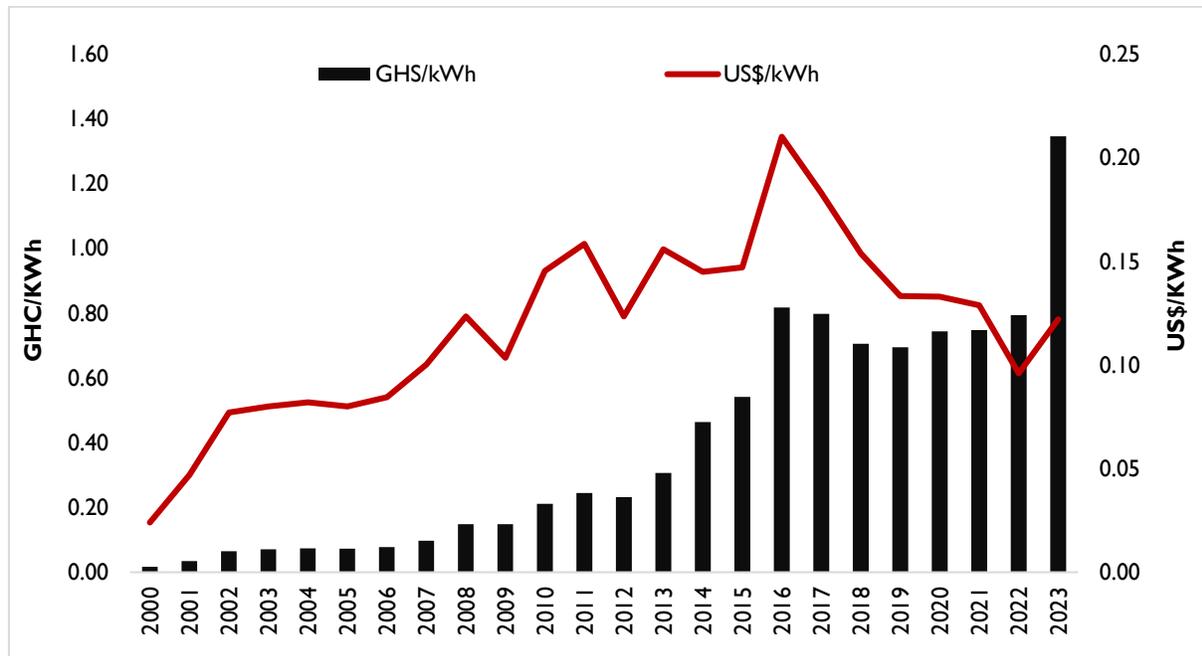
Over the 23 years, all petroleum product prices have increased significantly. Premium Gasoline rose from 13.7 Ghp/lt to 1,271.4 Ghp/lt, Gas Oil from 12.8 Ghp/lt to 1,317.3 Ghp/lt, Kerosene from 12.8 Ghp/lt to 1,526.0 Ghp/lt, and LPG from 18.2 Ghp/kg to 1,252.3 Ghp/kg. Notably, within the last three years (2021-2023), petroleum prices have more than doubled.

