AFRICAN UNION

AFREC ENERGY

AFRICAN ENERGY COMMISSION
COMMISSION AFRICAINE DE L'ENERGIE

An Integrated, Prosperous and Peaceful Africa

AFRICA ENERGY BALANCE & INDICATORS EDITION 2021

AFRICAN UNION AFREC ENERGY

An Integrated, Prosperous and Peaceful Africa

2021

Africa Energy Balances & Indicators

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FOREWORD

To identify Africa's problems and give rise to pragmatic and objective solutions, AFREC aspiration as mandated by the member states is to facilitate, promote and support rapid economic and social development of its people by strengthening Africa's energy sector & resource response to enhance energy development, integration, self-reliance and security on the African continent.

At AFREC, we are convinced that data and analysis will address the challenges facing African citizens, to plan and implement solutions which can provide the people with accessibility to clean and affordable energy. Collectively with our member states, pan – African institutions, development partners and all other stakeholders, we are committed to carefully analyse real Africa energy situation and challenges facing our continent, and prudently develop mechanisms informed by evidence-based information and data, which we champion through our programmes and policy implementation approach, to resolve energy poverty at all levels of the continent. Development cannot be undertaken without energy, and technology can also not be deployed without accessibility to energy. Hence, our collective response to Africa's energy challenge should be reflected in our actions, to meet local, regional and continental energy adequacy and sustainability.

In support of our commitment above, for the past year, AFREC continue to work with all member states in support of their effort to collect, validate and build robust accurate energy balance and indicators. In 2021 specifically, AFREC provided capacity building to train 338 African energy statisticians as nominated by their government ministers responsible of energy. We also trained 40 African Energy statistician under the training of trainers programme and are currently supporting eleven (11) member states to improve their national energy information system (NEIS).

These interventions and others will be sustained to build the capacity of African energy experts in collecting, validating and disseminating national energy statistics, which is a backbone for energy policies development and planning for our member states.

Thus, in this edition of the 2021 energy balance, AFREC provides you with a comprehensive outlook on energy supply and demand for 2019 from 13 African countries. The data will trigger our response to the growing demand of energy as one of the main development challenges facing the continent.

Throughout your reflection in reading this report for instance, you may notice that biofuels and waste remains one of the main sources of Total Primary Energy Supply (TPES) in most of the countries in southern, central west and east Africa, while in oil and gas producing countries such as Algeria, natural Gas and Crude Oil TPES is over 50%. These information provokes debates on energy development, accessibility gaps and actions in addressing this notion.

We therefore hope that the aggregated data presented in this publication will provide valuable insights. It is also my wish to encourage our member states to fully commit at collating and processing energy data at national level, to ensure governments, our regional continental institutions whose mandate is to develop and transform the African energy sector are planning and designing programmes or developing policies which are informed by evidence and are contributing to solving the energy plight of our people and integration on the continent.

RASHID Ali Abdallah

Executive Director, African Energy Commission

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UNIT ABBREVIATIONS

bcm	Billion cubic metres
Gcal	Gigacalorie
GCV	Gross calorific value
GW	Gigawatt
GWh	Gigawatt hour
kb/cd	Thousand barrels per calendar day
kcal	Kilocalorie
kg	Kilogram
kJ	Kilojoule
kWh	Kilowatt hour
MBtu	Million British thermal units
Mt	Million tons
Mtoe	Million tons of oil equivalent
t	Metric ton=tonne=1000kg
kt	Kilotonnes
TJ	Tera joule
toe	Ton of oil equivalent=10^7 kcal
TWh	terawatt hour

The African Energy Commission (AFREC)

The African Energy Commission (AFREC) is a specialized agency of the African Union, created by Decision AHG/Dec.167 (XXXVII) of the 37th Summit of the OAU African Heads of States and Governments which was held in Lusaka, Zambia, on 11 July 2001 and was launched by the African Union Ministers in charge of Energy in the meeting held on 15 – 17 February 2008 in Algiers, Algeria through the Algiers Declaration AU/EXP/EN/Decl (III).

As per its convention, AFREC has a broad mandate including:

- Develop policies, strategies, research and plans based on Member States, sub regional, regional and continental development priorities and recommend their implementation.
- Design, create and update an energy continental database and facilitate the rapid dissemination of information and exchange of information among Member States, sub-regional, regional and continental institutions;
- Provide technical support, mobilize financial and technical support while providing capacity building to the Member States, sub-regional, regional and continental institutions;
- Undertake training and capacity building programmes in various African energy sectors in order to develop political, managerial, technical and decision-making capacities in AU member states and advise and encourage the development of human resources in the energy sector;
- In addition to its convention, AFREC's activities and programmes are also based on the AUC Strategic Plan, various resolutions and declarations adopted by AU Summits and Energy Ministers with regard to energy development in Africa.

AFREC PILLARS

In order to fulfil the mandate of designing, creating and updating a continental database, AFREC successfully created the first ever Africa Energy Information System (AEIS). This made it possible for AFREC to develop, annually publish and disseminate the African Energy Database book since 2012. Other annual publications include: Africa Energy Efficiency for the Residential Sector, Key Africa Energy Statistics and Africa Energy Balance and Indicators. Other planned contents to be included in future publications include Africa Energy Efficiency for all Sector, CO2 emissions and Energy Prices and Taxes etc.

AFREC has also developed 5 main pillars that have been approved by the AU Specialized Technical Committee (STC) on Transport, Transcontinental and Interregional Infrastructure, Energy and Tourism (STC-TTIIET) and recently AFREC added a supplementary programme. These pillars are classified into *6 Programmes namely: Bioenergy, African Energy Information System, Energy Efficiency, Oil and Gas, Energy Transition and Capacity Building*.

The bioenergy programme provides sustainability indicators for bioenergy and related Food and Agriculture Organization (FAO) best practices by providing technical support capacity building of relevant institutions of the beneficiary countries to measure/collect, analyze and monitor bioenergy data.

This will enable them to track the environmental, social and economic impacts of their bioenergy production and consumption, particularly the actual contribution to GHG emission reductions by replacing fossil fuel and traditional biomass use while harnessing socio-economic co-benefits.

A*frican energy efficiency programme* was developed with the aim of significantly reducing the final energy demand and pollution emissions across the continent and to provide increased electricity access, competitiveness, energy security and economic development by supporting the unlocking of some $175 Billion in available savings by 2030.

The oil and gas programme focuses on creating an African domestic crude oil and petroleum products market in collaboration with main African stakeholders mainly crude oil producers, net oil products consumers, current owners of unused and underused refineries and regional and national authorities.

The African Energy Sector Transition programme was an analytical and engagement dimension that was inspired by the international "Deep Decarbonization Pathways (DDP)" initiative. This initiative, coordinated was by the Paris based Institut du Développement Durable et des Relations Internationales (IDDRI) since 2014 and is active today in around 40 countries where it supports the deployment of in-country capacities to elaborate context-driven strategies articulating development, sustainability and climate objectives.

The capacity building programme, the main objective is to invest in African human resources by designing a comprehensive capacity building programme with a 5-year implementation plan for AU Member States to enhance the capacities of policymakers, energy planners, regulators, experts and technicians from AU Member States, Regional Economic Communities (RECs), regional power pools, centres for renewable energy & energy efficiency and other relevant stakeholders supporting the sustainability of the African energy sector.

AFREC PILLARS

- African Energy Information System Programme (AEIS)
- Bioenergy Programme
- Energy Efficiency Programme
- Oil and Gas Programme
- Energy Transition Programme
- Capacity Building Programme

INDICATOR DEFINITIONS

Energy security

The Energy dependency rate represents the share of net import compared to the total primary energy supply. It is negative when exports are greater than imports in absolute value. It reflects the level at which an economy depends on the outside to provide for its needs.

Example: In the case of Algeria, exports exceed imports. The net import is negative and represents 1.34 times the total primary energy supply.

Share in imports

Coal and coal products

Share of Coal and coal products in the national imports.

Crude Oil

Share of Crude Oil in the national imports.

Oil products

Share of Oil products in the national imports.

Biofuels and Waste

Share of biofuels and waste in the national imports.

Natural gas

Share of Natural Gas in the national imports.

Electricity and Heat

Share of Electricity in the national imports.

Primary energy supply

Coal and Coal Product

Share of Coal and coal product in the total primary energy supply.

Example: In the case of Algeria, Coal and coal product represents 0.5% of the country's total primary energy supply.

Crude Oil

Share of Crude Oil in the total primary energy supply.

Biofuels and Waste

Share of Biofuels and waste in the total primary energy supply.

Natural Gas

Share of Natural Gas in the total primary energy supply.

Nuclear

Share of Nuclear in total primary energy supply.

Hydro

Share of Hydro in total primary energy supply.

Solar

Share of Solar in total primary energy supply.

Wind

Share of Wind in total primary energy supply.

Other sources

Share of nuclear in total primary energy supply.

Heat

Share of Heat in total primary energy supply.

Electricity

Rate of electricity transport and distribution losses

These are Electricity transmission and distribution losses divided by the sum of final electricity consumption, expressed as a percentage.

Electricity production mix

Coal and coal products
Share of Coal and Coal Products used for Gross Electricity Production
Crude Oil
Share of Crude Oil used for Gross Electricity Production
Oil Products
Share of Oil Products used for Gross Electricity Production
Natural Gas
Share of Natural Gas used for Gross Electricity Production
Biofuels and waste
Share of Biofuels and waste used for Gross Electricity Production
Nuclear
Share of Nuclear used for Gross Electricity Production
Hydro
Share of Hydro used for Gross Electricity Production
Solar PV
Share of Solar PV used for Gross Electricity Production
Wind
Share of Wind used for Gross Electricity Production
Other
Share of Other fuels used for Gross Electricity Production

Refining

Efficiency of refineries
It is Refinery Production divided by Refinery inputs. This will allow to know the efficiency of the petroleum products processing plant.

INTRODUCTION

In line with its mandate, AFREC has established and maintained the African Energy Information System (AEIS) since 2012, which allows collection and validation of African country energy statistics through the use of questionnaires and disseminate these statistics data through publications and datasets, which are available on AFREC website & visualization Dashboard at www.au-afrec.org .

In 2019, AFREC assessed the current AEIS and came up with a holistic improvement plan which attempted to address all the challenges including the information technology infrastructure requirements, procedural mechanisms, information flow processing, human capacity, technology architecture, programming and equipment, required funding, enhancement and expansion of the energy data collection into more sectors and indicators, thus making the AEIS a more integrated and comprehensive system.

The new AEIS will enhance the quality of the energy data collected by AFREC and increase the coverage scope of AEIS, to include more energy indicators (CO2 emission, SDG tracking, data visualisation tools etc.), so AFREC becomes the main source and central hub for quality, credible and reliable energy statistics for Africa.

For the African Energy Balance and Indicators publication of the year 2021, AFREC has validated Energy Balance from 13 African countries only, as a result of challenges presented by the impact of Covid 19, to process of data collection, validation and dissemination at National level.

ENERGY BALANCES AND INDICATORS

Algeria: *Aggregated Energy Balance*

Thousand Tonnes of Oil Equivalent (ktoe)	Coal and Coal Products	Crude oil	Oil products	Natural Gas	Biofuels and waste	Hydro	Solar	Wind	Electricity	Total of all energy sources
Production	-	65 716.6	-	76 539.7	10.3	13	58	0.8	-	142 338.5
Imports (+)	269.6	164.6	2 394.3	-	-	-	-	-	45.7	2 874.2
Exports (-)	-	-27 027.3	-21 178.9	-36 385.3	-	-	-	-	-57.9	-84 649.4
International Marine Bunkers (-)	-	-	-10	-	-	-	-	-	-	-10
International Aviation Bunkers (-)	-	-	-	-	-	-	-	-	-	-
Stock Changes (+ draw, - build)	8.1	-23.9	78.8	-	-	-	-	-	-	63
TOTAL PRIMARY ENERGY SUPPLY	**277.7**	**38 830.1**	**-18 715.7**	**40 154.4**	**10.3**	**13**	**58**	**0.8**	**-12.2**	**60 616.4**
Transfers : Origin (-) and Destination (+)	-	-8 218.3	9 015.2	-	-	-	-	-	-	796.9
Statistical Difference	-1.5	42.2	699.5	338.5	0	-	-	-	-24.9	1 053.7
TRANSFORMATION Inputs (-) and Outputs (+)	**982.6**	**-29 564.2**	**29 502.3**	**-17 078.9**	**-**	**-13**	**-58**	**-0.8**	**7 008.5**	**-9 221.6**
Electricity plants	-	-	-221.4	-17 078.9	-	-13	-58	-0.8	7 008.5	-10 363.6
CHP Plants	-	-	-	-	-	-	-	-	-	-
Heat Plants	-	-	-	-	-	-	-	-	-	-
Coke ovens	-213.2	-	-	-	-	-	-	-	-	-213.2
Blast furnaces	1 207.0	-	-	-	-	-	-	-	-	1 207.0
Oil Refineries	-	-29 564.2	29 074.8	-	-	-	-	-	-	-489.4
Coal-to-liquids plants	-	-	-	-	-	-	-	-	-	-
Gas-to-liquids plants	-	-	-	-	-	-	-	-	-	-
Charcoal production plants	-11.3	-	-	-	-	-	-	-	-	-11.3
Transformation not elsewhere specified	-	-	648.9	-	-	-	-	-	-	648.9
Energy Sector Own Use	**256.2**	**390**	**7.8**	**3 201.3**	**-**	**-**	**-**	**-**	**789.2**	**4 644.4**
Losses	**951.8**	**611**	**89.5**	**354.2**	**-**	**-**	**-**	**-**	**851**	**2 857.5**
FINAL CONSUMPTION	**53.8**	**4.4**	**19 004.9**	**19 181.6**	**10.3**	**-**	**-**	**-**	**5 381.0**	**43 636.1**
Industry	53.8	-	1 360.2	4 884.1	7	-	-	-	1 886.6	8 191.8
Transport	-	4.4	14 801.1	535.7	-	-	-	-	140.4	15 481.6
Households	-	-	1 594.2	9 333.6	3.3	-	-	-	2 281.5	13 212.6
Commercial and public services	-	-	132.4	1 041.5	-	-	-	-	961.3	2 135.2
Agriculture, Forestry and Fishing	-	-	37.8	34.4	-	-	-	-	111.2	183.5
Non-specified (HH, Com. & PS., Agri.)	-	-	917.5	-	-	-	-	-	-	917.5
Non-Energy Use	-	-	161.8	3 352.2	-	-	-	-	-	3 514.0

Note:

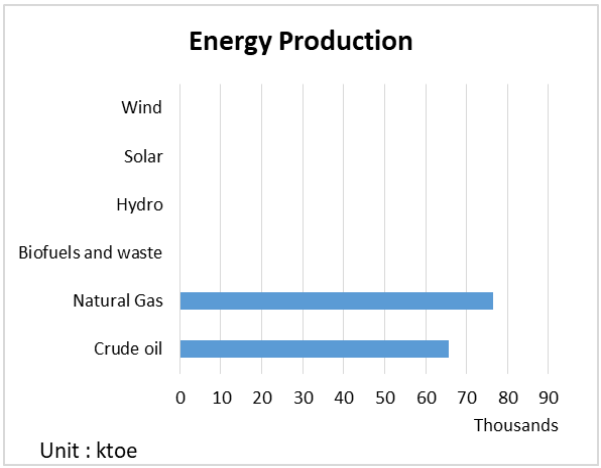
Algeria's Total Primary Energy Supply (TPES) is largely based on Natural Gas and Crude Oil, which represent 50.61% and 48.94% respectively. More than 98% of electricity production comes from Natural Gas with an average efficiency of Power Thermal Plants, 40.1% and Transmission & Distribution losses represent 13.7%. Final consumption is mainly split between Natural Gas and represent 43.96%, Petroleum Products 43.55% and 12.33% for Electricity.

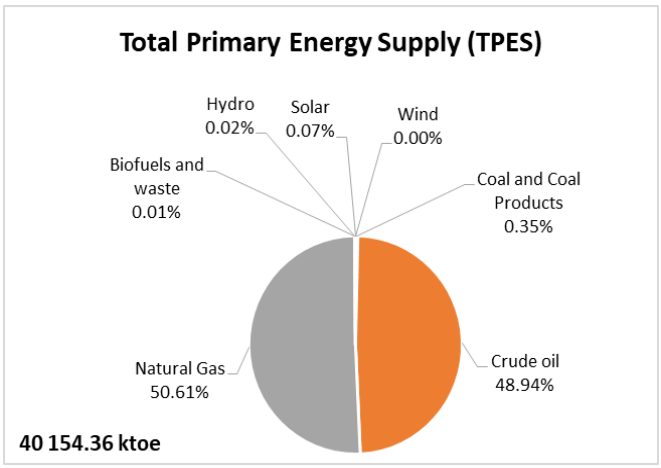
Algeria: *Indicators*

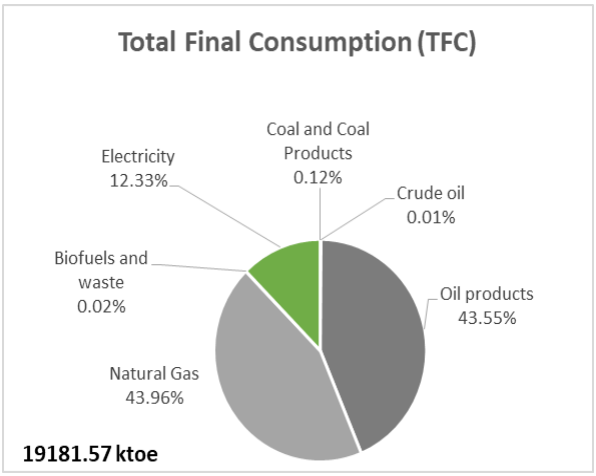
Energy security	Unit	Value
Energy dependency rate	%	-134.9
Share in imports		
Coal and coal products	%	9.4
Crude Oil	%	5.7
Oil products	%	83.3
Biofuels and Waste	%	0
Natural gas	%	0
Electricity and Heat	%	1.6
TOTAL	%	100
Primary energy supply		
Coal and coal products	%	0.35
Crude Oil	%	48.94
Biofuels and Waste	%	0.01
Natural gas	%	50.61
Nuclear	%	0
Hydro	%	0.02
Solar	%	0.07
Wind	%	0
Other sources	%	0
Net electricity & heat imports	%	0
Heat	%	0
TOTAL	%	100
Electricity		
Average efficiency of conventional thermal power generation	%	40.1
Rate of electricity transport and distribution losses	%	13.7
Electricity production mix		
Coal and coal products	%	0
Crude oil	%	0
Oil products	%	0.4
Natural gas	%	98.6
Biofuels and waste	%	0

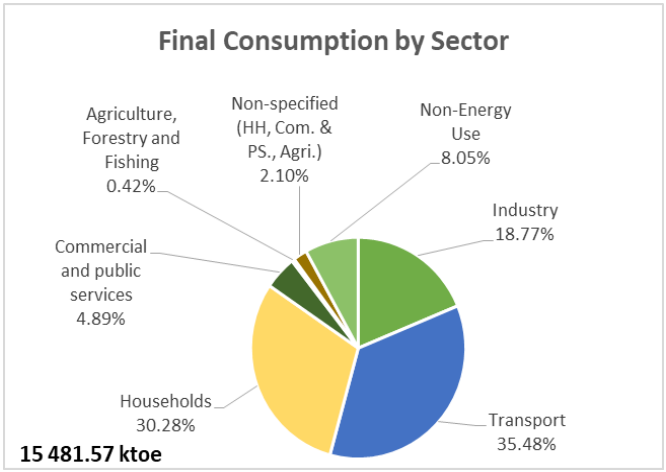
Nuclear	**%**	**0**
Hydro	**%**	**0.2**
Solar PV	**%**	**0.8**
Wind	**%**	**0**
Other	**%**	**0**
TOTAL	**%**	**100**
Refining		
Efficiency of refineries	**%**	**98.3**
Share of renewables		
Share of renewables in primary production	**%**	**0.1**
Share of renewables in total primary energy supply	**%**	**0.1**
Share of renewables in total final energy consumption	**%**	**0.2**
Share of renewables in electricity production	**%**	**1**
Share of solar thermal in final consumption	**%**	**0**
Final consumption		
Coal and coal products	**%**	**0.1**
Crude Oil	**%**	**0**
Oil products	**%**	**43.6**
Biofuels and Waste	**%**	**0**
Natural gas	**%**	**44**
Solar Thermal	**%**	**0**
Electricity and Heat	**%**	**12.3**
TOTAL	**%**	**100**

