



2022 NATIONAL ENERGY STATISTICS

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Energy Statistics and Balances

April 2022

| Securing Ghana's Future Energy Today

FOREWORD

The 2022 National Energy Statistics provides time series data on Ghana's energy supply and use situation largely from 2000 to 2021. It contains data on energy production, import, export, and consumption. Information on the country's progress towards achieving the Sustainable Development Goals (SDG 7) has been added to this publication

This publication was prepared with data from the main energy sector institutions, including the Ministry of Energy, Volta River Authority (VRA), Ghana Grid Company (GRIDCo), Ghana National Petroleum Corporation (GNPC), National Petroleum Authority (NPA), Ghana National Gas Company (GNGC), Tema Oil Refinery (TOR), Public Utilities Regulatory Commission (PURC), Electricity Company of Ghana, Northern Electricity Distribution Company (NEDCo), Enclave Power Company Ltd (EPC), West African Gas Pipeline Company (WAPCo), as well as data from the Bank of Ghana (BoG) and the Ghana Statistical Service (GSS). The cooperation and assistance of all these agencies and entities are gratefully acknowledged.

We expect that the statistics in this publication will be useful to a wide range of users, including planners, policymakers, researchers, and students.

We are very much appreciative of the feedback received from users. These have been used to update and improve the information provided in this year's publication. The 2022 National Energy Statistics, therefore, override those of previous years.

We would appreciate any feedback by way of comments and suggestions from readers.

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

Ing. Oscar Amonoo-Neizer
Executive Secretary

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ABBREVIATIONS AND ACRONYMS

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

CONVERSION FACTORS

Ghana Standard Figures				
Petroleum Products				
Gasoline / Petrol	l	Litres	1324.5	Metric Tonnes
Kerosene	l	Litres	1240.6	Metric Tonnes
Jet Kerosene	l	Litres	1240.6	Metric Tonnes
Gasoil / Diesel	l	Litres	1183.43	Metric Tonnes
Fuel Oil	l	Litres	1009.08	Metric Tonnes
LPG	l	Kg	1000	Metric Tonnes
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	6.289	Barrels
Natural Gas	l	GJ	1.05	MMBtu
	l	MMBtu	0.0252	TOE
	1.05	MMBtu	1.07	MSCF
	l	MMBtu	27.10	cubic metre (m3)
	1	MMBtu	5.82	bbl. of crude oil equivalent
Electricity	1000	m ³	36.91	MMBtu
	1000	W	l	Kw
	1000	kW	l	MW
	1000	MW	l	GW
	1000	kWh	l	MWh
	1000	MWh	l	GWh
	l	GWh	86	TOE
	l	GWh	3600	GJ
l	TOE	41.86	GJ	

Ghana Standard Figures

Woodfuel

Firewood/fuelwood	I	Tonne	0.30-0.36	TOE
Charcoal	I	Tonne	0.68-0.88	TOE
Sawdust/sawmill residues/wood chips	I	Tonne	0.20-0.30	TOE

The low side reflects average dry wood and corresponding charcoal in the forest zones while the high side reflects average dry wood and corresponding charcoal in the savannah zones of the country.

Between 4 – 5 mass units of wood are used to produce one mass unit of charcoal in the country

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	
Production	It covers the capture, extraction or manufacture of fuels or energy in forms that are ready for general use
Import	It comprises the quantities of fuels entering the national territorial
Export	It comprises the quantities of fuels leaving the national territorial
International Aviation Bunkers	It covers the quantities of fuels delivered to aeroplanes of any nationality for consumption during international flights
International Marine Bunkers	It covers the quantities of fuels delivered to ships of any nationality for consumption during international voyages
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
Transformation (Electricity plants)	It refers to power plants designed to produce electricity only for sale to third parties, as their primary activity
Transformation (Oil refineries)	It is the process where quantities of crude oil is processed into petroleum products
Own Use	It is the primary and secondary energy consumed by transformation industries for heating, pumping, lighting and other purposes
Losses	It refers to losses during the transmission, distribution and transport of fuels and electricity
Final Energy Consumption	It refers to all fuel and energy delivered to final users for their energy Use
Non-Energy Use	It comprises the use of energy products as raw materials for the manufacture of non-fuel products as well as well as for direct uses that do not involve using the products as a source of energy, nor as a transformation input
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

SECTION I: ELECTRICITY ACCESS MAPS OF GHANA

PROPORTION OF POPULATION WITH ACCESS TO ELECTRICITY



Figure 1.1: Population with access to electricity by region

2021 National population electricity access rate: 87%

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

PROPORTION OF HOUSEHOLDS WITH ACCESS TO ELECTRICITY



Figure 1.2: Household with access to electricity by region

2021 National household electricity access rate: 86.3%

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

SECTION 2: ENERGY SUPPLY AND FINAL CONSUMPTION

2.1 Total Energy Supply

The total energy supply is the sum of imported energy and energy extracted from natural resources (energy production), less exports and international bunkers after adjusting for stock changes. The total energy supply in 2000 was 6,255 ktoe. This doubled to 12,371 ktoe in 2021, representing an annual growth rate of 3.3% (Table 2.1).

Biomass constituted the largest share of the country's total energy supply from 2000 to 2011. Afterwards, oil became the dominant fuel until 2020, when biomass regained its initial position of being the dominant fuel, as illustrated in Fig 2.1. Biomass accounted for approximately 34% of the total energy supply in 2021, followed by oil and natural gas with shares of 35% and 26%, respectively.

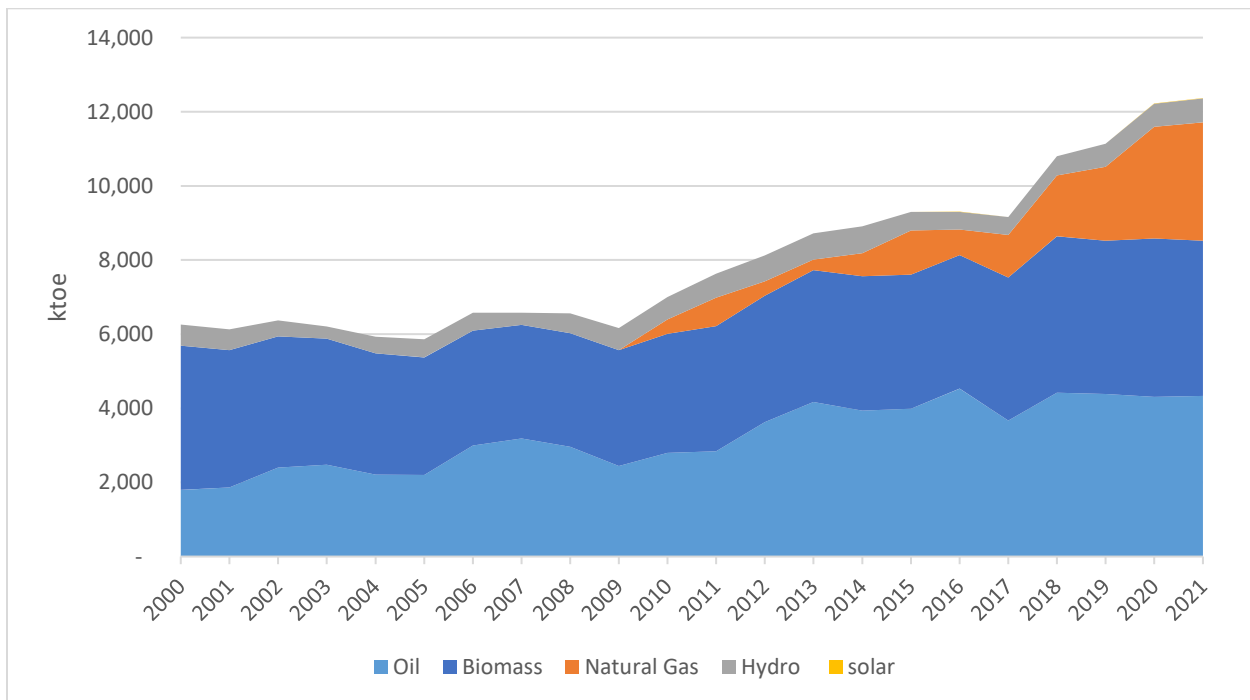


Figure 2.1: Total Energy Supply

Table 2.1: Total Energy Supply (ktoe)

Year	Oil		Natural Gas		Hydro		Solar		Biomass		Total ktoe
	ktoe	%	ktoe	%	ktoe	%	ktoe	%	ktoe	%	
2000	1,799	29	-	0	568	9	-	0	3,888	62	6,255
2001	1,861	30	-	0	568	9	-	0	3,703	60	6,132
2002	2,403	38	-	0	433	7	-	0	3,539	56	6,375
2003	2,481	40	-	0	334	5	-	0	3,395	55	6,210
2004	2,206	37	-	0	454	8	-	0	3,273	55	5,933
2005	2,200	38	-	0	484	8	-	0	3,174	54	5,858
2006	2,994	46	-	0	483	7	-	0	3,100	47	6,577
2007	3,185	48	-	0	321	5	-	0	3,068	47	6,574
2008	2,959	45	-	0	533	8	-	0	3,070	47	6,562
2009	2,440	40	5	0	591	10	-	0	3,127	51	6,163
2010	2,798	40	394	6	602	9	-	0	3,207	46	7,001
2011	2,843	37	769	10	650	9	-	0	3,371	44	7,633
2012	3,629	45	389	5	694	9	-	0	3,409	42	8,121
2013	4,169	48	292	3	708	8	-	0	3,554	41	8,723
2014	3,938	44	619	7	721	8	-	0	3,629	41	8,907
2015	3,991	43	1,185	13	503	5	-	0	3,618	39	9,296
2016	4,529	49	692	7	478	5	2	0	3,601	39	9,302
2017	3,672	40	1,146	13	483	5	2	0	3,858	42	9,161
2018	4,416	41	1,641	15	517	5	3	0	4,222	39	10,800
2019	4,387	39	1,993	18	624	6	4	0	4,132	37	11,140
2020	4,305	35	3,014	25	627	5	5	0	4,274	35	12,225
2021	4,334	35	3,189	26	647	5	11	0	4,190	34	12,371

2.2 Total Final Consumption by Fuel

This section covers all fuels and energy delivered to users for both their energy and non-energy uses, excluding transformation processes. The country's total final consumption (TFC) in 2021 was 9,345 ktoe, up by compound annual growth rate (CAGR) of 2.6% from its 2000 level of 5,467 Ktoe (Table 2.2). As illustrated in Fig 3.2, final electricity and petroleum consumption increased by compound annual growth rate (CAGR) of 4.7% and 5.7%, respectively, whilst biomass consumption declined by 0.4% during the period under review (2000-2021).

Comparing 2021 to 2020, the final energy consumption increased by 692 Ktoe, representing an annual increase of 8%.

Table 2.2: Total Final Energy Consumed by Fuels (ktoe)

Year	Electricity ¹		Petroleum ²		Biomass		Total
	Ktoe	%	Ktoe	%	Ktoe	%	
2000	592	11	1,442	26	3,432	63	5,467
2001	613	12	1,464	28	3,238	61	5,315
2002	582	11	1,546	30	3,082	59	5,211
2003	446	9	1,491	31	2,925	60	4,862
2004	456	9	1,701	34	2,839	57	4,996
2005	510	10	1,708	34	2,745	55	4,964
2006	621	12	1,769	35	2,671	53	5,061
2007	539	10	2,016	39	2,594	50	5,149
2008	621	12	1,966	39	2,518	49	5,104
2009	641	11	2,487	44	2,493	44	5,621
2010	715	13	2,394	43	2,464	44	5,573
2011	790	13	2,705	45	2,576	42	6,070
2012	796	12	3,189	49	2,589	39	6,574
2013	910	13	3,308	48	2,676	39	6,894
2014	920	13	3,275	47	2,792	40	6,986
2015	914	13	3,552	49	2,785	38	7,250
2016	1,077	15	3,320	46	2,783	39	7,180
2017	1,121	16	3,162	44	2,925	41	7,208
2018	1,238	16	3,593	46	2,961	38	7,792
2019	1,310	16	3,849	48	2,892	36	8,051
2020	1,421	16	4,255	49	2,977	34	8,653
2021	1,553	17	4,630	50	3,162	34	9,345

¹Includes commercial losses

²Petroleum consumption from 2016 onwards includes natural gas used in industry

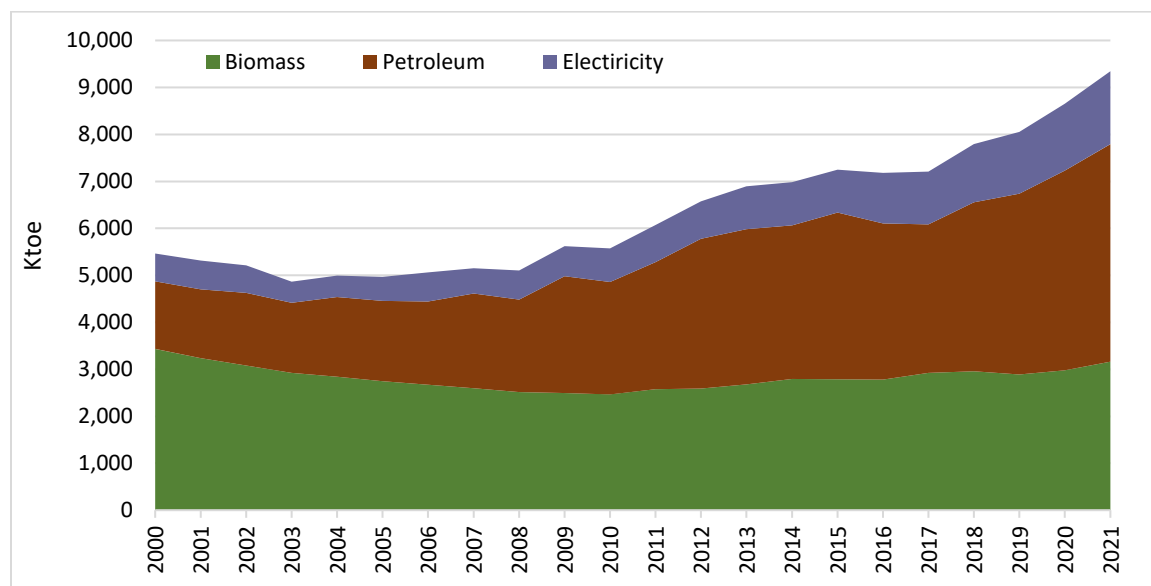


Figure 2.2: Trend in Final Energy Consumption by Fuel

2.3 Total Final Consumption by Sector

Energy consumption by the various sectors of the economy (industry, residential, etc.) increased over the period (Table 2.3). The residential and transport sectors are, by far, the largest final consumers of energy, consuming about 3,636 ktoe and 3,578 ktoe in 2021 respectively. The consumption by residential and transport sectors in 2021 represents about 38.9% and 38.3% of final energy consumption respectively. This represents an increase of about 4.6% and 8.7% of final consumption by residential and transport sectors respectively over the preceding year's consumption. The share of industry and service sectors increased to 16% and 5.1% of final energy consumption in 2021, respectively, compared to 14.8% and 5% in 2020, respectively. The share on the other hand for the Agriculture sector, decreased minutely from 1.77% in 2020 to 1.72% in 2021.

