

## POLICY BRIEF

### Accelerating the Transition to Cleaner Cooking Fuels in Ghana: Evidence from Demographic and Health Surveys (2008–2022)



*Cooking with polluting fuel.*

monitoring systems to align Ghana's clean cooking transition with its climate and health commitments under the Sustainable Development Goals (SDGs).

## INTRODUCTION

Global reliance on polluting cooking fuels remains a pressing public health and environmental challenge, with approximately 2.6 billion people using biomass, coal, or kerosene for daily cooking (IEA et al., 2021). Household air pollution from these fuels contributes to 3.8 million premature deaths annually, disproportionately affecting women and children in low-income countries (WHO, 2023). Ghana exemplifies this crisis: only 22% of households used clean fuels in 2022, despite constitutional mandates and policies such as the National Energy Transition Framework (2022–2050) and the Rural LPG Promotion Programme (GSS & ICF, 2024; Ministry of Energy, 2022).

Existing literature underscores the multidimensional nature of cooking fuel transitions. Studies highlight the “energy ladder” hypothesis, where households ascend from biomass to cleaner fuels as incomes rise (Waleed & Mirza, 2023), and the role of education in fostering awareness of clean energy benefits (Gould & Urpelainen, 2020). In Ghana, Mensah and Adu (2015) identified urbanisation and income as key drivers of LPG adoption, while Asante et al. (2018) documented challenges in sustaining LPG use due to affordability gaps. However, most prior analyses rely on cross-sectional data, limiting insights into long-term trends. This brief addresses this gap by analyzing DHS surveys spanning 2008–2022, offering a dynamic perspective on Ghana's clean cooking transition and its implications for policy.

## EXECUTIVE SUMMARY

Ghana's transition to cleaner cooking fuels is a critical yet unevenly realised component of its sustainable development agenda. Drawing on 14 years of nationally representative Demographic and Health Surveys (DHS), this brief highlights progress, disparities, and policy priorities. While clean cooking fuel adoption, primarily liquified petroleum gas (LPG), has doubled nationally (13.6% to 28.7%), 71% of households still rely on polluting fuels, with rural and northern regions disproportionately affected. Structural barriers such as income inequality, educational gaps, and infrastructural deficits, hinder equitable progress. This brief calls for context-specific interventions, diversified energy solutions, and strengthened

## METHODOLOGY

This study employs a quantitative, retrospective analysis of Ghanaian household cooking-fuel choices over the period 2008–2022, drawing on data from the Ghana Demographic and Health Surveys (GDHS) for 2008, 2014, and 2022.

Primary cooking fuels reported by households were categorised as either “clean” (LPG, electricity) and “dirty” (wood, charcoal, kerosene, crop residues), and linked to household location, regional jurisdiction, wealth quintile, and the demographic attributes of the household head. Trends were examined using descriptive statistics and cross-tabulations, while chi-square tests evaluated associations between fuel choice and key predictors. The results were then interpreted in the context of relevant scholarly literature, policy documents, and international reports on clean-cooking efforts in comparable settings.



Cooking with ‘clean’ fuel.



## FINDINGS AND POLICY IMPLICATIONS

### Key Findings: Trends in Cooking Fuel Transition (2008–2022)

The trajectory of household cooking fuel choices in Ghana between 2008 and 2022 reveals a nuanced picture of gradual change, marked by both progress and persistent challenges. Data from the Ghana Demographic and Health Surveys for these years reveal a slow national transition towards cleaner cooking fuels. Nationally, the use of clean fuels (mainly LPG) rose from approximately 13.6% in 2008 to 28.7% in 2022. Nonetheless, over 71% of households still relied on polluting fuels in 2022. Wood and charcoal remain prevalent, though their use has slightly declined. Of particular concern is the observed deceleration in the transition rate from dirty to clean fuels in the 2014–2022 period compared to 2008–2014, suggesting increasing challenges.

Socio-economic factors are strong determinants of household cooking fuel choices in Ghana. Household wealth is a primary driver, the wealthiest quintiles exhibit significantly higher rates of clean fuel adoption compared to the poorest, who show negligible uptake. For example, in 2022, 18.5% of the richest households used clean fuels, compared to only 0.1% of the poorest.

The educational attainment of the household head also correlates positively with clean fuel use. Additionally, male-headed households tend to report higher clean fuel use than female-headed ones, likely reflecting underlying socio-economic inequalities. These factors underscore that fuel transition is not merely a technological shift, but one that is deeply embedded in the socio-economic fabric of households.