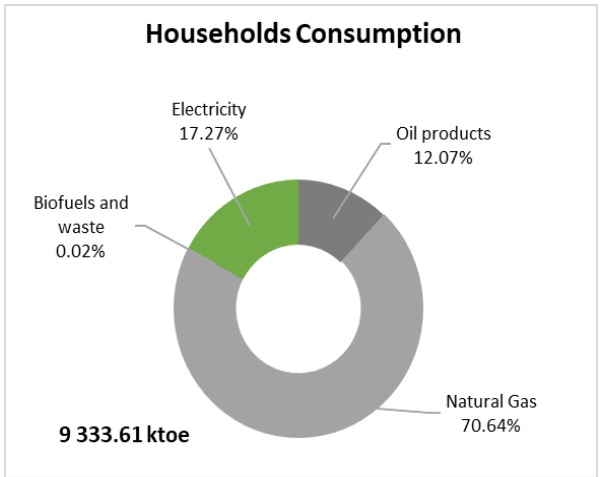
Algeria: *Charts*

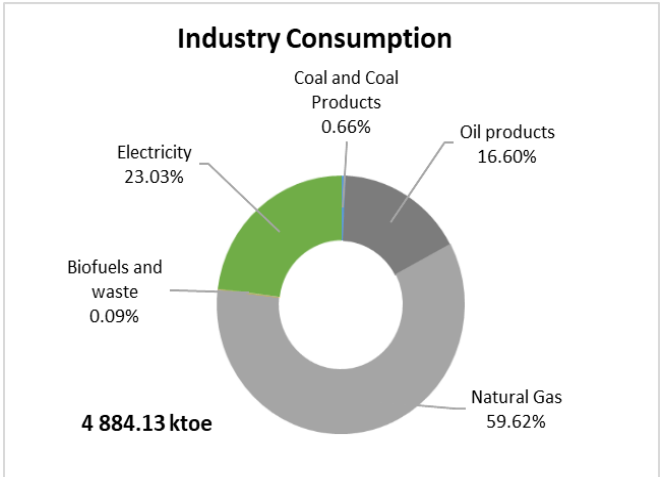












Benin: *Aggregated Energy Balance*

Thousand Tonnes of Oil Equivalent (ktoe)	Coal and Coal Products	Oil products	Natural Gas	Biofuels and waste	Hydro	Solar	Wind	Other sources	Electricity	Total of all energy sources
Production	-	-	-	3 069.8	-	0.6	-	-	-	3 070.4
Imports (+)	64.5	3 074.2	47.2	-	-	-	-	-	93.9	3 279.8
Exports (-)	-	-868.3	-	-	-	-	-	-	-0.2	-868.4
International Marine Bunkers (-)	-	-	-	-	-	-	-	-	-	-
International Aviation Bunkers (-)	-	-22.5	-	-	-	-	-	-	-	-22.5
Stock Changes (+ draw, - build)	-	-9.3	-	-	-	-	-	-	-	-9.3
TOTAL PRIMARY ENERGY SUPPLY	**64.5**	**2 174.1**	**47.2**	**3 069.8**	**-**	**0.6**	**-**	**-**	**93.8**	**5 450.0**
Transfers : Origin (-) and Destination (+)	-	-	-	-	-	-	-	-	-	-
Statistical Difference	-	7.5	-	0	-	-	-	-	0.1	7.6
TRANSFORMATION Inputs (-) and Outputs (+)	**-**	**-50.4**	**-47.2**	**-945.6**	**-**	**-0.6**	**-**	**-**	**45.4**	**-998.4**
Electricity plants	-	-50.4	-47.2	-	-	-0.6	-	-	45.4	-52.8
CHP Plants	-	-	-	-	-	-	-	-	-	-
Heat Plants	-	-	-	-	-	-	-	-	-	-
Coke ovens	-	-	-	-	-	-	-	-	-	-
Blast furnaces	-	-	-	-	-	-	-	-	-	-
Oil Refineries	-	-	-	-	-	-	-	-	-	-
Coal-to-liquids plants	-	-	-	-	-	-	-	-	-	-
Gas-to-liquids plants	-	-	-	-	-	-	-	-	-	-
Charcoal production plants	-	-	-	-945.6	-	-	-	-	-	-945.6
Transformation not elsewhere specified	-	-	-	-	-	-	-	-	-	-
Energy Sector Own Use	**-**	**0.6**	**-**	**-**	**-**	**-**	**-**	**-**	**5.5**	**6.1**
Losses	**-**	**1.3**	**-**	**-**	**-**	**-**	**-**	**-**	**25.7**	**27.1**
FINAL CONSUMPTION	**64.5**	**2 114.3**	**-**	**2 124.2**	**-**	**-**	**-**	**-**	**107.9**	**4 410.8**
Industry	64.5	57	-	11.7	-	-	-	-	23.9	157.1
Transport	-	1 981.6	-	-	-	-	-	-	-	1 981.6
Households	-	46.2	-	1 760.4	-	-	-	-	37.9	1 844.5
Commercial and public services	-	7.3	-	352.1	-	-	-	-	42.6	402
Agriculture, Forestry and Fishing	-	19.5	-	-	-	-	-	-	3.4	22.9
Non-specified (HH, Com. & PS., Agri.)	-	-	-	-	-	-	-	-	-	-
Non-Energy Use	-	2.7	-	-	-	-	-	-	-	2.7

Note:

The main sources of primary energy supply of Benin are dominated by Biofuels with the rate of 96.47% and followed by Coal and coal products 2.03%, Natural Gas with 1.48% and Solar with 0.02%. The biofuels and oil products dominate the final consumption with 48.16% and 47.93% respectively. Biofuels is consumed at 95.44% in the household sector which represents 41.82% of total final consumption

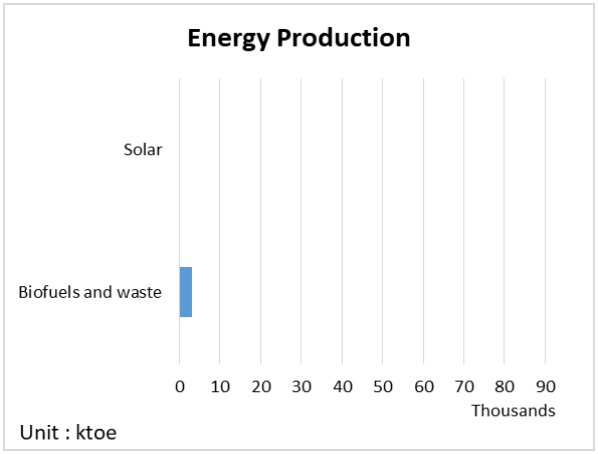
.

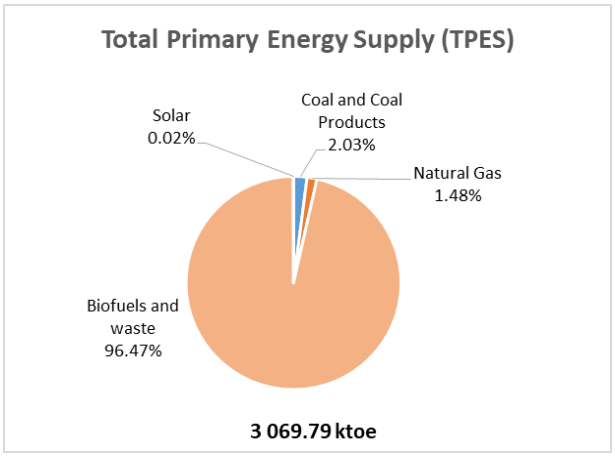
Benin: *Indicators*

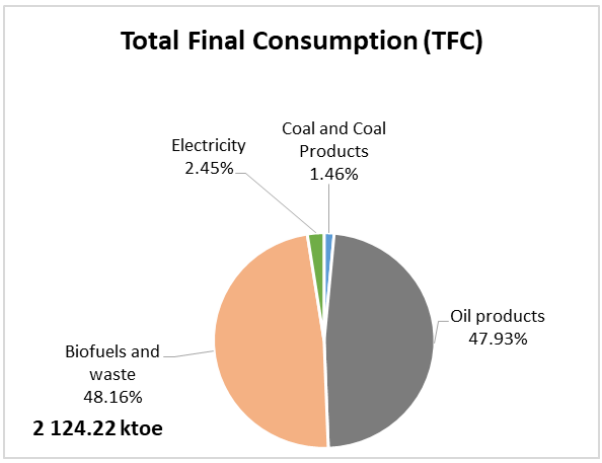
Energy security	Unit	Value
Energy dependency rate	%	44.2
Share in imports		
Coal and coal products	%	2
Crude Oil	%	0
Oil products	%	93.7
Biofuels and Waste	%	0
Natural gas	%	1.4
Electricity and Heat	%	2.9
TOTAL	%	100
Primary energy supply		
Coal and coal products	%	2.03
Crude Oil	%	0
Biofuels and Waste	%	96.47
Natural gas	%	1.48
Nuclear	%	0
Hydro	%	0
Solar	%	0.02
Wind	%	0
Other sources	%	0
Heat	%	0
TOTAL	%	100
Electricity		
Average efficiency of conventional thermal power generation	%	45.9
Rate of electricity transport and distribution losses	%	19.3
Electricity production mix		
Coal and coal products	%	0
Crude oil	%	0
Oil products	%	51.5
Natural gas	%	47
Biofuels and waste	%	0
Nuclear	%	0

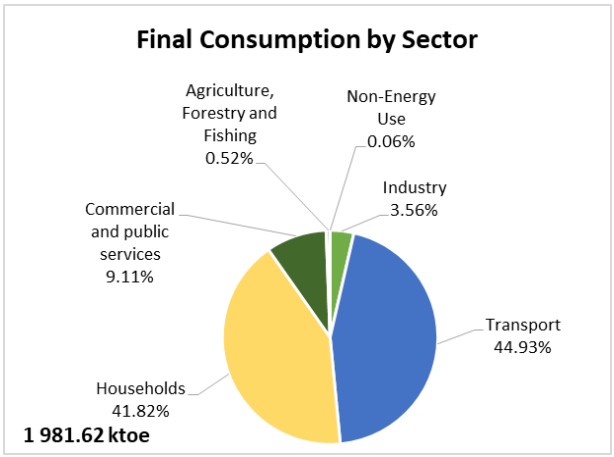
Hydro	**%**	**0**
Solar PV	**%**	**1.4**
Wind	**%**	**0**
Other	**%**	**0**
TOTAL	**%**	**100**
Share of renewables		
Share of renewables in primary production	**%**	**100**
Share of renewables in total primary energy supply	**%**	**56.3**
Share of renewables in total final energy consumption	**%**	**48.2**
Share of renewables in electricity production	**%**	**1.4**
Share of solar thermal in final consumption	**%**	**0**
Final consumption		
Coal and coal products	**%**	**1.5**
Crude Oil	**%**	**0**
Oil products	**%**	**47.9**
Biofuels and Waste	**%**	**48.2**
Natural gas	**%**	**0**
Solar Thermal	**%**	**0**
Electricity and Heat	**%**	**2.4**
TOTAL	**%**	**100**

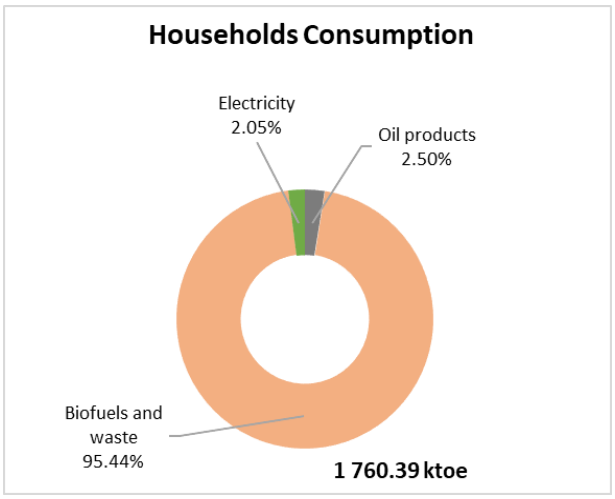
Benin: *Charts*

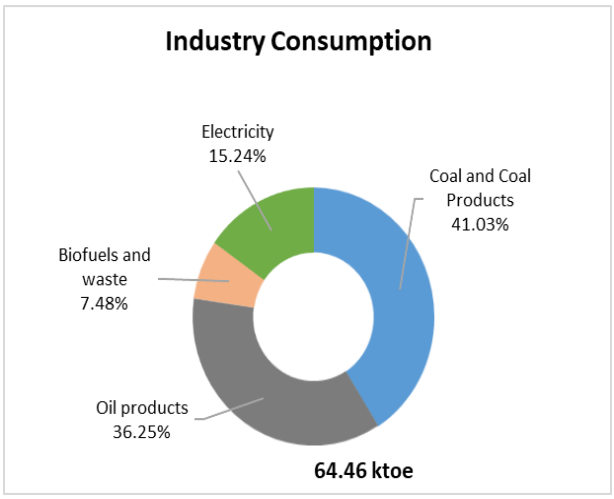












Cote d'Ivoire: *Aggregated Energy Balance*

Thousand Tonnes of Oil Equivalent (ktoe)	Coal and Coal Products	Crude oil	Oil products	Natural Gas	Biofuels and waste	Hydro	Solar	Wind	Electricity	Total of all energy sources
Production	-	1 890.8	-	1 860.7	6 691.0	299.3	-	-	-	10 741.8
Imports (+)	-	3 674.4	435.4	-	-	-	-	-	8.0	4 117.9
Exports (-)	-	-1 885.2	-1 742.7	-	-	-	-	-	- 107.3	-3 735.1
International Marine Bunkers (-)	-	-	- 99.7	-	-	-	-	-	-	- 99.7
International Aviation Bunkers (-)	-	-	- 181.2	-	-	-	-	-	-	- 181.2
Stock Changes (+ draw, - build)	-	287.9	55.7	-	-	-	-	-	-	343.6
TOTAL PRIMARY ENERGY SUPPLY	**-**	**3 968.0**	**-1 532.4**	**1 860.7**	**6 691.0**	**299.3**	**-**	**-**	**- 99.2**	**11 187.4**
Transfers : Origin (-) and Destination (+)	-	-	- 0.0	-	-	-	-	-	-	- 0.0
Statistical Difference	-	- 40.0	32.5	- 82.3	-	-	-	-	16.9	- 72.9
TRANSFORMATION Inputs (-) and Outputs (+)	**-**	**-4 008.0**	**4 030.9**	**-1 505.5**	**-2 126.1**	**- 299.3**	**-**	**-**	**916.7**	**-2 991.3**
Electricity plants	-	-	- 5.1	-1 505.5	-	- 299.3	-	-	912.5	- 897.4
CHP Plants	-	-	-	-	- 39.9	-	-	-	4.1	- 35.8
Heat Plants	-	-	-	-	-	-	-	-	-	-
Coke ovens	-	-	-	-	-	-	-	-	-	-
Blast furnaces	-	-	-	-	-	-	-	-	-	-
Oil Refineries	-	-4 008.0	4 036.0	-	-	-	-	-	-	28.0
Coal-to-liquids plants	-	-	-	-	-	-	-	-	-	-
Gas-to-liquids plants	-	-	-	-	-	-	-	-	-	-
Charcoal production plants	-	-	-	-	-2 086.2	-	-	-	-	-2 086.2
Transformation not elsewhere specified	-	-	-	-	-	-	-	-	-	-
Energy Sector Own Use	**-**	**-**	**-**	**93.6**	**-**	**-**	**-**	**-**	**2.0**	**95.6**
Losses	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**144.8**	**144.8**
FINAL CONSUMPTION	**-**	**-**	**2 466.0**	**343.9**	**4 564.9**	**-**	**-**	**-**	**653.7**	**8 028.5**
Industry	-	-	118.9	343.9	4.9	-	-	-	184.2	652.0
Transport	-	-	1 792.4	-	-	-	-	-	-	1 792.4
Households	-	-	401.2	-	4 070.8	-	-	-	239.3	4 711.3
Commercial and public services	-	-	13.8	-	489.1	-	-	-	200.0	702.9
Agriculture, Forestry and Fishing	-	-	35.9	-	-	-	-	-	18.1	54.1
Non-specified (HH, Com. & PS., Agri.)	-	-	-	-	-	-	-	-	12.0	12.0
Non-Energy Use	-	-	103.7	-	-	-	-	-	-	103.7

Note:

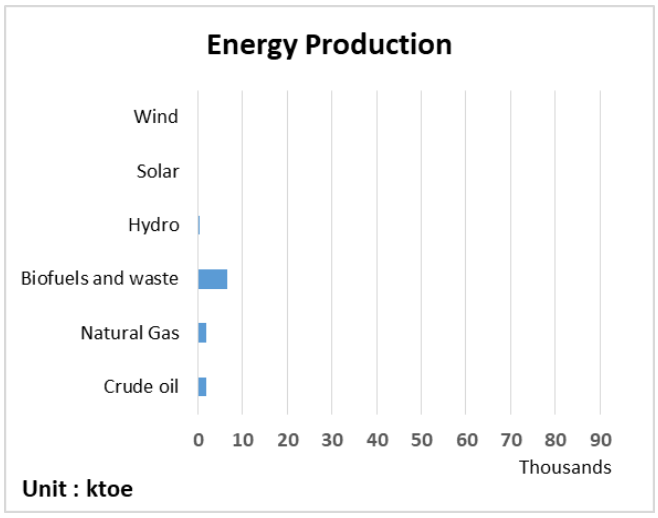
Côte d'Ivoire's Total Primary Energy Supply is dominated by Biofuels with 52.20%, followed by Crude Oil 30.96% and Natural Gas 14.52%. Biomass represents 56.86% of total final consumption and 86.40% of final household consumption. In the industrial sector, we observe that 52.75% of final consumption is dominated by Natural Gas followed by Electricity 28.25%.

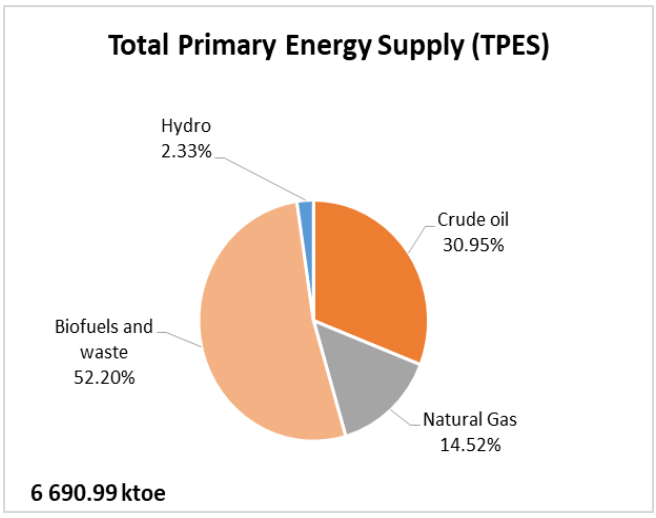
Cote d'Ivoire: *Indicators*

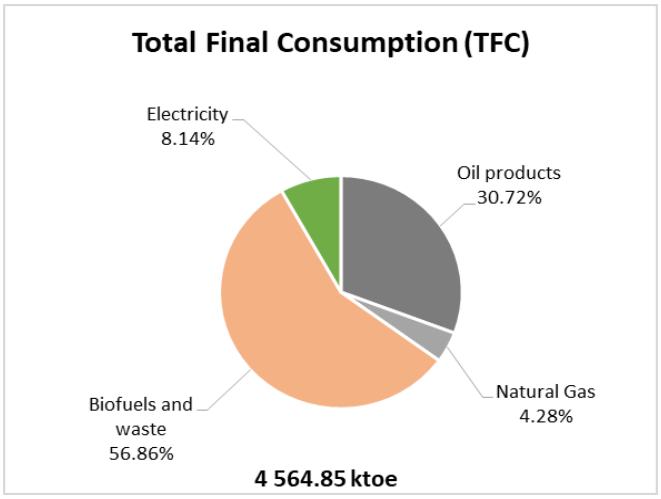
Energy security	Unit	Value
Energy dependency rate	%	3.4
Share in imports		
Coal and coal products	%	0
Crude Oil	%	89.2
Oil products	%	10.6
Biofuels and Waste	%	0
Natural gas	%	0
Electricity and Heat	%	0.2
TOTAL	%	100
Primary energy supply		
Coal and coal products	%	0
Crude Oil	%	30.95
Biofuels and Waste	%	52.2
Natural gas	%	14.52
Nuclear	%	0
Hydro	%	2.3
Solar	%	0
Wind	%	0
Other sources	%	0
Heat	%	0
TOTAL	%	100
Electricity		
Average efficiency of conventional thermal power generation	%	40.6
Rate of electricity transport and distribution losses	%	18.1
Electricity production mix		
Coal and coal products	%	0
Crude oil	%	0
Oil products	%	0.2
Natural gas	%	66.7
Biofuels and waste	%	0.5
Nuclear	%	0

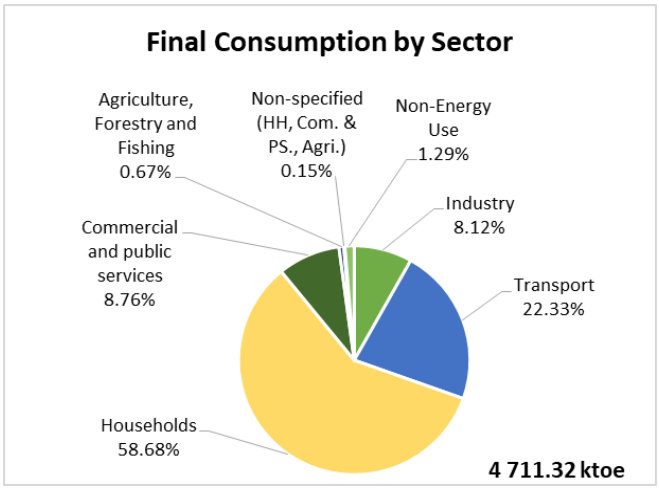
Hydro	**%**	**32.6**
Solar PV	**%**	**0**
Wind	**%**	**0**
Other	**%**	**0**
TOTAL	**%**	**100**
Refining		
Efficiency of refineries	**%**	**100.7**
Share of renewables		
Share of renewables in primary production	**%**	**65.1**
Share of renewables in total primary energy supply	**%**	**62.5**
Share of renewables in total final energy consumption	**%**	**61.4**
Share of renewables in electricity production	**%**	**33.1**
Share of solar thermal in final consumption	**%**	**0**
Final consumption		
Coal and coal products	**%**	**0**
Crude Oil	**%**	**0**
Oil products	**%**	**30.7**
Biofuels and Waste	**%**	**56.9**
Natural gas	**%**	**4.3**
Solar Thermal	**%**	**0**
Electricity and Heat	**%**	**8.1**
TOTAL	**%**	**100**