ELECTRICITY TARIFF BY CUSTOMER CLASS

Tariff Category	Effective Date								
	Oct, 2013	Oct, 2014	Dec, 2015	Oct, 2018	Oct, 2019	Oct, 2020	Jan, 2021	Sept, 2022	Dec, 2023
Residential									
0-30 (Exclusive)	-	-	-	-	-	-	-	42	63
0 - 50 (Exclusive)	16	21	34	28	33	33	33	-	-
31 - 300 (GHp/kWh)	-	-	-	-	-	-	-	89	140.6
51 - 300 (GHp/kWh)	31	41	67	56	65	65	65		
301 - 600 (GHp/kWh)	41	54	87	72	85	85	85	116	182.4
600+ (GHp/kWh)	45	59	97	80	94	94	94	128	202.7
Service Charge for Lifeline Consumers (GHp/month)	296	388	633	213	213	213	213	213	-
Service Charge for Other Residential Consumers (GHp/month)	296	388	633	633	746	746	746	1073	1073
Non-Residential									
0 -300 (GHp/kWh)	45	59	97	68	80	80	80	84	126.9
301 - 600 (GHp/kWh)	48	63	102	72	85	85	85	89	135.1
600+ (GHp/kWh)	76	100	163	114	134	134	134	133	201.6
Service Charge (GHp/month)	493	646	1,055	1,055	1,243	1,243	1,243	1,243	1,243
SLT - Low Voltage									
Maximum Demand (GHp/kVA/month)	2,760	3,617	5,910	5,910	6,960	6,960	6,960	6,960	6,960
Energy Charge (GHp/kWh)	47	62	101	76	89	89	105	133	200.9
Service Charge (GHp/month)	1,972	2,584	4,221	4,221	4,971	4,971	4,971	50,000	50,000
SLT - Medium Voltage									
Maximum Demand (GHp/kVA/month)	2,366	3,100	5,065	5,065	5,966	5,966	5,966	5,966	-
Energy Charge (GHp/kWh)	37	48	78	59	69	69	80	100	152.5
Service Charge (GHp/month)	2,760	3,617	5,910	5,910	6,960	6,960	6,960	50,000	50,000
SLT - High Voltage									
Maximum Demand (GHp/kVA/month)	2,366	3,100	5,065	5,065	5,966	5,966	5,966	5,966	-
Energy Charge (GHp/kWh)	34	44	72	54	63	63	83	75	160.1
Service Charge (GHp/month)	2,760	3,617	5,910	5,910	6,960	6,960	6,960	50,000	50,000
SLT-High Voltage - Mines									
Capacity Charge (GHp/KVA/Month)	2,760	3,617	5,910	5,910	6,960	6,960	6,960	6,960	-
Energy Charge (GHp/kWh)	53	70	114	103	121	121	264	264	399.9
Service Charge (GHp/Month)	2,760	3,617	5,910	5,910	6,960	6,960	6,960	50,000	50,000

Average Electricity End-User Tariff

Average Electricity End-User Tariff (2000-2023)



Average Electricity End-User Tariff by Customer Class

Year	Ghc/kWh			US\$/kWh		
	Residential	Non-Residential	SLT	Residential	Non-Residential	SLT
2018	0.62	0.89	0.78	0.13	0.19	0.17
2019	0.58	1.03	0.70	0.11	0.20	0.14
2020	0.62	1.16	0.76	0.11	0.21	0.14
2021	0.61	1.13	0.78	0.11	0.20	0.13
2022	0.69	1.05	0.83	0.08	0.13	0.10
2023	1.23	1.74	1.32	0.11	0.16	0.12

