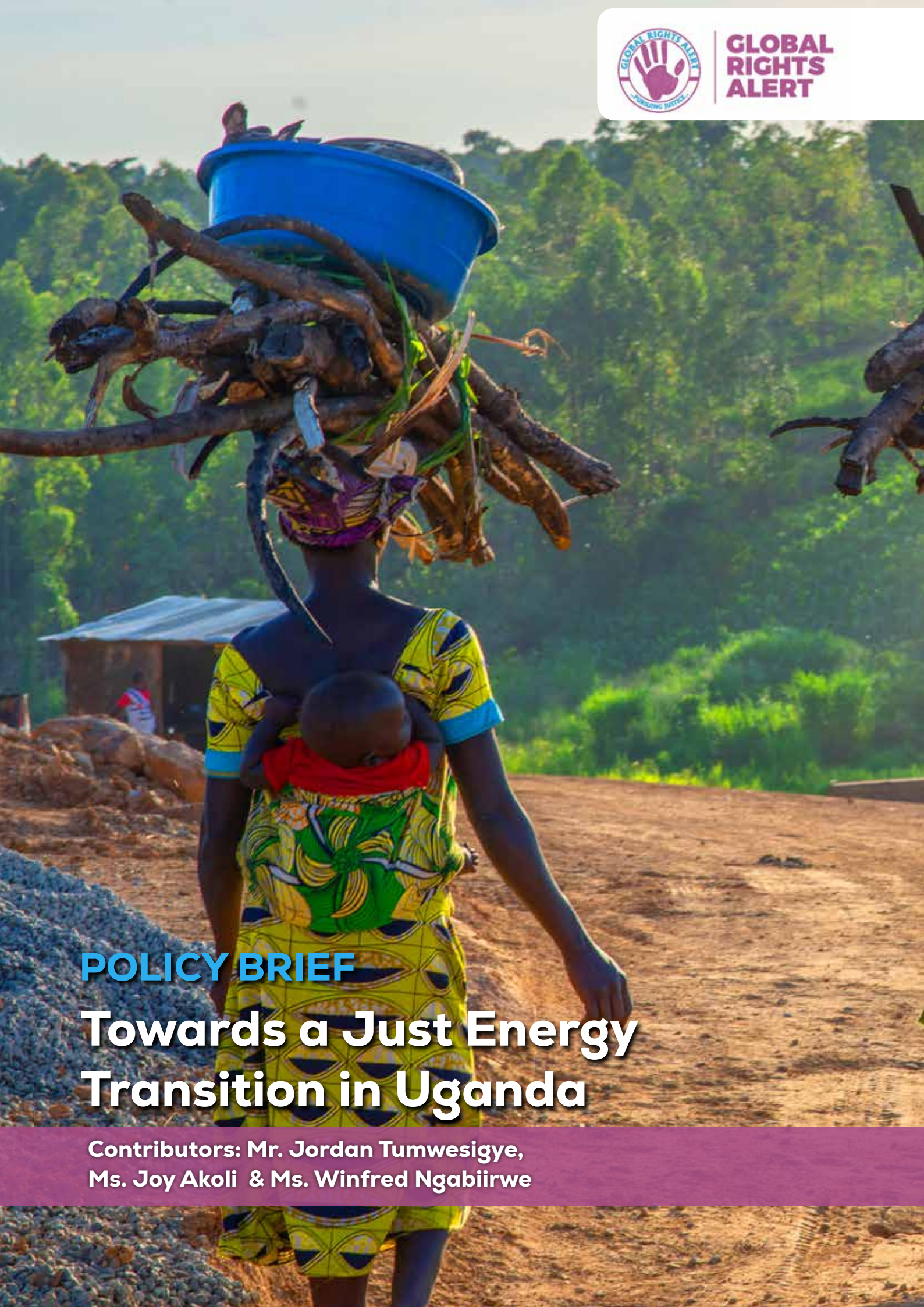

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POLICY BRIEF

Towards a Just Energy Transition in Uganda

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Introduction

Universal access to clean, affordable and sustainable energy is a key global concern that is recognised as Goal 7 among the 17 Sustainable Development Goals of the United Nations. This global position on clean energy is compelled by the resolve countries with advanced economies have made to mitigate the effects of greenhouse gases (GHG) in order to guarantee a sustainable energy future for all since they are the highest generators of these gases (Ambole et al., 2019). The United States, China and the European Union are responsible for over 50 percent of greenhouse gas emissions compared, say, to countries in Africa who are responsible for only 7.1 percent of the same emissions (Nalule, 2020).

