



Ministry of Foreign Affairs

# *Final Energy report Uganda*

*Commissioned by the Netherlands Enterprise Agency*

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International.*

# Report Uganda



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This document is based on information which is publicly available on the internet. The used publications and websites are mentioned in the Annex 1 of this document.

The information is checked with other sources. The information in Chapter 7 is based on interviews with several experts.

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## 1. Uganda General overview



Official name	Republic of Uganda
Area (km <sup>2</sup> )	241.038 (6x Nederland)
Land Area (km <sup>2</sup> )	197.100 (6x Nederland)
Population	39.570.125 (2x Nederland)
GDP per capita (2016 est) (WB)	\$ 580
Agriculture	coffee, tea, cotton, tobacco, cassava (manioc, tapioca), potatoes, corn, millet, pulses, cut flowers; beef, goat meat, milk, poultry, and fish
Industry	sugar processing, brewing, tobacco, cotton textiles; cement, steel production
CO <sub>2</sub> emissions (tCO <sub>2</sub> /capita)	0.10
Price of electricity (US cents/kWh)	16.5

Source: CIA Factbook, World Bank and Doingbusiness.org

## 2. Energy overview

### Overview of the energy sector/General description

Uganda has one of the lowest per capita electricity consumption rates in the world. Generation capacity is dominated by hydropower, supported by heavy fuel oil and biomass cogeneration power plants. As in other Sub-Saharan African countries that predominantly rely on hydropower, erratic rainfall and droughts have affected electricity supply in recent years and led to frequent load shedding. Currently, thanks to increased capacity and 50 MW of capacity from heavy fuel oil plants, incidence of load shedding has declined to almost zero. Uganda's largest hydroelectric power plant is the 250 MW Bujagali plant, which was commissioned in 2012 and almost doubled Uganda's installed capacity at the time. It is operated by a public-private partnership between the Government of Uganda, investment firm Blackstone, Sithe Global Power and the Aga Khan Fund for Economic Development. The country is under pressure to find additional energy sources, as electricity demand is growing at an annual rate of 10-12%. It also intends to achieve a rural electrification rate of 22% by 2022. [1]

Low-grade forms of energy, especially traditional biomass fuels, account for more than 90% of total energy consumption. Two bagasse plants have opened at sugar production facilities, at Kakira and Kinyara. [2]

### Primary energy use/Energy supply

Total Primary Energy Supply	ktoe
Coal	
Crude Oil	
Oil products	1550
Natural gas	7
Nuclear	
Hydro	266
Geothermal, solar, wind, etc.	1
Biofuels and waste	16624
Electricity	-6
Heat	
Total	18443

Source CIA Factbook 2015 (EST)

No IEA Statistics available

## Energy consumption

Total final consumption	ktoe
Coal	
Crude Oil	
Oil products	1531
Natural gas	7
Nuclear	0
Hydro	
Geothermal, solar, wind, etc.	
Biofuels and waste	12877
Electricity	216
Heat	
Total	14631

Source CIA Factbook 2015 (EST)

No IEA Statistics available

## Electricity production

Electricity production	GWh
Large Hydro	2771
Small Hydro	311
Co-generation (mainly bagasse)	353
Thermal Heavy Fuel Oil)	78
Hybrid (Solar/Diesel)	0,311
Electricity production	3513,311

Source CIA Factbook 2015 (EST)

No IEA Statistics available

## Transmission and distribution

The Ugandan power transmission network consists primarily of 132 kV lines to the various load centres, where power is distributed to the 11 kV and 33 kV distribution network. The transmission backbone runs from Jinja, where the Nalubaale, Kiira and Bujagali hydropower plants are situated, to Kampala. Future plans call for a regional 220 kV network around Lake Victoria. Lines at the Bujagali power station already run at 220kV. The 132 kV network extends to Bukoba in neighbouring Tanzania and to Kenya, via Tororo. There are lower capacity transmission lines (33 kV) to Rwanda and the Democratic Republic of Congo.

Since the establishment of the UETCL, 150 km of 220 kV and 1,441 km of 132 kV transmission lines have been added to the national grid. UETCL maintains and operates 16 substations, ranging from 66 kV to 220 kV. A number of old 132 kV lines are being reconnected to improve the reliability and quality of supply in some areas of the country. Uganda plans to increase the length of the transmission network to 3,400 km as it seeks to boost electricity production and reduce transmission losses. [1]

Strengthening the inter-connection of the Kenyan and Ugandan power grids, as well as establishing new grid connections with Rwanda, has been planned in the past. Substantial allocations have been made in the 2010/2011 budget for improvements to the energy infrastructure. Excessive water release into Lake Victoria due to the operation of the Owen Falls hydroelectric facilities has led to a need to reduce flow through the facilities, to preserve the water levels in the lake. This will translate to a loss of roughly 40 MW of capacity from the facilities. To counteract this, a number of developments are being made, including the early commissioning of 100 MW of the Bujagali hydroelectric dam, and the construction of the \$2.2 billion Karuma hydropower dam on River Nile in northern Uganda, one of the east African region's biggest power projects, is expected to commence early next year. The government has said it intends to develop the 700 MW project as a public-private partnership venture, and allocated 828 billion shillings for it in 2011/2012 budget. [2] Uganda is one of the few sub-Saharan countries to have liberalized its energy market; generation, transmission and supply were unbundled in 2001. Distribution is dominated by Umeme, which in 2015 supplied 98% of Uganda’s electricity consumption. The near-monopoly is a publicly traded company with a 20-year concession for distribution and retail in Kampala and several other territories. Uganda Electricity Transmission Company (UETCL) and UEGCL are both state owned and have a mandate to support government policy objectives. IPPs account for 60% of generation capacity, a share which is set to grow in the near term as a number of smaller renewables projects are developed. However, UEGCL expects to almost triple its capacity with 783MW due to come online in 2018 between the Karuma and Isimba hydropower projects. Another 1,2GW of new capacity in large hydro plants is currently planned for 2023.

[5]

Access to electricity (2015)	% of the population
Electrification total %	27 %
Electrification urban areas %	58 %
Electrification rural area %	18 %
Access to clean cooking	1 %

Source TRACKING SDG7: THE ENERGY PROGRESS REPORT 2018

**Off-Grid Electrification**

Uganda has one of the lowest electrification rates in Africa, remaining at 18.2% in 2016. Under the Strategy and Plan covering 2013-22, the Rural Electrification Agency aims to connect over 1.4m customers to the main grid. The Agency plans to increase today’s 7% rural electrification rate to 26% by 2022, with the ultimate goal of universal access by 2035. It is also in the process of building micro-grids to connect an additional 144,000 off-grid customers via solar PV, micro-hydro and biomass generation financed by private developers or local communities.

[5]

The solar PV market in Uganda has steadily grown over the last 15 years with new players, including foreign investors, entering the market. The lack of grid access in rural areas and the growth of telecoms, which facilitates mobile payment and monitoring systems, are structural factor that have benefited off-grid solar development. Policy measures such as tax exemptions<sup>1</sup> for equipment for solar and wind generation and subsidies for end-users have also supported expansion of the sector. However, many players complain that these mechanisms are poorly implemented, often creating additional challenges. Biofuels production has been lacklustre to date. However a biofuels blending

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<sup>1</sup> recently VAT exemption for renewable energy products until in Uganda was stopped.

bill has been introduced by the government and is expected to pass into law in 2017. This should support development of production capacity on top of an 18mLpa bioethanol plant that was commissioned in September 2016.

