GHANA KEY ENERGY STATISTICS HANDBOOK

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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 utilization of energy resources in the republic and coordinate policies in relation to them. Specifically, the Commission as part of its mandate is to secure a comprehensive energy database for national decision making on the extent of development and utilization of energy resources available to the nation.

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 produced by the Commission provides a comprehensive view on energy production, transformation and final use as well as their prices. The energy statistics publication of the Commission has been recognised the world over as the authoritative source of energy data and information on Ghana.

The statistics produced can be used to monitor changes in the production and use of energy and also provide a wider understanding of the pattern of energy use in the country. The key energy statistics presents highlights on some of the key facts and trend in energy production and use to enable researchers, policymakers and students have deeper knowledge about the energy situation in the country. It also contains information on energy efficiency, outlook and the Sustainable Development Goal (SDG 7).

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

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

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

Ing. Oscar Amonoo-Neizer
Executive Secretary

BE ENERGY WISE!

Learn to save Energy and save yourself MONEY

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Use Energy efficient appliances

*"**Turn Off the Lights** when you leave a room. **Switch Off** fans when not needed. **Iron your Clothes in bulk.** These are just a few, **simple Actions,** we can all take. Not only will you be saving money for yourself, but these habits are Acts of Citizenship and Common Humanity"...*

H. E. President
Nana Addo Dankwah Akuffo Addo
(Thursday 27th April, 2017)

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Energy Commission of Ghana

ABBREVIATIONS AND ACRONYMS

ATK	Aviation Turbo 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

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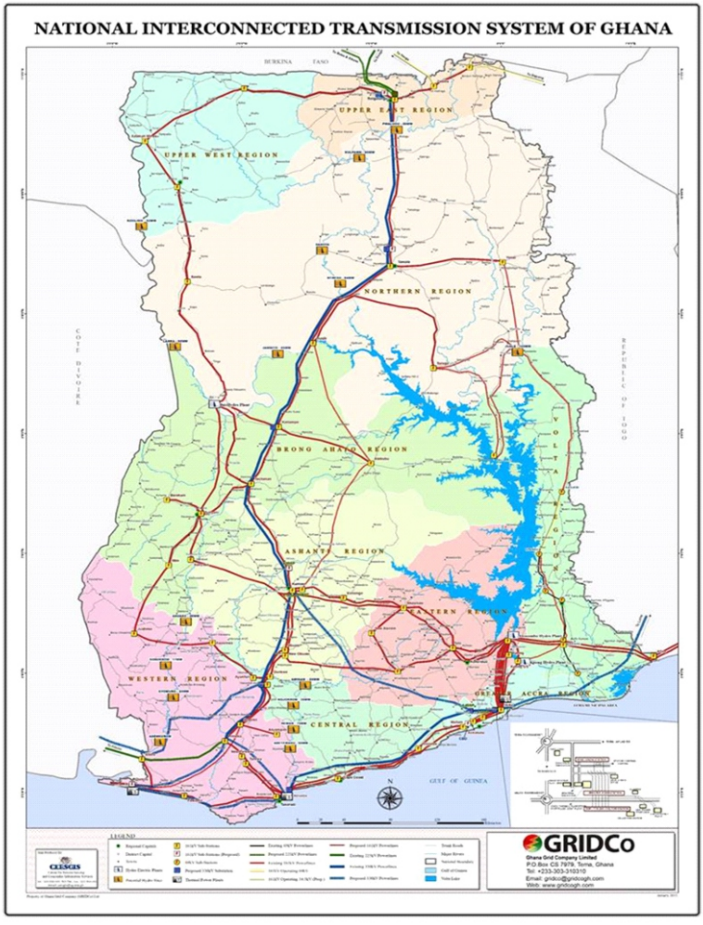
NATIONAL INTERCONNECTED TRANSMISSION SYSTEM OF GHANA



2020 ELECTRICITY ACCESS MAP OF GHANA

2020 National population electricity access rate: 85.3%

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

KEY HIGHLIGHTS

Indicator	Unit	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Population[1]	million	18.91	24.66	25.30	25.90	26.43	27.04	27.67	28.31	28.96	29.61	30.28	30.96
GDP (current US$)[1]	million US$	4,983	32,197	39,337	41,271	64,832	51,033	46,719	54,349	58,768	65,316	67,235	72,340
GDP, PPP (constant 2017 international $) [2]	million $	52,724	92,415	105,397	115,191	123,614	127,145	129,841	134,222	145,132	154,131	164,161	164,841
Total Energy Supply	ktoe	6,255	7,001	7,633	8,121	8,723	8,907	9,296	9,302	9,150	10,791	11,094	12,038
Total Final Energy Consumed	ktoe	5,467	5,573	6,070	6,574	6,894	6,986	7,250	7,181	7,208	7,792	8,051	8,654
Total Electricity Generated	GWh	7,224	10,166	11,200	12,024	12,870	12,963	11,491	13,023	14,067	16,246	18,188	20,230
Total Electricity Consumed	GWh	6,889	8,317	9,187	9,258	10,583	10,695	10,625	12,528	13,036	14,401	15,232	16,531
Total Petroleum Products Consumed	ktoe	1,442	2,394	2,705	3,189	3,308	3,275	3,552	3,320	3,162	3,593	3,849	4,255
Total Biomass Consumed	ktoe	3,432	2,464	2,576	2,589	2,676	2,792	2,785	2,783	2,925	2,961	2,892	2,977
Energy Intensity (TES/GDP current million US$)	toe/million US$	1,255	217	194	197	135	175	199	171	156	165	165	166
Total Primary Energy Supply/capita	toe/capita	0.33	0.28	0.30	0.31	0.33	0.33	0.34	0.33	0.32	0.36	0.37	0.39
Energy use per capita (TFC/persons)	toe/capita	0.29	0.23	0.24	0.25	0.26	0.26	0.26	0.25	0.25	0.26	0.27	0.28
Total Electricity Generated/capita	kWh/capita	382	412	443	464	487	479	415	460	486	549	601	654
Total Electricity Consumed/capita	kWh/capita	364	337	363	357	400	396	384	443	450	486	503	534
Total Petroleum Products Consumed/capita	toe/capita	0.08	0.10	0.11	0.12	0.13	0.12	0.13	0.12	0.11	0.12	0.13	0.14
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

[1]GDP in current prices and Population data from Ghana Statistical Service
[2]GDP in PPP (constant 2017 international $) from World bank database

SUSTAINABLE DEVELOPMENT GOALS 7 (SDG 7) INDICATORS

Target	Indicator	Indicator Definition	Disaggregation	Unit	2010	2015	2016	2017	2018	2019	2020
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	83.6	84.1	84.3	85	85.3
			Urban	%	83.9	93.6	96.6	100	100	100	100
			Rural	%	39.7	56.9	61.7	67	68.3	70.5	71.7
		Household with access to electricity	National	%	64.2	75.7	78.5	81.4	81.6	82.5	82.8
			Urban	%	83.8	90.7	91.4	92	92.2	92.6	93
			Rural	%	39.5	56.6	61.5	66.9	68.1	70.4	71.5
	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	%	0.54	0.3	0.3	0.3	0.3	0.3	0.3
			Urban	%	0.76	0.4	0.4	0.4	0.4	0.4	0.4
			Rural	%	0.27	0.1	0.1	0.2	0.2	0.3	0.3
		Proportion of population using LPG as primary source for cooking	National	%	18.2	23.9	24.3	24.5	24.8	25.1	25.3
			Urban	%	28.9	35.3	35.1	34.8	34.6	34.3	34.1
			Rural	%	4.8	6.8	7.7	8.7	9.9	11.3	12.8
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[3]	%	53.0	44.8	39.5	47.3	44.3	42.5	40.4
			National[4]	%	8.4	5.9	6.8	5.7	5.5	6.5	6.0
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 $)		National	TOE/million US$	75.8	71.6	69.3	63.0	70.0	67.6	73.0
	Energy intensity measured in terms of final energy consumption and GDP, PPP (constant 2017 international $)		National	TOE/million US$	60.3	55.8	53.5	49.7	50.6	49.0	52.5

[3]Includes woodfuel

[4]Excludes 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

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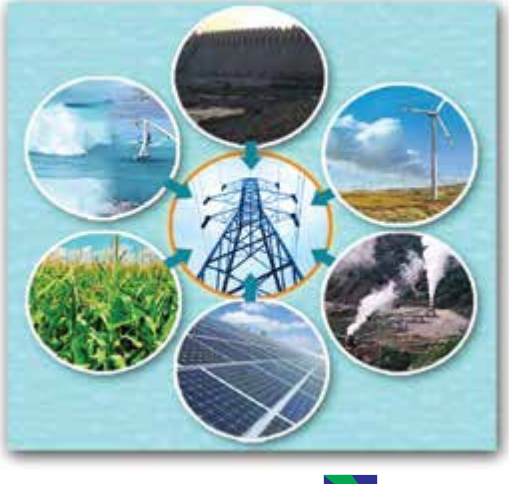
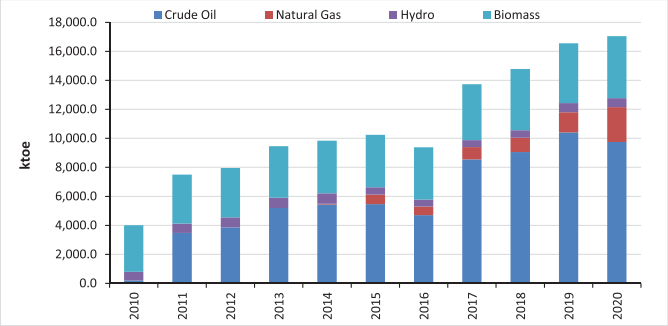