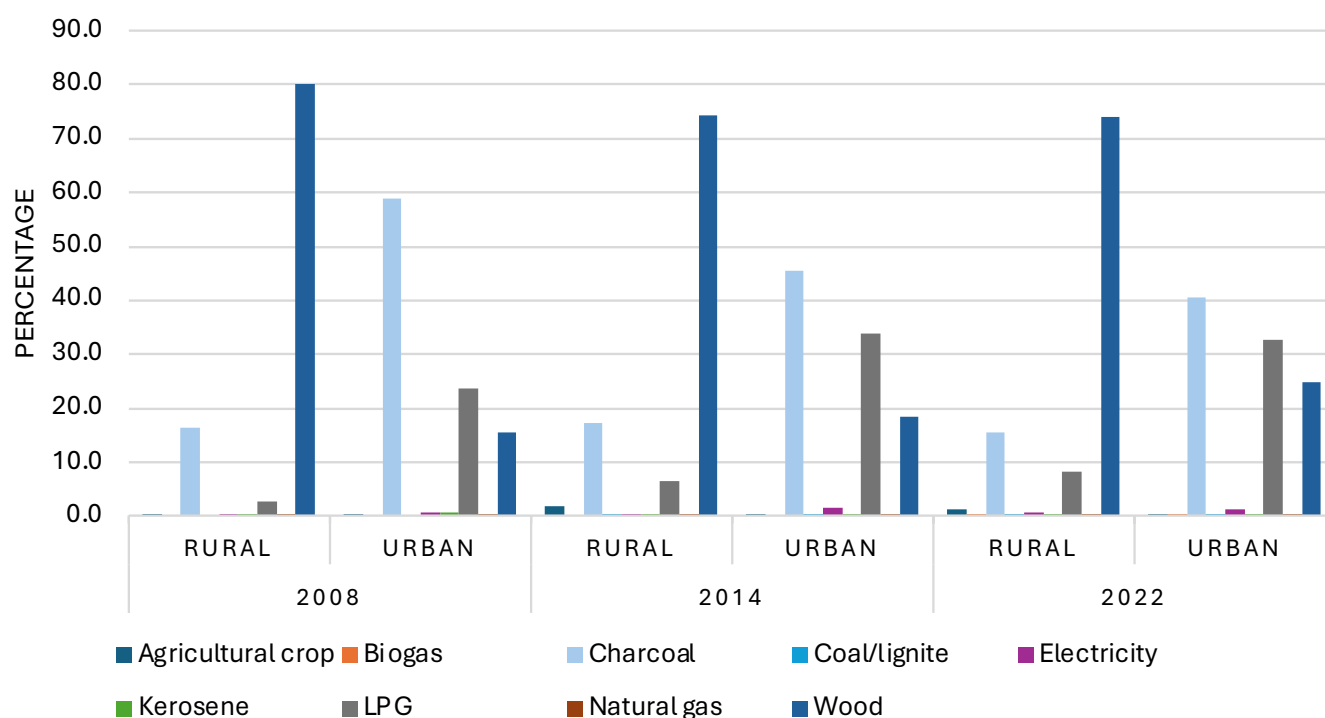
Table 1: National Trends in Primary Cooking Fuel Use in Ghana, 2008–2022