[5]



### **3. Renewable energy**

Uganda is richly endowed with renewable energy resources for energy production and the provision of energy services. The total estimated potential is about 5,300 MW. These resources, however, remain largely unexploited, mainly due to the perceived technical and financial risks. Hydro and biomass are considered to have the largest potential for electricity generation. But also solar power receives increasing attention by investors. Moreover, located in the East African Rift Valley, Uganda has promising potential for the exploitation of geothermal energy. Wind speeds are generally low and wind power is thus negligible. [1]

Uganda has a burgeoning renewable energy sector: with just over 900MW of power-generation capacity, 18% is made up of small renewables consisting of small hydro projects, biomass co-generation at sugar manufacturing plants and some new solar plants. This share will grow considerably, as 157MW of feed-in-tariff supported projects are expected to be commissioned by 2018. [5]

The bulk of the country's generation comes from large hydro plants owned by the state-run Uganda Electricity Generation Company (UEGCL) and Bujagali Energy Limited, an independent power producer (IPP). Under its 2007 Renewable Energy Policy, Uganda has a target to increase its renewables capacity, including large hydro, to 1,420MW by 2017 – in 2016 it stood at 635MW. The country will miss this target in 2017, but is expected to reach 1,418MW of installed hydropower capacity in 2018 (approximately 76% of expected total in country). Under its Nationally Determined Contribution, Uganda aims to have installed 3,400MW of generating capacity from renewable sources, a target it will likely meet. [5]

#### **Bio-energy**

Biomass is abundant and diverse due to different vegetation and land use types. The total standing biomass stock is stated with 284.1 million tons with a potential sustainable biomass supply of 45 million tons. The major sources are hardwood plantations, which consist of eucalyptus (50%), pine trees (33%) and cypresses (17%). Current accessible sustainable wood biomass supply lies at 26 million tons. The theoretical potential production of agriculture residues lies between 1.186 million and 1.203 million tons annually. The only sub-sector that utilizes biomass residues for electricity production yet is the sugar industry. A small amount of coffee and rice husks is also utilized for heat production in cement and tiles manufacturing and the production of briquettes. [1]

The transition from traditional biomass, which is often perceived as inefficient, to modern biomass and biofuel production and consumption is a main focal area of the government. Kakira Sugar Works (1985) Limited and Kinyara Sugar Limited are both licensed to generate electricity for sale to the national grid from bagasse, providing 12 MW and 5 MW respectively in 2010. Biomass cogeneration from agricultural wastes is seen to hold particular promise as a technology for the country, and a significant peat resource also exists, of which approximately 25 million tonnes is feasibly available for power generation, equivalent to 800 MW of potential capacity for 50 years. A limited program of biogas digester distribution was undertaken in the 1990s, and 50 digesters were installed in five districts in the country by 2004. [2]

## **Wind**

According to the Alternative Energy Resource Assessment and Utilization Study carried out between June and September 2003, the wind energy resource in Uganda is insufficient for large scale electricity generation. Measurements at two sites at Kabale and Mukono showed an average wind speed of 3.7 m/s at 20 m. [1]

Studies have concluded that whilst the wind resource is insufficient for large-scale power generation, possible applications for the technology exist, for example, water pumping and small-scale power generation in mountainous areas. Small industries in rural areas, where targets for a mill range from 2.5kV to 10kV, could benefit from the wind resource. Currently, no large-scale developments are being made in the wind power sector of the country. [2]

## **Solar**

Uganda is endowed with favorable solar irradiation of 1,825 kWh/m<sup>2</sup> to 2,500 kWh/m<sup>2</sup> per year. Small solar applications are often used in rural electrification projects such as Solar Home Systems or solar water heating. Over 30,000 solar PV systems have already been installed to in rural areas. Currently, two larger PV plants are at the planning stage. The Ugandan government intends to build a 500 MW utility-scale solar plant and awarded the implementation to Ergon Solair, a Taiwanese-US partnership. The capacity will be split up into four parks of 125 MW. The construction of the first park was planned to start in 2014 with an expected completion by October 2016. Additionally, the ERA has greenlighted the construction of a 10 MW PV plant by Dubai's Access Power MEA, the first PV project to benefit from the Get FIT scheme.

[1]

Solar energy is currently used primarily for off-grid electrification for rural communities, as well as for solar cooking, and providing water heating and power to public buildings, for example hospitals. An estimated 200 MW of potential electrical capacity are available in Uganda, and currently, a 50MW solar thermal plant, at Namugoga in Wakiso District outside of Kampala, is being investigated by a private firm, Solar Energy for Africa. Solar cooking also holds a significant potential in the country, with a large number of the population living in well-isolated areas, without access to energy services.

[2]

## **Hydro**

Hydropower is the major source of electricity generation. The government developed a Hydropower Development Master Plan. Uganda has considerable potential accumulating to over 2,000 MW. Two large-scale projects with a total of 783 MW are currently implemented and planned to be completed in 2018. Other large-scale sites with a potential of more than 1,500 MW have been identified as well as 59 mini hydropower sites with a potential of 210 MW. Recently, the Ministry of Energy and Mineral Development permitted the construction of five small hydropower projects with a total capacity of 33.7 MW. Some of these are developed under the GET FIT program. [1]

Uganda's electricity supply depends mainly on hydropower from the Nile. Due to this dependence, the country is facing severe climate change-related risks. Recent persistent droughts have reduced hydropower production from 340 to 140 MW. According to the ERA, the country's regulator, actual power generation stands at around 400 MW, from an installed capacity of approximately 550 MW. Power shortages have been compensated by installing numerous off-grid systems, and recently a 150 MW grid thermal power system, at the exceptionally high cost of 0.27 US\$/ kWh. Commercial losses are at roughly 35% due to poorly-maintained lines. The highly-centralised nature of the country's electricity infrastructure, and the continuing high costs of investment in the large-scale power sector

for low population outreach, are hampering further development.

### **Geothermal**

The geothermal resources in Uganda are still at the reconnaissance and exploration stage. [1]  
Uganda has an estimated geothermal resource potential of 450 MW, mainly located in the Western Rift valley part of the country (Katwe Kikorongo, Buranga and Kibiro). Feasibility studies are recommended to improve confidence in the resource and promote development. [2]

#### **4. Energy efficiency**

The Promotion of Renewable Energy and Energy Efficiency Programme (PREEEP) is a key project by the Ministry of Energy and Mines in collaboration with the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), to promote energy efficiency and renewable energy. The government is also promoting the use of energy saving bulbs by distributing approximately 800,000 of them to low-income households. The Energy Advisory Project, also funded through the GIZ, aims to provide energy users with information about energy efficiency, as well as promote the use of efficient equipment and appliances in manufacturing and at home, and assess the benefits that improved efficiency could have on the transport and agricultural sectors, particularly in terms of maintenance of fleet vehicles and auditing of agricultural businesses. Efficiency standards-setting is another goal of the project. The Energy Advisory Project goals have recently been incorporated into the PREEEP, and as such continue to be pursued.

The government acknowledges a number of key areas where energy efficiency could be improved. These include increasing solar water heater installations to 30,000 m<sup>2</sup>, and implementing industrial energy auditing and the dissemination of efficient equipment to industries. [2]

## 5. Governmental framework

The Ministry of Energy and Mineral Development (MEMD) implemented the Government's Power Sector Reform and Privatisation Policy, which resulted in liberalisation of Uganda's power sector. As part of this, the state-owned Uganda Electricity Board was unbundled in 2001 and broken up into Uganda Electricity Generation Company Limited (UEGCL), Uganda Electricity Transmission Company Limited (UETCL) and Uganda Electricity Distribution Company Limited (UEDCL). The Electricity Regulatory Authority (ERA) was created at the same time. Uganda introduced a feed-in-tariff (FiT) scheme in 2007. In cooperation with other donors, KfW introduced the GET FiT programme, which tops up government tariffs with a premium and boosts the attractiveness of investments in the sector. [1]

Relevant governmental stakeholders are:

### **Ministry of Energy and Mineral Development (MEMD)**

The MEMD's mandate is "to establish, promote, strategically manage and safeguard the rational and sustainable exploitation and utilisation of energy and mineral resources for social and economic development." Its role is to provide policy guidance, to create an enabling environment in order to attract investment, to acquire, process and interpret technical data in order to establish the energy and mineral resource potential of the country and to inspect, regulate, monitor and evaluate the activities of private companies in the sector. Irene Muloni is the current minister.