ENERGY SUPPLY

PRODUCTION OF PRIMARY FUELS

Production of Primary Fuels, 2010 - 2020



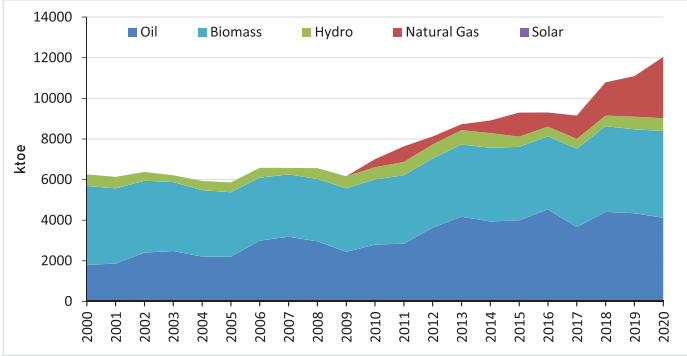
Production of Primary Fuels (ktoe)

Fuel	2010	2015	2016	2017	2018	2019	2020
Crude Oil	199	5,458	4,706	8,547	9,054	10,410	9,752
Natural Gas	0	665	592	850	985	1,394	2,398
Solar	0	0	2	2	3	4	5
Hydro	602	503	478	483	517	624	627
Biomass	3,207	3,618	3,602	3,858	4,222	4,132	4,274
Total	**4,008**	**10,244**	**9,381**	**13,741**	**14,781**	**16,564**	**17,056**

Production of primary fuels increased at an average annual growth rate of 15.6%, from 4,008 ktoe in 2010 to 17,056 ktoe in 2020 largely driven by increase in crude oil production. Crude oil production increased by 47.6% at an average annual growth rate from 2010 to 2020, reaching 9,752 ktoe in 2020.

TOTAL ENERGY SUPPLY

Total Energy Supply by Fuel, 2000 - 2020



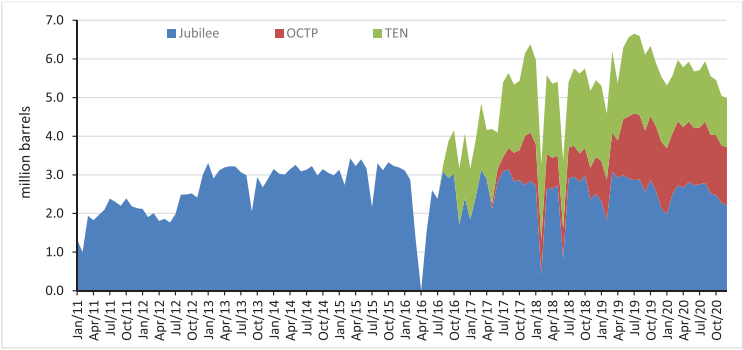
Total Energy Supply (ktoe)

TES	2000	2005	2010	2015	2016	2017	2018	2019	2020
Oil	1,799	2,200	2,798	3,991	4,529	3,661	4,408	4,341	4,118
Natural Gas	-	-	394	1,185	692	1,146	1,641	1,993	3,014
Hydro	568	484	602	503	478	483	517	624	627
Solar	-	-	-	-	2	2	3	4	5
Biomass	3,888	3,174	3,207	3,618	3,601	3,858	4,222	4,132	4,274
Total	**6,255**	**5,858**	**7,001**	**9,296**	**9,302**	**9,150**	**10,791**	**11,094**	**12,038**

The total energy supply in the country reached about 12,038 ktoe in 2020, representing an average annual growth rate of 3.3% from 2000 to 2020. Biomass constituted the largest share of the country's total energy supply from 2000 to 2011. However, oil has become the dominant energy supply in the last eight (8) years.

CRUDE OIL PRODUCTION

Crude Oil Production, Jan 2011 – Dec 2020



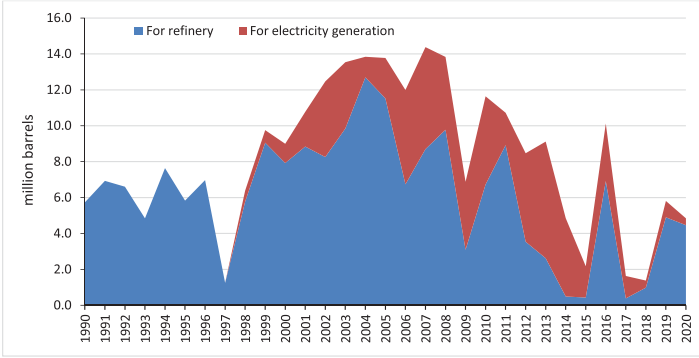
Crude Oil Production by field (Mbbls)

Year	Saltpond	Jubilee	TEN	OCTP	Total
2010	0.1	1.3	0.0	0.0	**1.4**
2012	0.1	26.4	0.0	0.0	**26.5**
2014	0.1	37.2	0.0	0.0	**37.3**
2016	0.0	27.0	5.3	0.0	**32.3**
2018	-	28.5	23.6	10.1	**62.1**
2019	-	31.9	22.3	17.2	**71.4**
2020	-	30.4	17.8	18.7	**66.9**

Crude oil production has been increasing at an average growth rate of 9.7% per annum from 2012 to 2020. A total of 66.9 million barrels of crude oil was produced from Ghana's three offshore producing fields in 2020. Crude oil production reduced by about 6.3% in 2020 over 2019, mainly due to the outbreak of COVID-19 pandemic

CRUDE OIL IMPORT

Crude Oil Import, 1990 - 2020



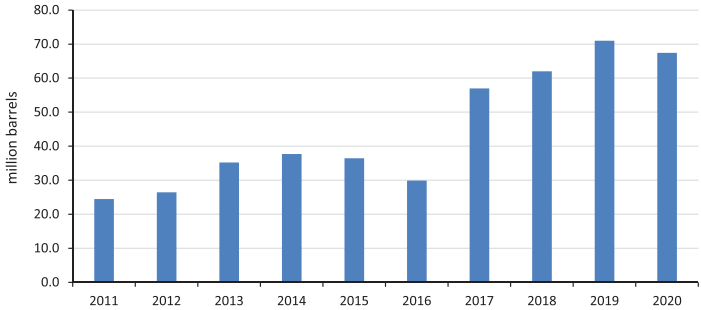
Crude Oil Import (MMBBL)

Use	2000	2005	2010	2012	2014	2016	2018	2019	2020
For refinery	7.9	11.5	6.7	3.5	0.5	6.9	1.0	4.9	4.5
For electricity	1.1	2.3	4.9	4.9	4.4	3.2	0.4	0.9	0.4
Total	**9.0**	**13.8**	**11.6**	**8.5**	**4.9**	**10.1**	**1.4**	**5.8**	**4.8**

Total crude oil imports increased by 53.3% from 2000 to 2005 but dropped by 15.9% by the end of 2010. Crude oil import declined drastically by 8.4% representing an average annual decline over the decade.

CRUDE OIL EXPORT

Crude Oil Export, 2011 - 2020



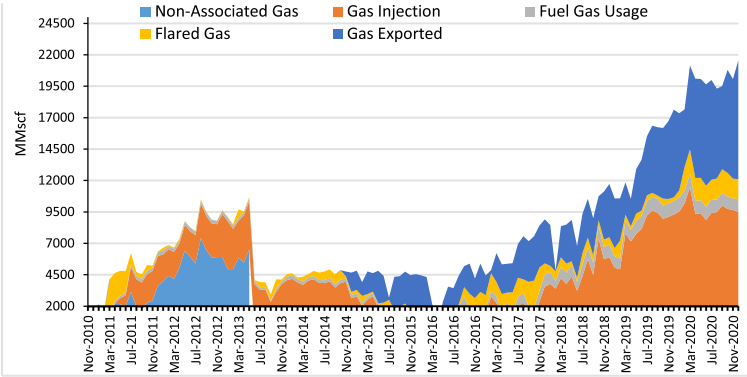
Crude Oil Export

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
2012	26.4	13,552.4	22.0
2014	37.7	13,216.8	28.2
2016	29.9	11,136.9	12.1
2018	62.0	14,942.7	30.6
2019	71.0	15,634.0	28.7
2020	67.46	14,471.5	20.1

Crude oil export substantially increased in 2011 with the commencement of commercial production. It increased from 24.5 million barrels in 2011 to 67.5 million barrels in 2020, representing an average annual growth rate of 11.9%. Crude oil export witnessed a decline of 5% in 2020, over that of 2019 largely due to a decline in production.

