



**Household Energy Assessment Rapid Tool (HEART):**

A template for conducting a rapid situational assessment and stakeholder mapping

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Household Energy Assessment Rapid Tool (HEART): Overview

1. Importance of clean household energy for health

Billions of people cook with polluting fuels such as kerosene, wood, animal dung, crop waste, and coal in open fires or traditional stoves. The use of polluting fuels for cooking, heating and lighting produces dangerous levels of household air pollution (HAP), which causes millions of deaths each year. Exposure to HAP is attributed to stroke, ischemic heart disease, chronic obstructive pulmonary disease (COPD), lung cancer, cataract, and acute lower respiratory infections (ALRI). The burden is especially great for women and children, who are often responsible for cooking and collecting fuel.

The World Health Organization (WHO) has set targets and guidelines for levels of fine particulate matter (PM2.5) and carbon monoxide (CO) that must be reached to protect health. The *WHO Guidelines for indoor air quality: household fuel combustion (2014)* provide practical recommendations for achieving the recommended levels. Recommendations include device and fuel emission rates for PM2.5 and CO required to meet the WHO air quality guidelines, strategies for prioritizing adoption of clean fuels or transitional fuels and technologies that offer substantial health benefits, avoiding unprocessed coal as a household fuel, and discouraging household use of kerosene.

Achieving the WHO air quality guidelines requires that households transition toward the use of clean fuels for household energy, with the possibility that some households may use transitional technologies that provide some health benefits until clean fuels become more widely available and affordable. Increasing the use of clean fuels can reduce the risk of non-communicable diseases and improve child health.

* 1. **WHO’s Clean Household Energy Solutions Toolkit**

WHO’s **Clean Household Energy Solutions Toolkit (CHEST)** was developed to help professionals and policy makers implement the recommendations found in the *WHO* *Guidelines for indoor air quality: household fuel combustion* *(2014).* The toolkit is intended to facilitate implementation and monitoring of policies promoting clean and safe household energy interventions that can improve health. CHEST provides tools for countries and programmes to create or evaluate policies that expand clean household energy access and use. CHEST includes six modules focused on conducting a situational assessment and mapping stakeholders related to household energy; identifying clean household energy technological and policy intervention options; setting standards for household energy devices; monitoring and evaluating household energy programmes; engaging the health community; and raising awareness through communication.

1. Objectives of the HEART template

The Household Energy Assessment Rapid Tool (HEART) is part of CHEST Module 1: Stakeholder mapping and situational assessment related to household energy use. HEART facilitates completion of the following:

1) A **rapid situational assessment** of current household energy use (particularly for cooking, heating and lighting), the extent of household air pollution and its impacts on health, and existing policies and programmes related to energy and environmental health. This situational assessment will build a foundational understanding of what fuels and technologies are used, what standards and regulations govern their distribution and use, relevant price and subsidy structures, and plans or barriers for expansion of clean fuels and technologies. Detailed knowledge of this information will inform and enable future clean household energy planning.

2) **Mapping of the stakeholders** engaged in household energy, air pollution, health and related sectors. These include stakeholders working in areas related to household energy use and its health impacts (with a particular focus on cooking, heating and lighting)in a country**,** including Ministries, institutions, organizations, programmes and individuals. The information gathered will include details on the scope of work of these stakeholders, their responsibilities, links, and any gaps. This mapping will identify windows of opportunity and partners for potential future involvement to accomplish the goal of delivering universal access to clean and modern fuels by 2030 (Sustainable Development Goal [SDG] 7).

This tool is primarily designed for use in countries where a high percentage of the population relies upon polluting fuels and technologies (e.g., biomass used in inefficient devices, coal or kerosene) for cooking, space heating or lighting.

Examples of previous reports produced in countries around the world using the HEART template can be found here: <https://www.who.int/tools/household-energy-assessment-rapid-tool-templates>.

Household energy is a cross-cutting theme that requires multi-sectoral action to improve health. The approach followed by each country towards increasing access to clean technologies and fuels will define and shape the way in which each country will work towards universal access to clean energy to ultimately improve public health. We hope that use of this tool will provide an overview of the various actors working on issues related to household energy and health, as well as identify challenges and opportunities for action within the country.

1. Instructions for using the tool

The tool consists of a set of questions and prompts to guide the process of information gathering. Data collected in each section can be written up into paragraphs and organized into a report following the structure of this template.

Each section has some broad topics addressed by many specific questions, with an indication of whether questions are considered essential or recommended for completion of the final report. Essential questions, marked with an asterisk, are those that are vital components of the final report. Recommended questions are those that are useful and enable a more comprehensive analysis, but are not necessary for the final report. Although the template includes essential and recommended categorizations, users will need to confirm that the classifications are appropriate in their local context.

* 1. **Data Collection**

The questions in the tool are designed to be answered through **a combination of stakeholder interviews** **and desk research.** The recommended data collection method is noted for each section. Stakeholder interviews can be conducted with representatives from government ministries, international organizations, cooperation agencies, non-governmental organizations (NGOs), private sector corporations, and academia, who have knowledge about topics such as energy, environment, health, development, climate change, regulatory environments, or other fields related to the questions in the tool. Desk research includes computer-based searches of research databases, publicly available datasets, governmental websites, and other online sources. Desk reviews may include demographic and economic indicators, local household air pollution and health information, general data on national energy use, and information on policies and stakeholders. It is very important to **record the sources** of all the information gathered and used in this document. In the final report, please cite the articles, websites, databases or individuals who have provided all information included.

* 1. **Recommended workshops**

Successful application of the HEART tool requires close collaboration and coordination between stakeholders. Implementation of two workshops are recommended to facilitate the process:

***Workshop 1 (Planning)***: Implementers who will be leading data collection and report development using the HEART tool as well as stakeholders who would be responsible for designing and taking action based on the findings should participate in a kick-off workshop. The goal of the first workshop is to develop and agree upon a plan for collecting data and completing the HEART report.

***Workshop 2 (Results Review):*** After completion of data collection and development of a first draft of the HEART report, a second workshop should be held with the HEART implementers and key stakeholders. The goal of the second workshop is to review the findings, identify any missing information, and solicit feedback on suggestions for action based on the findings. The report will then be finalized incorporating this feedback, and disseminated to all relevant stakeholders in the country.

Implementers and stakeholders can opt to engage on a more regular basis throughout data collection and report development if time and resources allow.

* 1. **Recommended qualifications and experience for individuals/teams completing HEART**

The HEART tool may be completed by one individual who has expertise across environmental health, energy and policy sectors; however, it is recommended that the tool be completed by a team of individuals with different expertise working together. If completed as a team, sections could be assigned to specific individuals, completed jointly, or divided such that different individuals answer the same questions but focus on different fields (i.e. an energy specialist focusing on energy stakeholders and an environmental health specialist focusing on environmental health stakeholders). It is advisable that the individuals completing the template have in-depth knowledge of and experience with the country context. If data collection is led by an international consultant with technical expertise, it is recommended that they collaborate with a national consultant.