<http://www.energyandminerals.go.ug/> [1]

### **Electricity Regulatory Authority (ERA)**

The ERA is a statutory body established in 2000 in accordance with the Electricity Act 1999, with the purpose of regulating the generation, transmission, distribution, sale, export and import of electricity in Uganda. It also guides the liberalisation of the electricity industry, and manages licensing, rates, safety and other matters concerning the industry. It is responsible for ensuring that electricity companies comply with the conditions of their licences, and for protecting the interests of consumers in respect of prices, charges and other terms of supply as well as the quality, efficiency, continuity and reliability of supply services.

<http://www.era.or.ug/> [1]

The ERA is financed through the Ministry of the Treasury, by fees prescribed by the Authority on licensing, and a levy not exceeding 0.3% on the revenue generated from the sale of electrical energy. The Electricity Act stipulates that, subject to the declared policy of the Government, the Authority is independent in the performance of its functions and duties, and shall not be subject to the direction of any person or authority. [2]

The ERA is responsible for:

- Issuing licenses for electricity generation, transmission, distribution, supply, import and export,
- Reviewing and approving tariffs,
- Establishing and enforcing sector standards,
- Advising minister on matters affecting the electricity sector.

[2]

### **Rural Electrification Agency (REA)**

The REA was established as a semi-autonomous agency by the MEMD in 2001, with an operational mission to implement the rural electrification agenda under a public-private partnership. It functions as the secretariat of the Rural Electrification Board, which carries out the Minister's rural electrification responsibilities, as defined in the Electricity Act of 1999. The REA is mandated to facilitate the goal of achieving a rural electrification rate of at least 22% by the year 2022, from 1% in 2010. <http://www.rea.or.ug/> [1]

### **Uganda Electricity Generation Company Limited (UEGCL)**

UEGCL was incorporated in 2001 and is wholly owned by the government of Uganda. Its key responsibilities are the generation of electric power, and its sale within Uganda or as exports to neighbouring countries; building, operating and maintaining electricity generation plants; monitoring the operation of and maintaining its assets; and providing technical support as and when required. UEGCL also organises, supports, encourages and maintains training facilities in technical and related fields. It owns the 180 MW Nalubaale hydropower plant and the 200 MW Kiira hydropower plant. These facilities have been operated and maintained by Eskom Uganda Limited since 2003 pursuant to a 20-year concession agreement. <http://uegcl.com/> [1]

### **Uganda Electricity Distribution Company Limited (UEDCL)**

UEDCL is the owner of the electricity distribution network. Network management was transferred to Umeme under a concession arrangement in 2004. As a result of this, UEDCL's responsibilities changed to incorporate:

- Administering the lease and assignment agreement
- Supervising the completion of rural electrification projects that were under construction before the transfer of operations to Umeme
- Ensuring that it is in a position to take over and resume operation of the electricity distribution and supply business in the event of premature termination of the concession Agreement

<http://www.uedcl.co.ug/> [1]

### **Umeme**

In 2004, UEDCL's 33 kV distribution assets were transferred to a consortium comprising Globeleq and Eskom, pursuant to a 20-year concession agreement. Umeme operates, maintains, upgrades and expands the distribution network. It sells electricity to its customers and improves efficiency within the electricity distribution system. Umeme is listed on the Uganda Securities Exchange (USE) and on the Nairobi Securities Exchange (NSE).

<http://www.umeme.co.ug/> [1]

### **Uganda Electricity Transmission Company Limited (UETCL)**

UETCL is owned by the Ministry of Finance, Planning and Economic Development and remains the single operator of the transmission system. It is the counterparty to power purchase agreements and sells on power to the distribution network companies. It is responsible for bulk power purchases and sales, imports and exports of energy, and operation of the high voltage transmission system, as well as having the role of national system operator.

<http://www.uetcl.com/> [1]

### **Independent Power Producers (IPPs)**

A number of IPPs and private distribution companies have entered the power sector following liberalisation. To date, seven companies and cooperatives sell electricity to households, commercial clients and industry. In addition to the largest distributor, Umeme, these include the West Nile Rural Electrification Company, Ferdult Engineering Services, Kilembe Investments, Bundibugyo Electricity Cooperative Society, Pader Abim Community Multipurpose Electricity Cooperative Society and Kyegegwa Rural Electricity Cooperative Society. [1]

### **Uganda National Renewable Energy and Energy Efficiency Alliance (UNREEEA)**

UNREEEA is a non for profit organization that was incorporated 2014 as result of the private sector players in the various renewable energy and energy efficiency sub-sectors signing a memorandum of understanding to come under one umbrella body. The primary role of the UNREEEA is to avail a platform for consolidating the renewable energy and energy efficiency private sector wing as well as improving its business environment. <http://unreeea.org/>

The Alliance as an umbrella organization currently brings together a network of six member associations under which the various companies and enterprises are subscribed and they include:

- Biomass Energy Efficient Technologies Association (BEETA)
- Uganda National Bio-gas Alliance (UNBA)
- Hydro-power Association of Uganda (HPAU)
- Uganda Solar Energy Association (USEA)
- Energy Efficiency Association of Uganda (EEAU/Energy Auditors)
- Wind Power Association of Uganda (WPAU)

[3]

#### **Vision of UNREEEA**

To be the lead alliance in the renewable energy and energy efficiency sub sector of Uganda and East Africa, being a partner of choice for government, private sector stakeholders and sister associations in the East African Community. [3]

#### **Mission of UNREEEA**

To consolidate the fragmented sector associations and further, improve the business environment for renewable energy and energy efficiency private sector players as well as contribute to sustainable development in Uganda and East Africa. [3]

### **Oil and gas market**

Uganda is currently described by the World Bank as the hottest inland exploration frontier in the world due to the commercial discovery of an estimated 6.5 billion barrels of oil, 1.4 billion of which are recoverable.

Against this backdrop, the major players in the Oil and Gas market are Total E & P Uganda, Tullow Uganda Operations Pty Limited and China National Offshore Oil Corporation (CNOOC) who are all holders of production licences issued in respect of six exploration blocks in Albertine Graben (located in the western arm of the Great East African Rift, which they operate under the terms of a Joint Operating Agreement).

The issuance of these production licenses was a huge milestone and is expected to fast-track the foreign investment decision of the 3 joint venture companies which is expected by the end of 2017. Oil production is expected to begin in 2020.

The GoU wants to establish a local oil refinery. Negotiations so far failed. The GoU is currently back to the drawing board in search of a new partner for the oil refinery project. Once completed, the refinery is expected to produce 60,000 barrels of oil per day.

The much anticipated crude oil pipeline is now set to run from Hoima in Uganda to Tanga in Tanzania. [10]

**National Environment Management Authority (NEMA)**

- Directorate of Water Resources Development,
- Private Sector Foundation Uganda,
- Uganda Investment Authority,
- Uganda Manufacturer's Association,
- Uganda Renewable Energy Association,
- Uganda Small Scale Industries Association,
- Other Government Ministries, including District Local Governments.

<http://www.nemaug.org/>



## 6. Regulatory framework

The Electricity Act mandates the Minister of Energy to table in parliament an annual report on the progress of the Rural Electrification Strategy and Plan that contains, amongst other things, information relating to renewable energy power generation for sale to the main grid and for mini-grids. Furthermore, the creation of the Energy Fund seeks to provide a public financing source to support or leverage private sector financing, in addition to providing for the construction of hydropower projects and the associated infrastructure. [2]

### Energy procedure

Energy planning is guided by the Rural Electrification Strategy and Plan covering the period 2001 to 2011/12. The objectives of the plan are to achieve equitable regional distribution of energy, maximise the economic, social and environmental benefits of rural electrification subsidies, promote expansion of the grid and development of off-grid electrification, and stimulate innovation within electricity suppliers. Specific objectives of the plan over the previous 2010 plan are to increase the financial resource base available for rural electrification by US\$ 40 million per annum, as well as increasing new grid connections by 40,000-50,000 per annum.