	Agricultural crop	Biogas	Charcoal	Coal/lignite	Electricity	Kerosene	LPG	Natural gas	Wood
<b>2008</b>	0.3	0.0	34.8	0.0	0.4	11.8	0.2	32.1	0
Ashanti	0.2	0.0	43.1	0.0	0.1	0.5	14.5	0.1	41.5
Brong Ahafo	0.0	0.0	32.0	0.0	0.0	0.0	3.0	0.0	65.0
Central	0.0	0.0	42.6	0.0	0.1	0.2	8.6	0.1	48.4
Eastern	0.0	0.0	39.5	0.0	0.2	0.4	5.6	0.1	54.2
Greater Accra	0.0	0.0	51.7	0.0	1.5	1.4	40.5	0.6	4.3
Northern	0.0	0.0	17.9	0.0	1.1	0.4	2.1	0.1	78.4
Upper East	3.3	0.0	16.5	0.0	0.0	0.0	4.7	0.0	75.5
Upper West	0.1	0.0	24.1	0.0	0.0	0.0	0.7	0.2	74.9
Volta	0.0	0.0	29.9	0.0	0.0	0.5	6.7	0.0	62.9
Western	0.0	0.0	29.1	0.0	0.2	0.2	11.6	0.5	58.5
<b>2014</b>	1.1	0.0	31.2	0.1	0.8	0.1	20.1	0.1	46.6
Ashanti	0	0	39.5	0	1.2	0.1	30.1	0.1	29
Brong Ahafo	0.3	0	21	0	0.7	0	11.7	0.3	66
Central	0.3	0	37.5	0	0.3	0.2	21.4	0	40.4
Eastern	0.1	0	33.6	0.1	1.3	0	14.5	0	50.4
Greater Accra	0	0	41.5	0	2.5	0.5	50.5	0.1	4.9
Northern	0	0	19.8	0.1	0.7	0	3.5	0.1	75.8
Upper East	10.5	0	24.1	0.4	0.2	0.1	9.4	0	55.3
Upper West	0.3	0	25.3	0.1	0.7	0	6.7	0	66.9
Volta	0.3	0	31.6	0	0	0.1	16.3	0	51.8
Western	0.2	0	33.1	0.1	0.3	0.2	26.1	0.2	39.9
<b>2022</b>	0.8	0.2	27.7	0.1	0.9	0	20.2	0.1	50.1
Ahafo	0.2	0	21.7	0	0.6	0	11.9	0	65.6
Ashanti	0	0	35.4	0.1	0.7	0	32.4	0.1	31.4
Bono	0	0.4	23.8	0	0.8	0	17.4	0.1	57.4
Bono East	0.2	0	28.2	0	1.5	0	9.8	0	60.4
Central	0.3	0	40.6	0.2	0.7	0	26.4	0	31.8
Eastern	0	0	35.7	0.2	1.1	0.1	27.3	0	35.6
Greater Accra	0	0	34.5	0.1	1.9	0	57.5	0.1	6
North East	0	0.1	9.8	0.1	0.8	0.1	3.5	0	85.6
Northern	0.2	0	21.2	0	2	0	10.6	0	66.1
Oti	0	0.2	26.6	0	0.6	0.1	9.4	0.1	63.1
Savannah	0	0	23.3	0	0.5	0	3.8	0	72.4
Upper East	9.9	1.8	21.4	0	0.5	0	11.2	0.3	55
Upper West	2.1	0	28.7	0.1	0.3	0	7.2	0.1	61.5
Volta	0	0.3	35.4	0	0.7	0	27.3	0	36.3
Western	0	0	30.2	0.1	0.7	0.1	35.1	0	33.8
Western North	0	0	19.5	0.1	0.6	0	15.8	0.1	63.9

Source: GDHS 2022, 2014 and 2008

**FIGURE 2: Urban vs. Rural Primary Cooking Fuel Use in Ghana, 2008-2022**

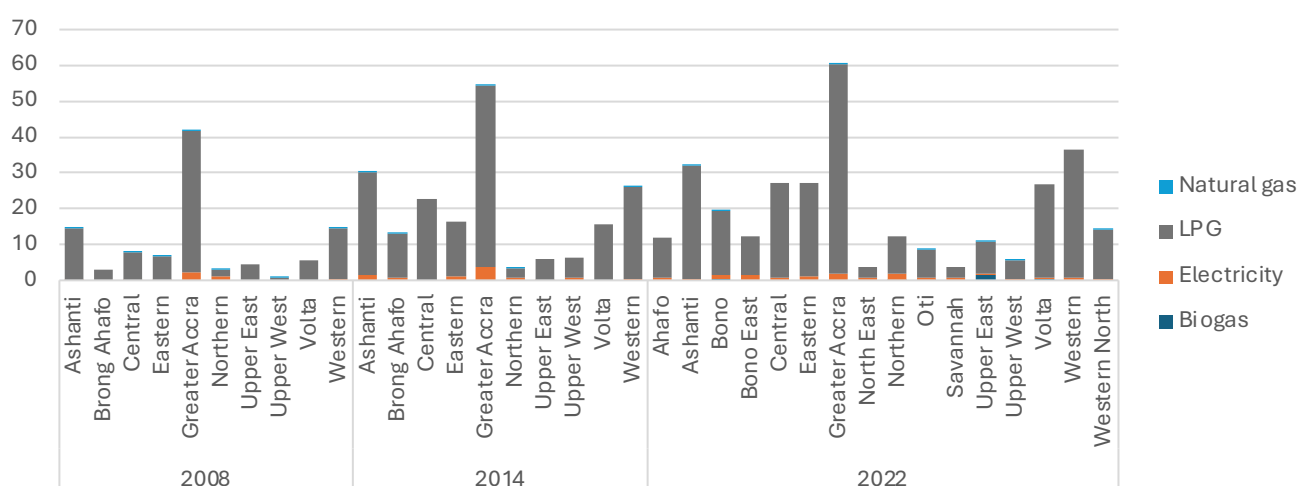
*Significant disparities persist. Urban areas have seen a more rapid adoption of clean fuels– rising from approximately 25% in 2008 to 42% in 2022 -- compared to rural areas, where adoption increased from around 3.3% to just 11.2%, thereby widening the access gap.*



