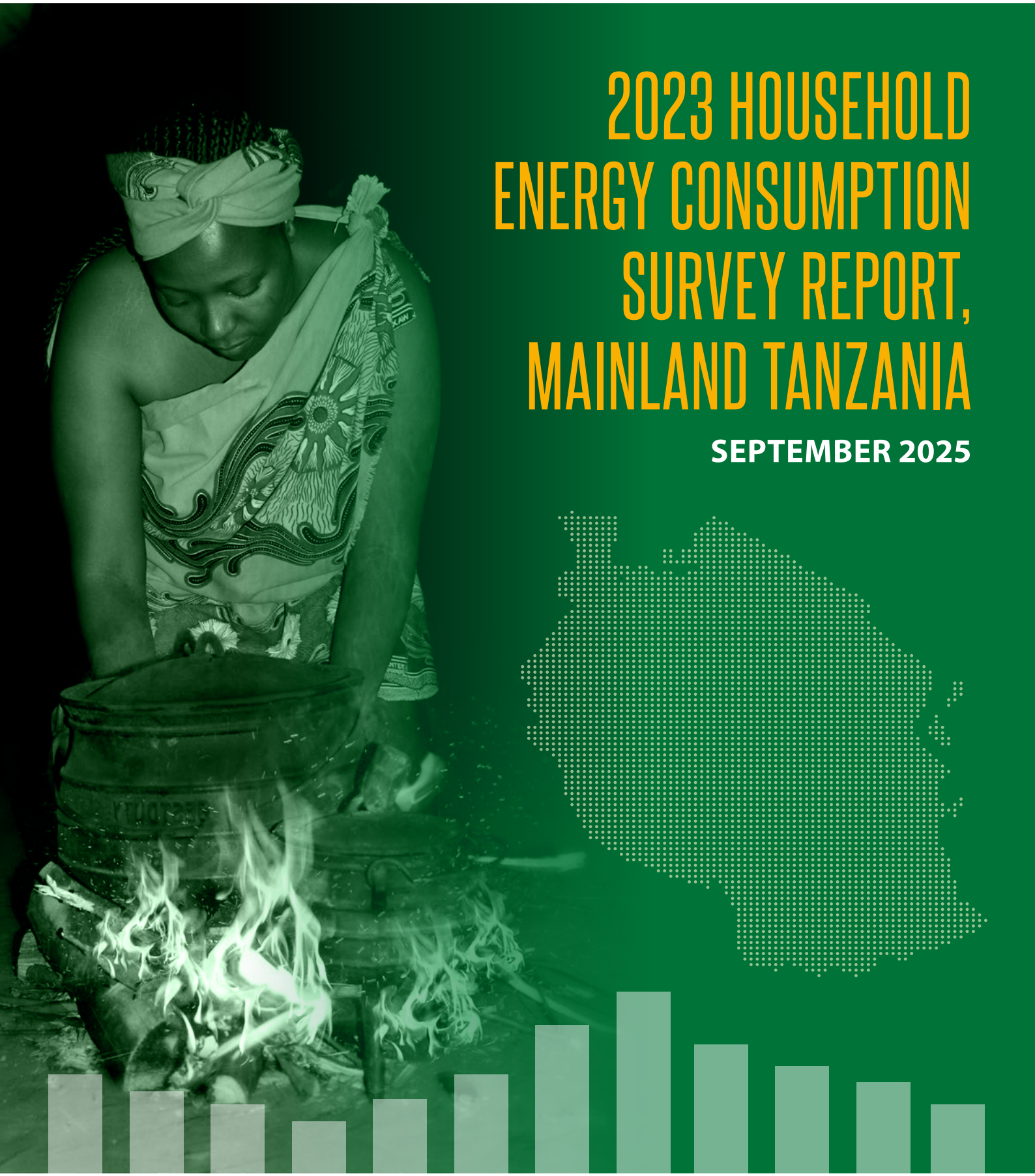
The United Republic of Tanzania



2023 HOUSEHOLD ENERGY CONSUMPTION SURVEY REPORT, MAINLAND TANZANIA

SEPTEMBER 2025

Funded by the European Union

EXPERTISE FRANCE
GROUPE AFD

Cover photo © Picture Perfect Photographs/Unsplash

2023 HOUSEHOLD ENERGY CONSUMPTION SURVEY REPORT, MAINLAND TANZANIA

SEPTEMBER 2025

TABLE OF CONTENT

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AfDB	Compressed Natural Gas
CAPI	Computer-Assisted Personal Interviews
D1	Lifeline Electricity Tariff
EU	European Union
EF	Expertise France
EA	Enumeration Areas
EWURA	Energy and Water Utilities Regulatory Authority
GWh	Gigawatt-hour
HECS	Household Energy Consumption Survey
kWh	Kilowatt-hour
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
MW	Megawatt
OSC	Out of School Care
PPS	Probability Proportional to Size
PBPA	Petroleum Bulk Procurement Agency
PURA	Petroleum Upstream Regulatory Authority
REA	Rural Energy Agency
T1	General Domestic Electricity Tariff
TPDC	Tanzania Petroleum Development Corporation
TAREA	Tanzania Renewable Energy Association

CONTENT

EXECUTIVE SUMMARY

The 2023 Household Energy Consumption Survey (HECS) was the first of its kind conducted in Mainland Tanzania. The National Bureau of Statistics (NBS) and the Ministry of Energy, with support from Expertise France and financial assistance from the European Union. Survey findings provide a comprehensive overview of household energy consumption. It was designed to inform policy aligned with Tanzania's Development Vision 2025 and the Sustainable Development Goal 7, which focuses on ensuring access to affordable, reliable, sustainable, and modern energy for all.

The main objectives of the survey were to assess the types and quantities of energy used by households for cooking, lighting, heating, and other household activities; evaluate access to and adoption of modern energy sources such as electricity, liquefied petroleum gas (LPG), and solar energy; identify affordability issues, regional disparities, and barriers to clean energy adoption; and offer data driven recommendations to support sustainable energy policy and planning.

Findings reveal that electricity access has expanded significantly, with 71.2 percent of households using electricity. Urban areas have much higher access (84.0 percent) compared to rural areas (61.0 percent). TANESCO remains the dominant electricity provider in urban areas, while rural households rely heavily on off-grid solar systems, with 59.7 percent citing solar as their main source. Most households (56.8 percent) benefit from the subsidized D1 tariff designed for low-income consumers, and 72.5 percent spend less than TZS 10,000 per month on electricity.

In terms of cooking energy, the survey shows continued reliance on biomass fuels. Fuelwood is used by 65.5 percent of households and charcoal by 44.0 percent. Cleaner fuels such as LPG (24.6 percent) and electricity (1.9 percent) are primarily used in urban areas. However, indoor cooking is often done without proper ventilation by 41.9 percent of households, raising concerns about indoor air pollution, especially when biomass is used.

Demographic data from the survey shows that 72.0 percent of households are male-headed, and educational attainment is generally low, with 68.8 percent of household members aged five and above having completed only primary school. The survey also highlights regional differences in marital status, education levels, and gender dynamics in household leadership.

Electricity consumption is modest for most households. Over 69.9 percent use between 21 and 40 kilowatt-hours (kWh) per month. Urban households tend to consume more electricity and own more electrical appliances, leading to higher monthly expenditure.

Finally, when it comes to cooking infrastructure, traditional methods still dominate. Among households using fuelwood, 94.4 percent rely on the traditional three-stone stove. The adoption of improved cookstoves remains very low, and the use of modern alternatives such as biogas (0.1 percent) and bioethanol (0.01 percent) are nearly negligible, despite their environmental and health benefits.

DEFINITION OF KEY TERMS

HOUSEHOLD

A single person/several persons living together, sharing the same plot and recognition of one of them as the head of household.

REFERENCE PERIOD

The reference period covered by the survey was 2023.

RESPONDENT

Any responsible adult household orfamily member who provided reliable answers to the survey questions.

ENERGY

Energy is technically defined as the "capacity to do work". In the household context, it refers to the fuel or power used to operate electrical and non-electrical appliances, vehicles, equipment, and other devices whether for daily needs, convenience, or home-based economic activities. Energy can be generated from and provided by a variety of forms: electricity, petroleum products, natural gas, and renewable energy sources. Electricity covers not only units distributed by utilities but also those produced by generators and batteries. Petroleum products include kerosene, LPG (or cooking gas), regular gasoline, premium gasoline, and diesel. Renewable energy sources include fuelwood, charcoal, biomass residues (such as forest products residues, wood waste, agriculture and animal waste), solar PV, hydro and others.

ELECTRICITY

This includes electricity from large and small power generation plants distributed to households by utilities like TANESCO or private providers, as well as electricity from generators and rechargeable batteries. Batteries are considered as an electricity source if they generate electricity for the household and not for transport purposes.

LIQUEFIED PETROLEUM GAS (LPG)

LPG is a flammable hydrocarbon gas composed primarily of propane (C_3H_8) and butane (C_4H_{10}). It is obtained as a byproduct during the refining of crude oil or the extraction of natural gas.

KEROSENE

Kerosene is a colorless liquid generally used for lighting, cooking and starting a fire.

DIESEL/PETROL

Diesel and petrol are fuels normally used in transport but can also be used in households to run generators.

BIOETHANOL

Ethanol is a renewable, water-free alcohol produced from fermentation of sugar or converted starch.

NATURAL GAS

A mixture of gaseous hydrocarbons, primarily methane (CH_4, 70 to 90 percent), it generally also includes ethane, propane and higher hydrocarbons in much smaller amounts and some non-combustible gases such as nitrogen and carbon dioxide. The separation process produces natural gas by removing or reducing the hydrocarbons other than methane to levels that are acceptable in the marketable gas. The natural gas liquids (NGL) removed in the process are distributed separately. Tanzania extracts natural gas from the Songo Songo and Mnazi fields. Currently, a few hundred households are connected to the natural gas grid in Dar es Salaam, Lindi and Mtwara.

CONTENT

COMPRESSED NATURAL GAS (CNG)

CNG sis natural gas that is compressed to less than 1% of its volume at standard atmospheric pressure. This makes it easier to store and transport in cylinders at high pressure, typically around 200–250 bar (2,900–3,600 psi). It is typically used to power vehicles or in some industrial processes. CNG is currently used in Tanzania.

LIQUEFIED NATURAL GAS (LNG)

LNG is natural gas (primarily methane, CH_4) that has been cooled to an extremely low temperature of approximately -162°C (-260°F) to convert it into a liquid state. This process reduces its volume by about 600 times, making it easier to store and transport over long distances where pipelines are not feasible. It is currently not in use in Tanzania.

RENEWABLE ENERGY SOURCES

Renewable energy sources are energy sources that are naturally replenished on a human timescale and include fuelwood, charcoal, biomass residues, biogas, hydro, geothermal, wind and solar.

BIOMASS

Organic material derived from plants, animals, or microorganisms that can be used as a source of energy. It is a renewable energy source because it is replenished through natural processes like photosynthesis and biological cycles.

GEOTHERMAL

Heat that originates from within the Earth. This heat is generated by the natural radioactive decay of minerals, the residual heat from Earth's formation, and tectonic activity. Geothermal energy can be harnessed for various applications, including power generation and heating. It is currently not in use in Tanzania, although there are projects to develop several sites.

FUELWOOD

Fuelwood is wood that is harvested and used as a fuel source for cooking, heating, or energy transformation into charcoal. It is one of the oldest and most widely used forms of biomass energy, particularly in rural and low-income areas where modern fuels are less accessible.

CHARCOAL

A solid, carbon-rich material derived from the thermal decomposition of organic matter, primarily fuelwood, in the absence of oxygen. This process, known as pyrolysis, removes moisture and volatile compounds, leaving behind almost pure carbon with a porous structure.

BIOGAS

The gaseous fuel formed when methane (CH_4) producing bacteria acts on organic matter in the absence of oxygen. It can be generated from animal manure, human feces, dead plants or animals and other materials into which plants and animals have been transformed.

SOLAR

Energy harnessed from the sun's radiation using various technologies. It is a renewable and sustainable source of energy. Solar energy can be converted into electricity, heat, or used directly for lighting and other applications. The two main technologies in use in Tanzania are solar photovoltaic (PV) panels and solar water heaters (SWH).

ACKNOWLEDGMENTS

© Freepik

The successful completion of the 2023 Household Energy Consumption Survey would not have been possible without the invaluable contributions and support of numerous individuals and institutions.

We extend our deepest gratitude to the households across the Mainland Tanzania who generously participated in the survey by providing essential information. Their cooperation and openness formed the backbone of this important survey.

We are also grateful to the dedicated team of field enumerators, supervisors, and data collectors whose commitment and professionalism ensured the quality and reliability of the data collected. Special thanks go to the regional and district administrative offices for their logistical support and coordination during fieldwork.

Our sincere appreciation goes to the technical team responsible for designing the survey tools, conducting data analysis, and preparing this report. Your expertise and tireless efforts made this publication possible.

We also acknowledge the support of our development partners and stakeholders whose financial and technical assistance was crucial throughout the planning, implementation, and reporting phases of the survey.

Finally, we recognize the leadership and guidance provided by the management of the National Bureau of Statistics (NBS), whose vision and oversight ensured the smooth execution of the survey.

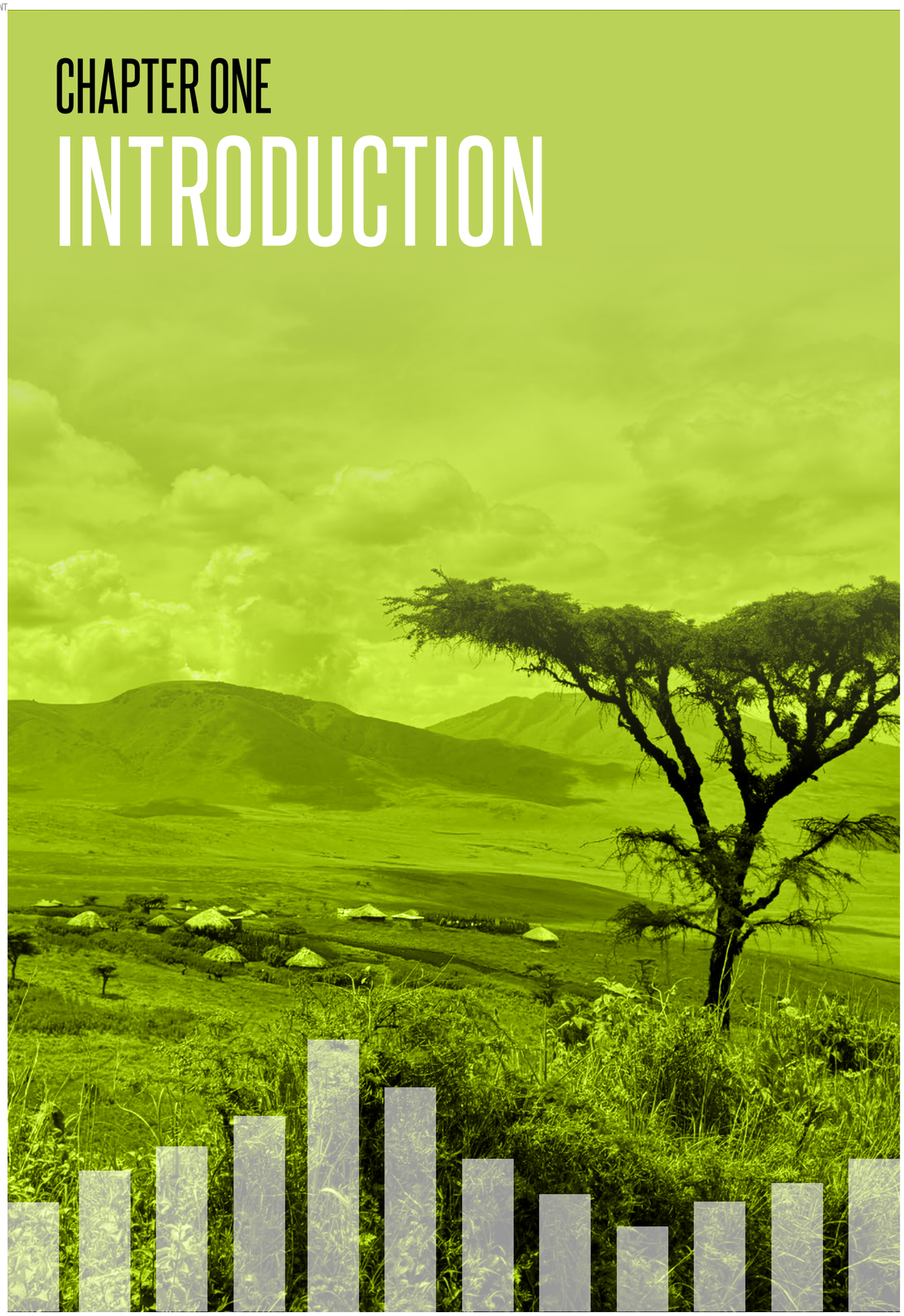
We say thank you to all who contributed to this important national effort.

Dr. Amina S. Msengwa
Statistician General
National Bureau of Statistics

September 2025

CONTENT

CHAPTER ONE
INTRODUCTION



© Irina Zhikh/Unsplash

1.1 BACKGROUND

The 2023 Household Energy Consumption Survey (HECS) was the first of its kind to be conducted in Mainland Tanzania. It was jointly undertaken by the National Bureau of Statistics (NBS) and the Ministry of Energy, with technical assistance from Expertise France (EF) and financial support from the European Union (EU). The survey plays a crucial role in tracking the transition to modern energy sources such as electricity (including off-grid solutions like solar PV) and LPG, aligning with Tanzania's Development Vision 2025 and SDG 7 (Affordable and Clean Energy). It also assesses barriers to adopting clean and renewable technologies, energy affordability, and disparities in access between rural and urban households.

1.2 OBJECTIVES OF THE SURVEY

The primary goal of this survey was to collect comprehensive data on energy consumption patterns and quantities of fuels used across households in Mainland Tanzania, which is essential for the country's energy planning and sustainability efforts. The data gathered will offer critical insights to guide policymaking, enhance energy efficiency, and promote sustainable energy practices. Since many households, particularly in rural areas, rely heavily on biomass fuels such as fuelwood and charcoal, the survey focuses on energy use for cooking, lighting, and heating.

The specific objective of the survey was the following:

i. To understand the types and amounts of energy used for cooking, lighting, space heating, water heating and other household activities;

ii. To measure the availability and adoption of modern energy solutions, such as electricity, liquefied petroleum gas (LPG), and solar power in both rural and urban areas;

iii. To provide data-driven insights to guide energy policies aimed at expanding energy access, improving energy efficiency, and promoting the use of clean energy;

iv. To track Tanzania's progress toward ensuring access to affordable, reliable, and sustainable energy for all by 2030;

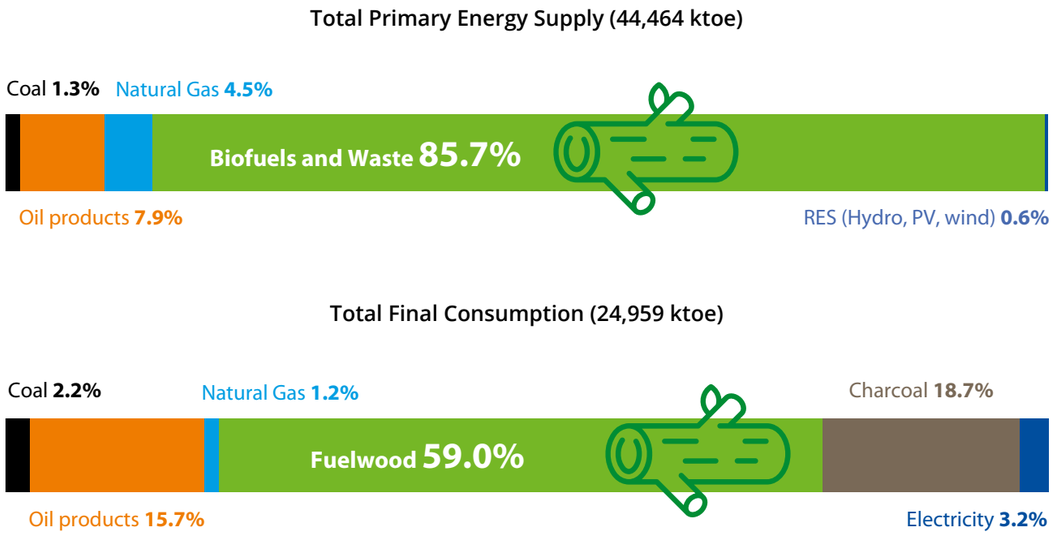
v. To assess household reliance on solid biomass fuels (i.e., fuelwood, charcoal) and identify opportunities for shifting to cleaner energy sources to reduce deforestation and indoor air pollution; and

vi. To identify needs and opportunities for expanding off-grid solutions, including solar PV systems, and understand the current levels of awareness and use of renewable technologies.

1.3 PRIMARY ENERGY SUPPLY IN TANZANIA

Total Primary Energy Supply (TPES) refers to the total amount of energy available to a country from various sources, including fossil fuels, nuclear, and renewable energy. In 2022, the total primary energy supply in Tanzania according to the 2022 Energy Balance Report amounted to 36,119 kilotons of oil equivalent (ktoe). Biofuels, encompassing primarily wood and charcoal, played a significant role in Tanzania's energy mix accounting for 82% of the total energy mix followed by oil 10.7 %, 5.1% natural gas, 1.5% coal, and 0.6% hydro. These figures reflect the country's reliance on traditional biomass and emphasize the need to diversify the energy mix by promoting renewable energy sources (Figure 1).

FIGURE 1: TOTAL PRIMARY ENERGY SUPPLY AND TOTAL FINAL CONSUMPTION BY FUEL IN TANZANIA, 2023

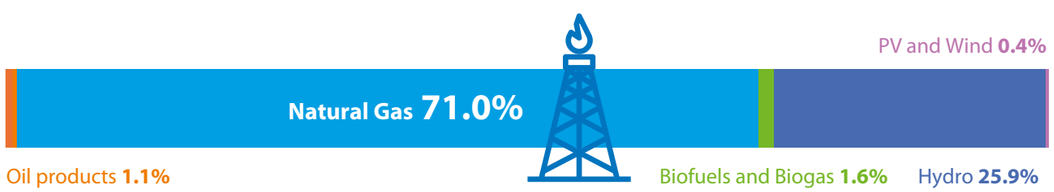


Source: Tanzania Energy Balance 2023

1.4 ELECTRICITY GENERATION

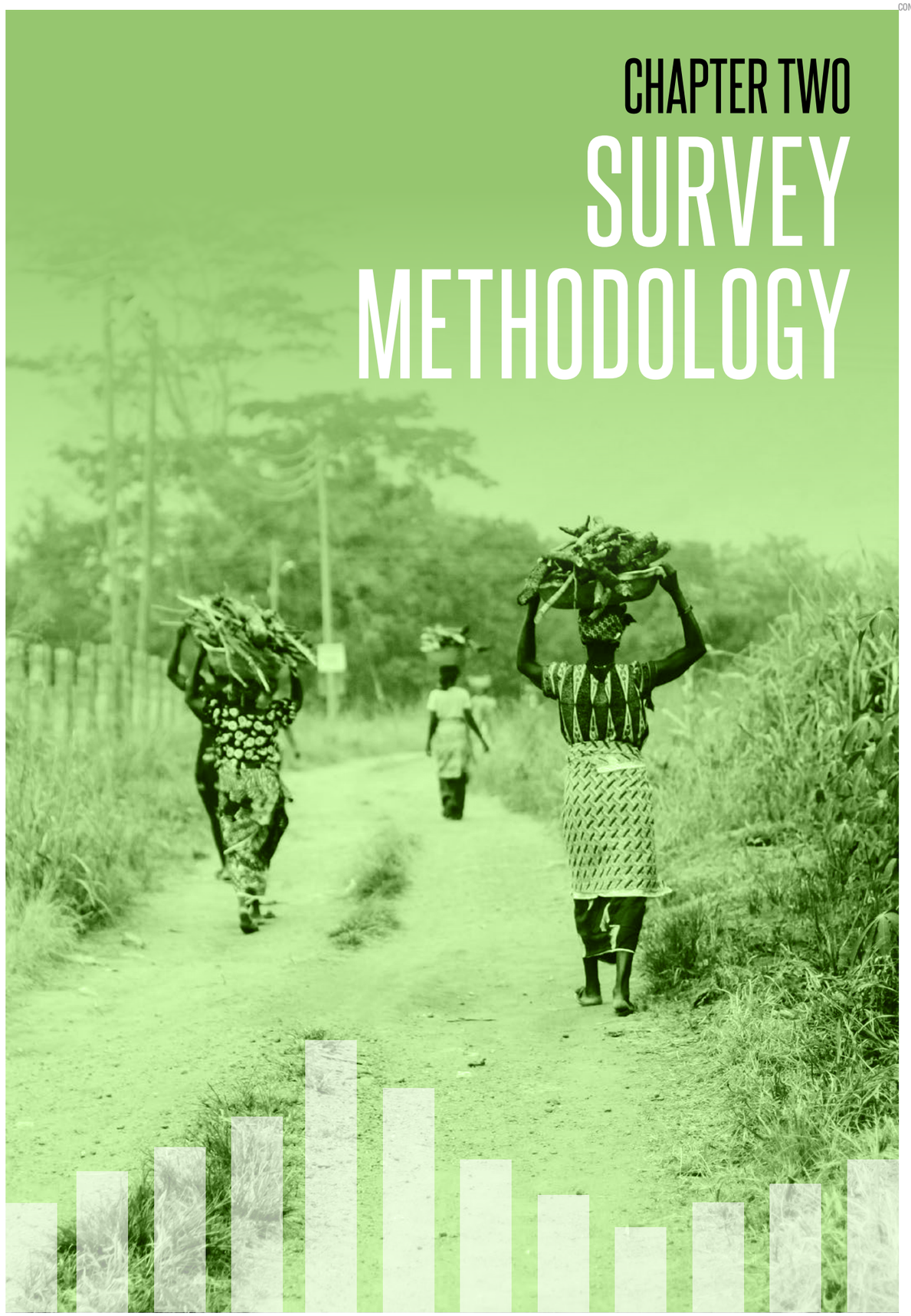
Electricity generation in Tanzania is derived from a mix of sources, reflecting the country's ongoing efforts to diversify its energy portfolio. The key components of Tanzania's electricity generation included natural gas, hydro power and other renewables such as solar PV, wind, and biomass. In 2022, the country's electricity was mostly generated from natural gas (77%), hydro (11%), oil (9.7%), coal (0.8%), and biofuels and waste (1.3%). Solar PV is negligible, followed by some wind (Figure 2).

FIGURE 2: GRID SUPPLIED ELECTRICITY GENERATION BY SOURCE IN TANZANIA, 2023



Source: Tanzania Energy Balance 2023

CHAPTER TWO
SURVEY METHODOLOGY



© Freepik

2.1 INTRODUCTION

The 2023 HECS employed a structured and statistically sound methodology to ensure the reliability and representativeness of the data collected across Mainland Tanzania.

2.2 SURVEY SCOPE AND COVERAGE

The survey covered scientifically selected households across all regions in Mainland Tanzania, including both rural and urban areas, to capture diverse energy consumption patterns. The survey examines all energy sources used by households, including solid biofuels (fuelwood, charcoal), electricity (grid connected and off-grid including solar PV and mini-hydro), liquefied petroleum gas (LPG), kerosene, biogas, and other sources that see minimal use.

2.3 SAMPLE DESIGN

The HECS used a cross-sectional design, collecting data from a nationally representative sample of households at a single point in time. The survey was designed to capture variations in household energy consumption across different geographic areas (urban vs. rural), socio-economic groups, and regions.

The domains cover 26 regions, which are Dodoma, Arusha, Kilimanjaro, Tanga, Morogoro, Pwani, Dar es Salaam, Lindi, Mtwara, Ruvuma, Iringa, Mbeya, Singida, Tabora, Rukwa, Kigoma, Shinyanga, Kagera, Mwanza, Mara, Manyara, Njombe, Katavi, Simiyu, Geita, and Songwe.

2.4 SAMPLING FRAMEWORK

A stratified two-stage sampling technique was applied. In the first stage, 845 Enumeration Areas (EAs) were systematically selected with probability proportional to size (PPS) from the national sampling frame based on the 2022 Population and Housing Census, ensuring both rural and urban areas were represented. In the second stage, a fixed number of 15 households were systematically selected within each EA to participate in the survey.

2.5 SAMPLE SIZE

The total sample size was calculated considering precision requirements of the estimates within each domain. The reference variables used to calculate the sample size were households connected to electricity as collected in the 2019/20 Energy Access and Use Situation Survey II. The total number of EAs selected were 845, resulting in 12,675 households. The sample size was determined to provide reliable estimates at the national and urban/rural levels, and to allow disaggregation by key demographic and socio-economic variables.

2.6 DATA COLLECTION TOOLS

In this survey, household questionnaires and other tools such as enumerator manual were used to collect information from private households. Scales were used to collect information on the weight of solid biomass consumed for energy purposes.

2.7 HOUSEHOLD QUESTIONNAIRE

A structured questionnaire was used to collect household-level information, covering the following areas:

1. Household demographic characteristics
2. Businesses operation
3. Electricity
4. Cooking
5. Water heating
6. Space heating
7. Lighting
8. Quantities used and related expenditures
9. Privately owned vehicles
10. Business related consumption

The questionnaire was pre-tested and translated into Kiswahili to ensure clarity and consistency.

2.8 ENUMERATOR'S MANUAL

The enumerator's manual guided data collectors, explaining key survey concepts, practical fieldwork approaches, and tips for gathering accurate, complete, and consistent data from respondents.

2.9 TABLET

A tablet was used by enumerators for listing and collecting data from the selected households.

2.10 EA MAPS

Digitized enumeration maps were used during surveys to clearly define the areas to be covered, ensuring enumerators stay within the assigned area and prevent duplicate data collection by marking already surveyed areas.

2.11 RECRUITMENT

Recruiting qualified field personnel was essential for ensuring quality data. A total of 120 experienced enumerators were engaged for the survey.

2.12 TRAINING

The 2023 HECS training took place over 3 days in the Morogoro where 120 enumerators and 26 supervisors were trained. The training ensured a shared understanding of survey questions, EA identification, tablet use, and data collection techniques. It included class presentations, mock interviews, and field practice. Supervisors also received training in household selection and field coordination. The trainers were experts from NBS headquarters, the Ministry of Energy, TANESCO, REA, TPDC, EWURA, TAREA, PBPA and PURA.

2.13 ORGANIZATION OF FIELD WORK

There was a total of 26 fields teams for data collection (one team per region). Each team consisted of 4 to 6 enumerators, a driver, and a supervisor – who was the Regional Statistical Manager.

2.14 DATA COLLECTION

Data was collected through face-to-face interviews conducted from July 29th to September 9th 2024 by trained enumerators using Computer-Assisted Personal Interviewing (CAPI) devices to enhance data accuracy and reduce processing time. Enumerators received comprehensive training on the questionnaire content, interviewing techniques, and ethical considerations.

To collect reliable data on fuelwood and charcoal use for cooking, water heating and space heating, the enumerators had been equipped with scales to weigh the amount of wood and charcoal used for one respective activity – cooking one meal a day.