### Electricity Act 1999

The Electricity Act of 1999 defines the authorities and their funding for the electricity sector. Additionally, the assignment of licenses, the rural electrification and the rights and duties of customers are regulated. The salient features of the Act are:

- Liberalization of the electricity industry
- Disband of the Uganda Electricity Board (historically a vertically integrated monopoly) into three entities
- Establishment of the Electricity Regulatory Authority
- Establishment of the Rural Electrification Fund
- Establishment of the Electricity Dispute Tribunal that has jurisdiction to hear and determine electricity sector disputes which are referred to it

[1]

### Energy Policy 2002

The objective set out by the Energy Policy for Uganda is to meet the energy needs of the population for social and economic development in an environmentally sustainable way. Therefore, the Policy calls to increase access to modern and reliable energy services. Its bold policy vision contains:

- to establish the availability, potential and demand of various energy resources in the country
- to increase access to modern affordable and reliable energy services as a contribution to poverty eradication
- to improve energy governance and administration
- to manage energy-related environmental impacts
- to increase the role of private sector in the power sector operations and future development

[1]

The policy goal in the energy sector is to meet the energy needs of the Ugandan population for social and economic development in an environmentally sustainable manner. Specific objectives under the energy policy include assessing the availability and demand of energy resources in the country, improving energy service access to reduce poverty, improve governance in the energy sector and

institute improved administrative procedures, and stimulate the economic development of the energy sector, whilst minimising environmental impacts. [2]

### **Renewable Energy Policy 2007**

Uganda is one of the few African countries with a clearly focussed renewable energy policy, which was published by the Ministry for Energy, Minerals and Development (MEMD) in 2007

The Renewable Energy Policy 2007 aims to provide a framework to expand the contribution of renewable energy in the energy mix beyond large hydropower from 4% in 2007 to 61% in 2017. The vision contains:

- to maintain and improve the responsiveness of the legal and institutional framework to promote renewable energy investments
- to establish an appropriate financing and fiscal policy framework for investments in renewable energy technologies
- to promote research and development, international cooperation, technology transfer and adoption of standards in renewable energy technologies
- to utilize biomass energy efficiently so as to contribute to the management of the resource in a sustainable manner
- to promote the sustainable production and utilization of bio-fuels
- to promote the conversion of municipal and industrial waste to energy

The Policy promotes power generation from mini-hydro power schemes, biomass, co-generation, wind, solar, geothermal and peat. There are plans to include nuclear power generation in the power mix. [1]

The Renewable Energy Policy establishes a Standardised Power Purchase Agreement and Feed-in Tariffs for renewable energy generation projects. It introduces favourable financial and fiscal regimes for RETs, including:

- preferential tax treatment or tax exemption,
- accelerated depreciation,
- provision of risk mitigation mechanisms and credit enhancement instruments,
- credit mechanisms for renewable energy consumers.

[2]

### **Feed-in tariff (FiT)**

To promote the development and use of renewable energy sources, the Government has developed a FiT structure for power plants of up to 20MW and first published it in 2007. Independent Power Producers (IPPs) enter a Purchase Power Agreement (PPA) with the UETCL. In 2014, both a Standardized Implementation Agreement and a Standardized Power Purchase Agreement were published. These documents are considered to pave the way for significantly reduced transaction costs while providing a security to investors.

Small-scale renewable energy generation projects in an advanced planning status and with a valid development permit by ERA can apply for premium payments under the GET FiT program through participation in a competitive Request for Proposal and the subsequent evaluation process. So far, three rounds of Requests for Proposals have been carried out.

The program was officially launched in 2013. It has been jointly developed by the Government of Uganda, ERA and KfW and is designed to leverage private investment into renewable energy generation projects. The Premium Payments constitute a result-based incentive grant designed to enhance the financial viability of the selected projects. Premium Payments are structured as

payments per kWh to chosen private developers, calculated on the basis of expected generation of eligible projects over the lifetime of the 20-year-long PPA.

The FiT for renewable energy power generation effective since March 2014 [1].

The GET FiT scheme originally focused on small hydro, bagasse (sugarcane waste) and other biomass. In 2014 solar PV was included in the list of eligible technologies. To encourage participation, developers benefited from a top-up on the existing feed-in tariff and standardisation of power purchase agreements and the development process.

By the end of 2015, 17 GET FiT projects had been approved for 20MW of biomass, 117MW of small hydro and 20MW of solar PV, with the first solar project commissioned in 2017, and others to follow in 2018. Now under its third phase, GET FiT will offer support for up to 295MW of hydro, bagasse and wind projects. However challenges remain to bring these projects online, as grid capacity is constrained and connections to the grid suffer of delays. Despite international donors agreeing to fund additional transmission and distribution capacity, projects have been slow to get off the ground. [5]

### **National Development Plan 2010-2014/15**

The current NDP sets forth a number of development objectives for the energy sector, in terms of generation facility construction, transmission network extension, the promotion of energy efficiency in the supply side, the strengthening of the institutional and regulatory framework for energy, and the promotion of renewable and atomic energies. Specific areas of action within the Plan include the construction/study and design of the Bujagali, Karuma, Ayago and Arianga large hydropower projects, with a potential capacity of 2,050 MW; the construction of 150 MW of small-hydro capacity, the expansion of the transmission grid to 2,750 km with support for 220 kV and 400 kV operation, the reduction of commercial and technical power losses to 16%, and strengthening of the institutional and human capacity of the energy sector. [2]

### **Regulatory barriers**

Further facilitation activities are required to make investment in RETs a truly viable prospect in the country, including the simplification of land acquisition procedures, and capacity-building measures in the sector. The NDP 2010 identifies some key issues as barriers to further energy sector development, including high power tariffs, the limited extent of the national grid, the poor regulation and history of public-private partnerships in the country, and unfocused and uncoordinated institutional planning. [2]

## **7. Access to finance**

Credit-enhancement and support instruments are available to the private sector for both on- and off-grid projects via the government owned – and internationally financed – Uganda Energy Credit Capitalisation Company (UECCC). Support includes technical assistance for early stage grid-scale project development and working capital for pay-as-you-go off-grid solar providers. [5]

## 8. Opportunities and barriers for Dutch companies

### Opportunities

Uganda is a large market with a lot of potential for renewable energy. With only around 27% of the country connected to the grid, over 30 million people lack access to electricity. This means there is a huge market potential for the supply of off grid renewable energy services as presented in chapter 2.

Even in areas where the grid is present, it is often prohibitively expensive to actually get connected, as the last part of the connection needs to be paid for by the households. With many households still below the poverty line this is not an affordable option. This means that at this point in time the only viable option for getting electricity access in the rural areas is through Solar Home Systems.

Even in Kampala there is some uptake of solar home systems. As the grid is not always very reliable people are interested in Solar Home Systems as a back up to the grid.

According to RECP [1], the following market segments are considered promising for the application of renewable energy for electricity generation. The potential includes, but is not limited to

- Hydro: large-scale power plants, rural electrification / small, mini and micro hydro plants (community-based)
- Biogas & Biomass: grid-tied / captive power plants for industry and institutions (flower, vegetable, fruit, tea); grid-tied / waste to energy conversion; dome biogas for cooking
- PV: rural electrification / mini-grids and stand-alone systems for households, commercial users, agriculture and industry; Stand-alone / back-up or captive power systems for small businesses and industry; Grid-tied power plants
- Geothermal: exploration, grid-tied power plants

Overall Uganda has a regulatory framework which is supportive of renewable energy investments and the rural electrification agency is well developed.

The Dutch embassy in Uganda has been very supportive of renewable energy development. They have provided subsidies for customers of two Dutch renewable energy companies which are active in Uganda; Solar Now and Barefoot power. The embassy is open to extend support to new companies who are complementary to the existing companies that are being supported while remaining cautious for destructive competition. Currently the embassy is providing subsidies to Solar Now for solar products that can be used in agriculture such as solar water pumps.

Some companies are providing finance for their customers so they can repay products over several years. According to one interviewee the default rates are less than 5%, which can be considered very low, especially in the African context.

