

RENEWABLE ENERGY

Mandate

To develop and promote the sustainable use of renewable energy resources and technologies (solar, wind, mini-hydro and biomass) in the country through establishment of a conducive enabling environment.

Key objectives

- I. To develop, implement, and review policies, regulation, laws, strategic plans and standards on renewable energy technology and applications.
- II. To coordinate key players and supervise renewable energy activities in the country
- III. To develop human resource capacity in renewable energy through trainings, seminars, , piloting and mentoring
- IV. To setup demonstrations system to show efficacy of the technology ensure reliable services to end users in renewable energy technologies.
- V. To promote renewable energy technologies to increase the adoption and sustainable use of modern renewable energy technologies

The key output for this department is to increase access to affordable, efficient and modern renewable sources of energy.

Renewable Energy Promotion

In line with the above objectives, the department implements the Renewable Energy Policy (2007) and currently the Biofuels Bill (2015) under development has been tabled before Parliament on the production, blending, transportation, and storage of bio fuel products for enactment into the law.

Solar energy promotion

Solar Energy is averaged at 5.1KWh/m²/daymanin applications are mainly photovoltaic systems for rural electrification using stand alone solar PV systems and solar water heating in few institutions and homes. Innovations have come up on the Uganda solar market that include pay as you go solar financing models, remote control and monitoring, financing in local financial institutions, and establishment of Uganda Energy Credit Capitalization company (UECCC) to provide Financing. Solar mini grid systems for isolated communities,

small scale institutional photovoltaic systems between 10 – 100KW to supply day time loads are becoming common where 52KW and 12KW Photovoltaic Solar systems have been installed separately in Kampala

There is a very high interest in solar grid connection investment in Uganda Government from investors although unsolicited bids for solar project have been halted by the Electricity Regulatory Authority which prefers solicited bids for solar grid connected systems. Currently 10MW solar PV systems was commissioned at Soroti Opuyo and government plans to set up a 4MW PV solar power in Busia District at Busitema University with support from the Arab Republic of Egypt.

The Ministry is supporting private sector companies through the Uganda Solar Energy Association (USEA) which has 60 subscribed members to address issues affecting the supply of quality solar systems to end-users. The association forms a forum for companies to discuss, lobby, and address technical, economical, financial and social issues that affect the solar energy business. It is estimated that over 200,000 solar institutional /home systems have been installed by companies since 2016 and majority of them are 3 -10 watts solar kit system obtained through pay as go financing model. Other model of tailored solar home and institutional systems of selling solar components involves designing, sizing, and installation of long lasting systems compared to small solar homes which due to unique spares that cannot be readily available in rural areas mainly like the lithium Iron Phosphate batteries, special low voltage lights and there is need for standardizing the solar kits to 12 Volts solar home systems.

Solar major component mainly the solar panels and batteries are tax exempted in Uganda since 2001 and the policy has resulted in massive importation and sale of solar product all over the country. Solar products are sold in every town in Uganda and its usage has penetrated the whole country. Currently some companies are lobbying for exemption of taxes on wiring accessories and appliances used in solar applications like cables, sockets, switches, connector, radios, televisions, phone charges, to mention a few. This is very challenging in implementation as those components can be used for other purposes other than solar, and it is very difficult to remove taxes on cables.

The Ministry is collecting the wind speed data at Napak and Kotido district headquarters by setting demonstration wind systems, and rehabilitating 4 wind mills for water pumping in Karamoja district, Private companies Sonex has been permitted to conduct a feasibility study

on wind and it has installed about 8 wind measuring masts in karamonja to collect wind speed data with an objective of setting up 10 MW wind farm for power generation.



Figure 1: Lowering of the windmill (left) and fitting the bearing (right).

Biomass is faced with many challenges which include; excess exploitation, inefficiency uses, poor technologies, indiscriminate harvest, lack of replacement, poor handling, transportation, informal biomass companies, and storage of biomass products. In addition to that biomass is both on public and private land which do not have stringent protection for replacement and it is also affected by other economic activities of farming, construction, and industrialization among others.

The department mandate is to address challenges that are affecting the biomass usage for energy and collaborating with other institutions to address the same problem. Key partners include among other Ministry of Water and Environment and its Institutions, Ministry of Agriculture, private sector companies, donors and end-users of biomass.

The roles, activities and outputs for Renewable Energy Department include;

Coordinating and supervising key players and renewable energy activities in the country. The Ministry together with various donors is strengthening the Biomass Energy Efficient Technologies Association (BEETA) through mobilization of members, sensitization, and market development to ensure the production and supply of efficient energy saving stoves and fuels. BEETA has so far fourteen (14) active members, and 200 potential interested members. The challenge with BEETA members and potential members is that they are informal, small companies with limited capital which makes their business slow. The role of BEETA is to lobby for good investment environment for member companies, capacity

building, and also to ensure quality of biomass products. Many organization and donors are closely working with BEETA to promote clean cooking that include among others Uganda National Alliance for Clean Cooking (UNACC), United Nations Capital Development Fund (UNCDF), GIZ- PREEEP, and UNDP.

The Ministry is promoting alternative technologies to increase the sustainable use of modern renewable energy technologies such as biogas to reduce on the pressure that firewood harvesting puts on forests. This is through the construction of bio latrines where over 45 bio latrines have been constructed in various schools across the country. The Bio latrines have helped schools by providing biogas for cooking, slurry manure for farms, they save schools from costly routine excavation of new pit latrines and have improved on school's hygiene. The challenge for massive adoption of institutional biogas technology includes high upfront costs for acquiring the system, limited supplementary feeding, lack of maintenance and simple repairs, limited end-user training, and transfer of staffs in schools.