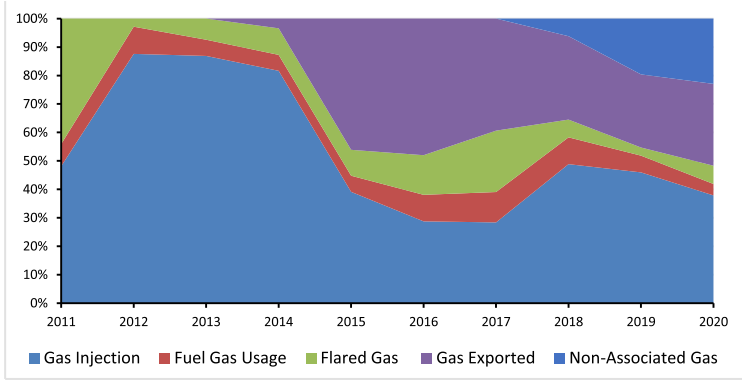
NATURAL GAS PRODUCTION

Natural Gas Extracted and Utilisation, Nov 2010 —Dec 2020



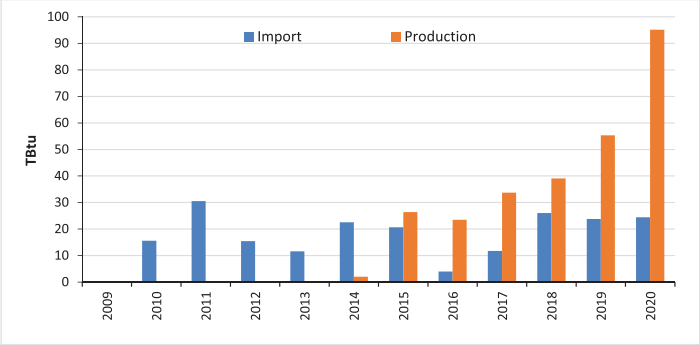
NB: All raw natural gas produced before November 2014 was used on the FPSO. It was injected, flared or used as fuel on the FPSO. Gas exported is the quantity transported through pipelines from the FPSO to the Gas processing plant.

Share in Annual Natural Gas Utilization



NATURAL GAS SUPPLY

Natural Gas Supply, 2009 - 2020



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

Share in Total Natural Gas Supply by Source

	Share (%) of total Supply						
	2014	2015	2016	2017	2018	2019	2020
Import	91.7	43.9	14.6	25.8	40.0	30.0	20.4
Production	8.3	56.1	85.4	74.2	60.0	70.0	79.6

The total flow of gas to the country's consuming facilities was 120 tBtu in 2020. Around 24.4 tBtu (20.4%) of this volume was imported from Nigeria via the West African Gas Pipeline (WAGP), an annual increase of 2.5% over the import volume in 2019. The remainder (79.6%) was derived from indigenous sources through the Atuabo plant. Gas production (from Atuabo and non-associated gas) witnessed its greatest boost since its inception with a total of 95.2 tBtu. The bulk of imported and indigenous gas is utilised by mainly the electricity generation system.

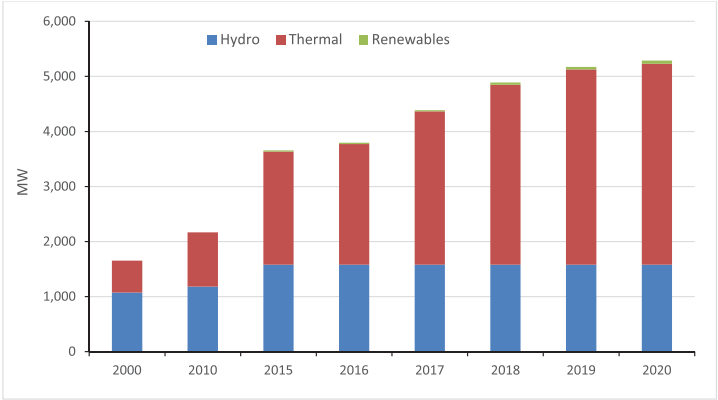
INSTALLED ELECTRICITY GENERATION CAPACITY

Installed Generation Capacities as at end of December 2020 (MW)

Plant	Installed Capacity
Hydro Power Plants	
Akosombo	1,020
Kpong	160
Bui	400
Total Hydro	***1,580***
Thermal Power Plants	
Takoradi Power Company (TAPCO)	330
Takoradi International Company (TICO)	340
Tema Thermal 1 Power Plant (TT1PP)	110
Tema Thermal 2 Power Plant (TT2PP)	87
Cenit Energy Ltd	110
Kpone Thermal Power Plant	220
Ameri Plant	250
Sunon Asogli Power (Ghana) Ltd	560
Karpowership	470
Amandi	203
AKSA	370
Cenpower	360
Early Power / Bridge	144
Genser[2]	95
Total Thermal	***3,649***
Renewables	
On-grid	
Navrongo Solar[2]	2.5
Lawra Solar[2]	6.5
BXC Solar[2]	20
Meinergy Solar[2]	20
Bui Solar[2]	10
Distributed Solar PV	28.1
Bui mini-Hydro	4
Tsatsadu Mini Hydro	0.05
Safisana Biogas[2]	0.1
Total Renewables On-grid	***91.3***
Off-grid	
Solar	7.3
Wind	0.02
Total Renewables Off-grid	***7.3***
Mini-grid	
Solar	0.3
Wind	0.01
Total Renewables Mini-grid	***0.33***
Total Renewables	***98.9***
Total	**5,328**

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

Installed Electricity Generation Capacity



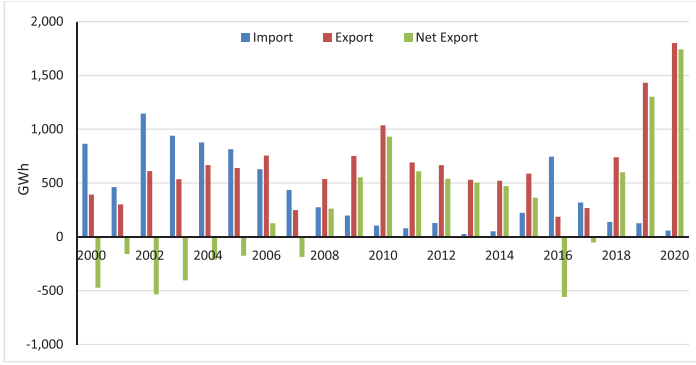
Share of Installed Electricity Generation Capacity

Generation Source	Shares (%)							
	2000	2010	2015	2016	2017	2018	2019	2020
Hydro	64.9	54.5	43.2	41.6	36.0	32.3	30.6	29.9
Thermal	35.1	45.5	56.2	57.8	63.5	66.8	68.6	69.0
Renewables	0.0	0.0	0.6	0.6	0.5	0.9	0.8	1.1
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

The total installed grid electricity generation capacity, excluding off-grid and mini-grid renewable facilities, increased from 2,165 MW in 2010 to 5,288 MW in 2020, representing an annual average growth of 9.3%. The long-term dependable capacity increased at an average annual growth rate of approximately 9.6% from 1,940 MW in 2010 to 4,842 MW in 2020

ELECTRICITY IMPORT AND EXPORT

Electricity Import and Export, 2000 - 2020



NB: negative net export means net import

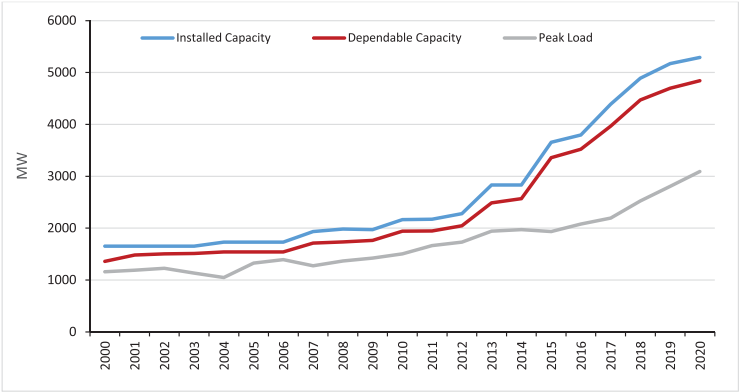
Electricity Import and Export (GWh)

	2000	2010	2015	2016	2017	2018	2019	2020
Import	864	106	223	745	320	139.7	127.4	58.3
Export	392	1,036	587	187	268	739.5	1,430.4	1,801.4
Net Export	-472	930	364	-558	-52	599.8	1,303	1,743

The electricity exported was 25.9% higher in 2020 than in 2019. Electricity imports, on the other hand, reduced from 320 GWh in 2017 to 58 GWh in 2020, representing an average annual decline of 43.4%.

