

POLICY BRIEF

Analysing the Trends and Challenges in Ghana's Energy Sector

EXECUTIVE SUMMARY

Ghana's energy sector relies mainly on hydropower, biomass, and crude oil. While, the use of modern renewable energy sources and natural gas is increasing, the consumption of biomass and petroleum products has resulted in environmental concerns. Also, the limited access to clean energy sources and electricity in rural areas negatively affects social and economic development. To tackle these challenges, we recommend promoting renewable energy, clean cooking fuels, and expanding electricity access to rural areas. Also, incentives such as tax credits and subsidies should be provided to encourage investment in clean energy.

INTRODUCTION

Sustainable development and economic growth are hinged on having access to reliable and affordable energy. Ghana has made considerable strides in expanding access to electricity, with over 85% of its population now having access to grid-connected power (Energy Commission, 2022a). However, universal access to clean energy remains a challenge, especially in the clean cooking sector, due to a range of complex and interrelated factors, including technology, family decision-making, cultural preferences, price, and convenience. In 2021, only 36.9 percent of Ghanaians relied on clean cooking fuels and technologies (GSS, 2022), indicating the need for comprehensive policies, strategies, and financing to achieve universal access by 2030. Energy prices have also gone up due to the COVID-19 pandemic and global events like the Russian and Ukraine conflict are increasing the cost of necessities (IRENA, 2022). To attain Sustainable Development Goal 7 and the Paris Agreement, Ghana must transition to

renewable energy. This policy brief is based on a desk-top research and provides an overview of Ghana's energy situation and trends from 2018 to 2022, highlighting energy generation and its social implications. It also identifies policy implications and recommendations for achieving universal access to clean energy by 2030.



KEY ISSUES

Primary energy supply and energy consumption (2018-2022)

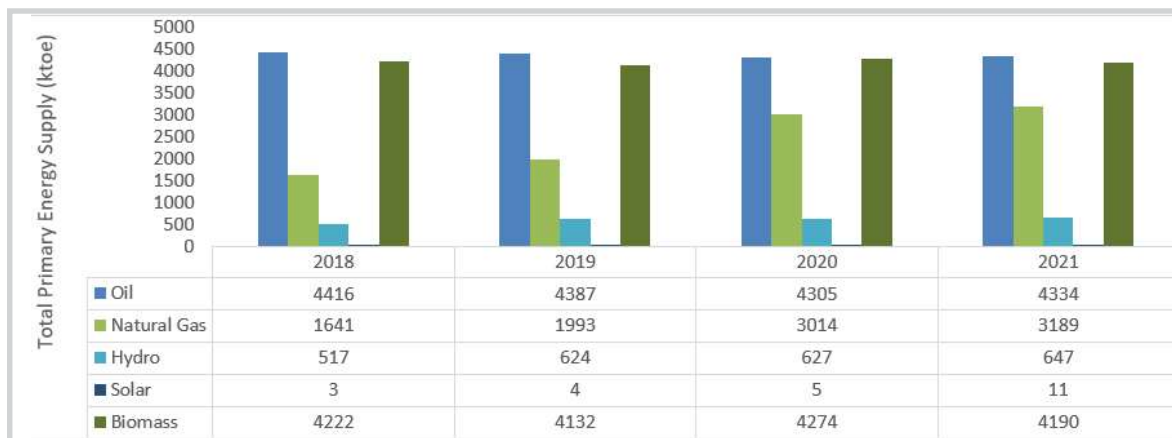
The demand and supply patterns of energy generation and consumption are crucial for a country's economic growth and overall wellbeing. In Ghana, hydropower, biomass, and crude oil are the main sources of energy for industrial and non-industrial activities (see figure 1). Between 2018 and 2021, the total final primary energy supply in Ghana increased from 10,800 ktoe to 12,371 ktoe. In 2021, crude oil accounted for 35%, followed by biomass (34%), natural gas (26%), and hydropower (5%). Although crude oil has contributed significantly to electricity generation and industry in Ghana, the use of natural gas and modern renewable energy sources is increasing while the share of biomass has declined from 39% in 2018 to 34% in 2021 (Energy commission 2022). The residential sector is the largest consumer of energy in Ghana, with an increase of 7.3 percent in consumption compared to 2018.

The transport sector comes second, accounting for about 38 percent of total final energy consumption in 2021.