The suggested qualifications for the individual or team who will undertake this work include:

* Strong understanding of the topic of household energy and health (particularly the use of clean and polluting fuels/technologies for cooking, heating and lighting, and the connections with air pollution, environment, and health);
* Understanding of policy decision-making processes in the country;
* Strong experience in development or evaluation of energy or environmental health policies and programmes;
* Experience conducting a needs and/or situational assessment, or stakeholder mapping in the country;
* Understanding of the challenges and intricacies of multi-sectoral policies and decisions in the country;
* Demonstrated strong research and analytical skills;
* Familiarity with WHO normative products, specifically the *WHO Guidelines for indoor air quality: household fuel combustion* *(2014)*
  1. **Resource considerations**

Individuals or teams planning to use HEART should discuss the potential resources needed to carry out the process. These may include: person time needed to complete data collection and report development, transportation costs for data collection, training costs, costs for convening workshops or other meetings, costs of designing and/or printing the final report, subscription fees for accessing key research publications, access to a computer and internet, etc. Those interested in using the HEART tool should consider these factors and develop a plan for procuring necessary resources, and adjust methods as needed based on resource availability.

1. Explanation of key terms used in the HEART template

**Clean technology/fuel**: Technology and fuel combinations that have PM2.5 and CO emissions at or below the rates recommended in the *WHO Guidelines for indoor air quality: household fuel combustion (2014).* The following fuels and technologies are known to be clean for health at the point of use and are categorized as clean for PM and CO household emissions: solar, electric, biogas, natural gas, liquefied petroleum gas (LPG), and alcohol fuels including ethanol. For more information visit: <https://www.who.int/tools/clean-household-energy-solutions-toolkit/module-7-defining-clean>.

**Desk research**: Computer-based searches of research databases, peer-reviewed journal articles, publicly available datasets, governmental websites, and other online sources.

**Disability adjusted life years (DALYs)**: One DALY represents the loss of the equivalent of one year of full health. DALYs for a disease or health condition are the sum of the years of life lost due to premature mortality (YLLs) and the years lived with a disability (YLDs) caused by the disease or health condition.

**Fine particulate matter (PM2.5)**: Particles that are 2.5 micrometers or smaller in diameter, small enough to be inhaled and penetrate deep into the lungs.

**Household air pollution (HAP)**: Air pollution generated by household fuel combustion, leading to indoor air pollution and contributing to ambient air pollution. Burning polluting fuels such as wood, crop wastes, charcoal, dung, coal and kerosene in open fires or inefficient stoves releases health-damaging pollutants. The term household air pollution focuses on pollution from sources of combustion in the home; indoor air pollution refers more broadly to other sources of pollution, i.e. radon, lead, volatile organic compounds (VOCs), and mould or other bacteria.

**Liquefied petroleum gas (LPG)**: A mixture of hydrocarbon gases (i.e. propane, butane) that is compressed into a liquid form and used as fuel for cooking, heating, lighting or other applications

**Livelihood:** The means by which a person secures the basic necessities of life, including the activities conducted in order to make a living.

**Polluting technology/fuel**: Technology and fuel combinations that have PM2.5 and CO emissions above the rates recommended in the *WHO Guidelines for indoor air quality: household fuel combustion (2014).*

**Renewable energy:** Energy from natural sources that are continuously replenished, such as wind and solar energy. Biomass fuel such as wood can also be considered renewable if sustainably harvested (and thus, not a cause of deforestation); if not sustainably harvested, biomass fuel is considered non-renewable.

**Stakeholder interview**: Semi-structured conversations with key actors that are guided by a list of questions and include spontaneous follow-up questions to elicit information about important points

**Subsidy**: Policies through which government funds are transferred or revenue is foregone in order to reduce the price and increase the consumption of specific goods or services (i.e. clean cooking, heating or lighting technologies and fuels)

**Household Energy Assessment Rapid Tool (HEART): Template**

Recommended title for report produced using the HEART template:

Opportunities for Transition to   
Clean Household Energy in [COUNTRY]

Application of the WHO Household Energy Assessment Rapid Tool (HEART) for   
Situational Assessment and Stakeholder Mapping

[DATE REPORT COMPLETED]

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# Preface

*Provide a preface, which can include the following text or be modified as appropriate using data from the WHO Global Health Observatory (*[*https://www.who.int/data/gho/data/themes/air-pollution/household-air-pollution*](https://www.who.int/data/gho/data/themes/air-pollution/household-air-pollution)*) or other sources:*

Household air pollution (HAP) from inefficient fuel combustion is one of the most important global environmental health risks today. Billions of people, mainly in low- and middle-income countries, still rely on solid fuels (wood, animal dung, charcoal, crop wastes and coal) and kerosene burnt in inefficient, highly polluting stoves for cooking, heating and lighting. Widespread use of polluting stoves and fuels causes millions of premature deaths annually among children and adults from respiratory illness, cardiovascular disease and cancer, as well as serious injuries from scalding, burns and poisoning. Use of kerosene stoves, heaters and lamps also results in many serious injuries and deaths from scalds, burns and poisoning.

The *WHO Guidelines for indoor air quality: household fuel combustion* *(2014)* are addressed to public health policy-makers and specialists working on energy, environmental and other issues to introduce the best approaches for reducing HAP: one of the greatest environmental health risk in the world today.

This report was developed using the WHO’s Household Energy Assessment Rapid Tool (HEART), a tool designed to support (a) the identification of relevant stakeholders in the health, energy and other sectors working on issues related to household energy use and/or its health impacts, and (b) a rapid situational assessment of a country’s readiness and current progress towards the adoption of clean energy technologies. The objective of this tool is to gather and synthesize information on household energy use and its public health impacts in a country or setting, and use the information as a basis to stimulate an informed discussion on household energy use and its health impacts, identify areas of shared responsibilities and coordinate actions, as well identify country-specific barriers to the adoption of clean household energy use and opportunities for the public health sector to better support and accelerate the transition to clean household energy.

This rapid assessment provides a broad overview of the current household energy and health situation, identifies key stakeholders and will ultimately support inter-sectoral cooperation to promote clean household energy. This report presents the results obtained from implementing the HEART tool in [COUNTRY].