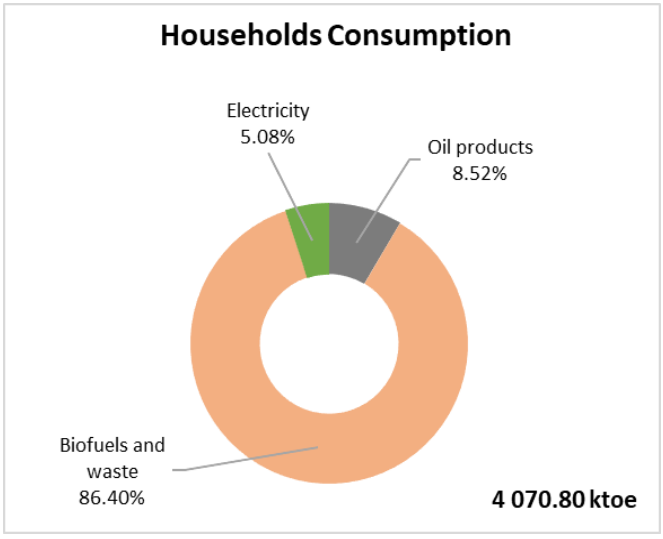
Cote d'Ivoire: *Charts*

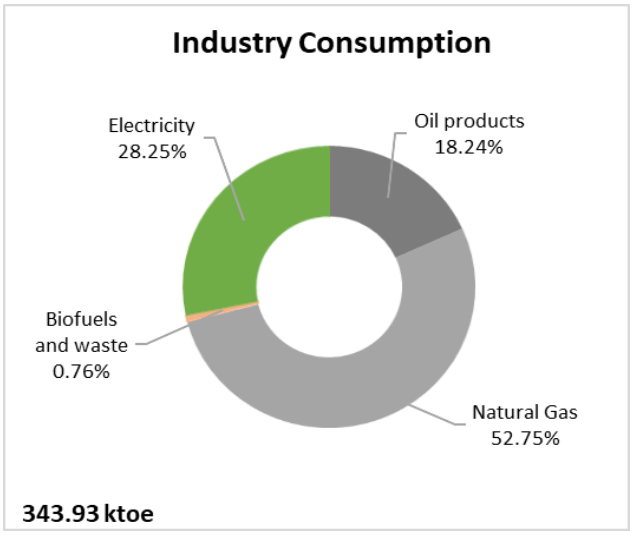












Eswatini: *Aggregated Energy Balance*

Thousand Tonnes of Oil Equivalent (ktoe)	Coal and Coal Products	Crude oil	Oil products	Natural Gas	Biofuels and waste	Hydro	Solar	Wind	Electricity	Total of all energy sources
Production	74.9	-	-	-	6 931.8	23.1	0.2	-	-	7 030.0
Imports (+)	46.8	-	310.9	-	-	-	-	-	81	438.7
Exports (-)	-74.9	-	-	-	-	-	-	-	-	-74.9
International Marine Bunkers (-)	-	-	-	-	-	-	-	-	-	-
International Aviation Bunkers (-)	-	-	-	-	-	-	-	-	-	-
Stock Changes (+ draw, - build)	-	-	-	-	-	-	-	-	-	-
TOTAL PRIMARY ENERGY SUPPLY	**46.8**	**-**	**310.9**	**-**	**6 931.8**	**23.1**	**0.2**	**-**	**81**	**7 393.7**
Transfers : Origin (-) and Destination (+)	-	-	-	-	-	-	-	-	-	-
Statistical Difference	-	-	0	-	-0.3	-	-	-	1	0.7
TRANSFORMATION Inputs (-) and Outputs (+)	**-20.7**	**-**	**-**	**-**	**-590.7**	**-23.1**	**-0.2**	**-**	**50.4**	**-584.2**
Electricity plants	-	-	-	-	-	-23.1	-0.2	-	23.3	0
CHP Plants	-20.7	-	-	-	-590.7	-	-	-	27.1	-584.2
Heat Plants	-	-	-	-	-	-	-	-	-	-
Coke ovens	-	-	-	-	-	-	-	-	-	-
Blast furnaces	-	-	-	-	-	-	-	-	-	-
Oil Refineries	-	-	-	-	-	-	-	-	-	-
Coal-to-liquids plants	-	-	-	-	-	-	-	-	-	-
Gas-to-liquids plants	-	-	-	-	-	-	-	-	-	-
Charcoal production plants	-	-	-	-	-	-	-	-	-	-
Transformation not elsewhere specified	-	-	-	-	-	-	-	-	-	-
Energy Sector Own Use	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Losses	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**15.7**	**15.7**
FINAL CONSUMPTION	**26.1**	**-**	**310.9**	**-**	**6 341.4**	**-**	**-**	**-**	**114.7**	**6 793.1**
Industry	26.1	-	55.2	-	2 454.2	-	-	-	33.8	2 569.2
Transport	-	-	223.5	-	-	-	-	-	-	223.5
Households	-	-	2.5	-	3 887.3	-	-	-	36.6	3 926.3
Commercial and public services	-	-	10.3	-	-	-	-	-	15.6	25.9
Agriculture, Forestry and Fishing	-	-	18.6	-	-	-	-	-	28.7	47.3
Non-specified (HH, Com. & PS., Agri.)	-	-	0.8	-	-	-	-	-	-	0.8
Non-Energy Use	-	-	-	-	-	-	-	-	-	-

Note:

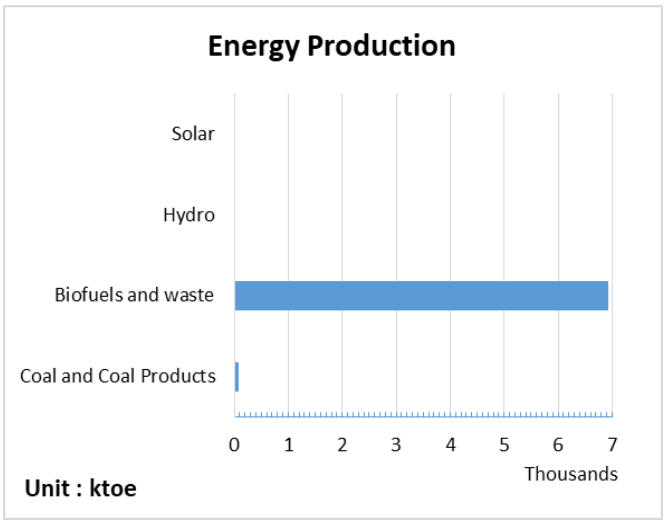
The main primary energy source in the energy supply of Eswatini is Biofuels and waste with 99.00%. It dominates at 93.35% in total final consumption and at 99% in the final consumption of the household sector. The Petroleum Products imported are consumed in the transport sector with 72% followed by industry sector and Agriculture, Forestry and Fishing, 18% and 6% respectively and the rest of the sector represent 4%.

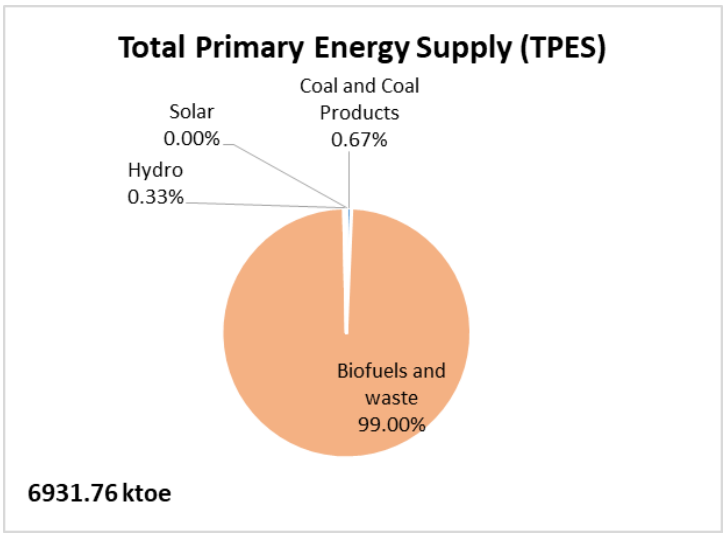
Eswatini: *Indicators*

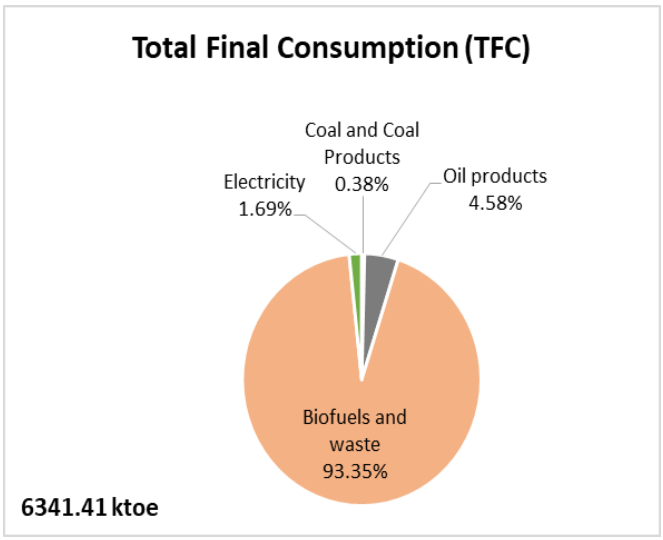
Energy security	Unit	Value
Energy dependency rate	%	4.9
Share in imports		
Coal and coal products	%	10.7
Crude Oil	%	0
Oil products	%	70.9
Biofuels and Waste	%	0
Natural gas	%	0
Electricity and Heat	%	18.5
TOTAL	%	100
Primary energy supply		
Coal and coal products	%	0.67
Crude Oil	%	0
Biofuels and Waste	%	99
Natural gas	%	0
Nuclear	%	0
Hydro	%	0.33
Solar	%	0
Wind	%	0
Other sources	%	0
TOTAL	%	100
Electricity		
Average efficiency of conventional thermal power generation	%	-
Rate of electricity transport and distribution losses	%	12
Electricity production mix		
Coal and coal products	%	1.8
Crude oil	%	0
Oil products	%	0
Natural gas	%	0
Biofuels and waste	%	52
Nuclear	%	0
Hydro	%	45.8

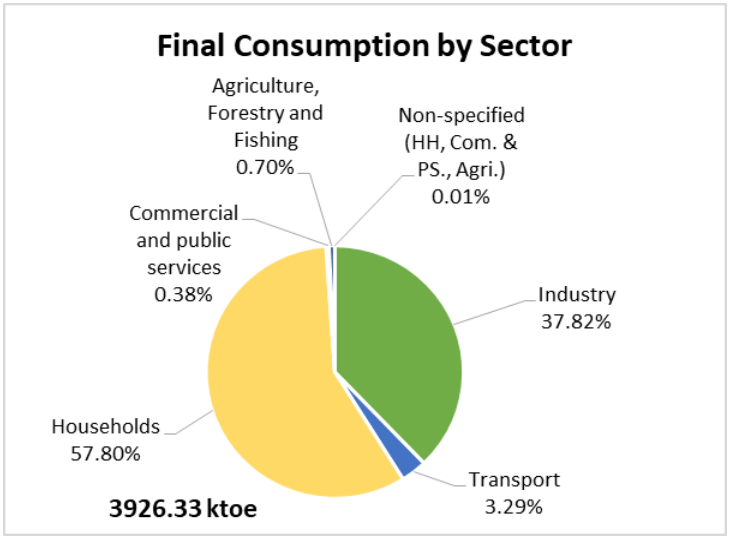
Solar PV	**%**	**0.4**
Wind	**%**	**0**
Other	**%**	**0**
TOTAL	**%**	**100**
Share of renewables		
Share of renewables in primary production	**%**	**98.9**
Share of renewables in total primary energy supply	**%**	**94.1**
Share of renewables in total final energy consumption	**%**	**94.1**
Share of renewables in electricity production	**%**	**98.2**
Share of solar thermal in final consumption	**%**	**0**
Final consumption		
Coal and coal products	**%**	**0.4**
Crude Oil	**%**	**0**
Oil products	**%**	**4.6**
Biofuels and Waste	**%**	**93.4**
Natural gas	**%**	**0**
Solar Thermal	**%**	**0**
Electricity and Heat	**%**	**1.7**
TOTAL	**%**	**100**

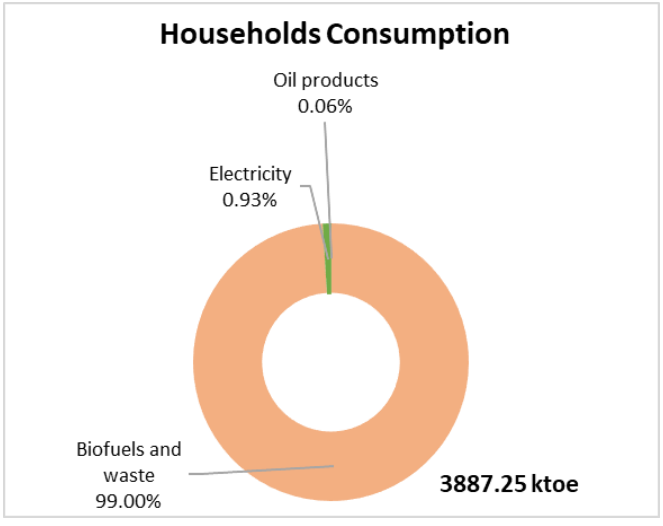
Eswatini: *Charts*

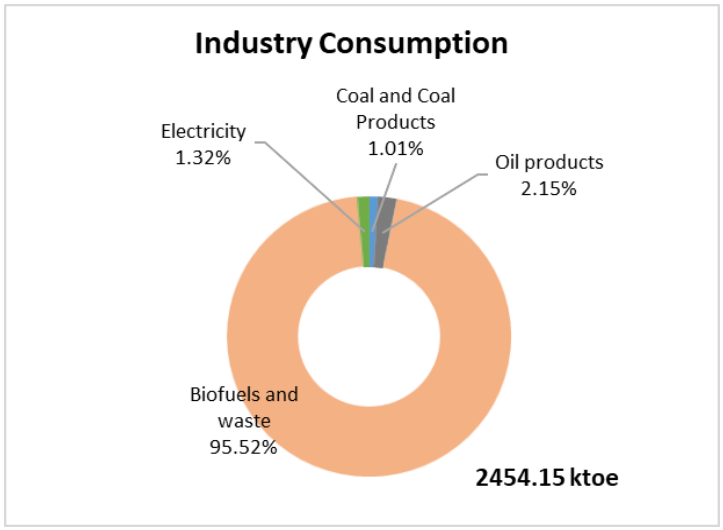












Ghana: *Aggregated Energy Balance*

Thousand Tonnes of Oil Equivalent (ktoe)	Crude oil	Oil products	Natural Gas	Biofuels and waste	Hydro	Solar	Wind	Other sources	Electricity	Total of all energy sources
Production	10 380.3	-	1 254.7	4 665.7	623.5	4.4	-	976.3	-	17 905.0
Imports (+)	838.6	3 981.9	539	0	-	-	-	-	11	5 370.5
Exports (-)	-10 245.3	-299.9	-	-0.9	-	-	-	-	-123	-10 669.1
International Marine Bunkers (-)	-	-7.4	-	-	-	-	-	-	-	-7.4
International Aviation Bunkers (-)	-	-215.9	-	-	-	-	-	-	-	-215.9
Stock Changes (+ draw, - build)	-13.8	16.4	-	-	-	-	-	-	-	2.6
TOTAL PRIMARY ENERGY SUPPLY	**959.8**	**3 475.1**	**1 793.7**	**4 664.8**	**623.5**	**4.4**	**-**	**976.3**	**-112**	**12 385.7**
Transfers : Origin (-) and Destination (+)	-69.4	74.2	-	-	-	-	-	-	-	4.9
Statistical Difference	59.5	-70.8	39.5	0.1	-	-	-	-	-	28.4
TRANSFORMATION Inputs (-) and Outputs (+)	**-762.8**	**282.4**	**-1 687.5**	**52.9**	**-623.5**	**-4.4**	**-**	**-976.3**	**1 604.3**	**-2 114.9**
Electricity plants	-137.4	-405.1	-1 687.5	-	-623.5	-4.4	-	-976.3	1 604.3	-2 229.9
CHP Plants	-	-	-	-	-	-	-	-	-	-
Heat Plants	-	-	-	-	-	-	-	-	-	-
Coke ovens	-	-	-	-	-	-	-	-	-	-
Blast furnaces	-	-	-	-	-	-	-	-	-	-
Oil Refineries	-625.4	635.3	-	-	-	-	-	-	-	9.9
Coal-to-liquids plants	-	-	-	-	-	-	-	-	-	-
Gas-to-liquids plants	-	-	-	-	-	-	-	-	-	-
Charcoal production plants	-	-	-	52.9	-	-	-	-	-	52.9
Transformation not elsewhere specified	-	52.2	-	-	-	-	-	-	-	52.2
Energy Sector Own Use	**23.1**	**93.5**	**-**	**-**	**-**	**-**	**-**	**-**	**80.7**	**197.3**
Losses	**45.1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**101.8**	**146.8**
FINAL CONSUMPTION	**-**	**3 809.1**	**66.7**	**4 717.6**	**-**	**-**	**-**	**-**	**1 309.7**	**9 903.1**
Industry	-	390.8	66.7	279.1	-	-	-	-	452.3	1 188.9
Transport	-	3 038.0	-	-	-	-	-	-	0.9	3 038.9
Households	-	227.4	-	4 200.5	-	-	-	-	599.1	5 026.9
Commercial and public services	-	21.3	-	238.1	-	-	-	-	256.4	515.7
Agriculture, Forestry and Fishing	-	117.4	-	-	-	-	-	-	1	118.4
Non-specified (HH, Com. & PS., Agri.)	-	-	-	-	-	-	-	-	-	-
Non-Energy Use	-	14.3	-	-	-	-	-	-	-	14.3

Note:

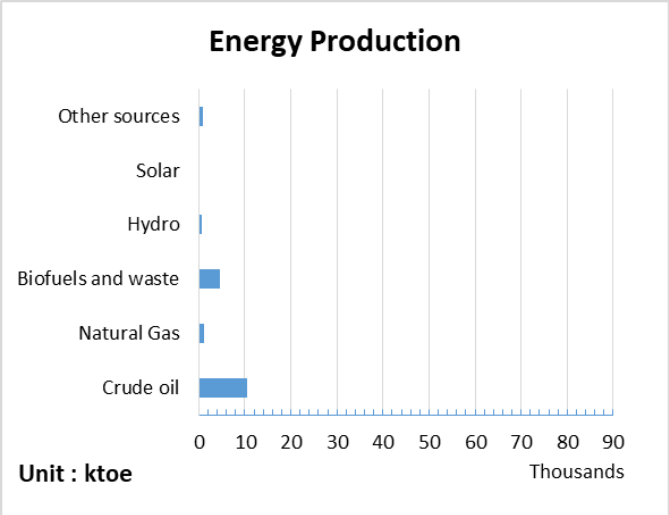
Over half of the Total Primary Energy Supply comes from Biofuels and represents 51.70%, followed by Natural Gas with 19.88% and Crude Oil 10.64%. The final energy consumption is split between Biofuels 47.64%, Petroleum Products 38.46% and Electricity 13.23%. The household sector represents 50.76% of final energy consumption with a very high consumption of Biofuels 83.56%.

