Rising energy prices: implications on Uganda's energy mix and the environment

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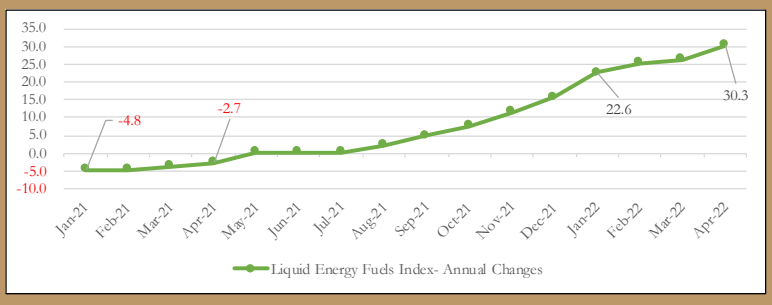
Uganda has experienced a surge in energy and fuel prices at a time when the economy is struggling to rebound from the devastating effects of the COVID-19 pandemic and its subsequent containment measures. More succinctly, Uganda experienced a 12 percent increase in its liquid energy fuels price index[1] between April 2021 and April 2022 (Figure 1). In addition, the fuel index for liquefied propane (cooking gas) slightly increased by 1.5 percent, and Paraffin by nearly 0.9 percent between January and April 2022 (UBOS, 2022).

The global economic recovery in the post-COVID-19 lockdown era is associated with increases in the global energy index and international fuel prices. The geopolitical tensions in Europe further exacerbated this surge. Conversely, since Uganda imports all its petroleum products, its domestic energy fuel prices are strongly dependent on international fuel prices (Odonkoyero & Bulime, 2022).

Cushioning the economy against the adverse effects of the skyrocketing energy prices is the focal point of most discussions amongst government officials, the media and the general public. Little or no concerns have been expressed towards its likely short- and long-term effects on the country's energy balance and subsequently on the environment. The escalating domestic energy prices could lead to a substitution of the relatively expensive energy sources (liquefied fuel energy) with the less costly energy source biomass (charcoal and wood fuel). In the long-term, this could lead to the overuse and exploitation of Wood-fuels posing an enormous threat to Uganda's forest cover.

This article aims at stimulating debate around the implications of the rising energy prices on Uganda's energy balance and subsequently on the environment. It adopts a trend analysis and descriptive statistics as part of its analytical framework. The domestic and international data sources used in the analysis include; the Uganda Bureau of Statistics (UBOS), the Ministry of Energy and Mineral Development (MEMD), the Ministry of Finance, Planning, and Economic Development (MoFPED), and the World Bank Commodity Price Database (2022).

Figure 1: Liquid Energy fuel Index – Annual Changes



Source: Author's computation based on UBOS data (2022)

Implications of a changing energy mix on the environment

According to MEMD, Uganda's energy balance is largely dominated by Biomass which constitutes nearly 89% of the total final energy consumption[2], whereas

1 Liquid energy fuels price Index measures the price changes in liquid petroleum fuels (including Diesel, petrol, kerosene/paraffin and liquefied gas – propane).

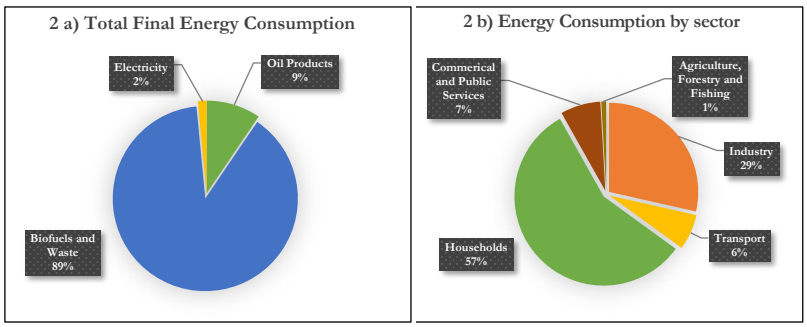
2 Biomass consumption can be further separated in

electricity and liquid energy fuels/oil products constitute 2 percent and 9 percent respectively (Figure 2 (a)). Figure 2 (b) shows that the household sector takes the largest portion (57 percent) of the country's total energy consumption. There is also a high consumption of biofuels and waste by the industrial sector at 89 percent.

Biomass (charcoal, wood fuel, and crop residue) is the most significant source of energy not only for households (both urban and rural) but also for many institutions (schools, hospitals, military barracks, and prisons) and commercial establishments (hotels, bakeries, sugar and oil factories, cement and lime factories). Increasing demand for wood fuels for heating, cooking and production purposes could result into inefficient energy use and depletion of forests.