Table 2.3: Final Energy Consumption by Sectors (ktoe)

Year	Residential	Industry	Service	Agriculture	Transport	Non-Energy Use	Total
2000	3,390	741	121	71	1,137	7	5,467
2001	3,218	749	123	65	1,151	8	5,315
2002	3,085	708	127	64	1,218	9	5,211
2003	2,945	559	132	66	1,151	8	4,862
2004	2,883	569	135	66	1,333	9	4,996
2005	2,814	613	145	69	1,313	10	4,964
2006	2,751	820	137	71	1,271	10	5,061
2007	2,656	800	130	84	1,470	9	5,149
2008	2,605	839	135	90	1,430	5	5,104
2009	2,713	857	165	99	1,774	13	5,621
2010	2,653	811	253	71	1,777	7	5,573
2011	2,790	928	268	89	1,986	10	6,070
2012	2,809	906	286	110	2,457	5	6,574
2013	2,900	952	330	109	2,599	4	6,894
2014	2,962	942	355	106	2,620	1	6,986
2015	3,057	973	252	101	2,868	1	7,250
2016	3,066	974	368	105	2,668	1	7,181
2017	3,231	1,023	377	126	2,439	12	7,208
2018	3,390	1,112	360	119	2,797	13	7,792
2019	3,341	1,158	401	123	3,014	14	8,051
2020	3,477	1,283	433	153	3,293	15	8,654
2021	3,636	1,497	474	161	3,578	0	9,345

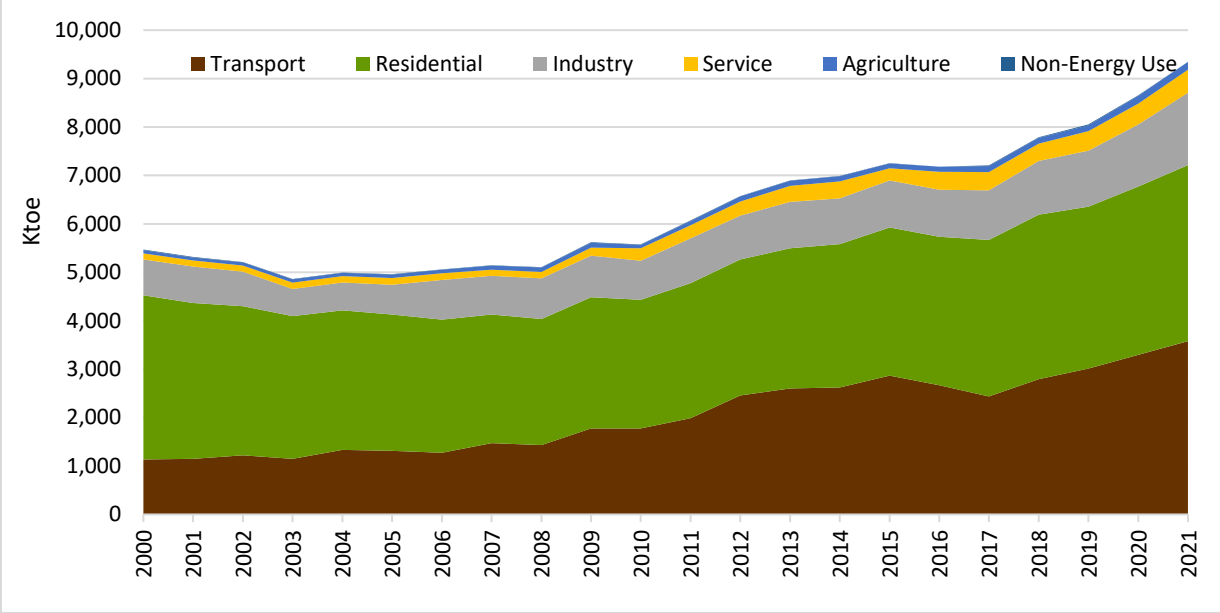


Figure 2.3: Final Energy Consumed by Sectors

SECTION 3: ELECTRICITY

3.1 Installed Electricity Generation Capacity

The total grid installed electricity generation capacity, including distributed generation, increased from 2,170 MW in 2011 to 5,481 MW in 2021, representing an annual average growth of 9.7%. Likewise, the dependable capacity increased at an annual growth rate of about 9.8%, from 1,945 MW in 2011 to 4,975 MW in 2021 (Table 3.1).

In 2011 the installed thermal generation capacity was 990 MW, quadrupling to 3,753 MW in 2021 at an annual average growth rate of 14.3%. The growth trend of the installed electricity generation capacity is presented in Figure 3.1.

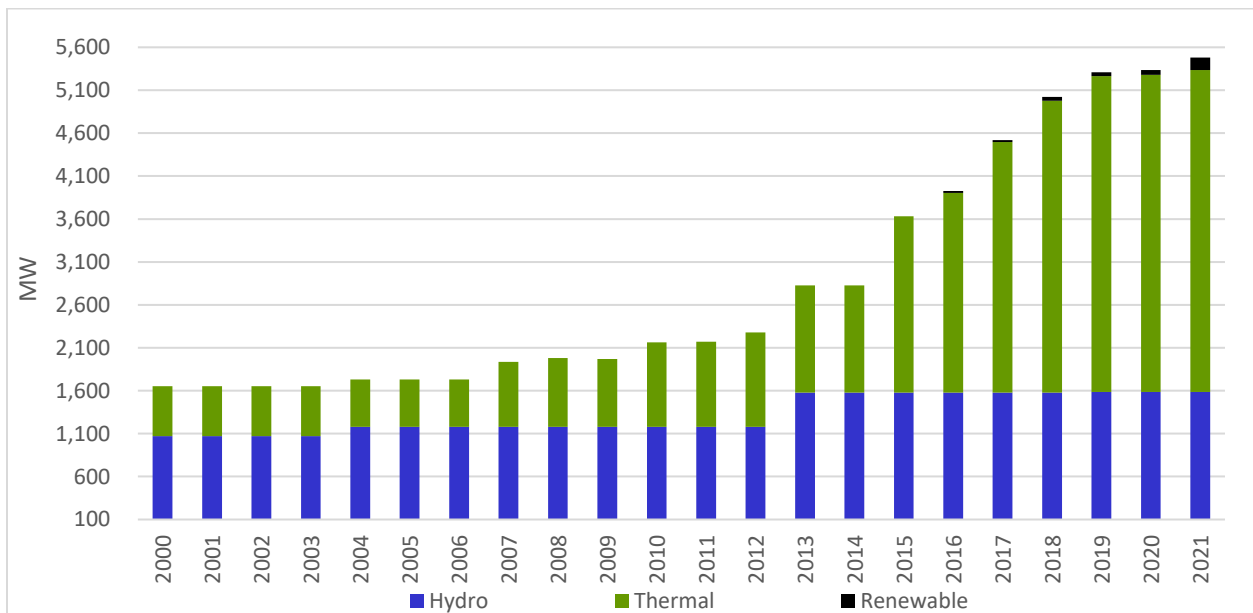


Figure 3.1: Installed Generating Capacity (2000-2021)

Table 3.1: Grid Installed and Dependable Capacity (MW)

Year	Installed Capacity				Dependable Capacity			
	Hydro	Thermal	Other Renewable ¹	Total	Hydro	Thermal	Other Renewable ¹	Total
2000	1,072	580	-	1,652	928	430	-	1,358
2001	1,072	580	-	1,652	951	530	-	1,481
2002	1,072	580	-	1,652	974	530	-	1,504
2003	1,072	580	-	1,652	982	530	-	1,512
2004	1,180	550	-	1,730	1,040	500	-	1,540
2005	1,180	550	-	1,730	1,040	500	-	1,540
2006	1,180	550	-	1,730	1,040	500	-	1,540
2007	1,180	755	-	1,935	1,040	670	-	1,710
2008	1,180	801	-	1,981	1,040	695	-	1,735
2009	1,180	790	-	1,970	1,040	725	-	1,765
2010	1,180	985	-	2,165	1,040	900	-	1,940
2011	1,180	990	-	2,170	1,040	905	-	1,945
2012	1,180	1,100	-	2,280	1,040	1,005	-	2,045
2013	1,580	1,248	-	2,828	1,380	1,105	-	2,485
2014	1,580	1,248	-	2,828	1,380	1,187	-	2,567
2015	1,580	2,053	-	3,633	1,380	1,957	-	3,337
2016	1,580	2,324	23	3,927	1,380	2,119	22	3,521
2017	1,580	2,917	23	4,520	1,380	2,568	18	3,966
2018	1,580	3,398	43	5,021	1,380	3,058	34	4,472
2019	1,584	3,682	43	5,309	1,365	3,296	34	4,695
2020	1,584	3,694	59	5,337	1,400	3,435	47	4,881
2021	1,584	3,753	144	5,481	1,400	3,480.6	94.65	4,975

¹Solar and waste

On the other hand, installed grid-connected renewable capacity increased considerably from 23 MW in 2016 to about 144 MW as of 2021.

The list of power plants, including off-grid and distributed generation, in Ghana as of the end of December 2021, is shown in Table 3.3.

Table 3.2: Installed Generation Capacities in Ghana as of 2021 (MW)

Plant	Installed Capacity	Dependable Capacity
Hydro Power Plants		
Akosombo	1,020	900
Kpong	160	140
Bui	404	360
Sub-total	1,584	1,400
Thermal Power Plants		
Takoradi Power Company (TAPCO)	330	300
Takoradi International Company (TICO)	340	320
Tema Thermal 1 Power Plant (TT1PP)	110	100
Tema Thermal 2 Power Plant (TT2PP)	87	70
Cenit Energy Ltd	110	100
Kpone Thermal Power Plant	220	200
Ameri Plant	250	230
Sunon Asogli Power (Ghana) Ltd	560	520
Karpowership	470	450
Trojan	44	39.6
Amandi	203	190
AKSA	370	350
Cenpower	360	340
Early Power / Bridge	144	140
Genser ²	155	131
Sub-total	3,753	3,480.6
Other Renewables		
On-grid		
VRA Solar (Navrongo) ²	2.5	2
VRA Solar (Lawra) ²	6.5	4.5
VRA Solar (Kaleo) ²	13	10
BXC Solar ²	20	16
Meinergy ²	20	16
Bui Solar ²	51	46
Safisana Biogas ²	0.1	0.1
Tsatsadu Hydro	0.05	0.05
Distributed Solar PV	30.9	-
Sub-total	144.05	94.65
Off-grid		
Solar	7.42	-
Wind	0.02	-

Sub-total	7.44	-
Mini-grid		
Solar	0.314	-
Wind	0.011	-
Sub-total	0.325	-
Total Renewables	119.865	94.6
Total	5,488.82	4,975.25

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

3.2 Electricity Generation

The electricity generation mix in Ghana has predominantly been from hydro and thermal sources. The share of renewable is gradually increasing due to continuous decline in the cost of PV and wind technologies and concerted effort to diversify the mix. In 2000, hydro plants generated the highest proportion (about 92%) of electricity requirement whereas thermal plants generated the remaining 8%. However, in 2021, the generation mix stood at approximately 34.1% from hydro against 65.3% from thermal and 0.55% from renewables. The share of renewables in the generation mix in 2021, represents a doubling of its 2020 share of 0.28%.

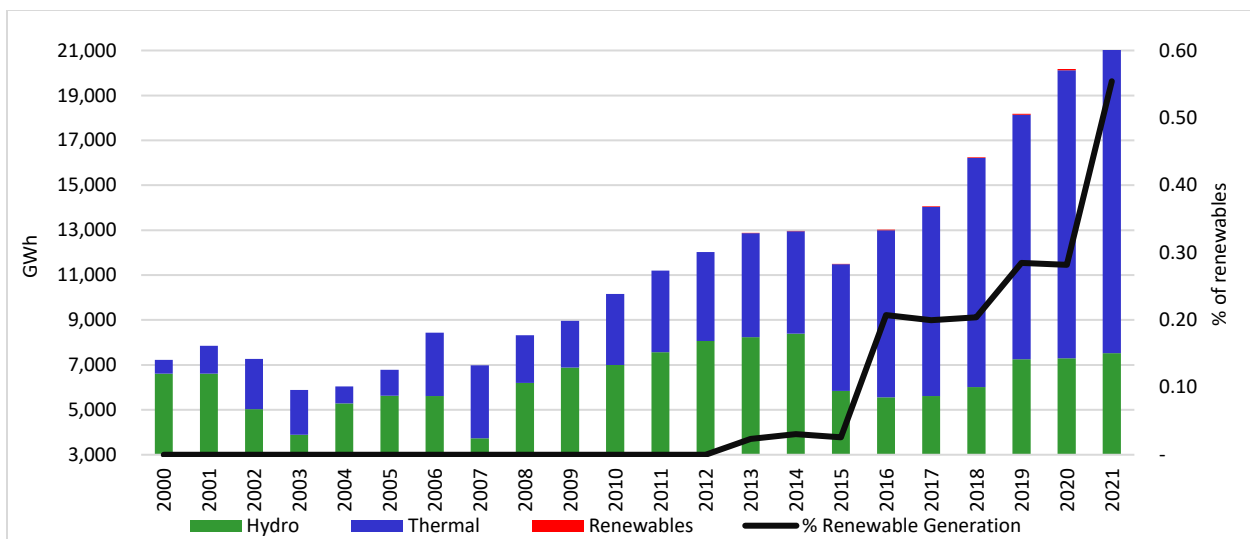


Figure 3.2: Electricity Generation (2000-2021)

Total electricity generation almost doubled from 11,200 GWh in 2011 to 22,051 GWh in 2021, representing an annual average growth rate of 7%. The total electricity generated in 2021 comprised 7,521 GWh from hydro generation, 14,408 GWh from thermal generation and 122 GWh from renewable sources.

Table 3.3: Annual Electricity Generation

Year	Generation (GWh)				Share (%)		
	Hydro	Thermal	Other Renewables	Total	Hydro	Thermal	Other Renewables
2000	6,610	614	-	7,224	92	8	-
2001	6,609	1,250	-	7,859	84	16	-
2002	5,036	2,237	-	7,273	69	31	-
2003	3,885	1,996	-	5,881	66	34	-
2004	5,280	758	-	6,038	87	13	-
2005	5,629	1,159	-	6,788	83	17	-
2006	5,619	2,811	-	8,430	67	33	-
2007	3,727	3,251	-	6,978	53	47	-
2008	6,196	2,129	-	8,325	74	26	-
2009	6,877	2,081	-	8,958	77	23	-
2010	6,995	3,171	-	10,166	69	31	-
2011	7,561	3,639	-	11,200	68	32	-
2012	8,071	3,953	-	12,024	67	33	-
2013	8,233	4,635	3	12,870	64	36	0.02
2014	8,387	4,572	4	12,963	65	35	0.03
2015	5,844	5,644	3	11,491	51	49	0.03
2016	5,561	7,435	27	13,023	43	57	0.21
2017	5,616	8,424	28	14,067	40	60	0.20
2018	6,017	10,195	33	16,246	37	63	0.20
2019	7,252	10,885	52	18,188	40	60	0.28
2020	7,293	12,820	57	20,170	36	64	0.28
2021	7,521	14,408	122	22,051	34	65	0.55

Source: GRIDCo and ECG

3.3 Electricity Export and Import

Export of electricity almost tripled from 392 GWh in 2000 to 1036 GWh in 2010. It then decreased by two-thirds to 377 GWh in 2017 and then increased by about three and half folds to 1734 GWh in 2021 (Table 3.4). On the other hand, electricity imports increased from 864 GWh to 1,146 GWh and then reduced to 44 GWh in 2021 at an annual rate of 15.8%.

Thus, Ghana's net export of electricity has increased from 600 GWh in 2018 to 1,690 GWh in 2021, representing an annual average growth rate of 41%.

Table 3.4: Electricity Import and Export (GWh)

Year	Import	Export	Net Export
2000	864	392	-472
2001	462	302	-160
2002	1,146	612	-534
2003	940	535	-405
2004	878	667	-211
2005	815	639	-176
2006	629	755	126
2007	435	249	-186
2008	275	538	263
2009	198	752	554
2010	141	1,036	896
2011	165	802	637
2012	177	716	539
2013	121	654	533
2014	165	630	465
2015	236	581	346
2016	765	473	-292
2017	320	377	56
2018	140	739	600
2019	127	1,430	1,303
2020	58	1,855	1,797
2021	44	1,734	1,690

Source: GRIDCo

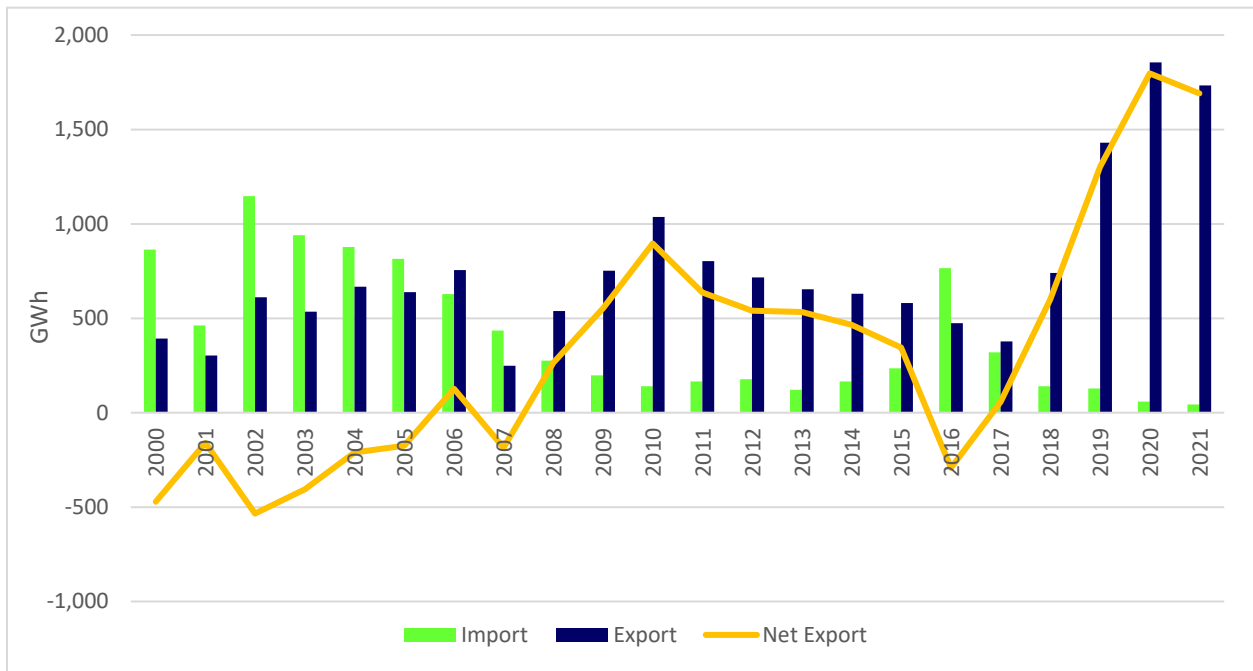


Figure 3.3: Electricity Import and Export

3.4 Peak Load

The Grid system peak load (Ghana Load at Peak + VALCO load + export load) increased by about two folds from 1,161 MW in 2000 to 3,246 MW in 2021, representing an average annual growth rate of 5%. (Table 3.6). Ghana or domestic Peak Load (ECG +NEDCo +Mines + Direct Customers of VRA), on the other hand, increased by about two and a half folds over the same period. Both the system peak load and Ghana or domestic Peak Load increased by about 5% in 2021 over 2020. The trend in the system and domestic peak load recorded over the period is presented in Figure 3.5.