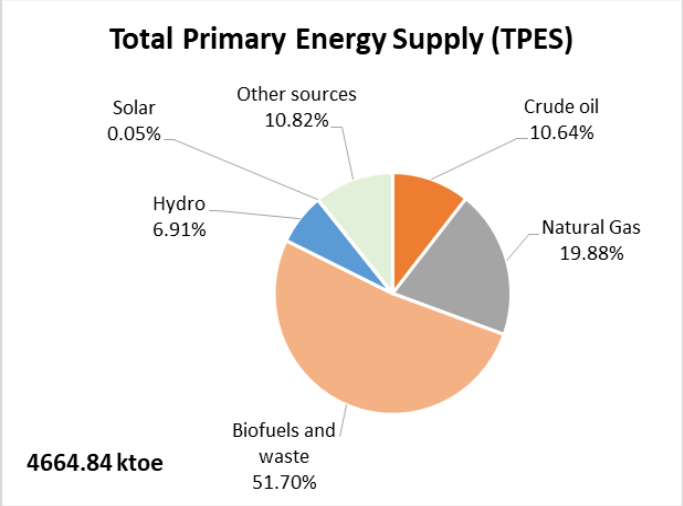
Ghana: *Indicators*

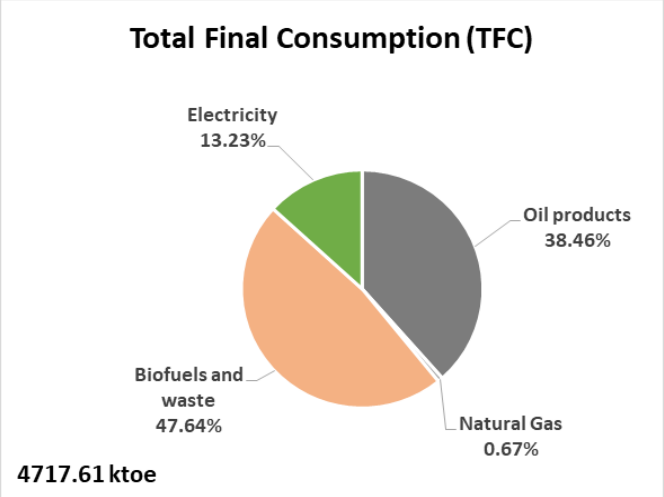
Energy security	Unit	Value
Energy dependency rate	%	-42.8
Share in imports		
Coal and coal products	%	0
Crude Oil	%	15.6
Oil products	%	74.1
Biofuels and Waste	%	0
Natural gas	%	10
Electricity and Heat	%	0.2
TOTAL	%	100
Primary energy supply		
Coal and coal products	%	0
Crude Oil	%	10.64
Biofuels and Waste	%	51.7
Natural gas	%	19.88
Nuclear	%	0
Hydro	%	6.91
Solar	%	0.05
Wind	%	0
Other sources	%	10.82
TOTAL	%	100
Electricity		
Average efficiency of conventional thermal power generation	%	0
Rate of electricity transport and distribution losses	%	7.2
Electricity production mix		
Coal and coal products	%	0
Crude oil	%	0
Oil products	%	0
Natural gas	%	0
Biofuels and waste	%	0
Nuclear	%	0
Hydro	%	38.9

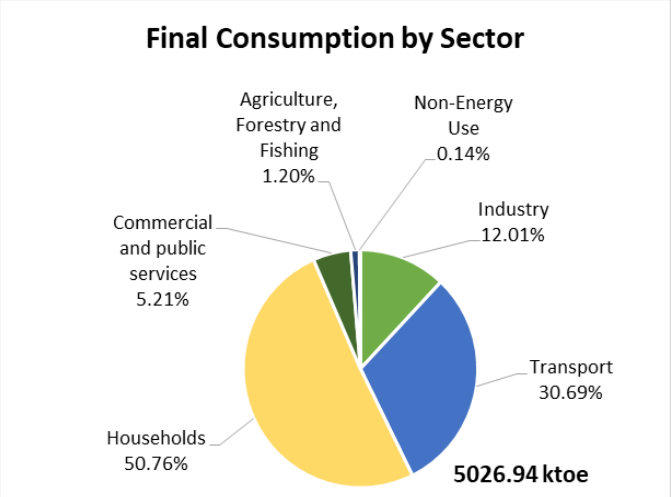
Solar PV	**%**	**0.3**
Wind	**%**	**0**
Other	**%**	**60.9**
TOTAL	**%**	**100**
Refining		
Efficiency of refineries	**%**	**99**
Share of renewables		
Share of renewables in primary production	**%**	**29.6**
Share of renewables in total primary energy supply	**%**	**42.7**
Share of renewables in total final energy consumption	**%**	**54.1**
Share of renewables in electricity production	**%**	**39.1**
Share of solar thermal in final consumption	**%**	**0**
Final consumption		
Coal and coal products	**%**	**0**
Crude Oil	**%**	**0**
Oil products	**%**	**38.5**
Biofuels and Waste	**%**	**47.6**
Natural gas	**%**	**0.7**
Solar Thermal	**%**	**0**
Electricity and Heat	**%**	**13.2**
TOTAL	**%**	**100**

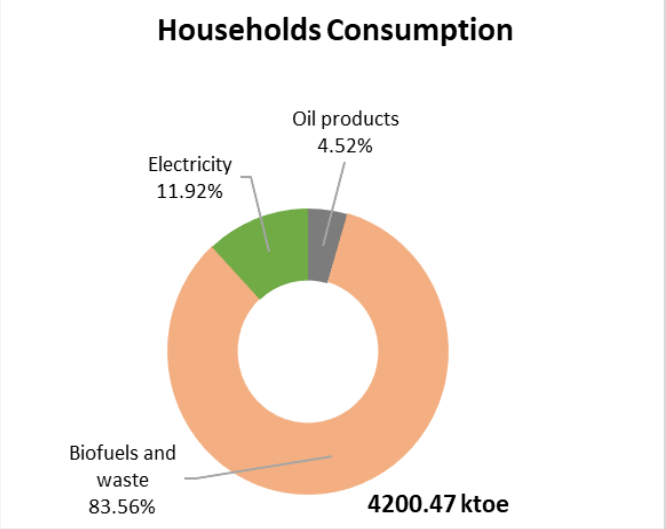
Ghana: *Charts*

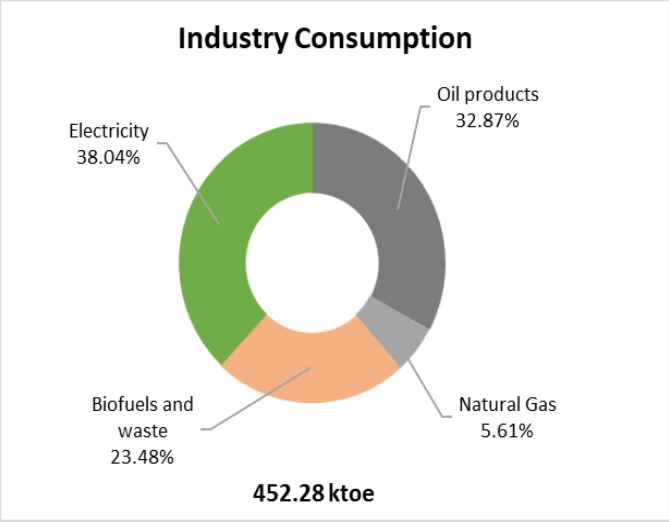












Morocco: *Aggregated Energy Balance*

Thousand Tonnes of Oil Equivalent (ktoe)	Coal and Coal Products	Crude oil	Oil products	Natural Gas	Biofuels and waste	Hydro	Solar	Wind	Other sources	Electricity	Total of all energy sources
Production	-	4.4	-	75	1 286.5	108.6	392.2	404.1	112	-	2 382.7
Imports (+)	6 674.1	-	13 171.3	800	-	-	-	-	-	45.2	20 690.5
Exports (-)	-	-	-	-	-	-	-	-	-	-125	-125
International Marine Bunkers (-)	-	-	-134	-	-	-	-	-	-	-	-134
International Aviation Bunkers (-)	-	-	-824.6	-	-	-	-	-	-	-	-824.6
Stock Changes (+ draw, - build)	-9.7	-	386.6	-	-	-	-	-	-	-	376.9
TOTAL PRIMARY ENERGY SUPPLY	**6 664.4**	**4.4**	**12 599.2**	**875**	**1 286.5**	**108.6**	**392.2**	**404.1**	**112**	**-79.8**	**22 366.5**
Transfers : Origin (-) and Destination (+)	-	-	-	-	-	-	-	-	-	-	-
Statistical Difference	0	-	-46	4.3	-	-	-	-	-	-	-41.7
TRANSFORMATION Inputs (-) and Outputs (+)	**-6 644.6**	**-**	**-158.8**	**-795.7**	**-34.4**	**-108.6**	**-343**	**-404.1**	**-112**	**3 547.7**	**-5 053.5**
Electricity plants	-6 644.6	-	-158.8	-795.7	-	-108.6	-343	-404.1	-	3 435.7	-5 019.1
CHP Plants	-	-	-	-	-	-	-	-	-112	112	-
Heat Plants	-	-	-	-	-	-	-	-	-	-	-
Coke ovens	-	-	-	-	-	-	-	-	-	-	-
Blast furnaces	-	-	-	-	-	-	-	-	-	-	-
Oil Refineries	-	-	-	-	-	-	-	-	-	-	-
Coal-to-liquids plants	-	-	-	-	-	-	-	-	-	-	-
Gas-to-liquids plants	-	-	-	-	-	-	-	-	-	-	-
Charcoal production plants	-	-	-	-	-34.4	-	-	-	-	-	-34.4
Transformation not elsewhere specified	-	-	-	-	-	-	-	-	-	-	-
Energy Sector Own Use	**-**	**4.4**	**-**	**1.4**	**-**	**-**	**-**	**-**	**-**	**15.2**	**21**
Losses	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**576.4**	**576.4**
FINAL CONSUMPTION	**19.8**	**-**	**12 486.4**	**73.7**	**1 252.0**	**-**	**49.2**	**-**	**-**	**2 876.3**	**16 757.3**
Industry	19.8	-	1 947.1	73.7	105.4	-	-	-	-	1 068.9	3 214.9
Transport	-	-	6 160.9	-	-	-	-	-	-	32.7	6 193.6
Households	-	-	2 696.7	-	485.4	-	36.9	-	-	983.5	4 202.4
Commercial and public services	-	-	167.3	-	661.3	-	12.3	-	-	504.1	1 345.1
Agriculture, Forestry and Fishing	-	-	974.4	-	-	-	-	-	-	287.1	1 261.5
Non-specified (HH, Com. & PS., Agri.)	-	-	-	-	-	-	-	-	-	-	-
Non-Energy Use	-	-	539.9	-	-	-	-	-	-	-	539.9

Note:

Coal is the main source of energy in Morocco's Total Primary Energy Supply with 67.58%. As for final energy consumption, it is dominated by Petroleum Products with 74.51% mainly consumed at household level with 64.17% and by industry with 60.57%. We also note that Electricity represent 23.40% in household consumption and 33.25% in industry. It's look that the share of renewables in total primary energy supply is 9.8%

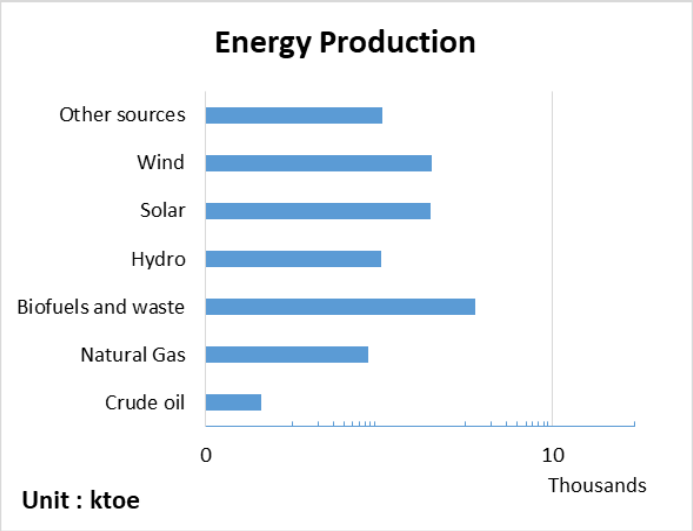
Morocco: *Indicators*

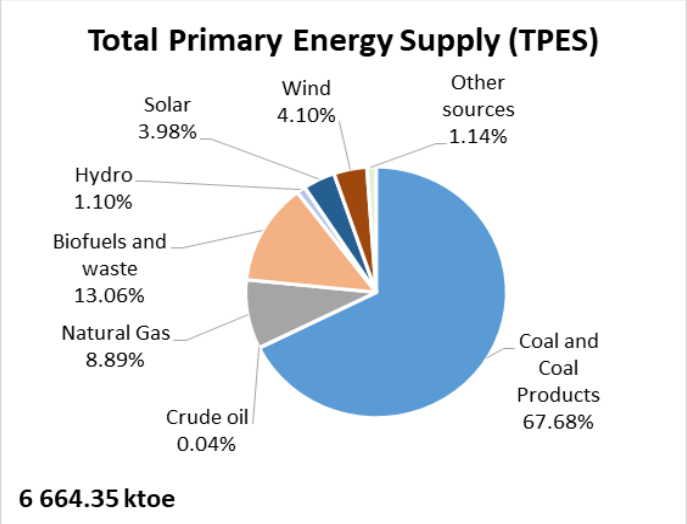
Energy security	Unit	Value
Energy dependency rate	%	91.9
Share in imports		
Coal and coal products	%	32.3
Crude Oil	%	0
Oil products	%	63.7
Biofuels and Waste	%	0
Natural gas	%	3.9
Electricity and Heat	%	0.2
TOTAL	%	100
Primary energy supply		
Coal and coal products	%	67.68
Crude Oil	%	0.04
Biofuels and Waste	%	13.06
Natural gas	%	8.89
Nuclear	%	0
Hydro	%	1.1
Solar	%	3.98
Wind	%	4.1
Other sources	%	0.5
Heat	%	0
TOTAL	%	100
Electricity		
Average efficiency of conventional thermal power generation	%	36.7
Rate of electricity transport and distribution losses	%	16.7
Electricity production mix		
Coal and coal products	%	65.2
Crude oil	%	0
Oil products	%	2
Natural gas	%	11.4
Biofuels and waste	%	0
Nuclear	%	0

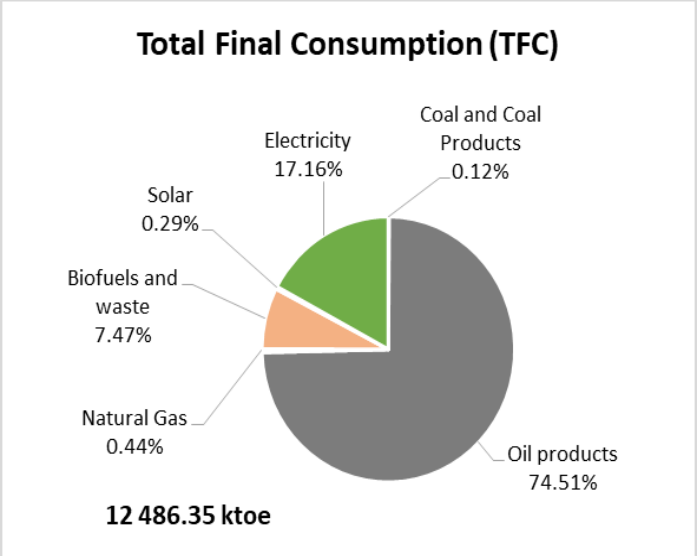
Hydro	**%**	**3.1**
Solar PV	**%**	**1**
Wind	**%**	**11.4**
Other	**%**	**6**
TOTAL	**%**	**100**
Share of renewables		
Share of renewables in primary production	**%**	**92**
Share of renewables in total primary energy supply	**%**	**9.8**
Share of renewables in total final energy consumption	**%**	**12**
Share of renewables in electricity production	**%**	**18.3**
Share of solar thermal in final consumption	**%**	**0.3**
Final consumption		
Coal and coal products	**%**	**0.1**
Crude Oil	**%**	**0**
Oil products	**%**	**74.5**
Biofuels and Waste	**%**	**7.5**
Natural gas	**%**	**0.4**
Solar Thermal	**%**	**0.3**
Electricity and Heat	**%**	**17.2**

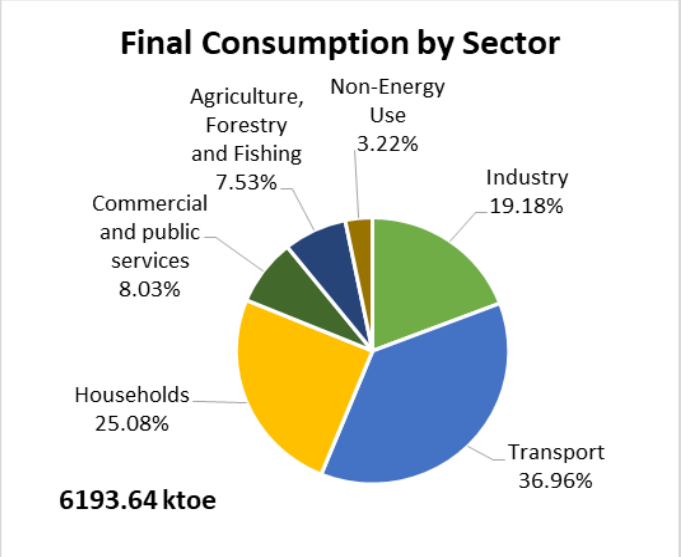
Total

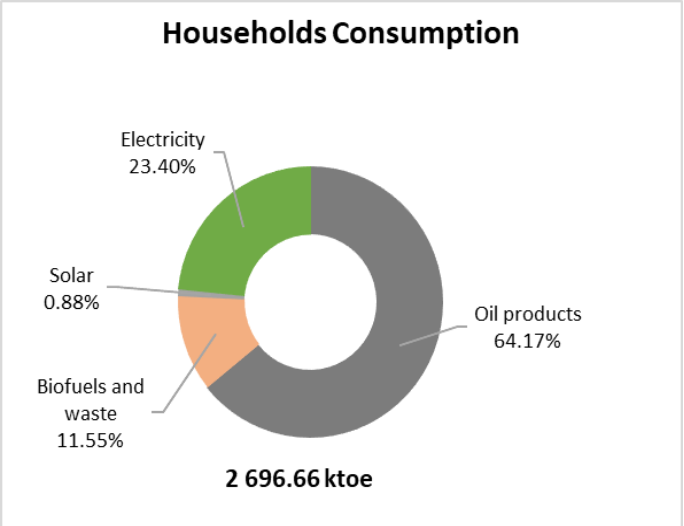
Morocco: *Charts*

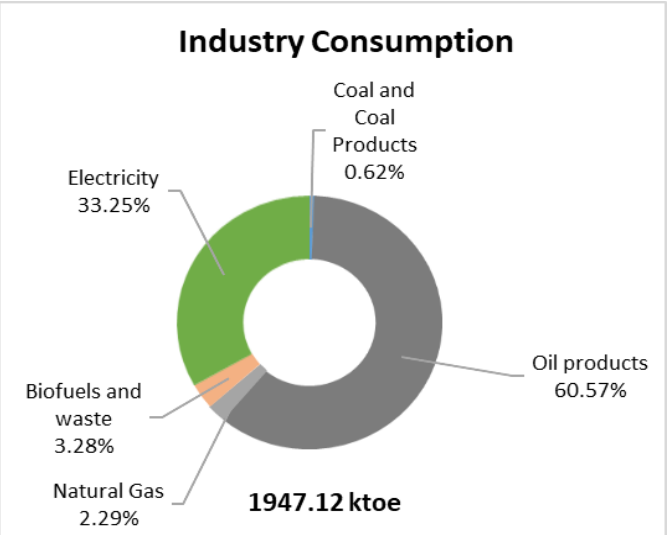












Mauritius: *Aggregated Energy Balance*

Thousand Tonnes of Oil Equivalent (ktoe)	Coal and Coal Products	Crude oil	Oil products	Biofuels and waste	Hydro	Solar	Wind	Other sources	Electricity	Total of all energy sources
Production	-	-	-	359	8.5	11.1	1.3	1.7	-	381.6
Imports (+)	-	-	1 871.2	-	-	-	-	-	-	1 871.2
Exports (-)	-	-	-	-	-	-	-	-	-	-
International Marine Bunkers (-)	-	-	-716.9	-	-	-	-	-	-	-716.9
International Aviation Bunkers (-)	-	-	-154.4	-	-	-	-	-	-	-154.4
Stock Changes (+ draw, - build)	-	-	-8.4	-	-	-	-	-	-	-8.4
TOTAL PRIMARY ENERGY SUPPLY	**-**	**-**	**991.5**	**359**	**8.5**	**11.1**	**1.3**	**1.7**	**-**	**1 373.1**
Transfers : Origin (-) and Destination (+)	-	-	-	-	-	-	-	-	-	-
Statistical Difference	-	-	0	641.3	-	-	-	-	-278.3	363
TRANSFORMATION Inputs (-) and Outputs (+)	**-**	**-**	**-268.1**	**320.2**	**-8.5**	**-11.1**	**-1.3**	**-1.7**	**316**	**345.6**
Electricity plants	-	-	-268.1	320.2	-8.5	-11.1	-1.3	-1.7	316	345.6
CHP Plants	-	-	-	-	-	-	-	-	-	-
Heat Plants	-	-	-	-	-	-	-	-	-	-
Coke ovens	-	-	-	-	-	-	-	-	-	-
Blast furnaces	-	-	-	-	-	-	-	-	-	-
Oil Refineries	-	-	-	-	-	-	-	-	-	-
Coal-to-liquids plants	-	-	-	-	-	-	-	-	-	-
Gas-to-liquids plants	-	-	-	-	-	-	-	-	-	-
Charcoal production plants	-	-	-	-	-	-	-	-	-	-
Transformation not elsewhere specified	-	-	-	-	-	-	-	-	-	-
Energy Sector Own Use	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**319.9**	**319.9**
Losses	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**15.7**	**15.7**
FINAL CONSUMPTION	**-**	**-**	**723.4**	**37.9**	**-**	**-**	**-**	**-**	**258.8**	**1 020.0**
Industry	-	-	83.8	33.8	-	-	-	-	85.2	202.7
Transport	-	-	553	-	-	-	-	-	-	553
Households	-	-	58.5	3.8	-	-	-	-	81.4	143.8
Commercial and public services	-	-	25.6	0.2	-	-	-	-	86.5	112.4
Agriculture, Forestry and Fishing	-	-	2.1	-	-	-	-	-	1.6	3.7
Non-specified (HH, Com. & PS., Agri.)	-	-	0.4	-	-	-	-	-	4	4.4
Non-Energy Use	-	-	-	-	-	-	-	-	-	-

Note:

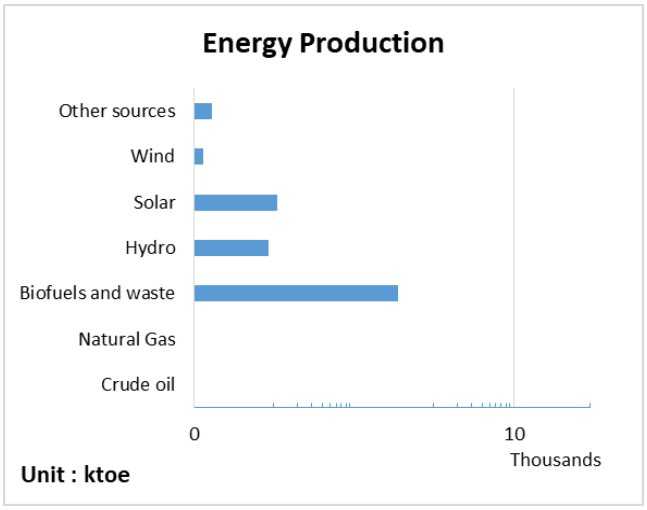
More than 94% of the Total Primary Energy Supply of Mauritius comes from Biofuels, but it represents only 3.71% in the final energy consumption. The large part of this final consumption is dominated by Petroleum Products with a rate of 70.92% followed by Electricity 25.37%. Electricity consumed at the household sector represents 56.65% while at the industrial sector, it occupies 42.01%. As for Petroleum Products, its represents 40.69% in households and 41.32% in industry.