2.15 QUALITY ASSURANCE

To ensure data quality, several measures were implemented:

i. Field supervision and spot checks;

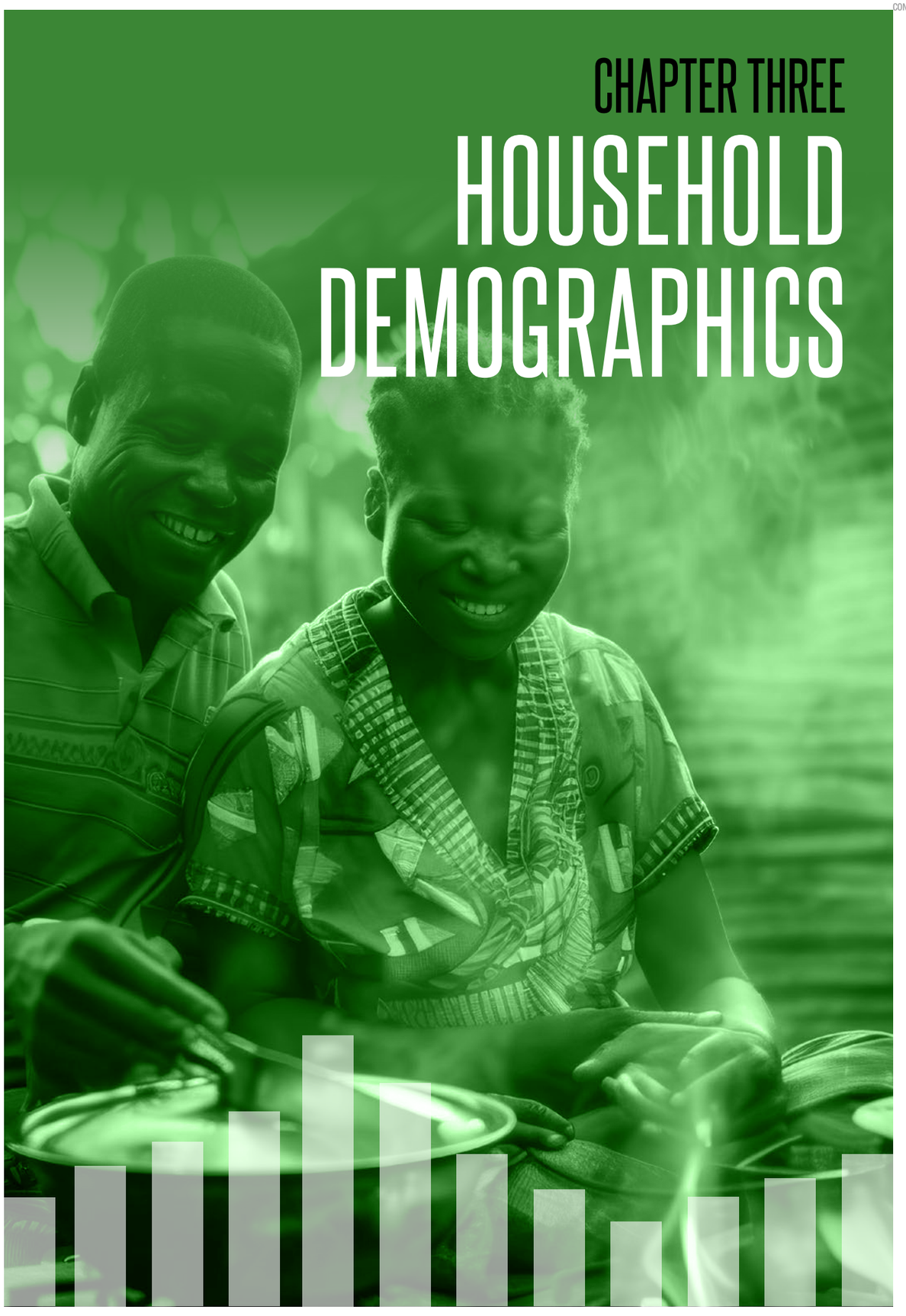
ii. Real-time data validation through CAPI; and

iii. Daily review and feedback mechanisms.

2.16 DATA PROCESSING AND ANALYSIS

The data was weighted to account for the survey design and non-response, enabling national-level aggregations. Analysis was conducted using statistical software (Stata), with results disaggregated by gender, location, and other relevant factors.

CHAPTER THREE
HOUSEHOLD DEMOGRAPHICS



3.1 INTRODUCTION

The 2023 HECS provides valuable insights into the demographic characteristics of households in Mainland Tanzania, which are crucial for understanding patterns of energy consumption and access. This chapter covers the composition and status of private households, focusing on demographics. It includes details on family structure, age, sex, marital status and education levels.

3.2 COMPOSITION OF HOUSEHOLDS

Household composition describes the members of a household based on characteristics like age, sex, relationship to the head of household, and the number of marital pairs or nuclear families within it. Age and sex are key demographic variables and form the basis for classifications in censuses and surveys.

Overall, the population is almost evenly split, with 48% male and 52% female, however, there are variations in the gender ratio across different age groups. In younger age groups (0–19 years), the gender ratio is relatively balanced, with slight male dominance in some groups (e.g., 5–9 years: 51% male). From ages 20–39, there is a noticeable shift, with females forming a larger proportion (e.g., 20–24 years: 43% male, 57% female). This could be due to factors such as migration or differing survival rates. In older age groups (60+), the male percentage increases in some age ranges (e.g., 60–64: 51% male), but at the oldest ages (80+), females dominate significantly (e.g., 80–84: 38% male, 62% female). This reflects higher female life expectancy. The population steadily decreases with age, reflecting mortality trends (Table 3.1).

TABLE 3.1: PERCENTAGE DISTRIBUTION OF HOUSEHOLD MEMBERS BY SEX AND AGE GROUP – 2023 HECS, MAINLAND TANZANIA

Age Group	Sex	
	Male	Female
0 - 4	49	51
5 - 9	51	49
10 - 14	50	50
15 - 19	48	52
20 - 24	43	57
25 - 29	44	56
30 - 34	48	52
35 - 39	47	53
40 - 44	49	51
45 - 49	50	50
50 - 54	49	51
55 - 59	49	51
60 - 64	51	49
65 - 69	55	45
70 - 74	48	52
75 - 79	47	53
80 - 84	38	62
85+	45	55
Mainland Tanzania	**48**	**52**

3.3 GENDER OF HOUSEHOLD HEAD

The results from the 2023 HECS indicate that 72% of households in Mainland Tanzania were male-headed, while only 28% were female-headed. This result highlights a significant gender disparity in household leadership, with nearly three-quarters of households being headed by men. It reflects broader socio-economic patterns where men are more likely to be considered the heads of households, potentially due to traditional norms, inheritance structures, or income-generating roles (Figure 3.1).

FIGURE 3.1: DISTRIBUTION OF HOUSEHOLDS BY SEX OF HOUSEHOLD HEAD – 2023 HECS, MAINLAND TANZANIA

Table 3.2 provides a detailed breakdown of the number of households by the sex of the household head across different regions in Mainland Tanzania.

The proportion of male household heads is significantly higher across all regions, with Katavi (81%) and Geita (78.9%) recording the highest percentages. The regions with relatively lower proportions of male household heads include Lindi (60.2%) and Mtwara (61.6%). suggesting a relatively more balanced gender distribution compared to other regions.

TABLE 3.2: DISTRIBUTION OF HOUSEHOLD BY SEX OF HOUSEHOLD HEAD AND REGION – 2023 HECS, MAINLAND TANZANIA

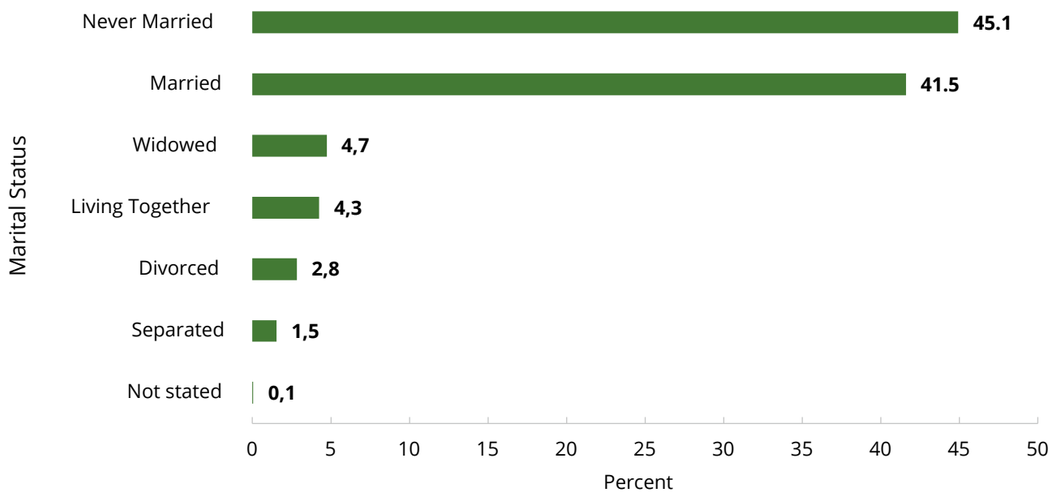
Region	Sex	
	Male	Female
Dodoma	65.0	35.0
Arusha	76.9	23.1
Kilimanjaro	68.2	31.8
Tanga	74.8	25.2
Morogoro	69.7	30.3
Pwani	70.3	29.7
Dar Es Salaam	71.6	28.4
Lindi	60.2	39.8
Mtwara	61.6	38.4
Ruvuma	76.0	24.0
Iringa	63.9	36.1
Mbeya	75.6	24.4
Singida	75.7	24.3
Tabora	75.8	24.2
Rukwa	76.1	23.9
Kigoma	74.6	25.4
Shinyanga	73.1	26.9
Kagera	71.6	28.4
Mwanza	71.4	28.6
Mara	67.8	32.2
Manyara	75.7	24.3
Njombe	67.3	32.7
Katavi	81.0	19.0
Simiyu	75.4	24.6
Geita	78.9	21.1
Songwe	78.1	21.9
Mainland Tanzania	**72.0**	**28.0**

3.4 MARITAL STATUS

Marital status and energy consumption can be influenced by several socio-economic and behavioral factors. Generally, married individuals or households may experience differences in energy use compared to single individuals, due to factors like household size, shared living arrangements, and collective decision-making regarding energy usage.

This section analyses marital status of the household members aged 12 years and above. Figure 3.2 indicates that 45.1% of household members aged 12 years and above in Mainland Tanzania were never married, while 41.5% were married. A small proportion of 4.7% were widowed, 4.3% were living together without a formal marriage, 2.8% were divorced, and 1.5% were separated.

FIGURE 3.2: PERCENTAGE DISTRIBUTION OF HOUSEHOLD BY MARITAL STATUS – 2023 HECS, MAINLAND TANZANIA



Dodoma, Dar Es salaam, Mwanza and Mara regions recorded highest among those never married at about 48% while Mtwara recorded the lowest at 38.0% of those never married. This could indicate socio-economic factors such as economic instability, delayed marriage, or cultural influences that affect the timing of marriage. This trend could also be reflective of urbanization, where people delay marriage due to career or educational pursuits.

Songwe and Shinyanga regions stand out with the highest percentages of married individuals (52.6% and 50.7%, respectively). This could be due to regional cultural norms that prioritize marriage, or it could reflect a more traditional family structure that is common in rural or semi-urban areas.

In regions such as Kilimanjaro (9.2%), Iringa (7.0%) and Mara (6.8%), the percentage of widowed individuals is notably higher. This could be due to factors such as higher mortality rates in certain areas, reflecting a younger demographic.

TABLE 3.3: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY MARITAL STATUS AND REGION – 2023 HECS, MAINLAND TANZANIA

Region	Marital Status						
	Never Married	Married	Living Together	Divorced	Separated	Widowed	Not stated
Dodoma	48.8	40.3	2.2	2.5	1.3	4.8	-
Arusha	43.8	47.9	0.5	1.8	0.8	5.2	-
Kilimanjaro	40.3	44.2	1.2	2.6	2.5	9.2	-
Tanga	46.2	42.4	1.8	2.4	2.0	5.1	-
Morogoro	44.0	35.4	11.2	4.1	1.0	4.2	0.1
Pwani	40.4	46.1	6.0	3.7	1.3	2.4	-
Dar Es Salaam	48.4	39.9	4.1	2.3	1.3	4.1	-
Lindi	40.5	40.3	4.2	8.1	1.3	5.6	-
Mtwara	38.0	45.0	1.1	6.9	3.1	5.8	0.1
Ruvuma	42.5	44.0	4.3	2.9	1.8	4.5	-
Iringa	47.4	40.9	2.1	0.9	1.6	7.0	-
Mbeya	42.6	43.5	4.8	2.0	2.3	4.8	-
Singida	47.9	30.7	13.3	2.8	1.3	4.0	-
Tabora	46.6	38.7	6.6	2.9	2.1	2.9	-
Rukwa	45.1	27.5	19.8	1.8	1.0	4.7	0.1
Kigoma	46.7	42.2	1.0	2.3	1.6	6.2	-
Shinyanga	43.7	50.7	-	1.9	0.4	3.2	0.0
Kagera	43.9	44.5	1.0	2.2	2.5	6.0	-
Mwanza	48.7	37.1	4.4	3.3	1.9	4.4	0.3
Mara	48.4	38.9	2.1	2.4	1.3	6.8	0.1
Manyara	44.3	46.9	0.6	1.0	1.1	4.9	1.2
Njombe	39.7	43.1	7.0	1.3	2.3	6.5	-
Katavi	44.3	39.2	9.1	2.9	1.9	2.4	0.2
Simiyu	47.4	45.9	0.8	2.3	0.4	3.2	-
Geita	47.0	39.0	5.9	4.1	1.1	2.8	-
Songwe	39.2	52.6	0.2	1.9	1.1	4.9	0.0
Mainland Tanzania	**45.1**	**41.5**	**4.3**	**2.8**	**1.5**	**4.7**	**0.1**

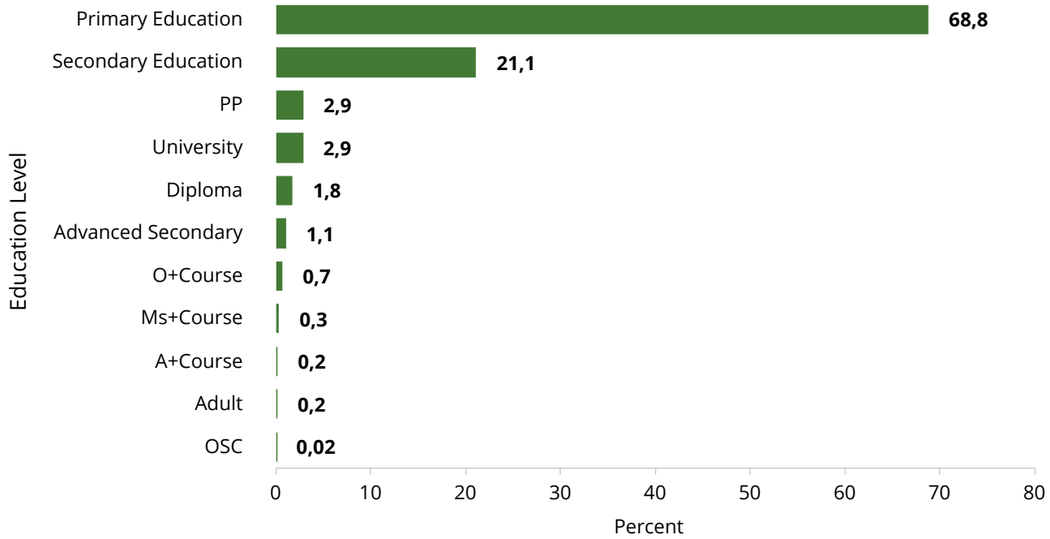
3.5 EDUCATION ATTAINMENT

The 2023 HECS results on the highest level of education attained by household members provides valuable insight into the educational landscape in Mainland Tanzania.

Figure 3.3 shows that most household members attained only primary education (68.8%), suggesting significant barriers to continued education. While 21.1% reached secondary education, only a small fraction progressed to higher levels. Advanced Secondary (1.1%), Diploma (1.8%), and University (2.9%) all together account for just 5.8%, indicating a sharp drop-off after basic education.

Pre-primary (2.9%) education is relatively low, although slightly better than other post-secondary categories. This suggests early childhood education is still developing. Adult education (0.2%) and out of school care (0.02%) are negligible, showing minimal investment in alternative education programs. Categories like A+Course, O+Course, MS+Course collectively account for 1.2%.

FIGURE 3.3: PERCENTAGE DISTRIBUTION OF HOUSEHOLD MEMBERS AGED 5 YEARS AND ABOVE BY HIGHEST LEVEL OF FORMAL EDUCATION REACHED – 2023 HECS, MAINLAND TANZANIA

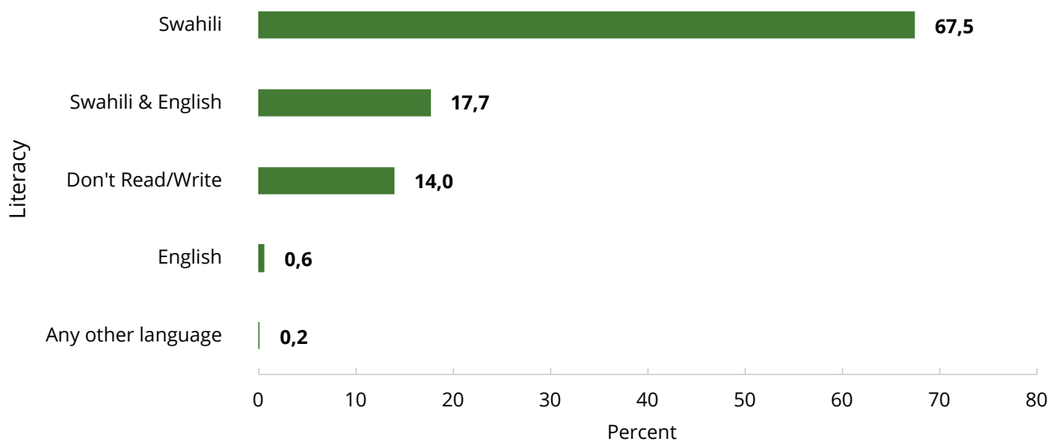


3.6 LITERACY

Literacy is the ability to read and write at a level that enables effective communication and understanding of written texts. It often includes not just basic reading and writing skills, but also the ability to understand, interpret, create, and use written information in various contexts such as at home, at work, or in the community.

The 2023 HECS provides valuable insights into the literacy profile of the population, showing that Swahili is the most widely used language for reading and writing. A significant 67.5% of people are literate in Swahili alone, reflecting its strong presence as the national language and its widespread use in early education. Meanwhile, 17.7% of individuals can read and write in both Swahili and English, indicating that a relatively smaller group has attained education levels where English is taught. On the other hand, 14.0% of respondents reported being illiterate, highlighting ongoing challenges in achieving universal literacy. English only literacy is minimal at 0.6%, and only 0.2% are literate in other languages (Figure 3.4).

FIGURE 3.4: LITERACY RATES (AGE 5+) BY LANGUAGE AND REGION – 2023 HECS, MAINLAND TANZANIA



CHAPTER FOUR
ENERGY CONSUMPTION PATTERN

© Freepik

4.1 INTRODUCTION

This chapter presents the results of the 2023 HECS on the energy consumption patterns of households. It describes the types of fuel used by households for cooking, lighting,water heating and space heating such as electricity, petroleum products (LPG, kerosene), renewable energy sources (fuelwood, charcoal and solid biomass residuals).

4.1.1 Distribution of Households

In 2023, Mainland Tanzania had a total of approximately 14.5 million households. Rural households made up the majority, with over 8.1 million households.

Most of these households relied on traditional biomass fuels for cooking, with fuelwood being the most used. Specifically, about 9.5 million households (66%) used fuelwood, 6.4 million (44%) used charcoal, and only 3.6 million (25%) used Liquefied Petroleum Gas (LPG).

Among rural households, 90% relied on fuelwood, 25% used charcoal, and only 8% used LPG. In contrast, urban households (6.4 million) have a different energy profile: 69% used charcoal, 47% used LPG, and just 36% used fuelwood. This shows that urban areas are more advanced in transitioning to cleaner cooking fuels compared to rural areas, where traditional biomass remains dominant.

Household size also significantly influenced fuel choice. Smaller households, particularly those with 1 to 4 members, showed a higher tendency to use LPG, especially in urban areas. Amongst single person urban households, 59% used LPG. This share drops to 49% of for 2–4 member households. However, as household size increased, the use of LPG declined noticeably. Among households with 8–10 members, only 13% used LPG, and for households with 11 or more members, this dropped further to just 4%. In contrast, fuelwood and charcoal use remained dominant among larger households. For example, 86% of 8–10 member households and 94% of households with 11+ members used fuelwood. These patterns suggest that larger households face greater financial and logistical barriers to adopting cleaner fuels like LPG, leading them to continue relying on more accessible and affordable biomass sources.

Overall, the findings reveal significant disparities in energy access based on residence type and household size. The adoption of clean cooking fuels, especially LPG, remains limited and is predominantly concentrated in urban areas and smaller households (Table 4.1).

TABLE 4.1: NUMBER OF HOUSEHOLDS BY PLACE OF RESIDENCE, HOUSEHOLD SIZE AND FUEL TYPE, MAINLAND TANZANIA - 2023 HECS

Place of Residence	Household Size	Total	Fuelwood	Charcoal	LPG
Rural	1	687,075	564,125	155,064	72,979
	2-4	3,438,500	2,949,007	1,022,875	328,538
	5-7	2,806,193	2,623,836	638,471	186,367
	8-10	867,579	851,089	156,978	25,958
	11+	292,060	287,524	34,224	4,067
	Total	**8,091,407**	**7,275,581**	**2,007,613**	**617,909**
Urban	1	1,011,598	179,336	448,910	599,718
	2-4	3,036,706	911,508	2,229,381	1,489,649
	5-7	1,877,436	868,996	1,420,065	749,820
	8-10	424,749	261,796	290,052	140,357
	11+	83,405	67,510	39,151	11,513
	Total	**6,433,894**	**2,289,146**	**4,427,558**	**2,991,056**
Mainland Tanzania	1	1,698,673	743,462	603,974	672,697
	2-4	6,475,206	3,860,515	3,252,255	1,818,187
	5-7	4,683,629	3,492,831	2,058,536	936,187
	8-10	1,292,327	1,112,885	447,030	166,315
	11+	375,466	355,034	73,375	15,580
	Total	**14,525,300**	**9,564,726**	**6,435,170**	**3,608,965**

4.1.2 Overall Energy Consumption in Energy Unit (TJ)

Total energy consumption in Mainland Tanzania is heavily dominated by fuelwood, which accounts for 436,266 TJ, representing approximately 69% of the total energy consumed across the three major cooking fuels. Charcoal follows at 178,193 TJ (28%), while LPG contributes only 12,214 TJ, making up just 2% of the total.

The reliance on fuelwood and charcoal is particularly evident among larger households, with those in the 5–7 members category consuming 168,153 TJ of fuelwood and 60,194 TJ of charcoal. This underscores the continued dependence on traditional biomass fuels for cooking across both rural and urban areas. Despite being the cleanest option, LPG adoption remains limited; its usage is concentrated among smaller urban households, especially those with 2–4 members, who account for 5,131 TJ of the total LPG consumed in Mainland Tanzania. This reflects ongoing disparities in access to clean energy, particularly for larger and rural households.

Rural areas account for the majority of fuelwood and charcoal consumption, highlighting a strong dependence on traditional biomass fuels. Rural households consume 348,803 TJ of fuelwood and 52,786 TJ of charcoal, while urban households use significantly less fuelwood at 87,463 TJ but considerably more charcoal at 125,407 TJ. In contrast, LPG consumption is substantially higher in urban areas, totaling 10,192 TJ compared to 2,023 TJ in rural areas.

Fuelwood consumption is highest among mid-sized households 2-4 and 5-7 members in both rural and urban areas. In rural areas, these groups consume 137,049 TJ and 133,356 TJ, respectively. Although fuelwood use is generally lower in urban areas, it follows a similar pattern, with mid-sized households consuming the most.

Charcoal consumption is also high among mid-sized urban households, with 62,834 TJ used by 2-4 members and 43,744 TJ by 5-7 members. In rural areas, however, charcoal use declines as household size increases beyond four members, suggesting that larger rural households may face limitations in accessing charcoal.

LPG consumption in urban areas rises with household size, reaching a peak of 5,131 TJ in households with 2-4 members before declining among larger groups. In contrast, LPG usage in rural areas remains minimal across all household sizes, indicating limited access and low adoption of clean cooking fuels (Table 4.2).

TABLE 4.2: OVERALL ENERGY CONSUMPTION PER YEAR BY PLACE OF RESIDENCE, HOUSEHOLD SIZE AND FUEL TYPE (TJ), MAINLAND TANZANIA - 2023 HECS

Place of Residence	Household Size	Fuelwood	Charcoal	LPG
Rural	1	17,812	3,105	247
	2-4	137,049	28,684	1,124
	5-7	133,356	16,450	562
	8-10	44,761	3,729	74
	11+	15,825	817	15
	Total	**348,803**	**52,786**	**2,023**
Urban	1	5,304	9,100	1,311
	2-4	33,126	62,834	5,131
	5-7	34,797	43,744	3,031
	8-10	10,848	8,756	676
	11+	3,388	974	43
	Total	**87,463**	**125,407**	**10,192**
Mainland Tanzania	1	23,117	12,205	1,558
	2-4	170,175	91,518	6,255
	5-7	168,153	60,194	3,593
	8-10	55,609	12,485	750
	11+	19,213	1,792	58
	Total	**436,266**	**178,193**	**12,214**

4.1.2.1 FUELWOOD

Overall, the results highlight that fuelwood remains a critical energy source in many parts of Mainland Tanzania, particularly for cooking and water heating.

The results presented in Table 4.3 reveals regional disparities in the use of fuelwood across Mainland Tanzania for various household purposes such as cooking, water heating, space heating, and lighting. Cooking remains the dominant use of fuelwood, accounting for a total of 381,282 terajoules (TJ) across Mainland Tanzania. Among the regions, Tanga leads with the highest consumption for cooking at 25,979 TJ, followed by Kagera (24,784 TJ), and Dodoma (22,769 TJ).

Water heating is the second purpose for fuelwood use, totaling 53,429 TJ. Kilimanjaro (5,705 TJ), Arusha (4,754 TJ), and Tanga (3,631 TJ) are leading in this category. These figures suggest that in cooler regions, fuelwood plays a significant role in meeting hot water needs. Similarly, space heating, while consuming a much smaller total of 1,286 TJ, shows notable use in Tanga (236 TJ), Pwani (214 TJ), and Mtwara (155 TJ).

Lighting is the least common use of fuelwood, totaling only 270 TJ across the mainland Tanzania. Nonetheless, Lindi (48 TJ), Pwani (31 TJ), and Geita (27 TJ) still use fuelwood for lighting, which may indicate limited access to electricity.

TABLE 4.3: OVERALL FUELWOOD CONSUMPTION (TJ) BY PURPOSE AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Fuelwood (TJ)			
	Cooking	Water heating	Space heating	Lighting
Dodoma	22,769	1,515	60	23
Arusha	15,679	4,754	62	20
Kilimanjaro	19,963	5,705	27	
Tanga	25,979	3,631	236	3
Morogoro	19,926	3,101		
Pwani	10,675	1,713	214	31
Dar Es Salaam	3,540	417		
Lindi	9,729	1,812		48
Mtwara	17,500	2,148	155	19
Ruvuma	17,758	3,421	5	11
Iringa	12,797	1,652	30	6
Mbeya	15,534	2,318	44	
Singida	13,831	1,958	12	5
Tabora	17,918	2,572	63	10
Rukwa	9,051	1,946	4	4
Kigoma	11,504	1,151	10	17
Shinyanga	13,978	137	38	16
Kagera	24,784	2,626	19	
Mwanza	17,808	979	10	
Mara	16,283	518	49	8
Manyara	12,759	1,373	46	4
Njombe	7,954	2,463	115	3
Katavi	5,760	818	4	
Simiyu	12,546	1,085	36	27
Geita	14,053	1,452	21	14
Songwe	11,201	2,161	28	
Mainland Tanzania	**381,282**	**53,429**	**1,286**	**270**

4.1.2.2 CHARCOAL

Charcoal remains a key household energy source in Mainland Tanzania, especially in urban areas where it serves as the primary fuel for cooking.

The results show that charcoal is predominantly used for cooking with total consumption reaching 154,752 terajoules (TJ) per year. Dar es Salaam, the most urbanized region, leads in charcoal use for cooking with 25,459 TJ, followed by Morogoro (12,109 TJ), Mwanza (11,520 TJ), and Pwani (8,966 TJ).

For water heating, the total consumption was 22,232 TJ. Morogoro had the highest consumption for water heating (2,255 TJ), followed by Mbeya (1,705 TJ) and Songwe (1,389 TJ).

Space heating accounts for the smallest portion of charcoal consumption, totaling 1,209 terajoules (TJ). Among the regions, Mbeya records the highest usage for charcoal for space heating at 318 TJ, followed by Iringa with 174 TJ and Njombe with 160 TJ (Table 4.4).

TABLE 4.4: OVERALL HOUSEHOLD CHARCOAL CONSUMPTION (TJ) BY PURPOSE AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Charcoal (TJ)		
	Cooking	Water heating	Space heating
Dodoma	6,367	785	10
Arusha	3,078	1,101	9
Kilimanjaro	2,164	531	11
Tanga	8,072	1,161	49
Morogoro	12,109	2,255	12
Pwani	8,966	1,359	42
Dar Es Salaam	25,459	1,490	
Lindi	3,959	630	
Mtwara	3,641	707	4
Ruvuma	2,564	664	73
Iringa	3,428	726	174
Mbeya	8,228	1,705	318
Singida	2,675	379	20
Tabora	8,001	1,414	28
Rukwa	4,526	759	34
Kigoma	3,009	243	33
Shinyanga	3,959	211	
Kagera	5,057	639	
Mwanza	11,520	1,146	62
Mara	3,919	133	50
Manyara	1,202	301	31
Njombe	2,198	893	160
Katavi	5,972	819	3
Simiyu	1,370	190	5
Geita	8,046	602	18
Songwe	5,265	1,389	63
Mainland Tanzania	**154,752**	**22,232**	**1,209**

4.1.2.3 LIQUEFIED PETROLEUM GAS (LPG)

The total LPG consumption for cooking was 8,235 terajoules (TJ), making it the dominant use, while water heating accounts for only 86 TJ.

Dar es Salaam leads in LPG use for cooking with a substantial 3,054 TJ.Other notable regions with high LPG cooking consumption include Mwanza (653 TJ), Arusha (484 TJ), Kilimanjaro (386 TJ), and Morogoro (402 TJ).

Use of LPG for water heating is minimal, with only a few regions reporting small quantities: Arusha (15 TJ), Kigoma (12 TJ), Kilimanjaro (11 TJ), and Songwe (11 TJ).

The category “Cooking + Water Heating”, with a total of 3,888 TJ, reflects combined uses where households did not distinguish between the two functions. Arusha again leads in this category with 703 TJ, followed by Dar es Salaam (623 TJ), Mbeya (322 TJ), and Pwani (345 TJ) (Table 4.5).