# Acknowledgements

*In the final report, include a list of all people who contributed to conducting the HEART assessment and creating the report, individuals or organizations who participated in interviews and workshops, as well acknowledgment of support received from government ministries or other organizations. It is suggested that any use of organizational logos receives appropriate clearance prior to inclusion in the report.*

# Abbreviations and acronyms

*In the final report, include a list of all abbreviations or acronyms used in the document and their definition.*

# Executive Summary

*Develop a 5-10 page summary of the HEART report that could be published separately as a complementary standalone document. The Executive Summary can be shared with key stakeholders and used as a resource for policy and programmatic decision-making and implementation related to household energy. It may include narrative descriptions and figures to capture key information in the following sections:*

**Key messages:** Summarize the most important takeaway points from the HEART report

**Methods:** Provide a brief summary of the processes for data collection and report development

**Country context:** Summarize the demographic, economic and other characteristics essential for understanding the household energy situation and its health impacts in the country

**Health impacts:** Summarize the burden of disease and health effects of household air pollution in the country

**National household energy context:** Describe the sources of energy available in the country and key information about their infrastructure and regulation

**Household energy use:** Describe the extent to which different fuels and technologies are used for household cooking, heating, and lighting, and common practices or perceptions related to their use

**Household energy-related stakeholders and policies:** Summarize key stakeholders involved in household energy-related processes in the country and existing programmes or policies that address or could be adapted to incorporate clean household energy objectives.

**Pathways forward:** List the key suggestions for how the country could expand access to and use of clean household energy based on the HEART findings

# Introduction

*Please provide a short introduction (2-3 paragraphs) summarizing the objectives for completing the HEART assessment in your country and the methods used to carry it out.*

# General country context

Objective: The goal of this section is to provide an overview of the general socio-demographic situation of the country. This broad picture can be helpful to understand how household energy use and access may be a function of other national variables including socio-economic status, access to fuels, and development.

Data collection: Primarily desk research.

## Geographical context

1. \*Provide an overview of the country’s geography, including a national map.
2. Provide an overview of the variation in climate, ecological zones and rainfall in the country.

## Demographic and economic data

1. \*What is the population of the country? (WHO observatory database: <https://www.who.int/data/gho/data/indicators/indicator-details/GHO/population-(in-thousands)>)
   1. \*What percent of the population is urban? (UN World Urbanization Prospects: <https://population.un.org/wup/>)
   2. What is the annual population growth rate? (World Bank: <http://data.worldbank.org/indicator/SP.POP.GROW>)
   3. What is the Annual Urbanization rate? (World Bank: <http://data.worldbank.org/indicator/SP.URB.GROW>)
   4. What is the average number of household members?
2. \*What is the per capita gross national income? (World Bank: <https://data.worldbank.org/indicator/NY.ADJ.NNTY.PC.CD>)
3. Other indicators:
   1. Gross domestic product (GDP) growth rate (World Bank: <http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG>)
   2. Human development index (UNDP: <http://hdr.undp.org/en/countries>)
   3. Under five mortality rate (per 1000) (WHO observatory data base: <https://www.who.int/data/gho/data/indicators/indicator-details/GHO/under-five-mortality-rate-(probability-of-dying-by-age-5-per-1000-live-births)>)
   4. Maternal deaths/100,000 live births (WHO observatory database: <https://www.who.int/data/gho/data/indicators/indicator-details/GHO/maternal-mortality-ratio-(per-100-000-live-births)>)
   5. Life expectancy (WHO observatory database: <https://www.who.int/data/gho/data/indicators/indicator-details/GHO/life-expectancy-at-birth-(years)>)
   6. Include any other relevant demographic or economic information from national censuses or surveys, or information on how the statistics differ by region or other relevant distinctions.

# Health impacts of household air pollution

Objective: The goal of this section is to provide an overview of the impacts of air pollution on health in the country. The full health burden from air pollution and household air pollution in particular are often not known by many in the country, and thus this data can be critical to motivate action towards expanding clean household energy access. Additionally, knowledge about certain vaccines provided in the country, such as the pneumococcal vaccine, can provide important information about other factors that may help explain changes in rates of disease related to household air pollution, and inform opportunities for synergizing environmental health and vaccine efforts.

Data collection: Primarily desk research.

## Burden of disease from household air pollution

1. \*How many deaths are caused each year from exposure to household air pollution in this country? Please also provide the number attributed to each particular disease. (WHO Global health observatory: <https://www.who.int/data/gho/data/indicators/indicator-details/GHO/household-air-pollution-attributable-deaths>)
2. \*How many DALYs are caused each year from exposure to household air pollution in this country? Please also provide the number attributed to each particular disease. (WHO Global health observatory: <https://www.who.int/data/gho/data/indicators/indicator-details/GHO/household-air-pollution-attributable-dalys>)
3. \*What are the main risk factors leading to premature death in this country? How does household air pollution rank in your country’s list of risk factors? (Institute for Health Metrics and Evaluation (IHME): <https://vizhub.healthdata.org/gbd-compare/>)

## Local information on health effects of household air pollution

1. \*What studies (if any) have been conducted on household air pollution in this country? Please summarize the key findings of the most recent or relevant studies. One data source for this information is the WHO’s Global household air pollution measurement database, available here: <https://www.who.int/data/gho/data/themes/air-pollution/hap-measurement-db>. A table, such as the one below, could be used to display the information; columns may be removed or added based on the data available.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Study authors and year | Kitchen type | N | PM2.5 (µg/m3) 24-hr mean exposure | Kitchen PM2.5  (µg/m3) cooking | Kitchen PM2.5  (µg/m3) 24hr | Living area  PM2.5 (µg/m3) cooking | Living area  PM2.5 (µg/m3) 24-hr | Outdoor concentration PM2.5 (µg/m3) |
| 1. |  |  |  |  |  |  |  |  |
| 2. |  |  |  |  |  |  |  |  |
| 3. |  |  |  |  |  |  |  |  |
| 4. |  |  |  |  |  |  |  |  |

1. \*What studies (if any) have been conducted on the health effects of household air pollution in this country? Please summarize the key findings from the most recent or relevant studies. Possible sources for this information include PubMed (<https://pubmed.ncbi.nlm.nih.gov>), Google Scholar (<https://scholar.google.com>), Scopus (<https://www.scopus.com>), or other online research databases.
2. Is the pneumococcal vaccine routinely administered as part of the basic vaccination scheme for children in this country?

# National household energy context

## National Energy Profile

1. \*What are the current energy resources and final uses in the country?