The industrial sector's share increased from 14 percent in 2018 to 16 percent in 2021, while the services and agriculture sectors had the same shares of 5 percent and 2 percent for 2018 and 2021, respectively (see Figure 2,(Energy Commission 2022))

Although Ghana has one of the highest proportions of population with electricity access in sub-Saharan Africa, with Greater Accra Region having the highest coverage (98.9%) and Savannah Region having the lowest (60.1%) (figure 3), there is still a significant lack of access to electricity in rural areas (figure 4) due to low population densities and distance from major medium voltage lines. This has a negative impact on national social and economic development, and efforts should be made to increase access to electricity in rural areas.

Figure 1: Total Primary Energy Supply, 2018-2021



Source: Energy Commission, 2022

Figure 2: Energy Consumed, by Sector, 2018-2021

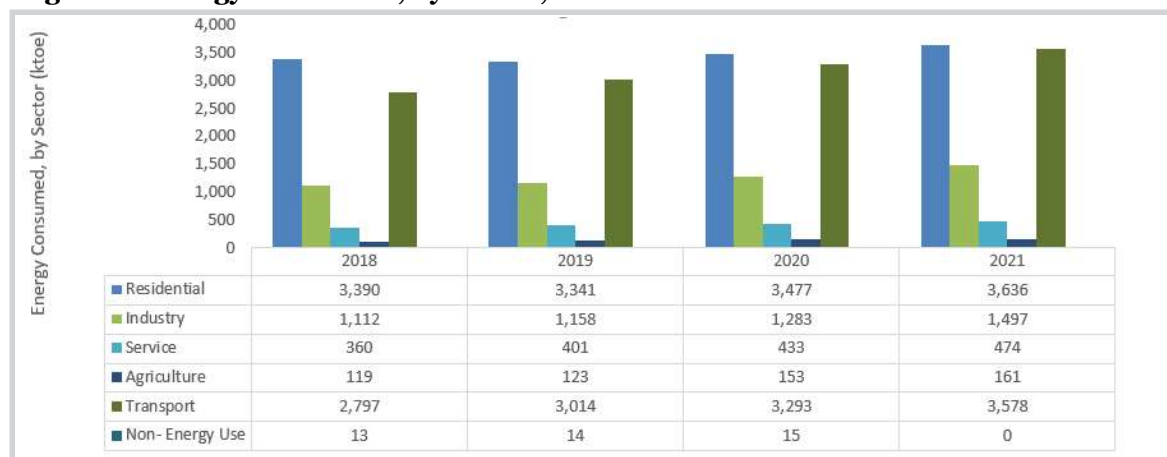
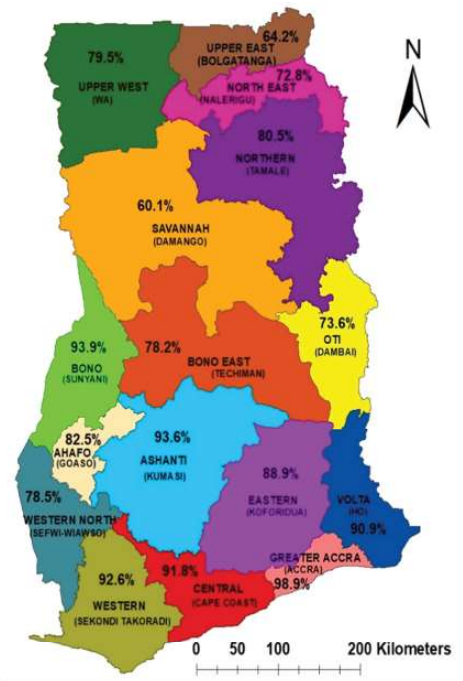
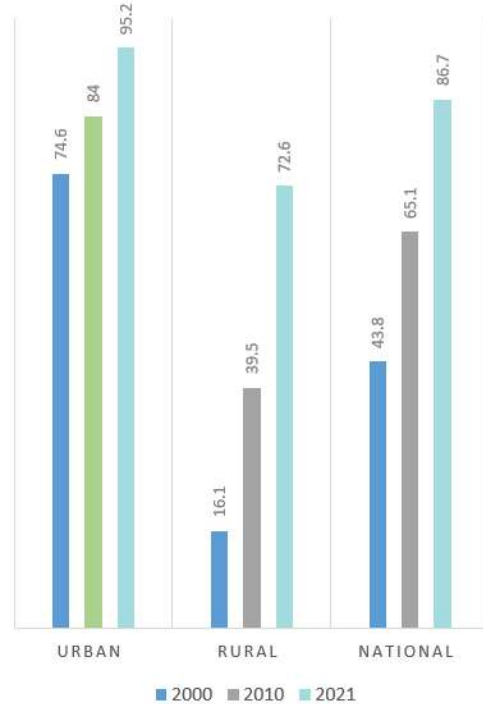