TABLE 4.5: OVERALL HOUSEHOLD LPG CONSUMPTION (TJ) BY PURPOSE AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	LPG		
	Cooking	Water heating	Cooking + Water heating
Dodoma	290		183
Arusha	484	15	703
Kilimanjaro	386	11	252
Tanga	291	3	140
Morogoro	402		121
Pwani	308		345
Dar Es Salaam	3,054	11	623
Lindi	88		33
Mtwara	98		56
Ruvuma	111		102
Iringa	109		100
Mbeya	293	4	322
Singida	173	3	94
Tabora	129	2	40
Rukwa	74	10	17
Kigoma	160	12	51
Shinyanga	176		32
Kagera	75		40
Mwanza	653		87
Mara	210		39
Manyara	130	1	94
Njombe	118		103
Katavi	66		70
Simiyu	78	2	41
Geita	122		35
Songwe	156	11	167
Mainland Tanzania	**8,235**	**86**	**3,888**

4.2 ELECTRICITY USAGE

4.2.1 Sources of Electricity

In Mainland Tanzania, electricity is sourced from a variety of renewable and non-renewable energy sources. The key sources of electricity generation reported during the survey include TANESCO, local grid, own solar, generator and other sources such as batteries (exclusively) or rechargeable lamps (not recharged from own electricity connection).

Figure 4.3 presents the sources of electricity in Mainland Tanzania, comparing rural and urban areas. 84.7% of households reported TANESCO to be their primary source of electricity in urban areas compared to rural areas where 38.3% of households used TANESCO as their primary electricity source.

Own solar is a significant source in rural areas with 59.7% of households reporting solar as at least one source of electricity, while urban areas only report 18.7% of own solar. This highlights the reliance on off-grid solutions where TANESCO may not be accessible.

Other sources of electricity are more prevalent in rural areas. In rural areas, 10.4% of households reported other sources while 3.3% were reported to use other sources in urban areas. Generators are used very minimally across all areas, indicating limited dependence on this source.

FIGURE 4.1: DISTRIBUTION OF HOUSEHOLDS BY SOURCES OF ELECTRICITY AND PLACE OF RESIDENCE - 2023 HECS, MAINLAND TANZANIA

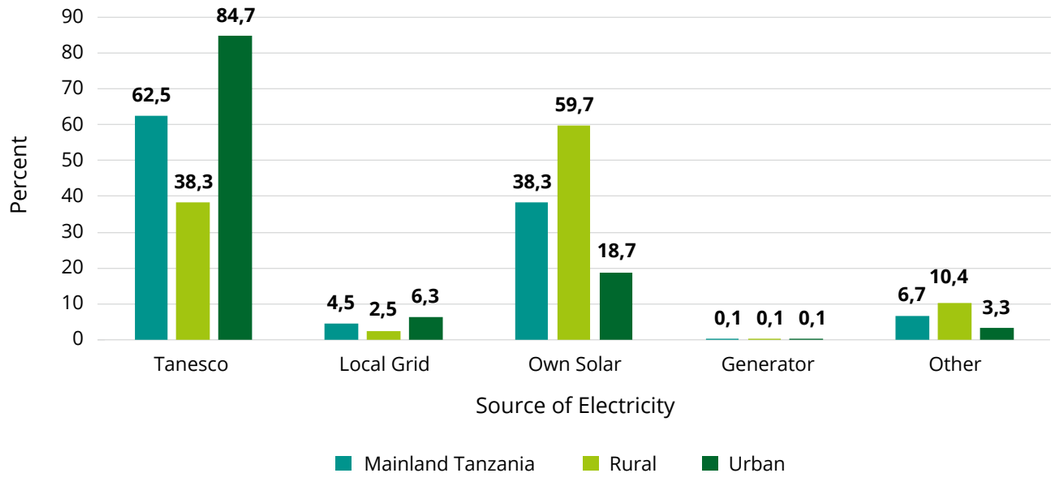


Table 4.2 presents the distribution of households using electricity by region and sources in Mainland Tanzania. The average distribution of households using electricity across Mainland Tanzania was 58.2%, but this varies significantly by region. Dar Es Salaam (96.1%), Arusha (86.6%) and Kilimanjaro (85.3%) show the highest reliance on TANESCO while Geita (30.4%), Manyara (34.5%) and Singida (35.8%) showed the lowest reliance on TANESCO alone, indicating reliance on other sources of electricity.

Overall, the local grid contributes 4.5% to total electricity supply in Mainland Tanzania. Kigoma (44.5%) and Shinyanga (20.4%) have notable contributions from local grids. Many regions, such as Tanga and Singida report 0.0%, indicating limited or no access to local grid electricity.

CONTENT

CHAPTER FOUR /// ENERGY CONSUMPTION PATTERN

Own solar power is significant, with an overall contribution of 38.3%. Geita (63.6%) and Lindi (62.0%) rely heavily on solar power, highlighting the importance of off-grid solutions. Regions such Dar Es Salaam, Arusha and Kilimanjaro show much lower reliance on solar (5.5 %, 18.8% and 18.9%, respectively).

Other sources account for 6.7% overall, with variations by region. Manyara (31.0%) and Kilimanjaro (22.9%) show a significant percentage of households relying on alternative methods, which may include less common electricity sources. The use of generators is minimal across all regions, averaging 0.1% (Table 4.1).

TABLE 4.7: DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY BY REGION AND SOURCE - 2023 HECS, MAINLAND TANZANIA

Region	Sources of Electricity (%)				
	TANESCO	Local Grid	Own Solar	Generator	Other
Dodoma	50.2	2.4	44.1	0.2	7.2
Arusha	86.6	0.4	18.8	-	1.5
Kilimanjaro	85.3	0.5	18.9	0.3	22.9
Tanga	46.9	-	48.3	-	12.6
Morogoro	56.3	6.0	50.8	0.3	5.7
Pwani	60.4	10.4	43.3	0.2	7.9
Dar Es Salaam	96.1	0.8	5.5	0.2	-
Lindi	42.8	6.0	62.0	-	-
Mtwara	42.2	-	59.7	-	0.3
Ruvuma	51.9	1.9	49.5	-	9.6
Iringa	71.4	2.7	29.4	-	-
Mbeya	78.6	14.4	27.0	-	0.7
Singida	35.8	-	60.3	0.2	7.5
Tabora	43.3	3.6	58.5	-	19.8
Rukwa	47.7	0.8	56.1	-	0.5
Kigoma	79.9	44.5	20.8	-	1.4
Shinyanga	72.1	20.4	19.9	-	10.6
Kagera	74.9	-	26.9	-	-
Mwanza	80.4	19.3	31.0	-	-
Mara	40.0	-	59.3	-	6.7
Manyara	34.5	0.2	39.6	0.3	31.0
Njombe	54.1	2.5	45.1	-	2.5
Katavi	39.0	0.5	57.6	-	13.6
Simiyu	58.1	1.4	43.7	-	-
Geita	30.4	5.4	63.6	-	18.6
Songwe	54.3	1.4	52.9	0.6	1.6
Mainland Tanzania	**62.5**	**4.5**	**38.3**	**0.1**	**6.7**

The 2023 Household Energy Consumption Survey (HECS) in Mainland Tanzania reveals that households used a variety of electricity sources, both on-grid and off-grid. Among households that reported using electricity; TANESCO was the primary source of electricity, used by 52.7% of all households. Its coverage was particularly high in urban areas, where 72.7% of households depended on it, compared to 30.7% in rural areas.

Solar was the second most widely used source of electricity, relied upon by 32.0% of households. It played a crucial role in rural areas, where it provided power to 52.6% of households, compared to 13.2% in urban areas. TANESCO with other sources such as solar, mini-grids, generators, or unspecified sources were used by a smaller share of households.

A small number of households relied on alternative or informal sources of electricity, such as community-based systems, car batteries, or locally generated power mostly in rural areas. Only a very limited share of households reported using generators or non-TANESCO grid connections.

TABLE 4.8: NUMBER AND PERCENTAGE OF HOUSEHOLDS USING SOURCES OF ELECTRICITY BY SOURCE OF POWER SUPPLY AND PLACE OF RESIDENCE IN MAINLAND TANZANIA - 2023 HECS

Region	Place of Residence					
	Mainland Tanzania		Rural		Urban	
	N	%	N	%	N	%
TANESCO only	5,451,851	52.7	1,517,820	30.7	3,934,031	72.7
Grid only	20,065	0.2	13,023	0.3	7,043	0.1
Solar only	3,309,274	32.0	2,593,968	52.6	715,306	13.2
Generator only	3,374	0.0	-	-	3,374	0.1
Other only	357,666	3.5	290,603	5.9	67,063	1.2
TANESCO+ Mini-grid	414,953	4.0	101,159	2.0	313,794	5.8
TANESCO+Solar	420,361	4.1	182,428	3.7	237,933	4.4
Mini-grid+Solar	757	0.01	-	-	757	0.01
TANESCO+Other	139,320	1.3	63,970	1.3	75,350	1.4
TANESCO+ Mini-grid +Solar	24,698	0.2	7,227	0.1	17,471	0.3
TANESCO+ Mini-grid +Other	1,452	0.01	-	-	1,452	0.03
TANESCO+Solar+Generator	1,816	0.02	1,816	0.04	-	-
TANESCO+Generator	6,216	0.1	4,543	0.1	1,672	0.03
TANESCO+Other+Solar	15,756	0.2	8,991	0.2	6,765	0.1
Other+ Solar	177,977	1.7	149,684	3.0	28,293	0.5
Generator + Solar	853	0.01	853	0.02	-	-
Total HH Using Electricity	**10,346,387**	**100.0**	**4,936,083**	**100.0**	**5,410,304**	**100.0**

4.2.2 Types of Electricity Tariffs

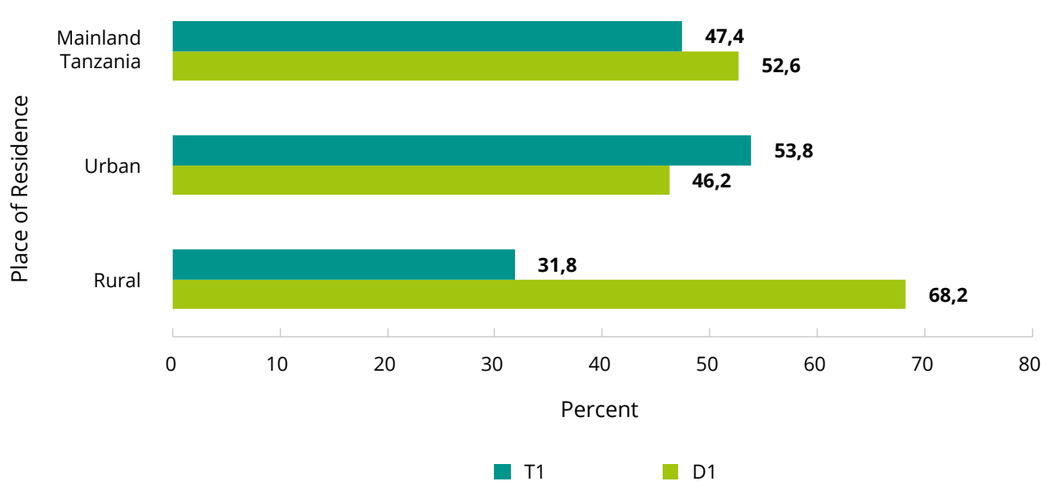
Electricity tariffs in Tanzania refer only to electricity supply by TANESCO and are regulated by the Energy and Water Utilities Regulatory Authority (EWURA). They are primarily determined based on the cost of generation, transmission, and distribution. The tariffs vary depending on the category of consumers, which include residential, commercial, industrial, and specialized users. During the survey, the following tariff types were asked – Domestic Low Usage Tariff (D1), General Usage Tariff (T1), Low Voltage Usage Tariff (T2) and Medium & High Voltage Usage Tariff (T3).

The results show that more than half (52.6%) of households in Mainland Tanzania rely on the subsidized D1 tariff, indicating that a large proportion of the population has low electricity consumption. Rural areas rely heavily on the D1 lifeline tariff (68.2%), showing that most rural households consume minimal electricity. 31.8% of rural consumers fall under T1, meaning relatively fewer households in rural areas use electricity beyond the lifeline limit.

More urban households (53.8%) use the T1 tariff compared to rural areas. However, 46.2% of urban households still rely on the D1 lifeline tariff, showing that a significant portion of urban residents still consume low amounts of electricity (Figure 4.4).

The number of households claiming to use D1 and T1 tariffs is around two-thirds higher than the official contracts recorded by TANESCO. This significant discrepancy suggests that many households are sharing electricity meters, a common practice in Tanzania.

FIGURE 4.2: DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY BY TARIFF TYPE AND PLACE OF RESIDENCE - 2023 HECS, MAINLAND TANZANIA



The regions using mostly the D1 tariff include Morogoro (98.3%), Kilimanjaro (96.4%), Kigoma (95.5%), Manyara (93.0%), Shinyanga (87.1%), Lindi (86.1%), Kagera (82.4%), Tanga (71.1%), Mara (75.6%), Rukwa (72.9%) and Mwanza (71.0%) and are likely have lower average household electricity consumption.

The regions under T1 indicating higher electricity usage include Katavi (84.6%), Iringa (82.0%), Dodoma (81.7%), Arusha (80.3%), Dar es Salaam (75.9%), Ruvuma (71.4%), and Tabora (68.0%).

Njombe (50.6% D1, 49.4% T1), Pwani (55.7% D1, 44.3% T1) and Singida (45.2% D1, 54.8% T1) show nearly equal split between D1 and T1 (Table 4.9).

TABLE 4.9: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY BY TARIFF TYPE AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Tariff Type	
	D1	T1
Dodoma	18.3	81.7
Arusha	19.7	80.3
Kilimanjaro	96.4	3.6
Tanga	71.1	28.9
Morogoro	98.3	1.7
Pwani	55.7	44.3
Dar Es Salaam	24.1	75.9
Lindi	86.1	13.9
Mtwara	40.3	59.7
Ruvuma	28.6	71.4
Iringa	18.0	82.0
Mbeya	60.2	39.8
Singida	45.2	54.8
Tabora	32.0	68.0
Rukwa	72.9	27.1
Kigoma	95.6	4.4
Shinyanga	87.1	12.9
Kagera	82.4	17.6
Mwanza	71.0	29.0
Mara	75.6	24.4
Manyara	93.0	7.0
Njombe	50.6	49.4
Katavi	15.2	84.8
Simiyu	60.7	39.3
Geita	63.7	36.3
Songwe	64.9	35.1
Mainland Tanzania	**52.6**	**47.4**

4.2.3 Monthly Household Electricity Expenditure

Household expenditures for electricity are a key indicator for energy access, consumption behavior, and economic capacity. In Mainland Tanzania, understanding how much households spend monthly on electricity helps policymakers assess affordability, usage patterns, and the effectiveness of tariff structures. The 2023 HECS provides important insights into these spending habits, revealing that most households spend modest amounts on electricity reflecting low consumption levels and the prevalence of lifeline tariffs.

4.2.3.1 DOMESTIC LOW USAGE TARIFF (D1)

The D1 tariff is a lifeline electricity tariff structure in Tanzania, designed to support low-income households and promote electricity access by offering subsidized rates for low electricity consumption.

Figure 4.5 presents the distribution of monthly household expenditure on electricity in Tanzanian Shillings (TZS). The expenditures are grouped into four categories, and their corresponding percentages reflect the share of households falling within each spending bracket.

The results shows that over 72.5% of households spend less than 10,000 TZS per month on electricity, reinforcing the picture of modest electricity consumption in Mainland Tanzania which aligns with the dominance of D1 tariff users (52.6%) as seen in Table 4.3. Nearly half of the households (45.6%) spend between 5,000–10,000 TZS monthly on electricity.

Households spending between 10,000–15,000 TZS account for 19.5%. This group reflects a transitional category of households that may be shifting from D1 to T1, possibly due to rising income or appliance use. A smaller segment, 8.0% of households, spends over 15,000 TZS per month on electricity, indicating significantly higher energy use. These households are likely situated in urban areas and may possess energy-intensive appliances such as air conditioners, electric cookers, and water heaters.

FIGURE 4.3: DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY TARIFF TYPE D1 BY MONTHLY EXPENDITURE - 2023 HECS, MAINLAND TANZANIA

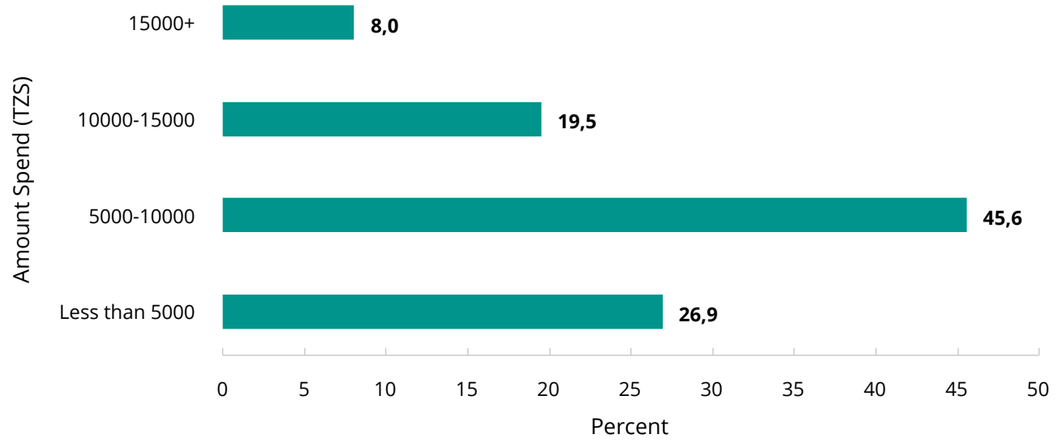


Table 4.10 shows the region's patterns on household's electricity expenditure per month. The results show that the percentage of households spent less than 5,000 TZS was high in Lindi (57.6%), Rukwa (55.7%), Kagera (51.2%) and Katavi (50.8%). Dar es Salaam (5.0%) and Simiyu (4.8%) show the lowest percentage in this category. For the households that spend 5,000–10,000 TZS, Simiyu (88.4%), Geita (67.2%), and Tabora (68.0%) dominate, indicating efficient electricity usage within the D1 tariff bracket. Katavi (25.8%) and Songwe (32.7%) recorded a lower percentage in this category.

In the 10,000–15,000 TZS category, Dar es Salaam (41.9%), Pwani (32.9%), and Kigoma (31.5%) have the highest shares, suggesting increasing appliance use or improved income. Geita (5.8%) and Simiyu (6.9%) show the least spending in this tier.

In the category spending more than 15,000 TZS, the highest percentage was observed in Dar es Salaam and Singida (18.7%) followed by Songwe (14.4%), Katavi (12.1%), and Morogoro (12.0%). Lindi, Mtwara, Tabora, Simiyu and several others have no recorded households spending in this category under D1.

TABLE 4.10: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY TARIFF TYPE D1 BY MONTHLY EXPENDITURE AND REGION - 2023 HECS, MAINLAND TANZANIA

Region	Amount Spent (TZS)			
	Less than 5000	5000-10000	10000-15000	15000+
Dodoma	46.2	36.3	11.1	6.4
Arusha	33.0	56.0	9.3	1.7
Kilimanjaro	30.8	47.8	18.1	3.3
Tanga	21.0	48.0	21.5	9.5
Morogoro	31.5	39.4	17.0	12.0
Pwani	13.8	42.3	32.9	11.0
Dar Es Salaam	5.0	34.4	41.9	18.7
Lindi	57.6	35.0	7.4	-
Mtwara	34.3	48.6	17.2	-
Ruvuma	33.0	46.1	12.0	8.9
Iringa	35.6	47.8	9.6	6.9
Mbeya	19.6	52.6	21.7	6.1
Singida	24.8	37.1	19.4	18.7
Tabora	15.6	68.0	16.4	-
Rukwa	55.7	35.2	6.1	3.1
Kigoma	13.6	43.9	31.5	11.0
Shinyanga	21.9	51.3	17.0	9.8
Kagera	51.2	36.3	9.9	2.7
Mwanza	23.7	59.4	12.5	4.4
Mara	34.6	35.2	21.6	8.6
Manyara	27.1	59.8	9.7	3.4
Njombe	14.7	52.0	26.0	7.2
Katavi	50.8	25.8	11.4	12.1
Simiyu	4.8	88.4	6.9	-
Geita	24.1	67.2	5.8	3.0
Songwe	40.4	32.7	12.5	14.4
Mainland Tanzania	**26.9**	**45.6**	**19.5**	**8.0**

4.2.3.2 GENERAL USAGE TARIFF (T1)

The T1 tariff is a standard residential electricity tariff in Tanzania, designed for general domestic consumers whose energy use exceeds the threshold defined under the lifeline D1 tariff.

The majority of T1 users (33.1%) spends between TZS 5,000–10,000, suggesting that many households under this tariff are still relatively moderate users but exceed the lifeline threshold of the D1 tariff. A significant portion, 31.0%, spends between TZS 10,000–15,000, indicating growing usage, possibly linked to ownership of appliances or larger household size.

Notably, 25.8% of households spend over TZS 15,000, representing high-consumption households likely to use energy-intensive appliances (e.g., fridges, air conditioners, water heaters). These are clearly beyond the D1 threshold and reflect upper-tier energy users under T1.

Only 10.2% of T1 households spend less than TZS 5,000, possibly due to occasional or minimal usage (Figure 4.6).

FIGURE 4.4: DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY TARIFF TYPE T1 BY MONTHLY EXPENDITURE - 2023 HECS, MAINLAND TANZANIA

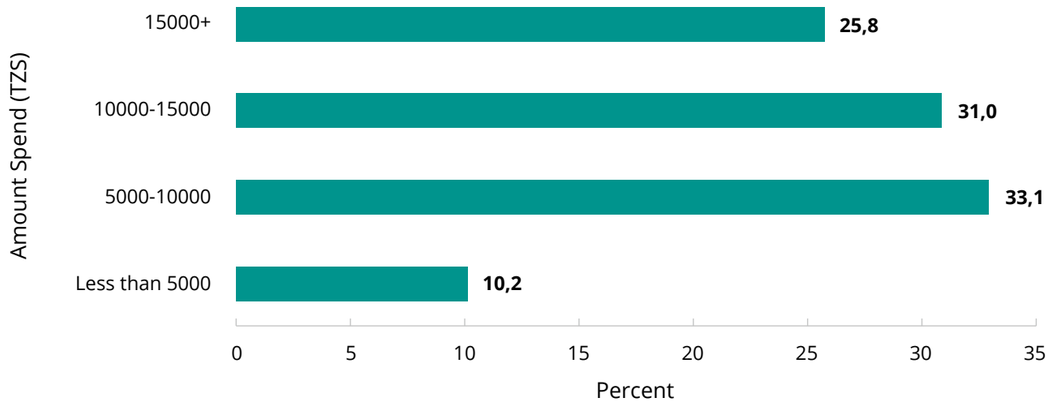


Table 4.11 provides insightful information on how households across Mainland Tanzania spend on electricity under Tariff Type T1. A majority (74.2%) of households under T1 spends between TZS 5,000 and TZS 15,000 per month.

Morogoro (78.8%) and Kigoma (76.0%) have the highest share of households spending more than TZS 15,000. Kilimanjaro (37.6%) and Dar es Salaam (40.6%) also show elevated spending in this category.

For moderate usage of TZS 10,000–15,000, Shinyanga stands out with 90.6% of households falling into this category followed by Dar es Salaam (42.7%), Simiyu (39.3%) and Arusha (34.2%). The smallest share of households was recorded in Rukwa (5.9%) and Kagera (6.8%) regions.

Rukwa (53.3%), Kagera (43.0%), and Kilimanjaro (30.1%) show a high share of households spending below TZS 5,000. The regions with the highest expenditure in the T1 category of TZS 5,000- 10,000 include Iringa (49.8%), Mbeya (49.7%), Njombe (57.9%) Manyara (57.3%) and Mtwara (51.4%).

TABLE 4.11: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY TARIFF TYPE T1 BY MONTHLY EXPENDITURE AND REGION - 2023 HECS, MAINLAND TANZANIA

Region	Amount Spent (TZS)			
	Less than 5000	5000-10000	10000-15000	15000+
Dodoma	13.6	42.9	25.9	17.6
Arusha	4.2	41.9	34.2	19.7
Kilimanjaro	30.1	22.7	9.6	37.6
Tanga	7.7	42.3	19.2	30.9
Morogoro	-	-	21.2	78.8
Pwani	14.2	39.3	23.7	22.9
Dar Es Salaam	1.2	15.4	42.7	40.6
Lindi	25.0	50.0	25.0	-
Mtwara	13.4	51.4	16.6	18.6
Ruvuma	28.3	36.8	23.9	10.9
Iringa	10.5	50.1	26.8	12.6
Mbeya	10.3	49.5	25.9	14.3
Singida	17.2	46.3	22.6	13.9
Tabora	18.2	30.4	23.5	27.9
Rukwa	53.3	40.8	5.9	-
Kigoma	-	24.0	-	76.0
Shinyanga	-	-	90.6	9.4
Kagera	43.0	45.2	6.8	5.0
Mwanza	26.8	38.1	19.2	15.9
Mara	25.3	34.6	26.1	14.0
Manyara	14.0	57.3	-	28.7
Njombe	15.5	57.9	17.9	8.8
Katavi	16.0	44.3	21.2	18.5
Simiyu	9.8	35.2	39.3	15.8
Geita	2.6	49.7	26.8	20.9
Songwe	19.7	45.7	16.3	18.4
Mainland Tanzania	**10.2**	**33.1**	**31.0**	**25.8**

4.2.4 Monthly Electricity Consumption (kWh)

Over 69.9% of households consume 21–40 kWh monthly. This aligns with monthly spending of 10,000–15,000 TZS, matching the most common expenditure bracket in Mainland Tanzania.

In rural areas, 80.4% of households use 21–40 kWh per month and 13.2% use only 1–20 kWh. In urban areas, households are more likely to consume 41–100+ kWh, with 12.1% consuming 41–60 kWh and 5.9% consuming 81–100 kWh. Only about 1.2% of households consume more than 100 kWh/month (Figure 4.7).

FIGURE 4.5: DISTRIBUTION OF HOUSEHOLDS BY MONTHLY ELECTRICITY CONSUMPTION - 2023 HECS, MAINLAND TANZANIA

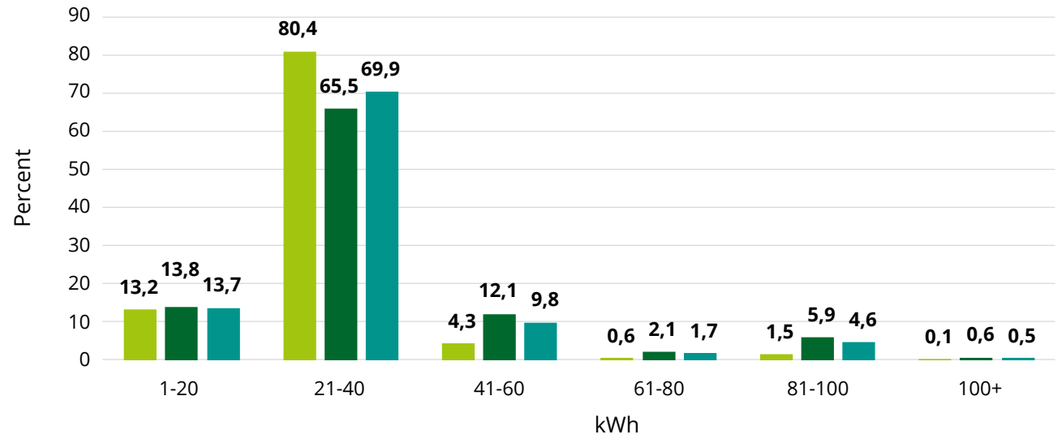


Table 4.12 indicates a dominance in low electricity consumption as most households fall under the 1-20 kWh and 21-40 kWh consumption categories.

Kilimanjaro (93.8%), Manyara (92.2%), and Shinyanga (90.8%) have the highest percentages of households that consume 21-40 kWh monthly. Katavi (38.2%) and Dodoma (35.4%) have the highest shares in the lowest bracket (1-20 kWh), suggesting limited access or affordability of electricity.

Households consuming above 100 kWh are very few, with Morogoro (1.7%), Tanga (1.4%), and Dar es Salaam (1.2%) having the highest (but still minimal) shares. Dar es Salaam stands out with 11.4% of households in the 81-100 kWh category, the highest among all regions, likely due to urbanization and higher appliance usage.

Dar es Salaam has a relatively higher share of mid-to-high consumption (21.3% in 41-60 kWh, 11.1% in 81-100 kWh), while Simiyu has almost no households consuming above 60 kWh per month. Regions such as Lindi, Mtwara and Rukwa have zero or negligible consumption in higher categories of monthly consumption, due to low electrification rates or reliance on alternative energy sources (Table 4.12).

TABLE 4.12: DISTRIBUTION OF HOUSEHOLDS BY MONTHLY ELECTRICITY CONSUMPTION AND REGION - 2023 HECS, MAINLAND TANZANIA

Region	kWh					
	1-20	21-40	41-60	61-80	81-100	100+
Dodoma	35.4	49.8	8.0	0.8	5.9	-
Arusha	31.5	53.0	10.4	0.3	4.7	-
Kilimanjaro	0.8	93.8	1.6	1.2	2.2	0.5
Tanga	12.2	74.2	9.2	1.5	1.5	1.4
Morogoro	-	87.0	5.8	0.9	4.6	1.7
Pwani	14.5	68.7	10.6	1.4	4.8	-
Dar Es Salaam	10.4	53.4	21.3	2.5	11.1	1.2
Lindi	7.4	91.0	-	1.6	-	-
Mtwara	25.2	63.7	6.8	-	4.3	-
Ruvuma	27.6	62.0	5.5	3.0	1.9	-
Iringa	33.4	54.9	7.4	1.8	2.5	-
Mbeya	13.0	75.5	7.8	2.5	1.1	-
Singida	20.1	64.7	13.3	0.6	1.4	-
Tabora	21.8	62.8	9.7	0.9	4.8	-
Rukwa	9.7	88.2	1.2	-	0.9	-
Kigoma	-	87.4	9.3	3.3	-	-
Shinyanga	-	90.8	4.5	1.8	3.0	-
Kagera	7.2	89.0	3.1	0.5	0.2	-
Mwanza	7.1	84.5	3.3	2.9	2.2	-
Mara	4.9	83.0	8.0	3.0	1.1	-
Manyara	4.0	92.2	2.1	1.0	0.7	-
Njombe	27.4	63.0	5.2	1.8	2.0	0.5
Katavi	38.2	51.6	6.6	-	3.7	-
Simiyu	8.6	90.3	1.2	-	-	-
Geita	9.1	85.9	2.6	-	2.3	-
Songwe	8.5	70.0	12.7	4.0	4.8	-
Mainland Tanzania	**13.7**	**69.9**	**9.8**	**1.7**	**4.6**	**0.5**

Based on the electricity consumption data reported by TANESCO customers who use electricity exclusively for lighting and/or charging, it is estimated that in 2023, households generated and consumed approximately 406 GWh of electricity from their own solar equipment (including solar lanterns) for lighting purposes, and about 77 GWh for charging devices..