ENERGY OUTLOOK

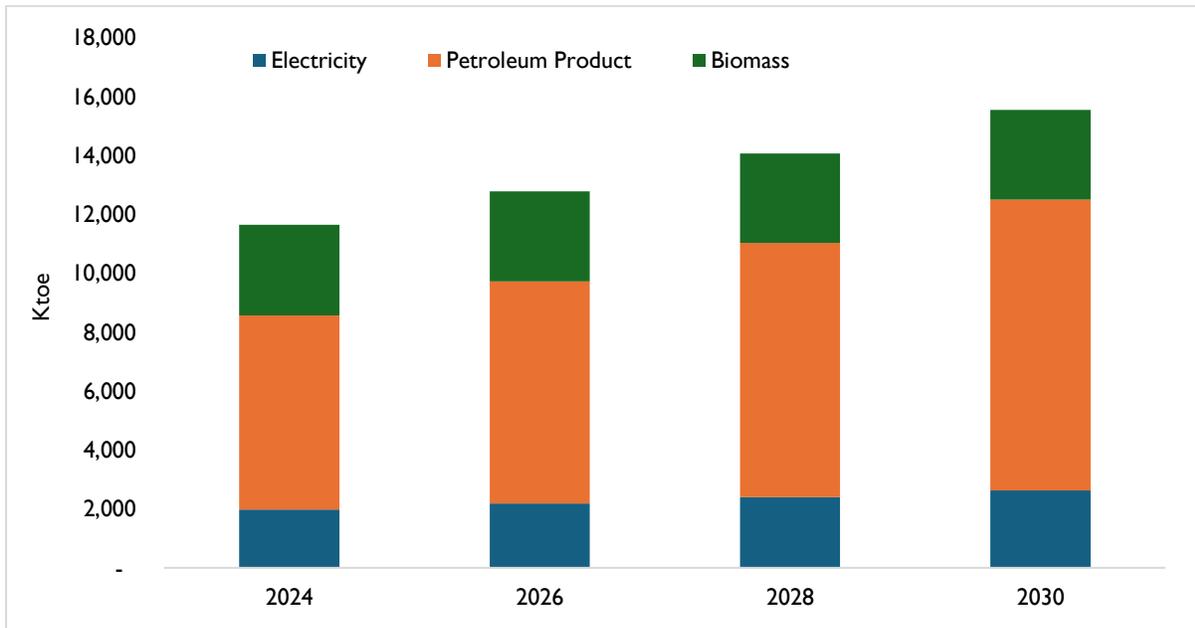


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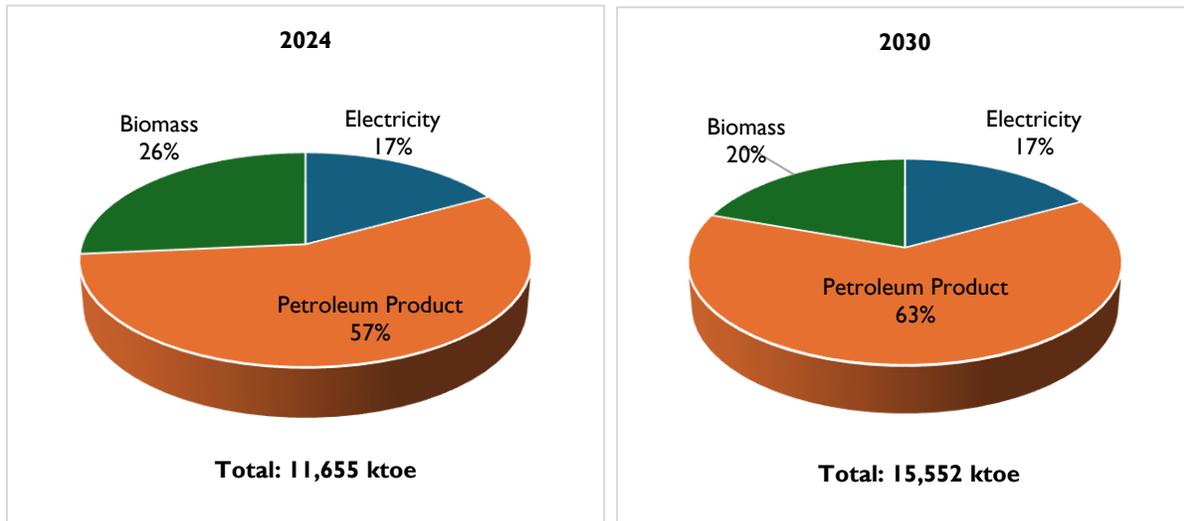


OUTLOOK FOR ENERGY DEMAND

Outlook for Energy Demand by Fuels (Business-as-Usual Scenario)