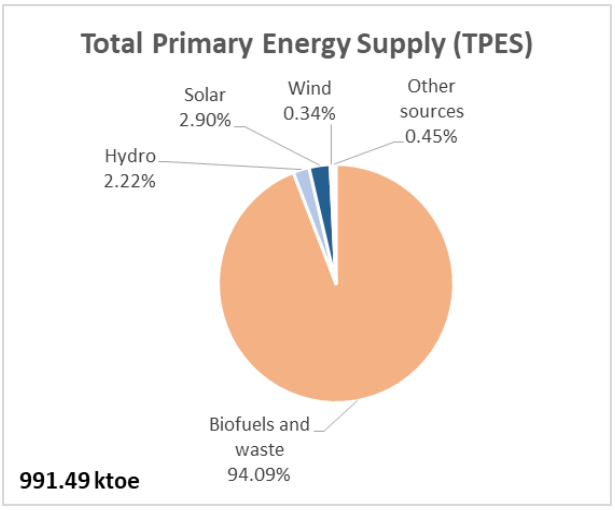
Mauritius: *Indicators*

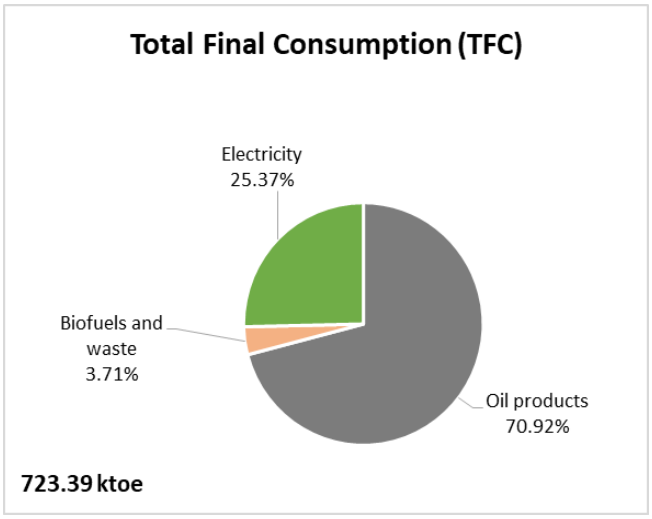
Energy security	Unit	Value
Energy dependency rate	%	21.2
Share in imports		
Coal and coal products	%	0
Crude Oil	%	0
Oil products	%	100
Biofuels and Waste	%	0
Natural gas	%	0
Electricity and Heat	%	0
TOTAL	%	100
Primary energy supply		
Coal and coal products	%	0
Crude Oil	%	0
Biofuels and Waste	%	94.08
Natural gas	%	0
Nuclear	%	0
Hydro	%	2.23
Solar	%	2.9
Wind	%	0.34
Other sources	%	0.45
Heat	%	0
TOTAL	%	100
Electricity		
Average efficiency of conventional thermal power generation	%	25.7
Rate of electricity transport and distribution losses	%	5.7
Electricity production mix		
Coal and coal products	%	36.3
Crude oil	%	0.0
Oil products	%	42.0
Natural gas	%	0.0
Biofuels and waste	%	13.6
Nuclear	%	0.0

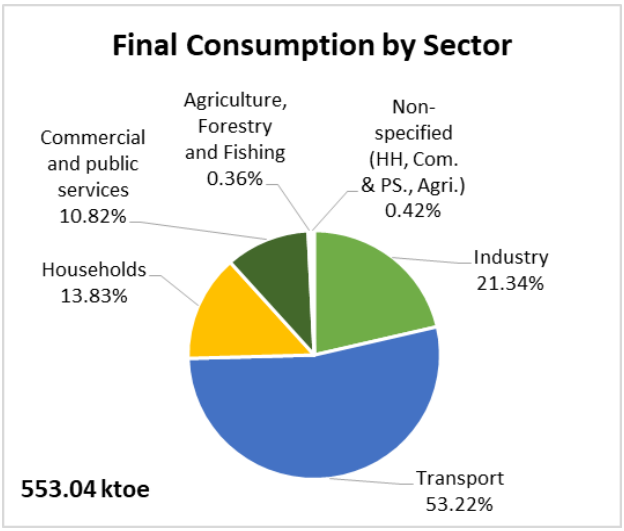
Hydro	**%**	**3.0**
Solar PV	**%**	**4.0**
Wind	**%**	**0.5**
Other	**%**	**0.6**
TOTAL	**%**	**100**
Share of renewables		
Share of renewables in primary production	**%**	**99.4**
Share of renewables in total primary energy supply	**%**	**27.7**
Share of renewables in total final energy consumption	**%**	**9.5**
Share of renewables in electricity production	**%**	**21.1**
Share of solar thermal in final consumption	**%**	**0**
Final consumption		
Coal and coal products	**%**	**0**
Crude Oil	**%**	**0**
Oil products	**%**	**70.9**
Biofuels and Waste	**%**	**3.7**
Natural gas	**%**	**0**
Solar Thermal	**%**	**0**
Electricity and Heat	**%**	**25.4**
TOTAL	**%**	**100**

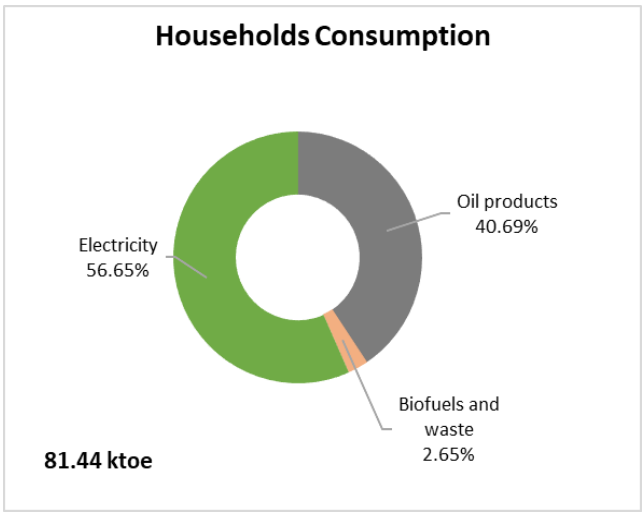
Mauritius: *Charts*

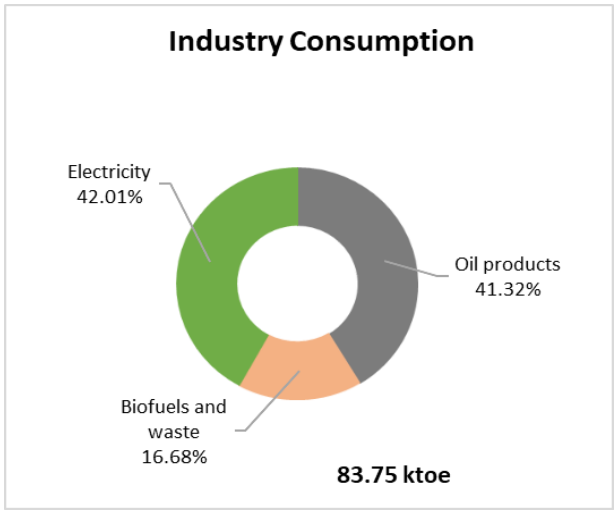












Niger: *Aggregated Energy Balance*

Thousand Tonnes of Oil Equivalent (ktoe)	Coal and Coal Products	Crude oil	Oil products	Natural Gas	Biofuels and waste	Hydro	Solar	Wind	Electricity	Total of all energy sources
Production	81	910.3	-	31	2 225.5		2.1	-	-	3 249.9
Imports (+)	-	-	122.3	-	-		-	-	90.9	213.1
Exports (-)	-	-	-306.2	-	-		-	-	-	-306.2
International Marine Bunkers (-)	-	-	-	-	-		-	-	-	-
International Aviation Bunkers (-)	-	-	-	-	-		-	-	-	-
Stock Changes (+ draw, - build)	-0.1	-26.3	-18	-	-		-	-	-	-44.4
TOTAL PRIMARY ENERGY SUPPLY	**80.9**	**884**	**-201.9**	**31**	**2 225.5**		**2.1**	**-**	**90.9**	**3 112.5**
Transfers : Origin (-) and Destination (+)	-	-	-	-	-		-	-	-	-
Statistical Difference	4.1	0	5.9	0.8	-		-	-	0.8	11.6
TRANSFORMATION Inputs (-) and Outputs (+)	**-73.3**	**-884**	**745.1**	**-30.2**	**41.2**		**-2.1**	**-**	**53.1**	**-150.1**
Electricity plants	-72	-	-92.6	-30.2	-		-2.1	-	53.1	-143.7
CHP Plants	-	-	-	-	-		-	-	-	-
Heat Plants	-	-	-	-	-		-	-	-	-
Coke ovens	-	-	-	-	-		-	-	-	-
Blast furnaces	-	-	-	-	-		-	-	-	-
Oil Refineries	-	-884	837.7	-	-		-	-	-	-46.4
Coal-to-liquids plants	-	-	-	-	-		-	-	-	-
Gas-to-liquids plants	-	-	-	-	-		-	-	-	-
Charcoal production plants	-	-	-	-	-		-	-	-	-
Transformation not elsewhere specified	-1.3	-	-	-	41.2		-	-	-	39.9
Energy Sector Own Use	**-**	**-**	**-**	**-**	**-**		**-**	**-**	**6.3**	**6.3**
Losses	**3.1**	**-**	**0.2**	**-**	**-**		**-**	**-**	**26.2**	**29.6**
FINAL CONSUMPTION	**0.5**	**-**	**537**	**-**	**2 266.7**		**-**	**-**	**110.6**	**2 914.8**
Industry	-	-	55.5	-	-		-	-	22.9	78.4
Transport	-	-	434.9	-	-		-	-	-	434.9
Households	0.1	-	28	-	2 220.8		-	-	58.2	2 307.2
Commercial and public services	0.3	-	18.7	-	45.9		-	-	28.8	93.7
Agriculture, Forestry and Fishing	-	-	-	-	-		-	-	0.7	0.7
Non-specified (HH, Com. & PS., Agri.)	-	-	-	-	-		-	-	-	-
Non-Energy Use	-	-	-	-	-		-	-	-	-

Note:

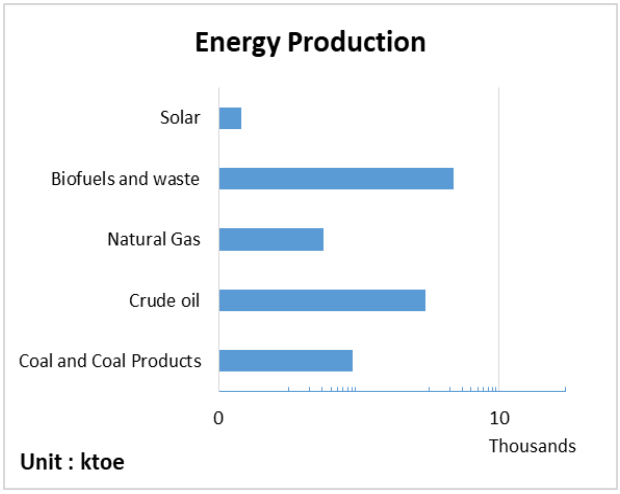
Niger is a Coal and Crude Oil producer country with a Total Primary Energy Supply dominated by Biofuel with the rate of 69.04%. The final energy consumption is dominated by Biofuels with 77.78%, and the same energy source is dominated also in the household sector consumption with 96.26%. Consumption in the industrial sector is shared between Petroleum Products 70.78% and Electricity 29.22%.

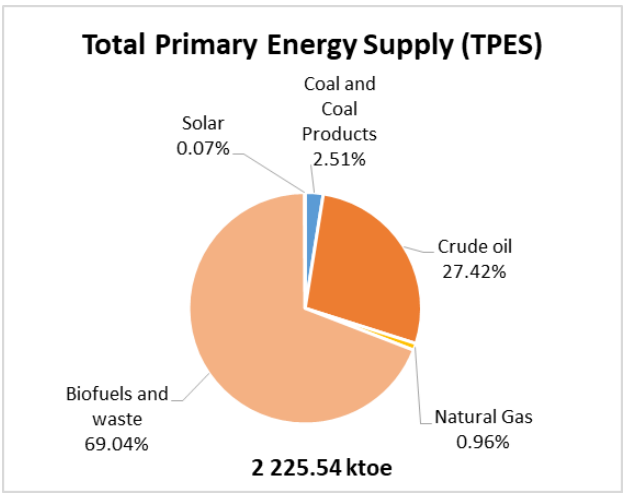
Niger: *Indicators*

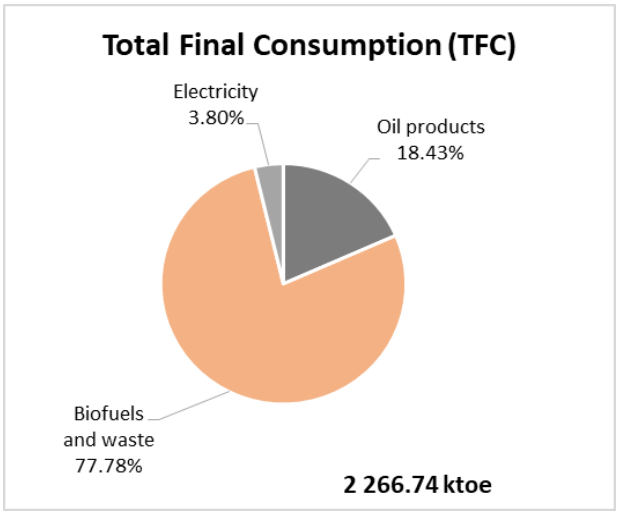
Energy security	Unit	Value
Energy dependency rate	%	-3
Share in imports		
Coal and coal products	%	0
Crude Oil	%	0
Oil products	%	57.4
Biofuels and Waste	%	0
Natural gas	%	0
Electricity and Heat	%	42.6
TOTAL	%	100
Primary energy supply		
Coal and coal products	%	2.51
Crude Oil	%	27.42
Biofuels and Waste	%	69.04
Natural gas	%	0.96
Nuclear	%	0
Hydro	%	0
Solar	%	0.07
Wind	%	0
Other sources	%	0
Heat	%	0
TOTAL	%	100
Electricity		
Average efficiency of conventional thermal power generation	%	26.2
Rate of electricity transport and distribution losses	%	19.2
Electricity production mix		
Coal and coal products	%	33
Crude oil	%	0
Oil products	%	55.4
Natural gas	%	7.6
Biofuels and waste	%	0
Nuclear	%	0

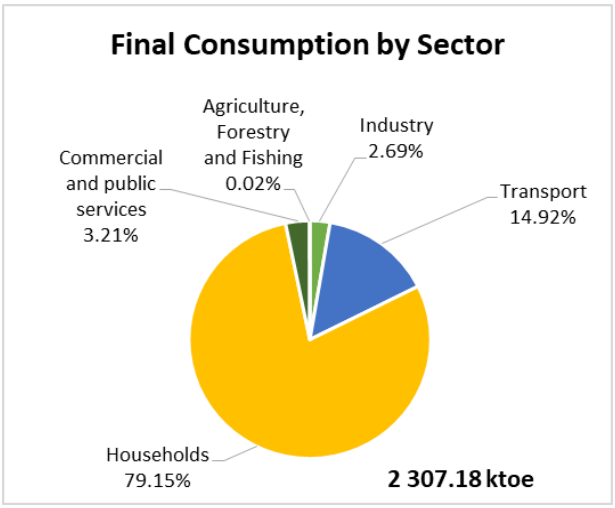
Hydro	**%**	**0**
Solar PV	**%**	**3.9**
Wind	**%**	**0**
Other	**%**	**0**
TOTAL	**%**	**100**
Refining		
Efficiency of refineries	**%**	**94.8**
Share of renewables		
Share of renewables in primary production	**%**	**60.1**
Share of renewables in total primary energy supply	**%**	**62.4**
Share of renewables in total final energy consumption	**%**	**67.3**
Share of renewables in electricity production	**%**	**3.9**
Share of solar thermal in final consumption	**%**	**0**
Final consumption		
Coal and coal products	**%**	**0.02**
Crude Oil	**%**	**0**
Oil products	**%**	**18.42**
Biofuels and Waste	**%**	**77.77**
Natural gas	**%**	**0**
Solar Thermal	**%**	**0**
Electricity and Heat	**%**	**3.79**
TOTAL	**%**	**100**

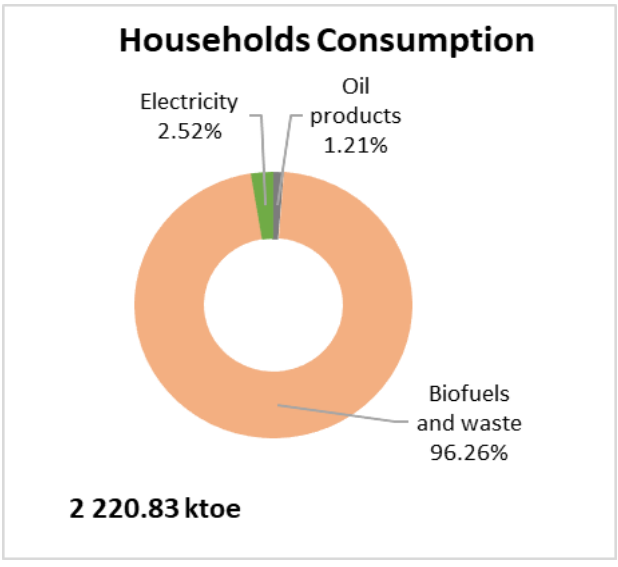
Niger: *Charts*

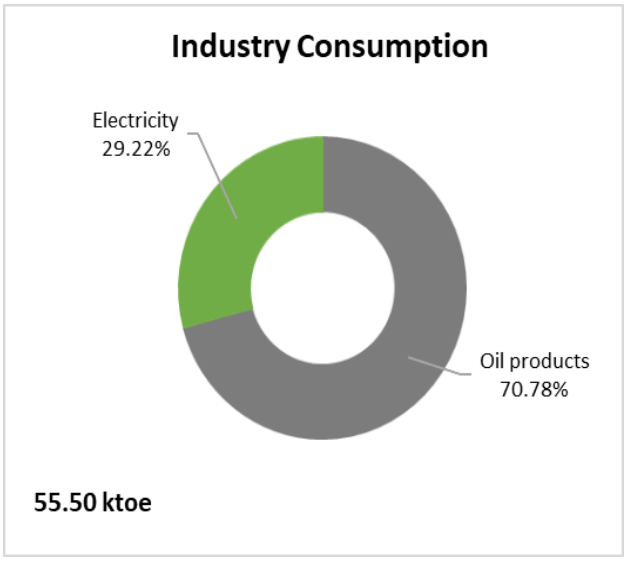












Central African Republic: *Aggregated Energy Balance*

Thousand Tonnes of Oil Equivalent (ktoe)	Crude oil	Oil products	Biofuels and waste	Hydro	Solar	Wind	Other sources	Electricity	Total of all energy sources
Production		-	1 132.1	12.1	-	-	-	-	1 144.2
Imports (+)		110	-	-	-	-	-	-	110
Exports (-)		-	-	-	-	-	-	-	-
International Marine Bunkers (-)		-	-	-	-	-	-	-	-
International Aviation Bunkers (-)		-6.4	-	-	-	-	-	-	-6.4
Stock Changes (+ draw, - build)		-2.3	-	-	-	-	-	-	-2.3
TOTAL PRIMARY ENERGY SUPPLY		**101.4**	**1 132.1**	**12.1**	**-**	**-**	**-**	**-**	**1 245.5**
Transfers : Origin (-) and Destination (+)		-	-	-	-	-	-	-	-
Statistical Difference		-0.1	0	-	-	-	-	0.2	0
TRANSFORMATION Inputs (-) and Outputs (+)		**-0.1**	**-26.2**	**-12.1**	**-**	**-**	**-**	**12.2**	**-26.2**
Electricity plants		-0.1	-	-12.1	-	-	-	12.2	0.1
CHP Plants		-	-	-	-	-	-	-	-
Heat Plants		-	-	-	-	-	-	-	-
Coke ovens		-	-	-	-	-	-	-	-
Blast furnaces		-	-	-	-	-	-	-	-
Oil Refineries		-	-	-	-	-	-	-	-
Coal-to-liquids plants		-	-	-	-	-	-	-	-
Gas-to-liquids plants		-	-	-	-	-	-	-	-
Charcoal production plants		-	-26.2	-	-	-	-	-	-26.2
Transformation not elsewhere specified		-	-	-	-	-	-	-	-
Energy Sector Own Use		**-**	**-**	**-**	**-**	**-**	**-**	**0.2**	**0.2**
Losses		**-**	**-**	**-**	**-**	**-**	**-**	**3.8**	**3.8**
FINAL CONSUMPTION		**101.4**	**1 105.9**	**-**	**-**	**-**	**-**	**8**	**1 215.3**
Industry		11.9	-	-	-	-	-	2	13.9
Transport		87.9	-	-	-	-	-	-	87.9
Households		1.6	1 060.6	-	-	-	-	2.7	1 064.9
Commercial and public services		0	45.3	-	-	-	-	3.3	48.6
Agriculture, Forestry and Fishing		-	-	-	-	-	-	-	-
Non-specified (HH, Com. & PS., Agri.)		-	-	-	-	-	-	-	-
Non-Energy Use		-	-	-	-	-	-	-	-

Note:

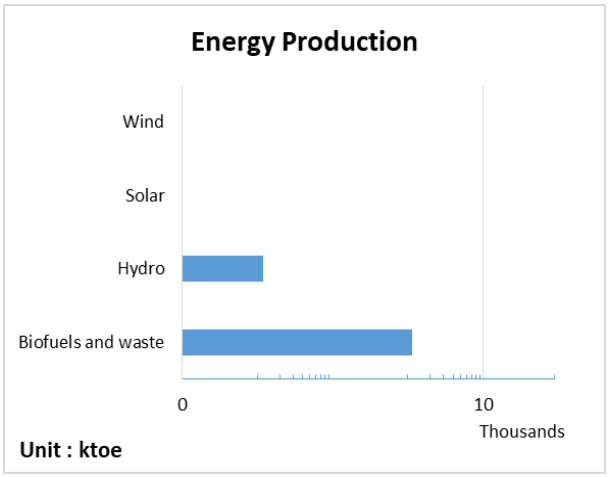
Biofuels and hydroelectricity are the two sources of energy in the Total Primary Energy Supply of the Central African Republic with 98.95% and 1.05% respectively. The final energy consumption is split between Biofuels 91%, Petroleum Products 8.34% and Electricity 0.66%. The household sector which represents 83.63% of final consumption is dominated by Biofuels at 99.6%.