4.3 FUEL USED FOR COOKING

Cooking fuel is an essential household energy source, particularly in developing countries where it significantly impacts health, the environment, and socio-economic well-being. In many regions, most households rely on traditional biomass fuels such as fuelwood and charcoal. These fuels are often used in inefficient stoves or open fires, leading to indoor air pollution and deforestation. However, there is a growing shift toward cleaner alternatives like liquefied petroleum gas (LPG), electricity, and biogas, driven by government policies, urbanization, and increased awareness of the health and environmental benefits of clean cooking solutions. Understanding the types of fuels used for cooking and their implications is crucial for promoting sustainable energy transitions and improving public health outcomes.

4.3.1 Households Cooking Mainly Indoor

Indoor cooking is widespread in Mainland Tanzania, especially in urban areas, but it's often done without proper ventilation leading to serious health and environmental risks.

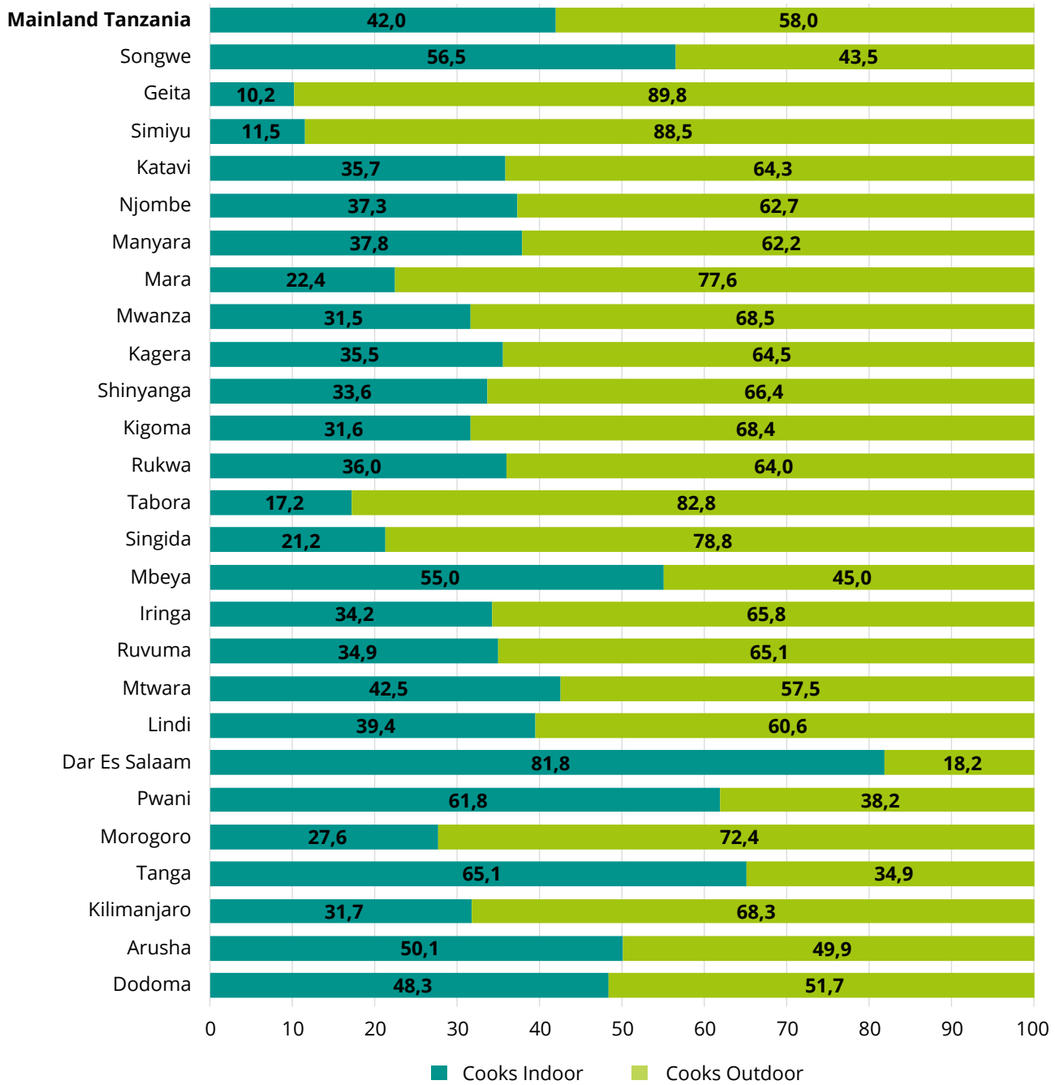
Figure 4.6 illustrates that 42% of households cook indoors, while the majority (58%) cook outside or in separate structures. Indoor cooking, especially when using solid biofuels like fuelwood and charcoal, can expose household members to harmful smoke and pollutants, increasing the risk of respiratory disease. These statistics highlight the importance of promoting well-ventilated cooking environments and transitioning to cleaner cooking technologies (Figure 4.8).

FIGURE 4.6: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS COOKING INDOOR - 2023 HECS, MAINLAND TANZANIA

Regions with the highest indoor cooking rates are Dar es Salaam (81.8%), Tanga (65.1%), Pwani (61.8%), Songwe (56.5%) and Mbeya (55.3%).

Regions with the lowest indoor cooking rates include Geita (10.2%), Simiyu (11.5%), Tabora (17.2%), Singida (21.2%) and Mara (22.4%). These lower rates are typically found in rural or less densely populated regions, where outdoor or detached kitchen spaces are common and traditional solid biomass fuels widely used (Figure 4.9).

FIGURE 4.7: DISTRIBUTION OF HOUSEHOLDS BY COOKING STYLE AND REGION - 2023 HECS, MAINLAND TANZANIA



4.3.2 Primary Cooking Fuels

In Mainland Tanzania, the primary fuels reported to be used by most of the households for cooking were fuelwood, charcoal and LPG, while electricity, kerosene, biogas, natural gas, bioethanol and other fuels are utilized only to a limited degree.

Overall, the results show that solid biofuels (fuelwood and charcoal) dominate cooking energy use in Mainland Tanzania, particularly in rural and peri-urban areas.

Fuelwood (65.5%) was the most widely used fuel for cooking, reflecting its accessibility and affordability, especially in rural areas. Charcoal followed at 44.0%, particularly in urban and peri-urban areas.

When it comes to cleaner fuels for cooking, LPG was the most widely used at 24.6%, but its adoption is still low compared to traditional biomass. LPG use is concentrated in urban areas and among middle-to high-income households due to the high upfront costs of cylinders and stoves.

Electricity (2.0%) was used by a small percentage of households, primarily in urban areas with reliable grid access.

Biogas (0.1%), and bioethanol (0.01%) have very low adoption rates, despite their potential to provide clean and sustainable cooking energy. Only 0.6% of households reported using other sources for cooking, including solar cookers, briquettes, and other experimental or locally available fuels (Figure 4.10).

FIGURE 4.8: DISTRIBUTION OF HOUSEHOLDS BY SOURCES FOR COOKING - 2023 HECS, MAINLAND TANZANIA

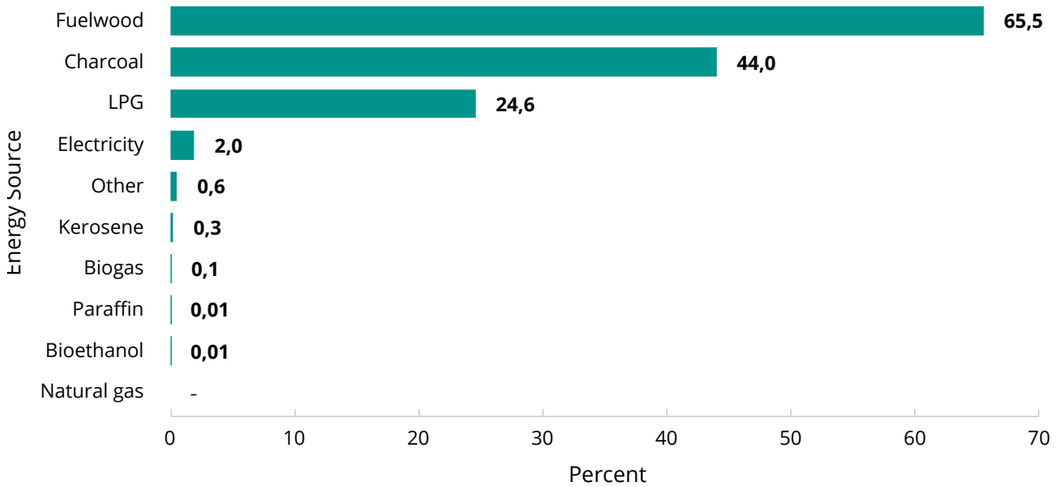


Figure 4.11 provides a detailed breakdown of the sources of energy used for cooking in Mainland Tanzania. It highlights significant disparities in energy use between rural and urban populations, reflecting differences in access to resources, infrastructure, and income levels.

The results show that most households in rural areas reported using fuelwood (89.6%) for cooking, while in urban areas, charcoal (68.9%) and LPG (46.2%) are more common. Cities have better access to cleaner fuels like LPG and electricity, but rural areas still depend mostly on traditional fuels like fuelwood.

LPG use in urban areas is 46.2% and 7.5% in rural areas. Electricity is also used more in urban areas (3.4%) compared to rural areas (0.4%) but is still not widely adopted. Other fuels like biogas (0.1%), and bioethanol (0.01%) are rarely used in both rural and urban areas. Kerosene (0.3%) is hardly used anymore.

FIGURE 4.9: DISTRIBUTION OF HOUSEHOLDS BY SOURCES FOR COOKING AND PLACE OF RESIDENCE

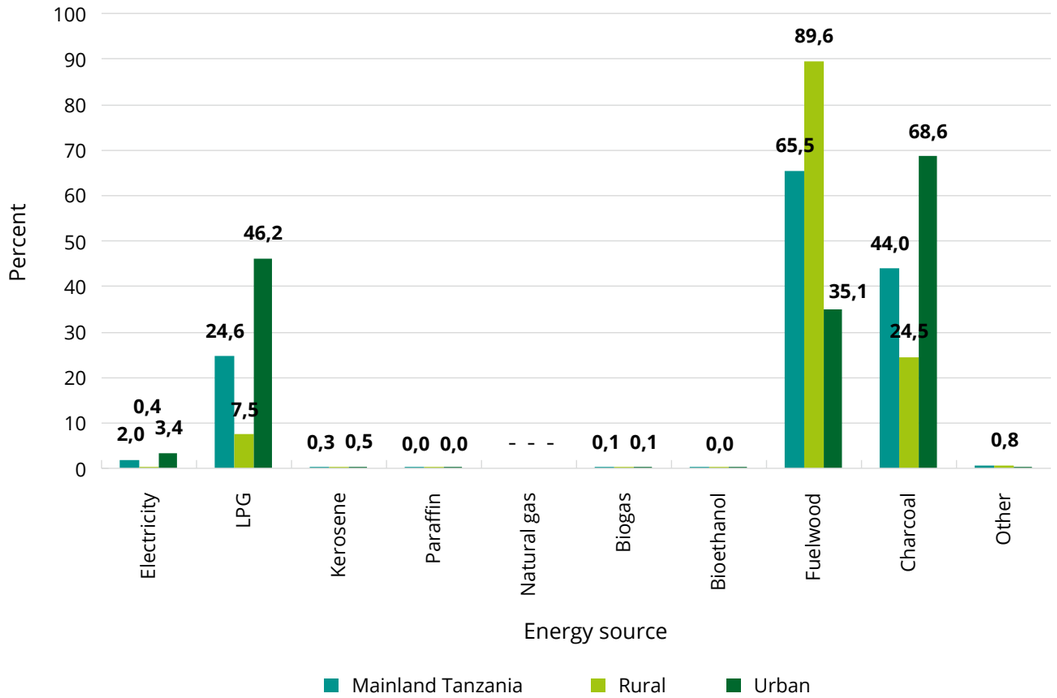


Table 4.13 provides a detailed breakdown of the primary energy sources used for cooking across different regions in Mainland Tanzania. The results show that fuelwood is the primary cooking energy source in most regions, with an overall national average of 65.5% followed by charcoal with a national average of 44.0%. Simiyu (91.2%), Manyara (90.0%), and Kagera (84.2%) rely heavily on fuelwood.

Electricity and LPG are the primary modern energy sources, but their usage is relatively low compared to solid biomass. Electricity usage is minimal, with the highest percentage in Dar Es Salaam (5.1%), followed by Pwani (4.4%) and Arusha (4.2%). Most regions have electricity use below 1.5%.

The use of LPG is higher than electricity but still limited, with the highest usage in Dar Es Salaam (74.4%), followed by Arusha (56.3%) and Kilimanjaro (37.0%). In contrast, regions like Kigoma (5.7%) and Rukwa (6.0%) have very low LPG usage. Other modern energy sources like natural gas, biogas, paraffin, and bioethanol are almost negligible, with shares close to zero in most regions.

TABLE 4.13: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY SOURCES FOR COOKING AND REGION - 2023 HECS, MAINLAND TANZANIA

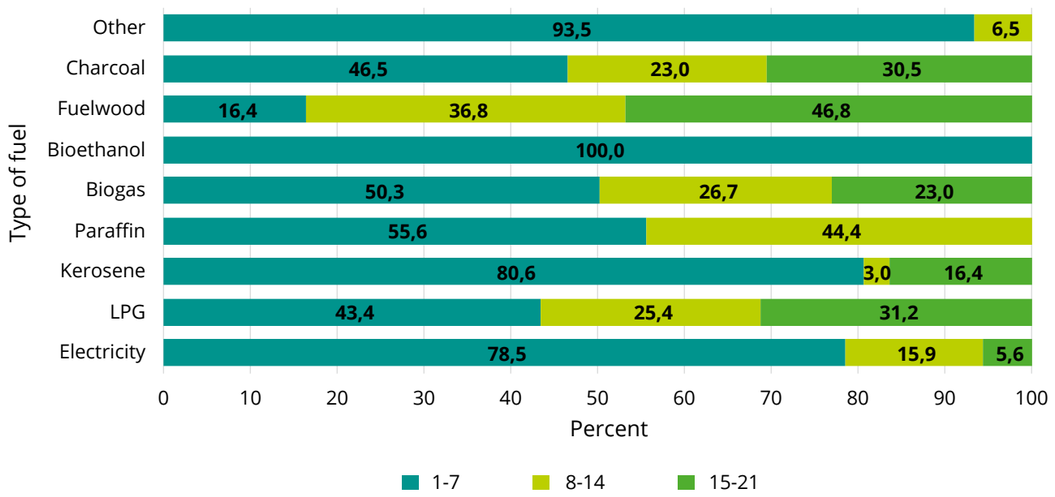
Region	Energy Source									
	Electri-city	LPG	Kerose-ne	Paraffin	Natural gas	Biogas	Bioetha-nol	Fuel-wood	Charcoal	Other
Dodoma	35.4	49.8	8.0	0.8	5.9	49.8	8.0	49.8	8.0	49.8
Arusha	31.5	53.0	10.4	0.3	4.7	53.0	10.4	53.0	10.4	53.0
Kilimanjaro	0.8	93.8	1.6	1.2	2.2	93.8	1.6	93.8	1.6	93.8
Tanga	12.2	74.2	9.2	1.5	1.5	74.2	9.2	74.2	9.2	74.2
Morogoro	-	87.0	5.8	0.9	4.6	87.0	5.8	87.0	5.8	87.0
Pwani	14.5	68.7	10.6	1.4	4.8	68.7	10.6	68.7	10.6	68.7
Dar Es Salaam	10.4	53.4	21.3	2.5	11.1	53.4	21.3	53.4	21.3	53.4
Lindi	7.4	91.0	-	1.6	-	91.0	-	91.0	-	91.0
Mtwara	25.2	63.7	6.8	-	4.3	63.7	6.8	63.7	6.8	63.7
Ruvuma	27.6	62.0	5.5	3.0	1.9	62.0	5.5	62.0	5.5	62.0
Iringa	33.4	54.9	7.4	1.8	2.5	54.9	7.4	54.9	7.4	54.9
Mbeya	13.0	75.5	7.8	2.5	1.1	75.5	7.8	75.5	7.8	75.5
Singida	20.1	64.7	13.3	0.6	1.4	64.7	13.3	64.7	13.3	64.7
Tabora	21.8	62.8	9.7	0.9	4.8	62.8	9.7	62.8	9.7	62.8
Rukwa	9.7	88.2	1.2	-	0.9	88.2	1.2	88.2	1.2	88.2
Kigoma	-	87.4	9.3	3.3	-	87.4	9.3	87.4	9.3	87.4
Shinyanga	-	90.8	4.5	1.8	3.0	90.8	4.5	90.8	4.5	90.8
Kagera	7.2	89.0	3.1	0.5	0.2	89.0	3.1	89.0	3.1	89.0
Mwanza	7.1	84.5	3.3	2.9	2.2	84.5	3.3	84.5	3.3	84.5
Mara	4.9	83.0	8.0	3.0	1.1	83.0	8.0	83.0	8.0	83.0
Manyara	4.0	92.2	2.1	1.0	0.7	92.2	2.1	92.2	2.1	92.2
Njombe	27.4	63.0	5.2	1.8	2.0	63.0	5.2	63.0	5.2	63.0
Katavi	38.2	51.6	6.6	-	3.7	51.6	6.6	51.6	6.6	51.6
Simiyu	8.6	90.3	1.2	-	-	90.3	1.2	90.3	1.2	90.3
Geita	9.1	85.9	2.6	-	2.3	85.9	2.6	85.9	2.6	85.9
Songwe	8.5	70.0	12.7	4.0	4.8	70.0	12.7	70.0	12.7	70.0
Mainland Tanzania	**13.7**	**69.9**	**9.8**	**1.7**	**4.6**	**69.9**	**9.8**	**69.9**	**9.8**	**69.9**

4.3.3 Cooking frequency by fuel type

The results indicate that electricity is primarily used for occasional cooking, with 78.5% of households using it 1 to 7 times per week, but only 5.6% using it 15 to 21 times per week. LPG shows a different pattern, with 43.4% using it occasionally and a notable 31.2% using it frequently, indicating its growing acceptance as a reliable cooking fuel. When used, biogas also shows balanced use, with 50.3%, 26.7%, and 23.0% of households using it across low, medium, and high frequencies respectively.

In contrast, fuelwood is mainly used by high frequency cooks. 46.8% of households cook with it 15 to 21 times weekly, while only 16.4% use it occasionally. Charcoal follows a similar trend, with 30.5% using it frequently and 46.5% occasionally, while bioethanol is used only for occasional cooking in all cases. Other fuels are used mainly for occasional cooking by 93.5% of households (Figure 4.12).

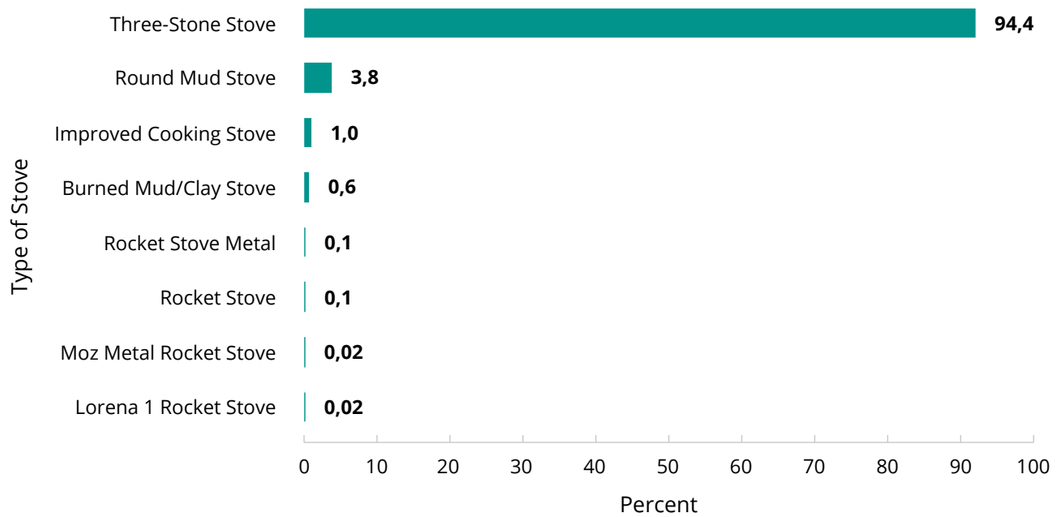
FIGURE 4.10: DISTRIBUTION OF HOUSEHOLDS BY COOKING FREQUENCY PER WEEK, FUEL TYPE IN MAINLAND TANZANIA



4.3.4 Types of Fuelwood Stoves for Cooking

In Mainland Tanzania, different types of fuelwood stoves are used for cooking, ranging from traditional to improved designs. The results show that Three-Stone Stove is the most widely used stove type, accounting for 94.4% of all households using fuelwood for cooking. This was followed by Round Mud Stove at 3.8% and Improved Cooking Stove at 1.0%. Other types of fuelwood cooking stoves accounted for a small percentage ranging from 0.02% to 0.6%. Despite the availability of more efficient fuelwood stoves, the three-stone stove remains dominant, highlighting the need for greater awareness and accessibility of improved cookstoves to reduce fuelwood consumption, deforestation, and indoor air pollution (Figure 4.13).

FIGURE 4.11: DISTRIBUTION OF HOUSEHOLDS BY TYPE OF STOVE USING FUELWOOD FOR COOKING, MAINLAND TANZANIA



4.3.5 Types of Charcoal Stoves for Cooking

Figure 4.14 provides insights into the different types of charcoal stoves used by households in Mainland Tanzania. The traditional charcoal stove is the most used, accounting for 41.0% of households. Ceramic-lined charcoal is the least used, with only 12.6% of households adopting it. Improved Cookstoves (ICS) collectively account for 38.5% of households, indicating some level of adoption of more efficient cooking technologies when using charcoal.

FIGURE 4.12: CHARCOAL STOVE TYPES USED FOR COOKING IN HOUSEHOLDS, MAINLAND TANZANIA

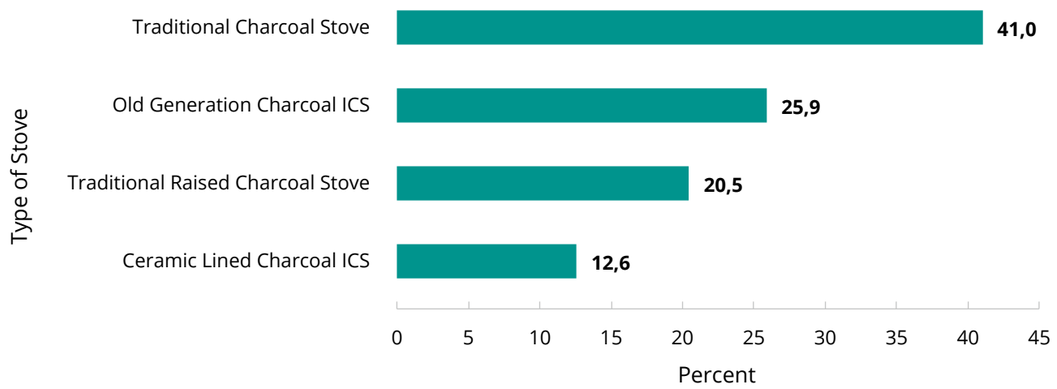


Table 4.14 provides valuable insights into the regional disparities in the use of charcoal stoves in Mainland Tanzania. While some regions have made significant progress in adopting improved cookstoves, others lag, relying heavily on traditional, less efficient stoves.

The use of charcoal stoves varies significantly across regions in Mainland Tanzania. Dodoma has the highest proportion of households reported to use ceramic-lined charcoal ICS (93.3%), while Manyara (84.9%), Mtwara (73.0%), Arusha (69.7%), Rukwa (68.8%), and Songwe (66.7%) primarily rely on traditional charcoal stoves. Kilimanjaro shows a mixed pattern, with 55.1% using old-generation charcoal ICS and 22.6% relying on traditional raised stoves. The adoption of efficient stoves remains low in many regions.

TABLE 4.14: DISTRIBUTION OF HOUSEHOLD BY TYPE OF STOVE USING CHARCOAL FOR COOKING AND REGION

Region	Type of Stove			
	Traditional Charcoal Stove	Traditional Raised Charcoal Stove	Old Generation Charcoal ICS	Ceramic Lined Charcoal ICS
Dodoma	5.7	0.4	0.7	93.3
Arusha	69.7	2.0	23.9	4.4
Kilimanjaro	17.6	22.6	55.1	4.6
Tanga	60.7	30.0	5.6	3.6
Morogoro	4.4	23.8	47.8	24.0
Pwani	8.0	9.1	46.5	36.3
Dar Es Salaam	51.6	24.2	24.3	-
Lindi	42.8	41.4	15.4	0.4
Mtwara	73.0	27.0	-	-
Ruvuma	26.1	14.2	36.9	22.8
Iringa	5.4	-	86.2	8.3
Mbeya	55.5	8.0	20.7	15.8
Singida	30.6	27.1	0.7	41.6
Tabora	66.3	3.2	30.6	-
Rukwa	68.8	29.0	2.2	-
Kigoma	31.9	24.2	23.2	20.7
Shinyanga	25.4	73.7	-	1.0
Kagera	62.6	10.1	19.4	8.0
Mwanza	66.7	1.1	32.1	0.1
Mara	30.0	25.3	37.9	6.8
Manyara	84.9	-	13.9	1.2
Njombe	40.3	23.7	35.5	0.6
Katavi	33.3	54.3	11.9	0.4
Simiyu	37.3	52.9	0.9	8.9
Geita	43.5	23.5	32.5	0.4
Songwe	28.4	56.6	4.3	10.7
Mainland Tanzania	**41.0**	**20.5**	**25.9**	**12.6**

The comparison of charcoal and fuelwood usage from the HBS 2018, IASES 2021, and HECS 2023 surveys highlights a rising dependence on traditional biomass fuels in Mainland Tanzania. Fuelwood consumption showed a steady increase from 60.9% in 2018 to 65.5% in 2023.

CONTENT

CHAPTER FOUR /// ENERGY CONSUMPTION PATTERN

The data shows a marked increase in reported charcoal consumption, with usage rates rising from 28.8% to 44% over the study period. However, this apparent growth does not necessarily reflect a true increase in charcoal use. Instead, it results from differences in how the surveys collect information. The HBS 2018 and IASES 2021 surveys record only the primary fuel used by households, ignoring any secondary fuels. HECS 2023 captures all fuels used by households, regardless of whether they are the main or supplementary source.

The relatively stable share of fuelwood suggests that when wood is used, it is typically the main fuel. In contrast, the higher charcoal usage reported in HECS 2023 indicates that charcoal is often used as a supplementary fuel alongside others. This difference in survey methodology explains the apparent rise in charcoal consumption figures (Table 4.15).

TABLE 4.15: SHARE OF HOUSEHOLDS USING CHARCOAL AND FUELWOOD – COMPARISON OF HECS, IASES, AND HOUSEHOLD BUDGET SURVEY

Energy Carries	HBS 2018	IASES 2021	HECS 2023
Fuelwood	60.9	63.3	65.5
Charcoal	28.8	28.5	44.0

4.4 FUEL USED FOR WATER HEATING

Water heating in Mainland Tanzania remains heavily dependent on traditional biomass (fuelwood and charcoal), together making up 97.2% of usage, with minimal use of modern or renewable sources. This highlights both the energy access challenges and the potential for policy interventions to promote cleaner alternatives like LPG, electricity, and solar water heating.

Fuelwood was the dominant source, used by 67.3% of households followed by charcoal at 29.9%. This use is high in regions such as Simiyu (90.0%), Manyara (83.0%), and Kilimanjaro (83.7%). LPG (13.7%) and electricity (5.3%) are more prevalent in urban centers, with Dar es Salaam leading at 45.5% of LPG use and 25.3% of electricity use for water heating, followed by Arusha at 36.7% of LPG use and 10.2% of electricity use. Natural gas (0.1%) and solar heat (0.1%) have very limited use (Figure 4.15).