GENERATION CAPACITY AND PEAK LOAD

Installed Capacity, Dependable Capacity and Peak Load, 2000 - 2020



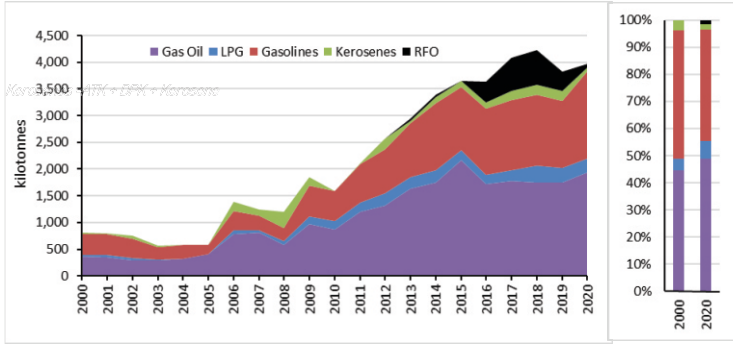
Generation Capacity and Peak Load (MW)

	2000	2005	2010	2015	2019	2020
Installed Capacity	1,652	1,730	2,165	3,656	5,172	5,288
Dependable Capacity	1,358	1,540	1,940	3,359	4,695	4,842
Peak Load	1,161	1,325	1,506	1,933	2,804	3,090

The system peak load (Ghana Load at Peak + VALCO load + export load) increased from 1,161 MW in 2000 to 3,090 MW in 2020, representing an average annual growth rate of 5%. The system peak load witnessed an increase of 10.2% in 2020 over 2019. The total dependable capacity, increased from 1,358 MW in 2000 to 4,842 MW in 2020 at an average annual growth rate of 13.6%.

PETROLEUM PRODUCT IMPORT

Trend in Petroleum product Import, 2000 - 2020



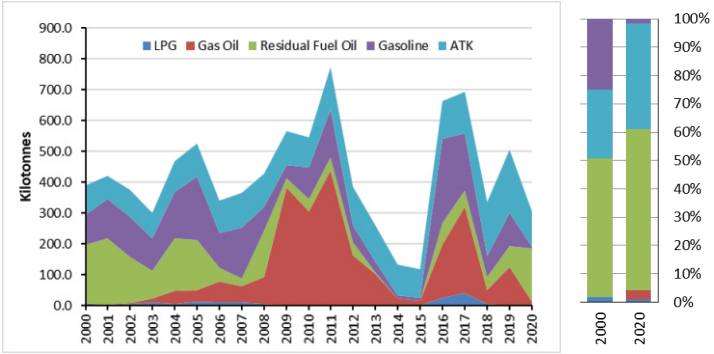
Petroleum Product Import (kilotonnes)

	2000	2005	2010	2015	2016	2017	2018	2019	2020
LPG	35.4	7.1	148.0	197.7	177.9	202.4	315.1	275.2	261.7
Gasolines	387.0	167.5	570.1	1,182.1	1,235.7	1,304.1	1,323.8	1,265	1,624.7
Kerosenes	30.4	0.0	0.0	109.1	112.7	181.4	183.9	180.7	79.6
Gas Oil	363.2	403.7	871.7	2,161.0	1,719.8	1,780.9	1,752.8	1,741.6	1,936.8
RFO	-	-	-	-	386.3	607.6	648.6	366.4	62.7
Total	816	578	1,590	3,650	3,632	4,076	4,224	3,829	3,965

Importation of gasoline and gasoil increased at an average annual growth rate of 7.4% and 8.7%, respectively, from 2000 to 2020. ATK recorded a drastic reduction of about 55.8% in 2020 from the 2019 import volume, mainly due to the outbreak of the COVID-19 pandemic. Similarly, HFO import volumes dropped by 82.8%. This was due to the increased utilisation of natural gas by thermal power plants.

PETROLEUM PRODUCT EXPORT

Petroleum Product Export, 2000 - 2020



Petroleum Product Export (kilotonnes)

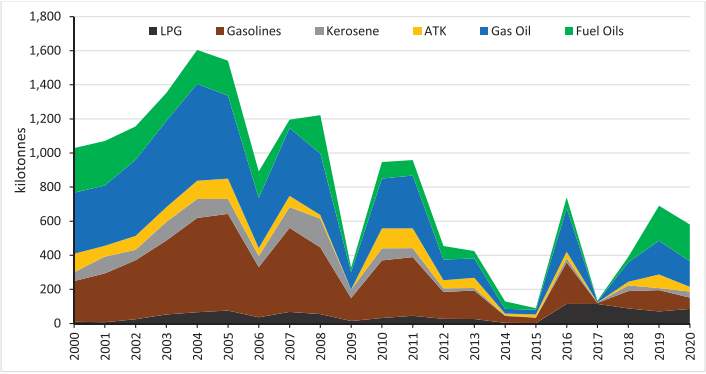
	2000	2005	2010	2015	2016	2017	2018	2019	2020
LPG	6.2	12.5	-	-	25.1	40.3	4.8	0.8	2.6
Gas Oil	0.6	37.7	304.3	14.4	172.5	279.1	45.4	124.7	10.4
Fuel Oil	190.7	162.8	40.6	-	69.8	53	41.5	66.2	173
ATK	94.8	109.5	97.0	92	122.7	135.3	176.9	205	113.4
Gasoline	97.1	203.9	103.5	9.9	271.6	184.5	67.4	108.2	5.2
Total	**389**	**526**	**545**	**116**	**662**	**692**	**336**	**505**	**305**

LPG export decreased at an average annual growth rate of 3.4%, from 6 kt in 2000 to 3 kt in 2020. ATK export (including volumes transferred to aircrafts engaged in international aviation bunkering) increased from 95 kt in 2000 to 205 kt in 2019. It reduced to 113 kt in 2020, representing a reduction of about 44.9% over 2019. Volumes of fuel oil export decreased at an average annual rate of 0.5% from 2000 to 2020.

TRANSFORMATION

REFINERY PRODUCTION

Refinery Production by Product Type (2000-2020)



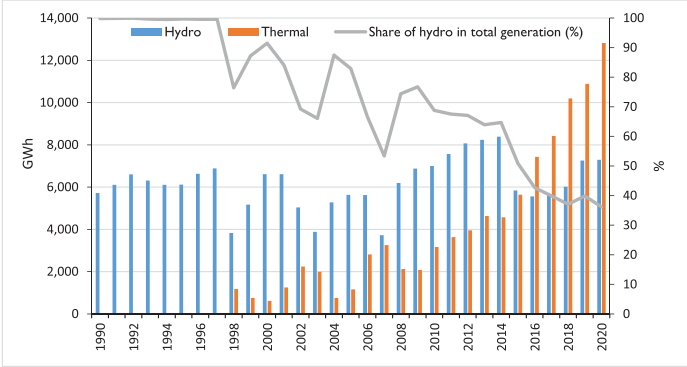
Refinery Production by Product (kilotonnes)

	2000	2005	2010	2015	2016	2017	2018	2019	2020
LPG	9.7	75.3	31.6	2.0	114.2	113.9	87.9	70.2	84.9
Gasolines	238.6	567.1	337.7	31.8	244.0	6.5	101.6	125.0	66.5
Kerosene	51.8	87.7	71.0	0.2	24.5	2.0	33.1	12.1	35.5
ATK	108.3	119.0	116.7	18.2	37.6	0.1	21.5	79.7	27.6
Gas Oil	358.1	486.3	292.6	28.0	254.7	6.1	114.1	198.1	149.6
Fuel Oils	261.9	205.4	96.8	8.9	64.0	4.4	31.5	205.2	216.1
Total	**1,028**	**1,541**	**946**	**89**	**739**	**133**	**390**	**690**	**580**

The production of petroleum products reduced, by almost two-fold, from 1,028 kt in 2000 to 580 kt in 2020. The lowest level of production of petroleum products in the country was recorded in 2015, with a production level of 89 kt.

ELECTRICITY PRODUCTION

Electricity Production, 1990 - 2020



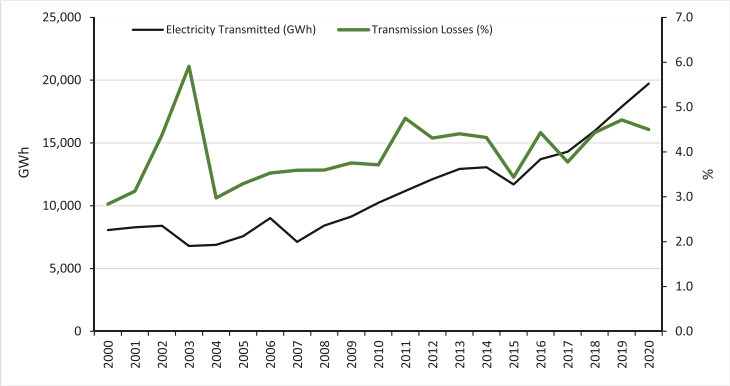
Share of Electricity Production

Source	Share (%) of electricity Production								
	2000	2005	2010	2015	2016	2017	2018	2019	2020
Hydro	91.5	82.9	68.8	50.9	42.7	39.9	37.0	39.9	36.2
Thermal	8.5	17.1	31.2	49.1	57.1	59.9	62.8	59.8	63.6
Renewables	-	-	-	-	0.2	0.2	0.2	0.3	0.3
Total	100	100	100	100	100	100	100	100	100

The total electricity generation increased from 5,732 GWh in 1990 to 20,170 GWh in 2020, representing an average annual increase of 4.3%. The share of hydro in the total electricity generation decreased from 99.8% in 1990 to 36.2% in 2020 whilst that of thermal increased from 0.2% in 1990 to 63.5% in 2020. Generation from renewable sources increased from 3 GWh in 2013 to 57 GWh by the end of 2020.