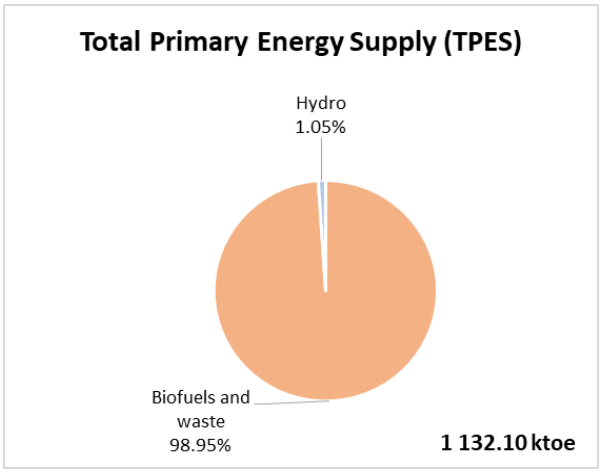
Central African Republic: *Indicators*

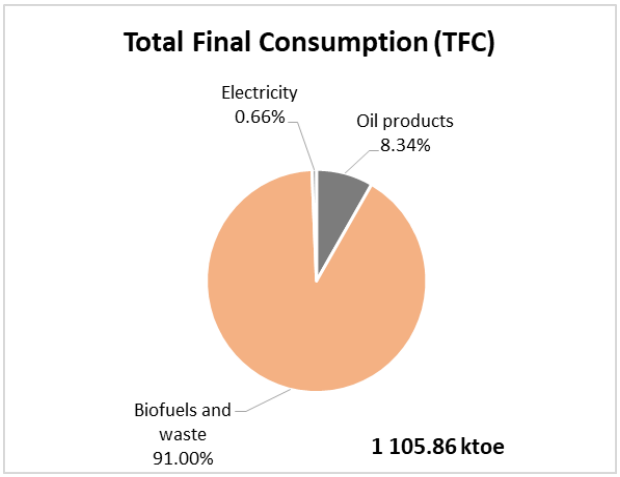
Energy security	Unit	Value
Energy dependency rate	%	8.8
Share in imports		
Coal and coal products	%	0
Crude Oil	%	0
Oil products	%	100
Biofuels and Waste	%	0
Natural gas	%	0
Electricity and Heat	%	0
TOTAL	%	100
Primary energy supply		
Coal and coal products	%	0
Crude Oil	%	0
Biofuels and Waste	%	98.95
Natural gas	%	0
Nuclear	%	0
Hydro	%	1.05
Solar	%	0
Wind	%	0
Other sources	%	0
Net electricity & heat imports	%	0
Heat	%	0
TOTAL	%	100
Electricity		
Average efficiency of conventional thermal power generation	%	-
Rate of electricity transport and distribution losses	%	32.2
Electricity production mix		
Coal and coal products	%	0
Crude oil	%	0
Oil products	%	1.2
Natural gas	%	0
Biofuels and waste	%	0

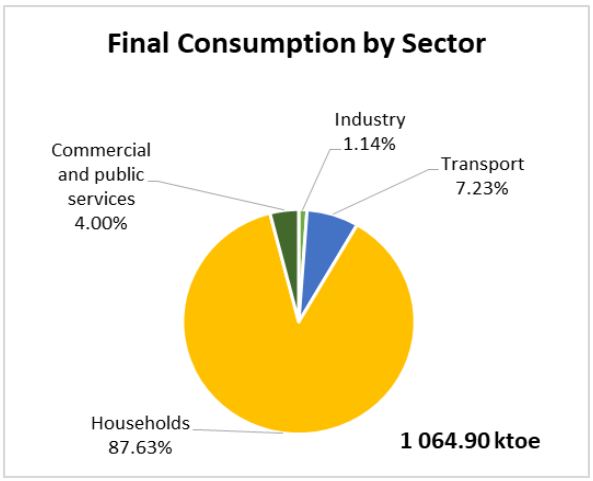
Nuclear	**%**	**0**
Hydro	**%**	**98.8**
Solar PV	**%**	**0**
Wind	**%**	**0**
Other	**%**	**0**
TOTAL	**%**	**100**
Share of renewables		
Share of renewables in primary production	**%**	**100**
Share of renewables in total primary energy supply	**%**	**91.9**
Share of renewables in total final energy consumption	**%**	**92**
Share of renewables in electricity production	**%**	**98.8**
Share of solar thermal in final consumption	**%**	**0**
Final consumption		
Coal and coal products	**%**	**0**
Crude Oil	**%**	**0**
Oil products	**%**	**0.15**
Biofuels and Waste	**%**	**99.6**
Natural gas	**%**	**0**
Solar Thermal	**%**	**0**
Electricity and Heat	**%**	**0.26**
TOTAL	**%**	**100**

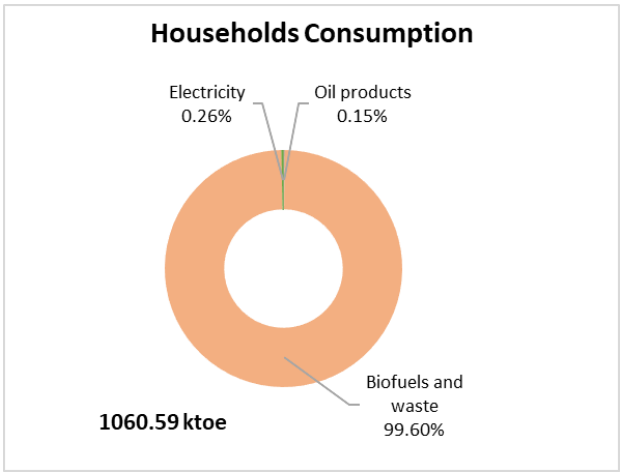
Central African Republic: *Charts*

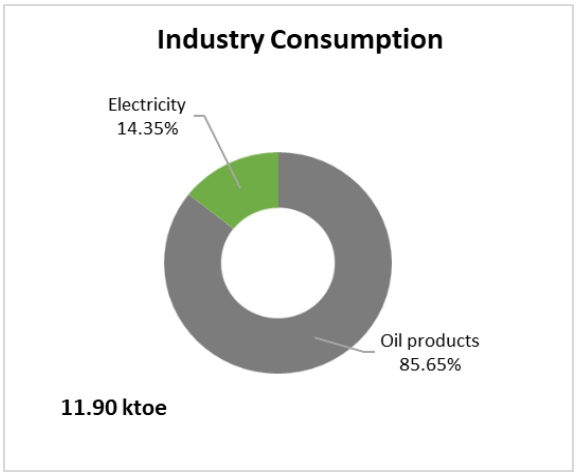












Togo: *Aggregated Energy Balance*

Thousand Tonnes of Oil Equivalent (ktoe)	Oil products	Natural Gas	Biofuels and waste	Hydro	Solar	Electricity	Total of all energy sources
Production	-	-	3 057.0	17.0	1.0	-	3 075.0
Imports (+)	503.0	54.0	-	-	-	72.0	629.0
Exports (-)	-	-	-	-	-	-	-
International Marine Bunkers (-)	- 2.0	-	-	-	-	-	- 2.0
International Aviation Bunkers (-)	- 59.0	-	-	-	-	-	- 59.0
Stock Changes (+ draw, - build)	11.0	-	-	-	-	-	11.0
TOTAL PRIMARY ENERGY SUPPLY	**453.0**	**54.0**	**3 057.0**	**17.0**	**1.0**	**72.0**	**3 654.0**
Transfers : Origin (-) and Destination (+)	-	-	-	-	-	-	-
Statistical Difference	- 2.0	-	-	-	-	1.0	- 1.0
TRANSFORMATION Inputs (-) and Outputs (+)	**- 77.0**	**- 54.0**	**-1 401.0**	**- 17.0**	**- 1.0**	**59.0**	**-1 491.0**
Electricity plants	- 77.0	- 54.0	- 6.0	- 17.0	- 1.0	59.0	- 96.0
CHP Plants	-	-	-	-	-	-	-
Heat Plants	-	-	-	-	-	-	-
Coke ovens	-	-	-	-	-	-	-
Blast furnaces	-	-	-	-	-	-	-
Oil Refineries	-	-	-	-	-	-	-
Coal-to-liquids plants	-	-	-	-	-	-	-
Gas-to-liquids plants	-	-	-	-	-	-	-
Charcoal production plants	-	-	-1 395.0	-	-	-	-1 395.0
Transformation not elsewhere specified	-	-	-	-	-	-	-
Energy Sector Own Use	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Losses	**-**	**-**	**-**	**-**	**-**	**8.0**	**8.0**
FINAL CONSUMPTION	**378.0**	**-**	**1 656.0**	**-**	**-**	**122.0**	**2 155.0**
Industry	53.0	-	-	-	-	19.0	72.0
Transport	263.0	-	-	-	-	-	263.0
Households	31.0	-	1 445.0	-	-	96.0	1 572.0
Commercial and public services	2.0	-	211.0	-	-	7.0	220.0
Agriculture, Forestry and Fishing	-	-	-	-	-	-	-
Non-specified (HH, Com. & PS., Agri.)	-	-	-	-	-	-	-
Non-Energy Use	28.0	-	-	-	-	-	28.0

Note

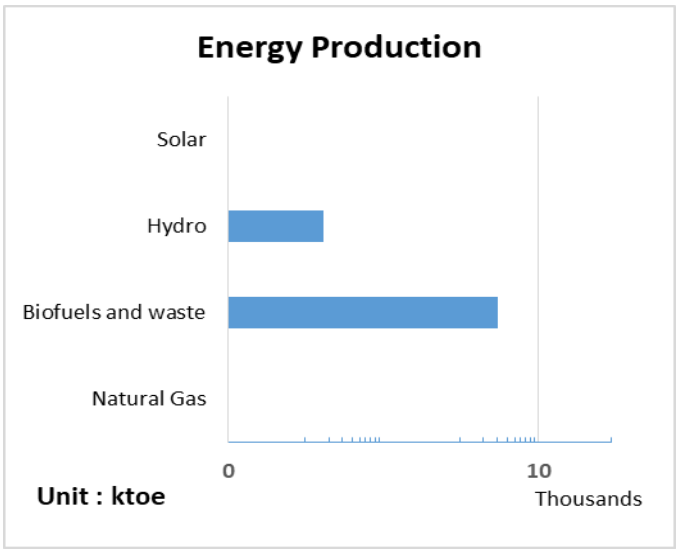
Togo's Total Primary Energy Supply comes largely from biomass, which represents 97.7%. It also dominates final consumption with 76.8%. 91.92% of this consumption occurs in the household sector which itself represents 72.95% of total final consumption.

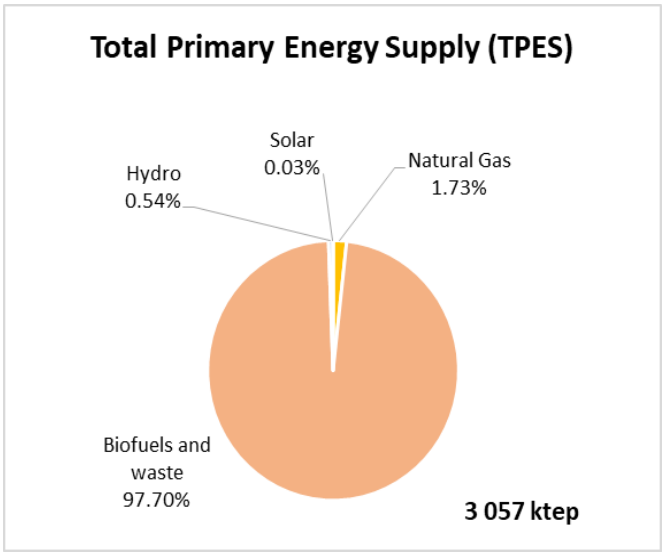
Togo: *Indicators*

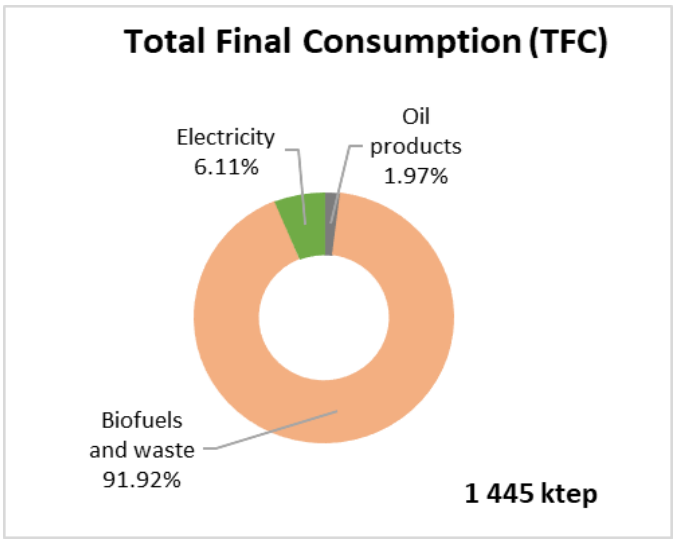
Energy security	Unit	Value
Energy dependency rate	%	17.2
Share in imports		
Coal and coal products	%	0.0
Crude Oil	%	0.0
Oil products	%	80.0
Biofuels and Waste	%	0.0
Natural gas	%	8.6
Electricity and Heat	%	11.4
TOTAL	%	100.0
Primary energy supply		
Coal and coal products	%	0.0
Crude Oil	%	0.0
Biofuels and Waste	%	97.7
Natural gas	%	1.73
Nuclear	%	0.0
Hydro	%	0.54
Solar	%	0.03
Wind	%	0.0
Other sources	%	0.0
Net electricity & heat imports	%	0.0
Heat	%	100.0
Electricity		
Average efficiency of conventional thermal power generation	%	29.9
Rate of electricity transport and distribution losses	%	6.5
Electricity production mix		
Coal and coal products	%	0.0
Crude oil	%	0.0
Oil products	%	1.5
Natural gas	%	67.6
Biofuels and waste	%	0.4
Nuclear	%	0.0

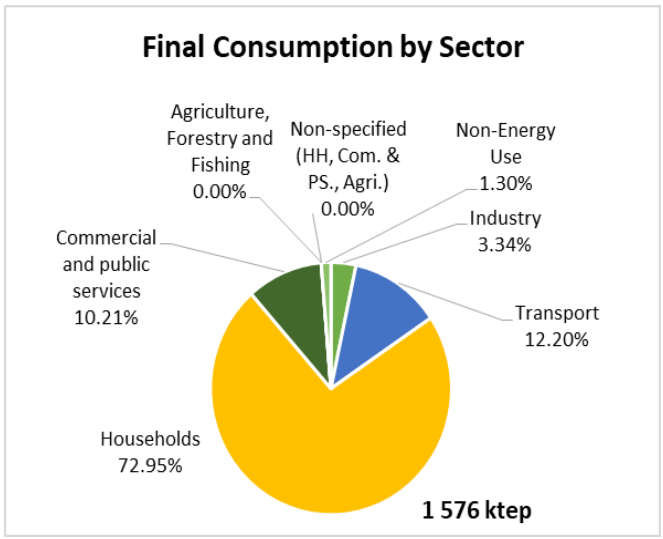
Hydro	**%**	**28.7**
Solar PV	**%**	**1.8**
Wind	**%**	**0.0**
Other	**%**	**0.0**
TOTAL	**%**	**100.0**
Share of renewables		
Share of renewables in primary production	**%**	**100.0**
Share of renewables in total primary energy supply	**%**	**84.2**
Share of renewables in total final energy consumption	**%**	**78.7**
Share of renewables in electricity production	**%**	**30.9**
Share of solar thermal in final consumption	**%**	**0.0**
Final consumption		
Coal and coal products	**%**	**0.0**
Crude Oil	**%**	**0.0**
Oil products	**%**	**17.5**
Biofuels and Waste	**%**	**76.8**
Natural gas	**%**	**0.0**
Solar Thermal	**%**	**0.0**
Electricity and Heat	**%**	**5.6**
TOTAL	**%**	**100.0**

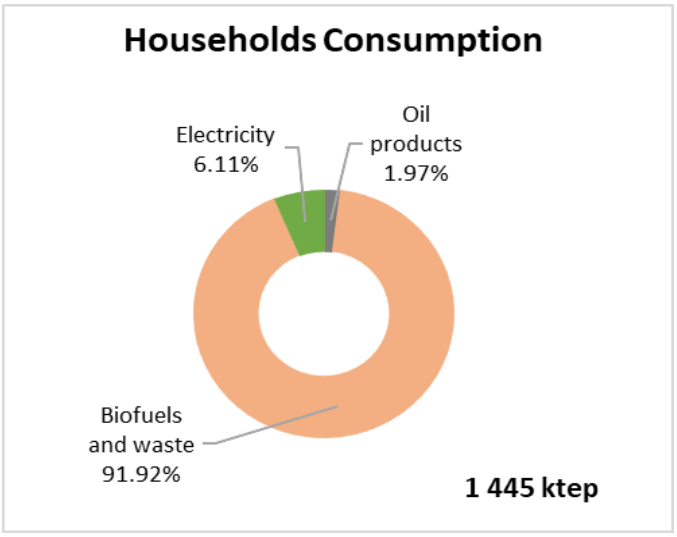
Togo: *Charts*

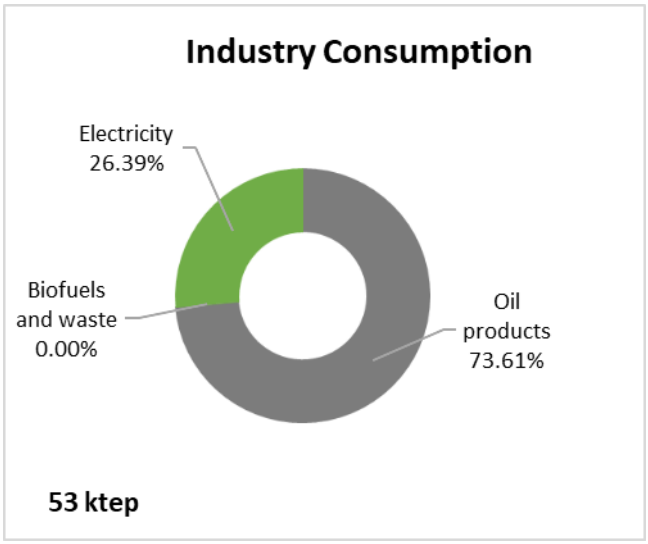

Energy Production
Solar
Hydro
Biofuels and waste
Natural Gas
0
10
Thousands
Unit : ktoe


Total Primary Energy Supply (TPES)
Solar
0.03%
Natural Gas
1.73%
Hydro
0.54%
Biofuels and
waste
97.70%
3 057 ktep


Total Final Consumption (TFC)
Electricity
6.11%
Oil
products
1.97%
Biofuels
and waste
91.92%
1 445 ktep


Final Consumption by Sector
Agriculture,
Forestry and
Fishing
0.00%
Non-specified
(HH, Com. &
PS., Agri.)
0.00%
Non-Energy
Use
1.30%
Industry
3.34%
Commercial
and public
services
10.21%
Transport
12.20%
Households
72.95%
1 576 ktep


Households Consumption
Electricity
6.11%
Oil
products
1.97%
Biofuels
and waste
91.92%
1 445 ktep


Industry Consumption
Electricity
26.39%
Biofuels
and waste
0.00%
Oil
products
73.61%
53 ktep