FIGURE 4.13: DISTRIBUTION OF HOUSEHOLDS BY SOURCE OF ENERGY USED FOR WATER HEATING AND REGION

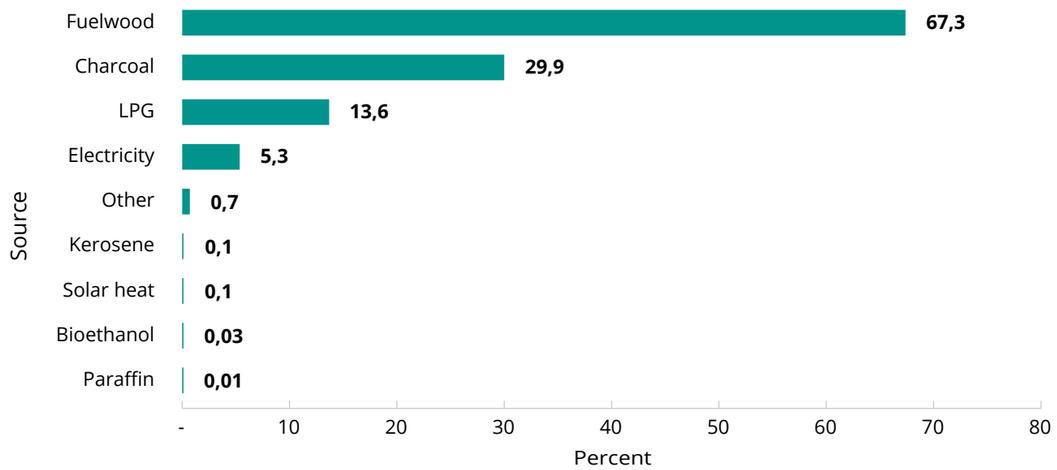


TABLE 4.17: DISTRIBUTION OF HOUSEHOLDS BY SOURCE OF ENERGY USED FOR WATER HEATING AND REGION 2023 HECS-MAINLAND TANZANIA

Region	Source										
	Electri-city	LPG	Kerose-ne	Paraffin	Natural gas	Biogas	Bioe-thanol	Fuel-wood	Char-coal	Solar heat	Other
Dodoma	3.5	16.8	-	-	-	-	-	56.2	29.9	-	-
Arusha	10.2	36.7	0.6	-	-	-	-	64.9	17.5	-	-
Kilimanjaro	2.9	17.1	0.2	-	-	-	0.2	83.7	9.7	-	-
Tanga	7.9	7.5	-	-	-	-	0.3	71.7	25.4	0.4	3.1
Morogoro	1.4	7.7	0.2	-	-	-	-	60.3	48.7	0.4	-
Pwani	4.9	26.6	-	-	-	-	-	58.9	61.1	0.3	1.7
Dar Es Salaam	25.7	44.5	-	-	-	-	-	8.5	35.7	-	-
Lindi	0.7	2.4	-	-	-	-	-	81.7	22.2	0.2	-
Mtwara	-	6.2	-	-	-	-	-	77.5	21.7	-	-
Ruvuma	2.1	4.1	-	-	-	-	-	83.9	19.1	-	1.4
Iringa	5.2	20.1	-	-	-	-	-	60.8	33.1	-	0.5
Mbeya	4.9	19.4	0.6	-	-	-	-	57.9	41.5	-	-
Singida	1.7	8.1	-	-	-	-	-	82.4	17.8	-	0.7
Tabora	1.2	5.2	-	-	-	-	-	67.7	35.4	-	-
Rukwa	3.5	2.8	0.3	-	-	-	-	75.9	32.7	0.3	-
Kigoma	2.0	4.3	-	-	-	-	-	78.2	20.7	-	-
Shinyanga	14.3	20.5	-	-	-	-	-	39.5	42.3	-	-
Kagera	5.6	6.1	-	-	-	-	-	80.4	19.1	-	-
Mwanza	10.1	6.4	-	-	-	-	-	54.7	54.7	-	-
Mara	0.6	5.5	-	-	-	-	-	79.3	20.0	-	-
Manyara	0.9	16.1	-	0.4	-	-	-	82.6	18.5	0.3	9.3
Njombe	3.0	5.4	-	-	-	-	-	75.0	27.9	0.3	0.6
Katavi	2.1	9.4	-	-	-	-	-	52.2	62.6	-	-
Simiyu	1.5	5.9	-	-	-	-	0.3	90.0	19.5	-	-
Geita	3.1	3.6	-	-	-	-	-	69.5	28.4	-	-
Songwe	4.3	11.6	-	-	-	-	-	63.8	31.6	-	0.7
Mainland Tanzania	**5.3**	**13.6**	**0.1**	**0.01**	**-**	**-**	**0.0**	**67.3**	**29.97**	**0.1**	**0.7**

4.5 SPACE HEATING

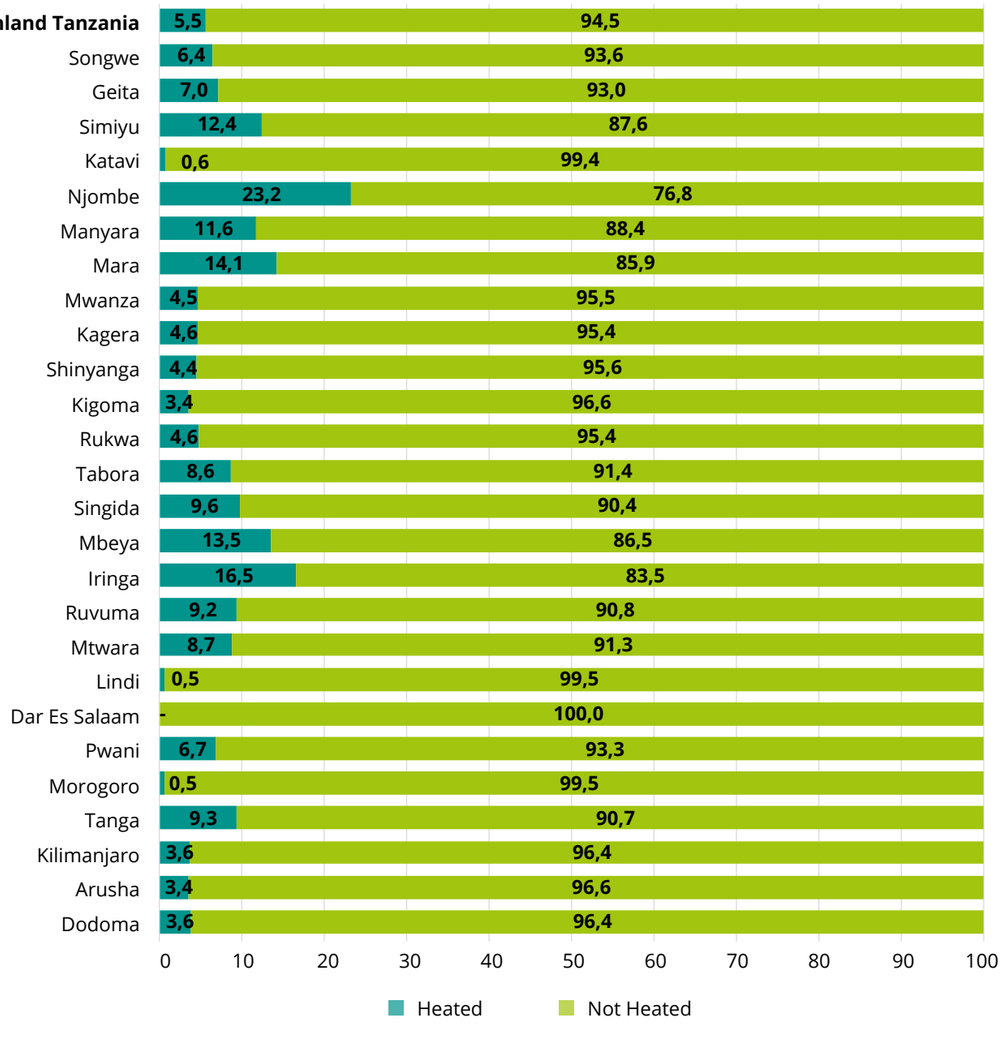
Space Heating refers to the processes of maintaining indoor thermal comfort by raising the temperature of a room or building. In Mainland Tanzania, space heating is often not a dedicated system but a by-product of other activities, like cooking indoors in cooler regions like Njombe or Iringa.

The results show that 5.5% of households reported that cooking indoors heats their dwelling while 94.5% said it did not.

Njombe tops the list with 23.2% of households reporting that indoor cooking contributes to heating their dwelling, followed by Iringa (16.9%), Mbeya (13.5%), and Mara (14.1%).

Morogoro and Lindi (both at 0.5%), and Katavi (0.5%) reported the lowest heating. Dar es Salaam shows 0% (or unreported), meaning all respondents indicated indoor cooking does not heat their household (Figure 4.16).

FIGURE 4.14: SHARE OF HOUSEHOLDS COOKING INDOORS THAT ALSO HEATED THE DWELLING, MAINLAND TANZANIA

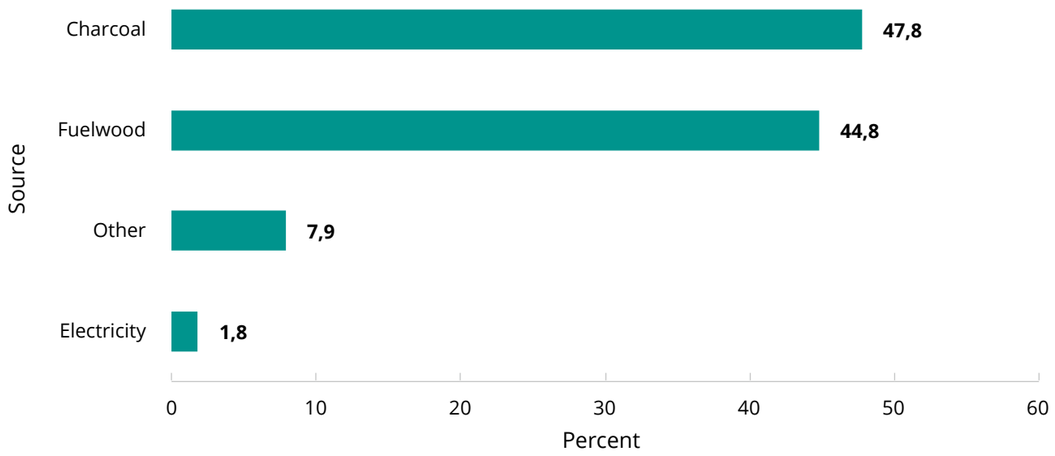


4.5.1 Energy sources for space heating

In Mainland Tanzania, space heating was not commonly practiced as a dedicated activity. Instead, in cooler regions such as Njombe, Iringa, and Mbeya, households often experienced incidental space heating as a by-product of indoor cooking. The primary energy sources contributing to this incidental heating included electricity, LPG, kerosene, fuelwood, charcoal and other.

Traditional biofuels, primarily fuelwood (47.8%) and charcoal (44.8%), remained the dominant energy sources for space heating and electricity accounted only for 1.8% while othr sources of heating recorded 7.9% (Figure 4.17).

FIGURE 4.15: HOUSEHOLDS THAT HEATED DWELLING BY SOURCE OF ENERGY FOR SPACE HEATING AND REGION IN 2023 HECS - MAINLAND TANZANIA



Fuelwood and charcoal emerged as the most dominant sources of energy for space heating across most regions in Mainland Tanzania. The findings reveal that Simiyu, Geita, and Kilimanjaro (100%), Mtwara (93.1%), Kilimanjaro (74.5%) Pwani (73.3%), and had the highest reliance on fuelwood, indicating a strong dependence on readily available natural biomass, particularly in rural and semi-rural areas. Conversely, charcoal was the primary source in more urbanized regions such as Morogoro (100%), Mbeya (85.6%), Iringa (81.2%) and Ruvuma (81.0%), due to its relative convenience, higher energy density, and suitability for indoor heating compared to fuelwood. On the other hand, other types of energy sources had a significant number as shown in Table 4.18.

CONTENT

CHAPTER FOUR /// ENERGY CONSUMPTION PATTERN

TABLE 4.18: DISTRIBUTION OF HOUSEHOLDS THAT HEATED DWELLING BY SOURCE OF ENERGY FOR SPACE HEATING AND REGION IN MAINLAND TANZANIA

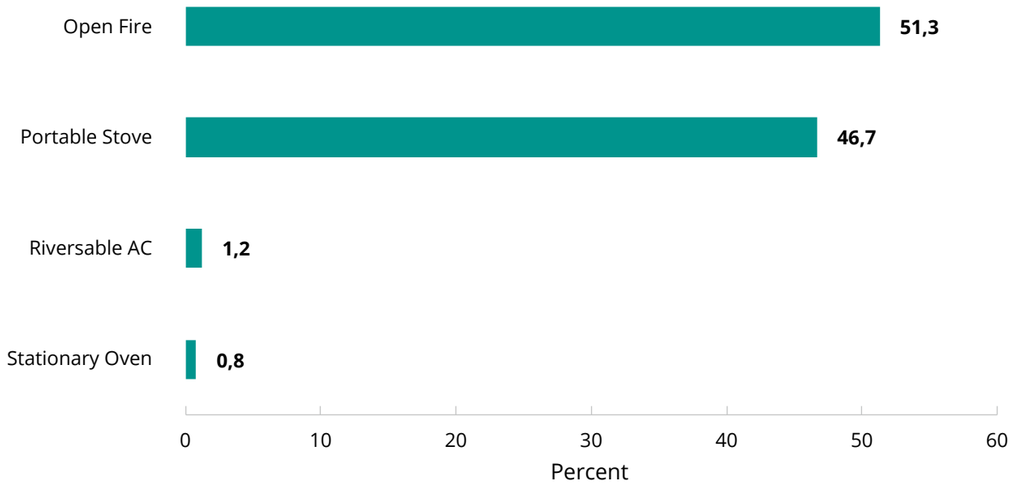
Region	Main Source			
	Electricity	Fuelwood	Charcoal	Other
Dodoma	-	63.8	21.5	14.7
Arusha	-	64.5	23.6	11.9
Kilimanjaro	-	74.5	25.5	-
Tanga	2.9	66.3	27.2	3.6
Morogoro	-	-	100.0	-
Pwani	-	73.3	39.8	-
Lindi	-	-	-	100.0
Mtwara	4.9	93.1	6.9	-
Ruvuma	6.9	12.2	81.0	-
Iringa	-	16.4	81.2	2.4
Mbeya	-	14.4	85.6	-
Singida	11.8	12.6	72.1	15.4
Tabora	-	51.5	29.5	19.0
Rukwa	-	25.7	74.3	-
Kigoma	-	56.7	43.3	-
Shinyanga	15.9	89.8	-	10.2
Kagera	7.9	31.3	-	60.7
Mwanza	-	22.9	57.4	19.7
Mara	-	47.4	34.9	17.7
Manyara	-	44.2	50.2	9.8
Njombe	-	32.9	60.9	6.2
Katavi	-	56.2	43.8	-
Simiyu	-	100.0	12.7	-
Geita	-	58.8	41.2	-
Songwe	-	29.8	55.9	14.3
Mainland Tanzania	**1.8**	**44.8**	**47.8**	**7.9**

4.5.2 Heating system

In Mainland Tanzania, space heating systems are largely informal and non-mechanized, reflecting both the country's warm climate and the socioeconomic conditions of most households. In areas where heating is necessary, particularly in the cooler highland regions or during colder seasons, households primarily depend on simple, traditional methods, rather than modern, centralized, or automated heating systems.

Open fire was the most used heating method, employed by more than half of the households (51.3%) followed by portable stoves accounting for 46.7% and reversable AC (1.2%). Stationary oven was the least common heating method, used by than 0.8% of households (Figure 4.18).

FIGURE 4.16: DISTRIBUTION OF HOUSEHOLDS THAT HEATED DWELLING BY MAIN HEATING SYSTEM IN MAINLAND TANZANIA



Open fire remains the most widely used method for space heating across many regions. Notably, regions such as Shinyanga, Simiyu, and Lindi reported full reliance (100%) on open fire. In contrast, regions with significantly lower usage include Mbeya (14.4%), Iringa (18.8%), and Ruvuma (12.2%), reflecting a shift toward alternative heating methods. On the other hand, the use of reversible air conditioners (ACs) was limited to a few regions, with Singida leading at 11.8%. Minimal usage was also recorded in Tanga (2.9%), Ruvuma (6.9%), and Kagera (7.9%) (Table 4.19).

Portable Stove was also common in some regions, the highest was recorded in Morogoro (100 %) followed by Mbeya (85.6%) and Iringa (81.2%) and the least was recorded in Mtwara (6.9%) (Table 4.19).

TABLE 4.19: DISTRIBUTION OF HOUSEHOLDS THAT HEATED DWELLING BY MAIN HEATING SYSTEM AND REGION IN TANZANIA

Region	Means of Heating Dwelling			
	Open Fire	Portable Stove	Stationary Oven	Reversable AC
Dodoma	78.5	21.5	-	-
Arusha	76.4	23.6	-	-
Kilimanjaro	74.5	25.5	-	-
Tanga	69.9	27.2	-	2.9
Morogoro	-	100.0	-	-
Pwani	73.3	26.7	-	-
Lindi	100.0	-	-	-
Mtwara	93.1	6.9	-	-
Ruvuma	12.2	81.0	-	6.9
Iringa	18.8	81.2	-	-
Mbeya	14.4	85.6	-	-
Singida	27.9	60.2	-	11.8
Tabora	70.5	29.5	-	-
Rukwa	25.7	74.3	-	-
Kigoma	56.7	43.3	-	-
Shinyanga	100.0	-	-	-
Kagera	82.2	9.8	-	7.9
Mwanza	42.6	57.4	-	-
Mara	47.4	34.9	17.7	-
Manyara	49.8	50.2	-	-
Njombe	39.1	60.9	-	-
Katavi	56.2	43.8	-	-
Simiyu	100.0	-	-	-
Geita	58.8	41.2	-	-
Songwe	44.1	55.9	-	-
Mainland Tanzania	**51.3**	**46.7**	**0.8**	**1.2**

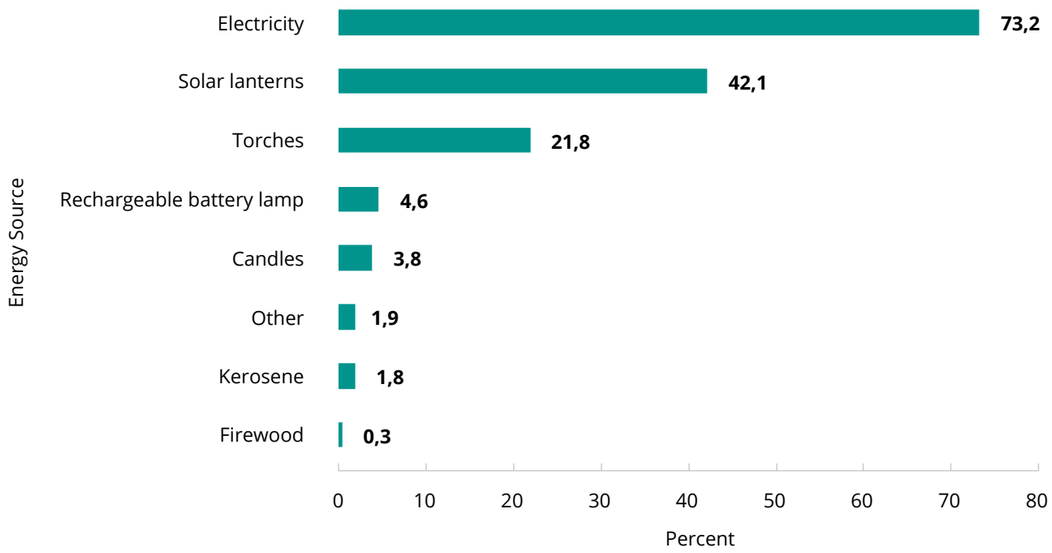
4.6 ENERGY SOURCES FOR LIGHTING

Lighting is a critical component of household energy consumption, reflecting both access to modern energy services and broader socioeconomic conditions. According to the 2023 HECS, households in Mainland Tanzania relied on a diverse mix of energy sources for lighting, ranging from grid electricity and solar lanterns to traditional fuels like kerosene and fuelwood.

In Mainland Tanzania, 73.2% of households reported using electricity as their primary source for lighting, showing continued progress in electrification efforts particular in rural areas.

Solar lanterns follow as the second most common source at 42.1%, highlighting the growing role of renewable energy in areas with limited or unreliable grid access and torches. Torches, used by 21.8% of households, indicate a continued reliance on portable lighting. Other sources such as rechargeable battery lamps (4.6%), candles (3.8%), other sources (1.9%), kerosene lamps (1.8%), and fuelwood (0.3%) were less common sources reported by the households.

FIGURE 4.17: DISTRIBUTION OF HOUSEHOLDS BY SOURCE OF ENERGY FOR LIGHTING IN MAINLAND TANZANIA



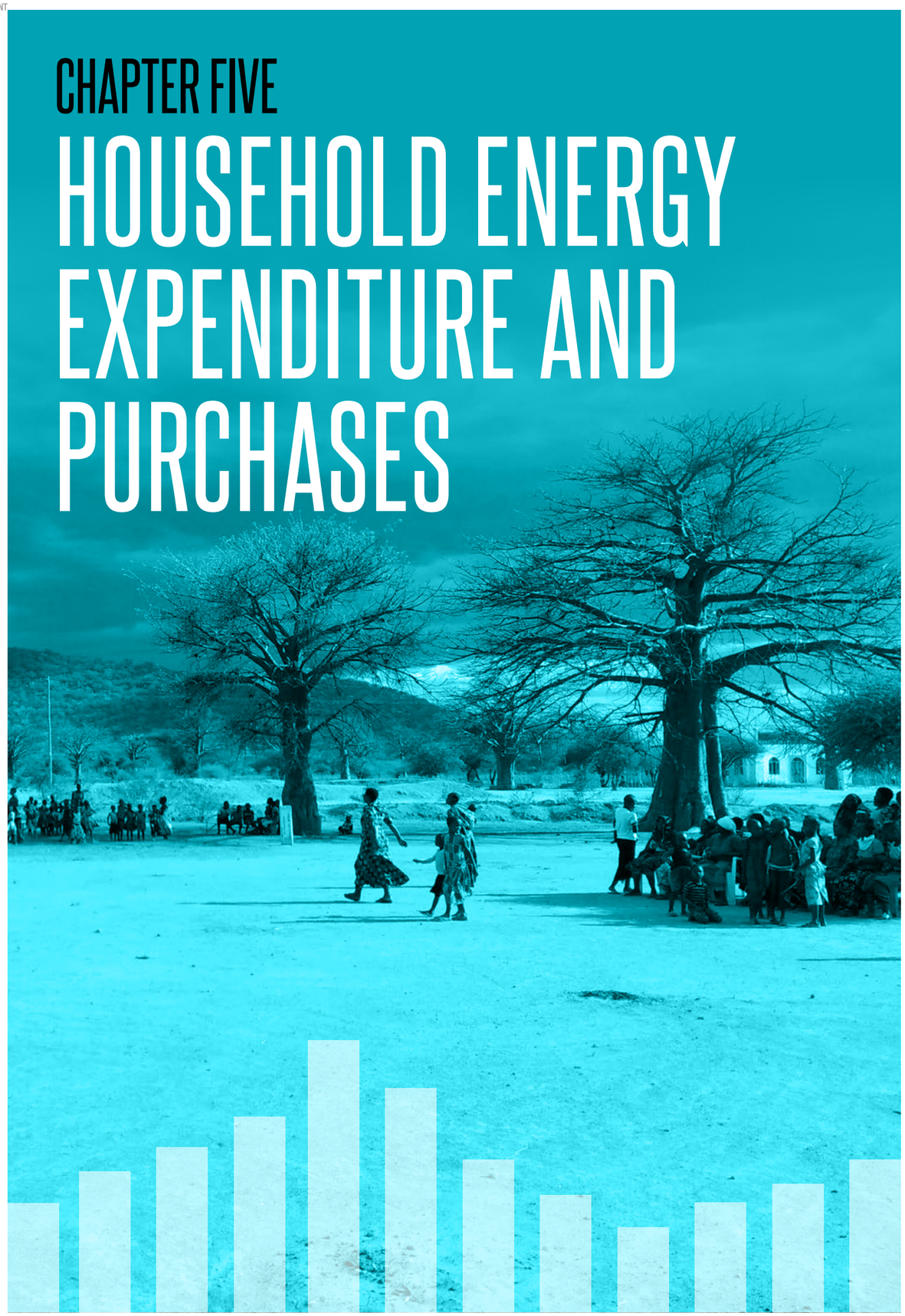
The use of kerosene, candles, and fuelwood remains minimal, yet they are still present in specific regions, signaling a need for further clean energy interventions. The high reliance on solar lighting in regions such as Ruvuma (61.8%) and Lindi (58.2%) highlights the success of solar distribution programs and market driven solar solutions in areas underserved by the national grid (Table 4.20).

Solar energy is an important backup source of light, especially in rural and off-grid areas. Regions like Lindi (58.2%), Singida (57.3%), Mara (57.0%), and Ruvuma (61.4%) depend heavily on solar power, showing how helpful it is where electricity from the grid is limited. On the other hand, regions such as Dar es Salaam (6.1%) and Kilimanjaro (31.3%) use less solar power because they have better access to electricity.

TABLE 4.20: DISTRIBUTION OF HOUSEHOLDS BY SOURCE OF ENERGY FOR LIGHTING AND REGION IN MAINLAND TANZANIA

Region	Energy Source for lightening							
	Electricity	Kerosene	Candles	Fuelwood	Solar lanterns	Torches	Rechar-geable battery lamp	Other
Dodoma	81.6	-	1.3	0.6	39.6	21.8	1.7	0.3
Arusha	72.1	3.6	12.5	0.6	39.1	5.7	13.1	4.0
Kilimanjaro	84.9	4.3	12.5	-	31.3	12.1	22.7	0.7
Tanga	85.5	9.6	4.8	0.1	47.9	13.3	3.4	1.2
Morogoro	84.5	1.3	5.2	-	46.9	32.2	3.8	4.8
Pwani	87.3	2.6	14.5	1.0	38.8	35.6	8.9	11.0
Dar Es Salaam	94.5	0.6	0.7	-	6.1	1.2	1.3	-
Lindi	63.2	0.2	1.7	2.6	58.2	25.5	2.2	-
Mtwara	66.4	0.4	1.0	0.7	51.7	23.9	1.4	4.6
Ruvuma	62.0	-	4.7	0.4	61.8	23.6	4.5	2.9
Iringa	80.6	0.4	2.1	0.3	37.7	6.3	2.4	2.9
Mbeya	74.7	0.6	2.7	-	32.3	12.7	5.1	1.5
Singida	93.0	0.2	0.2	0.2	57.3	20.5	0.4	-
Tabora	77.4	1.7	1.0	0.3	49.2	31.7	6.3	2.1
Rukwa	63.3	6.5	1.0	0.2	44.7	26.7	2.5	0.8
Kigoma	35.2	-	0.5	0.6	47.4	28.6	3.4	0.6
Shinyanga	43.6	-	0.7	0.7	49.8	25.7	2.0	3.7
Kagera	46.4	7.4	4.6	-	49.6	23.1	3.0	0.8
Mwanza	58.4	1.6	9.6	-	47.7	27.7	6.5	0.7
Mara	93.0	0.3	1.9	0.3	57.0	17.1	2.6	0.2
Manyara	66.8	-	0.6	0.2	50.2	46.3	6.4	1.1
Njombe	79.7	0.2	0.9	0.2	46.7	6.8	1.8	0.2
Katavi	91.5	0.4	2.1	-	40.4	25.2	3.4	0.1
Simiyu	32.2	-	0.1	1.3	38.3	59.8	1.4	4.4
Geita	65.0	-	0.2	0.5	57.0	33.0	2.8	0.8
Songwe	70.9	0.2	4.2	-	46.7	29.0	5.0	-
Mainland Tanzania	**73.2**	**1.8**	**3.8**	**0.3**	**42.1**	**21.8**	**4.6**	**1.9**

CHAPTER FIVE
HOUSEHOLD ENERGY EXPENDITURE AND PURCHASES



© Pieter Bouwer/Unsplash

5.1 INTRODUCTION

Understanding the quantities of energy used by households in mainland Tanzania is important for guiding national energy planning and improving access to affordable, reliable, and clean energy. It helps policymakers identify which fuels are most used, such as fuelwood, charcoal, LPG, or kerosene, and target interventions accordingly. Moreover, tracking energy consumption supports efforts to reduce deforestation and indoor air pollution, and helps monitor progress toward sustainable development goals.

5.2 AVERAGE MONTHLY HOUSEHOLD ENERGY PURCHASES

The findings from HECS 2023 show the typical amount of energy that households in Mainland Tanzania buy each month, based on their household size. It highlights the average use of the four main energy sources commonly used for cooking and heating: LPG, kerosene, fuelwood, and charcoal.

Across all household sizes, fuelwood is the most purchased energy source, with an average of 10 bundles per month. This is followed by charcoal, averaging 9 buckets, LPG at 6 kilograms (kg), and kerosene at 5 liters.

Generally, larger households (with 11 or more members) tend to purchase more energy overall, particularly LPG and fuelwood. However, charcoal use tends to decrease slightly as household size increases, possibly due to shifts in cooking methods or preferences (Table 5.1).

TABLE 5.1: MONTHLY AVERAGE ENERGY PURCHASES BY HOUSEHOLD SIZE AND TYPE OF ENERGY IN MAINLAND TANZANIA (KILOGRAMS)

Household Size	Type of Energy			
	LPG (Kg)	Kerosine (Liter)	Fuelwood (Bundles)	Charcoal (Buckets)
1	6	4	9	10
2-4	6	5	10	9
5-7	7	5	10	8
8-10	6	2	9	8
11+	8	6	10	7
Total	**6**	**5**	**10**	**9**

Table 5.2 provides insights into how household energy purchases vary by place of residence (rural vs. urban), household size, and type of energy in Mainland Tanzania. LPG usage is consistent across rural households regardless of the household size, averaging around 6 kg per month. Even larger households (8–10 and 11+ members) do not show increased usage, staying around 5–6 kg. Urban households tend to use more LPG as household size increases – households with 5–7 members use an average of 7 kg, and those with 11+ members use an average of 8 kg.

In rural areas, fuelwood remains the dominant fuel, with households averaging 9 bundles per month across all household sizes. Large households (11+ members) use around 8–9 bundles, indicating continued reliance on biomass for daily cooking. On the other hand, the use of fuelwood in urban areas is surprisingly higher than rural areas, averaging 11 bundles per month, and peaking at 14 bundles for 11+ member households. This could reflect usage by peri-urban residents or shared households, where traditional cooking is still common.

The use of charcoal in rural households is lower, averaging 6 buckets monthly. Larger households (8–10 and 11+ members) use even less, possibly due to switching to fuelwood which is more readily available in rural areas. Charcoal consumption in urban areas is much higher, averaging 10 buckets per month consistently across all household sizes.

TABLE 5.2: MONTHLY AVERAGE HOUSEHOLD ENERGY PURCHASES BY TYPE OF RESIDENCE, HOUSEHOLD SIZE, AND ENERGY SOURCE IN MAINLAND TANZANIA

Type of energy	Place of residence											
	Rural						Urban					
	1	2-4	5-7	8-10	11+	Total	1	2-4	5-7	8-10	11+	Total
LPG (kg)	6	6	5	5	6	**6**	5	6	7	6	8	**6**
Kerosene (Liter)	5	5	3	3	1	**4**	3	5	10	1	8	**6**
Fuelwood (Bundles)	9	9	10	9	9	**9**	9	11	11	9	14	**11**
Charcoal (Buckets)	7	6	6	4	4	**6**	11	11	10	10	9	**10**

5.3 AVERAGE MONTHLY HOUSEHOLD ENERGY EXPENDITURE

Energy expenditure reflects how much households are willing and able to pay to meet their daily needs for cooking, lighting, and heating. These spending patterns vary significantly depending on household size, location (urban or rural), income levels, and access to energy infrastructure.

Table 5.3 shows the estimated monthly spending rounded to the nearest thousand Tanzanian shillings on four common household energy sources – LPG, kerosene, fuelwood, and charcoal – categorized by household size. On average, households spent TZS 67,000 per month on LPG, with the highest expenditure observed among households with one member, while the lowest (TZS 61,000) was recorded in households with more than 11 members.

Household spending on fuelwood ranges from TZS 14,000 to TZS 17, 000 with an average spending of TZS 15,000 monthly. Fuelwood expenditure increases with household size, indicating more usage in larger families. Households with 11+ members spend the most (TZS 17,000), reflecting higher cooking demand and dependence on biomass.

Charcoal expenditure ranged between TZS 15,000 and TZS 21,000, averaging TZS 19,000 per month. The highest spending was observed in single-person households (TZS 21,000), possibly due to frequent small-scale purchases, which often come at a higher cost (Table 5.3).

TABLE 5.3: AVERAGE MONTHLY HOUSEHOLD ENERGY EXPENDITURE (TZS), BY HOUSEHOLD SIZE AND TYPE OF ENERGY IN MAINLAND TANZANIA - 2023 HECS

Household Size	Type of Energy			
	LPG	Kerosene	Fuelwood	Charcoal
1	69,000	10,000	14,000	21,000
2-4	67,000	14,000	15,000	19,000
5-7	66,000	15,000	16,000	17,000
8-10	68,000	8,000	14,000	18,000
11+	61,000	15,000	17,000	15,000
Total	**67,000**	**14,000**	**15,000**	**19,000**

Furthermore, when analyzing the results based on rural and urban areas, the average expenditure on LPG tends to be lower in rural areas compared to urban areas. For example, rural households of 1 person spend about TZS 54,000, while urban households spend 71,000 TZS per month. In urban areas, LPG expenditure is higher across all household sizes. The highest expenditure is seen in households with 8-10 people (TZS 73,000).

Fuelwood is a commonly used energy source in rural areas, where households consistently spend between 14,000 and 16,000 TZS per month, regardless of household size. In urban areas, fuelwood expenditure ranges from 13,000 TZS for single-person households to 20,000 TZS for those with 11+ members. While fuelwood is also used in urban areas, the spending patterns are more varied compared to the relatively stable expenditure observed in rural areas.

In rural areas, charcoal expenditure stays relatively consistent across all household sizes, averaging about 14,000 TZS. In contrast, urban households spend more on charcoal, with monthly costs ranging between 17,000 TZS and 23,000 TZS.