ELECTRICITY TRANSMISSION

Electricity Transmitted, 2000 - 2020



Electricity Transmitted and Transmission Losses

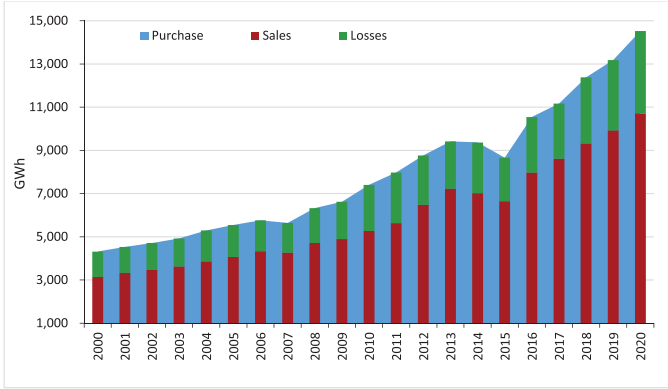
	2000	2005	2010	2015	2016	2017	2018	2019	2020
Electricity Transmitted (GWh)	8,067	7,565	10,232	11,692	13,700	14,308	15,960	17,887	19,717
Transmission Losses (GWh)	229	249	380	402	607	540	707	843	888
Transmission Losses (%)	2.8	3.3	3.7	3.4	4.4	3.8	4.4	4.7	4.5

The total energy consumed in 2020, was 19,717 GWh, representing a 10.2% increase over that of 2019. This was made up of 7,293.23 GWh (36.99%) from hydro generation, 12,365.09 GWh (62.71%) from thermal generation and 58.24 GWh (0.3%) import.

The total transmission losses recorded over the period was 888 GWh which is 4.50% of the total energy transmitted in 2020 (19,717 GWh).

ELECTRICITY DISTRIBUTION

Electricity Purchases and Sales by Distribution Utilities, 2000 - 2020



Sales and Distribution Losses

Year	Purchases (GWh)	Sales (GWh)	Distribution Losses[1]	
			GWh	%
2000	4,319	3,142	1,176	27.2
2005	5,546	4,072	1,474	26.6
2010	7,406	5,266	2,139	28.9
2015	8,659	6,646	2,013	23.3
2016	10,546	7,977	2,568	24.4
2017	11,165	8,618	2,546	22.8
2018	12,379	9,321	3,062	24.7
2019	13,183	9,924	3,260	24.7
2020	14,524	10,717	3,807	26.2

[1]Distrubution losses is made up of both technical and commercial losses

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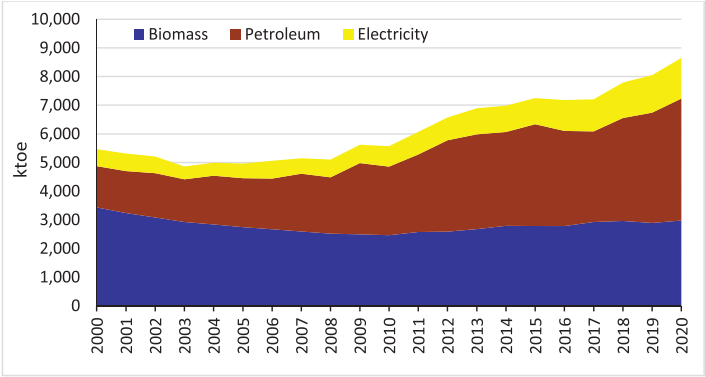
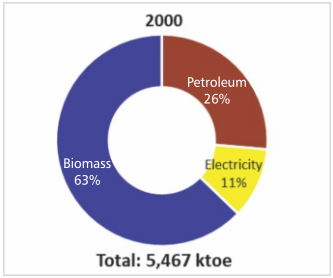
FINAL ENERGY CONSUMPTION

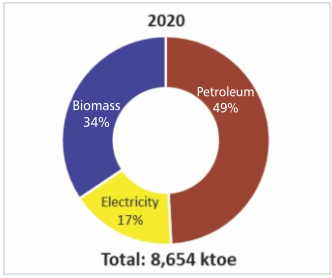
FINAL ENERGY CONSUMPTION

Final Energy Consumption by Fuel Type (2000 - 2020)



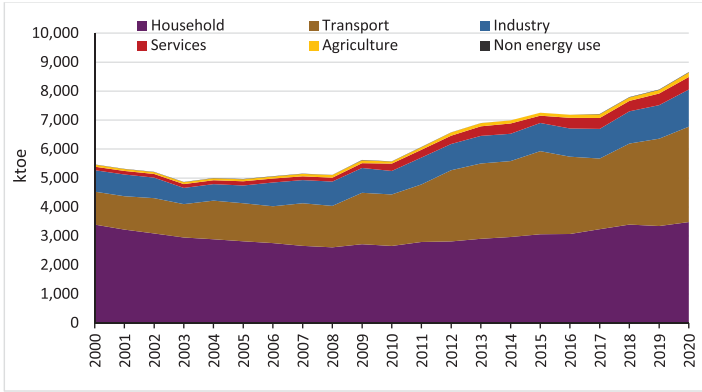
2000 and 2020 Share of Final Energy Consumption by Fuel Type



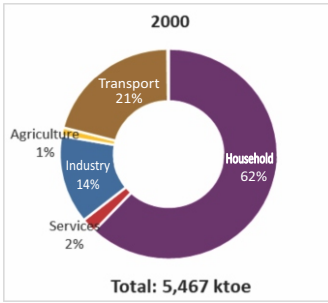


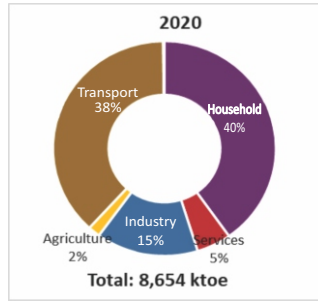
Final energy consumption increased at an annual average growth rate of 2.3%, from 5,478.4 ktoe in 2000 to 8,664.3 ktoe in 2020. The share of biomass in total final energy consumed decreased from 63% in 2000 to 34% in 2020.

Final Energy Consumption by Sector



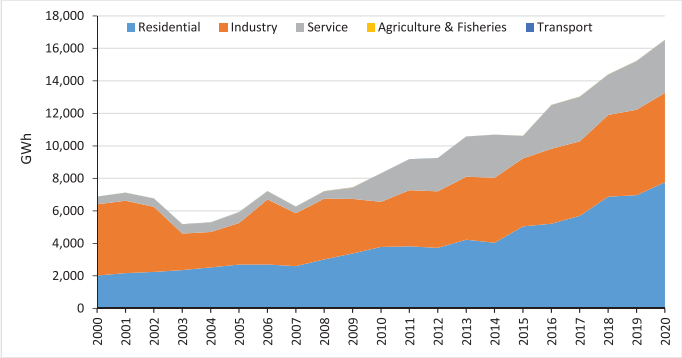
2000 and 2020 Share of Final Energy Consumption by Sector



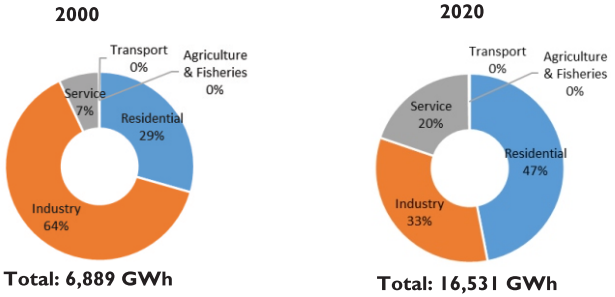


Final energy consumed by the residential sector in 2000 was 3,390 ktoe representing 61.9% of the total final energy consumed. In 2020, however, final energy consumed by the residential sector reduced marginally to 3,477 ktoe representing 40.1% of total final energy consumed by all sectors of the economy. Final energy consumed by the transport sector, increased from 1,149 ktoe in 2000, representing 21.0% of total energy consumed, to 3293 ktoe in 2020, representing 38% of total energy consumed by all sectors.

Electricity Consumption by Sector

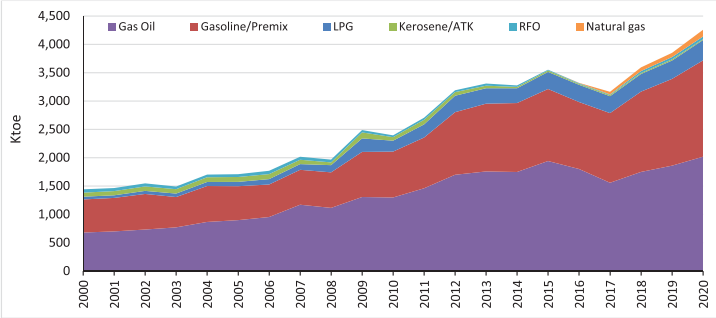


2000 and 2020 Share of Electricity Consumption by Sector

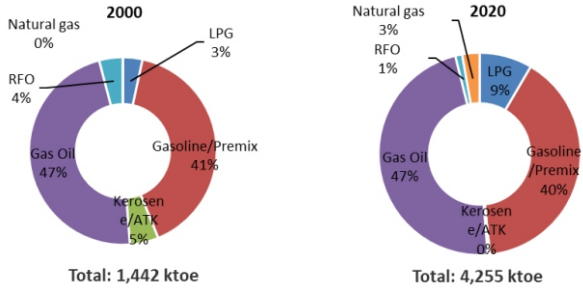


In 2000, the industrial and residential sectors consumed 4,380 GWh and 2,026 GWh of electricity respectively, representing 64% and 29% of total electricity consumed respectively. However, in 2020, the share of residential in final electricity consumption increased to 47%, representing 7,765 GWh, followed by the industrial sector with a share of 33% representing 5,499 GWh.