Table 3.5: System and Ghana Peak Load (MW)

Year	System Peak ³	Domestic Peak ⁴
2000	1,161	820
2001	1,190	854
2002	1,227	879
2003	1,135	925
2004	1,049	985
2005	1,325	1,064
2006	1,393	1,104
2007	1,274	1,158
2008	1,367	1,208
2009	1,423	1,263
2010	1,506	1,391
2011	1,665	1,520
2012	1,729	1,658
2013	1,943	1,791
2014	1,970	1,853
2015	1,933	1,757
2016	2,078	1,997
2017	2,192	2,077
2018	2,525	2,371
2019	2,804	2,613
2020	3,090	2,857
2021	3,246	2904

³System Peak = Ghana Load at Peak + VALCO Load + Export Load;

⁴Maximum Demand for Ghana (ECG +NEDCo + Direct Customers of VRA + Mines)

Source: GRIDCO

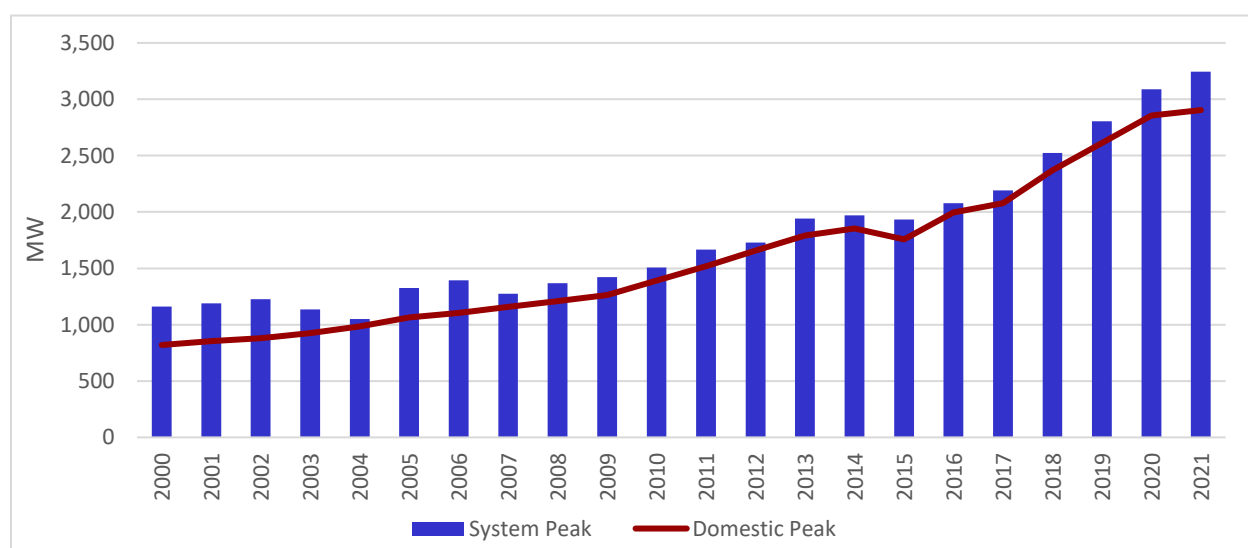


Figure 3.4: System and Ghana Peak Load

3.5 Electricity Demand and Supply Nexus

Ghana experienced an increase of about 180% in system peak load over the last 21 years. This translates into a compound annual growth rate of about 5%. On the other hand, generation capacity has more than tripled over the same period. The installed generation capacity and the peak demand increased by about 2% and 5%, respectively, from 2020 to 2021.

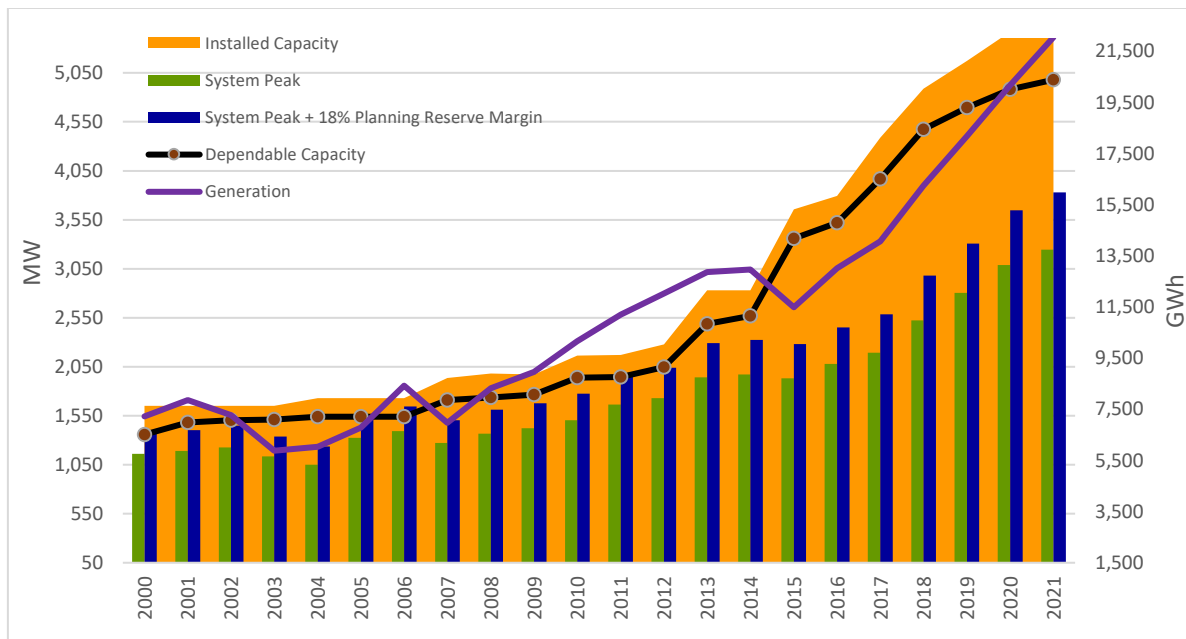


Figure 3.5: Trend in Installed and Dependable Capacity, Peak Load and Generation

3.6 Electricity Transmitted and Losses

Table 3.7 presents the total electricity transmitted as well as transmission losses recorded over the period. The total electricity transmitted increased from 8,067 GWh in 2000 to 21,466 GWh in 2021, representing about 166% increment. The energy transmitted in 2021 shows an increase of about 8.9% over that of 2020.

Transmission losses increased from 229 GWh in 2000 to 1,076 GWh in 2021. The total system transmission loss in 2021 was an increase of about 21% over that of 2020 (Table 3.7). The 2021 losses fell outside the PURC benchmark of not more than 4.1%.

Table 3.6: Electricity Transmitted and Transmission Losses (GWh)

Year	Electricity Transmitted	Transmission Losses	Transmission losses % of total electricity transmitted
2000	8,067	229	2.8
2001	8,293	259	3.1
2002	8,402	368	4.4
2003	6,800	402	5.9
2004	6,891	205	3.0
2005	7,565	249	3.3
2006	9,013	318	3.5
2007	7,123	256	3.6
2008	8,423	303	3.6
2009	9,131	343	3.8
2010	10,267	413	3.7
2011	11,340	505	4.8
2012	12,164	522	4.3
2013	12,927	580	4.4
2014	13,071	565	4.3
2015	11,692	443	3.4
2016	13,700	607	4.4
2017	14,308	587	3.8
2018	15,960	707	4.4
2019	17,887	843	4.7
2020	19,717	888	4.5
2021	21,466	1,076	5.0

Source: GRIDCO

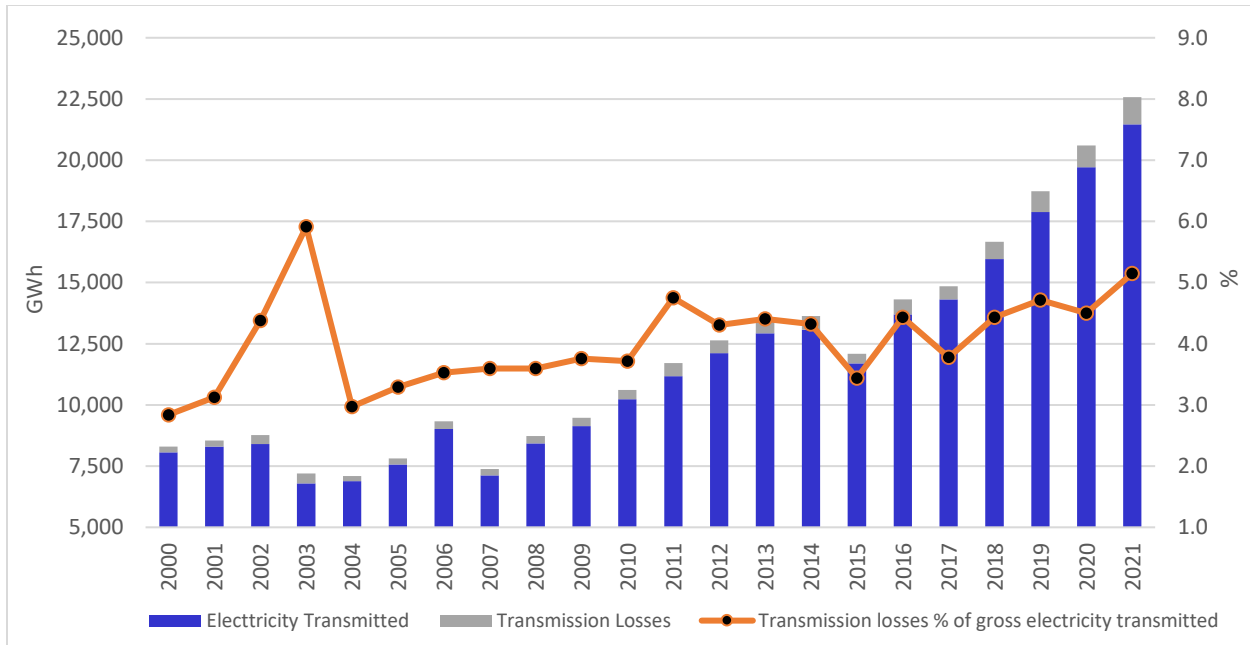


Figure 3.6: Electricity Transmitted and Transmission Losses

3.7 Electricity Purchase, Sales and Losses by Distribution Utilities

Table 3.8 shows the electricity purchases and sales by the Electricity Company of Ghana (ECG), Northern Electricity Distribution Company (NEDCo) and Enclave Power Company. ECG and NEDCo total purchases grew at an average annual growth rate of 6.2% and 8.3% from 2000 to 2021. Enclave Power Company (EPC), having acquired a distribution license in 2015, has since recorded an average annual growth of total purchases of about 14.7%. The total electricity purchase by distribution utilities in 2021 was 16,219 GWh against sales of 11,394 GWh.

Total sales of ECG, NEDCo and EPC increased from 8,251 GWh, 910 GWh and 160 GWh in 2018 to 9,884 GWh, 1,281 GWh and 230 GWh in 2021. ECG remains the largest buyer, taking 86.7% of total purchases, whereas NEDCo (11.3%) and EPC (2.0%) acquired the remaining 13.3%.

The corresponding distribution losses were 4,323 GWh (89.9%), 483 GWh (10.1%) and 3 (0.1%) GWh in 2021 for ECG, NEDCo and EPC, respectively.

Table 3.7: Distribution Utilities' Purchases, Sales and Losses (GWh)

Year	ECG				NEDCo				EPC				Total			
	Purchase	Sales	Losses ⁵	% of Losses	Purchase	Sales	Losses ⁵	% of Losses	Purchase	Sales	Losses ⁵	% of Losses	Purchase	Sales	Losses ⁵	% of Losses
2000	3,989	2,910	1,078	27.03	330	232	98	29.70	-	-	-	-	4,319	3,142	1,176	27.23
2001	4,175	3,080	1,095	26.23	355	251	104	29.30	-	-	-	-	4,530	3,331	1,199	26.47
2002	4,326	3,200	1,126	26.03	383	265	118	30.81	-	-	-	-	4,709	3,466	1,244	26.42
2003	4,496	3,343	1,153	25.65	426	283	143	33.57	-	-	-	-	4,922	3,625	1,296	26.33
2004	4,818	3,539	1,279	26.55	473	323	150	31.71	-	-	-	-	5,291	3,862	1,429	27.01
2005	5,045	3,760	1,285	25.47	501	312	189	37.72	-	-	-	-	5,546	4,072	1,474	26.58
2006	5,253	3,978	1,275	24.27	507	356	151	29.78	-	-	-	-	5,760	4,334	1,426	24.76
2007	5,146	3,909	1,237	24.04	494	366	128	25.91	-	-	-	-	5,640	4,275	1,365	24.20
2008	5,799	4,317	1,482	25.56	529	392	137	25.90	-	-	-	-	6,328	4,709	1,619	25.58
2009	6,052	4,483	1,570	25.94	566	413	153	27.03	-	-	-	-	6,618	4,896	1,723	26.04
2010	6,771	4,756	2,015	29.76	635	511	124	19.53	-	-	-	-	7,406	5,266	2,139	28.88
2011	7,259	5,050	2,209	30.43	719	581	138	19.19	-	-	-	-	7,978	5,631	2,347	29.42
2012	7,944	5,823	2,121	26.70	822	658	165	20.07	-	-	-	-	8,766	6,480	2,286	26.08
2013	8,479	6,496	1,983	23.39	937	737	200	21.34	-	-	-	-	9,416	7,233	2,183	23.18
2014	8,370	6,262	2,108	25.19	998	759	239	23.95	-	-	-	-	9,368	7,020	2,347	25.05
2015	7,544	5,831	1,713	22.71	1,013	720	294	29.02	102	96	6	6.17	8,659	6,646	2,013	23.25
2016	9,316	7,115	2,201	23.63	1,123	763	360	32.05	108	100	8	7.01	10,546	7,977	2,568	24.35
2017	9,783	7,575	2,208	22.57	1,224	889	335	27.38	157	155	3	1.68	11,165	8,618	2,546	22.80
2018	10,901	8,251	2,649	24.30	1,318	910	408	30.98	161	160	4	2.68	12,379	9,321	3,062	24.73
2019	11,535	8,685	2,850	24.71	1,413	1,010	403	28.53	235	229	6	2.59	13,183	9,924	3,260	24.72
2020	12,706	9,333	3,374	26.55	1,576	1,148	428	27.17	242	237	5	2.12	14,524	10,717	3,807	26.21
2021	14,222	9,884	4,323	30.39	1,764	1,281	483	27.40	232	230	3	1.21	16,219	11,394	4,809	29.7

⁵ Distribution Losses include technical and commercial losses

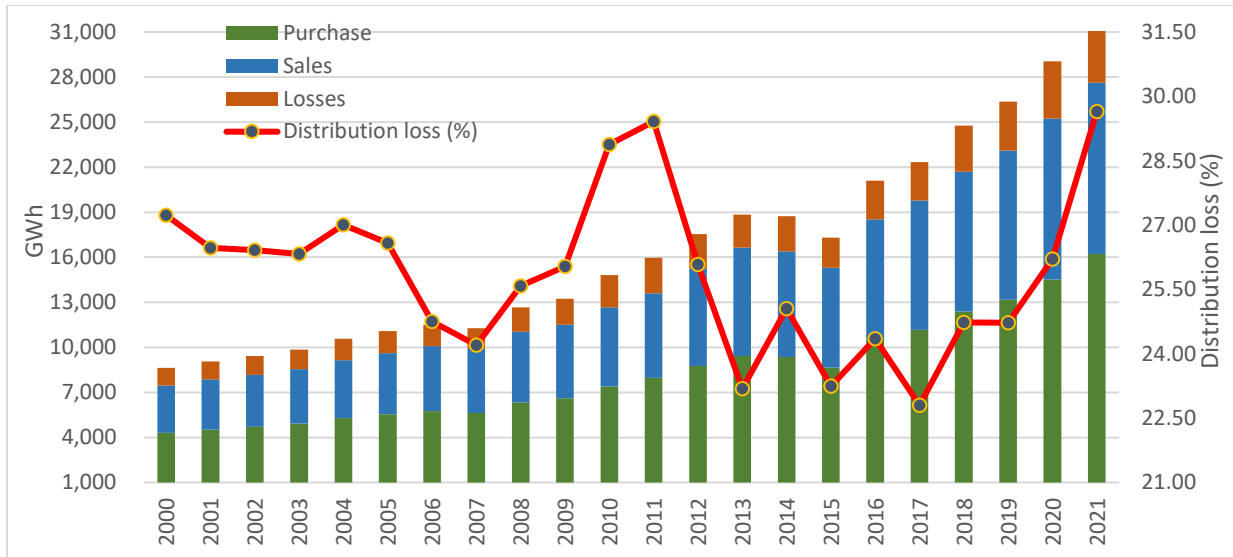


Figure 3.7: DISCO's Purchases, Sales and Losses

3.8 Electricity Consumption

Table 3.9 shows the final electricity consumption by the various sectors of the economy. Total electricity consumption increased annually at a rate of 4.7% from 2000 to 2021. Considerable increase in consumption of about 21.8%, 15.1%, 14.3% and 17.9% occurred in 2006, 2008, 2013 and 2016 respectively. However, electricity consumption decreased appreciably in 2003 and 2007 from the preceding year's consumption by 23.4% and 13.2% respectively. The decline was attributed to supply-side constraints.