The following table may be used as a template. This information can help document the resources available and indicate challenges related to energy production, distribution, security and dependency on imported energy. Data needed to complete the table can be found for most countries at <https://www.iea.org/countries>.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **COAL** | **CRUDE OIL** | **OIL PRODUCTS** | **NATURAL GAS** | **NUCLEAR** | **HYDRO** | **GEOTHERMAL SOLAR ETC** | **BIOFUELS AND WASTE** | **ELECTRICITY** | **TOTAL** |
| PRODUCTION: For each energy type, what quantity is produced in the country per year? |  |  |  |  |  |  |  |  |  |  |
| IMPORTS: For each energy type, what quantity is imported into the country per year? |  |  |  |  |  |  |  |  |  |  |
| EXPORTS: For each energy type, what quantity is exported from the country per year? |  |  |  |  |  |  |  |  |  |  |
| **TOTAL ENERGY SUPPLY: Sum of the production and import quantities, minus the export quantity (for each energy type)** |  |  |  |  |  |  |  |  |  |  |
| ELECTRICITY PRODUCTION: From the total energy supply for each energy type, how much is used to produce electricity? |  |  |  |  |  |  |  |  |  |  |
| INDUSTRY: From the total energy supply for each energy type, how much goes to the Industry sector? |  |  |  |  |  |  |  |  |  |  |
| TRANSPORT: From the total energy supply for each energy type, how much goes to the Transport sector? |  |  |  |  |  |  |  |  |  |  |
| RESIDENTIAL: From the total energy supply for each energy type, how much goes to the Residential sector? |  |  |  |  |  |  |  |  |  |  |
| COMMERCIAL AND PUBLIC SERVICES: From the total energy supply for each energy type, how much goes to Commercial and Public services sectors? |  |  |  |  |  |  |  |  |  |  |
| OTHER: From the total energy supply for each energy type, how much goes to other sectors? |  |  |  |  |  |  |  |  |  |  |
| \*NOTE: Please use the same units for all quantities and clearly indicate which unit is used | | | | | | | | | | |

## Infrastructure for fuels and technologies

Objective: The goal of this section is to assess the industry for each of the applicable household energy choices in the country for cooking, heating, and lighting. Identifying capacity, regulatory frameworks, pricing structures and barriers for increasing access is vital. **If a particular fuel is not being used in the country, please skip the questions in the section related to that fuel or energy source.** *NOTE: Descriptions of governmental policies and programmes should be included in Section 6.*

Data collection: Primarily desk research (i.e., review of the WHO Household energy databases and recent national surveys and censuses).

### Electricity

1. \*What percentage of the population has access to electricity? (World Bank: <https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS>)
   1. What percentage of households with access to electricity have access through the grid?
   2. How do households with access to electricity who are not connected to the grid get their electricity?
2. What percentage of electricity generated comes from renewable sources?
3. What electric devices are available for household cooking, heating, or lighting? Please list examples of available devices (as appropriate) and include a range of prices, including subsidized price and informal economy/unregulated market price if applicable.
4. \*What prices do households pay for electricity? Please include the range of prices, including subsidized price and informal economy/unregulated market price if applicable. How are prices for electricity determined?
5. \*How reliable is electricity service in this country? What is the frequency and duration of outages by region?
6. \*What are the future plans for production and expansion of electrification? Which regions are prioritized, if any?
   1. Is the focus on electrification through the grid? What solutions outside the grid are being considered, if any?
   2. \*Are there significant infrastructural limitations for expanding the carrying capacity of the electrical grid if electricity were to be used for cooking and/or heating for the whole country? If so, what are the infrastructural limitations?

### Liquefied Petroleum Gas (LPG)/Cooking gas

1. \*What is the availability of LPG in the country? Does this differ in rural, urban or other areas?
2. What LPG devices are available for household cooking, heating, or lighting? Please list examples of available devices (as appropriate) and include a range of prices, including subsidized price and informal economy/unregulated market price if applicable.
3. \*What prices do households pay for LPG? Please include the range of prices, including subsidized price and informal economy/unregulated market price if applicable. How are prices for LPG determined?
4. What is the industry structure?
   1. \*Please describe whether LPG is produced/extracted locally or imported. Also include information on the producers (including via import) and wholesale distributors of LPG fuel and/or technologies that use LPG for cooking/heating/lighting, including any regional variation.
5. Are there any limitations in storage capacity for receiving imported LPG? If so, please state the current refinery capacity and receiving storage capacity, and provide information on the severity of the limitation, if known.
6. What is the market size for domestic LPG consumption?
7. \*What private/industry market promotion measures are in place to expand current market penetration of LPG, if any? (e.g., discounts, financing, awareness raising, etc.) NOTE: Governmental and NGO measures are covered in Section 6.
8. \*What are the main infrastructural barriers to increasing penetration of LPG for household use, if any? For example, consider road infrastructure.
9. \*What challenges do households face with refilling cylinders? If information is available, please provide details on any challenges related to distance to refill points, supply, availability of LPG, or other challenges related to accessing LPG.
10. Is Bio-LPG available or produced within the country? See report here for more information about Bio-LPG: <https://mecs.org.uk/wp-content/uploads/2020/09/GLPGP-Potential-for-BioLPG-Production-and-Use-as-Clean-Cooking-Energy-in-Africa-2020.pdf>
11. Are domestic LPG cylinders the same as those for automotive use, and to what extent is there leakage across end uses through transfer of domestic gas to automotive use?

### Natural gas

1. What natural gas devices are available for household cooking, heating, or lighting? Please list examples of available devices (as appropriate) and include a range of prices, including subsidized price and informal economy/unregulated market price if applicable.
2. \*What prices do households pay for natural gas? Please include the range of prices, including subsidized price and informal economy/unregulated market price if applicable. How are prices for natural gas determined?
3. What is the industry structure?
   1. \*Please describe whether natural gas is produced/extracted locally or imported. Also include information on the producers (including via import) and wholesale distributors of natural gas and/or technologies that use natural gas for cooking/heating/lighting, including any regional variation.
   2. Are there any limitations in storage capacity for receiving imported natural gas? If so, please state the current refinery capacity and receiving storage capacity, and provide information on the severity of the limitation, if known.
   3. What is the market size for domestic natural gas consumption?
   4. \*What private/industry market promotion measures are in place to expand current market penetration of natural gas, if any? (e.g., discounts, financing, awareness raising, etc.) NOTE: Governmental and NGO measures are covered in Section 6.
   5. \*Are there plans to increase access to domestic natural gas? What are the main infrastructural barriers to increasing penetration of natural gas for household use, if any?

### Biogas

1. \*What is the cost of building a biogas plant/digester? Please include the range of prices, including subsidized price if applicable, and note whether the price is per household or per community.
   1. How are the prices determined?
2. What biogas-powered devices are available for household cooking, heating, or lighting? Please list examples of available devices (as appropriate) and include a range of prices, including subsidized price and informal economy/unregulated market price if applicable.
3. What is the industry structure?
   1. \*Please describe the producers (whether large-scale, community, or only household level) of biogas fuel and/or technologies that use biogas for cooking/heating/lighting, including any regional variation.
   2. \*What private/industry market promotion measures are in place to expand current market penetration of biogas, if any? (e.g., discounts, financing, awareness raising, etc.) *NOTE: Governmental and NGO measures are covered in Section 6.*
   3. \*What is used to produce biogas and how available is it by region?
   4. \*What are the main infrastructural barriers to increasing penetration of biogas for household use, if any?