Tunisia: *Aggregated Energy Balance*

Thousand Tonnes of Oil Equivalent (ktoe)	Crude oil	Oil products	Natural Gas	Biofuels and waste	Hydro	Solar	Wind	Other sources	Electricity	Heat	Total of all energy sources
Production	1 883.9	-	1 857.7	1 095.0	5.7	82.6	43	24.6	-	100.1	5 092.6
Imports (+)	128.1	4 497.0	3 629.9	-	-	-	-	-	40.6	-	8 295.6
Exports (-)	-1 636.4	-77.6	-	-	-	-	-	-	-54.2	-	-1 768.2
International Marine Bunkers (-)	-	-10	-	-	-	-	-	-	-	-	-10
International Aviation Bunkers (-)	-	-310.5	-	-	-	-	-	-	-	-	-310.5
Stock Changes (+ draw, - build)	-87.8	76	-	-	-	-	-	-	-	-	-11.9
TOTAL PRIMARY ENERGY SUPPLY	**288.7**	**4 175.0**	**5 487.7**	**1 095.0**	**5.7**	**82.6**	**43**	**24.6**	**-13.7**	**100.1**	**11 288.6**
Transfers : Origin (-) and Destination (+)	-113	125.3	-	-	-	-	-	-	-	-	12.2
Statistical Difference	24.1	-36.2	-3.9	-	-	0.1	-	-	4.3	-	-11.6
TRANSFORMATION Inputs (-) and Outputs (+)	**-145.6**	**124.1**	**-3 968.0**	**-233**	**-5.7**	**-21.1**	**-43**	**-24.6**	**1 898.8**	**-100.1**	**-2 518.1**
Electricity plants	-	-19.5	-3 917.7	-	-5.7	-21.1	-43	-24.6	1 848.5	-100.1	-2 283.2
CHP Plants	-	-	-50.3	-	-	-	-	-	50.3	-	0
Heat Plants	-	-	-	-	-	-	-	-	-	-	-
Coke ovens	-	-	-	-	-	-	-	-	-	-	-
Blast furnaces	-	-	-	-	-	-	-	-	-	-	-
Oil Refineries	-145.6	143.6	-	-	-	-	-	-	-	-	-2
Coal-to-liquids plants	-	-	-	-	-	-	-	-	-	-	-
Gas-to-liquids plants	-	-	-	-	-	-	-	-	-	-	-
Charcoal production plants	-	-	-	-233	-	-	-	-	-	-	-233
Transformation not elsewhere specified	-	-	-	-	-	-	-	-	-	-	-
Energy Sector Own Use	**4**	**15.3**	**136.6**	**-**	**-**	**-**	**-**	**-**	**72**	**-**	**227.9**
Losses	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**313.1**	**-**	**315.1**
FINAL CONSUMPTION	**-**	**4 445.2**	**1 386.9**	**862**	**-**	**61.4**	**-**	**-**	**1 495.9**	**-**	**8 251.4**
Industry	-	800.5	808.2	-	-	-	-	-	491.7	-	2 100.5
Transport	-	2 332.3	98	-	-	-	-	-	8	-	2 438.3
Households	-	603.3	254.5	850.3	-	58.8	-	-	486	-	2 253.0
Commercial and public services	-	96.4	197.8	11.7	-	2.6	-	-	413.5	-	722.1
Agriculture, Forestry and Fishing	-	381.9	28.4	-	-	-	-	-	96.5	-	506.8
Non-specified (HH, Com. & PS., Agri.)	-	-	-	-	-	-	-	-	-	-	-
Non-Energy Use	-	230.8	-	-	-	-	-	-	-	-	230.8

Note:

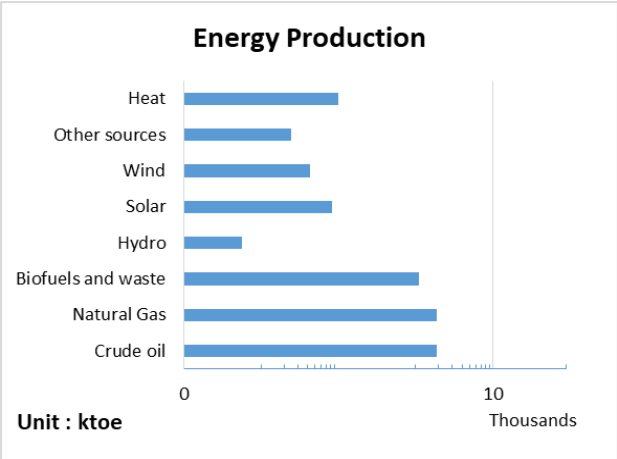
Natural gas represents 76.99% in Tunisia's primary energy supply, followed by Biofuels and waste with 15.36%, then Crude Oil with 4.05% finally by Heat, Solar, Wind, Other Sources and hydro with 2.22%. The breakdown of the final energy consumption gives 53.87% for petroleum products, 18; 13% for electricity, 16.81% for natural gas and 10.45% for biomass. At the household sector level, it can be seen that 37.74% of consumption comes from biomass followed by petroleum products and electricity, respectively 26.78% and 21.57%.

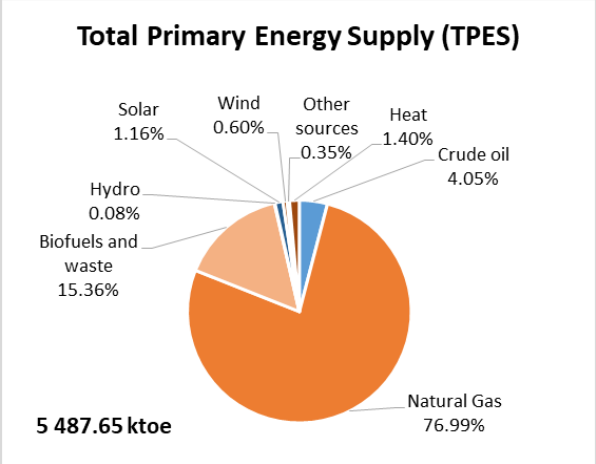
Tunisia: *Indicators*

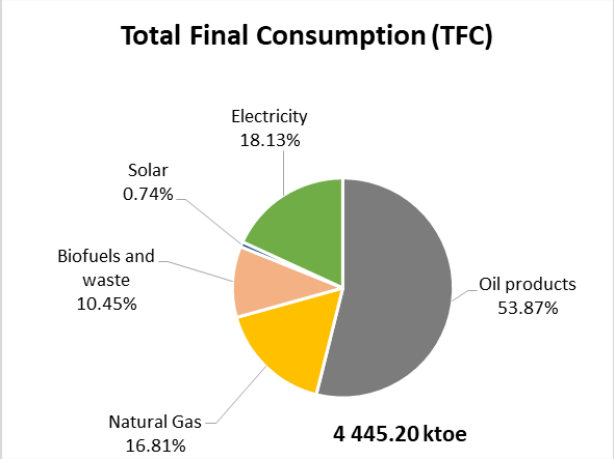
Energy security	Unit	Value
Energy dependency rate	%	57.8
Share in imports		
Coal and coal products	%	0
Crude Oil	%	1.5
Oil products	%	54.2
Biofuels and Waste	%	0
Natural gas	%	43.8
Electricity and Heat	%	0.5
TOTAL	%	100
Primary energy supply		
Coal and coal products	%	0
Crude Oil	%	4.05
Biofuels and Waste	%	15.36
Natural gas	%	76.99
Nuclear	%	0
Hydro	%	0.08
Solar	%	1.16
Wind	%	0.6
Other sources	%	0.35
Heat	%	1.4
TOTAL	%	100.9
Electricity		
Average efficiency of conventional thermal power generation	%	44.6
Rate of electricity transport and distribution losses	%	17.3
Electricity production mix		
Coal and coal products	%	0
Crude oil	%	0
Oil products	%	0.2
Natural gas	%	94.8
Biofuels and waste	%	0
Nuclear	%	0

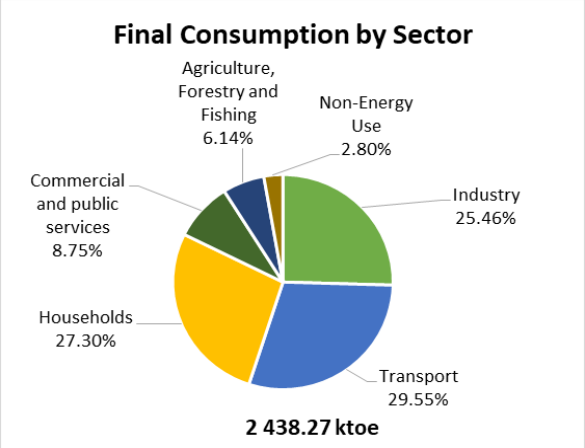
Hydro	**%**	**0.3**
Solar PV	**%**	**1.1**
Wind	**%**	**2.3**
Other	**%**	**1.3**
TOTAL	**%**	**100**
Refining		
Efficiency of refineries	**%**	**98.6**
Share of renewables		
Share of renewables in primary production	**%**	**24.1**
Share of renewables in total primary energy supply	**%**	**10.9**
Share of renewables in total final energy consumption	**%**	**12.4**
Share of renewables in electricity production	**%**	**3.7**
Share of solar thermal in final consumption	**%**	**0.7**
Final consumption		
Coal and coal products	**%**	**0**
Crude Oil	**%**	**0**
Oil products	**%**	**53.9**
Biofuels and Waste	**%**	**10.4**
Natural gas	**%**	**16.8**
Solar Thermal	**%**	**0.7**
Electricity and Heat	**%**	**18.1**
TOTAL	**%**	**100**

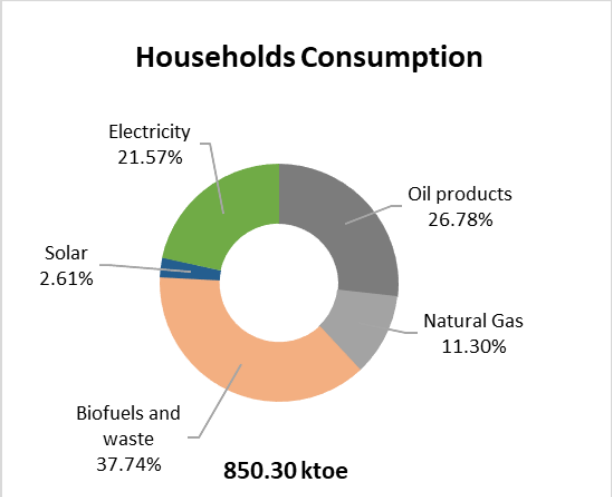
Tunisia: *Charts*

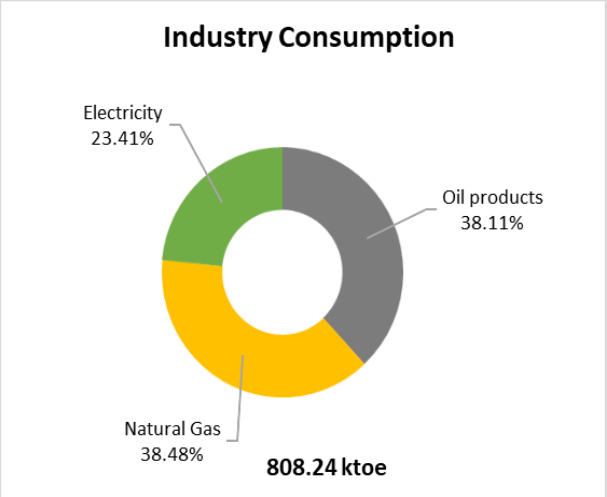












Uganda: *Aggregated Energy Balance*

Thousand Tonnes of Oil Equivalent (ktoe)	Crude oil	Oil products	Natural Gas	Biofuels and waste	Hydro	Solar	Wind	Other sources	Electricity	Total of all energy sources
Production	-	-	-	20 637.7	346.8	6.9	-	-	-	20 991.4
Imports (+)	-	1 925.2	-	2 608.2	-	-	-	-	1.8	4 535.2
Exports (-)	-	-	-	-	-	-	-	-	-25.7	-25.7
International Marine Bunkers (-)	-	-	-	-	-	-	-	-	-	-
International Aviation Bunkers (-)	-	-	-	-	-	-	-	-	-	-
Stock Changes (+ draw, - build)	-	-	-	-	-	-	-	-	-	-
TOTAL PRIMARY ENERGY SUPPLY	**-**	**1 925.2**	**-**	**23 245.9**	**346.8**	**6.9**	**-**	**-**	**-24**	**25 500.8**
Transfers : Origin (-) and Destination (+)	-	-	-	-	-	-	-	-	-	-
Statistical Difference	-	-3	-	-991.6	-	-	-	-	8	-986.6
TRANSFORMATION Inputs (-) and Outputs (+)	**-**	**-24.1**	**-**	**-9 405.9**	**-346.8**	**-6.9**	**-**	**-**	**379.7**	**-9 404.0**
Electricity plants	-	-24.1	-	-4 517.8	-346.8	-6.9	-	-	362.8	-4 532.9
CHP Plants	-	-	-	-	-	-	-	-	16.9	16.9
Heat Plants	-	-	-	-	-	-	-	-	-	-
Coke ovens	-	-	-	-	-	-	-	-	-	-
Blast furnaces	-	-	-	-	-	-	-	-	-	-
Oil Refineries	-	-	-	-	-	-	-	-	-	-
Coal-to-liquids plants	-	-	-	-	-	-	-	-	-	-
Gas-to-liquids plants	-	-	-	-	-	-	-	-	-	-
Charcoal production plants	-	-	-	-4 888.1	-	-	-	-	-	-4 888.1
Transformation not elsewhere specified	-	-	-	-	-	-	-	-	-	-
Energy Sector Own Use	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.5**	**0.5**
Losses	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**69.8**	**69.8**
FINAL CONSUMPTION	**-**	**1 904.0**	**-**	**14 831.6**	**-**	**-**	**-**	**-**	**277.4**	**17 013.1**
Industry	-	383	-	3 262.4	-	-	-	-	185.8	3 831.2
Transport	-	1 278.4	-	-	-	-	-	-	-	1 278.4
Households	-	49.5	-	10 291.1	-	-	-	-	60	10 400.6
Commercial and public services	-	25.4	-	1 278.1	-	-	-	-	31.7	1 335.1
Agriculture, Forestry and Fishing	-	167.7	-	-	-	-	-	-	-	167.7
Non-specified (HH, Com. & PS., Agri.)	-	-	-	-	-	-	-	-	-	-
Non-Energy Use	-	-	-	-	-	-	-	-	-	-

Note:

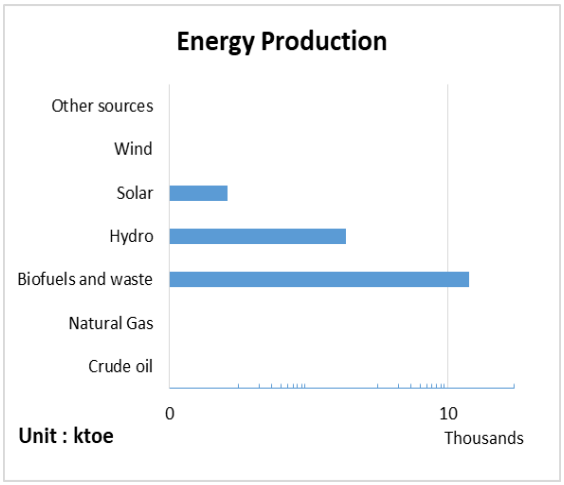
Biofuels and waste is the main source of Total Primary Energy Supply in Uganda with 98.5%. The final energy consumption is split between Biofuels and waste with 87.18%, Petroleum Products 11.19% and Electricity 1.63%. The household sector which represents 61.13% of final consumption is dominated by Biofuels and waste at 98.95%. There is also a high consumption of Biofuels and waste in the industrial sector at 85.15%.

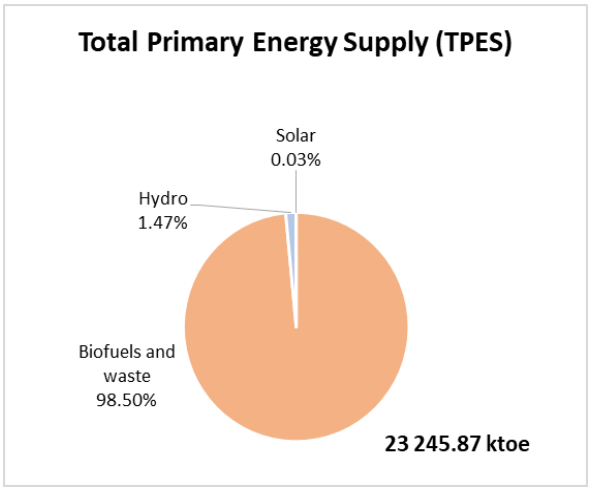
Uganda: *Indicators*

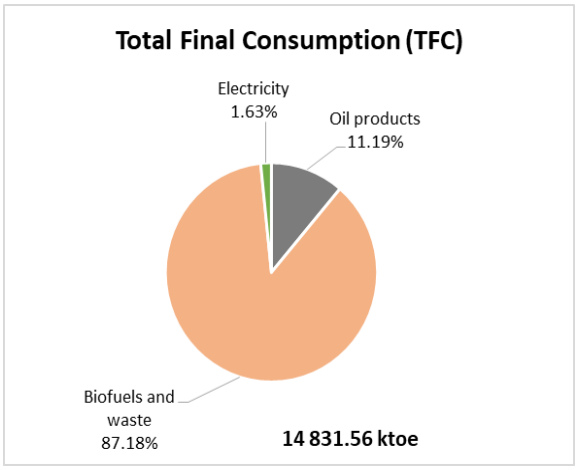
Energy security	Unit	Value
Energy dependency rate	%	17.7
Share in imports		
Coal and coal products	%	0
Crude Oil	%	0
Oil products	%	42.5
Biofuels and Waste	%	57.5
Natural gas	%	0
Electricity and Heat	%	0
TOTAL	%	100
Primary energy supply		
Coal and coal products	%	0
Crude Oil	%	0
Biofuels and Waste	%	98.5
Natural gas	%	0
Nuclear	%	0
Hydro	%	1.47
Solar	%	0.03
Wind	%	0
Other sources	%	0
TOTAL	%	100
Electricity		
Average efficiency of conventional thermal power generation	%	-
Rate of electricity transport and distribution losses	%	20.1
Electricity production mix		
Coal and coal products	%	0
Crude oil	%	0
Oil products	%	2.4
Natural gas	%	0
Biofuels and waste	%	4.5
Nuclear	%	0
Hydro	%	91.3

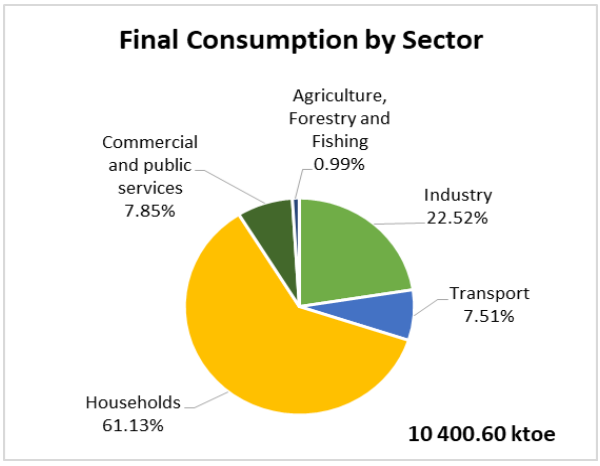
Solar PV	**%**	**1.8**
Wind	**%**	**0**
Other	**%**	**0**
TOTAL	**%**	**100**
Share of renewables		
Share of renewables in primary production	**%**	**100**
Share of renewables in total primary energy supply	**%**	**92.5**
Share of renewables in total final energy consumption	**%**	**89.3**
Share of renewables in electricity production	**%**	**93.2**
Share of solar thermal in final consumption	**%**	**0**
Final consumption		
Coal and coal products	**%**	**0**
Crude Oil	**%**	**0**
Oil products	**%**	**11.19**
Biofuels and Waste	**%**	**87.18.0**
Natural gas	**%**	**0**
Solar Thermal	**%**	**0**
Electricity and Heat	**%**	**1.63**
TOTAL	**%**	**100**

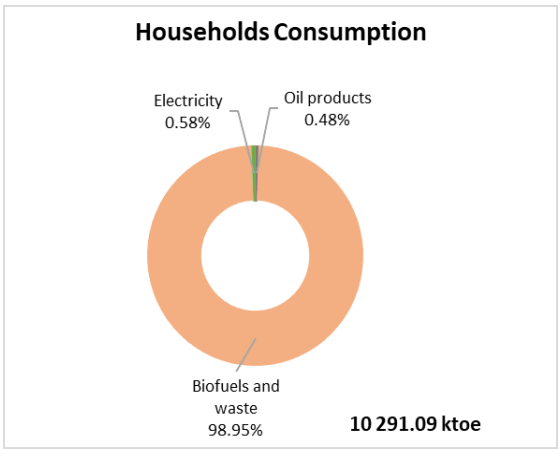
Uganda: *Charts*

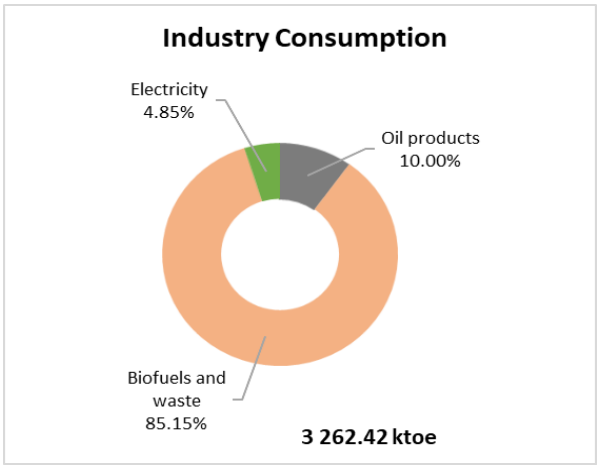












Zambia: *Aggregated Energy Balance*

Thousand Tonnes of Oil Equivalent (ktoe)	Coal and Coal Products	Crude oil	Oil products	Biofuels and waste	Hydro	Solar	Wind	Electricity	Total of all energy sources
Production	780.1	-	-	7 875.2	1 060.2	10.1	-	-	9 725.6
Imports (+)	115.9	712	889.4	-	-	-	-	17	1 734.3
Exports (-)	-7.8	-	-1.7	-	-	-	-	-83.9	-93.3
International Marine Bunkers (-)	-	-	-	-	-	-	-	-	-
International Aviation Bunkers (-)	-	-	-36.9	-	-	-	-	-	-36.9
Stock Changes (+ draw, - build)	-	-	-	-	-	-	-	-	-
TOTAL PRIMARY ENERGY SUPPLY	**888.2**	**712**	**850.8**	**7 875.2**	**1 060.2**	**10.1**	**-**	**-66.8**	**11 329.7**
Transfers : Origin (-) and Destination (+)	-	-	-	-	-	-	-	-	-
Statistical Difference	-5.6	-	-187.3	-	-	-	-	140.7	-52.2
TRANSFORMATION Inputs (-) and Outputs (+)	**-568.7**	**-712**	**431.7**	**-2 181.9**	**-1 060.2**	**-10.1**	**-**	**1 314.4**	**-2 786.8**
Electricity plants	-568.7	-	-210	-109.5	-1 060.2	-10.1	-	1 314.4	-644.2
CHP Plants	-	-	-	-	-	-	-	-	-
Heat Plants	-	-	-	-	-	-	-	-	-
Coke ovens	-	-	-	-	-	-	-	-	-
Blast furnaces	-	-	-	-	-	-	-	-	-
Oil Refineries	-	-712	641.7	-	-	-	-	-	-70.3
Coal-to-liquids plants	-	-	-	-	-	-	-	-	-
Gas-to-liquids plants	-	-	-	-	-	-	-	-	-
Charcoal production plants	-	-	-	-2 072.3	-	-	-	-	-2 072.3
Transformation not elsewhere specified	-	-	-	-	-	-	-	-	-
Energy Sector Own Use	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**7.1**	**7.1**
Losses	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**64.9**	**64.9**
FINAL CONSUMPTION	**325.1**	**-**	**1 469.8**	**5 693.3**	**-**	**-**	**-**	**1 034.8**	**8 523.0**
Industry	267.4	-	268.3	327.3	-	-	-	588.5	1 451.6
Transport	-	-	1 148.5	-	-	-	-	2.7	1 151.2
Households	-	-	10.7	5 223.7	-	-	-	345.9	5 580.2
Commercial and public services	48.9	-	-	-	-	-	-	70.9	119.9
Agriculture, Forestry and Fishing	8.7	-	-	142.4	-	-	-	26.9	177.9
Non-specified (HH, Com. & PS., Agri.)	-	-	1.1	-	-	-	-	-	1.1
Non-Energy Use	-	-	41.2	-	-	-	-	-	41.2

Note:

Zambia's Total Primary Energy Supply is made up largely of 74.68% Biofuels and waste. It includes also Hydro with 10.05%, Crude Oil with 6.75% and Coal and coal products with 8.42%. Biofuels and waste represents 66.80% in the total final consumption and 93.61% in the final household consumption. In the industrial sector, 40.54% of final consumption is made from Electricity followed by Biofuels and waste and Coal.