The urgent demand for clean energy has renewed calls for a transition in energy sources, which seeks to decarbonise all sectors–particularly energy from which 73 percent of human induced greenhouse gases emanate–with the aim of reducing the impact of greenhouse gas emissions (United Nations, 2015; Norton Rose Fulbright, 2023). Decarbonisation in turn means changing from the use of fossil fuels such as coal, natural gas or oil to carbon free and renewable energy sources as soon as possible (My Climate, 2022). This shift from the use of traditional biomass and fossil fuels to electricity have been associated with economic growth due to the associated effects of urbanization and industrialization (Leach, 1992).

The demand for energy transition globally has been criticized as ambitious because energy decisions are made on a local, regional or individual scale with limited or no coordination methods for enforcement (Solomon and Krishna, 2011). Nonetheless, considering the world is facing a crisis of climate change and an increasing scarcity and expense of petroleum, the transition to a sustainable energy system has become a matter of necessity (Solomon and Krishna, 2011) even if it has to be seen as an incremental process largely dependent on household and regional accumulations of technological abilities (Murphy, 2001).

Researchers have identified five crucial drivers to the global energy transition namely: addressing climate change, meeting domestic energy demand, tackling energy access challenges, realization that oil and gas resources across the region are not infinite and could be depleted within the next few decades and, finally, a fall in oil prices (Olawuyi, 2021). So far, energy transition has been identified as one of the responses to climate change (Nik and Perera, 2020). There is optimism that

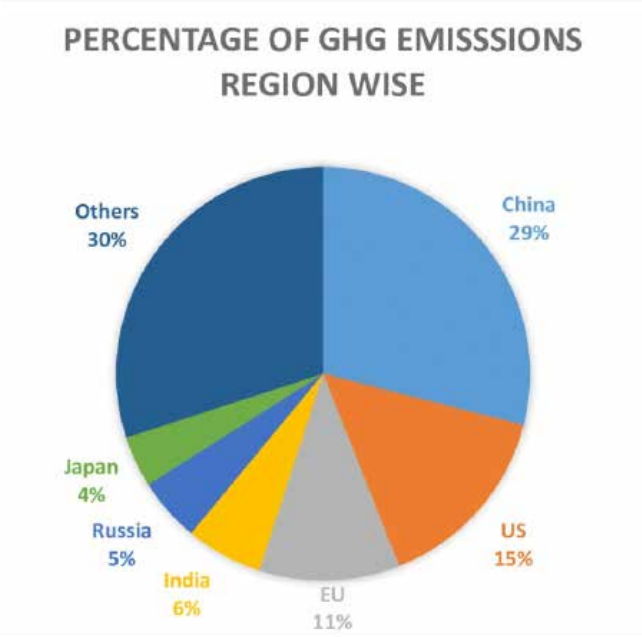
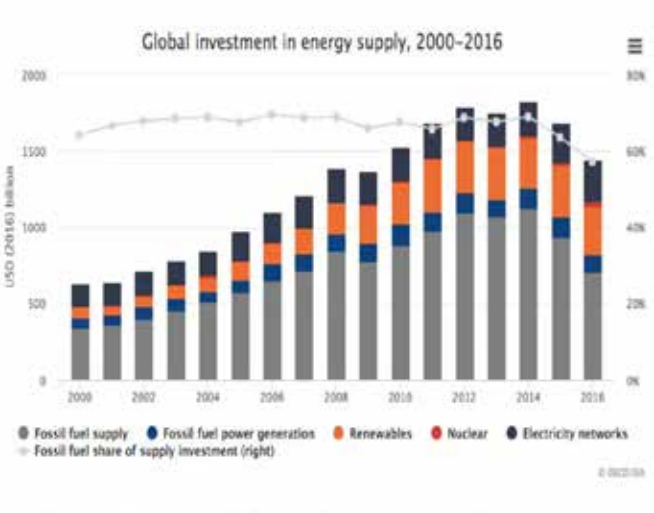


Figure 1. Piechart showing the percentage of GHG emissions region wise.

renewable energy sources will meet domestic energy demand while tackling energy access challenges. Beginning in 2020, the total global demand for renewable forms of energy was projected to grow by three percent (3%) across the key sectors of power, heating, industry and transport (International Energy Agency, 2020). Additionally, in 2020 oil demand saw its biggest annual decline (International Energy Agency, 2020), which prompted several international financial institutions to ban investment in fossil fuels (Nalule, 2020).