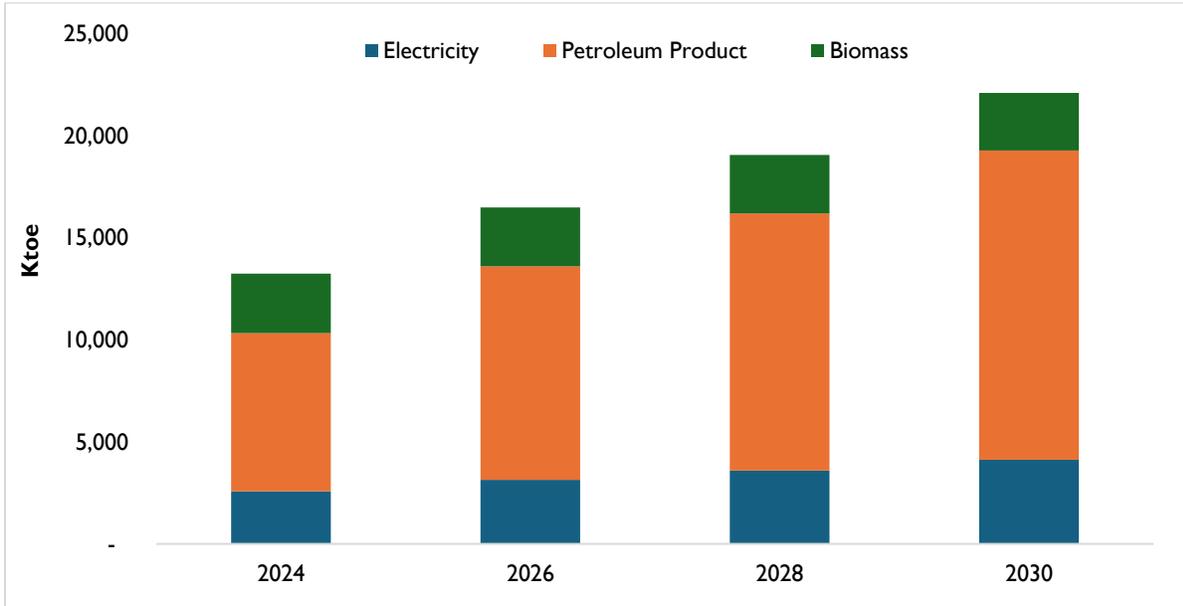


2024 and 2030 Shares of Energy Demand by Fuels (Business-as-Usual Scenario)