### Ethanol and other alcohol fuels

1. What ethanol/alcohol-fueled devices are available for household cooking, heating, or lighting? Please list examples of available devices (as appropriate) and include a range of prices, including subsidized price and informal economy/unregulated market price if applicable.
2. \*What prices do households pay for ethanol or other alcohol fuels? Please include the range of prices, including subsidized price, and informal economy/unregulated market price if applicable. How are prices determined? What is the industry structure?
   1. \*Please describe the producers (including via import) and wholesale distributors of ethanol/alcohol fuel and/or technologies that use ethanol/alcohol fuel for cooking/heating/lighting, including any regional variation.
   2. What is the market size for domestic ethanol/alcohol fuel consumption?
   3. \*What private/industry market promotion measures are in place to expand current market penetration of ethanol/alcohol fuels, if any? (e.g., discounts, financing, awareness raising, etc.) NOTE: Governmental and NGO measures are covered in Section 6.
   4. \*What are the main infrastructural barriers to increasing penetration of ethanol/alcohol fuels for household use, if any?
3. Please describe the nature of any competition between production of ethanol and food production.

### Kerosene

1. What kerosene-powered devices are used for household cooking, heating, or lighting? Please list examples of available devices (as appropriate) and include a range of prices, including subsidized price and informal economy/unregulated market price if applicable.
2. \*What prices do households pay for kerosene? Please include the range of prices, including subsidized price and informal economy/unregulated market price if applicable. How are prices for kerosene determined?
3. What is the industry structure?
   1. \*Please describe the producers (including via import) and wholesale distributors of kerosene fuel and/or technologies that use kerosene for cooking/heating/lighting, including any regional variation in the country.
   2. What private/industry market promotion measures are in place for kerosene or household energy technologies that use kerosene? (e.g., discounts, financing, awareness raising, etc.) (NOTE: Identifying existing promotion of kerosene (if any) is important in order to consider removing this support as part of clean fuel transitions, because *WHO Guidelines for indoor air quality: household fuel combustion (2014)* discourage the use of kerosene due to health risks; see: <https://www.who.int/publications/i/item/9789241548885>. Governmental and NGO measures are covered in Section 6.)

### Coal

1. What type of coal is used for household energy in the country (if any)- e.g., raw/unprocessed, refined/processed?
2. What coal-burning devices are used for household cooking, heating, or lighting, and do they burn processed coal, unprocessed coal, or both? Please list examples of available devices (as appropriate) and include a range of prices, including subsidized price and informal economy/unregulated market price if applicable.
3. \*What prices do households pay for coal? Please include the range of prices, including subsidized price and informal economy/unregulated market price if applicable. How are prices for coal determined?
4. What is the industry structure?
   1. \*Please describe the producers/suppliers (including via import) and wholesale distributors of coal fuel and/or technologies that use coal for cooking/heating/lighting, including any regional variation.
   2. What private/industry market promotion measures are in place for coal or household energy technologies that use coal? (e.g., discounts, financing, awareness raising, etc.) (NOTE: Identifying existing promotion of coal (if any) is important in order to consider removing this support as part of clean fuel transitions, because *WHO Guidelines for indoor air quality: household fuel combustion* *(2014)* recommend against the use of unprocessed or raw coal in the home due to health risks; see: <https://www.who.int/publications/i/item/9789241548885>. Governmental and NGO measures are covered in Section 6.)

### Charcoal

1. What charcoal-burning devices are used for household cooking, heating, or lighting? Please list examples of available devices (as appropriate) and include a range of prices, including subsidized price and informal economy/unregulated market price if applicable.
   1. What options exist for charcoal-burning household cooking, heating, or lighting devices that emit lower levels of household air pollution? What is the range of prices?
2. \*What prices do households pay for charcoal? Please include the range of prices, including subsidized price and informal economy/unregulated market price if applicable. How are prices for charcoal determined?
   1. What percentage of charcoal is sold through the formal vs. informal market?
3. What is the industry structure?
   1. \*Please describe the producers/suppliers (including via import) and wholesale distributors of charcoal fuel and/or technologies that use charcoal for cooking/heating/lighting, including any regional variation.
   2. What is the market size for domestic charcoal consumption?
   3. What private/industry market promotion measures are in place for charcoal or household energy technologies that use charcoal? (e.g., discounts, financing, awareness raising, etc.) NOTE: Governmental and NGO measures are covered in Section 6.
4. How is charcoal produced (i.e., using traditional methods or more efficient methods like the retort kiln, etc.)? What restrictions, if any, are in place related to charcoal production?

### Firewood/ Biomass

1. What biomass-burning devices are used for household cooking, heating, or lighting? Please list examples of available devices (as appropriate) and include a range of prices, including subsidized price and informal economy/unregulated market price if applicable.
   1. What options exist for biomass-burning household cooking, heating, or lighting devices that emit very low levels of household air pollution? What is the range of prices?
2. \*What prices do households pay for firewood? Please include the range of prices, including subsidized price and informal economy/unregulated market price if applicable. How are prices for firewood determined?
3. What is the industry structure?
   1. \*Please describe the producers/suppliers (including via import) and wholesale distributors of firewood/biomass fuel and/or technologies that use firewood/biomass for cooking/heating/lighting, including any regional variation.
   2. What is the market size for domestic firewood consumption?
   3. What private/industry market promotion measures are in place for firewood or household energy technologies that use firewood? (e.g., discounts, financing, awareness raising, etc.) NOTE: Governmental and NGO measures are covered in Section 6.
4. \*What restrictions, if any, are in place related to firewood production and/or consumption (i.e. for fuel wood harvesting or for use of firewood in urban areas)?
5. \*What fraction of biomass used for household energy is sustainably harvested? This information is available from: <http://www.wisdomprojects.net/global/csdetail.asp?id=31>. There is also an online map available here: <http://www.wisdomprojects.net/global/cs.asp>.

### Solar home systems

1. \*What options exist for solar home systems? Please list examples of available options (as appropriate) and include a range of prices, including subsidized price and informal economy/unregulated market price if applicable. How are prices determined?
2. What is the industry structure?
   1. \*Please describe the producers/suppliers of solar panels, batteries and related equipment (including via import) and wholesale distributors, including any regional variation.
   2. \*What private/industry market promotion measures are in place to expand current market penetration of solar home systems? (e.g., discounts, financing, awareness raising, etc.) NOTE: Governmental and NGO measures are covered in Section 6.

### Solar thermal cookers/stoves

1. \*What solar cookers/stoves are available for household cooking, heating, or lighting? Please list examples of available devices (as appropriate) and include a range of prices, including subsidized price and informal economy/unregulated market price if applicable. How are prices determined?
2. What is the industry structure?
   1. \*Please describe the producers/suppliers of solar cookers/stoves (including via import) and wholesale distributors, including any regional variation.
   2. \*What private/industry market promotion measures are in place to expand current market penetration of solar cookers/stoves? (e.g., discounts, financing, awareness raising, etc.) NOTE: Governmental and NGO measures are covered in Section 6.

# Household energy use

Objective: The goal of this section is to understand the types of technologies and fuels that are used for cooking, heating, and lighting and the conditions under which they are used. The section also considers factors related to household energy use that may affect adoption, such as manners of use, safety of fuels and technologies, time spent collecting fuel, and the impact on livelihoods.