**Source:** GDHS 2022, 2014 and 2008

**FIGURE 3: Regional Distribution of Clean Cooking Fuel Adoption in Ghana, 2008-2022**

*Regionally, southern, urbanised areas like Greater Accra and Ashanti lead in clean fuel use, while northern regions lag considerably, reflecting socio-economic and infrastructural disparities.*



**Source:** GDHS 2022, 2014 and 2008



## Implications for Development

### *Public Health Implications*

The persistent use of polluting fuels, particularly in rural and northern regions, poses serious public health risks. Household air pollution from biomass combustion releases harmful pollutants, including fine particulate matter (PM<sub>2.5</sub>) and carbon monoxide (CO). These are linked to a range of issues, including to respiratory diseases (such as chronic obstructive pulmonary disease, pneumonia), cardiovascular conditions, and adverse birth outcomes.

Rural households bear the brunt of these health burdens, with 88.8% still using dirty fuels in 2022, perpetuating exposure risks for women and children who spend prolonged periods near cooking areas. Child health is particularly compromised, as studies link indoor air pollution to stunted growth and neonatal mortality (Zahra et al., 2024). Globally, the World Health Organization estimates 3.8 million premature deaths annually due to household air pollution, a crisis mirrored in Ghana's rural communities (WHO, 2018).

### *Environmental Sustainability Implications*

The continued reliance on wood and charcoal, particularly in rural areas, raises significant concerns about deforestation and environmental degradation. Ghana's forest cover continues to decline, partly due to unsustainable harvesting of wood for fuel (Kemausuor and Ackom, 2017). The slow transition to clean fuels in rural areas suggests that this environmental pressure is likely to persist for the foreseeable future.

Moreover, the heavy reliance on polluting fuels contributes to greenhouse gas emissions, impacting Ghana's climate change mitigation efforts (Batchelor et al., 2019). Regional disparities in clean fuel adoption indicate that some areas contribute more to emissions than others, resulting in an uneven environmental impact that may require targeted interventions.

### *Social Development Implications*

Disparities in the adoption of clean fuels have far-reaching implications for social equity and development. The slower rate of transition in rural areas and northern regions risks exacerbating existing socio-economic inequalities (Adusah-Poku and Takeuchi, 2019).

Clean cooking technologies are often associated with time savings, particularly for women and children who typically bear the responsibility for fuel collection and cooking. As such, the

urban-rural divide in clean fuel use may be contributing to disparities in educational and economic outcomes (Crentsil et al., 2019).

Regional variations in clean fuel adoption also have implications for Ghana's efforts towards achieving the Sustainable Development Goals, particularly SDG 7 (Affordable and Clean Energy) and SDG 3 (Good Health and Well-being). Limited progress in certain regions may hinder the country's overall achievement of these targets (Acheampong et al., 2019).

Educational initiatives are key to promoting the adoption of clean cooking technologies. Research shows that households with greater environmental awareness are more likely to choose cleaner cooking fuels, thereby reducing their likelihood of energy poverty (Adjei-Mantey et al., 2024). This suggests that raising awareness about the health, economic, and environmental benefits of clean cooking technologies could significantly enhance adoption rates (Agbokey et al., 2019). Ghana's transition to cleaner household cooking fuels continues to face significant challenges despite modest progress. The persistent urban-rural divide and regional disparities in clean fuel access risk deepening existing socio-economic inequalities. This has serious implications for public health, environmental sustainability, and social development outcomes. By implementing targeted, evidence-informed policies that address accessibility, affordability, and awareness, Ghana can accelerate its journey toward universal access to clean, safe cooking energy.

## CONCLUSION AND RECOMMENDATIONS

Based on the findings of this study, the following three key recommendations are proposed to accelerate the transition to clean cooking fuels in Ghana:

### *Targeted rural interventions and regional equity:*

The Ministry of Energy, in collaboration with local government authorities, should implement targeted programmes aimed at improving access to clean fuels in rural and northern regions. Measures could include mobile LPG distribution services, rural-specific subsidies, and prioritised infrastructure development in underserved areas.

*Diversification of clean cooking solutions:* The Ministry of Energy and Energy Commission should expand the promotion of clean cooking technologies beyond LPG. This includes support for improved

biomass stoves as interim solutions in areas where transitioning to cleaner fuels may be slower. In addition, challenges related to electric cooking adoption should be systematically addressed.

*Awareness, education, and research:* The Ministry of Information, in partnership with non-governmental organisations, should lead nationwide awareness campaigns about the benefits of clean cooking. Also, the Ministry of Environment, Science, Technology and Innovation should prioritise funding for research into locally appropriate technologies and adoption strategies, with emphasis on fostering environmental consciousness and behaviour change at the household level.

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