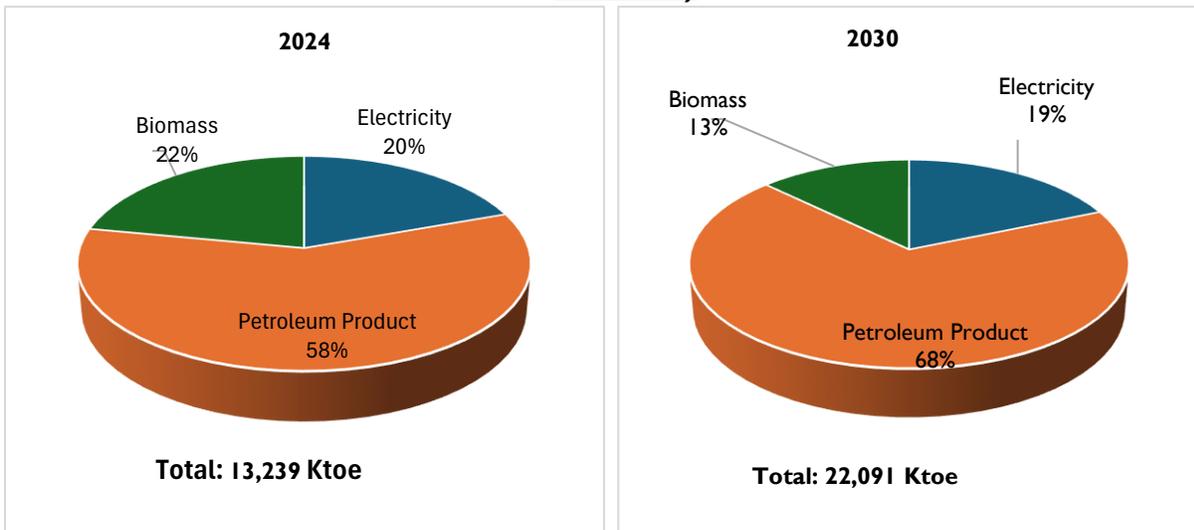


NB: The business-as-usual scenario describes a socio-economic outlook based on trends from the historical past until 2030.

Outlook for Energy Demand by Fuels (Accelerated Economic Growth Scenario)

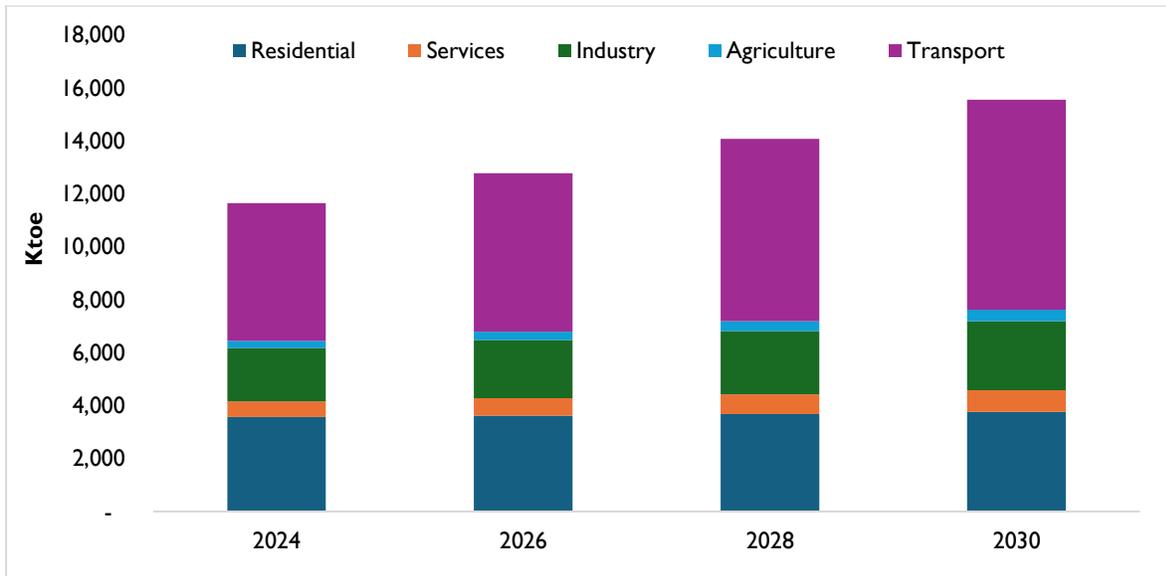


2024 and 2030 Shares of Energy Demand by Fuels (Accelerated Economic Growth Scenario)