Figure 3 shows a steep increase in the liquefied energy fuel prices index for Diesel, Petrol and Propane (cooking) gas between July 2021 and April 2022. With this escalation, households and industries are more likely to demand less of the increasingly expensive petroleum products in favour of the readily available and cheaper alternative (wood fuels). This has negative implications on Uganda's forest cover and the environment. Uganda's forest cover has tremendously reduced from 24 percent in 1990 to 8 percent in 2020 of the total land area.[3] This has primarily been attributed to agriculture expansion and wood fuel harvesting.

Figure 2: Energy Consumption



Source: Author's computation using data from the Ministry of Energy and Mineral Development (2020).

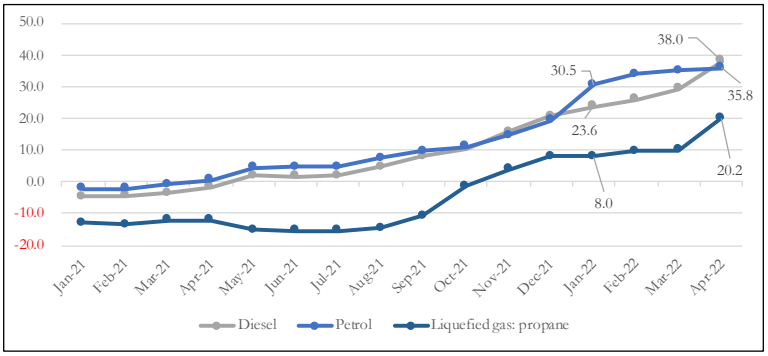
A steep increase in the demand for wood fuels could inevitably lead to extensive illegal firewood harvesting and exploitative charcoal burning, leading to overuse and depletion of forests. According to MEMD, the production of charcoal is carried out under poor conditions with extremely low efficiency of roughly 10 percent to 12 percent on a weight-in to weight-out basis, leading to energy waste.

Despite government's effort to combat deforestation, it is faced with the challenge of how to deal with forests on private lands. Section 27(1)[4] of the National Forestry and Tree Planting Act 2003, puts the management and usage of forest products on private land entirely under the hands of land owners. Ironically, 70 percent of the tree cutting happens on private land yet the law does not specify any punitive action against people who cut trees on private lands.

In addition, this surge could hinder government's efforts towards achieving equitable distribution of clean energy for production and household consumption. The sustainable energy development program in the third National Development Plan (NPA, 2020) aims to ensuring access to reliable, clean and affordable energy sources for all to achieve economic growth, poverty reduction and the social and cultural transformation of society. In particular, it aims to reduce the share of Biomass energy used in cooking and heating from 88 percent in FY2018/19 to 50 percent in FY2024/25 and subsequently increase the share of clean energy used for cooking from 15 percent in FY2018/19 to 50 percent in FY2024/25.

Furthermore, the use of wood fuels has a significant contribution to air pollution in Uganda. The continued use of traditional wood fuels for cooking and heating is responsible for the high indoor pollution levels and the resultant Acquired Respiratory Infections (ARIs) and cardiovascular diseases that mostly affect women and children.

Figure 3: Energy Fuel index [Diesel, Petrol, & Propane Gas]



Source: Author's computation based on UBOS data (2022)

Recommendations

- In spite of the government's effort to scale up rural electrification, the high electricity tariff has hindered access to electricity, especially amongst the marginalized rural households. The government should ensure lower electricity tariffs, especially for rural households.

- The government should forge partnerships with innovative energy firms to establish sustainable energy sources (for instance, solar and wind energy sources). Capital investments to exploit Uganda's potential solar energy resource[5] and wind resources could produce substantial amounts of electricity.

- The government should support the establishment of more co-generation plants to exploit and utilize biomass residues for electricity generation. According to MEMD (2007), Uganda has the potential to produce roughly between 1,186,000 and 1,203,000 tons of agricultural residues annually.

- Since most of the forest cover in Uganda is under private land, the government should develop incentive schemes to discourage the exploitative harvesting of woodfuels. Furthermore, the government should draft and administer guidelines,

firewood (78.6 %), charcoal (5.6 %), and crop residues (4.7 %)

3 Uganda's forested area decreased from 49, 240km2 in 1990 to 29,880km2 in 2020

4 Section 27(1) of the National Forestry and Tree Planting Act states that: For avoidance of doubt, Government or a local government has no ownership over trees or forest produce situated on private land.

5 Uganda's average solar radiation is 5.1 kWh/m2 per day throughout the year.

procedures, and laws for sustainable wood fuel harvesting practices and methods especially on Private lands.

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