The market in Uganda is getting more mature, this is exemplified by the investment of Shell in Solar Now; together with other investors they took an equity stake in Solar Now of 9 million USD. Also Total is investing in renewable energy in Uganda.

Renewable energy products until recently were VAT exempt in Uganda which helped to make renewable energy products more competitive, unfortunately this VAT exemption was recently stopped.

## Challenges

Around 27% of the Ugandan population is still below the poverty line<sup>2</sup>, and many are close to the poverty line which means that for example one poor harvest could push them below the poverty line, this is also reflected in the average gdp/capita of around 615 euro in 2016. This means that the ability to pay for renewable energy solutions is still limited. Especially when the entire investment is expected up front.

Another challenge is related to transport and distribution of goods. As Uganda is land locked, all goods come in through Mombassa and Dar Es Salaam. Somehow it is cheaper to transport goods from Shanghai to Mombassa than from Mombassa to Kampala.

Distribution of goods from Kampala to the end users is also expensive. According to one of the interviewed experts this is sometimes disregarded by Dutch companies that would like to sell products in Tanzania. If one were to try to sell everything from Kampala, the products suddenly become very expensive at household level, a decentralized distribution model will therefore be required. With a smart distribution model and an affordable solution however it should nevertheless be possible to set up a competitive business, which is exemplified by Solar Now.

In the past quite a few NGO's and companies have been active in Uganda and have provided low quality pv products without providing sufficient after sales service. This has harmed the image of solar products in Uganda which could affect companies offering pv products.

Access to affordable finance is also problematic in Uganda. Local interest rates are around 20%, while even larger companies need to pay around 11% on international loans. This appears to be due to unfamiliarity of financial institutions with renewable energy which results in a perceived higher risk with associated risk premium.

Uganda is now considered a transition country for Dutch development policy. This means that less development aid will be made available for Uganda, and therefore also for energy access related development aid.

The previously mentioned market maturity is also a downside. As a new entrant it will be rather difficult to compete with established parties in Uganda.

Despite the welcoming policy regarding renewable energy, it is not always clear which import tariffs apply. At some point all products were exempt but recently some of these products are being taxed again. According to one of the interviewees, it appears that within the tax authority the expertise is lacking to assess which taxes should be applied for certain products. Civil servants prefer to be cautious related to tax exemptions, this sometimes results in wrong taxes being applied. The associated uncertainty has a negative impact on the business climate for renewable energy.

As customs are different, and quite a bit of red tape applies for new companies, one of the interviewees advises to only enter the Ugandan market through a joint venture with a local party.

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<sup>2</sup> <http://www.monitor.co.ug/News/National/34-million-Ugandans-poverty-income-prices/688334-4115106-mulfd7z/index.html>

## 9. Dutch companies active in Uganda

Advance consulting\*  
African Clean Energy\*  
Barefoot Power  
Ecozoom\*  
Foundation Rural Energy Services  
Mimi Moto\*  
Waka Waka  
Solar Now\*  
The Green Elephant [6]

Companies marked with \* took part in an interview related to taking part in a green trade mission

## 10. Relevant Dutch support schemes

### **Subsidies & Programmes run by the Netherlands Enterprise Agency (RVO)**

This chapter provides a selection of the programmes run by the Netherlands Enterprise Agency (RVO). For a full overview: <http://www.rvo.nl/subsidies-regelingen> (in Dutch)

For country specific information see:

<https://www.rvo.nl/onderwerpen/internationaal-ondernemen/landenoverzicht/tanzania>

### **Dutch international governmental network**

The Dutch government has an extensive network of international offices. This network helps companies by advising them, making contacts for and opening doors. They are present on site, know local players, networks and the market, and know how to deal with language and culture barriers.

They can help Dutch entrepreneurs finding their way abroad when doing business internationally. They can help to find reliable, foreign business partners. They also can make a business partner scan.

<https://www.rvo.nl/onderwerpen/internationaal-ondernemen/netwerken-en-contacten/buitenlandnetwerk>

### **Dutch Good Growth Fund (DGGF)**

The Dutch Ministry of Foreign Affairs provides finance and insurance through the Dutch Good Growth Fund (DGGF) programme, facilitating development related trade and investment in over 60 countries. The fund consists of 3 parts:

#### Investing

The DGGF provides Dutch SMEs doing business in developing countries and emerging markets with customised financing. Do you want to invest in a DGGF countries, but have trouble getting the necessary financing? The DGGF facility Investing Dutch SMEs offers guarantees and direct financing with a repayment obligation, such as loans and equity investments in projects.

#### Local SMEs

Do you manage an investment fund that aims to improve the access of local SMEs to finance? Read more about the DGGF facility Investment funds local SMEs.

#### Exporting

If you need help exporting capital goods to one or more of the DGGF countries, the DGGF facility Exporting Dutch SMEs provides export credit insurance and export financing.

More information: Find information about the qualifications, procedures and transactions on [english.dggf.nl](http://english.dggf.nl).

The Dutch Good Growth Fund is a programme of the Dutch Ministry of Foreign Affairs. It is administered by the Netherlands Enterprise Agency (RVO.nl), Atradius Dutch State Business (for Dutch SMEs) and a consortium of PwC and Triple Jump (for local SMEs).

### **Dutch Trade and Investment Fund (DTIF)**

The Dutch Trade and Investment Fund (DTIF) consists of two components: Investment and Exports. The fund was established in 2016 and replaces the Facility Emerging Markets (FOM) and Finance for International Business (FIB) financing instruments.



### For whom?

Dutch companies wanting to invest in or export to foreign markets can apply for DTIF. The fund was established to stimulate the globalisation of Dutch companies.

### Budget

DTIF can offer up to € 15 million in financial support for each project. The total budget is € 102 million.

### For which countries?

DTIF is available to all countries, with the exception of those which are eligible for DGGF finance and countries under sanction by the United Nations Security Council or the European Union. These applications will be assessed with extra scrutiny. The sanctions policy of the Security Council and/or European Union will be maintained in all cases.

### DTIF Investment

DTIF Investment offers support through loans, guarantees and direct or indirect shares with a repayment obligation. The Netherlands Enterprise Agency (RVO.nl) serves as the fund manager for this facility.

### DTIF Exports

Interested in exporting capital goods to one or more DTIF countries? The DTIF Exports facility can help by offering export credit insurance and funding. Atradius Dutch State Business serves as fund manager for this resource.

### Differences between DTIF and DGGF

DTIF is closely linked to the Dutch Good Growth Fund (DGGF). However, the two funds differ in terms of their target countries. DGGF is mainly focused on developing countries, whereas DTIF targets other foreign markets.

DTIF is open to all Dutch companies, whereas DGGF exclusively services businesses in the SME sector. DTIF does not offer funding for local SMEs, while DGGF does.

### **Energising Development Partnership Programme (EnDev)**

The Energising Development Partnership Programme (EnDev) gives households, social institutions and SMEs in developing countries permanent access to modern energy technologies and energy services. The projects take place in 24 countries in Africa, Latin America and Asia.

### What does EnDev do?

EnDev supports the development of markets for modern energy facilities, especially in rural areas. For example, the development of renewable energy to cook, for lighting and for mobile phones. Part of the EnDev programme is the training and coaching of manufacturers and retailers of for example energy-efficient cookstoves and small solar energy systems. The programme also supports the construction of electricity connections via mini-grids and better network coverage. And EnDev stimulates the production of biogas digesters for household purposes.

### Outcome-oriented

The EnDev program focuses on supply and demand. On the demand side, financial products can be developed that allow poor households to buy energy products. On the supply side, projects concern the quality and availability of these energy products.

The programme EnDev has no subsidy component. It publishes Specific Calls for Proposals in the form of Result Based Financing (RBF). The calls can be found on the website [www.endev.info](http://www.endev.info).