Electricity consumption by the industrial and residential sectors accounted for 31.8% and 47% of the total electricity consumed in 2021, respectively, compared to about 30.4% and 43% of the final electricity consumption in 2020. The trend in electricity consumption by the various sectors is presented in Figure 3.9.

Table 3.8: Electricity Consumption by Sectors (GWh)

Year	Residential	Industry	Service	Agriculture	Transport	Total
2000	2,026	4,380	476	2	4	6,889
2001	2,174	4,455	491	4	4	7,128
2002	2,249	4,001	513	5	4	6,773
2003	2,360	2,249	558	6	14	5,187
2004	2,528	2,177	571	8	16	5,299
2005	2,699	2,558	655	10	11	5,932
2006	2,705	4,001	500	9	9	7,224
2007	2,604	3,254	392	8	12	6,270
2008	3,019	3,740	439	9	11	7,219
2009	3,384	3,357	688	16	9	7,454
2010	3,786	2,775	1,745	2	10	8,317
2011	3,822	3,454	1,897	2	13	9,187
2012	3,729	3,478	2,040	2	9	9,258
2013	4,230	3,876	2,470	2	5	10,583
2014	4,043	4,003	2,640	3	7	10,695
2015	5,048	4,185	1,381	6	5	10,625
2016	5,214	4,611	2,687	8	7	12,528
2017	5,699	4,583	2,738	9	8	13,036
2018	6,877	5,029	2,475	10	9	14,401
2019	6,968	5,260	2,982	11	10	15,232
2020	7,765	5,499	3,242	12	12	16,531
2021	8,484	5,746	3,827	6	6	18,067

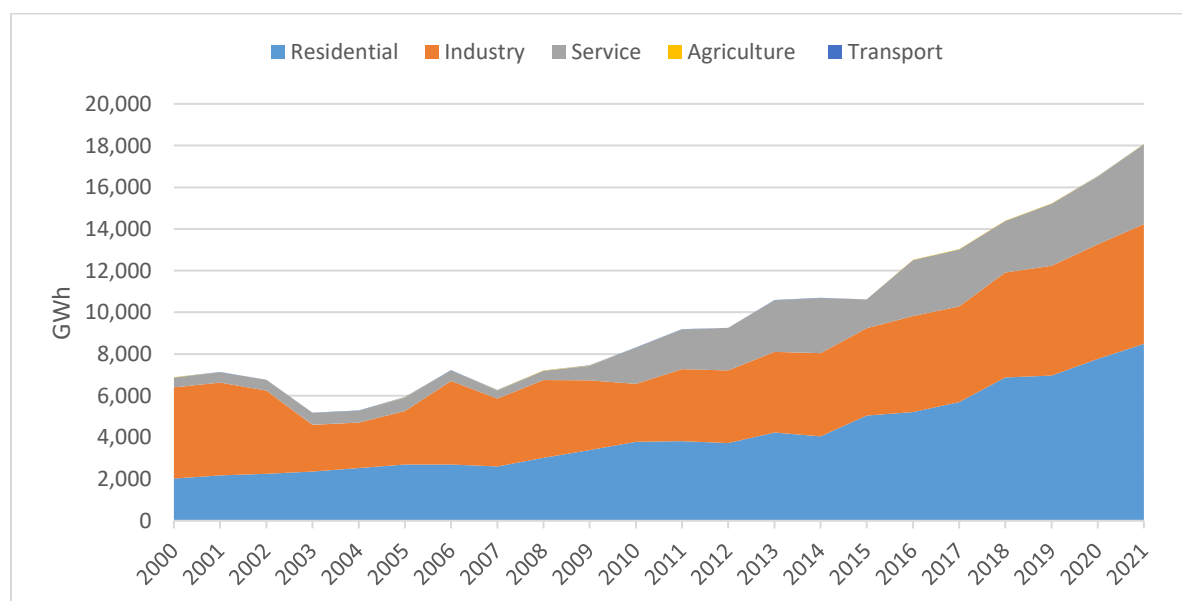


Figure 3.8: Electricity Consumption by Sectors

3.9 Customer Population by classification

The total customer population increased from 1,109,357 in 2000 to 5,426,242 in 2021, representing an annual growth rate of 8.7%. Within the same period, ECG and NEDCO customers grew at annual rates of 8.1% and 11.7%, respectively. Since 2015, EPC customer population has increased at an annual rate of 15.8%. As of 2021, the largest electricity service provider in Ghana at the distribution level is still ECG with about 79% of the total customer population of 5,426,242, followed by NEDCo with about 20.9%, then EPC with about 0.003%. From 2000 to 2021, the total population of residential customers increased by about five-fold, whilst that of non-residential and Special Load Tariff (SLT) increased by about three and half folds, and one and half folds respectively. In 2021, residential, non-residential and SLT customers accounted for about 85.5%, 14.3% and 0.04% respectively of the total customer population.

Table 3.9: Distribution Utilities Customer Population

Year	Residential	Non-Residential	SLT	Total
2000	758,558	173,245	795	932,598
2001	832,212	189,807	828	1,022,847
2002	902,815	205,687	855	1,109,357
2003	1,014,404	230,651	880	1,245,935
2004	1,146,016	253,340	902	1,400,258
2005	1,253,330	272,442	964	1,526,736
2006	1,347,067	295,703	1,016	1,643,786
2007	1,463,679	328,511	1,055	1,793,245
2008	1,634,407	365,844	1,157	2,001,408
2009	1,856,962	413,634	1,233	2,271,829
2010	2,006,972	454,430	1,369	2,462,771
2011	2,209,957	505,447	1,481	2,716,885
2012	2,511,208	514,492	1,647	3,027,347
2013	2,582,294	545,665	1,882	3,129,841
2014	2,789,913	779,780	2,034	3,571,727
2015	3,445,423	630,518	2,115	4,078,055
2016	3,600,185	568,473	1,438	4,170,096
2017	3,474,163	641,003	1,496	4,116,662
2018	3,743,430	650,971	1,544	4,395,945
2019	4,046,358	692,046	1,744	4,740,148
2020	4,275,929	733,550	1,805	5,011,284
2021	4,648,932	775,312	1,998	5,426,242

Source: ECG, EPC & NEDCo

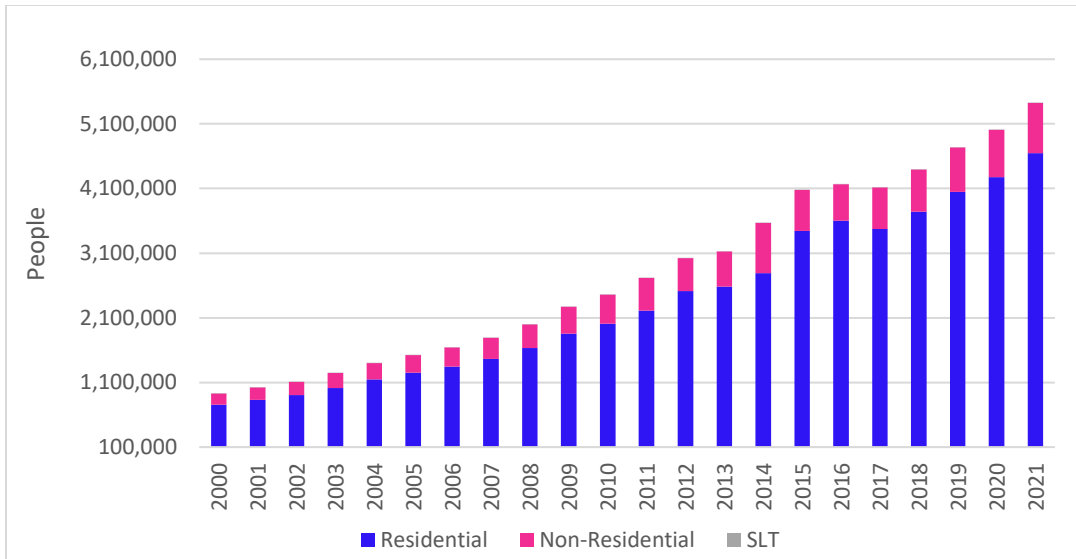


Figure 3.9: Customer Population

3.10 Dam Headwater level

The water levels of the two major dams in the country, the Akosombo and Bui, have remained largely above their respective minimum levels of 240 ft and 550 ft, respectively, as shown in Figure 3.11 and Figure 3.12 respectively. Tables 3.11 and 3.12 show the summary of Akosombo and Bui dam water levels.

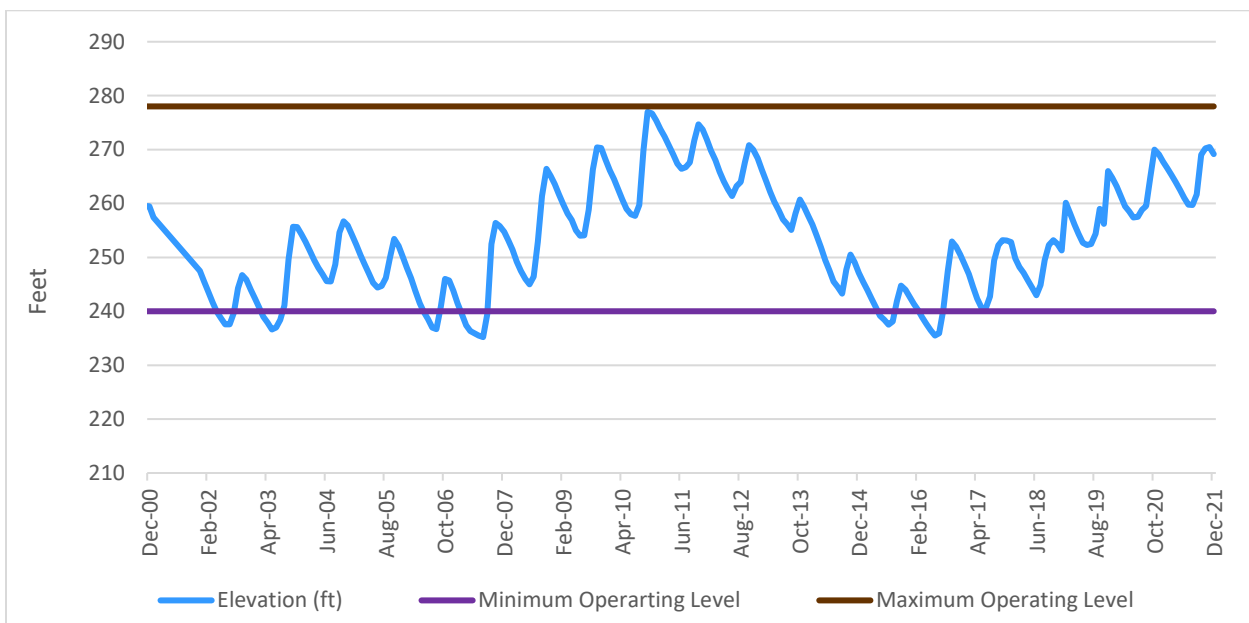


Figure 3.10: Trend in Akosombo Headwater Level

Table 3.10: Akosombo Dam Month End Elevation (feet)

Years	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2000	260	258	257	255	253	252	252	255	260	263	262	260
2001	257	255	253	251	250	248	247	246	250	252	249	248
2002	246	244	242	240	239	238	238	240	244	247	246	244
2003	242	241	239	238	237	237	238	241	250	256	256	254
2004	253	251	250	248	247	246	246	249	255	257	256	254
2005	252	250	249	247	245	244	245	246	250	253	252	250
2006	248	246	244	242	240	239	237	237	241	246	246	244
2007	242	239	237	236	236	236	235	240	253	256	256	255
2008	253	251	249	248	246	245	246	253	261	266	265	264
2009	262	260	258	257	255	254	254	259	266	270	270	268
2010	266	265	263	261	259	258	258	260	270	277	277	275
2011	274	272	271	269	267	266	267	268	272	275	274	272
2012	270	268	266	264	263	261	263	264	268	271	270	268
2013	266	264	262	260	259	257	256	255	258	261	259	258
2014	256	254	252	250	248	246	245	243	248	251	249	247
2015	245	244	242	241	239	238	238	238	242	245	244	243
2016	241	240	239	238	236	236	236	240	247	253	252	251
2017	249	247	245	242	241	240	243	249	252	253	253	253
2018	250	248	247	246	244	243	245	250	252	253	253	251
2019	260	258	256	254	253	252	253	254	259	256	266	265
2020	263	261	260	259	257	257	259	260	265	270	269	268
2021	267	265	264	263	261	260	260	262	269	270	270	269

Table 3.11: Bui Dam Month-End Elevation (feet)

Month	2014	2015	2016	2017	2018	2019	2020	2021
Jan	576	582	586	577	577	573	588	559
Feb	571	578	580	573	573	566	582	553
Mar	565	574	574	565	565	561	575	550
Apr	559	571	565	562	562	557	570	549
May	554	567	554	559	559	554	564	547
Jun	551	563	552	557	557	554	561	547
Jul	552	558	552	557	557	558	559	550
Aug	554	555	554	559	559	565	559	566
Sep	559	561	563	564	564	586	563	588
Oct	572	575	581	576	576	600	573	591
Nov	584	592	585	579	579	597	570	588
Dec	584	591	581	576	576	592	565	583

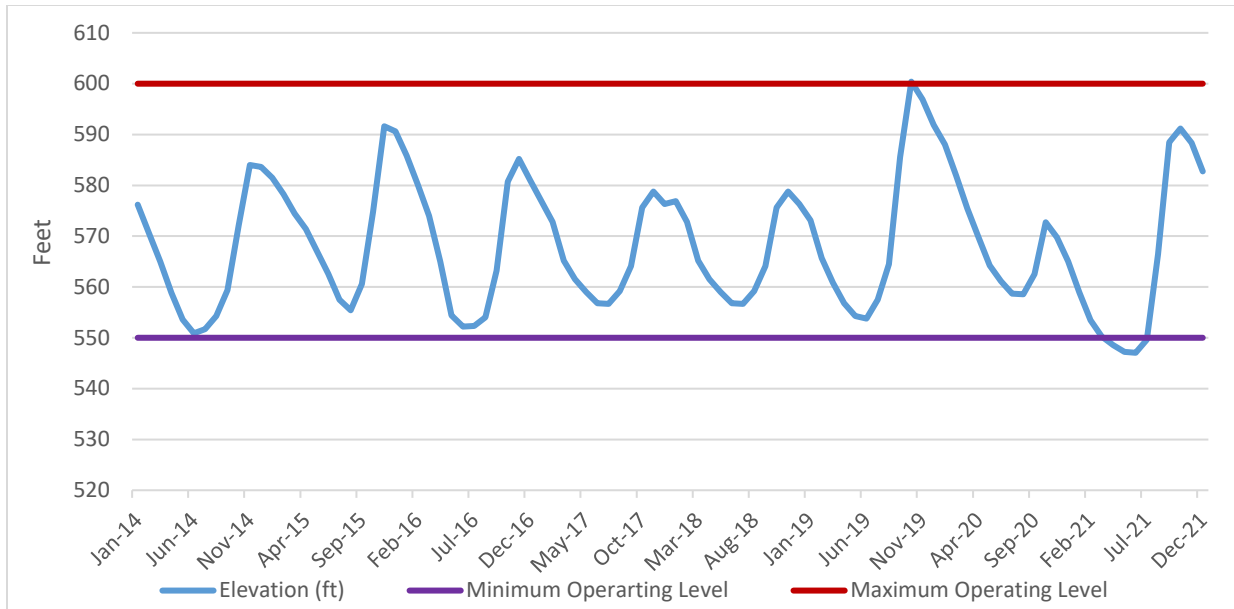


Figure 3.11: Trend in Bui Dam Headwater Level

3.11 Electricity Distribution Reliability Indices

Reliability of a power distribution system is defined as the ability to deliver uninterrupted service to customers. Reliability Indices for frequency and duration are used to quantify the performance of the utility systems. Reliability indices for ECG and NEDCo is presented in Table 3.13.

The System Average Interruption Frequency Index (SAIFI) is a measure of the number of interruptions recorded for the distribution system during a year. As presented in Table 3.13, ECG and NEDCo have both exceeded the maximum number of outages permitted per year according to the regulatory benchmark (per L.I 1935) from 2015 to 2021.

Also, the System Average Interruption Duration Index (SAIDI) provides information about the average duration of interruptions recorded for a distribution system during a year. Since 2015, ECG has exceeded the 48 hours maximum average duration of outage per year in metropolitan areas thrice; in 2015, 2016 and 2019. The average outage duration in metropolitan areas peaked in 2015 and 2016 at 161 hours and 130 hours respectively. However, the urban and rural yearly average duration of outage exceeded the allowable average duration of 72 hours and 144 hours respectively only twice since 2015.

NEDCo, since 2017 has had its System average duration of outage per year in rural areas within the regulatory benchmark. Within that same period, metropolitan areas, on the other, have had their yearly average duration of outage exceeding the regulatory benchmark. In 2017, 2018 and 2019 only, NEDCo's average duration of outage in urban areas was 117 hours, 123 hours and 85 hours respectively exceeding the benchmark specified in L.I. 1935.