Global efforts towards an energy transition

In 1992, member states of the United Nations signed the Convention on Biological Diversity, which entered into force in 1993. The Convention focuses on nature conservation and sustainable use of natural resources (United Nations, 1992a). In 1994, the United Nations Framework Convention on Climate Change established an international environmental treaty to deal with climate change through evening out greenhouse gas concentrations in the atmosphere (United Nations, 1992b). The United Nations Convention to Combat Desertification (UNCCD), adopted in the same year, sought to connect environment and development to sustainable land management (United Nations, 1994).

However, it was not until the 2015 Paris Agreement that the UN member states took more deliberate steps to hold the global increment of average temperatures to well below 2°C above pre-industrial levels and pursue efforts to limit temperature increase to 1.5°C post-industrial levels (United Nations, 2015). By 2017, human induced global warming had reached above 1.0°C post-industrial levels. It is estimated that by 2040, if drastic action is not taken, human induced global warming will exceed the 1.5°C limit set by the Paris Agreement (Connors and Pidcock, 2022)

Since Paris 2015, policies to hasten the energy transition are frequent. Typically, they aim to support provisions for better living standards such as the reduction of associated health risks from the use of biomass fuels, the reduction of irreversible damage to forests and other biomass stocks while easing the pressure on biomass fuel supplies for low income earners who cannot make the transition as yet (Leach, 1992). For instance, the Kunming-Montreal Global Diversity Framework of December 2022 stipulates a target of ensuring that by 2030, at least 30 percent of areas of degraded terrestrial, inland water and other ecosystems are under effective restoration while also ensuring conservation of at least 30 percent of all ecosystems (United Nations, 2022).

Tracing lessons from past energy transitions

The current drive for a transition in energy sources is by no means the first. Countries have struggled to transfer from one form of energy to another. The biggest lesson is that energy transitions have the potential to occur rapidly when conditions are favourable. For instance, in India the transition from biomass to modern fuels was due to an increase in firewood prices between the late 1970s and early 80s as compared to competitive modern fuels during a time when household incomes also increased (Leach, 1992).

In Senegal, Liquefied Petroleum Gas (LPG) was heavily subsidized from 1974 to encourage its use instead of charcoal with the aim of halving charcoal consumption by 1977. Consumption of LPG almost quadrupled from 2900 tons to 11000 tons in 1981 but charcoal use rose slightly instead of falling. The main effect of the subsidy was to persuade middle income kerosene users rather than charcoal users to switch to LPG (Leach, 1992)

The energy transition from wood to fossil fuels across much of Europe in the 1700s–1800s was driven by urbanization, commerce, technological innovations, and the discovery of major fossil fuel reserves. By the end of the 19th century, fossil fuels had surpassed total supply of biomass fuels to become the primary global energy source despite the fact that the transition occurred at different rates by sector, ranging from 80 to 400 years (Fouquet, 2010).

The 1973-74 oil embargo from

Kwiyocwiny Nyarwoth, a resident of Nyakasenini village in Hoima City fetches firewood for her family. FILE PHOTO

A photo of biothanol and a kerosene stove (below). COURTSEY PHOTOS.

the Oil Producing and Exporting Countries (OPEC) forced countries to rethink their energy approaches. France, for instance, chose to turn to nuclear power. Consequently, by 2008 nuclear power had displaced oil as France's primary energy source (Solomon and Krishna, 2011).

The Brazilian transition from over reliance on oil to bioethanol lasted from 1975 to 2009 and saved gasoline emissions of about 110 million tons of carbon. This transition was due to three main factors: multiple government objectives were met by supporting a major ethanol program, widespread stakeholder support for the program and government emphasis on technology innovation (Solomon and Krishna, 2011).

In 1983, Ethiopia increased kerosene imports as well as kerosene stoves from India and China. By 1986, some 70 percent of households owned kerosene stoves and kerosene displaced 40 percent of demand in wood fuel (Leach, 1992).

Oil well pad development at Jobiri5 within Murchison National Park. FILE PHOTO.

Energy Transition in Uganda

Uganda discovered commercially viable oil deposits in 2006 (Petroleum Authority of Uganda, 2017). In February 2022, it announced a final investment decision for its oil and gas projects with Total Energies Uganda, China National Oil Offshore Corporation (CNOOC) and the Uganda National Oil Company (UNOC) as joint venture partners (Petroleum Authority of Uganda, 2022).