Data collection: Primarily desk research (i.e., review of the WHO Household energy databases, and recent national surveys and censuses). Information may be accessed from the following resources:

* WHO Household air pollution data: <https://www.who.int/data/gho/data/themes/air-pollution/household-air-pollution>
  + Proportion of population with primary reliance on polluting fuels and technologies for cooking: <https://www.who.int/data/gho/data/indicators/indicator-details/GHO/gho-phe-population-with-primary-reliance-on-polluting-fuels-and-technologies-for-cooking-proportion>
  + Proportion of population with primary reliance on clean fuels and technologies for cooking: <https://www.who.int/data/gho/data/indicators/indicator-details/GHO/gho-phe-primary-reliance-on-clean-fuels-and-technologies-proportion>
  + Proportion of population with primary reliance on fuels and technologies for cooking, by fuel type: <https://www.who.int/data/gho/data/indicators/indicator-details/GHO/proportion-of-population-with-primary-reliance-on-fuels-and-technologies-for-cooking-by-fuel-type>
* WHO Household energy database: <https://www.who.int/data/gho/data/themes/air-pollution/who-household-energy-db>
* WHO Global database of household air pollution measurements: <https://www.who.int/data/gho/data/themes/air-pollution/hap-measurement-db>
* Email [householdenergy@who.int](mailto:householdenergy@who.int) to obtain country-specific WHO databases
* Energypedia: <https://energypedia.info/wiki/Portal:Countries>
* ESMAP Multi-Tier Framework for Energy Access: <https://mtfenergyaccess.esmap.org/countries>; <https://energydata.info/dataset?q=mtf>

## Household energy use for cooking

1. \*What fuels and technologies are currently used for cooking?
2. \*Please provide this information for both the *primary* fuel and technology, as well as *supplementary* fuels/technologies if known.
3. \*Provide the breakdown of types of energy used for household cooking at the national, urban, and rural level. It is suggested to provide this information in three pie charts. Are there any noticeable differences in the types of fuels and technologies used in different geographic areas?
4. What percent of households use ventilation (e.g., a hood or chimney) while cooking? Provide this information as a matrix by fuel/technology used for cooking if this information is available.
5. \*Where do households cook? Provide information on the percent of households that cook indoors in a separate kitchen, indoors without a separate kitchen, a separate room outdoors, or outdoors. Provide this information as a matrix by fuel/technology used for cooking if this information is available.
6. Please also provide general information and photographs (if possible) of a range of cooking locations and scenarios.
7. \*How much time do households spend cooking each day?
8. \*What are the key barriers or challenges related to adoption and sustained use of clean fuels and technologies for cooking? What are some of the leading factors that facilitate or accelerate adoption of clean fuels and technologies for cooking?
9. What is the availability and use of energy efficient cooking devices / cookware such as pressure cookers?
10. What percentage of average household income is spent on cooking fuels (provide time frame)? Provide this information for the main cooking fuels used in the country.
11. Please describe the structure and size of urban and rural kitchens.
12. What local foods or drinks require a special stove or preparation method, if any?

## Household energy use for lighting

1. \*What fuels and technologies are currently used for lighting?
2. \*Please provide this information for both the *primary* fuel and technology, as well as *supplementary* fuels/technologies, if known.
3. \*Provide the breakdown of types of energy used for household lighting at the national, urban, and rural level. It is suggested to provide this information in three pie charts.
4. Please also provide photographs (if possible) of a range of different lighting options from the country.
5. \*What are the key barriers or challenges related to adoption and sustained use of clean fuels and technologies for lighting? What are some of the leading factors that facilitate or accelerate adoption of clean fuels and technologies for lighting?
   1. What percentage of average household income is spent on lighting (provide time frame)? Provide this information for the main lighting options used in the country.
6. \*What lighting source(s) are used as backup in the event of electricity outages?
7. How much time do households use different lighting sources each day?

## Household energy use for heating

1. \*What fuels and technologies are currently used for space heating?
2. \*Please provide this information for both the primary fuel and technology, as well as supplementary fuels/technologies if known.
3. \*Provide the breakdown of types of energy used for household space heating at the national, urban, and rural level. It is suggested to provide this information in three pie charts.
4. Please also provide photographs (if possible) of a range of different space heating options from the country.
5. \*How many months per year is space heating required? Please provide information on regional variation.
6. \*What are the key barriers or challenges related to adoption and sustained use of clean fuels and technologies for heating? What are some of the leading factors that facilitate or accelerate adoption of clean fuels and technologies for heating?
7. During the cold season, how much time do households use space heating each day?
8. What percentage of average household income is spent on heating (provide time frame)? Provide this information for the main heating options used in the country.

## Safety of household energy use

1. \*What is the frequency of severe burns from the use of fuels and technologies at the household level? If available, please provide information on:
2. Number of serious burns due to household cooking per year (disaggregated by fuel/technology leading to the burn, if possible)
3. Number of serious burns to children due to household cooking per year (disaggregated by fuel/technology leading to the burn, if possible)
4. Number of serious burns due to household lighting per year (disaggregated by fuel/technology leading to the burn, if possible)
5. Number of serious burns to children due to household lighting per year (disaggregated by fuel/technology leading to the burn, if possible)
6. Number of serious burns due to household heating per year (disaggregated by fuel/technology leading to the burn, if possible)
7. Number of serious burns to children due to household heating per year (disaggregated by fuel/technology leading to the burn, if possible)
8. \*What is the frequency and nature of poisonings from use of liquid fuels? Please provide any available information.
9. What is the frequency and risk of carbon monoxide exposure from household air pollution in the country? Please provide any available information.
10. What is the frequency and nature of explosions or accidents related to the use of LPG in households?
11. \*What other safety issues exist related to household energy use in the country, if any?
12. What are common perceptions of accidents and safety related to household energy fuels or technologies used within the population? Please list safety perceptions separately for each type of fuel for which they exist.

## Fuel collection time

1. \*How much time do households in this country usually spend gathering fuels for cooking, lighting and heating?
2. If possible, please provide information on time spent collecting different fuels, and how it is distributed across different population segments (age and sex) and geographic locations (urban, peri-urban, rural).

## Livelihood considerations

1. \*What factors related to household livelihoods should be considered in the context of a transition to clean fuels and technologies? For example, how could livelihoods be negatively impacted (i.e., charcoal production, firewood harvesting)? How could livelihoods be positively impacted? Please provide details and quantify if possible.

## Environmental considerations

1. \*What, if any, environmental concerns arise or are related to household energy use in the country? This can include deforestation (from wood or charcoal use and production), land use issues, climate change, etc.