### Background

EnDev is a partnership between the Netherlands, Germany, Norway, Australia, the United Kingdom and Switzerland. The programme is coordinated by the German Gesellschaft für Internationale Zusammenarbeit (GIZ) and the Netherlands Enterprise Agency (RVO.nl). RVO.nl does this on behalf of the Dutch Ministry of Foreign Affairs.

More information can be found at [www.endev.info](http://www.endev.info).

### **Starters International Business (SIB)**

Exporting goods and services abroad offers your business more opportunities. It can lead to greater sales and serve as a solution to the challenge of increased competition in the domestic market. With its Starters International Business (SIB) programme, the Ministry of Foreign Affairs can help you move into foreign markets.

### Vouchers

Export allows you to effectively spread your risks. Buy how do you start? What are your company's strengths? Which markets can offer opportunities and how can you successfully seize them?

Three different SIB vouchers can help you with your plans to take your business abroad:

- Individual coaching voucher (in Dutch) to hire a consultant / coach to look at your opportunities abroad and to work towards a concrete plan of action.
- Collective activity voucher (in Dutch) to participate in an outbound trade delegation or a joint trade fair presentation.
- Knowledge acquisition voucher to hire an international lawyer or tax consultant.

### **DHI**

Subsidy scheme for demonstration projects, feasibility studies and investment preparation studies (DHI)

The DHI scheme supports Dutch enterprises that want to invest in or execute a project in emerging markets and in developing countries.

The DHI scheme is a tender programme. Enterprises can submit a tender during the tender periods. The 1st tender for 2018 closed on 29 March at 3 p.m. The 2nd tender in 2018 opens on 9 August and closes on 21 September, 3 p.m. (Dutch time).

### 3 modules

The DHI scheme consists of 3 modules:

- Demonstration projects: presentation of a technology, capital goods or service in one of the DHI countries.
- Feasibility studies: assessment of the profitability of a foreign investment in a product or service.
- Investment preparation studies: assessment of the technical and commercial profitability of an investment in a company in one of the DHI countries.

### For whom?

DHI focuses on SMEs in the Kingdom of the Netherlands with international ambitions and an interest in emerging markets and developing countries. The SME test tells you whether you are an SME entrepreneur.

### Countries

The DHI scheme is open to projects in all countries, with the exception of the European part of the Kingdom of the Netherlands and possibly countries that are subject to international sanctions.

More information (in Dutch) can be found on the Dutch RVO website.

### **Clean Cooking Programme**

The Netherlands Enterprise Agency participates in the Clean Cooking Programme, which supports key stakeholder organisations in the cooking energy sector in Kenya, Ghana, Uganda, Ethiopia and Bangladesh. This programme is not a subsidy programme.

### Developing markets for clean cooking

Every year there are more than 4 million deadly accidents in developing countries because of cooking in traditional ovens or on open fires. The commitment of international organisations and local governments, companies and NGOs can help the development of commercial markets for energy-efficient cookstoves with lower emissions or for smoke-free ovens. In this way, these ovens will become widely available to people in developing countries.

#### Connecting people and networks

The Global Alliance for Clean Cookstoves plays an important role in building international networks. Nationally, this work is done by National Alliances for Clean Cookstoves. The Netherlands Enterprise Agency supports the growth of these key stakeholder organisations.

## 11. Relevant international donors

The following international donors are active in Africa and are relevant for energy related projects in African countries. The overview below is a shortlist for more details we refer to the websites mentioned in the text.

### **The World Bank**

The World Bank is a vital source of financial and technical assistance to developing countries around the world.

The Bank is made up of two unique development institutions owned by 184 member countries:

- the International Bank for Reconstruction and Development (IBRD)
- the International Development Association (IDA)

Each institution plays a different but supportive role in the Bank's mission of global poverty reduction and the improvement of living standards. The IBRD focuses on middle income and creditworthy poor countries, while IDA focuses on the poorest countries in the world.

Together they provide low-interest loans, interest-free credit and grants to developing countries for education, health, infrastructure, communications and many other purposes.

Target group: consultants, businesses, government, industries.

More information: <http://www.worldbank.org/>

### **International Finance Corporation (IFC)**

IFC is a sister organization of the World Bank and member of the World Bank Group. IFC is the largest global development institution focused exclusively on the private sector in developing countries. The Bank Group has set two goals for the world to achieve by 2030: end extreme poverty and promote shared prosperity in every country.

The IFC applies their financial resources, technical expertise and global experience to help their clients and partners to overcome financial, operational, and other challenges.

IFC is also a leading mobilizer of third-party resources for projects.

More information:

[https://www.ifc.org/wps/wcm/connect/corp\\_ext\\_content/ifc\\_external\\_corporate\\_site/home](https://www.ifc.org/wps/wcm/connect/corp_ext_content/ifc_external_corporate_site/home)

### **Energy Sector Management Assistance Program(ESMAP)**

ESMAP is a partnership between the World Bank Group (WBG) and 18 partners to help low and middle-income countries reduce poverty and boost growth, through environmentally sustainable energy solutions. ESMAP's analytical and advisory services are fully integrated within the WBG's country financing and policy dialogue in the energy sector. Through the WBG, ESMAP works to accelerate the energy transition required to achieve Sustainable Development Goal 7 (SDG7) to ensure access to affordable, reliable, sustainable and modern energy for all. It helps to shape WBG strategies and programs to achieve WBG Climate Change Action Plan targets: 28% of WBG financing with climate co-benefits; scale up 20 GW in renewable energy generation and integrate an additional 10 GW of variable renewable energy sources into grids over 5 years; mobilize \$25 billion in commercial funds for clean energy; invest at least \$1 billion to promote energy efficiency and resilient buildings by 2020; and, increase support to policy actions for sector reform, including for fossil fuel subsidies.

More information: <https://www.esmap.org/>

### **African Development Bank (AfDB)**

The African Development Bank group (ADB) is a multilateral development bank. The Bank group's primary objective is to promote sustainable economic growth in order to reduce poverty in Africa. It achieves this objective by financing a broad range of development projects and programs through:

- loans;
- equity investments;
- technical assistance.

The Bank prioritizes national and multinational projects and programs that promote regional economic cooperation and integration. The Bank group consists of:

- African Development Bank (ADB);
- African Development Fund (ADF);
- Nigerian Trustfund (NTF).

Target group: Small and medium-sized enterprises (SMEs).

More information: <https://www.afdb.org/en/>

Sustainable Energy Fund for Africa: Project Preparation Grants and Seed/Growth Capital. It is an equity/grant. See also: <https://goo.gl/D71MEh>

### **The European Union (EU)**

The EU invests in countries and regions within Europe (internal programs), but also in countries outside Europe (external programs). In addition, the EU also spends orders and services for its own use.

#### External programs

The European Commission spends part of the EU budget on aid programs in countries outside the EU. [https://ec.europa.eu/europeaid/home\\_en](https://ec.europa.eu/europeaid/home_en)

The responsibility for the implementation of external aid programs and the procurement of contracts lies with the Directorate-General (DG) for International Cooperation and Development (DG DEVCO) . [https://ec.europa.eu/europeaid/general\\_en](https://ec.europa.eu/europeaid/general_en)

DG DEVCO also does this for programs from, among others, the Directorate-General for Neighbourhood and Accession Negotiations (DG NEAR).

On the website of DG DEVCO you will find information on how you can qualify for:

- Financial support from the EU budget for relief activities.
- Assignments in the framework of the European aid programs.

You will also find practical information about procedures, conditions, contracts and more.

### **European Investment Fund (EIF)**

The EIF's activity is centred upon two areas, venture capital and guarantees:

- EIF's venture capital instruments consist of equity investments in venture capital funds and business incubators that support SMEs, particularly those that are early stage and technology-oriented;
- EIF's guarantee instruments consist of providing guarantees to financial institutions that cover credits to SMEs.

Through the leverage effect of its venture capital and guarantee instruments, the EIF is able to contribute to the development of SMEs in the EU Member States and the candidate countries. Both instruments implemented by the EIF for SMEs are complementary to the Global Loans provided by the European Investment Bank to financial intermediaries in support of SME financing. EIF's instruments are implemented on commercial terms.