Uganda stands to earn close to US$70billion from its oil discoveries, which has renewed the country's hopes in the fight against poverty (Anderson and Browne, 2011; Uganda National Oil Company, n.d.). The promise of an oil boom has however been met with concerns from environmentalists and human rights activists. In 2019, six organisations sued Total for failure to comply with French law when it failed to exercise vigilance in assessing the threats the oil and gas project it is involved in had on human rights and the environment (Friends of the Earth v Total, 2023).

Against such backdrop, and mounting international pressure on countries to decarbonise, Total Energies and the Government of Uganda entered into a Memorandum of Understanding (MoU) in February 2022. The MoU empowers Total Energies to explore renewable energy technologies specifically production of liquefied petroleum gas as well as potential wind and geothermal projects to generate clean energy for the country (The East African, 2022). This is because the Government of Uganda recognizes that access to clean energy services is a necessary precondition for achieving development goals

that extend far beyond the energy sector such as poverty eradication, access to clean water, improved public health and education, women's empowerment and increased food production (Government of Uganda, 2015).

This recognition is enshrined in a number of key government plans, policies and laws. To start with, Article 39 of the 1995 Constitution (as amended) provides for a right to a clean and healthy environment. Objective XXVII under the National Objectives and Directive Principles of State Policy says the State is enjoined to promote and implement energy policies that ensure that people's energy needs are met while also ensuring environmental preservation. These provisions of the supreme law lay a foundation for cleaner sources of energy in Uganda.

Section 65 of the National Environment Act empowers government to promote the conservation and efficient use of energy by promoting research in appropriate renewable sources of energy and energy efficiency. The same Section also empowers government to create incentives for the promotion of renewable energy sources.

In 2008, Uganda enacted the Atomic Energy Act whose Section 52 empowers the government to promote and develop the use of nuclear energy for power generation and other peaceful purposes in Uganda. The Act ties up with Uganda Vision 2040, which looks at improving energy efficiency by promoting the use of energy efficient technologies. The Vision encourages the use of LPG and also supports the generation of electricity from nuclear energy (Government of Uganda, 2013).

The Green Growth Development Strategy 2017/18-2030/31 seeks to operationalize the tenets of a green economy as exposed in the Uganda Vision 2040. One of the Strategy's main objectives is to support a low emissions economic pathway integrating resource use efficiency, climate resilience, disaster risk reduction and optimal use of natural capital (National Planning Authority, 2017).

The National Biodiversity Strategy and Action Plan II (2015-2025) seeks to support Uganda's transition to middle income status as well as deliver on the UN Sustainable Development Goals (NEMA, 2016). Specifically, the Action Plan relies on the strategy of promoting sustainable use of biofuels in Uganda. This seems to depart from global efforts towards decarbonising.

The Uganda Nationally Determined Contributions (NDC) provide an ambitious blueprint to help Uganda's climate change mitigation and adaptation as well as highlighting the country's contributions towards the objectives of the Paris Agreement (Ministry of Water and Environment, 2022). The NDC suggests mitigation measures which include renewable energy generation, 100% charcoal production through using improved efficiency kilns; improved cook stove efficiency through dissemination of 65,000 improved cook stoves (Ministry of Water and Environment, 2022).

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Challenges with Energy Transition in Uganda

Uganda, like other less developed economies, have been urged to consider "leapfrogging" from fossil fuels to cleaner forms of energy (Murphy, 2001). Leapfrogging refers to the immediate shift from traditional forms to cleaner forms of energy (Fetter, 2022). However, this frog's leap has been criticized for not recognizing the myriad challenges of transitioning to clean energies and for ignoring the social circumstances and economic realities of daily life that hamper access to the range of implements required to obtain clean energies (Murphy, 2001).

In Uganda, the continued heavy reliance on solid biomass sources like charcoal, firewood and crop residues is a consequence of its own challenges. These include the following:

1. Unreliable infrastructure for renewable forms of energy

The generation and distribution of hydroelectricity in Uganda remains disproportionate to the population. Overall, only 15 percent of Uganda's population of 45 million people has access to electricity with only five percent (5%) connectivity in rural areas (Government of Uganda, 2015). The Rural Electrification Authority of Uganda registers several completed projects connecting rural areas to the grid. However, the sustenance of biomass demand over electricity in these areas can be attributed to the unreliability of electricity supply and its high cost relative to firewood, which remains as an affordable alternative (Nalule, 2020). Families usually

COURTSEY PHOTO

have an ideal fuel preference ladder which is influenced by income levels that runs from biomass fuels up through to kerosene and then to LPG and finally electricity (Leach, 1992). Generally, most people across Uganda use electricity only for light tasks such as ironing, watching television. They turn to charcoal or wood for cooking because electricity is expensive and erratic in its availability (Drazu, Olweny and Kazoora, 2015). In addition, the electricity access problem is worsened by illegal electricity connections which can result in death (Ambole et al., 2019).