# Existing household energy programmes and policies

## Policies related to household energy and air pollution

Objective: The goal of this section is to create a list of existing household energy policies and other related policies that might influence household energy use. Please consider a wide variety of sector policies including health, environment, energy, transportation, commerce, infrastructure, housing, forestry, climate change and others. Identifying existing policies that are directly or indirectly related to household energy and air pollution can be useful to determine how existing household energy policies could be improved, how household energy could be integrated into existing policies, and to identify opportunities for synergy between household energy and related policies.

Data collection: Primarily desk research, supplemented with stakeholder interviews.

### Household air quality/Household energy

1. \*What regulations or national standards exist related to **fuels** used for household energy (i.e. electricity, LPG, natural gas, biogas, ethanol/alcohol fuels, kerosene, coal, charcoal, firewood/other biomass fuels), including for fuel composition/quality, distribution (including quantity distributed, and [for LPG] maintenance of cylinders (including cylinder regulators) for recirculation, cylinder exchange programs), storage, use, consumption, etc.? Please answer for the fuels used as household energy for cooking, heating or lighting in the country.
2. \*Please describe in detail any regulations or standards that impact or could impact household choices about fuels used for cooking, heating or lighting.
3. \*Which ministry or agency is in charge of the regulations?
4. What are the processes for inspection and enforcement to ensure the regulations/standards are followed?
5. \*What regulations or national standards exist regarding the performance or quality of **stoves or devices** used for household cooking?
6. \*Please explain the standards in detail.
7. \*Which ministry or agency is in charge of the standards?
8. What are the processes for inspection and enforcement to ensure the standards are followed?
9. \*What regulations or national standards exist regarding the performance or quality of space heaters or devices used for household space heating? Please provide details.
10. \*What regulations or national standards exist regarding lights/lamps for lighting performance and quality? Please provide details.
11. \*Is there currently, or has there been in the past, any national policies or master plans related to improving household energy access?
12. \*Please provide a list and description of all policies that the government has implemented previously or currently.
13. \*Which Ministries are involved, and what are their roles?
14. \*Is there currently, or has there been in the past, any national policies related to improving household air quality?
15. \*Please provide a list and description of all policies that the government has implemented previously or currently.
16. \*Which Ministries are involved, and what are their roles?
17. \*In what way, if at all, have WHO guidelines or regulations been adopted for household air pollution?
18. Is there an intersectoral working group/committee related to household energy use or the use of certain fuels/technologies for cooking, heating and lighting (such as improved cookstoves, solid fuels, kerosene, gas, LPG, solar, etc.)? If so, who are its members, what are the goal or objectives of the group, and who facilitates or chairs the group?

### Outdoor (ambient) air quality

1. \*Is there currently, or has there been in the past, any national policies related to improving outdoor air quality?
2. \*Please provide a list and description of all policies that the government has implemented previously or currently.
3. \*Which Ministries are involved, and what are their roles?
4. Do the policies consider the connection between outdoor air quality, household air pollution, and household energy use (including the contribution of HAP to ambient air pollution)? If so, please describe.
5. Please describe any regulations that are in place to reduce emissions from power plant stations, LPG production, natural gas/LPG distribution, etc.
6. \*In what way, if at all, have WHO guidelines or local air quality standards been adopted to control ambient/outdoor air pollution?
7. Are there monitoring stations to measure outdoor air pollution? If yes, where are they, and what pollutants do they monitor? Is this information made publicly available?

### Climate change and deforestation

1. \*Please describe any policies related to reducing CO2 emissions, increasing use of renewable energy and fuels, reducing short-lived climate pollutants (SLCPs), black carbon, or any other climate-related issues.
2. \*Please describe any policies related to reducing deforestation or biomass consumption, or to increasing the fraction of biomass that is renewably harvested.

## Programmes related to clean household energy

Objective: The goal of this section is to outline programs that address access to household energy (with a particular focus on cooking, heating, and lighting), or social programs that could be altered to incorporate promotion of clean household energy use. For example, a program providing cash transfers for pregnant women who access antenatal care could be expanded to include cash transfers for clean household energy use, social welfare programmes could be expanded to include subsidies for clean fuel, or educational programmes providing meals for children could require that meals be prepared using clean fuels and technologies. This section can include both current or previous programmes, and programmes run by government (i.e. Ministry of Health, Environment, Energy, Social Development, etc.) or other stakeholders. The information collected from this section is critical to explain what has been done so far in the country regarding household energy and what programmes already exist that could be leveraged to support clean household energy use.

Data collection: Combination of desk research and stakeholder interviews.

1. \*Are there currently, or have there been in the past, any **governmental programmes** related to improving household energy access and use? These may include programmes that provided or subsidized technologies (i.e. improved biomass stoves, clean fuel stoves, biogas plants, space heaters, or lights), programmes that provided or subsidized clean fuels (i.e., LPG, electricity, natural gas, ethanol/alcohol fuels, biomass pellets), conditional cash transfer programmes focused on clean household energy use, household electrification programmes, financing allowing consumers to spread payments for clean technologies or fuels over time, behavior change campaigns or awareness raising efforts focused on clean household energy use, or other programmes related to clean household energy expansion. Please also include programmes designed to help households in the installation and/or maintenance of clean energy options such as biogas digesters, solar home systems, etc.
2. For each programme, please answer the following questions:
3. \*Please provide a detailed description of the programme’s scope.
4. \*Which Ministries are involved, and what are their roles?
5. \*What are the dates of programme operation?
6. \*Which regions/areas of the country are targeted or prioritized?
7. \*What are the inclusion criteria (i.e., what sub-populations are eligible to participate in the program)?
8. \*What is the programme’s reach? (i.e. number of stoves distributed, number of beneficiaries, percentage of the population participating, etc.)
9. \*How is the programme funded?
10. \*What are the future plans for the programme, i.e. expansion, restriction, programmatic changes, or other plans?
11. \*Are there currently, or have there been in the past, any programmes run by **NGOs or other organizations** (i.e. donor or philanthropic organizations, World Bank, UN agencies) related to improving household energy access and use? For each programme, please answer the following questions:
12. \*Please provide a detailed description of the programme’s scope.
13. \*Which organizations are involved, and what are their roles?
14. \*What are the dates of programme operation?
15. \*Which regions/areas of the country are targeted or prioritized?
16. \*What are the inclusion criteria?
17. \*What is the programme’s reach? (i.e. number of stoves distributed, number of beneficiaries, percentage of the population participating, etc.)
18. \*How is the programme funded?
19. \*What are the future plans for the programme, i.e. expansion, restriction, programmatic changes, or other plans?
20. What public health, social, welfare, or other programmes are currently in place in the country that could be used as a foundation for promoting clean household energy use or protecting health from household air pollution? Relevant programmes may include: cash transfer for elderly citizens, economic help for the unemployed, social welfare for women living in poverty, programmes targeting pregnant women, reducing childhood pneumonia, educational programmes that provide meals for children in schools, etc. For each identified programme, please answer the following questions:
21. What is the programme’s mandate/what does it include?
22. Who is the organizational authority/who implements the programme? If this varies by region, please specify.
23. What are the criteria for enrollment?
24. What percentage of the eligible population participates?