The average duration of interruptions for customers interrupted during a year is measured using the Customer Average Interruption Duration Index (CAIDI). From Table 3.13, the average duration of interruptions experienced by customers from 2015 to 2021 did not exceed the regulatory benchmark of eight hours, in a metropolitan area, twelve hours, in an urban area, and twenty-four hours, in a rural area. The average duration of interruptions experienced by both ECG and NEDCo customers was 1.8 hours in 2021 which is relatively consistent with previous years except for the preceding year for ECG customers.

Table 3.12: Electricity Distribution Reliability Indices

Reliability Index	Area	Regulatory Benchmarks per L.I 1935	2015		2016		2017		2018		2019		2020		2021	
			ECG	NEDCo	ECG	NEDCo	ECG	NEDCo	ECG	NEDCo	ECG	NEDCo	ECG	NEDCo	ECG	NEDCo
System Average Interruption Frequency Index (SAIFI)	Metro	6	74	N/A	60	42	48	132	28	146	27	42	16	51	17	28
	Urban	6	74		89		88		57		45	60	26	34	27	25
	Rural	6	109		108		104		61		60	53	34	48	28	55
System Average Interruption Duration Index (SAIDI)	Metro	48 hours	161	N/A	130	41	77	117	44	123	38	61	24	65	26	59
	Urban	72 hours	13		146		115		71		63	85	43	45	52	39
	Rural	144 hours	203		156		135		76		80	75	52	80	56	81
Customer Average Interruption Duration Index (CAIDI)	Metro	8 hours	2	N/A	2	1	2	1	2	1	1	1	6	1	2	2.2
	Urban	12 hours	2		2		1		1		1	1	7	1	2	1.6
	Rural	24 hours	2		2		1		1		1	1	6	2	2	1.5

SECTION 4: PETROLEUM

Ghana currently has three offshore producing fields; Jubilee, Tweneboa, Enyere and Ntomme (TEN) and Sankofa and Gye Nyame Field. In 2007, the Jubilee field became Ghana's first major commercial discovery. Before the discovery of Jubilee fields, Ghana had been producing oil, albeit on a limited scale, since the 1980s from the Saltpond Fields.

4.1 Crude Oil Production

Table 4.1 indicates the quantity of crude oil produced in the country from 2002 to 2021. Since the inception of commercial production of crude oil in 2011, there has been an increase in production at an annual growth rate of 8.7% as of the end of 2021. Despite the increase in production, in 2016, 2020 and 2021, production reduced by about 13.8%, 6.3% and 17.7% from their preceding year's production. Ghana's three offshore fields produced a total of 55,050 thousand barrels of crude oil in 2021 (Figure 4.1).

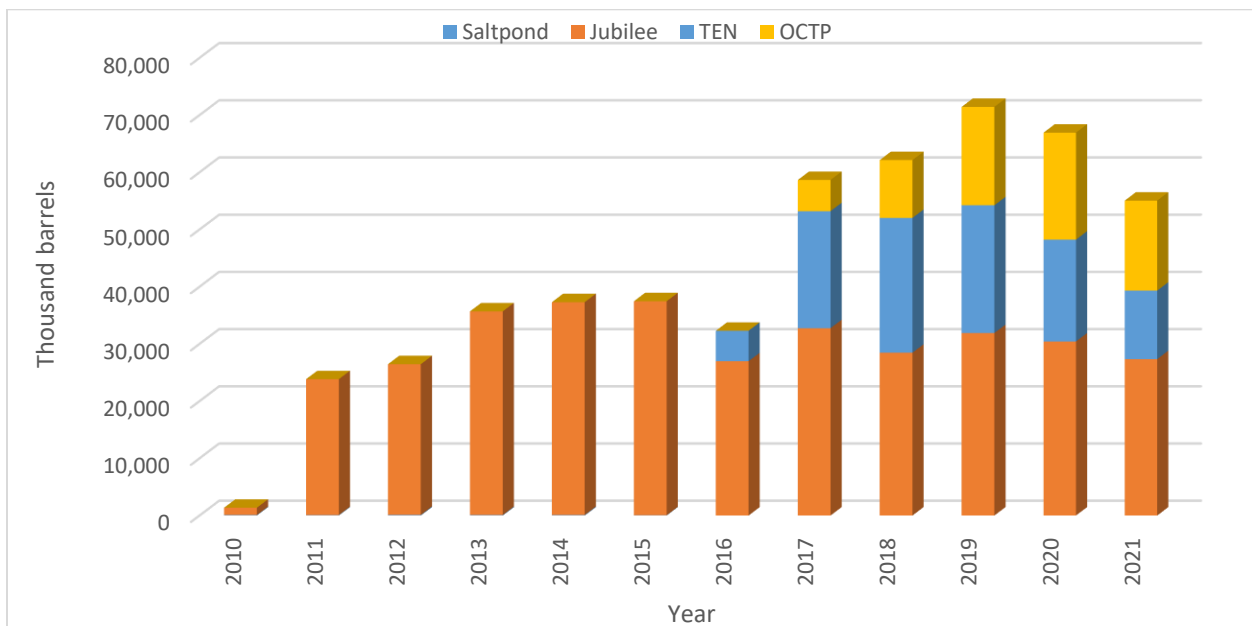


Figure 4.1: Trend in Crude Oil Production

Table 4.1: Crude Oil Production (thousand barrels)

Year	Saltpond	Jubilee	TEN	OCTP	Total
2002	62	-	-	-	62
2003	72	-	-	-	72
2004	160	-	-	-	160
2005	82	-	-	-	82
2006	160	-	-	-	160
2007	189	-	-	-	189
2008	214	-	-	-	214
2009	173	-	-	-	173
2010	98	1,268	-	-	1,365
2011	76	23,758	-	-	23,833
2012	105	28,831	-	-	28,937
2013	98	36,760	-	-	36,859
2014	97	37,202	-	-	37,299
2015	47	37,412	-	-	37,458
2016	-	26,982	5,316	-	32,298
2017	-	32,750	20,453	5,456	58,658
2018	-	28,462	23,557	10,116	62,135
2019	-	31,915	22,319	17,205	71,440
2020	-	30,425	17,803	18,700	66,927
2021	-	27,335	11,978	15,737	55,050

Source: Petroleum Commission & Ghana National Petroleum Corporation

4.2 Crude Oil Import and Export

Ghana imported 8,994 thousand barrels of Crude oil in 2000. Since then crude oil imports increased to 11,638 thousand barrels in 2010 and decreased significantly to 2,173 thousand barrels in 2015. Imports then increased to 10,119 thousand barrels in 2016 and thereafter decreased at an annual rate of 44.9% to 514 thousand barrels in 2021.

Crude oil import for power generation reduced significantly from 6,495 thousand barrels in 2013 to 382 thousand barrels in 2020. In 2021, virtually all crude oil imports were used by refineries (Table 4.2).

Crude oil export substantially increased in 2011 with the commencement of commercial production. It increased from 24,451 thousand barrels in 2011 to 55,416 thousand barrels in 2021, at a compound annual growth rate of 8.5%.

Table 4.2: Crude Oil Import and Export

Year	Import (000' bbls)			Export (000' bbls)
	Refinery use	Electricity Generation	Total Import	
2000	7,923	1,072	8,994	-
2001	8,840	1,931	10,772	-
2002	8,256	4,212	12,467	62
2003	9,843	3,693	13,537	72
2004	12,695	1,144	13,838	160
2005	11,519	2,254	13,772	82
2006	6,735	5,254	11,990	160
2007	8,698	5,679	14,376	189
2008	9,777	4,054	13,831	214
2009	3,090	3,787	6,877	173
2010	6,728	4,910	11,638	98
2011	8,919	1,802	10,721	24,451
2012	3,541	4,926	8,467	26,431
2013	2,621	6,495	9,116	35,194
2014	491	4,362	4,852	37,703
2015	433	1,741	2,173	36,460
2016	6,920	3,199	10,119	29,904
2017	385	1,248	1,633	56,990
2018	984	395	1,379	62,020
2019	4,901	909	5,810	70,985
2020	4,461	382	4,843	67,458
2021	514	0	514	55,416

Source: NPA & Petroleum Commission

Figure 4.2 shows the trend in crude oil import and export from 2000 to 2020.

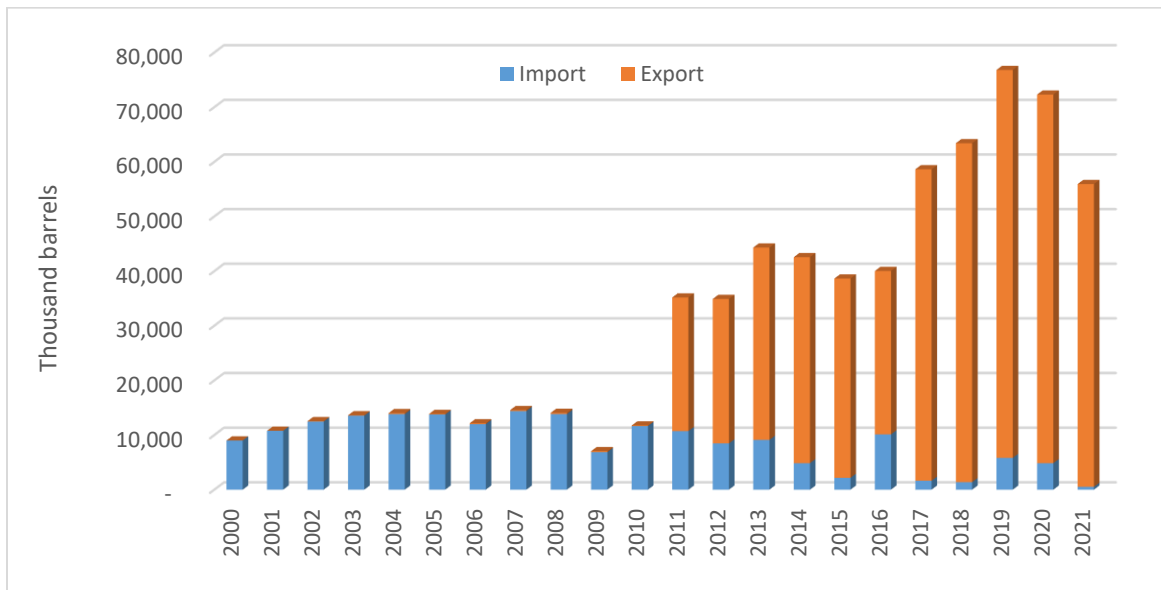


Figure 4.2: Trend in Crude Oil Import and Export

4.3 Natural Gas Production and Import

Ghana started full commercial natural gas production from the Jubilee field in 2014 with a production volume of about 2 tBtu. Production of natural gas since then has increased significantly to 107.83 tBtu in 2021 at an annual average growth rate of 76.3% (Table 4.3).

Natural gas is imported from Nigeria via the West African Gas Pipeline (WAGP). However, there has been a reduction in the imports of natural gas due to the increase in the production from indigenous sources (Figure 4.3). The bulk of gas imported is utilised for electricity generating, with only a small proportion, less than 2%, used for non-power activities. In 2020, a total of 18.71 tBtu was imported representing a reduction of 23.5% over the preceding year's import.

Table 4.3: Natural Gas Production and Import

Year	Production ¹ (tbtu)	Import ² (tbtu)
2009	-	0.2
2010	-	15.6
2011	-	30.5
2012	-	15.4
2013	-	11.6
2014	2.0	22.5
2015	26.4	20.6
2016	23.5	4.0
2017	33.7	11.7
2018	39.1	26.0
2019	55.3	23.8
2020	95.2	24.4
2021	107.8	18.71

¹Include natural gas production from GNGC and non-associated gas

²Natural gas delivered through WAGP

Source: GNGC & VRA

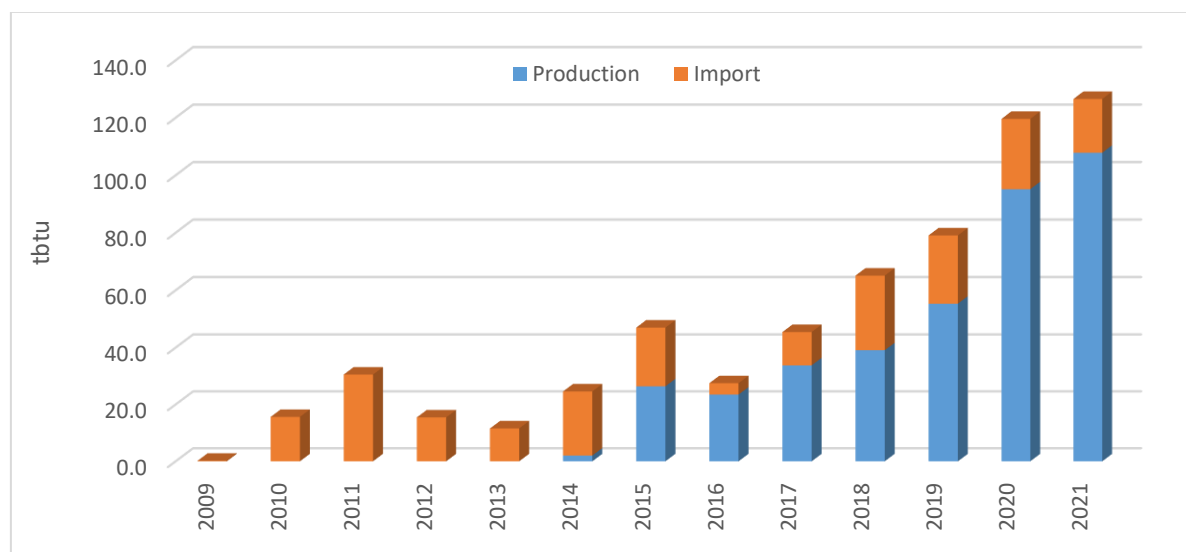


Figure 4.3: Trend in Natural Gas Production and Import

4.4 Petroleum Products Production

The production of petroleum products declined by almost two-folds, from 1,028 kt in 2000 to 378 kt in 2021. The lowest level of production of petroleum products in the country was recorded in 2015 with a production level of 89 kt (Table 4.4).

Unlike LPG which had an increased production of about 11.8% from 2020 to 2021, production volumes of gasoline, kerosene, ATK, gas oil and RFO decreased by 34.6%, 33.6%, 97.5%, 53.2% and 32.7% respectively in 2021 over 2020 production volumes.

Table 4.4: Production of Petroleum Products (kt)

Year	LPG	Gasoline	Kerosene	ATK	Gas Oil	RFO	Total
2000	10	239	52	108	358	262	1,028
2001	7	286	98	64	353	261	1,070
2002	24	346	61	82	447	196	1,155
2003	53	434	110	86	507	164	1,352
2004	66	553	111	107	568	199	1,604
2005	75	567	88	119	486	205	1,541
2006	36	294	65	46	294	156	891
2007	67	493	122	66	398	49	1,195
2008	55	391	169	21	361	225	1,222
2009	14	135	49	1	103	25	327
2010	32	338	71	117	293	97	946
2011	45	344	53	116	310	91	958
2012	27	158	21	48	122	79	454
2013	26	167	15	60	113	43	424
2014	3	40	4.5	9	28	44	129
2015	2	32	0.2	18	28	9	89
2016	114	244	24.5	38	255	64	739
2017	114	6	2	0	6	4	133
2018	88	102	33	22	114	32	390
2019	70	125	12	80	198	205	690
2020	85	66	35	28	150	216	580
2021	95	43	24	1	70	145	378

Source: TOR, GNGC & NPA

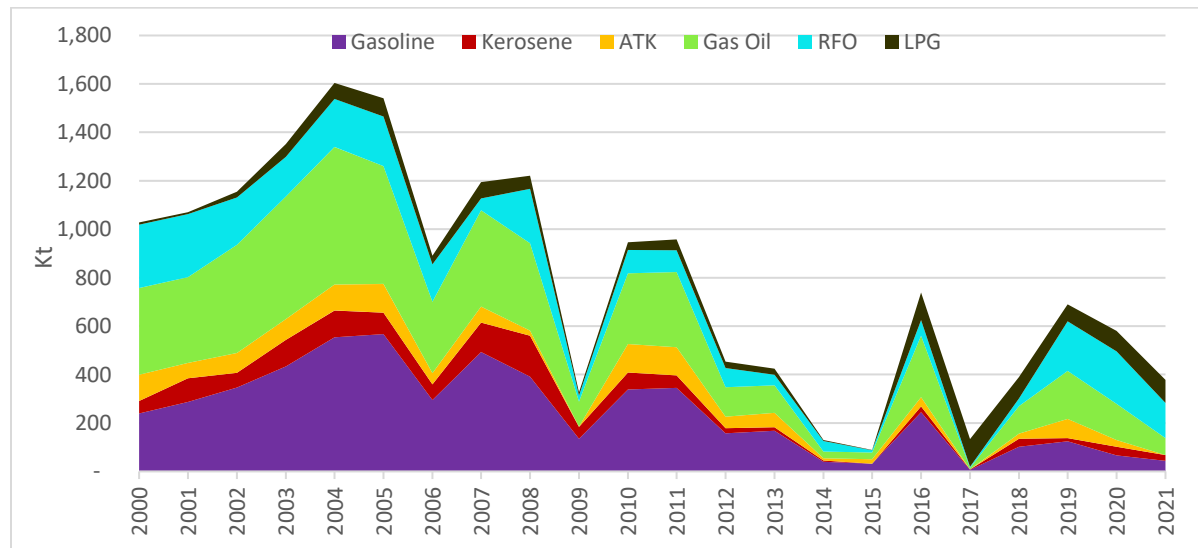


Figure 4.4: Trend in Production of Petroleum Products

4.5 Petroleum Products Import

Table 4.5 presents import data for the period 2000 to 2021. The table shows that the imports volumes for gasoline and gasoil have increased significantly over the period. Importation of gasoline and gasoil increased at a compound annual growth rate of 7.5% and 8% respectively from 2000 to 2021. ATK grew at about 5.9% from 2006 to 2021 whilst HFO import increased 44 kt in 2013 to 649 kt and then declined to 85 kt in 2021. The reduction in HFO imports is primarily due to the increased utilization of natural gas by thermal power plants. Import of LPG grew at an annual rate of 10% from 2000 to 2021. The total volume of petroleum products imported in 2021 was 4,126 kilotonnes representing about four-fold increase over the volume in 2000.

