# Energy storage market uganda

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Uganda has set an ambitious agenda to develop its substantial energy and mineral resources, promote economic development, end energy poverty, and lead the country to a just energy transition. Uganda"s stated objective in Vision2040 is to transform into "a modern and prosperous country", ensuring a better future for its citizens. The energy sector will play an important role in helping Uganda achieve this.

Uganda is endowed with abundant natural resources, including fertile soils; petroleum deposits; and reserves of iron ore, phosphates, copper, cobalt, aluminium and gold. The agricultural sector employs over 80% of the workforce, mostly in subsistence farming. Uganda had a population of 47million in2022, around 25% of which was urban. The country"s fast population growth has undermined efforts to increase access to modern energy.

Final energy consumption was about 16800 kilotonnes of oil equivalent (ktoe) (703petajoules [PJ]) in2021. Traditional biomass, mostly wood and charcoal used by households for cooking, accounted for around 87% of the total. Around 11% of final consumption was in the form of oil products, mostly petrol and diesel for transportation. Only around 2% was in the form of electricity, most of which was from hydropower. Households accounted for 61% of final energy consumption, industry 22%, transportation 7%, and commercial and public services together consumed around 9%.

The National Energy Policy for Uganda 2023 focuses on expanding the electricity transmission and distribution grid networks; increasing energy efficiency; promoting the use of alternative sources of energy; and strengthening the policy, legal and institutional framework. Uganda has developed a number of subsectoral policies, including the 2008National Oil and Gas Policy (currently under review), the Renewable Energy Policy (2007), and the Electricity Connections Policy (2018).

In recent years, Uganda has improved the coverage, quality and timeliness of energy balances and related data. Although Uganda is a leader in the region in terms of energy statistics, as in many other countries, data collection, organisation and quality control often are not allocated sufficient and consistent resources.

While electricity represents only around 2% of Uganda"s total energy consumption, over 80% of generating capacity is based on hydropower. Most of the remainder is also renewable, including several solar photovoltaic (PV) installations and thermal power plants that burn sugarcane bagasse. The significant reliance on hydropower has implications for energy security, particularly due to uncertainties surrounding future climate change impacts on the region"s water resources.

Uganda increased its electricity generating capacity from about 320megawatts (MW) in2002 to over 1346MW at the beginning of 2023 and now has a significant surplus relative to its peak demand of about 800MW. The Karuma hydroelectric power plant, expected to come fully online in2023, will add a further 600MW.

Investment in transmission and distribution has not kept pace with generation, resulting in an inability to fully use a significant share of the country"s generating capacity. Since past power purchase agreements (PPAs) signed with the state-owned system operator have often included take-or-pay clauses, the government has had to pay for energy that it has not been able to use, adding significantly to the cost of power.

The government has avoided subsidising electricity consumption. However, high tariffs have prevented many customers from consuming power, even when initial connections are subsidised. This, in turn, has made it challenging to finance grid extensions, as well as operation and maintenance; lowering the cost of power is one of the government"s priorities.

Amendments to the Electricity Act passed in 2022 include the possibility for net metering and for generators to sell directly to customers instead of to the transmission company, which has served as the single buyer. However, regulations allowing market participants to take advantage of such measures have yet to be implemented.

The government has a scenario to develop a 1000MW nuclear power plant by 2031 and another 1000MW plant by2040 in anticipation of rising demand. It is working with the International Atomic Energy Agency (IAEA), considered to be in Phase2 of the IAEA Milestone Approach, and has signed non-binding agreements with companies in the People"s Republic of China (hereafter "China") and the RussianFederation (hereafter "Russia") to explore options.

Approximately 92% of Uganda"s generating capacity is renewable, of which about 80% consists of large hydro, 8% sugarcane bagasse-fired plants and 4.5% solar PV plants. Uganda aims to increase its non-hydro renewable electricity generating capacity, particularly from solar. It introduced PPAs with feed-in tariffs for renewable energy projects under 20MW in2007.