# Stakeholder organizations and coordination

## Government agencies and their role in addressing HAP

Objective: The goal of gathering the information in this section is to map how responsibilities for household energy are distributed across governmental structures. Even if household energy and air pollution are not addressed explicitly in government organization, this section provides the foundation to show potential opportunities for improving coordination and identifies ministries that could be involved in future work on clean household energy (e.g., formation of a taskforce focused on household energy and air pollution, development of an action plan for clean household energy). Government organizational flowcharts can provide an idea of ​​the structure of each ministry, the breadth of topics covered, and relative prominence of different ministries.

Data collection: Stakeholder interviews.

1. \*For any Ministries whose work relates to energy or environmental health, including the **Ministry of Health, Ministry of Environment, Ministry of Energy, Ministry of social welfare/livelihoods (or similar Ministries), and any other relevant Ministries**, please include the following:
2. \*The institutional organogram
3. \*Who is responsible for household energy, air pollution, or related programmes? Please include job title, role, and contact information.
4. \*Please describe which national authorities are in charge of regulating the industry, setting prices, or other oversight related to the following types of fuels and technologies:
5. Electricity
6. LPG
7. Natural gas
8. Biogas
9. Ethanol/alcohol fuels
10. Kerosene
11. Coal
12. Charcoal
13. Firewood/biomass

## Role of the health sector in addressing HAP

Objective: The objective of this section is to evaluate the current capacity and engagement of the health sector in addressing the impacts of household energy use on health. This may include integration of clean household energy into ongoing work on disease prevention and community health, collaboration on clean household energy programs, among other efforts. This section is also intended to capture and identify awareness in the health sector of the role of household energy in those diseases accepted by WHO to be causally related to air pollution exposures (Acute Lower Respiratory Infection, Chronic Obstructive Lung Disease (COPD), Cardiovascular Disease, Ischemic Heart Disease (IHD), Stroke, and Lung Cancer). It is also important to gauge the awareness of the burden of disease and the leading causes of disease in the country.

Data collection: Combination of desk research and stakeholder interviews.

1. \*What role does the Ministry of Health play in addressing household energy or environmental health issues? To what extent is air pollution (household, outdoor and/or both) perceived as a critical public health problem?
2. \*What role does the Ministry of Health play in addressing air pollution?
3. To what extent is air pollution viewed as a problem in rural compared to urban areas?
4. \*To what extent is household energy perceived as a source of air pollution or a risk for air pollution exposure?
5. \*What is the level of awareness of the health sector about household air pollution?
6. What is the level of awareness that cardiovascular and respiratory diseases are linked to air pollution exposures?
7. \*What resources are available to improve the ability of the health sector to address household air pollution and household energy use?
8. What training is available related to environmental health?
9. What training is available related to health impacts of household energy use and/or household (indoor) air pollution?
10. What is the health sector doing related to non-communicable disease (NCD) prevention? What areas are covered within ongoing activities? Is there any consideration of air pollution or environmental determinants as risk factors for NCDs?
    1. How are environmental risks/social or environmental determinants of health addressed in existing NCD programmes, if at all?

## Non-governmental stakeholder organizations

Objective: The goal of this section is to map the non-governmental partners engaged in household energy work in the country, as identified during the situational assessment. A clear listing of these organizations and their programmes is instrumental for ensuring that appropriate stakeholders are involved in future work on household energy.

Data collection: Stakeholder interviews.

1. \*Please list any **NGOs, cooperation agencies (e.g. GIZ, World Bank, development banks), international agencies (e.g. WHO, UNICEF), researchers/academic institutions, or others** who are working on improving access to clean household energy (especially for cooking, heating and lighting). This can include organizations involved in designing, building, and/or distributing improved or clean technologies, raising awareness of household air pollution, promoting behavior change for clean household energy adoption, evaluating household energy use, implementing household energy interventions, or conducting other activities related to household energy. For each identified stakeholder, please answer the following:
2. \*What are their objectives, plans, and scope?
3. \*In which part of the country do they work? (Prepare a map if feasible)
4. Provide contact information for key individuals.

## Coordination mechanisms

Objective: The goal of this section is to identify any existing method used by the in-country offices and programmes to coordinate their work on household energy, if any. Knowledge of this framework will be instrumental for informing suggestions on developing mechanisms to coordinate or leveraging what already exists.

Data collection: Stakeholder interviews.

1. \*Do the government ministries, NGOs and other agencies working on household energy and/or household air pollution have a mechanism for coordination, such as a taskforce or regular meeting on the topic of household energy? Please provide details on any way that these groups coordinate their household energy-related activities.

# Recent national disasters and other disruptions

Objective: The goal of this section is to understand how recent natural disasters and other disruptions (i.e. disease outbreaks, fuel shortages) have impacted the availability, access, and use of clean household energy fuels and technologies. This section also seeks to determine what measures countries have in place to support supply and demand of clean household energy during and following such disasters.

1. Have there been any recent natural disasters (i.e. earthquakes, monsoons, volcano eruptions, drought, etc.) or other disruptions (i.e. disease outbreaks, fuel shortages) that have affected supply or demand for household energy? If so, describe the event(s).
   1. What impact have these events had on availability of energy sources?
   2. What impact have these events had on household-level use of energy sources?
   3. What governmental programmes or policies are in place to support recovery from natural disasters or disruptions?
   4. Do the disaster recovery programmes address household energy (i.e., through measures for restoring energy supply or supporting household-level ability to access and use energy)? If so, how?

# Discussion

*Include a discussion section with the following sections, as well as others as appropriate.*

## Barriers to adoption of clean fuels and technologies

*Summarize the key challenges related to achieving widespread access to and use of clean fuels for household cooking, heating, and lighting. These may include household-level factors (i.e., affordability, preferences, convenience), infrastructural factors (i.e., accessibility, supply), political factors (i.e., financial availability, capacity), among others.*

## Opportunities for increasing access to clean fuels and technologies

*Summarize the potential avenues available for achieving widespread access to and use of clean fuels for household cooking, heating, and lighting. These may include building upon existing efforts, capitalizing on public demand for clean energy options, encouraging cooperation between identified stakeholders, engaging the health community, setting up systems for multi-sectoral collaboration, among others.*

# Conclusions and suggestions

*Include a conclusion section summarizing suggestions for how the country can increase access to and use of clean household energy based on the information discussed in the report. Consider targeting suggestions at particular sectors using the following categories:*

1. *Convening and coordination*
2. *Assessment, monitoring and evaluation*
3. *Communication and education*
4. *Policy advocacy*

# References

*In the final report, please include a full citation for all sources of data.*

# Annexes

*In the final report, include any annexes as needed (i.e. stakeholder interview guides, supplemental data or information, etc.)*