Table 4.5: Petroleum Products Import (kt)

Year	LPG	Gasoline	Kerosene	ATK	Gas Oil	DPK	HFO	Total
2000	35	387	30	0	363	0	0	816
2001	36	389	22	0	354	0	0	801
2002	32	371	49	0	298	0	0	750
2003	17	232	35	0	286	0	0	569
2004	11	255	0	0	313	0	0	579
2005	7	167	0	0	404	0	0	578
2006	68	360	100	79	780	0	0	1,387
2007	47	275	67	43	807	0	0	1,238
2008	68	255	136	156	579	0	0	1,194
2009	151	563	78	84	970	0	0	1,845
2010	148	570	0	0	872	0	0	1,590
2011	178	713	0	0	1,201	18	0	2,109
2012	242	812	0	96	1,309	115	0	2,573
2013	204	1,017	0	41	1,639	0	44	2,946
2014	236	1,254	0	112	1,742	0	49	3,394
2015	198	1,182	0	109	2,161	0	0	3,650
2016	178	1,236	0	113	1,720	0	386	3,632
2017	202	1,304	0	181	1,781	0	608	4,076
2018	315	1,324	0	184	1,753	0	649	4,224
2019	275	1,265	0	181	1,742	0	366	3,829
2020	262	1,625	0	80	1,937	0	63	3,965
2021	263	1,769	0	188	1,820	0	85	4,126

Source: National Petroleum Authority

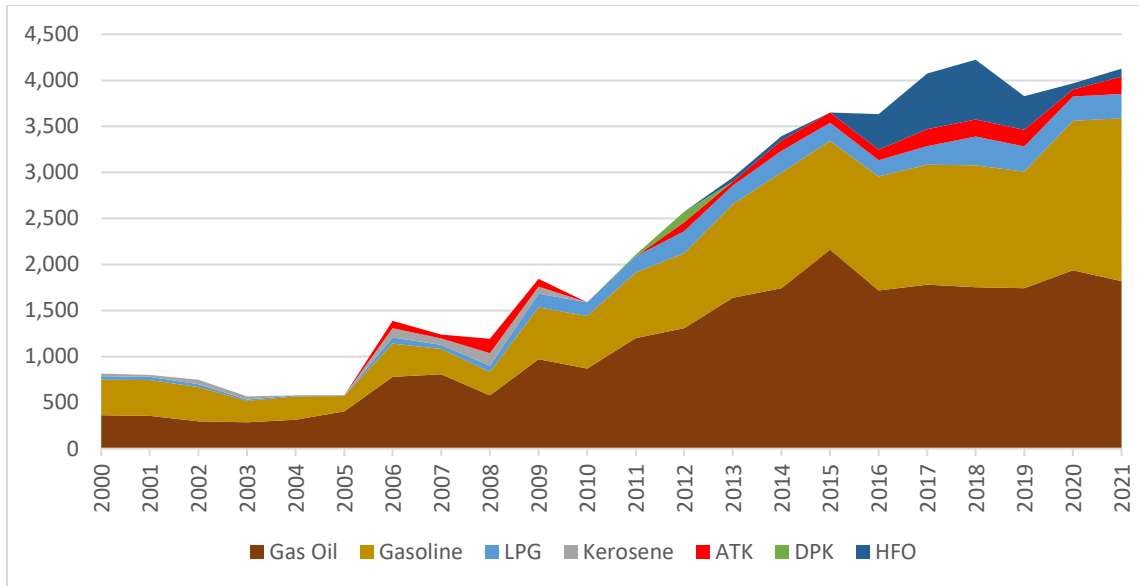


Figure 4.5: Trend in Petroleum Product Import

4.6 Petroleum Products Export

Petroleum products export is presented in Table 4.6. LPG export decreased at a compound annual growth rate of 21.4%, from 6 kt in 2000 to 0.04 kt in 2021. However, since 2018, petroleum products export has reduced significantly at an annual rate of 82.3%. ATK export (including volumes transferred to aircrafts engaged in international aviation bunkering) increased by about doubled from 95 kt in 2000 to 184 kt in 2021. Fuel oil export volumes decreased at a compound annual rate of 4.3% from 2000 to 2021. The highest quantity fuel oil exported was 216 kt in 2001 (Figure 4.6).

Gasoil and Gasoline export (including gasoil supplies to ships engaged in international marine bunkering) increased by 28.9% and 0.6%, respectively, from 2000 to 2019. Export volumes of gasoil and gasoline then reduced significantly from 125 kt and 108 kt respectively in 2019 to 10 kt and 18 kt respectively in 2021.

Table 4.6: Petroleum Products Export (kt)

Year	LPG	Gas Oil ¹	Fuel Oil	ATK ²	Gasolines	Total
2000	6	1	191	95	97	389
2001	1	1	216	75	127	419
2002	4	2	152	88	129	375
2003	11	12	89	84	104	301
2004	6	42	169	99	151	467
2005	13	38	163	110	204	526
2006	10	66	46	105	113	341
2007	10	53	26	114	164	366
2008	5	88	148	107	78	427
2009	1	382	30	111	41	566
2010	-	304	41	97	104	545
2011	-	437	44	136	155	772
2012	-	162	45	125	54	385
2013	-	104	4	116	36	259
2014	-	22	-	100	10	131
2015	-	14	-	92	10	116
2016	25	173	70	123	272	662
2017	40	279	53	135	184	692
2018	5	45	41	177	67	336
2019	1	125	66	205	108	505
2020	3	10	173	113	5	305
2021	0.04	10	75	184	18	288

¹Includes sales to international marine bunkers

²Includes sales to international aviation bunkers

Source: NPA and JUHI Ghana

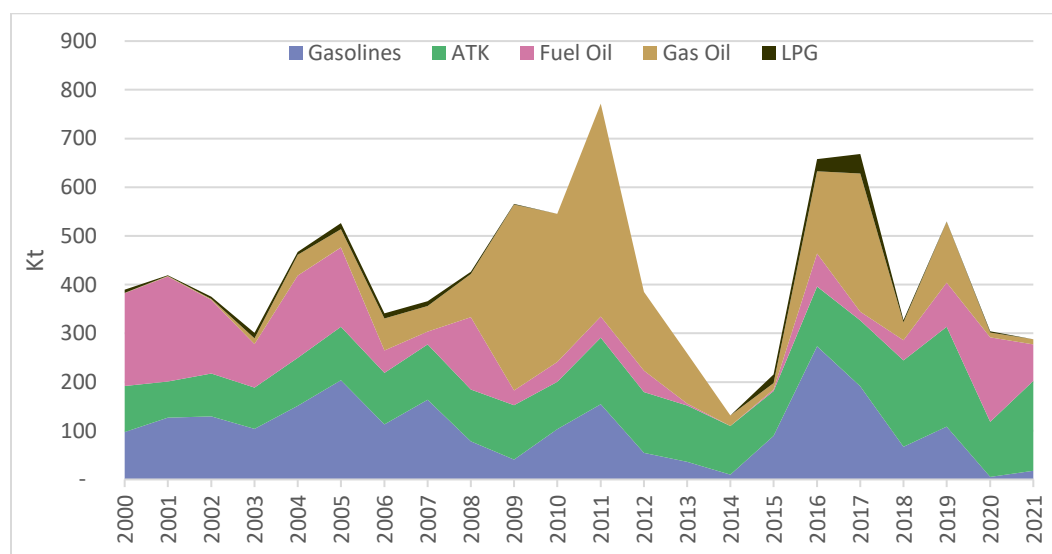


Figure 4.6: Trend in the Export of Petroleum Products

4.7 Final Consumption of Petroleum Products

Petroleum products consumption by fuel and sector are presented in Tables 4.7 and 4.8, respectively. Since 2000, final consumption of petroleum products has tripled to 4,630 ktoe in 2021 at an annual growth rate of 5.7%. Gasoline and gasoil constitute an average of 36.4% and 51.6% of the total petroleum products consumed in the country over the last 21 years respectively.

Table 4.7: Petroleum Products Consumption by Fuels (Ktoe)

Year	LPG	Gasoline / Premix	Kerosene / ATK	Gas Oil	RFO	Natural Gas	Total
2000	49	584	72	679	59	-	1,442
2001	46	591	74	699	54	-	1,464
2002	54	628	79	732	53	-	1,546
2003	61	535	77	770	47	-	1,491
2004	71	634	84	866	47	-	1,701
2005	76	599	86	898	49	-	1,708
2006	95	574	88	953	59	-	1,769
2007	101	616	77	1,170	53	-	2,016
2008	127	627	49	1,114	49	-	1,966
2009	238	796	106	1,306	41	-	2,487
2010	193	810	62	1,297	32	-	2,394
2011	232	895	82	1,460	36	-	2,705
2012	290	1,104	64	1,698	32	-	3,189
2013	272	1,196	45	1,757	38	-	3,308
2014	261	1,216	24	1,747	26	-	3,275
2015	301	1,271	26	1,941	13	-	3,552
2016	304	1,181	17	1,800	13	5	3,320
2017	299	1,229	21	1,557	10	46	3,162
2018	311	1,417	17	1,748	35	65	3,593
2019	324	1,531	22	1,859	40	74	3,849
2020	359	1,699	15	2,017	47	118	4,255
2021	373	1,880	17	2,130	77	153	4,630

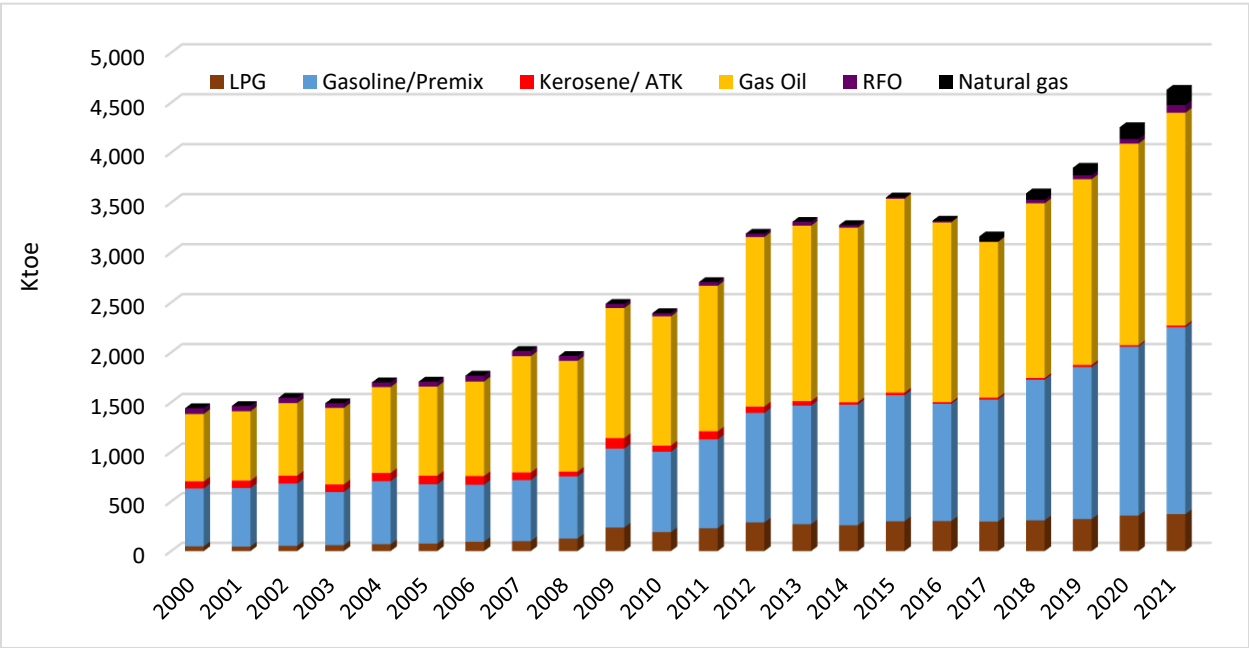


Figure 4.7: Final Energy Consumption of Petroleum Products by Fuel, 2000-2021

The consumption of petroleum products by sector is shown in Figure 4.8. The transport sector remains the main consumer of petroleum products with an annual average growth rate of 5.6% from 2000 to 2021. Table 4.8 presents consumption of petroleum products by sector from 2000 to 2021.

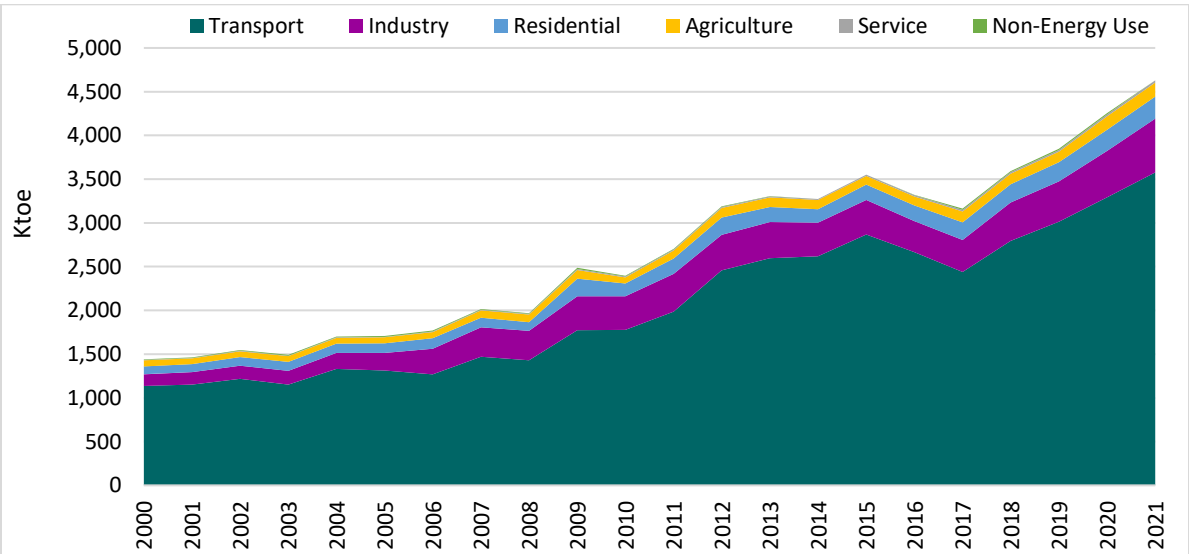


Figure 4.8: Final Energy Consumption of Petroleum Products by Sector, 2000-2021

Table 4.8: Petroleum Product Consumption by Sector (Ktoe)

Year	Residential	Industry	Service	Agriculture	Transport	Non-Energy Use	Total
2000	88	134	5	70	1,136	7	1,442
2001	90	145	5	65	1,151	8	1,464
2002	100	151	6	64	1,217	9	1,546
2003	100	160	7	65	1,150	8	1,491
2004	106	183	5	66	1,332	9	1,701
2005	112	201	6	68	1,312	10	1,708
2006	121	290	7	71	1,270	10	1,769
2007	110	337	8	83	1,469	9	2,016
2008	99	337	7	89	1,429	5	1,966
2009	204	386	13	97	1,774	13	2,487
2010	144	386	8	71	1,776	7	2,394
2011	176	434	11	89	1,984	10	2,705
2012	198	407	12	110	2,456	5	3,189
2013	173	412	12	109	2,598	4	3,308
2014	153	384	11	106	2,619	1	3,275
2015	174	396	14	100	2,867	1	3,552
2016	177	356	15	104	2,667	1	3,320
2017	202	367	17	125	2,438	12	3,162
2018	210	437	19	118	2,796	13	3,593
2019	217	462	20	122	3,013	14	3,849
2020	242	531	23	152	3,292	15	4,255
2021	252	615	25	160	3577	0	4,630

SECTION 5: BIOMASS

5.1 Woodfuel Production

The main supply of biomass is in the form of charcoal, firewood, and others (saw dust, saw mill residue, etc.) as illustrated in Figure 5.1. The quantity of wood used for firewood has been reducing steadily from about 2,742 ktoe in 2000 to 1,438 ktoe in 2020 at an annual rate of 3% and then increased in 2021 to 1,937 ktoe. As of 2021, about 45.3% of the total wood supply is used for firewood compared to 70.5% in 2000. Wood used for charcoal production has, on the other hand, been increasing at a compound annual growth rate of 4.82% from 1,094 ktoe in 2000 to 2,807 ktoe in 2020 and afterwards decreased to 2,225 ktoe in 2021. As of 2021, 52.1% of the total wood supply is used for charcoal production compared to 28% in 2000. Total biomass supply increased at an annual average growth rate of 0.35% from 2000 to 2021.