Consumption of Petroleum Products, by Fuel Type

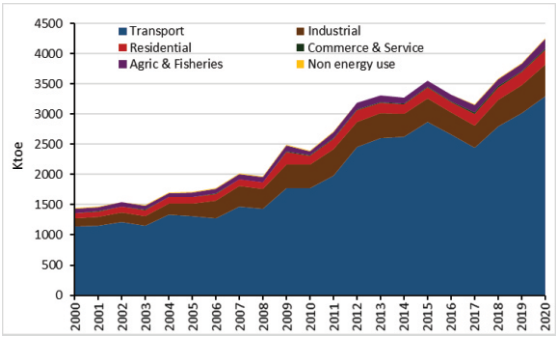


2000 and 2020 Share of Petroleum Products Consumption



The total petroleum products consumed increased at an annual average growth rate of 5.2% from 1,442 ktoe in 2000 to 4,193 ktoe in 2020. The share of gas oil in final petroleum product consumption average about 51.9% from 2000 to 2020 whilst LPG share of final petroleum product consumed increased from 3.3% in 2000 to 8.6% in 2020.

Consumption of Petroleum Products, by Sector



Petroleum Product Consumption by Sector (ktoe)

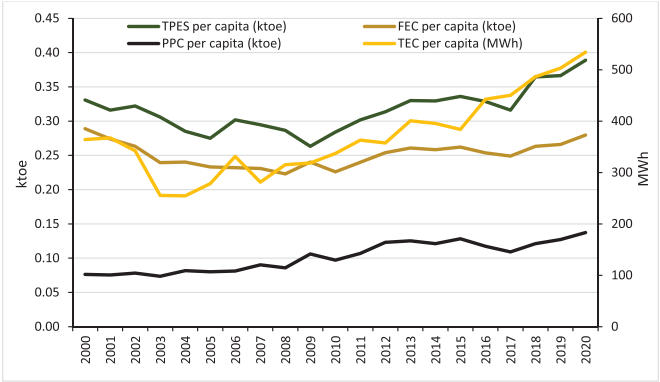
	2000	2005	2010	2015	2016	2017	2018	2019	2020
Residential	88	112	144	174	177	202	210	217	242
Industrial	134	201	386	396	356	367	437	462	531
Service	5	6	8	14	15	17	19	20	23
Agriculture	70	68	71	100	104	125	118	122	152
Transport	1,136	1,312	1,776	2,867	2,667	2,438	2,796	3,013	3,292
Non energy use	7	10	7	1	1	12	13	14	15
Total	**1,442**	**1,708**	**2,394**	**3,552**	**3,320**	**3,162**	**3,593**	**3,849**	**4,255**

In 2000, 1,136 ktoe of petroleum products were consumed by the transport sector representing 79% of the total petroleum products consumed. It almost tripled to 3,292 ktoe in 2020, representing 77.3% of the total petroleum product consumed. The share of total petroleum products consumed in the industrial sector in 2000 was 9.3%, increasing to 12.5% in 2020. Consumption of petroleum products in the residential sector which is largely LPG, increased from 88 ktoe (6.1% of total consumption) in 2000 to 242 ktoe (5.7% of total consumption) in 2020.

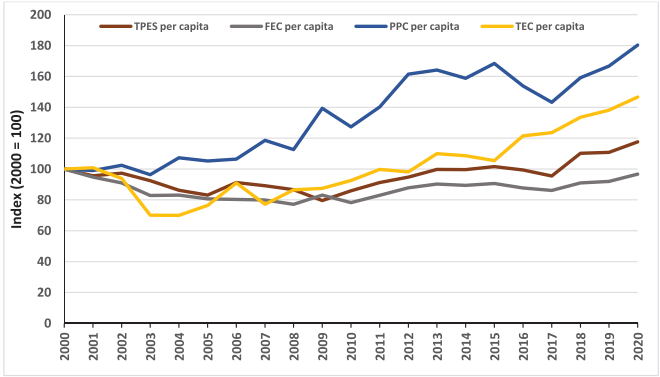
ENERGY INDICATORS

ENERGY SUPPLY AND CONSUMPTION PER CAPITA

Energy Supply and Consumption per capita, 2000 - 2020

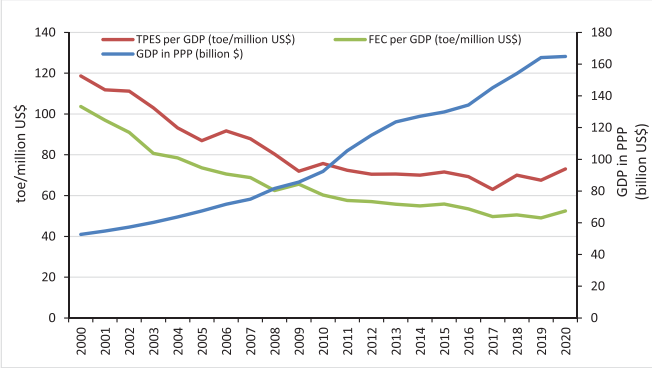


Energy Supply and Consumption per capita Index (2000=100)

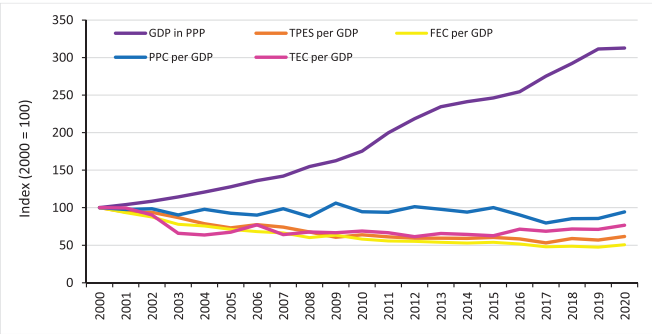


ENERGY SUPPLY AND CONSUMPTION PER GDP

Energy Supply and Consumption per GDP, 2000 - 2020



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


← CRUDE OIL →

ENERGY BALANCE

2020 Energy Balance, ktoe

Supply and Consumption	Crude Oil	Natural Gas	Petroleum Products	Wood	Charcoal	Solar	Hydro	Electricity	Total
Production	9,752	2,398		4,274	-	5	627	-	17,056
Imports	706	616	4,107	-	0.02	-	-	5	5,434
Exports	-9,830	-	-181	-	-1	-	-	-155	-10,166
Intl. Marine Bunkers	-	-	-5	-	-	-	-	-	-5
Intl. Aviation Bunkers	-	-	-117	-	-	-	-	-	-117
Stock changes	-91	-	-222	-	-	-	-	-	-314
TES	**537**	**3,014**	**3,581**	**4,274**	**-1**	**5**	**627**	**-150**	**11,887**
Transfers	-88	-	95	-	-	-	-	-	6
Statistical differences	-187	132	-105	-	-	-	-	-	-160
Electricity plants	-53	-2,764	-107	-	-	-5	-627	1,735	-1,822
Oil refineries	-516	-	498	-	-	-	-	-	-18
Other transformation	-	-	-	-2,807	1,511	-	-	-	-1,297
Energy industry own use	21	-	34	-	-	-	-	53	108
Losses	45	-	-	-	-	-	-	111	156
TFC	**-**	**118**	**4,137**	**1,467**	**1,510**	**-**	**-**	**1,422**	**8,654**
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

2019 Energy Balance, ktoe

Supply and Consumption	Crude Oil	Natural Gas	Petroleum Products	Wood	Charcoal	Solar	Hydro	Electricity	Total
Production	10,410	1,394		4,132	-	4	624	-	16,564
Imports	847	599	3,943	-	0.02	-	-	11	5,400
Exports	-10,344	-	-298	-	-0.43	-	-	-123	-10,765
Intl. Marine Bunkers	-	-	-7	-	-	-	-	-	-7
Intl. Aviation Bunkers	-	-	-211	-	-	-	-	-	-211
Stock changes	-14	-	16	-	-	-	-	-	2
TES	**899**	**1,993**	**3,442**	**4,132**	**-0.41**	**4**	**624**	**-112**	**10,982**
Transfers	-69	-	74	-	-	-	-	-	5
Statistical differences	-9	44	-125	-	-	-	-	-	-90
Electricity plants	-139	-1,875	-405	-	-	-4	-624	1,564	-1,482
Oil refineries	-631	-	632	-	-	-	-	-	0.3
Other transformation	-	-	-	-2,684	1,444	-	-	-	-1,240
Energy industry own use	23	-	93	-	-	-	-	40	157
Losses	45	-	-	-	-	-	-	102	147
TFC	**-**	**74**	**3,775**	**1,448**	**1,444**	**-**	**-**	**1,310**	**8,051**
Residential	-	-	217	1,181	1,343	-	-	599	3,341
Industry	-	74	388	240	4	-	-	452	1,158
Commerce & Service	-	-	20	27	97	-	-	256	401
Agriculture & Fisheries	-	-	122	-	-	-	-	1	123
Transport	-	-	3,013	-	-	-	-	1	3,014
Non-Energy Use	-	-	14	0	0	0	0	0	14