Figure 3: Regional Access to Electricity, 2021



Source: Energy Commission, 2022

Figure 4: Proportion and location of population with access to electricity, 2000, 2010 and 2021 (%)



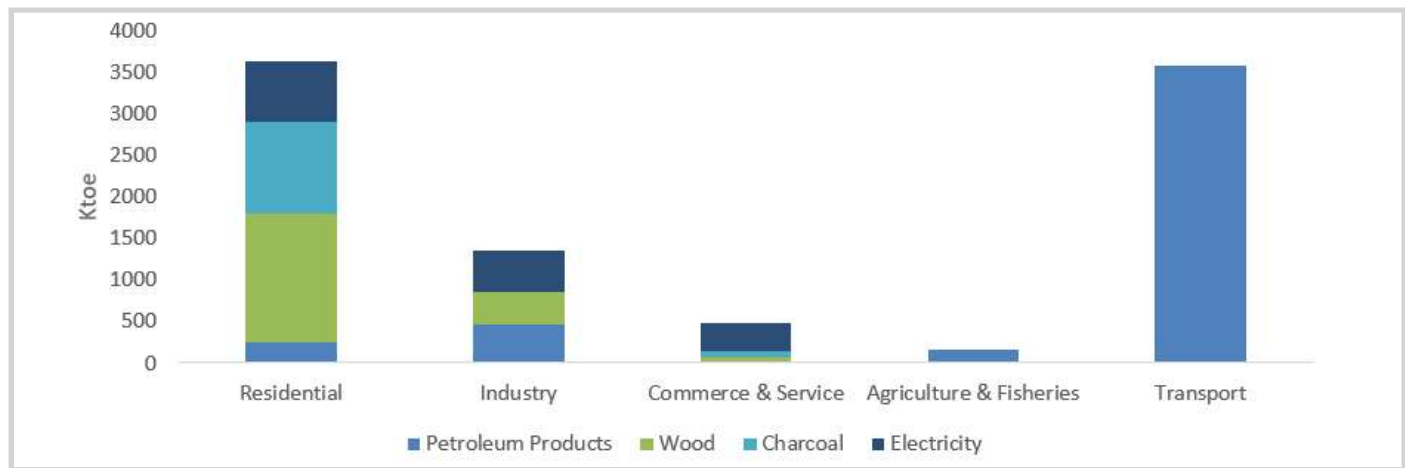
Source: NDPC, 2022

Environmental Concerns and Health Implications of Energy Consumption

The energy consumption in Ghana’s end-use sectors is dominated by biomass fuels for cooking, and petroleum products for transportation (see figure 5). The use of these fuels has led to environmental concerns such as air and water pollution and global warming. Citing the Ghana Statistical Service (GSS) et al. (2015), the Ghana Country Environmental Analysis (World Bank, 2020) indicates that due to the use of solid fuel or biomass for cooking, 9 million people in urban areas and 11.5 million people in rural areas are exposed to indoor air pollution. Accordingly, it is estimated that residential air pollution causes 8,800 early deaths per year. Over 50 percent of these deaths occur in women and children, who are the most frequently exposed to household air pollution, which can also raise the risk of pneumonia, low birth weights, and stillbirths (UN 2021). This household pollution has adverse implications for the effort to attain SDG 3 of ensuring healthy lives and promoting well-being for every person at all ages, and Indicator 3.9.1 of reducing mortality rates attributed to household and ambient air pollution.