Table 5.1: Biomass Production (Ktoe)

Year	Wood for Charcoal	Wood for Firewood	Other	Total Wood Supply
2000	1,094	2,742	55	3,891
2001	1,116	2,539	51	3,705
2002	1,144	2,350	47	3,541
2003	1,178	2,176	44	3,398
2004	1,219	2,017	40	3,277
2005	1,268	1,873	37	3,178
2006	1,325	1,742	35	3,102
2007	1,391	1,644	33	3,068
2008	1,474	1,566	31	3,070
2009	1,577	1,520	30	3,127
2010	1,687	1,490	30	3,207
2011	1,805	1,535	31	3,371
2012	1,859	1,520	30	3,409
2013	1,989	1,535	30	3,554
2014	2,049	1,550	30	3,629
2015	2,043	1,545	30	3,618
2016	2,033	1,540	29	3,602
2017	2,324	1,505	29	3,858
2018	2,731	1,463	28	4,222
2019	2,684	1,418	29	4,132
2020	2,807	1,438	29	4,274
2021	2,225	1,937	29	4,190

NB: 2007-2009 figures extrapolated from 2003 field survey data; 2011-2021 figures extrapolated from 2010 field survey data and include saw dust, sawmill residue, etc.

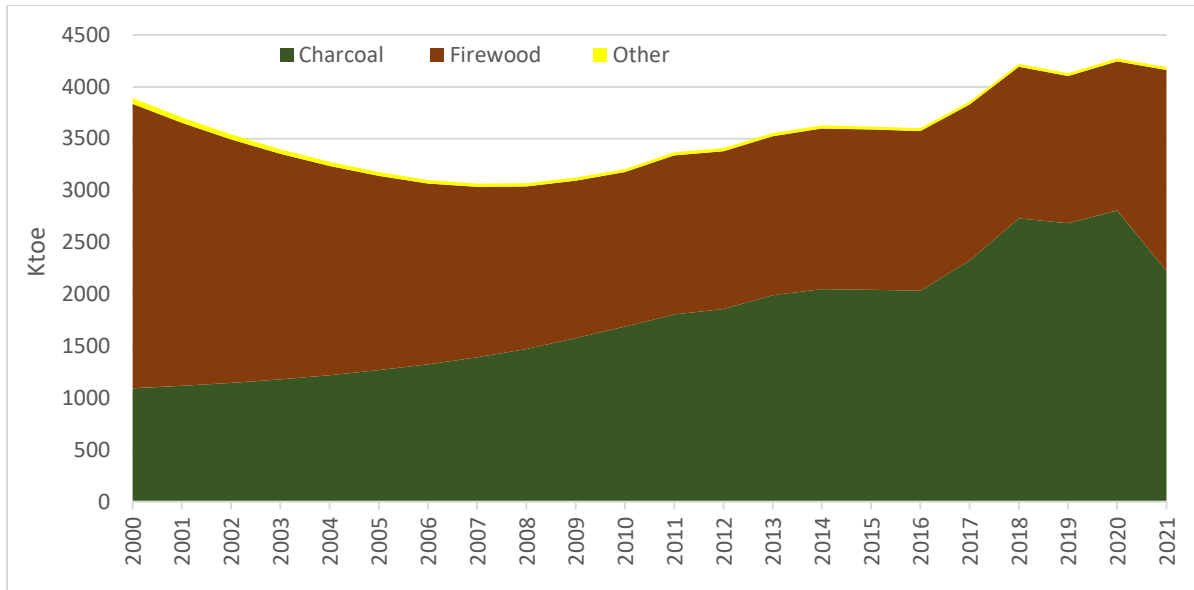


Figure 5.1: Trend in Biomass Production

5.2 Charcoal Import and Export

Ghana's imports and exports of charcoal from 2000-2021 is presented in Table 5.2. Charcoal import increased by 18.6% over the decade from 0.003 ktoe (4.2 tonnes) in 2010 to 0.02 ktoe (29.6 tonnes) in 2020. The year with the highest import of charcoal was 2016 registering an import value of 0.06 ktoe (82.6 tonnes). Charcoal export on the other hand, increased from 2.34 ktoe in 2000 to 4.45 ktoe in 2005. It then reduced to 0.28 ktoe in 2017 and thereafter increased to 1.32 ktoe in 2021.

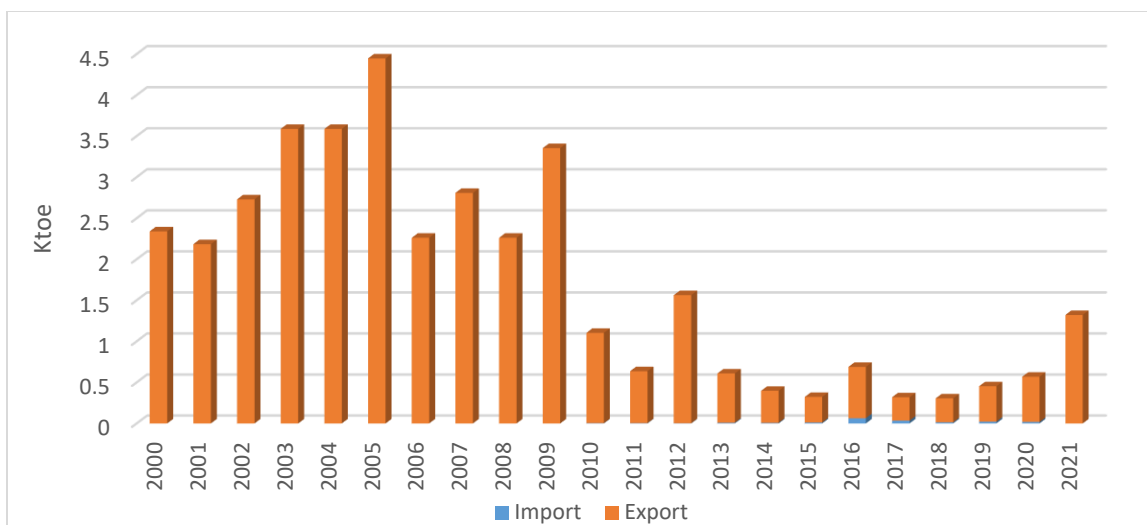


Figure 5.2: Trend in Charcoal Import and Export

Table 5.2: Charcoal Import and Export (ktoe)

Years	Import	Export
2000	-	2.34
2001	-	2.18
2002	-	2.73
2003	-	3.59
2004	-	3.59
2005	-	4.45
2006	-	2.26
2007	-	2.81
2008	-	2.26
2009	-	3.35
2010	0.00	1.10
2011	0.00	0.63
2012	0.00	1.56
2013	0.01	0.60
2014	0.01	0.39
2015	0.01	0.31
2016	0.06	0.62
2017	0.03	0.28
2018	0.01	0.29
2019	0.02	0.43
2020	0.02	0.55
2021	-	1.32

5.3 Woodfuel Consumption

The consumption of biomass declined from 3,432 ktoe in 2000 to 3,162 ktoe in 2021, representing an annual average rate of 0.4% (Table 5.3). The residential sector is the largest

consumer of biomass in the country since 2000. It accounted for about 84% of biomass consumed in 2021, followed by the industrial sector and service sector with 12.2% and 3.8% of total consumption respectively.

Table 5.3: Biomass Consumption by Sector (Ktoe)

Year	Residential	Service	Industry	Total
2000	3,127	75	230	3,432
2001	2,941	75	222	3,238
2002	2,792	77	214	3,082
2003	2,642	77	206	2,925
2004	2,560	80	199	2,839
2005	2,470	83	192	2,745
2006	2,398	87	186	2,671
2007	2,322	89	183	2,594
2008	2,247	90	181	2,518
2009	2,218	93	183	2,493
2010	2,183	95	186	2,464
2011	2,285	93	197	2,576
2012	2,291	98	200	2,589
2013	2,363	106	207	2,676
2014	2,461	117	214	2,792
2015	2,448	119	217	2,785
2016	2,440	122	221	2,783
2017	2,539	124	262	2,925
2018	2,589	128	243	2,961
2019	2,524	124	244	2,892
2020	2,567	131	279	2,977
2021	2,655	120	387	3,162

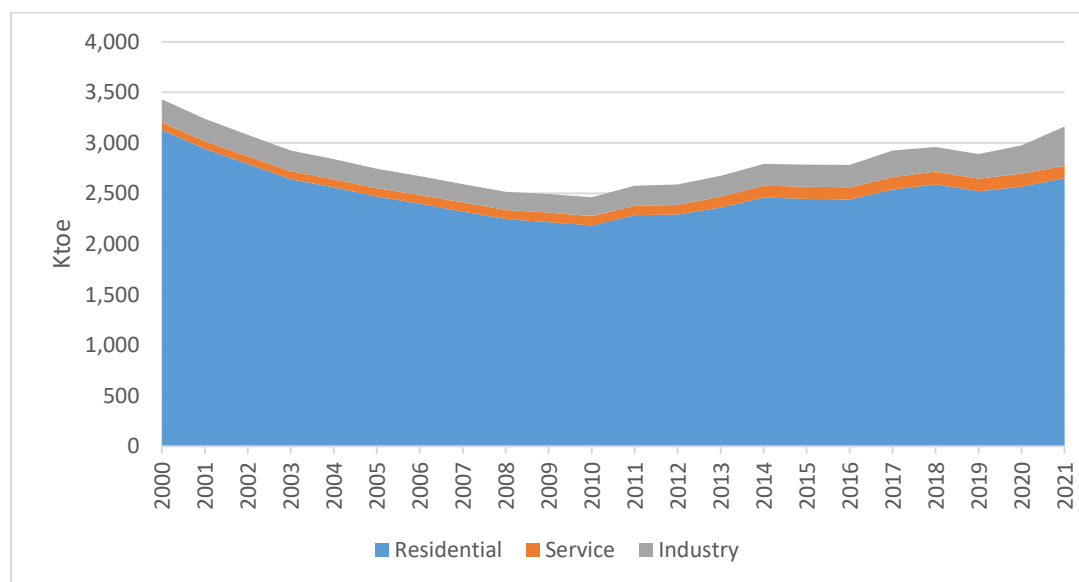


Figure 5.3: Trend in Biomass Consumption by Sector

SECTION 6: ENERGY BALANCES AND INDICATORS

6.1 Energy Balance

The country's energy balance for 2021 and 2020 is presented in Tables 6.1 and 6.2 respectively. The energy balance shows the summary of all flows of energy products in the country in a specified period of time, usually one year. It is presented in a common unit ktoe and with products aggregated by category: oil, natural gas, petroleum products, wood, charcoal, solar, hydro, and electricity, displaying their flows from supply to final consumption.

6.2 Energy Indicators

Energy indicators are energy use/supply characteristic with specific, observable and measurable attributes. They are developed to describe the link between energy use/supply and human activities. They, therefore, support policy formulation and implementation efforts. They also help to define potential targets and assess comparative analysis among countries. There are various indicators relating to energy, and its resultant emission. Some are energy intensity, energy use per capita and grid emission factor. Table 6.3 presents an overview of statistical indicators with respect to relative importance of energy.

6.2.1 Sustainable Development Goal 7 (SDG7) indicators

The Sustainable Development Goals (SDGs) aim to foster economic growth, ensure social inclusion and protect the environment. Sustainable Development Goal indicators, includes statistical indicators on Social, Economic and Environment. While the importance of these various indicators is recognised, this section focuses on indicators with respect to relative importance of energy. SDG 7, specifically, dedicated to energy, is to ensure access to affordable, reliable, sustainable and modern energy for all by 2030. Table 6.4 presents the country's progress in achieving SDG 7.

Table 6.1: Energy Balance, 2021 (ktoe)

Supply and Consumption	Crude Oil	Natural Gas	Petroleum Products	Wood	Charcoal	Solar	Hydro	Electricity	Total
Production	8,120	2,717	0	4,190	-	11	647	-	15,685
Imports	75	471	4,275	-	-	-	-	4	4,825
Exports	-8,075	-	-96	-	-1	-	-	-149	-8,321
Intl. Marine Bunkers	-	-	-7	-	-	-	-	-	-7
Intl. Aviation Bunkers	-	-	-190	-	-	-	-	-	-190
Stock changes	29	-	203	-	-	-	-	-	232
TES	149	3,189	4,186	4,190	-1	11	647	-145	12,226
Transfers	-98	-	105	-	-	-	-	-	7
Statistical differences	-297	291	-11	0	0	0	0	0	-17
Electricity plants	-52	-2,745	-79	-	-	-11	-647	1,896	-1,638
Oil refineries	-242	-	285	-	-	-	-	-	43
Other transformation	-	-	-	-2,225	1,198	-	-	-	-1,027
Energy industry own use	24	-	32	-	-	-	-	62	118
Losses	30	-	-	-	-	-	-	135	165
TFC	-	153	4,477	1,965	1,197	-	-	1,553	9,345
Residential	-	-	252	1,542	1,113	-	-	729	3,636
Industry	-	153	462	384	3	-	-	494	1,496
Commerce & Service	-	-	25	39	81	-	-	329	474
Agriculture & Fisheries	-	-	160	-	-	-	-	0	160
Transport	-	-	3,577	-	-	-	-	0	3,577
Non-Energy Use	-	-	0	-	-	-	-	-	0

Table 6.2: Energy Balance, 2020 (ktoe)*

Supply and Consumption	Crude Oil	Natural Gas	Petroleum Products	Wood	Charcoal	Solar	Hydro	Electricity	Total
Production	9,841	2,398		4,274	-	5	627	-	17,145
Imports	706	616	4,107	-	0.02	-	-	5	5,434
Exports	-9,830	-	-181	-	-1	-	-	-160	-10,172
Intl. Marine Bunkers	-	-	-5	-	-	-	-	-	-5
Intl. Aviation Bunkers	-	-	-117	-	-	-	-	-	-117
Stock changes	7	-	-223	-	-	-	-	-	-216
TES	724	3,014	3,581	4,274	-1	5	627	-155	12,069
Transfers	-88	-	95	-	-	-	-	-	7
Statistical differences	0	132	-105	0	0	0	0	0	27
Electricity plants	-53	-2,764	-107	-	-	-5	-627	1,734	-1,822
Oil refineries	-516	-	498	-	-	-	-	-	-18
Other transformation	-	-	-	-2,807	1,511	-	-	-	-1,296
Energy industry own use	21	-	34	-	-	-	-	49	104
Losses	45	-	-	-	-	-	-	110	155
TFC	-	118	4,137	1,467	1,510	-	-	1,421	8,653
Residential	-	-	242	1,163	1,404	-	-	668	3,477
Industry	-	118	413	275	4	-	-	473	1,283
Commerce & Service	-	-	23	29	102	-	-	279	433
Agriculture & Fisheries	-	-	152	-	-	-	-	1	153
Transport	-	-	3,292	-	-	-	-	1	3,293
Non-Energy Use	-	-	15	-	-	-	-	-	15

* Revised

Table 6.3: Energy Indicators

Indicator	Unit	2000	2010	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Population	million	18.91	24.66	25.90	26.43	27.04	27.67	28.31	28.96	29.61	30.28	30.6	30.8
GDP (current US\$) ¹	million US\$	4,983	32,197	41,271	64,832	54,058	48,595	56,010	60,327	67,299	68,338	70,029	79,083*
GDP, PPP (constant 2017 international \$) ¹	million \$	54,123	94,867	118,247	126,894	130,518	133,286	137,782	148,983	158,220	168,516	169,215	172,331**
Total Energy Supply	ktoe	6,255	7,001	8,121	8,723	8,907	9,296	9,302	9,150	10,791	11,094	12,038	12,371
Total Final Energy Consumed	ktoe	5,467	5,573	6,574	6,894	6,986	7,250	7,181	7,208	7,792	8,051	8,654	9,345
Total Electricity Generated	GWh	7,224	10,166	12,024	12,870	12,963	11,491	13,023	14,067	16,246	18,188	20,230	22,051
Total Electricity Consumed	GWh	6,889	8,317	9,258	10,583	10,695	10,625	12,528	13,036	14,401	15,232	16,531	18,067
Total Petroleum Products Consumed	ktoe	1,442	2,394	3,189	3,308	3,275	3,552	3,320	3,162	3,593	3,849	4,255	4,630
Total Biomass Consumed	ktoe	3,432	2,464	2,589	2,676	2,792	2,785	2,783	2,925	2,961	2,892	2,977	3,162
Energy Intensity (TES/GDP current million US\$)	toe/million US\$	1,255	217	197	135	165	191	166	152	160	162	175	156
Energy Intensity in PPP (TES/ GDP in PPP)	toe/million \$	116	74	69	69	68	70	68	61	68	66	72	72
Energy Intensity in PPP (FEC/ GDP in PPP)	toe/million \$	101	59	56	54	54	54	52	48	49	48	51	54
Total Primary Energy Supply/capita	toe/capita	0.33	0.28	0.31	0.33	0.33	0.34	0.33	0.32	0.36	0.37	0.40	0.40
Energy use per capita (TFC/persons)	toe/capita	0.29	0.23	0.25	0.26	0.26	0.26	0.25	0.25	0.26	0.27	0.28	0.30
Total Electricity Generated/capita	kWh/capita	382	412	464	487	479	415	460	486	549	601	654	715
Total Electricity Consumed/capita	kWh/capita	364	337	357	400	396	384	443	450	486	503	534	586
Total Petroleum Products Consumed/capita	toe/capita	0.08	0.10	0.12	0.13	0.12	0.13	0.12	0.11	0.12	0.13	0.14	0.15
Total Biomass Consumed/capita	toe/capita	0.18	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Total Electricity Consumed/GDP	kWh/US\$ 1,000 of GDP	1,382	258	224	163	198	219	224	216	214	223	236	228
Total Energy Supply/GDP	toe/US\$ 1,000 of GDP	1,255	217	197	135	165	191	166	152	160	162	175	156
Total Petroleum Products Consumed/GDP	toe/US\$ 1,000 of GDP	289	74	77	51	61	73	59	52	53	56	61	59
Grid Emission Factor (wind/solar projects) ¹	tCO2/MWh		0.35	0.35	0.35	0.32	0.28	0.39	0.43	0.46	0.39	0.36	0.36*
Grid Emission Factor (all other projects) ¹	tCO2/MWh		0.51	0.48	0.46	0.36	0.31	0.43	0.47	0.53	0.45	0.40	0.40*

*Provisional

**Estimated

NB: Grid emission factor is the amount of CO₂ emitted per unit of electricity generated and supplied into the national electricity grid. In simple terms, it measures the carbon intensity of the national electricity grid. Project activities displacing electricity from the grid can use this emission factor to estimate the CO₂ emissions impacts of the project.