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ENERGY PRICES

CRUDE OIL PRICES

Average Crude Oil Prices ($/bbls), Jan 2001 – Dec 2020

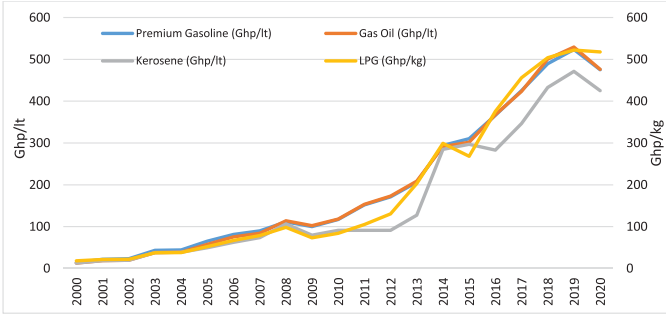
Monthly Average Crude Oil Prices ($/bbl)

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
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
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
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

In Ghana, as of December 2020, the average price of crude oil stood at 50.2 U.S. dollars per barrel, a decrease of 15 U.S. dollars compared to the December, 2019. Furthermore, over the period observed, the international prices of crude oil fluctuated but decreased generally. Overall, in 2020, Ghana reached a high and low crude oil price of 63.7 and 26.6 U.S. dollars per barrel January and April 2020, respectively.

PETROLEUM PRODUCTS PRICES

Petroleum Products Prices, 2000 - 2020



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

Petroleum Product Prices

Year	Premium Gasoline (Ghp/lt)	Gas Oil (Ghp/lt)	Kerosene (Ghp/lt)	LPG (Ghp/kg)
2000	13.7	12.8	12.8	18.2
2005	65.0	57.8	49.7	52.4
2010	117.0	118.1	91.0	83.8
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

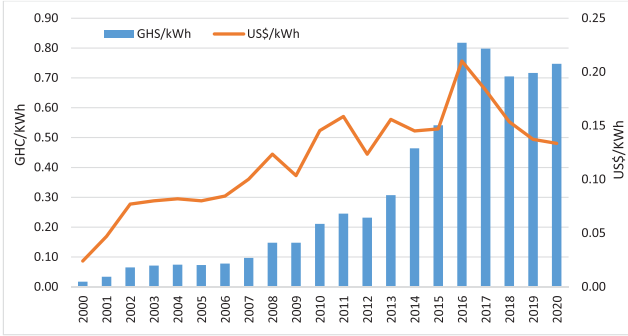
The average ex-pump prices of petroleum products specifically petrol, diesel, kerosene and LPG increased from Ghp13.69/litre, Ghp12.78/litre, Ghp 12.78/litre and Ghp 18.24/kg respectively in 2000 to Ghp 475/litre, Ghp 476.2/litre, Ghp 425.1/litre and Ghp 517.8/kg respectively as at the end of 2020.

ELECTRICITY PRICES

Electricity Tariff by Customer Class

Tariff Category	Effective dates							
	Dec, 2011	Oct, 2013	Oct, 2014	Dec, 2015	Oct, 2018	Jul, 2019	Oct, 2019	Oct, 2020
Residential								
0 - 50 (Exclusive)	10	16	21	34	28	31	33	33
51 - 300 (GHp/kWh)	18	31	41	67	56	62	65	65
301 - 600 (GHp/kWh)	23	41	54	87	72	80	85	85
600+ (GHp/kWh)	25	45	59	97	80	89	94	94
Service Charge for Lifeline Consumers (GHp/month)	165	296	388	633	213	213	213	213
Service Charge for Other Residential Consumers (GHp/month)	165	296	388	633	633	704	746	746
Non-Residential								
0 -300 (GHp/kWh)	25	45	59	97	68	75	80	80
301 - 600 (GHp/kWh)	27	48	63	102	72	80	85	85
600+ (GHp/kWh)	42	76	100	163	114	126	134	134
Service Charge (GHp/month)	276	493	646	1055	1055	1173	1243	1243
SLT - Low Voltage								
Maximum Demand (GHp/kVA/month)	1543	2760	3617	5910	5910	-	6960	6960
Energy Charge (GHp/kWh)	26	47	62	101	76	99	89	89
Service Charge (GHp/month)	1102	1972	2584	4221	4221	4693	4971	4971
SLT - Medium Voltage								
Maximum Demand (GHp/kVA/month)	1323	2366	3100	5065	5065	-	5966	5966
Energy Charge (GHp/kWh)	20	37	48	78	59	75	69	69
Service Charge (GHp/month)	1543	2760	3617	5910	5910	6570	6960	6960
SLT - High Voltage								
Maximum Demand (GHp/kVA/month)	1323	2366	3100	5065	5065	-	5966	5966
Energy Charge (GHp/kWh)	19	34	44	72	54	79	63	63
Service Charge (GHp/month)	1543	2760	3617	5910	5910	6570	6960	6960
SLT-High Voltage - Mines								
Capacity Charge (GHp/KVA/Month)	1543	2760	3617	5910	5910	-	6960	6960
Energy Charge (GHp/kWh)	30	53	70	114	103	249	121	121
Service Charge (GHp/Month)	1543	2760	3617	5910	5910	6570	6960	6960

Average Electricity End-User Tariff



Average Electricity End-User Tariff

Year	GHS/kWh	US$/kWh
2000	0.017	0.024
2005	0.073	0.080
2010	0.211	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

The electricity end-user tariff increased at an annual average growth rate of 20.8%, from 2000 to 2020. From 2019 to 2020, the average electricity end-user tariff (GHS/kWh) witnessed a 4.3% increment.

HOW LONG WILL ONE UNIT OF ELECTRICITY LAST?

ENERGY COMMISSION
GHANA

No. OF HOURS TO CONSUME ONE UNIT (kWh) OF ELECTRICITY

125 Hours

67 Hours

30 Hours

20 Hours

14 Hours

6 Hours 30Mins

4 Hours

3 Hours

1 Hour 15Mins

1 Hour

1 Hour

40 Mins

17Mins

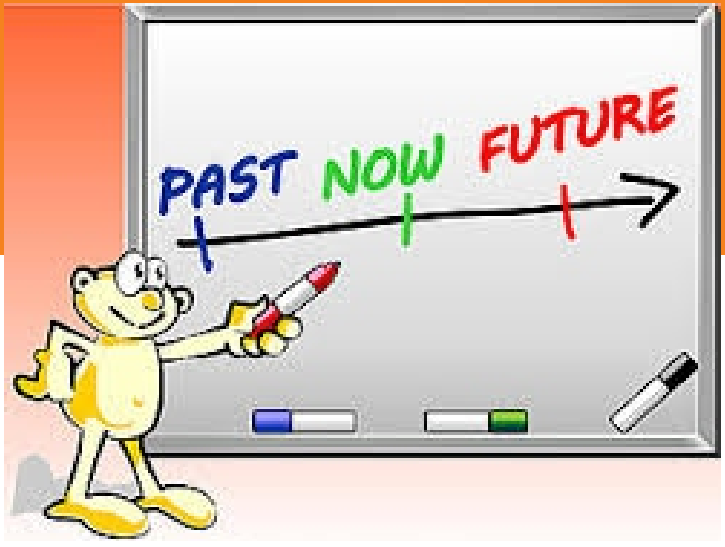
7Mins

USE ELECTRICITY WISELY

LOW CONSUMPTION

DOMESTIC APPLIANCES

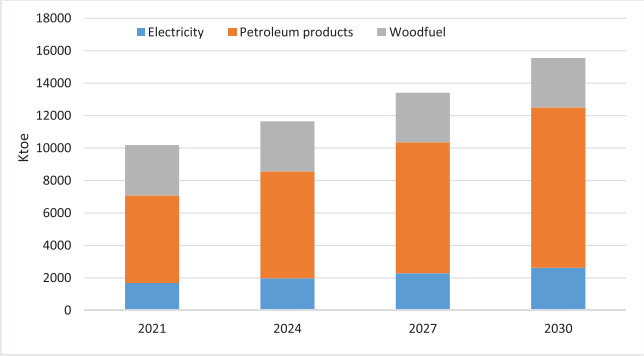
HIGH CONSUMPTION



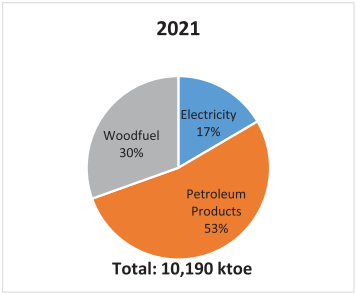
OUTLOOK

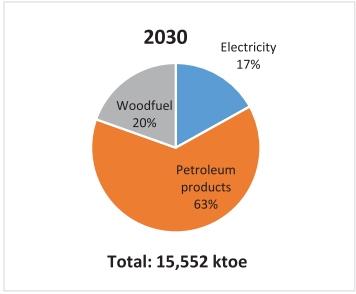
OUTLOOK FOR ENERGY DEMAND

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



2021 and 2030 Shares of Energy Demand by Fuels (Business-as-Usual Scenario)