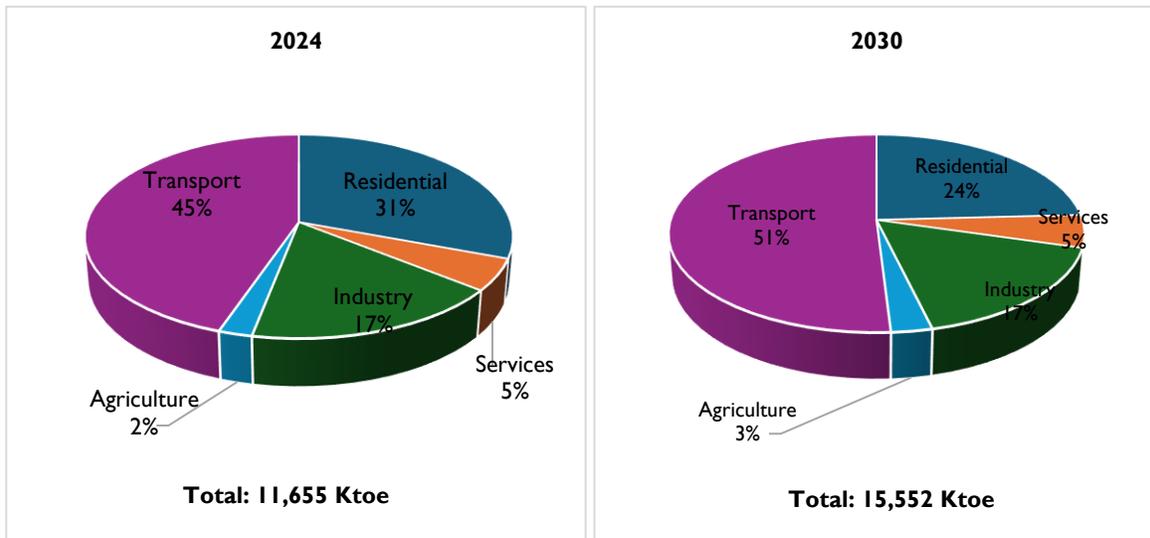


NB: The Accelerated Economic Growth scenario considers the objectives of the Ghana Shared Growth and Development Agenda, Medium-Term National Development Policy Framework (2018-2021) and the Coordinated Programme for Economic and Social Development Policies (2017-2024), which included project and programmes in the industrial and agricultural sectors such as the ‘One District-One Factory’ initiative and the ‘planting for food and jobs’ policy.

Outlook for Energy Demand by Sectors (Business-as-Usual Scenario)

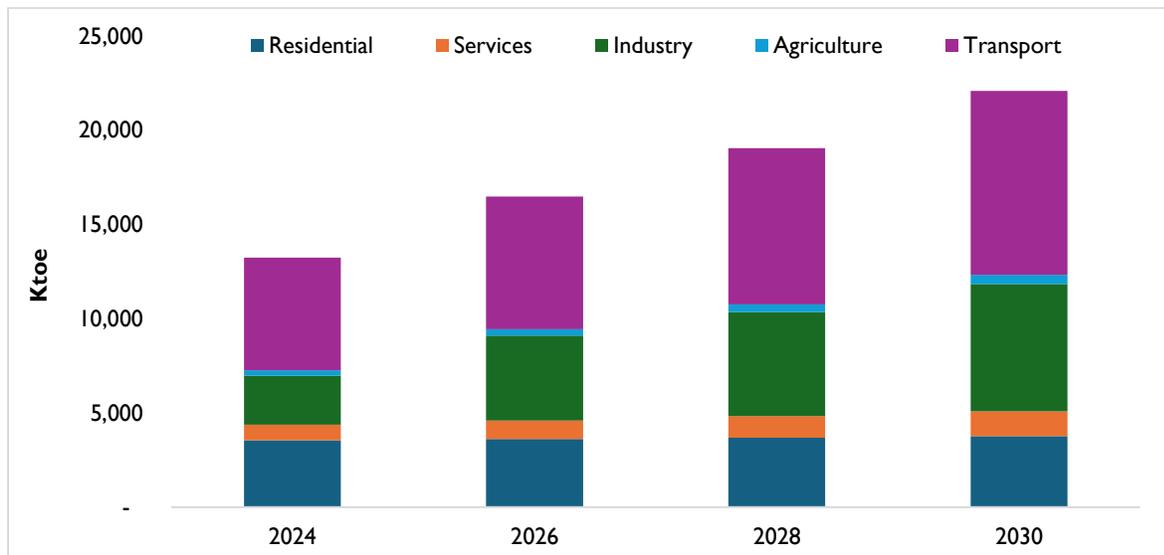


Outlook for Energy Demand by Sectors (Business-as-Usual Scenario)