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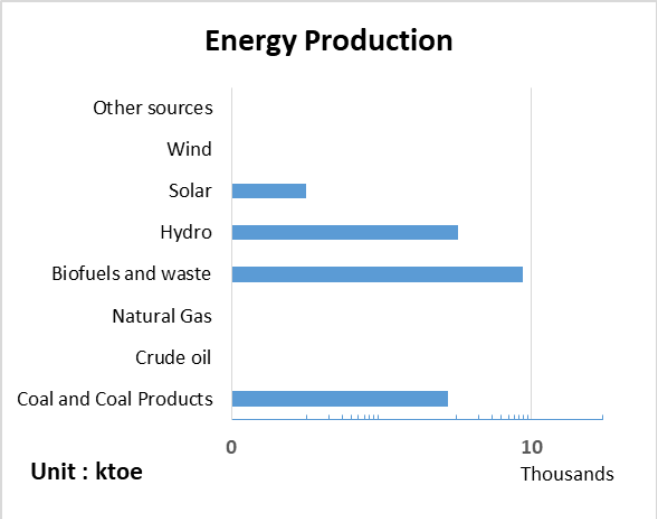
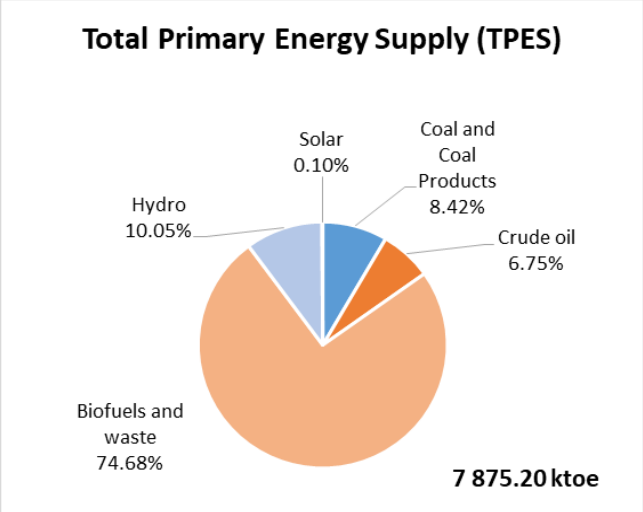
Zambia: *Indicators*

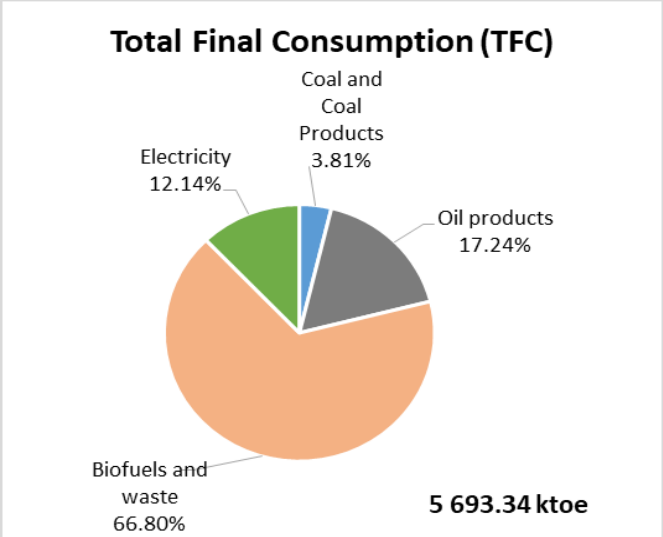
Energy security	Unit	Value
Energy dependency rate	%	14.5
Share in imports		
Coal and coal products	%	6.7
Crude Oil	%	41.1
Oil products	%	51.3
Biofuels and Waste	%	0
Natural gas	%	0
Electricity and Heat	%	1
TOTAL	%	100
Primary energy supply		
Coal and coal products	%	8.42
Crude Oil	%	6.75
Biofuels and Waste	%	74.68
Natural gas	%	0
Nuclear	%	0
Hydro	%	10.05
Solar	%	0.1
Wind	%	0
Other sources	%	0
Heat	%	0
TOTAL	%	100
Electricity		
Average efficiency of conventional thermal power generation	%	27.5
Rate of electricity transport and distribution losses	%	5.9
Electricity production mix		
Coal and coal products	%	12.3
Crude oil	%	0
Oil products	%	5.8
Natural gas	%	0
Biofuels and waste	%	0.5
Nuclear	%	0

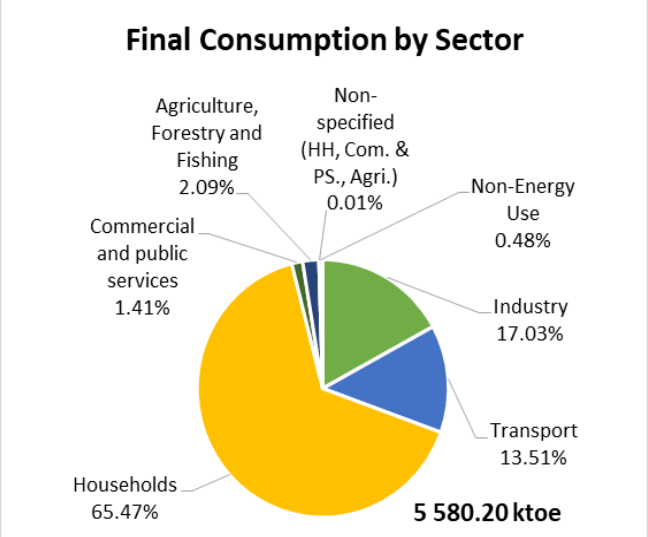
Hydro	**%**	**80.7**
Solar PV	**%**	**0.8**
Wind	**%**	**0**
Other	**%**	**0**
TOTAL	**%**	**100**
Refining		
Efficiency of refineries	**%**	**90.1**
Share of renewables		
Share of renewables in primary production	**%**	**92**
Share of renewables in total primary energy supply	**%**	**79**
Share of renewables in total final energy consumption	**%**	**79.8**
Share of renewables in electricity production	**%**	**81.9**
Share of solar thermal in final consumption	**%**	**0**
Final consumption		
Coal and coal products	**%**	**3.81**
Crude Oil	**%**	**0**
Oil products	**%**	**17.25**
Biofuels and Waste	**%**	**66.8**
Natural gas	**%**	**0**
Solar Thermal	**%**	**0**
Electricity and Heat	**%**	**12.14**
TOTAL	**%**	**100**

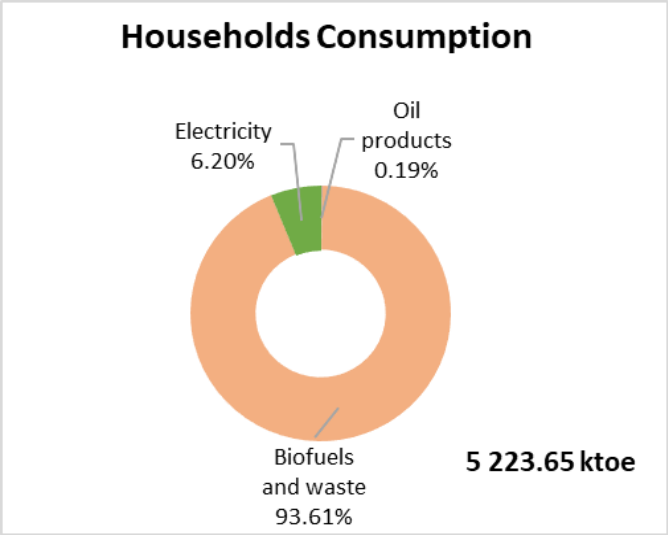
Zambia: *Charts*

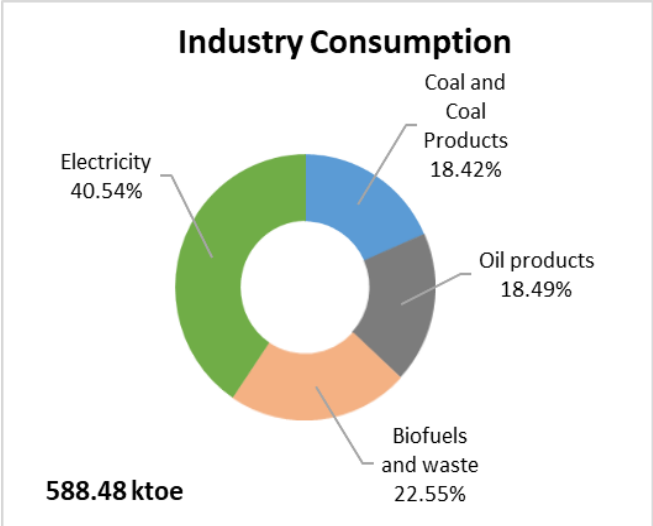












GLOSSARY

Coal/Peat

Coal/peat includes all coal primary (including hard coal and lignite) and derived fuels (including patent fuel, coke oven coke, gas coke, BKB, gas works gas, coke oven gas, blast furnace gas and other recovered gases). Peat is also included in this category.

Hard coal

Hard coal comprises anthracite coking coal and other bituminous coal.

Steam coal

Steam coal comprises anthracite, other bituminous coal and sub-bituminous coal.

Crude oil

Crude oil comprises crude oil, natural gas liquids, refinery feedstock and additives as well as other hydrocarbons.

Oil products

Oil products comprise refinery gas liquids, refinery feedstock and additives as well as other hydrocarbons.

Oil products

Oil products comprises refinery gas, ethane, LPG, aviation gasoline, motor gasoline, jet fuels, kerosene, gas/diesel oil, fuel oil, naphtha, white spirit, lubricants, bitumen, paraffin waxes, petroleum coke and other oil products.

Natural gas

Natural gas includes both “associated” and “non-associated” gas.

Nuclear

Nuclear shows the primary heat equivalent of the electricity produced by a nuclear power plant with an average thermal efficiency of 33%.

Hydro

Hydro shows the energy content of the electricity produced in hydro power plants hydro output excludes output from pumped storage plants.

Biofuels and waste

Biofuels and waste comprises solid biofuels liquid biofuels, biogases, industrial waste and municipal waste. Biofuels are defined as any plant matter used directly as fuel or converted into fuels (e.g., charcoal) or electricity and/or heat. Included here are wood, vegetal waste (including wood waste and crops used for energy production), ethanol, animal materials/ wastes and sulphite lyes. Municipal waste comprises wastes produced by residential, commercial and public services that are collected by local authorities for disposal in a central location for the production of heat and/or power.

Other

Other includes geothermal, solar, wind, tide/wave/ocean energy, electricity and heat. Unless the actual efficiency of the geothermal process is known, the quantity of geothermal energy entering electricity generation is inferred from the electricity production at geothermal plants assuming an average thermal efficiency of 10% For solar, wind and tide/Wave/ocean energy, the quantities entering electricity generation are equal to the electrical energy generated. Direct use of geothermal and solar heat is also included here. Electricity is accounted for at the same heat value as electricity in final consumption (i.e., 1GWh = 0.000086 Mtoe). Heat includes heat that is produced for sale and is accounted for in the transformation sector.

Production

Production is the production of primary energy, i.e., hard coal, lignite, peat, crude oil, NGLs, natural gas, biofuels and waste, nuclear, hydro, geothermal, solar and the heat from heat pumps that is extracted from the ambient environment production is calculated after removal of impurities (e.g., sulphur from natural gas).

Imports and exports

Imports and exports comprise amounts having crossed the national territorial boundaries of the country, whether or not

customs clearance has taken place.

Oil and natural gas

Quantities of crude oil and oil products imported or exported under processing agreements (i.e., refining on account) are included. Quantities of oil in transit are excluded Crude oil, NGL and natural gas are reported as coming from the country of origin; refinery feedstock and oil products are reported as coming from the country of last consignment Re-exports of oil imported for processing within bonded areas are shown as exports of product from the processing country to the final destination.

Coal/peat

Imports and exports comprise the amount of fuels obtained from or supplied to other countries, whether or not there is an economic or customs union between the relevant countries Coal in transit is not included.

Electricity

Amounts are considered as imported or exported when they have crossed the national territorial boundaries of the country.

International marine bunkers

International marine bunkers cover those quantities delivered to ships of all flags that are engaged in international navigation. The international navigation may take place at sea, on inland lakes and waterways, and in coastal waters. Consumption by ships engaged in domestic navigation is excluded. The domestic/International split is determined on the basis of port of departure and port of arrival, and not by the flag or nationality of the ship. Consumption by fishing vessels and by military forces is also excluded.

International aviation bunkers

International aviation bunkers covers deliveries of aviation fuels to aircraft for international aviation. Fuels used by airlines for their road vehicles are excluded. The domestic/International split should be determined ON THE BASIS OF DEPARTURE AND LANDING LOCATIONS AND NOT BY THE NATIONALITY OF THE AIRLINE; For many countries this incorrectly excludes fuel used by domestically owned carriers for their international departures.

Stock changes

Stock changes reflects the difference between opening stock levels on the first day of the year and closing levels on the last day of the year of stocks on national territory held by producers, importers, energy transformation industries and large consumers. A stock build is shown as a negative number, and a stock draw as a positive number.

Total primary energy supply (TPES)

Total primary energy supply (TPES) is made up of production + imports – exports – international marine bunkers – international aviation bunkers ± stock changes. For the world total, international marine bunkers and international aviation bunkers are not subtracted from TPES.

Transfers

Transfers includes both inter-product transfers, products transferred and recycled products.

Statistical differences

Statistical differences include the sum of the unexplained statistical differences for individual fuels, as they appear in the basic energy statistics. It also includes the statistical differences that arise because of the variety of conversion factors in the coal/peat and oil columns.

Electricity plants

Electricity plants refer to plants which are designed to produce electricity only. If one or more units of the plant is a CHP unit (and the inputs and outputs cannot be distinguished on a unit basis) then the whole plant is designated as a CHP plant. Both main activity producers and auto producer plants are included here.

Combined heat and power plants

Combined heat and power plants refers to plants which are designed to produce both heat and electricity. Sometimes referred to as cogeneration power stations. If possible, fuel inputs and electricity/heat outputs are on a unit basis rather than on a plan basis. However, if data are not available on a unit basis, the convention for defining a CHP plan noted above is adopted. Both main activity producers and auto producer plants are included here.

Blast furnaces

Blast furnaces contain inputs to and outputs of fuels from blast furnaces.

Gas works

Gas works is treated similarly to electricity generation, with the quantity produced appearing as a positive figure in the coal/peat column or the natural gas column after blending with natural gas, inputs as negative entries in the coal/peat and oil products columns, and conversion losses appearing in the total column.

Coke ovens

Coke ovens contain losses in transformation of coal from primary to secondary fuel and from secondary to tertiary fuels (hard coal to coke and patent fuel, lignite to BKB, etc.).

Oil refineries

Oil refineries show the use of primary energy for the manufacture of finished oil products and the corresponding output. Thus, the total reflects transformation losses. In certain cases the data in the total column are positive numbers. This can be due to either problem in the primary refinery balance or to the fact that the IEA uses regional net calorific values for oil products.

Petrochemical plants

Petrochemical plants covers backflows returned from the petrochemical industry. Note that backflows from oil products that are used for non-energy purposes (i.e white spirit and lubricants) are note included here, but in non-energy use.

Liquefaction plants

Liquefaction plants include diverse liquefaction processes, such as coal liquefaction plants and gas-to-liquid plants.

Other transformation

Other transformation covers non-specified transformation not shown elsewhere, such as the transformation of primary solid biofuels into charcoal.

Energy industry own use

Energy industry own use contains the primary and secondary energy consumed by transformation industries for heating, pumping, traction and lighting purposes (ISIC 05, 06, 19 and 35, Group 091 and Classes 0892 and 0721).

Losses

Losses include losses in energy distribution, transmission and transport.

Total final consumption (TFC)

Total final consumption (TFC) is the sum of consumption by the different end-use sectors; Backflows from the petrochemical industry are not included in final consumption.

Industry

Industry consumption is specified in the following subsectors (energy used for transport by industry is not included here but reported under transport):

Iron and steel industry [ISIC Group 241 and Class 2431];

Chemical and petrochemical industry [ISIC Divisions 20 and 21] excluding petrochemical feedstock;

Non-ferrous metals basic industries [ISIC Group 242 and class 2432];

Non-metallic minerals such as glass, ceramic, cement, etc. [ISIC Division 23];

Transport equipment [ISIC Divisions 29 and 30];

Machinery comprises fabricated metal product, machinery and equipment other than transport equipment [ISIC Divisions 25 to 28]
Mining (excluding fuels) and quarrying [ISIC Divisions 07 and 08 and Group 099];

Food and tobacco [ISIC Divisions 10 and 12];

Paper, pulp and printing [ISIC Divisions 17 and 18];

Wood and wood products (other than pulp and paper) [ISIC Division 16];

Construction [ISIC Divisions 41 and 43];

Textile and leather [ISIC Divisions 13 to 15];

Non-specified (any manufacturing industry not included above) [ISIC Divisions 22, 31 and 32].

Transport

Transport includes all fuels used for transport [ISIC Divisions 39 to 51]. It includes transport in industry and covers domestic aviation, road, rail, pipeline transport, domestic navigation and non-specified transport. Fuel used for ocean, coastal and inland fishing (included under fishing and military consumption (included in other non-specified) are excluded from transport.

Please note that international marine and international aviation bunkers are also included here for world total.

Other

Other covers residential, commercial and public services [ISIC Divisions 33, 36-39, 45-47, 52, 53, 56, 58-66, 68-75, 77-82, 84 (excluding Class 8422) 85-88, 90-99], agriculture/forestry [ISIC Divisions 01 and 02], fishing [ISIC Division 03] and non-specified consumption.

Non-energy use

Non-energy use covers those fuels that are used as raw materials in the different sectors and are not consumed as a fuel or transformed into another fuel. Non-energy use also includes petrochemical feedstock. Non-energy use is shown separately in final consumption under the heading non-energy use.

CONVERSION FACTORS

Conversion Factors for Energy

	TJ	Gcal	Mtoe	MBtu	GWh
TJ	1	238.8	2.388×10^{-5}	947.8	0.2778
Gcal	4.1868×10^{-3}	1	10^{-7}	3.968	1.163×10^{-3}
Mtoe	4.1868×10^{4}	10^{7}	1	3.968×10^{7}	11630
MBtu	1.0551×10^{-3}	0.252	2.52×10^{-8}	1	2.931×10^{-4}
GWh	3.6	860	8.6×10^{-5}	3412	1

Conversion Factors for Mass

	kg	t	lt	st	lb
kilogram (kg)	1	0.001	9.84×10^{-4}	1.102×10^{-3}	2.2046
ton (t)	1 000	1	0.984	1.1023	2 204.6
long ton (lt)	1 060	1.016	1	1.120	2 240.0
short ton (st)	907.2	0.9072	0.893	1	2 000.0[4]
pound (lb)	0454	4.54×10^{-4}	4.46×10^{-4}	5.0×10^{-4}	1

Conversion Factors for Volume

	gal U.S.	gal U.K.	bbl	Ft^3	l	m^3
U.S. gallon (gal)	1	0.8327	0.02381	0.1337	3.785	0.0038
U.K. gallon (gal)	1.201	1	0.02859	0.1605	4.5466	0.0045
barrel (bbl)	42.0	34.97	1	5.615	159.0	0.159
cubic foot (ft^3)	7.48	6.229	0.1781	1	28.3	0.0283
litre(l)	0.2642	0.220	0.0063	0.0353	1	0.001
cubic metre (m^3)	264.2	220.0	6.289	35.3147	1 000	1

NOTES

Africa Energy Balances & Indicators

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