SMEs in search of finance are requested to contact an EIF intermediary in their country or region for information on eligibility criteria and application procedures.

Target group: Small and medium-sized enterprises (SMEs) in the European Union and the candidate countries

More information: [www.eif.org](http://www.eif.org)

**Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH(GIZ)**

GIZ is a provider of international cooperation services for sustainable development and international education work. GIZ has over 50 years of experience in a wide variety of areas, including economic development and employment, energy and the environment, and peace and security.

GIZ works for the German Government, European Union institutions, the United Nations, the private sector and governments of other countries. The German Federal Ministry for Economic Cooperation and Development (BMZ) is the main commissioning party.

The registered offices of GIZ are in Bonn and Eschborn. In 2016 GIZ had a business volume of around EUR 2.4 billion and 19,506 employees in 120 countries. Almost 70 percent of them is national personnel working in the field.

More information: <https://www.giz.de/en/html/index.html>

## Annex 1 References:

- [1] <https://www.africa-eu-renewables.org/market-information/uganda/>
- [2] <http://www.reegle.info/policy-and-regulatory-overviews/UG> (This policy & regulatory overview is not updated anymore since 2015. We decided to keep it online due to high demand but would like to make you aware of the fact that it might be outdated).
- [3] <http://unreeea.org/>
- [4] <https://www.cia.gov/library/publications/resources/the-world-factbook/>
- [5] <http://global-climatescope.org/en/country/uganda/#/enabling-framework>
- [6] Source: Energy crops: healthier, more efficient, cheaper and cleaner than charcoal (article on RVO DGGF website)
- [7] <http://www.doingbusiness.org/data/exploreconomies/uganda/#getting-electricity>
- [8] <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=TZ-KE-MZ-ZA-UG>
- [9] <http://www.irena.org/publications/2018/May/Tracking-SDG7-The-Energy-Progress-Report>
- [10] <http://www.mmaks.co.ug/sites/mmaks.co.ug/files/article-attachments/2017/07/state-oil-and-gas-east-africa.pdf>

## Annex 2 Legislation

Source [5]

### Uganda Biofuels Blending Mandate

In June 2015 the Ugandan Cabinet approved a draft biofuels blending bill which will now go before Parliament. The bill requires a 20% biofuels content in petroleum products.

The 2007 Ugandan Renewable Energy Policy laid the groundwork for a biofuels blending bill by stipulating the broad details and aims. However there was no follow-up and the draft bill was never approved by the government. The discovery of 2.5bn barrels of oil reserves in Uganda meant biofuels ceased to be a priority and the bill lay dormant until 2014 when it was revived.

In June 2015 the Cabinet approved the biofuels bill, which requires petroleum products to have 20% biofuels content. It will now go before Parliament to be passed into law. It was first tabled before Parliament in December 2016.

As well as mandating the biofuels content, the bill also proposes tax and financing incentives to facilitate the development of biofuels production facilities.

### Uganda GET FiT Solar Facility

As a supplement to its GET FiT Programme, Uganda offers output-based premiums to solar PV projects on top of a new solar PV FiT. The funding will be allocated via a competitive reverse bidding tender process, with the first round scheduled to close at the end of Q1 2014.

On 23 January 2014, the Electricity Regulatory Authority (ERA) invited expressions of interest for developing 20–30MW of on-grid solar PV power plants under the Uganda GET FiT Solar Facility. The deadline for the first round of applications was 28 March 2014.

Funding will be granted to the developers offering the cheapest tariff (on a kWh basis) through a reverse auction after a due diligence process. The aim of the funding is to bridge the gap between the new solar PV tariff determined by the ERA and the tariff sought by bidders.

Solar PV will receive a base FiT of \$110/MWh

On 10 December 2014, the successful bids were announced. Two 10MW project were selected, comprising two 5MW sites each:

- Soroti I & II developed by Access Power and EREN Renewable Energy
- Tororo I & II developed by Simba Telecom and Building Energy

The average tariff for the total 20MW was \$163.70/MWh, equating to a premium of \$53.70/MWh on top of the solar PV FiT.

Projects were originally expected to be commissioned by the end of 2015. However due to uncertainty surrounding VAT exemptions<sup>3</sup> for solar, financial close and construction was delayed. The

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<sup>3</sup> [recently VAT exemption for renewable energy products until in Uganda was stopped.](#)



Soroti project reached financial close in January 2016 and Soroti I and II plants were commissioned on 12 December 2016.

#### Process

Developers were asked to submit expressions of interest in January 2014 of which some were pre-qualified by March 2014. Pre-qualified projects then submitted technical proposals and financial bids; the proposals were short-listed in August 2014 and successful bids were chosen in October 2014.

Single projects are limited to 5MW in size, but developers can bid for up to two projects. The facility aims to procure total capacity of 20–30MW.

The process was due to be repeated on a similar time frame to procure a further 20–30MW of solar PV capacity. However due to depreciation of available funds against the dollar there will be no further projects developed.

#### **Uganda GET FiT Programme**

This programme, launched 31 May 2013, aims to fast-track up to 20–25 small-scale renewable energy generation projects with a total combined capacity of 170MW. Successful projects will receive a premium payment on top of the government's feed-in tariff scheme and are expected to reach commercial operation by 2016–18.

GET FiT comprises several components:

- FiT premium payment mechanism – a results-based top-up on the existing feed-in tariff paid on a per-kWh-basis over the lifetime of a 20-year power-purchase agreement – which is designed to make small-scale (1-20MW) projects financially viable;
- Guarantee facility to secure against off-taker and political risks;
- Private financing mechanism that will offer debt and equity at competitive rates.
- A standardised set of documents including bankable power purchase and implementation agreements.
- International development financial support for construction and reinforcement of the electricity grid to facilitate new connections.

Only hydro, co-generation (bagasse) and biomass generation projects are eligible. The premium payments and capacity factors are as follows:

Hydro (1-20MW): \$14/MWh up to 60%

Biomass: \$10/MWh up to 40%

Bagasse: \$5/MWh up to 40%

Half of the premium payment is awarded upon project commissioning and half alongside the PPA against energy delivered but front-loaded so that payment for all 20 years of energy delivery is received in the first five years.

The World Bank has committed \$160m for the sake of:

- Short term liquidity to support the transmission operator with its PPA obligations
- Compensation in the event of utility or government default on PPAs
- Commercial debt guarantee

By December 2016, 17 projects with a combined capacity of 157MW had qualified for the GET FiT

premium (11 under construction, 4 soon to be construction and 2 commissioned). This includes 14 hydro, 2 solar and 1 bagasse projects.

In 2016, ten hydropower projects and one solar project were under construction, and one solar plant was commissioned. Eight projects reached financial close (six hydropower and two solar), resulting in 10/17 projects reaching financial close. In March 2017, two hydro projects (Muvumbe and Siti I) were commissioned. GET FIT expects six projects to be commissioned in 2017.

The projects are now in the process of licensing, signing PPAs or construction. Financial close was expected for all projects by end of 2016 and commissioning 2016–18. Three projects totaling 15MW of capacity have dropped out of the scheme including the only biomass project.

Timely grid interconnection is a concern for some of the projects, and UK DFID committed GDP 14.7 million under the GET FIT program for grid investments. Construction of improvements is due to begin in 2017. The World Bank and Government of Germany have also committed to provide financing towards grid infrastructure improvements.

#### Process

The GET FIT Program has been jointly developed by KfW and the Electricity Regulatory Agency (ERA) in close cooperation with the Ministry of Energy and Mineral Development and development partners, including the Norwegian Embassy in Kampala.

#### **Uganda REFIT Scheme**

Feed-in-tariff paid for electricity from hydro, wind, and biomass systems between 0.5MW and 20MW. Solar power is not eligible under the scheme. The FIT is dollar denominated, and payments are guaranteed for 20 years. New (Phase 3) tariff rates were announced in July 2016 for the period 2016–18.