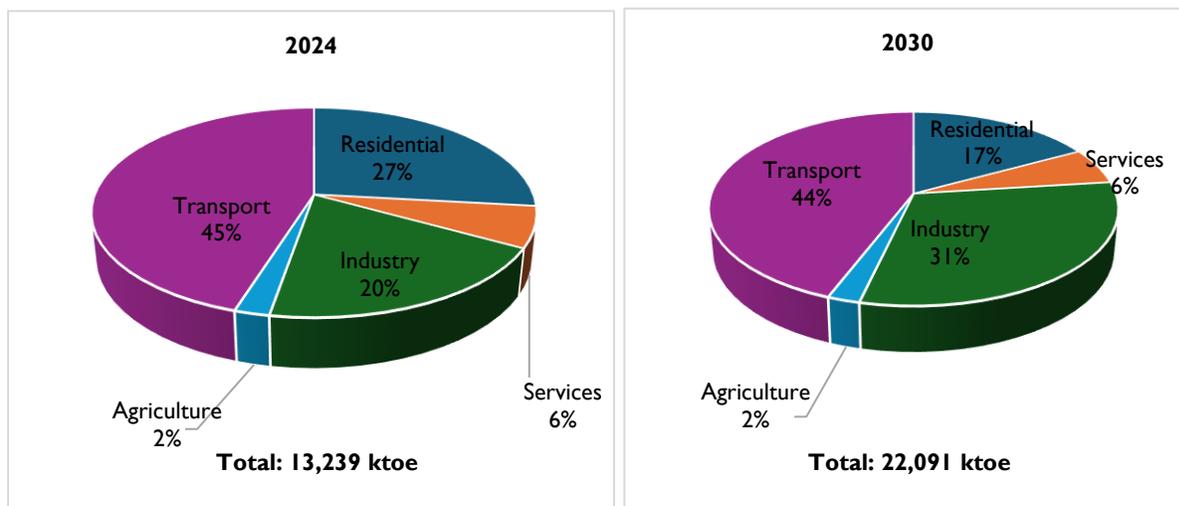


NB: The Business-as-Usual scenario describes a socio-economic outlook based on trends from the historical past until 2030.

Outlook for Energy Demand by Sectors (Accelerated Economic Growth Scenario)



2023 and 2030 Outlook for Energy Demand by Sectors (Accelerated Economic Growth Scenario)



NB: The Accelerated Economic Growth scenario considers the objectives of the Ghana Shared Growth and Development Agenda, Medium-Term National Development Policy Framework (2018-2021) and the Coordinated Programme for Economic and Social Development Policies (2017-2024), which included project and programmes in the industrial and agricultural sectors such as the ‘One District-One Factory’ initiative and the ‘planting for food and jobs’ policy.

CONVERSION FACTORS

Ghana Standard Figures					
Petroleum					
Crude Oil	l	Tonne		1.02	TOE
Gasoline / Petrol	l	Tonne		1.05	TOE
Kerosene	l	Tonne		1.03	TOE
Jet Kerosene	l	Tonne		1.03	TOE
Gasoil / Diesel	l	Tonne		1.02	TOE
Fuel Oil	l	Tonne		0.97	TOE
LPG	l	Tonne		1.08	TOE
Crude Oil	l	barrel		36	Imperial gallons
	36	Imperial gallons		163.66	Litres
	7	Barrels		1	Tonne
	l	cubic metre		6.29	Barrels
Natural Gas	l	GJ		1.05	MMBtu
	1.05	MMBtu		1.07	MSCF
	l	MMBtu		27.10	cubic metre (m ³)
	l	MMBtu		5.82	bbl. of crude oil equivalent
	1000	m ³		36.91	MMBtu
Electricity	1000	W		1	Kw
	1000	kW		1	MW
	1000	MW		1	GW
	1000	kWh		1	MWh
	1000	MWh		1	GWh
	l	GWh		86	TOE
	l	GWh		3600	GJ
	l	TOE		41.86	GJ

