

# ENERGY WEEK | GEOTHERMAL ENERGY, THE NEXT ENERGY SOURCE FOR UGANDA

Growth in the human population and energy use, as well as the consequent environmental impacts have led to interest in finding new energy resources that are renewable and have reduced greenhouse gas emissions. Geothermal energy is a versatile resource that can be used in many situations to meet these goals.

In its effort to address ongoing power shortages, Uganda is making geothermal technology a viable option to solve energy problems and has taken a strategic decision to develop available energy sources in the country.

According to Kato Vincent, the Asst. Commissioner Geothermal Resource Department in the Ministry of Energy and Mineral Development, geothermal energy will solve problems pertaining to energy reliability and security, economic development and air quality.

## What is geothermal energy?

Geothermal Energy is heat derived from the earth. It manifests as hot springs and warm pools at surface. Geothermal energy is ubiquitous, abundant, and inexhaustible. "It has been present for 4,500 million years and will be present for billions of years into the future. It flows through the earth constantly, 24 hours a day, 7 days a week, rain or shine, eon upon eon," Kato explains.

The interior of the Earth is expected to remain extremely hot for billions of years to come, ensuring an essentially limitless flow of heat and energy. Geothermal energy can be used for commercial power production and many other diverse applications. It has been used to produce power for more than a century.



Installing micro-seismic survey equipment in Kibiro, Hoima District.

## Abundance of geothermal energy in Uganda

Geothermal energy is present everywhere beneath the earth's surface, although the highest temperature, and thus the most desirable, resources are concentrated in regions of tectonically active or geologically young volcanoes like in the western rift valley in Uganda.

Geothermal power is generated by using steam to turn a turbine-generator set to produce electricity. To date, geothermal energy has played virtually no role in Uganda's energy mix yet the potential of geothermal energy is vast.

Despite the abundant hydropower resources, there has historically been little development of the geo-thermal resource in Uganda. Fortunately however, the Ministry of Energy and Mineral Development has come up with the Renewable Energy and Geothermal Policy bill to help improve the utilization of the resource.

This was in consultation with all stakeholders and in collaboration with Climate Technology Center and Network (CTCN). This policy is expected to attract public and private investment in the geothermal sector.

The Assistant Commissioner for Geothermal Resources Mr. Vincent Kato says, if widely used, geothermal energy can play a major role in Uganda's energy sector.

"Several geothermal energy resource sites have been identified in Uganda. Slot of Geothermal Reservoirs have been indicated at Kibiro (Hoima) and Panyimur (Nebbi) and drilling is yet to be confirmed. The resource was estimated by J.R McNitt to be 450MW but could even be more. The development of 50MW geothermal power plant is equal to developing 500,000 barrels of oil per year," Kato says.

## Geothermal exploration surveys

There has been interesting geothermal exploration in Uganda since 1954 and although in recent years the question of security of energy supply has given the development greater impetus, a higher emphasis on the use of renewable energy generally needs to be instituted prior to further progress.

Government led exploration has resulted in accumulation of huge data sets which is spurring interest in geothermal development. In addition, Government is supporting Private developers in their early phase exploration activities.



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## Benefits of geothermal energy

According to Kato, the use of geothermal steam for electricity production is a proven technology dating back in 1904 when the first demonstration was done in Italy.

"Geothermal energy is considered a renewable energy source because the heat emanating from the interior of the earth is essentially limitless. The interior of the earth is expected to remain extremely hot for billions of years, ensuring an essentially limitless flow of heat. Geothermal power plants capture this heat and convert it to energy, in the form of electricity," Kato says

A secure and sustainable energy mix is one of the central challenges which Uganda faces in the years ahead, as the whole world responds to the challenges of climatic change, energy security and economic competitiveness.

Geothermal energy seems to be the answer; it is a major resource and potential source of low-emission renewable energy, suitable for base load electricity generation and direct use application.

Uganda's generation capacity is expected to more than double in the next four to five years after the completion of the 600MW Karuma hydro power plant and other power projects. It is also expected that power tariffs will drop from the current 11 cents per unit – the highest in the region.

Kato says, geothermal is a versatile energy form as it can be used to produce power in utility scale facilities or for a wide variety of direct use applications such as spas, swimming pools, baths, heating green houses and dehydrating agricultural products," says Kato. In addition to environmental benefits, the industry could also create jobs and boost local revenue through royalties and taxes.