In rural areas, the highest energy expenditure is on LPG at 56,000 TZS, followed by fuelwood at 16,000 TZS. Similarly, in urban areas, LPG remains the most expensive energy source, with households spending around 69,000 TZS, while charcoal also accounts for a notable share at 20,000 TZS. Overall, energy expenditure tends to increase with household size. In rural areas, larger households (11+ members) spend less on kerosene (3,000 TZS) but more on fuelwood (16,000 TZS) compared to smaller households. A similar pattern is observed in urban areas, although kerosene expenditure among large households remains relatively high at 17,000 TZS.

TABLE 5.4: AVERAGE MONTHLY HOUSEHOLD EXPENDITURE (TZS) ON ENERGY BY PLACE OF RESIDENCE, HOUSEHOLD SIZE, AND ENERGY TYPE IN MAINLAND TANZANIA

Type of energy	Place of residence											
	Rural						Urban					
	1	2-4	5-7	8-10	11+	**Total**	1	2-4	5-7	8-10	11+	**Total**
LPG	54,000	57,000	58,000	50,000	49,000	**56,000**	71,000	69,000	68,000	73,000	63,000	**69,000**
Kerosene	12,000	14,000	9,000	11,000	3,000	**12,000**	8,000	14,000	28,000	3,000	18,000	**17,000**
Fuelwood	14,000	15,000	15,000	14,000	16,000	**15,000**	13,000	16,000	17,000	12,000	20,000	**16,000**
Charcoal	16,000	14,000	14,000	13,000	12,000	**14,000**	23,000	21,000	19,000	21,000	17,000	**20,000**

The results from the 2023 HECS on energy prices reveal significant disparities in the average unit prices of kerosene, fuelwood, and charcoal across different regions. These differences are influenced by factors such as regional resource endowments, transportation infrastructure, urbanization, demand patterns, environmental regulations, and market dynamics.

The price of kerosene ranges from TZS 2,300 (Rukwa, Mtwara) to TZS 4,200 (Lindi, Njombe, Manyara) with the national average of TZS 2,800 per liter. Some regions (e.g., Dodoma, Ruvuma, Iringa, Kigoma, Shinyanga) show no kerosene data, which could indicate low usage or possibly a shift in energy preference. Coastal and well-connected regions such as Dar es Salaam, Arusha, and Tanga have moderate high prices.

The Lindi region recorded the lowest price of fuelwood (TZS 800) per bundle while the highest price was recorded in Tabora and Dar es salaam (TZS 2,200) per bundle. The national average price was TZS 1,600.

Overall, fuelwood tended to be more affordable in regions such as Lindi, Rukwa, and Ruvuma, where it is commonly collected rather than bought. In contrast, urban and peri-urban areas like Dar es Salaam, Tabora, and Singida recorded higher prices, largely due to stricter forest-use regulations, deforestation pressures, and increased transportation costs.

The results also indicate that the average price of charcoal was TZS 2,600 per bucket, with the highest price observed in Njombe region at TZS 6,000 and the lowest price recorded in Ruvuma, Morogoro, and Rukwa at TZS 1,700.

Generally, charcoal exhibits the widest price variation among the energy sources, highlighting significant regional disparities in production, access, and demand. Highland and southern regions such as Njombe and Mtwara report notably high prices, which may be attributed to factors like deforestation-related restrictions, long distances from major production centres, limited local availability, and stricter policy enforcement, including bans or taxation on charcoal. In contrast, regions such as Dar es Salaam maintain more moderate prices at TZS 2,600 per bucket, supported by well-established supply chains. However, these prices may still reflect the effects of increasing urban demand and a tightening supply (Table 5.5).

TABLE 5.5: AVERAGE UNIT PRICE (TZS) OF ENERGIES BY REGION IN MAINLAND TANZANIA

Region	Type of Energy		
	Kerosene (Litre)	Fuelwood (Bundle)	Charcoal (Bucket)
Dodoma	-	1,800	2,000
Arusha	2,900	1,700	3,300
Kilimanjaro	2,800	2,100	2,400
Tanga	3,000	1,200	2,100
Morogoro	2,700	1,600	1,700
Pwani	3,400	1,600	2,000
Dar Es Salaam	3,500	2,200	2,600
Lindi	4,200	800	2,300
Mtwara	2,300	1,700	4,800
Ruvuma	-	1,500	1,700
Iringa	-	2,000	3,300
Mbeya	2,400	1,700	3,100
Singida	3,000	2,000	4,400
Tabora	2,700	2,200	4,200
Rukwa	2,300	1,300	1,700
Kigoma	-	1,500	2,100
Shinyanga	-	1,400	2,800
Kagera	3,000	1,400	2,200
Mwanza	2,800	1,200	1,800
Mara	3,000	1,600	2,300
Manyara	4,200	2,100	4,100
Njombe	4,200	1,700	6,000
Katavi	3,100	2,100	3,100
Simiyu	-	1,600	3,700
Geita	-	1,300	2,400
Songwe	3,000	1,700	2,700
Mainland Tanzania	**2,800**	**1,600**	**2,600**

Compared to traditional biomass fuels, LPG tends to be more consistent in price across regions, primarily due to its centralized distribution and regulation. Price variations reflect differences in distribution logistics, market competition, and access to infrastructure in different regions. In rural areas, where distribution networks are limited and initial setup costs such as purchasing cylinders and stoves are prohibitively high for many households, affordability and access remain significant barriers. Urban centres, especially Dar es Salaam and regional capitals, generally have better access to LPG due to a stronger retail presence and government incentives promoting clean energy.

The Mainland Tanzania average stands at TZS 24,000 for a 6 kg cylinder and TZS 56,000 for a 15 kg cylinder. For the 6 kg cylinder, prices range from as low as TZS 22,000 in Arusha to TZS 26,000 in Mara. For the 15 kg cylinder, the price variation is more pronounced ranging from TZS 53,000 in Rukwa to TZS 64,000 in Kagera. Dar es Salaam (TZS 24,000 for 6 kg and TZS 56,000 for 15 kg) benefit from better supply chains and competition among retailers.

Regions such as Kagera, Mwanza, Katavi and Mara show relatively high prices for the 15 kg cylinder, potentially due to higher transport costs, limited LPG suppliers, and weaker distribution infrastructure. Rukwa recorded the lowest prices for 15 kg LPG, which could suggest proximity to distribution points or subsidies/interventions in those regions (Table 5.6).

TABLE 5.6: AVERAGE PRICE OF LPG BY CYLINDER SIZE AND REGION IN MAINLAND TANZANIA

Region	Size of Cylinder	
	6 Kg	15 Kg
Dodoma	25,000	56,000
Arusha	22,000	54,000
Kilimanjaro	23,000	54,000
Tanga	24,000	56,000
Morogoro	25,000	54,000
Pwani	24,000	56,000
Dar Es Salaam	24,000	56,000
Lindi	25,000	55,000
Mtwara	24,000	55,000
Ruvuma	24,000	55,000
Iringa	24,000	57,000
Mbeya	25,000	56,000
Singida	25,000	55,000
Tabora	25,000	55,000
Rukwa	25,000	53,000
Kigoma	25,000	54,000
Shinyanga	24,000	58,000
Kagera	25,000	64,000
Mwanza	24,000	58,000
Mara	26,000	57,000
Manyara	25,000	54,000
Njombe	25,000	56,000
Katavi	25,000	58,000
Simiyu	25,000	55,000
Geita	25,000	54,000
Songwe	24,000	54,000
Mainland Tanzania	**24,000**	**56,000**

CONCLUSION

The 2023 HECS highlights significant progress in electricity access, particularly in urban areas, and identifies key challenges in the adoption of clean cooking energy. The findings call for stronger policy support for clean energy technologies, improved rural electrification, and greater investment in clean cooking infrastructure to meet national and global sustainability goals.

Despite these gains, rural areas still lag in reliable access to electricity, with many households relying on non-grid solutions such as solar home systems, rechargeable lamps, or batteries — often recharged outside their own homes. Fuel stacking remains widespread, with households using multiple energy sources simultaneously, reflecting both supply insecurity and cultural preferences.

The survey also reveals a high proportion of households that continue to cook with biomass fuels, particularly fuelwood and charcoal, and provides the first-time reliable quantities for these two key fuels in Mainland Tanzania. Both contribute to indoor air pollution, especially where cooking is done indoors with poor ventilation. Adoption of improved cookstoves and clean fuels such as LPG and electricity remains limited in rural settings, largely due to affordability, availability, and awareness gaps

Significant regional disparities in energy access persist, with some zones showing near-universal grid connection while others are still heavily dependent on traditional fuels. Household size, income, and education level also correlate strongly with the type of energy used and the likelihood of transitioning to modern sources.

The results underscore the need for integrated policy approaches that not only expand infrastructure but also address behavioral, financial, and logistical barriers to clean energy use. In addition to reinforcing investments in rural grid expansion and off-grid solutions, there is a clear need to accelerate support for clean cooking programs, including subsidies, microfinancing schemes, and local supply chain development.

RECOMMENDATIONS

To accelerate the transition to sustainable energy and improve household wellbeing in Mainland Tanzania, several strategic policy recommendations emerge from the 2023 HECS findings. First, there is a pressing need to promote clean cooking technologies. This involves increasing public awareness and accessibility of Improved Cookstoves (ICS) and cleaner fuels such as liquefied petroleum gas (LPG), biogas, and electricity. Education campaigns should be conducted to encourage behavioral change by highlighting the health and environmental risks associated with traditional stoves and fuelwood use.

Strengthening rural electrification is also critical. This can be achieved by prioritizing investments in rural energy infrastructure and expanding the reach of mini-grids and solar photovoltaic (PV) systems. Such efforts would help reduce dependence on biomass fuels like fuelwood and charcoal. Solar energy solutions should be enhanced in underserved and off-grid areas where TANESCO's reach remains limited.

Supporting affordability measures is another key intervention. The continued implementation of the subsidized D1 lifeline electricity tariff will help ensure that low-income households maintain access to basic energy services. In addition, the government and partners should develop targeted subsidies or financing options to help households acquire clean energy appliances, such as LPG kits, improved cookstoves, and solar lanterns.

Local production of clean energy technologies should be encouraged to improve availability and reduce costs. Promoting local manufacturing and the assembly of improved cookstoves and solar equipment can help build a domestic market and create employment opportunities. Energy policy should also be integrated with other sectors such as health, environment, and education. For example, cleaner energy use can reduce indoor air pollution, slow deforestation, and improve access to lighting for schoolchildren.

Finally, public-private partnerships (PPPs) should be leveraged to accelerate progress in clean cooking and off-grid electrification. PPP models can attract investment and innovation in the energy sector, while support for energy entrepreneurs through microfinance and incubation programs can spur local solutions and drive sustainable development from the ground up.

CONTENT

APPENDICES

APPENDIX ONE
TABLES

LIST OF TABLES

TABLE 1: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLD BY SEX OF THE HOUSEHOLD HEAD AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Sex		
	Male %	Female %	Total N
Dodoma	65.0	35.0	761,645
Arusha	76.9	23.1	614,212
Kilimanjaro	68.2	31.8	519,263
Tanga	74.8	25.2	682,898
Morogoro	69.7	30.3	853,923
Pwani	70.3	29.7	571,805
Dar Es Salaam	71.6	28.4	1,635,473
Lindi	60.2	39.8	368,434
Mtwara	61.6	38.4	500,353
Ruvuma	76.0	24.0	471,368
Iringa	63.9	36.1	368,793
Mbeya	75.6	24.4	638,471
Singida	75.7	24.3	400,382
Tabora	75.8	24.2	598,909
Rukwa	76.1	23.9	367,096
Kigoma	74.6	25.4	491,515
Shinyanga	73.1	26.9	437,135
Kagera	71.6	28.4	704,890
Mwanza	71.4	28.6	817,178
Mara	67.8	32.2	474,692
Manyara	75.7	24.3	425,230
Njombe	67.3	32.7	279,608
Katavi	81.0	19.0	250,832
Simiyu	75.4	24.6	355,712
Geita	78.9	21.1	567,027
Songwe	78.1	21.9	368,456
Mainland Tanzania	**72.0**	**28.0**	**14,525,300.0**

TABLE 2: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLD MEMBERS BY SEX AND AGE GROUP IN MAINLAND TANZANIA - 2023 HECS

Age	Sex		
	Male %	Female %	Total N
0 - 4	49	51	9,031,693
5 - 9	51	49	9,069,405
10 - 14	50	50	8,647,411
15 - 19	48	52	6,753,887
20 - 24	43	57	5,445,346
25 - 29	44	56	4,744,875
30 - 34	48	52	4,338,747
35 - 39	47	53	3,485,495
40 - 44	49	51	2,992,321
45 - 49	50	50	2,616,101
50 - 54	49	51	2,202,035
55 - 59	49	51	1,381,472
60 - 64	51	49	1,433,539
65 - 69	55	45	857,272
70 - 74	48	52	703,462
75 - 79	47	53	450,051
80 - 84	38	62	340,027
85+	45	55	328,064
Mainland Tanzania	**48**	**52**	**64,821,200**

TABLE 3: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLD BY RELATIONSHIP TO THE HEAD OF HOUSEHOLDS AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Relationship with the Household Head							
	Total	Head of House-hold	Spouse	Son/ Daughter	Father/ Mother	Grand Son/ Daughter	Other Relative	Other Not Relative
	N	%	%	%	%	%	%	%
Dodoma	3,026,032	25.2	14.6	47.5	0.9	7.4	3.8	0.6
Arusha	2,680,556	22.9	15.9	46.8	0.8	7.2	4.9	1.4
Kilimanjaro	1,942,908	26.7	15.4	36.2	1.1	13.7	4.2	2.7
Tanga	3,179,579	21.5	14.0	45.1	1.0	11.2	3.8	3.4
Morogoro	3,637,227	23.5	15.3	41.7	0.8	10.8	5.3	2.6
Pwani	2,352,279	24.3	16.7	42.9	0.8	5.8	4.5	5.0
Dar Es Salaam	5,390,074	30.3	16.0	37.0	0.5	4.9	9.1	2.1
Lindi	1,241,144	29.7	15.3	34.8	1.3	8.8	7.6	2.5
Mtwara	1,681,866	29.7	16.4	35.8	0.9	10.8	5.8	0.6
Ruvuma	2,039,944	23.1	17.1	44.9	0.8	9.7	4.2	0.2
Iringa	1,409,333	26.2	14.8	42.6	0.4	9.6	5.5	1.0
Mbeya	2,500,169	25.5	16.6	44.0	0.6	7.2	4.5	1.6
Singida	2,095,084	19.1	13.5	51.6	0.5	9.7	4.2	1.4
Tabora	3,407,591	17.6	12.8	50.7	0.6	11.4	5.1	1.8
Rukwa	1,743,575	21.1	15.7	53.1	0.6	5.6	3.4	0.5
Kigoma	2,649,244	18.6	13.1	53.3	0.4	8.5	5.3	0.9
Shinyanga	2,362,667	18.5	12.2	51.9	0.5	10.9	4.8	1.1
Kagera	3,045,573	23.1	14.3	49.8	0.3	8.5	3.5	0.4
Mwanza	4,078,427	20.0	12.5	49.2	0.8	12.1	3.7	1.7
Mara	2,654,595	17.9	11.1	52.2	0.8	12.1	3.8	2.1
Manyara	1,774,479	24.0	15.1	48.9	1.1	6.6	3.5	0.8
Njombe	1,016,289	27.5	17.5	41.9	0.7	7.7	3.9	0.9
Katavi	1,388,394	18.1	13.6	51.1	0.4	7.6	4.8	4.4
Simiyu	2,463,177	14.4	10.6	51.5	0.4	18.0	4.1	0.9
Geita	3,509,767	16.2	12.5	54.4	0.5	8.1	6.0	2.3
Songwe	1,551,230	23.8	17.4	46.3	0.6	6.5	4.7	0.8
Mainland Tanzania	**64,821,200**	**22.4**	**14.4**	**46.6**	**0.7**	**9.3**	**4.9**	**1.7**

TABLE 4: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLD BY MARITAL STATUS AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Marital Status							
	Total	Never Married	Married	Living Together	Divorced	Sepa-rated	Widowed	Not stated
	N	%	%	%	%	%	%	%
Dodoma	3,026,032	48.8	40.3	2.2	2.5	1.3	4.8	-
Arusha	2,680,556	43.8	47.9	0.5	1.8	0.8	5.2	-
Kilimanjaro	1,942,908	40.3	44.2	1.2	2.6	2.5	9.2	-
Tanga	3,179,579	46.2	42.4	1.8	2.4	2.0	5.1	-
Morogoro	3,637,227	44.0	35.4	11.2	4.1	1.0	4.2	0.1
Pwani	2,352,279	40.4	46.1	6.0	3.7	1.3	2.4	-
Dar Es Salaam	5,390,074	48.4	39.9	4.1	2.3	1.3	4.1	-
Lindi	1,241,144	40.5	40.3	4.2	8.1	1.3	5.6	-
Mtwara	1,681,866	38.0	45.0	1.1	6.9	3.1	5.8	0.1
Ruvuma	2,039,944	42.5	44.0	4.3	2.9	1.8	4.5	-
Iringa	1,409,333	47.4	40.9	2.1	0.9	1.6	7.0	-
Mbeya	2,500,169	42.6	43.5	4.8	2.0	2.3	4.8	-
Singida	2,095,084	47.9	30.7	13.3	2.8	1.3	4.0	-
Tabora	3,407,591	46.6	38.7	6.6	2.9	2.1	2.9	-
Rukwa	1,743,575	45.1	27.5	19.8	1.8	1.0	4.7	0.1
Kigoma	2,649,244	46.7	42.2	1.0	2.3	1.6	6.2	-
Shinyanga	2,362,667	43.7	50.7	-	1.9	0.4	3.2	0.0
Kagera	3,045,573	43.9	44.5	1.0	2.2	2.5	6.0	-
Mwanza	4,078,427	48.7	37.1	4.4	3.3	1.9	4.4	0.3
Mara	2,654,595	48.4	38.9	2.1	2.4	1.3	6.8	0.1
Manyara	1,774,479	44.3	46.9	0.6	1.0	1.1	4.9	1.2
Njombe	1,016,289	39.7	43.1	7.0	1.3	2.3	6.5	-
Katavi	1,388,394	44.3	39.2	9.1	2.9	1.9	2.4	0.2
Simiyu	2,463,177	47.4	45.9	0.8	2.3	0.4	3.2	-
Geita	3,509,767	47.0	39.0	5.9	4.1	1.1	2.8	-
Songwe	1,551,230	39.2	52.6	0.2	1.9	1.1	4.9	0.0
Mainland Tanzania	**64,821,200**	**45.1**	**41.5**	**4.3**	**2.8**	**1.5**	**4.7**	**0.1**

TABLE 5: NUMBER AND PERCENTAGE OF HOUSEHOLD MEMBERS 5 YEARS AND ABOVE, WHO CAN READ AND WRITE BY ANY TYPE OF LANGUAGE AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Knows how to read and write in English or Kiswahili or both					
	Total	Swahili	English	Swahili & English	Any Other Language	Don't Read/ Write
	N	%	%	%	%	%
Dodoma	2,616,487	73.8	0.2	13.2	-	12.8
Arusha	2,337,267	59.7	0.2	30.9	-	9.3
Kilimanjaro	1,747,778	66.7	0.6	28.4	-	4.3
Tanga	2,761,589	75.4	0.9	10.8	0.1	12.8
Morogoro	3,140,517	72.0	0.3	11.1	-	16.6
Pwani	2,023,561	71.9	0.1	18.3	-	9.8
Dar Es Salaam	4,774,179	47.5	0.5	49.7	0.1	2.3
Lindi	1,136,610	73.5	1.3	6.5	-	18.8
Mtwara	1,496,000	76.5	0.7	9.2	0.1	13.6
Ruvuma	1,790,841	73.1	0.3	15.2	-	11.4
Iringa	1,238,441	80.2	1.3	13.6	-	4.8
Mbeya	2,198,675	60.0	0.4	26.0	0.1	13.6
Singida	1,806,131	81.7	0.4	7.2	0.7	9.9
Tabora	2,885,350	53.8	0.2	17.4	-	28.5
Rukwa	1,499,115	73.2	0.4	8.3	-	18.1
Kigoma	2,238,988	73.6	1.8	6.4	0.5	17.6
Shinyanga	1,896,264	71.0	0.9	10.0	2.3	15.9
Kagera	2,594,708	72.4	0.8	13.8	-	13.0
Mwanza	3,476,921	65.0	0.7	23.2	-	11.1
Mara	2,232,657	71.6	0.6	17.3	0.1	10.4
Manyara	1,598,657	67.8	0.7	7.0	-	24.4
Njombe	892,554	74.7	1.1	14.5	-	9.7
Katavi	1,145,668	57.0	0.1	16.9	0.0	25.9
Simiyu	2,038,218	67.9	1.3	2.3	0.4	28.1
Geita	2,862,284	64.9	1.0	11.1	-	23.0
Songwe	1,360,051	74.4	0.9	13.8	0.5	10.4
Mainland Tanzania	**55,789,508**	**67.5**	**0.6**	**17.7**	**0.2**	**14.0**

TABLE 6: NUMBER AND PERCENTAGE OF HOUSEHOLD MEMBERS BY SCHOOL STATUS AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Schooling Status				
	Total	Attending School	Drop out	Completed	Never Attended School
	N	%	%	%	%
Dodoma	3,026,032	33.3	8.1	45.9	12.7
Arusha	2,680,556	39.6	3.5	55.6	1.3
Kilimanjaro	1,942,908	31.6	8.3	58.8	1.2
Tanga	3,179,579	38.1	7.4	50.9	3.6
Morogoro	3,637,227	32.8	12.2	53.8	1.3
Pwani	2,352,279	34.5	6.6	56.4	2.5
Dar Es Salaam	5,390,074	30.7	5.4	63.6	0.3
Lindi	1,241,144	34.5	19.3	42.1	4.2
Mtwara	1,681,866	30.8	9.2	54.9	5.1
Ruvuma	2,039,944	32.3	5.8	61.0	0.9
Iringa	1,409,333	37.3	4.0	56.8	1.9
Mbeya	2,500,169	37.0	5.3	57.2	0.5
Singida	2,095,084	40.5	4.2	52.1	3.3
Tabora	3,407,591	36.4	12.4	50.7	0.5
Rukwa	1,743,575	37.3	8.0	49.4	5.2
Kigoma	2,649,244	42.2	9.1	45.2	3.5
Shinyanga	2,362,667	33.4	6.7	49.2	10.8
Kagera	3,045,573	39.7	8.9	49.2	2.3
Mwanza	4,078,427	40.3	9.2	48.2	2.3
Mara	2,654,595	44.8	15.4	39.5	0.4
Manyara	1,774,479	39.0	7.7	50.9	2.5
Njombe	1,016,289	33.3	20.3	46.1	0.3
Katavi	1,388,394	38.8	16.9	43.0	1.4
Simiyu	2,463,177	39.7	8.4	48.4	3.5
Geita	3,509,767	43.2	12.9	42.6	1.3
Songwe	1,551,230	31.3	7.6	53.2	7.8
Mainland Tanzania	**64,821,200**	**36.6**	**8.8**	**51.8**	**2.9**

TABLE 7: NUMBER AND PERCENTAGE OF HOUSEHOLD MEMBERS AGED 5 YEARS AND ABOVE BY HIGHEST LEVEL OF FORMAL EDUCATION REACHED AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Highest level of School reached											
	Total	PP	Adult	Primary Education	OSC	MS+ Course	Secondary Education	O+ Course	Advanced Secondary	A+ Course	Diploma	University
	N	%	%	%	%	%	%	%	%	%	%	%
Dodoma	2,616,487	2.4	0.8	70.8	-	-	19.1	0.2	1.2	-	1.5	4.0
Arusha	2,337,267	4.2	0.3	61.9	0.1	0.5	22.5	0.7	1.6	0.8	2.5	4.9
Kilimanjaro	1,747,778	3.1	0.1	63.7	-	1.9	25.2	1.4	0.7	0.2	1.5	2.3
Tanga	2,761,589	3.5	0.2	72.7	-	0.1	19.6	0.2	0.9	0.2	1.0	1.4
Morogoro	3,140,517	3.1	0.1	71.1	-	0.2	20.6	0.8	0.9	-	1.1	2.0
Pwani	2,023,561	3.1	-	68.2	-	0.3	23.7	1.1	0.3	0.4	1.0	2.0
Dar Es Salaam	4,774,179	2.3	0.1	46.4	-	0.7	32.1	1.0	2.2	0.3	5.5	9.5
Lindi	1,136,610	1.8	0.4	76.9	-	0.1	18.7	0.0	0.8	0.0	0.4	0.8
Mtwara	1,496,000	1.7	0.2	74.5	-	-	19.3	0.3	0.3	-	1.5	2.2
Ruvuma	1,790,841	2.1	-	78.8	-	-	14.3	-	0.6	0.2	0.8	3.2
Iringa	1,238,441	3.1	0.2	65.7	0.1	1.0	23.0	0.7	1.4	0.1	1.1	3.5
Mbeya	2,198,675	2.0	-	63.6	-	0.2	25.1	2.2	1.5	-	1.7	3.8
Singida	1,806,131	2.7	-	74.7	-	0.4	17.9	0.6	1.3	-	1.2	1.2
Tabora	2,885,350	1.1	-	70.5	0.1	0.1	21.1	0.9	1.9	0.3	2.4	1.6
Rukwa	1,499,115	3.7	-	74.4	-	0.3	17.7	0.3	0.9	0.2	1.0	1.6
Kigoma	2,238,988	2.9	0.6	75.5	-	-	16.5	0.8	1.0	0.1	0.6	1.9
Shinyanga	1,896,264	2.8	0.1	77.8	0.1	0.1	14.4	0.3	0.6	0.1	1.7	2.1
Kagera	2,594,708	4.7	0.2	73.0	0.2	0.7	18.6	0.7	0.5	-	1.0	0.4
Mwanza	3,476,921	3.5	0.1	62.9	-	0.1	26.8	0.4	1.0	0.2	2.2	2.7
Mara	2,232,657	4.8	-	72.8	-	0.5	18.2	0.7	0.8	0.5	0.8	0.9
Manyara	1,598,657	3.5	0.4	75.1	0.1	0.6	15.3	0.9	0.7	0.4	1.5	1.6
Njombe	892,554	2.7	0.1	70.6	-	0.5	19.8	1.0	1.1	-	2.0	2.2
Katavi	1,145,668	1.2	0.0	72.6	0.1	0.2	21.6	0.7	0.6	0.1	1.5	1.4
Simiyu	2,038,218	2.3	0.3	80.1	-	0.1	13.9	0.1	0.5	-	1.6	1.2
Geita	2,862,284	1.9	0.1	79.0	-	0.2	16.4	0.7	0.7	0.1	0.6	0.4
Songwe	1,360,051	3.5	0.2	73.4	-	0.2	17.8	0.3	0.8	0.1	1.3	2.3
Mainland Tanzania	**55,789,508**	**2.9**	**0.2**	**68.8**	**0.0**	**0.3**	**21.1**	**0.7**	**1.1**	**0.2**	**1.8**	**2.9**

TABLE 8: NUMBER AND PERCENTAGE OF HOUSEHOLDS LINKED TO SMALL BUSINESSES BY TYPE OF BUSINESS AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Type of Business								
	Total HHs	HHs run business	Crop Farming	Cattle Breeding	Charcoal Production	Restau-rants	Brick-yards	Brewery	Other Business
	N	%	%	%	%	%	%	%	%
Dodoma	761,645	74.7	37.5	8.8	-	1.8	1.7	-	4.3
Arusha	614,212	95.6	52.3	35.3	-	5.0	-	-	6.8
Kilimanjaro	519,263	84.1	68.2	54.5	1.5	19.4	1.8	-	76.1
Tanga	682,898	58.1	44.7	6.6	8.3	26.8	-	-	35.9
Morogoro	853,923	40.5	20.0	0.8	3.4	14.9	-	7.9	3.8
Pwani	571,805	82.7	42.5	9.2	1.1	3.4	-	-	15.0
Dar Es Salaam	1,635,473	21.9	5.0	-	-	6.2	-	-	5.3
Lindi	368,434	66.2	64.5	0.5	-	25.1	-	2.8	11.0
Mtwara	500,353	95.6	88.9	11.9	-	-	-	-	-
Ruvuma	471,368	78.4	77.5	4.9	-	9.4	-	-	82.2
Iringa	368,793	45.1	18.6	-	-	9.7	2.5	10.6	27.5
Mbeya	638,471	62.3	22.8	5.2	-	6.6	-	3.2	9.6
Singida	400,382	93.9	75.2	31.8	3.3	5.8	0.9	4.7	3.8
Tabora	598,909	67.9	68.9	23.5	-	4.9	-	-	46.1
Rukwa	367,096	87.1	73.5	13.4	-	-	-	-	19.4
Kigoma	491,515	91.0	41.6	4.6	-	5.7	-	-	3.7
Shinyanga	437,135	55.9	70.8	19.5	6.2	-	-	-	12.2
Kagera	704,890	46.2	39.1	15.0	3.7	4.7	3.9	6.2	4.9
Mwanza	817,178	15.4	5.2	-	-	12.5	-	-	4.8
Mara	474,692	98.5	65.9	31.4	-	-	-	-	11.8
Manyara	425,230	52.2	88.8	58.2	-	18.6	43.0	-	17.3
Njombe	279,608	68.8	54.6	6.1	3.2	11.6	-	7.1	8.2
Katavi	250,832	89.0	74.7	14.2	2.0	7.2	10.0	3.0	8.9
Simiyu	355,712	95.5	86.6	23.9	2.5	8.9	-	-	35.2
Geita	567,027	58.9	20.0	-	-	19.4	-	7.0	10.4
Songwe	368,456	67.0	81.5	21.7	4.2	8.6	-	8.5	34.5
Mainland Tanzania	**14,525,300**	**62.6**	**55.7**	**21.0**	**1.3**	**7.9**	**1.0**	**2.0**	**15.8**

TABLE 9: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY BY REGION AND PLACE OF RESIDENCE, MAINLAND TANZANIA - 2023 HECS

Region	Place of Residence					
	Rural		Urban		All	
	Total HHs	HHs Using Electricity	Total HHs	HHs Using Elec-tricity	Total HHs	HHs Using Electricity
	N	%	N	%	N	%
Dodoma	375,815	74.9	385,830	80.8	761,645	77.9
Arusha	306,048	52.3	308,164	91.4	614,212	71.9
Kilimanjaro	403,430	81.1	115,832	97.8	519,263	84.8
Tanga	437,188	81.7	245,710	91.0	682,898	85.0
Morogoro	416,065	78.1	437,858	87.3	853,923	82.9
Pwani	295,117	80.7	276,688	90.1	571,805	85.3
Dar Es Salaam			1,635,473	90.5	1,635,473	90.5
Lindi	283,522	56.3	84,912	64.0	368,434	58.1
Mtwara	349,368	56.9	150,985	86.5	500,353	65.8
Ruvuma	334,016	59.5	137,352	65.7	471,368	61.3
Iringa	221,163	73.8	147,630	86.4	368,793	78.8
Mbeya	317,481	57.7	320,990	79.3	638,471	68.5
Singida	296,475	89.4	103,907	97.7	400,382	91.5
Tabora	440,312	72.5	158,597	88.6	598,909	76.8
Rukwa	259,058	59.1	108,038	71.6	367,096	62.8
Kigoma	313,083	16.2	178,433	68.0	491,515	35.0
Shinyanga	241,069	18.6	196,066	65.5	437,135	39.6
Kagera	590,419	38.0	114,471	88.5	704,890	46.2
Mwanza	402,856	35.2	414,323	75.7	817,178	55.7
Mara	271,712	90.1	202,981	93.3	474,692	91.5
Manyara	333,098	57.4	92,133	77.9	425,230	61.8
Njombe	170,304	70.7	109,304	87.5	279,608	77.3
Katavi	146,610	94.7	104,222	86.9	250,832	91.5
Simiyu	290,572	24.7	65,140	62.0	355,712	31.5
Geita	356,918	65.4	210,109	58.9	567,027	63.0
Songwe	239,708	60.4	128,748	87.3	368,456	69.7
Mainland Tanzania	**8,091,407**	**61.0**	**6,433,894**	**84.0**	**14,525,300**	**71.2**