Table 6.4: Sustainable Development Goals (SDG7) Indicators

Target	Indicator	Indicator Definition	Disaggregation	Unit	2010	2013	2014	2015	2016	2017	2018	2019	2020	2021	
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	70.8	80.5	83.2	83.6	84.1	84.3	85	85.3	87	
			Urban	%	83.9	88.7	91	93.6	96.6	100	100	100	100	100	100
			Rural	%	39.7	48.6	52.5	56.9	61.7	67	68.3	70.5	71.7	72.9	
		Household with access to electricity	National	%	64.2	70.6	73.1	75.7	78.5	81.4	81.6	82.5	82.8	83.9	
			Urban	%	83.8	88.6	89.8	90.7	91.4	92	92.2	92.6	93	93.1	
			Rural	%	39.5	48.3	52.2	56.6	61.5	66.9	68.1	70.4	71.5	72.8	
	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	%	0.54	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.29
			Urban	%	0.76	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.35
			Rural	%	0.27	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.36	
		Proportion of population using LPG as primary source for cooking	National	%	18.2	22.3	23.2	23.9	24.3	24.5	24.8	25.1	25.3	25.4	
Urban			%	28.9	35.8	35.6	35.3	35.1	34.8	34.6	34.3	34.1	33.9		
Rural			%	4.8	5.5	6.1	6.8	7.7	8.7	9.9	11.3	12.8	13.3		
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 ¹	%	53.1	47.3	48.5	44.8	45.2	46.9	44.1	42.7	40.5	39.6		
		National ²	%	8.8	8.5	8.5	6.4	6.5	6.3	6.1	6.7	6.0	5.76		
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\$	73.8	68.7	68.2	69.7	67.5	61.4	68.2	65.8	72.2	71.8		
		Energy intensity measured in terms of final energy consumption and GDP, PPP (constant 2017 international \$)	National	TOE/ million US\$	58.7	54.3	53.5	54.4	52.1	48.4	49.2	47.8	51.1	54.2	

¹Includes woodfuel

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

Sources: Ghana Statistical Service 2010 Population and Housing Census, Ghana Living Standard Survey (GLSS 6 & 7), Ministry of Energy & Energy Commission

SECTION 7: ENERGY PRICES

7.1 Crude Oil Prices

Crude oil price increased by an annual growth rate of 14.9% from 2000 to 2012 and then reduced by annually at a rate of 5% to US\$70.79 per barrel in 2021. The lowest and highest monthly average price for 2021 was recorded in January and October respectively. Table 7.1 shows the monthly average crude oil price from 2001 to 2021. Table 7.1 below shows the monthly average crude oil price from 2001 to 2021.

Table 7.1: Average Crude Oil Prices (US\$/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
2002	20	20.2	24	26	25.7	24.5	25.7	26.3	28.3	27.5	24.5	27.5
2003	30.2	32.4	29.5	24.8	25.4	27.2	28.2	29.4	26.8	29	28.8	29.6
2004	30.6	30.3	32.7	30	37.1	35.5	37.7	41.7	42.8	49.4	44.6	40.6
2005	44.9	45.9	53.3	53.2	49.9	55.6	57.9	63.8	63.7	59.4	56.2	57.6
2006	63.9	61.1	63.1	70.6	71	69.7	74.2	73.9	63.5	60.1	60	62.5
2007	54.6	59	62.4	67.5	67.9	70.6	75.8	71.2	77	82.5	92.1	91.5
2008	91.9	94.5	103	110.4	124.6	133.5	134.8	115.2	100.8	73.6	55.1	43.3
2009	45.6	43.7	47.3	51.2	58.6	69.3	65.8	73.1	68.2	73.9	77.5	75.2
2010	76.9	74.7	79.9	85.7	77	75.7	75.5	77.1	78.2	83.5	86.1	92.4
2011	96.8	104.1	114.6	123.1	114.5	113.9	116.7	109.8	110	108.8	110.6	107.7
2012	111.6	127	124.6	125.9	109.4	95.9	102.8	113.2	113	111.5	109.5	109.2
2013	112.3	116.1	109.5	103.3	103.3	103.3	107.4	110.3	111.2	109.5	107.8	110.6
2014	107.3	108.8	107.7	108.1	109.2	112	108.2	103.5	98.6	88.1	79.4	62.4
2015	49.7	58.7	57	60.9	65.6	63.8	56.8	48.2	48.6	48.1	44.4	37.7
2016	31.9	33.4	39.8	43.3	47.6	49.9	46.6	47.2	47.2	51.4	47.1	54.9
2017	55.5	56	52.5	53.7	51.1	47.5	49.2	51.9	55.2	57.5	62.9	62.3
2018	69.1	65.7	66.7	71.7	77.1	75.9	75.0	73.9	79.1	80.6	66.0	57.7
2019	60.2	64.5	67.1	71.7	70.3	63.1	64.2	59.5	62.3	59.6	62.7	65.2
2020	63.7	55.5	33.7	26.6	32.1	40.8	43.2	45.0	41.9	41.4	44.0	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

Source: Bank of Ghana



Figure 7.1: Trend in Average Crude Oil Prices

7.2 Petroleum Products Prices

Table 7.2 presents the yearly average ex-pump prices of petroleum products (petrol, diesel, kerosene and LPG) in the country.

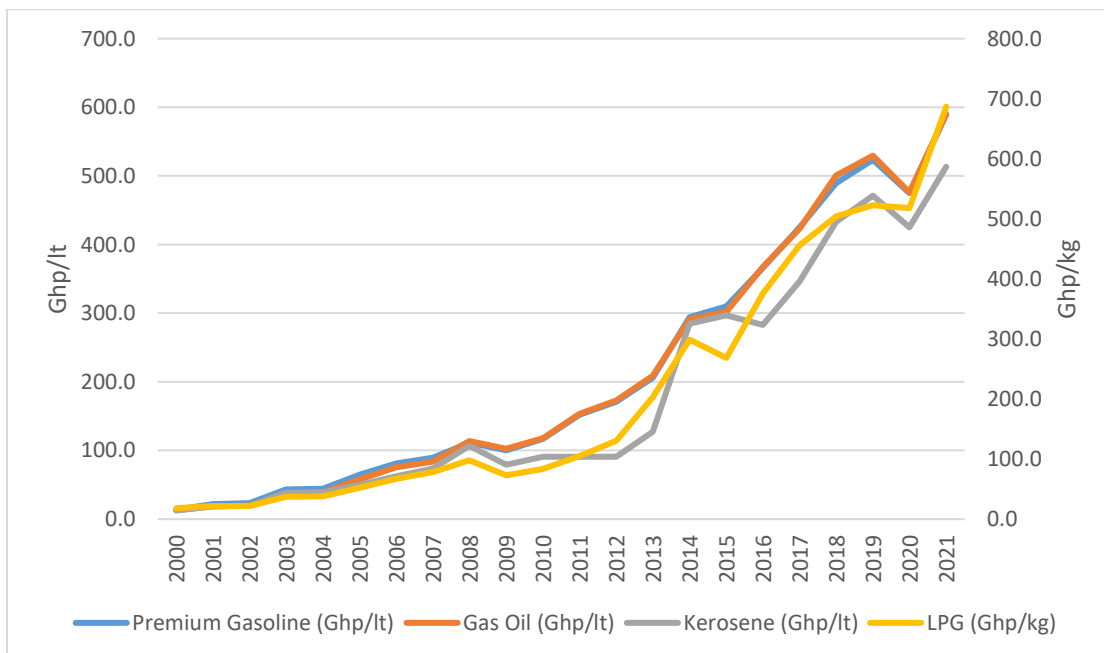


Figure 7.2: Trend in petroleum products prices

Table 7.2: Average Ex-pump Prices for Petroleum Products

Year	Premium Gasoline (Ghp/lit)	Gas Oil (Ghp/lit)	Kerosene (Ghp/lit)	LPG (Ghp/kg)
2000	13.7	12.8	12.8	18.2
2001	22.0	18.6	18.6	21.6
2002	23.3	19.6	19.6	22.0
2003	43.5	38.0	38.0	37.3
2004	44.4	38.9	38.9	38.0
2005	65.0	57.8	49.7	52.4
2006	81.2	75.5	62.4	67.2
2007	89.6	83.8	73.8	78.4
2008	111.3	113.9	106.5	98.2
2009	100.2	102.4	79.3	73.1
2010	117.0	118.1	91.0	83.8
2011	151.9	153.3	91.0	104.8
2012	171.3	172.9	91.0	130.6
2013	206.0	208.7	127.2	202.8
2014	294.1	291.3	285.0	299.0
2015	310.1	301.9	296.9	268.3
2016	366.1	367.4	283.0	375.7
2017	425.0	423.3	346.5	456.0
2018	489.7	500.9	432.9	503.9
2019	523.6	529.5	471.2	522.5
2020	475.1	476.2	425.1	517.8
2021	589.9	589.8	513.3*	686.8

*Indicative ex-pump price

Source: NPA

7.3 Average Electricity End User Tariff

The average electricity end-user tariff of electricity consumers consists of the following three categories: residential, non-residential and special load tariff. The electricity end-user tariff increased at an annual average growth rate of 19.8%, from 2000 to 2021 (Table 7.3). Comparing 2020 to 2021, there was a minute increase of about 0.2%, in the average electricity end-user tariff (GH¢/kWh).

Table 7.3: Average Electricity End-User Tariff

Year	GH¢/kWh	US\$/kWh
2000	0.017	0.024
2001	0.034	0.047
2002	0.065	0.077
2003	0.071	0.080
2004	0.074	0.082
2005	0.073	0.080
2006	0.078	0.084
2007	0.097	0.100
2008	0.148	0.123
2009	0.148	0.104
2010	0.211	0.145
2011	0.245	0.158
2012	0.232	0.124
2013	0.307	0.156
2014	0.464	0.145
2015	0.541	0.147
2016	0.817	0.210
2017	0.798	0.183
2018	0.705	0.154
2019	0.716	0.137
2020	0.747	0.134
2021	0.749	0.129

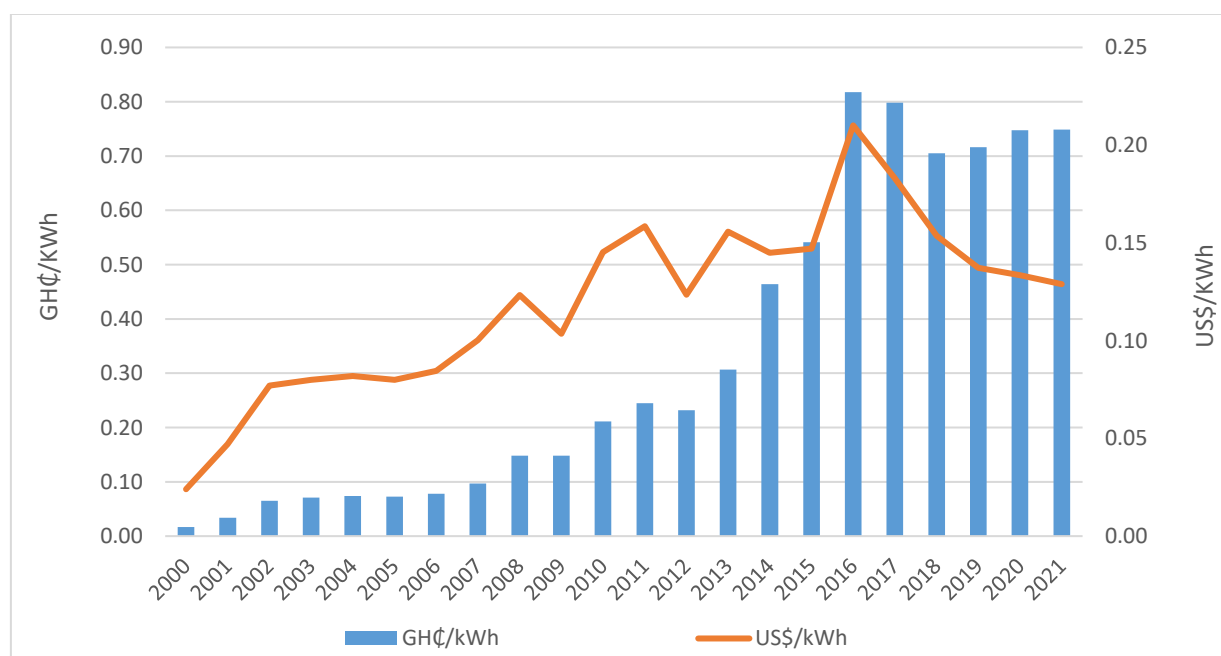


Figure 7.3: Trend in Average Electricity End-User Tariff

Table 7.4: Electricity Tariff by Customer Class

Tariff Category	Effective Date												
	Dec, 2011	Oct, 2013	Jan, 2014	Jul, 2014	Oct, 2014	Apr, 2015	Jul, 2015	Dec, 2015	Oct, 2018	Jul, 2019	Oct, 2019	Oct, 2020	Jan, 2021
Residential													
0 - 50 (Exclusive)	10	16	17	19	21	21	21	34	28	31	33	33	33
51 - 300 (GHP/kWh)	18	31	35	39	41	42	42	67	56	62	65	65	65
301 - 600 (GHP/kWh)	23	41	45	50	54	55	55	87	72	80	85	85	85
600+ (GHP/kWh)	25	45	50	56	59	61	61	97	80	89	94	94	94
Service Charge for Lifeline Consumers (GHP/month)	165	296	325	364	388	398	398	633	213	213	213	213	213
Service Charge for Other Residential Consumers (GHP/month)	165	296	325	364	388	398	398	633	633	704	746	746	746
Non-Residential													
0 -300 (GHP/kWh)	25	45	50	56	59	61	61	97	68	75	80	80	80
301 - 600 (GHP/kWh)	27	48	53	59	63	65	65	102	72	80	85	85	85
600+ (GHP/kWh)	42	76	83	93	100	102	102	163	114	126	134	134	134
Service Charge (GHP/month)	276	493	541	606	646	663	663	1055	1055	1173	1243	1243	1243
SLT - Low Voltage													
Maximum Demand (GHP/kVA/month)	1543	2760	3029	3395	3617	3712	3712	5910	5910	-	6960	6960	6960
Energy Charge (GHP/kWh)	26	47	52	58	62	63	63	101	76	99	89	89	105
Service Charge (GHP/month)	1102	1972	2164	2425	2584	2651	2651	4221	4221	4693	4971	4971	4971
SLT - Medium Voltage													
Maximum Demand (GHP/kVA/month)	1323	2366	2596	2910	3100	3182	3182	5065	5065	-	5966	5966	5966
Energy Charge (GHP/kWh)	20	37	40	45	48	49	49	78	59	75	69	69	80
Service Charge (GHP/month)	1543	2760	3029	3395..1	3617	3712	3712	5910	5910	6570	6960	6960	6960
SLT - High Voltage													
Maximum Demand (GHP/kVA/month)	1323	2366	2596	2910	3100	3182	3182	5065	5065	-	5966	5966	5966
Energy Charge (GHP/kWh)	19	34	37	41	44	45	45	72	54	79	63	63	83
Service Charge (GHP/month)	1543	2760	3029	3395	3617	3712	3712	5910	5910	6570	6960	6960	6960
SLT-High Voltage - Mines													
Capacity Charge (GHP/KVA/Month)	1543	2760	3029	3395	3617	3712	3712	5910	5910	-	6960	6960	6960
Energy Charge (GHP/kWh)	30	53	58	66	70	72	72	114	103	249	121	121	264
Service Charge (GHP/Month)	1543	2760	3029	3395	3617	3712	3712	5910	5910	6570	6960	6960	6960