

Achieving Sustainable Energy Consumption in Tanzania

By Karumuna Kaijage, Psychology of Science in Policy (PsySiP)

The synthesis report of the Secretary-General on the post-2015 sustainable development agenda states that “innovation and investment in sustainable and resilient infrastructure, cities and settlements, industrialization, small and medium-sized enterprises, energy and technology can both generate employment and remedy negative environmental trends” (§ 73). The reform of Tanzania’s science, technology, and innovation (STI) system that got underway in 2008 under UNESCO leadership places this country in an excellent position to strengthen the energy and technology system as part of the post-2015 sustainable development agenda.

Background

In August 2007, the heads of the UN agencies in Tanzania agreed to UNESCO’s proposal for science components to be included in the One UN programme for Tanzania.¹ UNESCO began by providing support for mainstreaming STI into a new National Growth and Poverty Reduction Strategy Documents, and, through the Economic Growth Working Group of UNDAP, mainstreaming STI into national development. More broadly, consultative meetings in response to regional development efforts in Africa occur as part

¹ <http://www.unesco.org/new/en/natural-sciences/science-technology/sti-policy/country-studies>

² <http://www.unesco.org/new/en/natural-sciences/science-technology/cluster>

the UN Secretary-General’s reform agenda – as urged by the UN Economic and Social Science Council (ECOSOC).²

Energy and technology in Tanzania

Under the 2012 POWER MASTER PLAN³, the Tanzanian government is planning a 30 percent electrification by 2015, up from 18 percent in 2012. The overall projections splits the forecast into three periods: the shorter term of 2012 to 2017 with relatively high growth during which 1.25 million customers will be connected (i.e. an increase of 250,000 customers per annum from 2013); the medium term period covering 2018 to 2025 with moderate growth rate responding to Tanzania Development Vision 2025; and the Long Term Plan Perspective (LTPP), from 2026 to 2036, responding to characteristics of middle income countries.

Tanzania has three main sources of energy: Hydroelectric Power, Coal and Natural Gas. Hydroelectric is the dominant source of energy with over 50 percent of all energy provided. However, following recent surge of discoveries and investments, natural gas is projected to be the leading source of energy in Tanzania within the projected period of the Power Master Plan.

Energy consumption and distribution

Based on the 2010 data compiled by the Tanzania Ministry of Energy and Minerals (2013) across all regions of Tanzania,

³ UNITED REPUBLIC OF TANZANIA POWER SYSTEM MASTER PLAN 2012 UPDATE, Ministry of Energy and Minerals, May 2013.

households followed closely by the light commercial/industry and street lighting, are by far the leading consumers of energy in Tanzania. However, with the increase of industrial activities in the country, particularly in the expanding mining sector, there will be an aggregate increase of high-voltage share in energy consumption.

The Ministry of Energy and Minerals (2013) estimates eight members living in every household in Tanzania. This estimate factored in the traditional and urban-dwelling system of living where multiple families reside in a single house, which in some cases would feature a compound.

The distribution of grid energy services in Tanzania can currently be categorized into three clusters:

1. The old manual “in-person” meter-reading service. This old system still requires for personnel from the Tanzania Electric Supply Company (TANESCO) to visit individual households to collect monthly data of usage from the meters that are normally built outside of homes. It is a rather expensive and heavily bureaucratic system. It is not uncommon for households to receive monthly bills that are three months late due to backlogs and other inefficiencies. It is also not uncommon for households to receive inaccurate bills that are mostly way above the consumed amount. Within the last two decades, the country has slowly begun to move away from this system.
2. LUKU (Prepaid System). This prepaid system of electricity use, introduced in the late 1990s, revolutionized energy consumption in Tanzania. It brought both accountability on the part of consumers and instituted efficiency to the state-run utility company. The system has even evolved to include more customized and “user-friendly” methods of payments, notably mobile phones, ATM bank cards and Point of Sale (POS) Terminals at supermarkets, post-offices, shops etc. The LUKU system however is still not available in almost half of the regions in the country where the old system is still in operation.
3. Automatic Meter Reader (AMR). This system, which is common in developed countries, automatically reads and generates monthly bills from smart meters and delivers them to customers on time. Similar to the LUKU system, it eliminates common billing errors that were prevalent in the old manual system. For big clients referred to as Tariff two and three, TANESCO use a blended technology of LUKU and AMR that allows these clients to monitor their consumption records through the TANESCO website at any time.

Off-grid, solar, biomass and wind renewable energy, are playing an increasing role in the energy sector in Tanzania. There is limited data on the extent of off-grid energy, but the Ministry of Energy and Minerals (2013) estimates an increasing role of the renewable energy sector to the overall energy supply in the country.

It is also not uncommon in some mid to high income households and businesses in Tanzania to find either solar panels or diesel-powered generators providing back-up power during frequent power-outages from grid-supplied electricity. Typically, these backup sources of energy are programmed with automatic changeover switches that provide instant power in an event of outage.

Important characteristics of energy consumption in Tanzania

The vast majority of households and informal commercial sectors in Tanzania still lack power supply. In the remaining areas where power supply is available, it is still unreliable. As detailed above, energy consumption and supply in Tanzania has for the longest time been characterized by waste and inefficiencies. It is therefore useful to equate sociological and behavioral dimensions when analyzing energy consumption and distribution in Tanzania. In typical extended Tanzanian family households that averages eight members per household, there is a very likely chance of finding higher levels of energy waste. In addition, chances are that levels of energy literacy in the household would also be low.

In parallel, it is also very common to find energy waste in various government, businesses and other public institutions facilities where protocols for sustainable energy consumption are either lacking or ignored. Nonetheless, it is safe to assume that in this transitional period of both energy consumption and supply in Tanzania, energy literacy and behaviors in most households and institutions are also evolving. The expansion of the LUKU system in more

regions of the country will continue to serve as a reliable indicator for energy consumption in Tanzania particularly at the household level.

Policy considerations

- A strategy is needed to translate advances in the STI system into strengthened energy and technology systems to promote sustainable energy consumption in Tanzania.
- Research into social and cultural factors influencing energy choices in Tanzanian households.
- Promote sustainable energy literacy through both formal and informal education.
- Create incentives through the existing public-private partnerships with banks and mobile phone companies that promote and reward sustainable practices of energy consumption.