2. High costs for some forms of renewable energy

Another constraint is the relatively high costs for equipment that aid in energy transition. For instance, costs for importing a charcoal kiln range from US$3,000 to 300,000 without taxes (Made in China, 2023). Additionally, installation costs for a solar kit are about US$100 (International Renewable Energy Agency, 2022). Whereas fuel efficient cook stoves are ideal in the energy transition, their relatively high costs of purchase means that not every Ugandan can afford them (Gifts With A Difference, 2023).

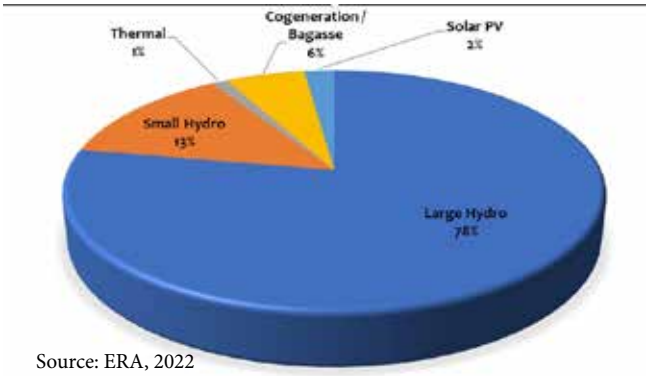
3. Counterfeit Products

One of the major constraints to Uganda's energy transition to a low carbon economy is counterfeit products (Tumusiime, 2020). Counterfeits themselves are significant factors in propagating market distortion of the clean energy products ecosystem (Diecker, et al., 2016).

4. Inadequate Access to Supplies for Cleaner Forms of Energy

There are also complications in obtaining supplies for modern fuels especially LPG and LPG cylinders, which are notoriously erratic in many least developed countries while the available supplies are often routed to higher income areas where there is dependable demand (Leach, 1992). Moreover, insufficient access to cleaner forms of energy means that most households in Uganda heavily rely on biomass fuels such as wood and charcoal which when used in poorly ventilated houses produce indoor air pollutants such as carbon monoxide which can cause respiratory infections and other health conditions (Ambole et al., 2019). The common substitute for biomass fuels is paraffin which produces less indoor air pollutants but is often the cause of house fires and human poisonings (Ambole et al., 2019)

Renewable Energy generation in Uganda



- Source: ERA, 2022

Recommendations

- Provide subsidies for distributors of clean fuels within cities and across the urban-rural divide and provide conditions that subsidize clean energy appliance costs (Leach, 1992). It is also important to note that subsidies for modern fuels are not necessarily an accelerator for the energy transition unless there is more equitable distribution of income (Leach, 1992).
- Government should encourage local design, manufacture of appropriate technologies to aid in the energy transition. This can be done through providing incentives for local producers. This is also crucial in encouraging national content.
- Encouraging more innovations that spearhead the energy transition. For instance, in December 2021, the Electricity Regulatory Authority (ERA) rolled out the cooking tariff plan, which was a deliberate strategy to shift away from charcoal to electricity (Electricity Regulatory Authority, 2021)
- Government regulators such as Uganda Bureau of Standards (UBOS) should be empowered to better regulate equipment on energy transition. This is to deal with the challenge of counterfeits.
- Service providers should provide affordable avenues through which individuals can pay for clean energy products such as entering into flexible end user agreements for payments. This is because low income earners usually avoid lump some payments as part of their energy household strategy even if it means paying up to twice as much per unit of energy than bulk purchasing (Leach, 1992).
- Energy transition approaches should focus on technological absorption rather than technological adoption. Technological absorption is embedding different technologies to the current way of life as opposed to technological adoption, which means embracing newer forms of technology that encourage clean energy and abandoning all other forms that encourage use of fossil fuels (Murphy, 2001). Technological absorption necessitates the advancement of technological capabilities which include information and skills – technical, organizational and institutional that allow productive enterprises to utilize information and equipment efficiently. (Murphy, 2001)
- Government should ensure that there is adequate stakeholder participation when it comes to developing future policies on the energy transition. This is important because it ensures that the country designs approaches that are workable within the country's socio-economic context. This ensures communal ownership and support for the energy initiatives developed.

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