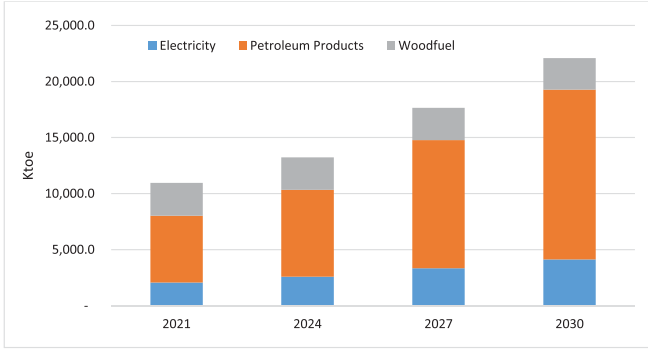




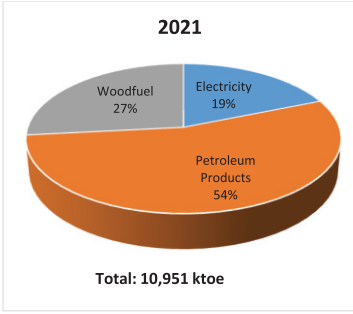
NB: The Business-as-Usual scenario describes a socio-economic outlook based on trends from the historical past until 2030.

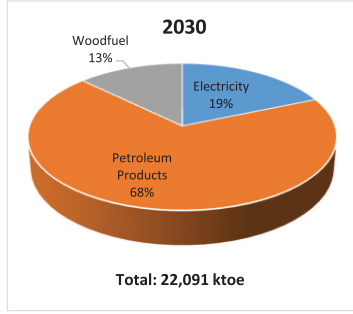
Outlook for Energy Demand by Fuels

(Accelerated Economic Growth Scenario)



2021 and 2030 Shares of Energy Demand by Fuels (Accelerated Economic Growth Scenario)

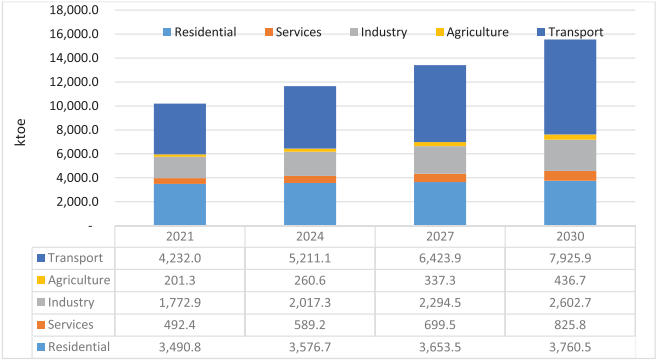




NB: *The Accelerated Economic Growth scenario considers the objectives of the Ghana Shared Growth and Development Agenda, Medium-Term National Development Policy Framework (2018-2021) and the Coordinated Programme for Economic and Social Development Policies (2017-2024), which included project and programmes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

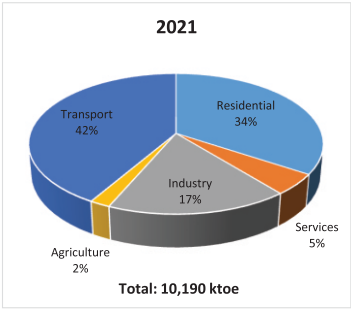
Outlook for Energy Demand by Sectors

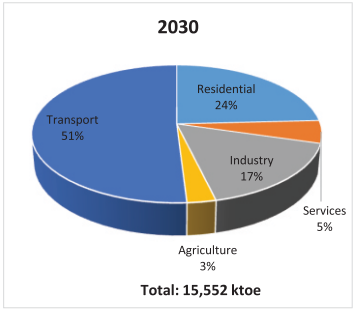
(Business-as-Usual Scenario)



	2021	2024	2027	2030
Transport	4,232.0	5,211.1	6,423.9	7,925.9
Agriculture	201.3	260.6	337.3	436.7
Industry	1,772.9	2,017.3	2,294.5	2,602.7
Services	492.4	589.2	699.5	825.8
Residential	3,490.8	3,576.7	3,653.5	3,760.5

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

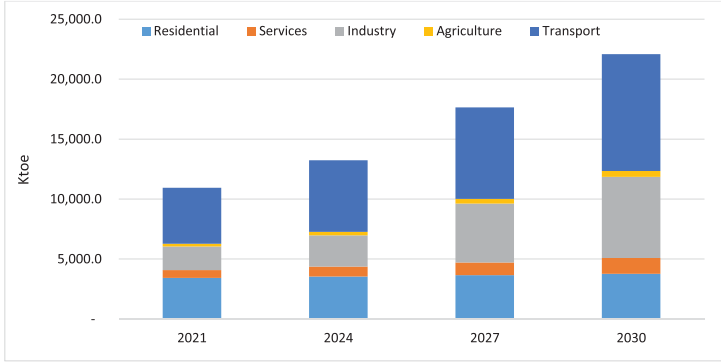




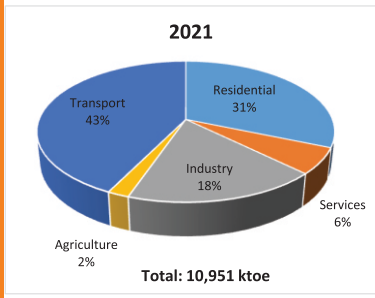
***NB**: The Business-as-Usual scenario describes a socio-economic outlook based on trends from the historical past until 2030.*

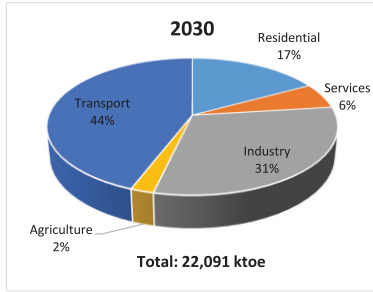
Outlook for Energy Demand by Sectors

(Accelerated Economic Growth Scenario)



2021 and 2030 Outlook for Energy Demand by Sectors (Accelerated Economic Growth Scenario)





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CONVERSION FACTORS

Ghana Standard Figures				
Petroleum				
Crude Oil	1	Tonne	1.02	TOE
Gasoline / Petrol	1	Tonne	1.05	TOE
Kerosene	1	Tonne	1.03	TOE
Jet Kerosene	1	Tonne	1.03	TOE
Gasoil / Diesel	1	Tonne	1.02	TOE
Fuel Oil	1	Tonne	0.97	TOE
LPG	1	Tonne	1.08	TOE
Crude Oil	1	barrel	36	Imperial gallons
	36	Imperial gallons	163.66	Litres
	7	Barrels	1	Tonne
	1	cubic metre	6.29	Barrels
Natural Gas	1	GJ	1.05	MMBtu
	1.05	MMBtu	1.07	MSCF
	1	MMBtu	27.10	cubic metre (m3)
	1	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
	1	GWh	86	TOE
	1	GWh	3600	GJ
	1	TOE	41.86	GJ

Ghana Standard Figures				
Woodfuel				
Firewood/fuelwood	1	Tonne	0.30-0.36	TOE
Charcoal	1	Tonne	0.68-0.88	TOE
Sawdust/sawmill residues/wood chips	1	Tonne	0.20-0.30	TOE

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.

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

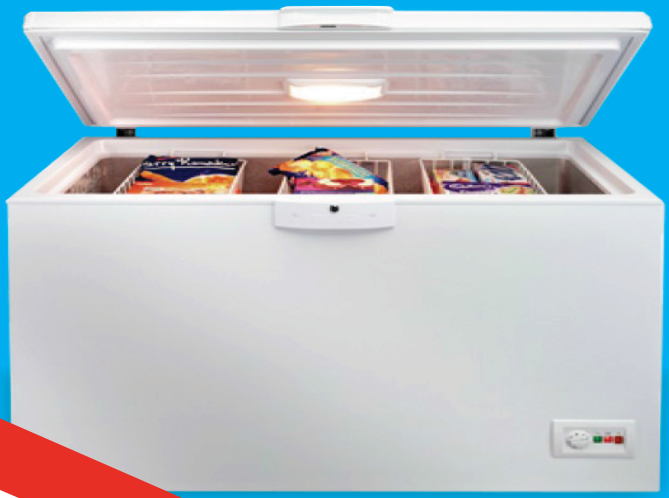
Charcoal Source	Average Weight (kg) of Charcoal		
	Mini Bag	Maxi Bag	Moisture Content
Sawmill residue	21 – 22	44 - 45	Up to 40%
Savannah wood	30 – 32	55 - 60	Up to 20%
Acacia plant	31 – 32	57 - 63	Up to 20%
All other woods	25 – 27	50 - 55	Up to 25%

GLOSSARY

Average	It is a measure of central tendency. It could be mean, median or mode depending upon the distribution of the data. For a normal distribution set, the mean, median and mode are the same.
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

Save Power by Switching off Your FREEZER in the Night

Automatic Timer Switch



ENERGY COMMISSION

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