Ghana Standard Figures

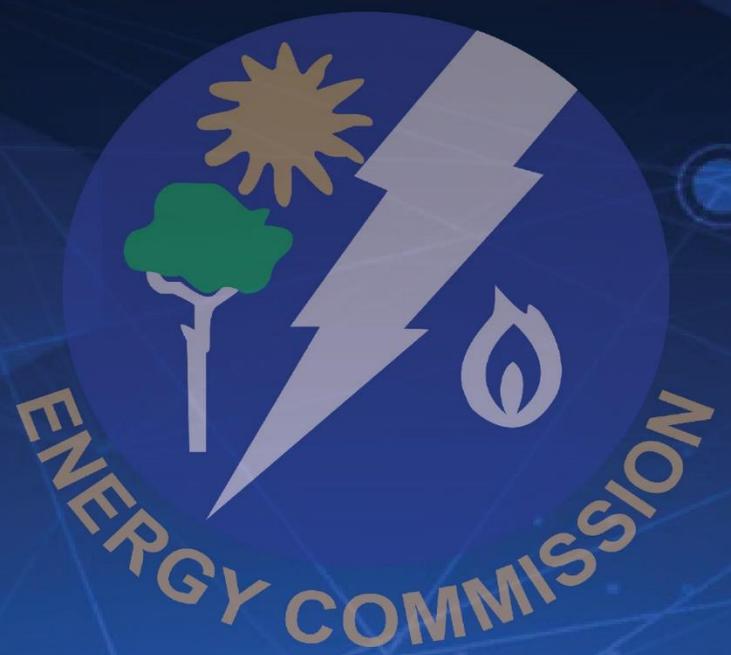
Woodfuel				
Firewood/fuelwood		Tonne		0.30-0.36 TOE
Charcoal		Tonne		0.68-0.88 TOE
Sawdust/sawmill residues/wood chips		Tonne		0.20-0.30 TOE
<i>Low side reflecting average dry wood and corresponding Charcoal in the forest zones and the high side reflecting average dry wood and corresponding charcoal in the savannah zones of the country.</i>				
<i>Between 4 – 5 mass units of wood are used to produce one mass unit of charcoal in the country</i>				
Charcoal Source	Average Weight (kg) of Charcoal			
	Mini Bag	Maxi Bag	Moisture Content	
Sawmill residue	21 – 22	44 - 45	Up to 40%	
Savannah wood	30 – 32	55 - 60	Up to 20%	
Acacia plant	31 – 32	57 - 63	Up to 20%	
All other woods	25 – 27	50 - 55	Up to 25%	

GLOSSARY

Energy Flows	Definition
Electricity Plants	It refers to powerplants designed to produce only electricity.
Final Energy Consumption	It refers to all fuel and energy delivered to final users for their energy use
Import and export	It comprises of quantities of fuels entering or leaving the national territorial
International Aviation Bunkers	It covers quantities of fuels delivered to airplanes of any nationality for consumption during international flights
International Marine Bunkers	It covers quantities of fuels delivered to ships of any nationality for consumption during international voyages
Own Use	It is the primary and secondary energy consumed by transformation industries for heating, pumping, lighting and other purposes
Production	It covers the capture, extraction or manufacture of fuels or energy in forms that are ready for general use
Statistical differences	It is the numerical difference between the total energy supply and the total use of it. It includes the sum of the unexplained differences for individual fuels as they appear in the energy statistics
Stock changes	It is the difference between opening and closing stock levels. A stock draw is an addition to supply and so will be entered with a positive sign. The converse applies for a stock build.
Total Energy Supply	Represents the amount of energy that is available in the national territory during the reference period. It includes production, import and stock changes, less export and international aviation and marine bunkers

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