TABLE 10: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY SOURCES OF ELECTRICITY AND PLACE OF RESIDENCE IN MAINLAND TANZANIA - 2023 HECS

Sources of Electricity	Place of Residence					
	All		Rural		Urban	
	N	%	N	%	N	%
TANESCO	6,439,609	62.5	1,887,953	38.3	4,551,657	84.7
Local Grid	461,926	4.5	121,408	2.5	340,518	6.3
Own Solar	3,950,525	38.3	2,943,999	59.7	1,006,526	18.7
Generator	12,258	0.1	7,212	0.1	5,046	0.1
Other	690,007	6.7	512,327	10.4	177,680	3.3
Total HHs connected to electricity	**10,307,688**		**4,934,196**		**5,373,493**	

TABLE 11: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY BY REGION AND SOURCE OF ELECTRICITY IN MAINLAND TANZANIA - 2023 HECS

Region	Sources of Electricity					
	HHs Connected to Electricity	TANESCO	Local Grid	Own Solar	Generator	Other
	N	%	N	%	N	%
Dodoma	593,141	50.2	2.4	44.1	0.2	7.2
Arusha	441,455	86.6	0.4	18.8	-	1.5
Kilimanjaro	440,294	85.3	0.5	18.9	0.3	22.9
Tanga	580,590	46.9	-	48.3	-	12.6
Morogoro	707,567	56.3	6.0	50.8	0.3	5.7
Pwani	486,695	60.4	10.4	43.3	0.2	7.9
Dar Es Salaam	1,450,983	96.1	0.8	5.5	0.2	-
Lindi	214,095	42.8	6.0	62.0	-	-
Mtwara	329,370	42.2	-	59.7	-	0.3
Ruvuma	288,842	51.9	1.9	49.5	-	9.6
Iringa	290,242	71.4	2.7	29.4	-	-
Mbeya	437,554	78.6	14.4	27.0	-	0.7
Singida	366,410	35.8	-	60.3	0.2	7.5
Tabora	456,060	43.3	3.6	58.5	-	19.8
Rukwa	230,422	47.7	0.8	56.1	-	0.5
Kigoma	172,076	79.9	44.5	20.8	-	1.4
Shinyanga	173,245	72.1	20.4	19.9	-	10.6
Kagera	325,770	74.9	-	26.9	-	-
Mwanza	455,428	80.4	19.3	31.0	-	-
Mara	434,272	40.0	-	59.3	-	6.7
Manyara	262,285	34.5	0.2	39.6	0.3	31.0
Njombe	216,043	54.1	2.5	45.1	-	2.5
Katavi	229,479	39.0	0.5	57.6	-	13.6
Simiyu	112,060	58.1	1.4	43.7	-	-
Geita	357,209	30.4	5.4	63.6	-	18.6
Songwe	256,099	54.3	1.4	52.9	0.6	1.6
Mainland Tanzania	**10,307,688**	**62.5**	**4.5**	**38.3**	**0.1**	**6.7**

CONTENT

APPENDIX NUMBER 1 /// TABLES

TABLE 12: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY BY TARIFF TYPE AND PLACE OF RESIDENCE IN MAINLAND TANZANIA - 2023 HECS

Place Of Residence	Tariff Type	
	D1 %	T1 %
Rural	68.2	31.8
Urban	46.2	53.8
Mainland Tanzania	**52.6**	**47.4**

TABLE 13: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY BY TARIFF TYPE AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Tariff Type	
	D1 %	T1 %
Dodoma	18.3	81.7
Arusha	19.7	80.3
Kilimanjaro	96.4	3.6
Tanga	71.1	28.9
Morogoro	98.3	1.7
Pwani	55.7	44.3
Dar Es Salaam	24.1	75.9
Lindi	86.1	13.9
Mtwara	40.3	59.7
Ruvuma	28.6	71.4
Iringa	18.0	82.0
Mbeya	60.2	39.8
Singida	45.2	54.8
Tabora	32.0	68.0
Rukwa	72.9	27.1
Kigoma	95.6	4.4
Shinyanga	87.1	12.9
Kagera	82.4	17.6
Mwanza	71.0	29.0
Mara	75.6	24.4
Manyara	93.0	7.0
Njombe	50.6	49.4
Katavi	15.2	84.8
Simiyu	60.7	39.3
Geita	63.7	36.3
Songwe	64.9	35.1
Mainland Tanzania	**52.6**	**47.4**

TABLE 14: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY TARIFF TYPE D1 BY MONTHLY EXPENDITURE AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Amount Spent			
	Less than 5000	5000-10000	10000-15000	15000+
	%	%	%	%
Dodoma	46.2	36.3	11.1	6.4
Arusha	33.0	56.0	9.3	1.7
Kilimanjaro	30.8	47.8	18.1	3.3
Tanga	21.0	48.0	21.5	9.5
Morogoro	31.5	39.4	17.0	12.0
Pwani	13.8	42.3	32.9	11.0
Dar Es Salaam	5.0	34.4	41.9	18.7
Lindi	57.6	35.0	7.4	-
Mtwara	34.3	48.6	17.2	-
Ruvuma	33.0	46.1	12.0	8.9
Iringa	35.6	47.8	9.6	6.9
Mbeya	19.6	52.6	21.7	6.1
Singida	24.8	37.1	19.4	18.7
Tabora	15.6	68.0	16.4	-
Rukwa	55.7	35.2	6.1	3.1
Kigoma	13.6	43.9	31.5	11.0
Shinyanga	21.9	51.3	17.0	9.8
Kagera	51.2	36.3	9.9	2.7
Mwanza	23.7	59.4	12.5	4.4
Mara	34.6	35.2	21.6	8.6
Manyara	27.1	59.8	9.7	3.4
Njombe	14.7	52.0	26.0	7.2
Katavi	50.8	25.8	11.4	12.1
Simiyu	4.8	88.4	6.9	-
Geita	24.1	67.2	5.8	3.0
Songwe	40.4	32.7	12.5	14.4
Mainland Tanzania	**26.9**	**45.6**	**19.5**	**8.0**

TABLE 15: PERCENTAGE DISTRIBUTION OF HOUSEHOLDS USING ELECTRICITY TARIFF TYPE T1 BY MONTHLY EXPENDITURE AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Amount Spent (TZS)			
	Less than 5000	5000-10000	10000-15000	15000+
	%	%	%	%
Dodoma	13.6	42.9	25.9	17.6
Arusha	4.2	41.9	34.2	19.7
Kilimanjaro	30.1	22.7	9.6	37.6
Tanga	7.7	42.3	19.2	30.9
Morogoro	-	-	21.2	78.8
Pwani	14.2	39.3	23.7	22.9
Dar Es Salaam	1.2	15.4	42.7	40.6
Lindi	25.0	50.0	25.0	-
Mtwara	13.4	51.4	16.6	18.6
Ruvuma	28.3	36.8	23.9	10.9
Iringa	10.5	50.1	26.8	12.6
Mbeya	10.3	49.5	25.9	14.3
Singida	17.2	46.3	22.6	13.9
Tabora	18.2	30.4	23.5	27.9
Rukwa	53.3	40.8	5.9	-
Kigoma	-	24.0	-	76.0
Shinyanga	-	-	90.6	9.4
Kagera	43.0	45.2	6.8	5.0
Mwanza	26.8	38.1	19.2	15.9
Mara	25.3	34.6	26.1	14.0
Manyara	14.0	57.3	-	28.7
Njombe	15.5	57.9	17.9	8.8
Katavi	16.0	44.3	21.2	18.5
Simiyu	9.8	35.2	39.3	15.8
Geita	2.6	49.7	26.8	20.9
Songwe	19.7	45.7	16.3	18.4
Mainland Tanzania	**10.2**	**33.1**	**31.0**	**25.8**

TABLE 16: PERCENTAGE DISTRIBUTION OF HOUSEHOLD BY ELECTRICITY CONSUMPTION PER MONTH AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Place of Residence																	
	Rural						Urban						All					
	1-20 kWh	21-40 kWh	41-60 kWh	61-80 kWh	81-100 kWh	100+ kWh	1-20 kWh	21-40 kWh	41-60 kWh	61-80 kWh	81-100 kWh	100+ kWh	1-20 kWh	21-40 kWh	41-60 kWh	61-80 kWh	81-100 kWh	100+ kWh
Dodoma	37.4	55.5	4.3	-	2.9	-	34.8	48.1	9.2	1.1	6.8	-	35.4	49.8	8.0	0.8	5.9	-
Arusha	22.4	63.9	8.6	-	5.1	-	35.1	48.8	11.1	0.4	4.6	-	31.5	53.0	10.4	0.3	4.7	-
Kilimanjaro	0.8	94.4	1.2	0.8	2.1	0.7	0.8	92.3	2.5	2.0	2.3	-	0.8	93.8	1.6	1.2	2.2	0.5
Tanga	8.2	87.6	4.2	-	-	-	15.5	63.0	13.4	2.7	2.8	2.6	12.2	74.2	9.2	1.5	1.5	1.4
Morogoro	-	95.7	4.3	-	-	-	-	83.6	6.4	1.2	6.4	2.4	-	87.0	5.8	0.9	4.6	1.7
Pwani	12.5	72.7	10.1	2.3	2.5	-	15.4	66.9	10.9	1.0	5.8	-	14.5	68.7	10.6	1.4	4.8	-
Dar Es Salaam							10.4	53.4	21.3	2.5	11.1	1.2	10.4	53.4	21.3	2.5	11.1	1.2
Lindi	-		-	-	-	-	16.3	80.3	-	3.4	-	-	7.4	91.0	-	1.6	-	-
Mtwara	25.6	71.2	3.2	-	-	-	25.1	62.0	7.6	-	5.2	-	25.2	63.7	6.8	-	4.3	-
Ruvuma	23.8	67.8	3.6	2.8	1.9	-	32.6	54.3	8.1	3.3	1.8	-	27.6	62.0	5.5	3.0	1.9	-
Iringa	34.0	57.7	5.8	-	2.5	-	32.9	52.5	8.9	3.3	2.5	-	33.4	54.9	7.4	1.8	2.5	-
Mbeya	19.0	75.4	5.7	-	-	-	10.2	75.6	8.8	3.7	1.6	-	13.0	75.5	7.8	2.5	1.1	-
Singida	23.4	67.1	8.4	1.1	-	-	15.8	61.5	19.6	-	3.1	-	20.1	64.7	13.3	0.6	1.4	-
Tabora	28.5	62.7	8.8	-	-	-	18.8	62.9	10.1	1.3	7.0	-	21.8	62.8	9.7	0.9	4.8	-
Rukwa	10.6	89.4	-	-	-	-	8.6	86.7	2.7	-	2.0	-	9.7	88.2	1.2	-	0.9	-
Kigoma	-	83.0	17.0	-	-	-	-	88.3	7.7	4.0	-	-	-	87.4	9.3	3.3	-	-
Shinyanga	-		-	-	-	-	-	89.6	5.1	2.0	3.4	-	-	90.8	4.5	1.8	3.0	-
Kagera	9.3	86.6	3.7	-	0.4	-	4.2	92.4	2.2	1.2	-	-	7.2	89.0	3.1	0.5	0.2	-
Mwanza	1.2	94.6	-	-	4.2	-	8.8	81.7	4.2	3.7	1.6	-	7.1	84.5	3.3	2.9	2.2	-
Mara	3.8	92.3	1.9	1.9	-	-	5.4	78.7	10.8	3.5	1.6	-	4.9	83.0	8.0	3.0	1.1	-
Manyara	2.0	92.6	4.1	-	1.3	-	6.1	91.9	-	2.0	-	-	4.0	92.2	2.1	1.0	0.7	-
Njombe	28.2	63.5	4.8	1.5	2.0	-	27.0	62.8	5.4	2.0	2.0	0.8	27.4	63.0	5.2	1.8	2.0	0.5
Katavi	43.0	54.4	1.3	-	1.3	-	36.0	50.4	8.9	-	4.7	-	38.2	51.6	6.6	-	3.7	-
Simiyu	9.4	90.6	-	-	-	-	7.8	90.0	2.2	-	-	-	8.6	90.3	1.2	-	-	-
Geita	7.3	90.2	-	-	2.5	-	12.0	79.2	6.7	-	2.0	-	9.1	85.9	2.6	-	2.3	-
Songwe	14.5	67.8	10.9	4.0	2.8	-	6.0	70.9	13.5	3.9	5.7	-	8.5	70.0	12.7	4.0	4.8	-
Mainland Tanzania	**13.2**	**80.4**	**4.3**	**0.6**	**1.5**	**0.1**	**13.8**	**65.5**	**12.1**	**2.1**	**5.9**	**0.6**	**13.7**	**69.9**	**9.8**	**1.7**	**4.6**	**0.5**

TABLE 17: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS COOKING MAINLY INDOOR BY REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Cooks Indoor		
	N	Cooks Indoor	Not Indoor
	%	%	%
Dodoma	761,645	48.3	51.7
Arusha	614,212	50.1	49.9
Kilimanjaro	519,263	31.7	68.3
Tanga	682,898	65.1	34.9
Morogoro	853,923	27.6	72.4
Pwani	571,805	61.8	38.2
Dar Es Salaam	1,635,473	81.8	18.2
Lindi	368,434	39.4	60.6
Mtwara	500,353	42.5	57.5
Ruvuma	471,368	34.9	65.1
Iringa	368,793	34.2	65.8
Mbeya	638,471	55.0	45.0
Singida	400,382	21.2	78.8
Tabora	598,909	17.2	82.8
Rukwa	367,096	36.0	64.0
Kigoma	491,515	31.6	68.4
Shinyanga	437,135	33.6	66.4
Kagera	704,890	35.5	64.5
Mwanza	817,178	31.5	68.5
Mara	474,692	22.4	77.6
Manyara	425,230	37.8	62.2
Njombe	279,608	37.3	62.7
Katavi	250,832	35.7	64.3
Simiyu	355,712	11.5	88.5
Geita	567,027	10.2	89.8
Songwe	368,456	56.5	43.5
Mainland Tanzania	**14,525,300**	**42.0**	**58.0**

TABLE 18: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY SOURCES FOR COOKING AND PLACE OF RESIDENCE - 2023 HECS

Source of Cooking	Source of Cooking		
	N	Rural	Urban
N	761,645	48.3	51.7
14,525,300	8,091,407	6,433,894	49.9
Electricity	2.0	0.4	3.4
LPG	24.6	7.5	46.2
Kerosene	0.3	0.1	0.5
Paraffin	0.0	0.0	0.0
Natural gas	-	-	-
Biogas	0.1	0.1	0.1
Bioethanol	0.0	0.0	0.0
Fuelwood	65.5	89.6	35.1
Charcoal	44.0	24.5	68.6
Other	0.6	0.8	0.3

TABLE 19: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY SOURCES FOR COOKING AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Energy Source										
	N	Electricity	LPG	Kerosene	Paraffin	Natural gas	Biogas	Bioethanol	Fuelwood	Charcoal	Other
	N	%	%	%	%	%	%	%	%	%	%
Dodoma	761,645	1.7	22.2	-	-	-	-	-	65.5	36.7	-
Arusha	614,212	4.2	56.3	0.8	-	-	-	-	66.4	32.8	-
Kilimanjaro	519,263	1.0	37.0	1.4	0.2	-	0.4	-	83.5	23.6	0.3
Tanga	682,898	2.3	15.5	-	-	-	-	-	72.8	38.2	1.1
Morogoro	853,923	0.4	16.4	0.6	-	-	-	-	64.2	59.6	-
Pwani	571,805	4.4	37.2	0.4	-	-	-	-	62.7	75.8	0.7
Dar Es Salaam	1,635,473	5.1	74.4	0.4	-	-	-	-	7.6	65.3	-
Lindi	368,434	-	6.4	-	-	-	-	-	82.4	42.3	-
Mtwara	500,353	1.0	11.7	-	-	-	-	-	77.9	29.4	-
Ruvuma	471,368	1.3	7.8	-	-	-	-	-	84.1	31.4	1.9
Iringa	368,793	0.7	25.6	-	-	-	-	-	72.4	41.3	-
Mbeya	638,471	1.7	22.1	0.3	-	-	-	-	61.3	51.0	-
Singida	400,382	1.0	13.5	-	-	-	-	-	82.0	30.6	0.2
Tabora	598,909	0.6	12.0	-	-	-	-	-	67.0	41.6	-
Rukwa	367,096	1.3	6.0	0.3	-	-	-	0.2	73.7	50.2	-
Kigoma	491,515	2.1	5.7	-	-	-	0.3	-	77.2	30.7	-
Shinyanga	437,135	2.2	15.6	-	0.2	-	1.4	-	71.4	36.5	-
Kagera	704,890	0.8	8.1	-	-	-	-	-	84.2	27.1	-
Mwanza	817,178	2.5	28.1	0.9	-	-	-	-	61.8	59.7	-
Mara	474,692	0.2	14.8	-	-	-	0.2	-	78.4	40.6	-
Manyara	425,230	-	16.0	0.2	-	-	-	-	90.0	21.5	13.1
Njombe	279,608	0.5	12.4	-	-	-	0.2	-	76.3	32.3	0.2
Katavi	250,832	0.8	9.9	-	-	-	-	-	53.9	65.6	-
Simiyu	355,712	0.8	6.5	-	-	-	0.2	0.1	91.2	21.8	-
Geita	567,027	-	7.7	-	-	-	-	-	73.6	48.2	-
Songwe	368,456	2.1	15.0	-	-	-	-	-	67.7	43.5	0.2
Mainland Tanzania	**14,525,300**	**2.0**	**24.6**	**0.3**	**0.0**	**-**	**0.1**	**0.0**	**65.5**	**44.0**	**0.6**

TABLE 20: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY TYPE OF STOVE USING FUELWOOD FOR COOKING AND REGION DURING HECS 2023, TANZANIA

Region	Type of Stove								
	N	Three-Stone Stove %	Round Mud Stove %	Improved Cooking Stove %	Rocket Stove %	Burned Mud/Clay Stove %	Lorena 1 Rocket Stove %	Rocket Stove Metal %	Moz Metal Rocket Stove %
Dodoma	497,699	99.4	0.6	-	-	-	-	-	-
Arusha	407,842	98.4	0.6	0.3	0.3	-	0.5	-	-
Kilimanjaro	433,516	88.5	6.2	3.8	-	1.3	-	0.2	-
Tanga	497,099	87.7	11.4	0.2	-	0.6	-	-	-
Morogoro	548,289	98.2	1.2	0.6	-	-	-	-	-
Pwani	357,974	97.9	1.1	-	-	0.5	-	0.5	-
Dar Es Salaam	121,840	100.0	-	-	-	-	-	-	-
Lindi	303,625	98.8	1.0	0.1	-	-	-	-	-
Mtwara	389,895	99.4	0.4	-	0.3	-	-	-	-
Ruvuma	396,457	85.7	3.1	5.6	-	5.7	-	-	-
Iringa	266,578	94.9	2.3	1.5	0.3	1.0	-	-	-
Mbeya	391,591	97.0	1.5	1.1	-	0.4	-	-	-
Singida	328,223	98.7	1.1	0.3	-	-	-	-	-
Tabora	398,232	93.2	3.0	0.2	-	2.4	-	1.2	-
Rukwa	270,447	82.9	17.1	-	-	-	-	-	-
Kigoma	379,311	91.5	5.0	1.9	0.4	1.1	-	-	0.2
Shinyanga	311,704	99.4	0.6	-	-	-	-	-	-
Kagera	593,577	89.1	9.1	1.8	-	-	-	-	-
Mwanza	504,920	99.7	0.3	-	-	-	-	-	-
Mara	372,201	96.2	3.8	-	-	-	-	-	-
Manyara	381,944	98.6	0.4	0.6	-	0.3	-	-	-
Njombe	213,389	76.0	20.1	2.6	0.2	-	-	0.4	0.6
Katavi	135,300	96.3	2.3	1.1	-	0.4	-	-	-
Simiyu	324,372	100.0	-	-	-	-	-	-	-
Geita	417,229	98.9	0.5	-	-	0.5	-	-	-
Songwe	248,529	82.5	12.5	3.9	-	1.0	-	-	-
Mainland Tanzania	**9,491,782**	**94.4**	**3.8**	**1.0**	**0.1**	**0.6**	**0.0**	**0.1**	**0.0**

TABLE 21: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLD BY TYPE OF STOVE USING CHARCOAL FOR COOKING AND REGION DURING HECS 2023, TANZANIA

Region	Type of Stove				
	N	Traditional Charcoal Stove %	Traditional Raised Charcoal Stove %	Old Generation Charcoal ICS %	Ceramic Lined Charcoal ICS %
Dodoma	278,765	5.7	0.4	0.7	93.3
Arusha	201,507	69.7	2.0	23.9	4.4
Kilimanjaro	122,437	17.6	22.6	55.1	4.6
Tanga	260,991	60.7	30.0	5.6	3.6
Morogoro	508,774	4.4	23.8	47.8	24.0
Pwani	432,644	8.0	9.1	46.5	36.3
Dar Es Salaam	1,046,787	51.6	24.2	24.3	-
Lindi	155,950	42.8	41.4	15.4	0.4
Mtwara	147,152	73.0	27.0	-	-
Ruvuma	148,218	26.1	14.2	36.9	22.8
Iringa	152,071	5.4	-	86.2	8.3
Mbeya	325,891	55.5	8.0	20.7	15.8
Singida	122,463	30.6	27.1	0.7	41.6
Tabora	246,909	66.3	3.2	30.6	-
Rukwa	184,411	68.8	29.0	2.2	-
Kigoma	150,769	31.9	24.2	23.2	20.7
Shinyanga	159,435	25.4	73.7	-	1.0
Kagera	190,777	62.6	10.1	19.4	8.0
Mwanza	487,904	66.7	1.1	32.1	0.1
Mara	192,901	30.0	25.3	37.9	6.8
Manyara	91,112	84.9	-	13.9	1.2
Njombe	90,346	40.3	23.7	35.5	0.6
Katavi	164,536	33.3	54.3	11.9	0.4
Simiyu	77,369	37.3	52.9	0.9	8.9
Geita	273,176	43.5	23.5	32.5	0.4
Songwe	159,556	28.4	56.6	4.3	10.7
Mainland Tanzania	**6,372,853**	**41.0**	**20.5**	**25.9**	**12.6**

TABLE 23: OVERALL ENERGY CONSUMPTION (KG) PER YEAR BY HOUSEHOLDS BY PLACE OF RESIDENCE, HOUSEHOLD SIZE AND FUEL TYPE, MAINLAND TANZANIA - 2023 HECS

Place of Residence	Household Size	Fuelwood (Kg)	Charcoal (Kg)	LPG (Kg)
Rural	1	1,141,815,424	105,259,944	5,219,996
	2-4	8,785,191,936	972,354,880	23,760,106
	5-7	8,548,449,280	557,631,808	11,890,802
	8-10	2,869,271,040	126,404,936	1,569,825
	11+	1,014,417,152	27,708,346	320,075
	Total	**22,359,144,448**	**1,789,360,000**	**42,760,804**
Urban	1	340,025,632	308,472,672	27,708,318
	2-4	2,123,460,352	2,129,953,152	108,476,896
	5-7	2,230,567,936	1,482,835,584	64,081,312
	8-10	695,385,024	296,799,872	14,296,810
	11+	217,188,288	33,025,876	906,720
	Total	**5,606,627,328**	**4,251,087,104**	**215,470,064**
Mainland Tanzania	1	1,481,841,024	413,732,608	32,928,312
	2-4	10,908,652,544	3,102,308,096	132,237,008
	5-7	10,779,017,216	2,040,467,456	75,972,112
	8-10	3,564,656,128	423,204,800	15,866,635
	11+	1,231,605,504	60,734,220	1,226,795
	Total	**27,965,771,776**	**6,040,446,976**	**258,230,864**

TABLE 24: OVERALL HOUSEHOLD FUELWOOD CONSUMPTION BY PURPOSE (KG) AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Fuelwood			
	Cooking	Water heating	Space heating	Lighting
Dodoma	1,459,524,224	97,136,592	3,821,780	1,471,625
Arusha	1,005,076,864	304,759,488	3,948,174	1,275,005
Kilimanjaro	1,279,690,880	365,698,016	1,713,165	-
Tanga	1,665,339,648	232,769,760	15,157,972	184,591
Morogoro	1,277,282,944	198,793,888	-	-
Pwani	684,275,072	109,838,984	13,717,459	2,015,220
Dar Es Salaam	226,928,704	26,725,520	-	-
Lindi	623,677,632	116,144,280	-	3,066,984
Mtwara	1,121,795,712	137,682,640	9,944,832	1,188,302
Ruvuma	1,138,310,144	219,290,848	289,450	688,498
Iringa	820,341,888	105,926,040	1,930,410	411,818
Mbeya	995,789,184	148,616,096	2,833,198	-
Singida	886,581,760	125,533,984	749,943	326,810
Tabora	1,148,605,440	164,877,328	4,060,944	649,620
Rukwa	580,220,672	124,765,456	262,423	268,988
Kigoma	737,437,824	73,773,056	632,405	1,104,916
Shinyanga	896,056,320	8,784,053	2,442,786	1,035,594
Kagera	1,588,709,248	168,302,976	1,204,647	-
Mwanza	1,141,567,104	62,727,828	620,307	-
Mara	1,043,783,040	33,235,196	3,151,894	542,945
Manyara	817,894,592	88,022,896	2,934,016	245,173
Njombe	509,847,392	157,899,984	7,372,994	199,426
Katavi	369,248,640	52,439,328	225,255	-
Simiyu	804,262,720	69,566,528	2,289,666	1,721,622
Geita	900,844,224	93,104,152	1,347,613	911,781
Songwe	718,032,064	138,501,264	1,771,360	-
Mainland Tanzania	**24,441,124,864**	**3,424,916,224**	**82,422,688**	**17,308,916**

TABLE 25: OVERALL HOUSEHOLD CHARCOAL CONSUMPTION BY PURPOSE (KG) AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Charcoal		
	Cooking	Water heating	Space heating
Dodoma	215,828,224	26,624,304	350,324
Arusha	104,353,600	37,327,304	318,068
Kilimanjaro	73,340,704	17,996,282	388,456
Tanga	273,619,456	39,345,612	1,668,554
Morogoro	410,470,176	76,434,432	391,963
Pwani	303,917,984	46,064,044	1,430,593
Dar Es Salaam	863,003,200	50,507,808	-
Lindi	134,218,032	21,359,878	-
Mtwara	123,417,752	23,950,008	133,913
Ruvuma	86,922,624	22,498,602	2,460,522
Iringa	116,189,880	24,594,782	5,913,466
Mbeya	278,902,400	57,806,256	10,784,990
Singida	90,676,840	12,837,514	694,163
Tabora	271,220,288	47,922,420	943,931
Rukwa	153,419,952	25,738,492	1,150,618
Kigoma	102,015,136	8,247,236	1,104,944
Shinyanga	134,218,736	7,163,630	-
Kagera	171,407,040	21,649,266	-
Mwanza	390,497,664	38,836,424	2,087,632
Mara	132,835,920	4,517,899	1,688,117
Manyara	40,729,188	10,218,673	1,054,701
Njombe	74,520,432	30,267,776	5,439,429
Katavi	202,428,416	27,764,340	87,762
Simiyu	46,453,288	6,446,410	167,608
Geita	272,755,872	20,421,524	608,600
Songwe	178,481,504	47,074,272	2,119,157
Mainland Tanzania	**5,245,844,480**	**753,615,168**	**40,987,508**

TABLE 26: OVERALL HOUSEHOLD LPG CONSUMPTION BY PURPOSE (KG) AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	LPG		
	Cooking	Water heating	Cooking + Water heating
Dodoma	6,124,114	-	3,861,992
Arusha	10,241,734	320,106	14,852,781
Kilimanjaro	8,169,924	228,215	5,321,973
Tanga	6,159,029	71,037	2,951,407
Morogoro	8,504,526	-	2,558,895
Pwani	6,504,459	-	7,290,665
Dar Es Salaam	64,568,472	242,894	13,166,248
Lindi	1,869,993	-	694,039
Mtwara	2,080,884	-	1,193,948
Ruvuma	2,344,465	-	2,150,214
Iringa	2,295,104	-	2,109,634
Mbeya	6,186,087	88,786	6,801,409
Singida	3,663,225	66,729	1,990,373
Tabora	2,737,835	33,786	840,900
Rukwa	1,564,408	211,442	363,285
Kigoma	3,384,988	261,299	1,081,592
Shinyanga	3,714,071	-	669,127
Kagera	1,583,185	-	847,501
Mwanza	13,812,429	-	1,831,341
Mara	4,436,793	-	822,660
Manyara	2,748,809	18,778	1,982,011
Njombe	2,485,505	-	2,185,677
Katavi	1,396,449	-	1,478,318
Simiyu	1,654,783	39,441	873,557
Geita	2,588,481	-	744,841
Songwe	3,291,896	227,741	3,536,689
Mainland Tanzania	**174,111,648**	**1,810,254**	**82,201,080**