The lack of access to clean energy sources, such as electricity and liquefied petroleum gas (LPG), has a negative impact on the provision of social services, business operations, and overall quality of life. Data from the Voluntary National Report show that the proportion of households using LPG as their primary cooking fuel increased from 6.2 percent in 2000 to 36.9 percent in 2021, with the Greater Accra Region having the highest proportion and the North East Region having the lowest proportion. Firewood/charcoal production has detrimental effects on the climate, biodiversity, and livelihoods, making it an unsustainable option. Ghana’s energy sector, as reported by the Ministry of Environment, Science, Technology and Innovation (MESTI, 2018), is the second-largest contributor to national greenhouse gas emissions, with half of these emissions resulting from fuel combustion in the road transport sector and a third from thermal electricity generation.

Figure 5: Types of Energy Consumed, by End-Use Sector (2021)



Source: Energy Commission, 2022

CONCLUSION AND RECOMMENDATIONS

In conclusion, the demand and supply patterns of energy in Ghana have significant implications for the country's economic growth and overall well-being. While hydropower, biomass, and crude oil remain the primary sources of energy, the use of modern renewable sources of energy and natural gas is gaining ground. However, the energy consumption in Ghana's end-use sectors is dominated by biomass fuels and petroleum products, leading to environmental concerns such as air and water pollution and global warming. Additionally, the lack of access to clean energy sources and electricity in rural areas has a negative impact on national social and economic development.

Policy Recommendations:

- **Promote the use of modern renewable sources of energy:** The government of Ghana should invest in the development of modern renewable energy sources such as solar, wind, and geothermal energy. This will help to diversify the country's energy mix and reduce the dependence on fossil fuels. Incentives such as tax credits and subsidies should be provided to encourage investment in renewable energy.
- **Encourage the use of clean cooking fuels:** The government of Ghana should promote the use of clean cooking fuels such as liquefied petroleum gas (LPG) to reduce the negative impact of household air pollution

through the provision of subsidies and incentives to households that switch from traditional cooking fuels to LPG.

- **Expand access to electricity in rural areas:** The government of Ghana should invest in the expansion of electricity infrastructure to improve access to electricity in rural areas. This can be achieved through the provision of subsidies and incentives to private sector investors that invest in electricity infrastructure in rural areas. Additionally, community-based renewable energy projects such as mini-grids should be encouraged to improve access to electricity in remote areas.



REFERENCES

Energy Commission. (2022). National Energy Statistics. <https://energycom.gov.gh/pages/data-downloads>

International Renewable Energy Agency (IRENA). (2022). COVID-19 and the Energy Sector: Impacts and Responses. <https://www.irena.org/publications/2022/May/COVID-19-and-the-Energy-Sector-Impacts-and-Responses>

Ministry of Environment, Science, Technology and Innovation. (2018). Ghana's Second Biennial Update Report to the United Nations Framework Convention on Climate Change. Accra: Environmental Protection Agency.

National Development Planning Commission. (2022). Ghana's Voluntary National Review Report on the Implementation of the 2030 Agenda for Sustainable Development. Available at:

https://ghana.un.org/sites/default/files/2022-08/VNR_2022_Report_c5cXm4Q.pdf. (Accessed on 17 October 2022).

United Nations. (2021). Leveraging Energy Action for Advancing the Sustainable Development Goals: Policy Briefs in Support of the High-Level Political Forum. United Nations Department of Economic and Social Affairs (UN DESA), SDG7 Technical Advisory Group (2021). New York: United Nations.

World Bank. 2020. Ghana Country Environmental Analysis. Washington, DC.: World Bank. Available at <https://openknowledge.worldbank.org/handle/10986/33726> License: CC BY 3.0 IGO.

Photo credit (page 1): Wikipedia, Akosombo Dam
Photo credit (page 4): Freepik

Researcher:

Dr. Aba Obrumah Crentsil (PhD)
ISSER, University of Ghana
aocrentsil@ug.edu.gh

*For a full version of this Policy Brief see 'Energy' chapter in Ghana Social Development Outlook 2022 published by ISSER.

Acknowledgment:

ISSER gratefully acknowledges the support provided by the Agricultural Development Bank (ADB) for the research summarised in this policy brief, and associated dissemination activities.

Published by:

Institute of Statistical, Social, and Economic Research (ISSER), University of Ghana
P. O. Box LG 74, Legon, Accra
Tel: (+233) 057 7699900; (+233) 057 7699902
Email: isser@ug.edu.gh
Website: www.isser.ug.edu.gh

   ISSERUG

Editorial review & Design:

Vicentia Quartey
(vquartey@ug.edu.gh; +233 244 766492)