The Ministry is providing technical support to various institutions, artisans, companies, donors including Government departments like Ministry of Local Government under the Restoration of Livelihoods in the Northern Region (PRELNOR) project financed by the International Fund for Agricultural Development (IFAD). They have setup demonstration bio latrines, efficient energy saving stoves, and solar photovoltaic in eight districts in the Acholi sub-region (Agago, Amuru, Gulu, Lamwo, Nwoya, Omoro, Kitgum, and Pader) together with the adjoining district of Adjumani

The Ministry in collaboration with the United Nations Development Programme (UNDP) with funding from the Global Environment Facility (GEF) is implementing the green charcoal project. The overall objective is to address barriers to sustainable charcoal production through the adoption of improved charcoal production technologies in Uganda, sustainable forest management and sustainable land management.

Through the charcoal project, the Ministry has conducted National Charcoal Survey (2015) for Uganda to provide baseline information for charcoal production in Uganda. The study found out that the charcoal sub sector directly supports more than 900,000 people and the main source of wood for charcoal production in Uganda is from privately owned forests (43%), followed by central forests reserves (22%), on-farm trees (20%)and others(14%). The study further shows that almost all districts didn't have trees planted specifically for charcoal production. 41% of the charcoal producers engage in full- time charcoal production while the rest are part time charcoal producers.

The sustainable charcoal laboratory was established and launched in August 2016 at Nyabyeya Forest College with an objective of testing and providing technical specifications for the biomass technologies, and fuels. The laboratory tests will make basis for further trainings, research, and greatly improve the quality of the product and clean cooking environment.

Key laws and regulatory frameworks /charcoal ordinances at district level have been formulated and put in place. The ordinances have been established with the objective of regulating charcoal production right from the district level.

A Standard National Database for charcoal and firewood has been formulated and established at the Ministry. The database will enable the capture and storage of charcoal and firewood production and consumption practices within the country.

The Ministry is providing small grants for Masters of Science students to conduct research targeting the charcoal industry. Five students were selected from different universities and are currently undertaking data collection for their Thesis. When completed, the programme will build capacity of young researchers to conduct research in the charcoal industry as well as provide more information and data for planning.

The Ministry trained charcoal producers, metal fabricators and installed 80 collapsible casamance kilns in the districts of Kiboga, Kiryandongo, Mubende and Nakaseke in 2016. 11 charcoal producer groups, with 150 charcoal producers were trained on utilization of improved charcoal production technologies (collapsible casamance kiln). Eight (8) artisans were trained in fabrication of casamance kilns.

The intervention has created skills for the fabrication of the kilns locally to meet future needs. Similarly, 11 officials from the ministry, UNDP, the four district local governments of Nakaseke, Kiryandongo, Mubende and Kiboga as well as representatives of the charcoal associations participated in a learning visit on sustainable charcoal management in Namibia. Best practices and lessons learnt will be integrated in the project interventions in 2017.

Collapsible casamance kilns have production efficiency of 35% compared to the traditional earth kilns estimated at 10%. Casamance kilns also take half the time used by a traditional kiln to make charcoal. Furthermore, the density and quality of charcoal improves with the use of casamance kiln which burns for longer time compared to the traditional one.



Figure 2: Demonstration of the operation principles of the collapsible Casamance

The Ministry has mobilized, identified and trained groups in sustainable forest management and contracted 691 private woodlot owners in the four pilot districts to make land available for woodlot establishment in 2016. Awareness campaigns were conducted on radio stations and community meetings and over 1,500 farmers applied for tree seedlings from the 4 project districts.



Figure 3: Eucalyptus plantation planted by Max Hotels Ltd group in Kiryandongo

The Ministry in collaboration with the Ministry of Agriculture, Animal Industries and Fisheries (MAAIF), with funding from UNDP/GEF, promoted Climate Smart Agriculture (CSA) in the four project districts. The first intervention involved organizing a capacity building training for 40

Local Extension Staff at Bukalasa Agriculture College so that they can effectively support farmers practicing the new technologies in the villages. The extension staff would also support the district production team who may not frequently engage with the farmers.

The project completed the review of the communications strategy and media materials based on results from the national charcoal survey. These include policy brief, newsletters, and fact sheets. This has enhanced dissemination of vital information to the relevant audiences.

As part of efforts to ensure behavior change towards improved charcoal management practices, the four pilot district Local Government teams comprising of both the technical and political officials featured in 25 radio talk shows through 4 FM stations held in the four districts. Listenership extended to 15 districts neighboring the four pilot districts with majority of the listeners asking for project services to be extended to their districts.

The National Biomass Dialogue was conducted under the theme; *“Increasing access to modern biomass energy for sustainable development”* The objective of the Dialogue was to share the latest interventions in the Biomass subsector amongst various stakeholders

To ensure quality services to the end users of renewable energy technologies, the Ministry collaborates with the Uganda National Bureau of Standards to establish standards and codes of practice for renewable energy technologies such as biogas systems and appliance, improved cook stoves. Currently ISO TC/ 285: Clean cook stoves and clean cooking international standards and National Standards for Wood Charcoal and Charcoal Briquettes are under development.