TABLE 27: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY MAIN SOURCE OF ENERGY USED FOR WATER HEATING AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Source												
	Total HHs	HHs heat up water regularly for other purposes than cooking	Electricity	LPG	Kerosene	Paraffin	Natural gas	Biogas	Bioethanol	Fuelwood	Charcoal	Solar heat	Other
	N	%	%	%	%	%	%	%	%	%	%	%	%
Dodoma	761,645	37.1	3.5	16.8	-	-	-		-	56.2	29.9	-	-
Arusha	614,212	91.4	10.2	36.7	0.6	-	-		-	64.9	17.5	-	-
Kilimanjaro	519,263	82.4	2.9	17.1	0.2	-	-	-	0.2	83.7	9.7	-	-
Tanga	682,898	55.4	7.9	7.5	-	-	-		0.3	71.7	25.4	0.4	3.1
Morogoro	853,923	53.3	1.4	7.7	0.2	-	-		-	60.3	48.7	0.4	-
Pwani	571,805	62.7	4.9	26.7	-	-	-		-	58.7	61.3	0.3	1.7
Dar Es Salaam	1,635,473	24.0	25.3	45.5	-	-	-		-	7.8	36.0	-	-
Lindi	368,434	69.4	0.7	2.4	-	-	-		-	81.7	22.2	0.2	-
Mtwara	500,353	64.9	-	6.2	-	-	-		-	77.5	21.7	-	-
Ruvuma	471,368	88.7	2.1	4.1	-	-	-		-	83.9	19.1	-	1.4
Iringa	368,793	51.2	5.2	20.1	-	-	-		-	60.8	33.1	-	0.5
Mbeya	638,471	56.3	4.9	19.4	0.6	-	-		-	57.9	41.5	-	-
Singida	400,382	60.2	1.7	8.1	-	-	-		-	82.4	17.8	-	0.7
Tabora	598,909	71.0	1.2	5.3	-	-	-		-	67.3	35.2	-	-
Rukwa	367,096	63.9	3.5	2.8	0.3	-	-		-	75.9	32.7	0.3	-
Kigoma	491,515	32.9	2.0	4.3	-	-	0.9	-	-	78.2	20.7	-	-
Shinyanga	437,135	11.0	14.3	20.5	-	-	7.5	-	-	39.5	42.3	-	-
Kagera	704,890	48.0	5.6	6.1	-	-	-		-	80.4	19.1	-	-
Mwanza	817,178	33.5	10.1	6.4	-	-	-		-	54.7	54.7	-	-
Mara	474,692	38.5	0.6	5.5	-	-	-		-	79.3	20.0	-	-
Manyara	425,230	50.9	0.9	16.2	-	0.4	-		-	83.0	18.2	0.3	9.3
Njombe	279,608	98.2	3.0	5.4	-	-	-	-	-	75.0	27.9	0.3	0.6
Katavi	250,832	48.8	2.1	9.4	-	-	-		-	52.2	62.6	-	-
Simiyu	355,712	39.1	1.5	5.9	-	-	-	-	0.3	90.0	19.5	-	-
Geita	567,027	44.3	3.1	3.6	-	-	-		-	69.5	28.4	-	-
Songwe	368,456	68.2	4.3	11.1	-	-	-		-	64.2	31.3	-	0.7
Mainland Tanzania	**14,525,300**	**52.1**	**5.3**	**13.7**	**0.1**	**0.0**	**0.1**	**-**	**0.0**	**67.3**	**29.9**	**0.1**	**0.7**

TABLE 28: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS MAINLY COOKED INDOORS THAT HEATING DWELLING BY REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Heating Dwelling		
	HHs mainly cooked indoors	Heated	Not Heated
	N	%	%
Dodoma	367,102	3.6	96.4
Arusha	307,814	3.4	96.6
Kilimanjaro	164,444	3.6	96.4
Tanga	444,607	9.3	90.7
Morogoro	235,995	0.5	99.5
Pwani	352,827	6.7	93.3
Dar Es Salaam	1,311,197	-	100.0
Lindi	145,040	0.5	99.5
Mtwara	212,581	8.7	91.3
Ruvuma	164,651	9.2	90.8
Iringa	125,909	16.5	83.5
Mbeya	351,081	13.5	86.5
Singida	84,857	9.6	90.4
Tabora	102,110	8.6	91.4
Rukwa	132,016	4.6	95.4
Kigoma	155,154	3.4	96.6
Shinyanga	146,904	4.4	95.6
Kagera	250,006	4.6	95.4
Mwanza	257,529	4.5	95.5
Mara	106,163	14.1	85.9
Manyara	160,315	11.6	88.4
Njombe	104,239	23.2	76.8
Katavi	89,620	0.6	99.4
Simiyu	40,998	12.4	87.6
Geita	57,650	7.0	93.0
Songwe	207,569	6.4	93.6
Mainland Tanzania	**6,078,378**	**5.5**	**94.5**

TABLE 29: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS HEATED DWELLING BY SOURCE OF ENERGY FOR SPACE HEATING AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Main Source								
	HHs Heated Dwelling	Electri-city	Natural gas	LPG	Kerosene	Fuelwood	Charcoal	Solar heat	Other
	N	%	%	%	%	%	%	%	%
Dodoma	13,331	-	-	-	-	63.8	21.5	-	14.7
Arusha	10,343	-	-	-	-	64.5	23.6	-	11.9
Kilimanjaro	5,846	-	-	-	-	74.5	25.5	-	-
Tanga	41,135	2.9	-	-	-	66.3	27.2	-	3.6
Morogoro	1,074	-	-	-	-	-	100.0	-	-
Pwani	23,589	-	-	-	-	73.3	39.8	-	-
Lindi	672	-	-	-	-	-	-	-	100.0
Mtwara	18,592	4.9	-	-	-	93.1	6.9	-	-
Ruvuma	15,159	6.9	-	-	-	12.2	81.0	-	-
Iringa	20,743	-	-	-	-	16.4	81.2	-	2.4
Mbeya	47,285	-	-	-	-	14.4	85.6	-	-
Singida	8,164	11.8	-	-	-	12.6	72.1	-	15.4
Tabora	8,768	-	-	-	-	51.5	29.5	-	19.0
Rukwa	6,097	-	-	-	-	25.7	74.3	-	-
Kigoma	5,349	-	-	-	-	56.7	43.3	-	-
Shinyanga	6,447	15.9	-	-	-	89.8	-	-	10.2
Kagera	11,378	7.9	-	-	-	31.3	-	-	60.7
Mwanza	11,518	-	-	-	-	22.9	57.4	-	19.7
Mara	14,963	-	-	-	-	47.4	34.9	-	17.7
Manyara	18,580	-	-	-	-	44.2	50.2	-	9.8
Njombe	24,187	-	-	-	-	32.9	60.9	-	6.2
Katavi	549	-	-	-	-	56.2	43.8	-	-
Simiyu	5,066	-	-	-	-	100.0	12.7	-	-
Geita	4,049	-	-	-	-	58.8	41.2	-	-
Songwe	13,250	-	-	-	-	29.8	55.9	-	14.3
Mainland Tanzania	**336,134**	**1.8**	**-**	**-**	**-**	**44.8**	**47.8**	**-**	**7.9**

TABLE 30: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS HEATED DWELLING BY MEANS OF HEATING DWELLING AND REGION IN MAINLAND TANZANIA - 2023 HECS

Region	Means of Heating Dwelling				
	HHs Heated Dwelling	Open Fire	Portable Stove	Stationary Oven	Reversable AC
	N	%	%	%	%
Dodoma	13,331	78.5	21.5	-	-
Arusha	10,343	76.4	23.6	-	-
Kilimanjaro	5,846	74.5	25.5	-	-
Tanga	41,135	69.9	27.2	-	2.9
Morogoro	1,074	-	100.0	-	-
Pwani	23,589	73.3	26.7	-	-
Lindi	672	100.0	-	-	-
Mtwara	18,592	93.1	6.9	-	-
Ruvuma	15,159	12.2	81.0	-	6.9
Iringa	20,743	18.8	81.2	-	-
Mbeya	47,285	14.4	85.6	-	-
Singida	8,164	27.9	60.2	-	11.8
Tabora	8,768	70.5	29.5	-	-
Rukwa	6,097	25.7	74.3	-	-
Kigoma	5,349	56.7	43.3	-	-
Shinyanga	6,447	100.0	-	-	-
Kagera	11,378	82.2	9.8	-	7.9
Mwanza	11,518	42.6	57.4	-	-
Mara	14,963	47.4	34.9	17.7	-
Manyara	18,580	49.8	50.2	-	-
Njombe	24,187	39.1	60.9	-	-
Katavi	549	56.2	43.8	-	-
Simiyu	5,066	100.0	-	-	-
Geita	4,049	58.8	41.2	-	-
Songwe	13,250	44.1	55.9	-	-
Mainland Tanzania	**336,134**	**51.3**	**46.7**	**0.8**	**1.2**

TABLE 31: NUMBER AND PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY SOURCE OF ENERGY FOR LIGHTING AND REGION - 2023 HECS

Region	Energy Source for Lightening								
		Electri-city	Kerosene	Candles	Fuel-wood	Solar lanterns	Torches	Rechar-geable battery lamp	Other
	N	%	%	%	%	%	%	%	%
Dodoma	721,347.8	81.6	-	1.3	0.6	39.6	21.8	1.7	0.3
Arusha	612,446.9	72.1	3.6	12.5	0.6	39.1	5.7	13.1	4.0
Kilimanjaro	517,374.1	84.9	4.3	12.5	-	31.3	12.1	22.7	0.7
Tanga	678,918.5	85.5	9.6	4.8	0.1	47.9	13.3	3.4	1.2
Morogoro	837,160.3	84.5	1.3	5.2	-	46.9	32.2	3.8	4.8
Pwani	561,492.8	87.3	2.6	14.5	1.0	38.8	35.6	8.9	11.0
Dar Es Salaam	1,521,146.3	94.5	0.6	0.7	-	6.1	1.2	1.3	-
Lindi	326,799.2	63.2	0.2	1.7	2.6	58.2	25.5	2.2	-
Mtwara	491,362.4	66.4	0.4	1.0	0.7	51.7	23.9	1.4	4.6
Ruvuma	467,479.6	62.0	-	4.7	0.4	61.8	23.6	4.5	2.9
Iringa	359,806.7	80.6	0.4	2.1	0.3	37.7	6.3	2.4	2.9
Mbeya	566,741.7	74.7	0.6	2.7	-	32.3	12.7	5.1	1.5
Singida	393,941.9	93.0	0.2	0.2	0.2	57.3	20.5	0.4	-
Tabora	584,151.8	77.4	1.7	1.0	0.3	49.2	31.7	6.3	2.1
Rukwa	364,274.2	63.3	6.5	1.0	0.2	44.7	26.7	2.5	0.8
Kigoma	488,432.6	35.2	-	0.5	0.6	47.4	28.6	3.4	0.6
Shinyanga	396,103.8	43.6	-	0.7	0.7	49.8	25.7	2.0	3.7
Kagera	703,544.6	46.4	7.4	4.6	-	49.6	23.1	3.0	0.8
Mwanza	786,820.8	58.4	1.6	9.6	-	47.7	27.7	6.5	0.7
Mara	473,002.5	93.0	0.3	1.9	0.3	57.0	17.1	2.6	0.2
Manyara	388,828.5	66.8	-	0.6	0.2	50.2	46.3	6.4	1.1
Njombe	271,944.9	79.7	0.2	0.9	0.2	46.7	6.8	1.8	0.2
Katavi	250,831.9	91.5	0.4	2.1	-	40.4	25.2	3.4	0.1
Simiyu	352,931.1	32.2	-	0.1	1.3	38.3	59.8	1.4	4.4
Geita	548,503.2	65.0	-	0.2	0.5	57.0	33.0	2.8	0.8
Songwe	360,033.8	70.9	0.2	4.2	-	46.7	29.0	5.0	-
Mainland Tanzania	**14,025,422.0**	**73.2**	**1.8**	**3.8**	**0.3**	**42.1**	**21.8**	**4.6**	**1.9**

TABLE 33: AVERAGE ENERGY PURCHASED PER MONTH BY HOUSEHOLDS BY PLACE OF RESIDENCE, HOUSEHOLD SIZE AND ENERGY TYPE, MAINLAND TANZANIA - 2023 HECS

Type of energy	Place of residence											
	Rural						Urban					
	1	2-4	5-7	8-10	11+	**Total**	1	2-4	5-7	8-10	11+	**Total**
LPG (kg)	6	6	5	5	6	**6**	5	6	7	6	8	**6**
Kerosene (Liter)	5	5	3	3	1	**4**	3	5	10	1	8	**6**
Fuelwood (Bundles)	9	9	10	9	9	**9**	9	11	11	9	14	**11**
Charcoal (Buckets)	7	6	6	4	4	**6**	11	11	10	10	9	**10**

TABLE 34: AVERAGE HOUSEHOLD EXPENDITURE (TZS) ON ENERGY PER MONTH BY HOUSEHOLD SIZE AND ENERGY TYPE, MAINLAND TANZANIA - 2023 HECS

Household Size	Type of Energy			
	LPG	Kerosene	Fuelwood	Charcoal
1	69,000	10,000	14,000	21,000
2-4	67,000	14,000	15,000	19,000
5-7	66,000	15,000	16,000	17,000
8-10	68,000	8,000	14,000	18,000
11+	61,000	15,000	17,000	15,000
Total	**67,000**	**14,000**	**15,000**	**19,000**

TABLE 35: AVERAGE HOUSEHOLD EXPENDITURE (TZSH) ON ENERGY PER MONTH BY PLACE OF RESIDENCE, HOUSEHOLD SIZE AND ENERGY TYPE, MAINLAND TANZANIA - 2023 HECS

Type of energy	Place of residence											
	Rural						Urban					
	1	2-4	5-7	8-10	11+	**Total**	1	2-4	5-7	8-10	11+	**Total**
LPG	54,000	57,000	58,000	50,000	49,000	**56,000**	71,000	69,000	68,000	73,000	63,000	**69,000**
Kerosene	12,000	14,000	9,000	11,000	3,000	**12,000**	8,000	14,000	28,000	3,000	18,000	**17,000**
Fuelwood	14,000	15,000	15,000	14,000	16,000	**15,000**	13,000	16,000	17,000	12,000	20,000	**16,000**
Charcoal	16,000	14,000	14,000	13,000	12,000	**14,000**	23,000	21,000	19,000	21,000	17,000	**20,000**

TABLE 36: UNIT PRICE (TZS) OF ENERGIES BY PLACE OF RESIDENCE, MAINLAND TANZANIA - 2023 HECS

Type of Energy	Place of Residence		
	Rural	Urban	Total
Kerosene (Liter)	2,800	2,900	**2,800**
Fuelwood (Bundle)	1,600	1,500	**1,600**
Charcoal (Bucket)	3,000	2,400	**2,600**

TABLE 37: UNIT PRICE (TZS) OF ENERGIES BY REGION, MAINLAND TANZANIA - 2023 HECS

Region	Type of Energy		
	Kerosene (Litre)	Fuelwood (Bundle)	Charcoal (Bucket)
Dodoma	-	1,800	2,000
Arusha	2,900	1,700	3,300
Kilimanjaro	2,800	2,100	2,400
Tanga	3,000	1,200	2,100
Morogoro	2,700	1,600	1,700
Pwani	3,400	1,600	2,000
Dar Es Salaam	3,500	2,200	2,600
Lindi	4,200	800	2,300
Mtwara	2,300	1,700	4,800
Ruvuma	-	1,500	1,700
Iringa	-	2,000	3,300
Mbeya	2,400	1,700	3,100
Singida	3,000	2,000	4,400
Tabora	2,700	2,200	4,200
Rukwa	2,300	1,300	1,700
Kigoma	-	1,500	2,100
Shinyanga	-	1,400	2,800
Kagera	3,000	1,400	2,200
Mwanza	2,800	1,200	1,800
Mara	3,000	1,600	2,300
Manyara	4,200	2,100	4,100
Njombe	4,200	1,700	6,000
Katavi	3,100	2,100	3,100
Simiyu	-	1,600	3,700
Geita	-	1,300	2,400
Songwe	3,000	1,700	2,700
Mainland Tanzania	**2,800**	**1,600**	**2,600**

TABLE 38: THE PRICE OF LPG BY CYLINDER SIZE AND REGION - 2023 HECS

Region	Size of Cylinder	
	6 Kg	15 Kg
Dodoma	25,000	56,000
Arusha	22,000	54,000
Kilimanjaro	23,000	54,000
Tanga	24,000	56,000
Morogoro	25,000	54,000
Pwani	24,000	56,000
Dar Es Salaam	24,000	56,000
Lindi	25,000	55,000
Mtwara	24,000	55,000
Ruvuma	24,000	55,000
Iringa	24,000	57,000
Mbeya	25,000	56,000
Singida	25,000	55,000
Tabora	25,000	55,000
Rukwa	25,000	53,000
Kigoma	25,000	54,000
Shinyanga	24,000	58,000
Kagera	25,000	64,000
Mwanza	24,000	58,000
Mara	26,000	57,000
Manyara	25,000	54,000
Njombe	25,000	56,000
Katavi	25,000	58,000
Simiyu	25,000	55,000
Geita	25,000	54,000
Songwe	24,000	54,000
Mainland Tanzania	**24,000**	**56,000**

TABLE 39: THE PRICE OF LPG BY CYLINDER SIZE AND PLACE OF RESIDENCE IN MAINLAND TANZANIA - 2023 HECS

Place of Residence	Size of Cylinder	
	6 Kg	15 Kg
Rural	24,000	55,000
Urban	24,000	56,000
Total	**24,000**	**56,000**

APPENDIX TWO
QUESTIONNAIRE

CONFIDENTIAL

United Republic of Tanzania

HOUSEHOLD ENERGY CONSUMPTION SURVEY 2023/24

(This information is collected under the Statistics Act, [Cap 351 R.E 2019])

THIS INFORMATION IS STRICTLY CONFIDENTIAL AND IS TO BE USED FOR STATISTICAL PURPOSES ONLY

Executed by the Ministry of Energy and National Bureau of Statistics

IDENTIFICATION DETAILS 0.

HH GPS Coordinates

Y(S) ☐☐☐☐☐☐

X(E) ☐☐☐☐☐☐

	CODE	NAME
1. REGION	☐☐	.....
2. DISTRICT	☐☐	.....
3. COUNCIL	☐☐	.....
4. ELECTION STATE	☐	.....
5. DIVISION	☐	.....
6. WARD/SHEHIA	☐☐☐	.....
7. VILLAGE/MTAA	☐☐	.....
8. ENUMERATION AREA (EA)	☐☐☐	.....
9. HOUSEHOLD NUMBER & NAME OF HOUSEHOLD HEAD	☐☐☐	.....
10. NAME OF LOCAL LEADER/SHEHA		.....
11. PHONE NUMBER OF LOCAL LEADER/SHEHA	☐☐☐☐☐☐☐☐☐☐	
12. NAME OF ENUMERATOR & ID	☐☐	.....
13. PHONE NUMBER OF ENUMERATOR	☐☐☐☐☐☐☐☐☐☐	
14. DATE OF INTERVIEW		...../...../.....
15. DID THE HOUSEHOLD AGREE TO BE INTERVIEWED?	☐	

YES.....1 NO 2

SECTION I: HOUSEHOLD MEMBERS

IN ORDER TO MAKE A COMPREHENSIVE LIST OF INDIVIDUALS CONNECTED TO THE HOUSEHOLD, USE THE FOLLOWING PROBE QUESTIONS:

First, give me the names of all the members of your immediate family who normally live and eat their meals together here.

WRITE DOWN NAMES, SEX, AND RELATIONSHIP TO HH HEAD. LIST HOUSEHOLD HEAD ON LINE 1.

Then, give me the names of any other persons related to you or other household members who normally live and eat their meals together here.

Then, give me the names of other persons who are not present now but normally live and eat their meals here. For example, are there members studying elsewhere or travelling.

Finally, give me the names of any other persons not related to you or other household members who normally live and eat their meals together here, such as servants, lodgers, or other who are not relatives.

DO NOT LIST SERVANTS WHO HAVE A HOUSEHOLD ELSEWHERE, AND GUESTS WHO ARE VISITING TEMPORARILY AND HAVE A HOUSEHOLD ELSEWHERE.

	1. NAME MAKE A COMPLETE LIST OF ALL INDIVIDUALS WHO NORMALLY LIVED AND ATE THEIR MEALS TOGETHER IN THIS HOUSEHOLD IN THE PAST 6 MONTHS, STARTING WITH THE HEAD OF HOUSEHOLD. (CONFIRM THAT HOUSEHOLD HEAD HERE IS SAME AS HOUSEHOLD HEAD LISTED ON COVER.)	2. What is the sex of [NAME]? MALE.....1 FEMALE..2	3. What is [NAME]'s relationship to the head? HEAD OF HOUSEHOLD SPOUSE SON/DAUGHTER BROTHER/SISTER GRAND SON/DAUGHTER OTHER RELATIVE OTHER NOT RELATIVE	4. How old is [NAME]? IF LESS THAN 1 YEAR OF AGE, TYPE ZERO	5. What is [NAME]'s current marital status? Never Married.....1 Married.....2 Living Together.....3 Divorced.....4 Separated.....5 Widowed.....6 Not stated.....7	6. What is the main economic activity of (NAME)?
	LIST	CODE	CODE	YEAR	CODE	CODE
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

SECTION II: EDUCATION

	For all household member 5 years and older we would like to know about their education.		
	1.Can [Name] read and write ?	2. What is the schooling status of (NAME)?	3.What is the highest grade of education [Name] completed?
INDIVIDUAL ID	Kiswahili.....1 English.....2 Kiswahili & English.....3 Any other language .....4 Don't Read/Write.....5	Attending School.....1 Dropped Out.....2 Completed.....3 Never Attended School...4	PP...1 ADULT...1 **PRIMARY** D1...11 D2...12 D3...13 D4...14 D5...15 D6...16 D7...17 D8...18 OSC...19 MS+COURSE...20 **SECONDARY** F1...21 F2...22 F3...23 F4...25 O+COURSE...25 F5...31 F6...32 A+COURSE...33 DIPLOMA...34 **UNIVERSITY & EQUIVALENT** U1...41 U2...42 U3...43 U4...44 U5&+...45
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Section 1: Businesses operation

Questions asked/Variables requested	Yes=1/no=2	Share	Specification
1. Did you run one or more business linked to your household in 2023?			
1.1. Was this the only income?			
1.2. Is it possible to separate the energy consumption of business activities from private consumption?			
Type of business			
Crop Farming			
Livestock breeding			
Charcoal production			
Restaurant			
Brickyard			
Brewery			
Other			

Section 2: Electricity

Questions asked/Variables requested	Yes=1/no=2	Frequency annually=1 monthly=2	Quantity in l/kwh	Specification	Expenditures
2. Did your household use Electricity during the period of January to December 2023?					
2.1. What were the sources of your electricity?					
Tanesco					
Minigrid					
Own solar					
Own generator					
Diesel					
Petrol					
Kerosene					
Other					
Other					
2.2.Is electricity used for					
Business					
Lighting					
Consumer/office electronics					
Kitchen appliances					
Charger					
Air condition					
Other					
2.3. What were the quantities purchased in the last month?					
D1 Contract					
T1 Contract					
T2 Contract					
T3 Contract					
2.4.1 How much did you pay for electricity in the last month?					

Section 3: Cooking

Questions asked/Variables requested	Yes=1/no=2	Frequency	Quantity in kg	Specification
3. Do you cook mainly indoors				
3.1. Do you use cooking activity during cool season also for space heating?				
3.2 Do you use cooking also for water heating for other purposes than cooking, e.g. dish washing or body care?				
3.3. Do you use electricity for cooking?				
3.4 Do you use LPG for cooking?				
3.5. Do you use kerosene for cooking?				
3.6. Do you use paraffin for cooking?				
3.7. Do you use natural gas for cooking?				
3.8. Do you use biogas for cooking?				
3.9. Do you use bioethanol for cooking?				
3.10. Do you use fire wood for cooking?				
Three-stone stove				
Round mud stove				
Improved cooking stove				
Rocket stove				
Burned mud/clay stove				
Lorena 1 Rocket stove				
Rocket stove metal				
Lorena 2 Rocket stove				
Moz Metal rocket stove				
3.10.3 Do you heat up water for other purposes than cooking (e.g. dish washing) directly after cooking?				
3.11.Do you use charcoal for cooking?				
Traditional charcoal stove				
Traditional raised charcoal stove				
Old generation charcoal ICS				
Ceramic lined charcoal ICS				
3.11.3 Do you heat up water for other purposes like cooking directly after cooking?				
3.12.Do you use other?				
3.13.Do you use other?				
3.14.Do you use other?				

Section 4: Water heating

Questions asked/Variables requested	Yes=1/no=2	Frequency	Quantity in kg	Specification	m³/kWh
4.1. Do you heat up water regularly for other purposes than cooking and independently from cooking ?					
4.2 Do you use electricity for water heating?					
4.3 Do you use LPG for heating?					
4.4.Do you use kerosene for water heating?					
4.5.Do you use paraffin for water heating?					
4.6.Do you use natural gas for water heating ?					
4.7.Do you use biogas for water heating ?					
4.8.Do you use bioethanol for water heating?					
4.9 Do you use fire wood for water heating?					
4.10 Do you use charcoal for water heating?					
4.11 Do you use solar heat for water heating?					
4.12.Do you use other ?					
4.13.Do you use other ?					

Section 5: Space heating

Questions asked/Variables requested	Yes=1/no=2	Period	Quantity in kg	Specification	m³/kWh
5.0 Do you use additional energy commodities for space heating?					
5.1 Do you heat your dwellings during the cool season?					
5.2.Did you use electricity for space heating?					
5.3.Did you use natural gas for space heating ?					
5.4.Did you use biogas for space heating?					
5.5.Did you use LPG for space heating?					
5.6.Did you use kerosene for space heating?					
5.7.Did you use fire wood for space heating?					
5.8.Did you use charcoal for space heating?					
5.9.Did you use Solar heat for space heating?					
5.10.Did you use other ?					
5.12.What is your main heating system?					
Open fire					
Portable stove					
Stationary oven					
Reversable AC					
Electric heater					
Solar heating systsem					

Section 6: Lighting

Questions asked/Variables requested	Yes=1/no=2	Room nr	Time	Specification	Quantity/Frequency
6.0 Did you light your dwelling in 2023 regularly?					
6.1.Did you use electricity for lighting (excluding torches and solar lantern)?					
6.2.Did you use LPG for lighting?					
6.3.Did you use kerosene lighting?					
6.4.Did you use candles for lighting (paraffin wax)?					
6.5.Did you use acetylene for lighting ?					
6.6.Did you use biogas for lighting?					
6.7.Did you use fire wood for lighting?					
6.8.Did you use solar lanterns for lighting ?					
6.9.Did you use torches (using dry cells) for lighting ?					
6.10.Did you use rechargeable battery lamp for lighting ?					
6.11.Did you use other?					

Section 7: Quantities used/related expenditures

Questions asked/Variables requested	Purchased Yes=1/no=2	Consumption annually=1 monthly=2	Unit/Size kg/l/m³/basket	Quantity	Expenditures	Storage period
LPG						
Kerosene						
Paraffin						
Acethylene						
Candles						
Natural gas						
Biogas						
Fire wood						
Charcoal						
Specified 1 in Section 2-Section 6						
Specified 2 in Section 2-Section 6						
Specified 3 in Section 2-Section 6						
Specified 4 in Section 2-Section 6						
Specified 5 in Section 2-Section 6						

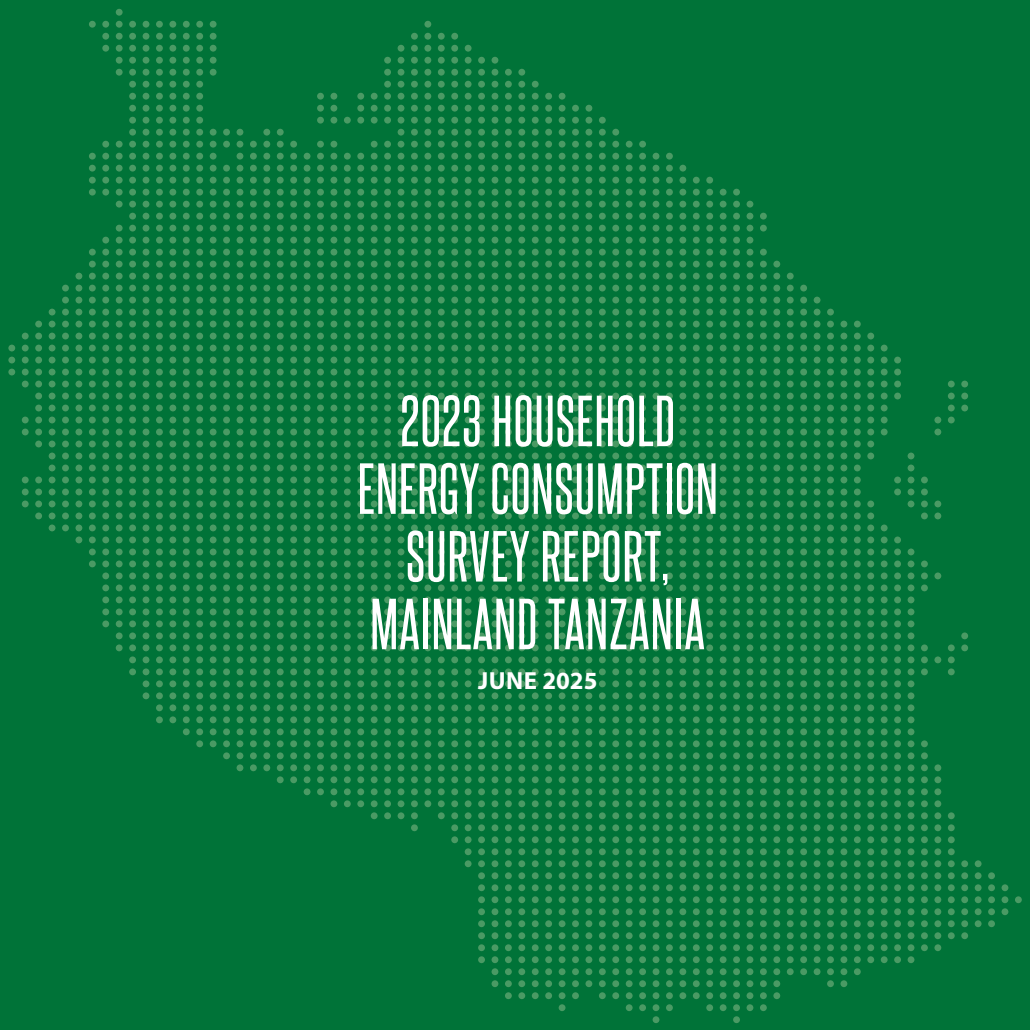
CONTENT

Section 8: Privately owned vehicles

Questions asked/Variables requested	Ownership Yes=1/no=2	Business use Yes=1/no=2	Number	Quantity	Expenditures	l/100 km	Annual km
8.1.1.Do you own personal cars ?							
Diesel							
Gasoline							
LPG							
Kerosine							
Electricity							
8. 1.2 Do you own light duty vehicles ?							
Diesel							
Gasoline							
LPG							
Kerosine							
Electricity							
8.1.3.Do you own heavy duty vehicles?							
Diesel							
Gasoline							
LPG							
Kerosine							
Electricity							
8.1.4.Do you own 3-wheelers?							
Diesel							
Gasoline							
LPG							
Kerosine							
Electricity							
8.1.5.Do you own 2-wheelers?							
Diesel							
Gasoline							
LPG							
Kerosine							
Electricity							

Section 9: Business related consumption for Businesses reported in Section 1 (except charcoal production)

Questions asked/Variables requested	Yes=1/no=2	Consumption annually=1 monthly=2	Unit/Size kg/l/m³/basket	Quantity	Expenditures	Storage period
Electricity consumption						
D1 Contract						
T1 Contract						
T2 Contract						
T3 Contract						
LPG consumption						
Kerosene consumption						
Paraffin consumption						
Acethylene consumption						
Candles consumption						
Natural gas consumption						
Biogas consumption						
Fire wood consumption						
Charcoal consumption						
Other 1 consumption						
Other 2 consumption						
Other 3 consumption						
Other 4 consumption						
Other 5 consumption						



2023 HOUSEHOLD ENERGY CONSUMPTION SURVEY REPORT, MAINLAND TANZANIA

JUNE 2025