Uganda's renewable energy feed-in-tariff (REFIT) provides payments to eligible renewable power projects. The cumulative capacity for which FIT is paid is capped per year from 2016-18. All producers are eligible to submit a bid between the threshold capacities.

The maximum tariffs available at auction are:

Hydro:

11-20MW: \$0.094/kWh

5-10MW: linear tariff

500kW-5MW: \$0.107/kWh

Bagasse: \$0.088/kWh

Wind: \$0.122/kWh

Feed-in tariffs are guaranteed for 20 years and O&M costs are adjusted yearly to be in-line with inflation. Project developers are responsible for "shallow" connection to the grid, meaning the connection to the nearest point of the electricity distribution grid. Grid reinforcement costs are born by the system operator.

FITs were first instituted in 2007 under REFIT Phase 1, and were revised in 2012 under Phase II.

### **Uganda Rural Electrification Fund**

Under the Rural Electrification Strategy and Plan covering 2013-22, the fund aims to increase electricity access in rural areas of Uganda, with the ultimate goal of reaching universal access by 2035.

In particular, the fund is used for grants for rural electrification projects, and to finance the operational expenses of the Rural Electrification Agency (REA) and Board. REA prioritises project applications based on the Rural Electrification Strategy and Plan. This document contains, among other things, information relating to renewable power generation for sale to the main grid and to mini-grids.

The funding comes from:

- Money appropriated by Parliament
- Any surplus monies from the operations of the Electricity Regulatory Authority declared to the Minister of Finance and paid into the fund
- A levy of 5% on the cost of bulk electricity purchases
- Donations, grants and loans from bodies international governments and development institutions.

REA's budget allocation in the FY2016/17 budget was UGX 269.16 billion (USD 80m), a share of which will then contribute to the Rural Electrification Fund.

REA is developing its mini-grid strategy and is currently assessing the costs of six pilot projects. REA will fund the construction of mini-grids but will not contribute towards to the costs of the generation technology. In future, generation for mini-grids is likely to be funded one of three ways:

- Privately funded with an adequate state subsidy.
- Publicly funded but managed by a private operator
- Community funded but managed by a private operator

### Process

Each year, a package (or packages) of projects, known as 'priority rural electrification projects' (PREPs) is marketed to various financing agencies or directly financed from the Consolidated Fund of Government (the 5% levy on electricity purchases). The implementation of PREPs, including construction and the procurement of network operators, is carried out according to the following procedure:

1. REA identifies PREPs using the Rural Electrification Master Plan. During the identification, REA prequalifies those projects that stand out for new concessions on the basis of size and potential demand. The others are earmarked for assigning to the adjacent grid operator, eg, Umeme.
2. Feasibility studies and environmental impact assessments are conducted. Demand projections are used to confirm potential candidates for concessions.
3. REA procures contractors in line with international (donor) or national procurement guidelines.
4. Contracts are awarded to winning bidders, which proceed to execute and commission the projects.
5. REA, working closely with the Electricity Regulatory Authority, procures private sector operators on a 10-year lease (or concession) to manage and run the new networks. The Authority issues a licence to the procured operator.
6. The winning bidder signs a lease agreement with the Rural Electrification Board.

### **Uganda Credit Support Mechanisms**

The Uganda Energy Credit Capitalisation Company (UECCC) provides financing options and support instruments with the aim of facilitating investment in renewable energy projects.

This government agency works with development partners and financial institutions to offer a range of services to private-sector-led projects. In the 2015/16 fiscal year the following services were available:

- Solar loan programme: on-lending through local financial institutions for residential and commercial customers acquiring solar systems. The aim is to increase access to solar products by reducing the upfront cost. Budget of UGX 1bn (USD 290,200) in 2015/16. Participating financial institutions (PFIs) include Centenary Bank Uganda, Post Bank Uganda Ltd, Finance Trust Bank and Pride Micro Finance Ltd;

With tier IV financial institutions, a solar financing facility was established in 2015 to establish links between target communities through savings and credit cooperative organisations (SACCO) and member organisations. The facility is available at the pilot stage through Tujijenge Uganda Ltd, Hofokam Ltd, and Ebo Sacco Ltd.

- Connection loan refinance facility: on-lending through local financial institutions to residential and commercial customers for the cost of grid connection. Funds can be used for the cost of premises wiring, poles and utility connection fees. USD 650,000 budget.

- Technical assistance and transaction advisory services: technical assistance for early stage project development, such as pre-feasibility studies and business plans. EUR 1.5m (USD 1.7m) budget with a maximum of EUR 150,000 (USD 166,000) per project.

- ORIO mini-hydro: EUR 13.1m (USD 14.5m) grant provided by the Dutch government to support the development of 10 mini-hydro sites with capacities ranging 0.5–1.5MW. All sites are located off-grid and will support rural electrification. Total project costs are estimated to be EUR 24.4m (USD 27.1m) In the 2016/17 fiscal year, the following additional support was available:

- Biomass refinance facility: UECCC partnered with Ebo Sacco Ltd to pilot a biomass financing facility for lending to households and business acquiring biogas digesters. At an average price of UGX 2.5m per biogas digester (approximately USD 700), the pilot could finance 84 biogas digester, thus suggesting a budget of approximately UGX 210 million (USD 58,600).

- A facility to provide working capital to financial institutions for on-lending to solar companies selling solar systems on a PAYG basis. The facility is expected to be rolled out in July 2017.

### **East African Community Import Duty Exemption**

The East African Community - Rwanda, Burundi, Kenya, Tanzania and Uganda - has a common agreement on import duty waivers. In clean energy, this applies to equipment for the generation of solar and wind energy, including accessories and deep cycle batteries.

The agreement reduces import duties to 0% for the following technologies:

- "Specialised equipment for development and generation of Solar and Wind Energy, including accessories and deep cycle batteries which use and/or store solar power" (Part B-General Exemptions, paragraph 26).

### **Uganda Accelerated Depreciation**

In Uganda, plant, equipment and machinery used in certain industries are subject to a depreciation rate of 20-40%, under the Income Tax Act 1997.

Under the Act, depreciation is allowable on a written-down basis at the rates below. The 20% rate is likely to be the most relevant for clean energy projects:

– 40%: computers and data-handling equipment

– 35%: automobiles, buses and minibuses with a seating capacity of fewer than 30 passengers, goods

vehicles with a load capacity of less than 7t, construction and earth-moving equipment

- 30%: specialised trucks, tractors, trailers and trailer-mounted containers, plant and machinery used in farming, manufacturing or mining operations; buses with a seating capacity of 30 or more passengers, goods vehicles designed to carry or pull loads of 7t or more
- 20%: specialised public utility plant, equipment and machinery, office furniture, fixtures and equipment, railroad cars, locomotives and equipment, vessels, barges, tugs and similar water transportation equipment, aircraft, any depreciable asset not included in another group. For hydro projects this includes diversion intake and weir, desilting basin, fore bay and surge, water tank, penstock, tailrace, electro-mechanical equipment and power evacuation infrastructure.
- 5%: power houses are classified as an industrial building and eligible for 5% depreciation on straight line basis.

### Process

All investors require a licence from the Uganda Investment Authority.

The fiscal year in Uganda runs from 1 July to 30 June. Companies must file a return of income each year by 31 December following the end of the tax year. A different accounting period (referred to as substituted year) can be used by seeking permission from the revenue authorities. In such cases, a return should be filed within six months of the applicable year-end.

### **Uganda Tax Incentives**

Uganda offers a range of fiscal incentives, including investment capital allowances (ie, tax deductible expenditure) and exemption for duties and taxes for imports of plant and machinery. These incentives were last updated in June 2005.

In particular, the following incentives are available:

Capital allowances:

Under the Income Tax Act 1997:

- An initial capital allowance on plant and machinery of 50% for investments in Kampala, Entebbe, Jinja, Namanve and Njeru;
- Outside these areas, the rate is 75%;
- This allowance only applies for the first year;
- Industrial (but not approved commercial) buildings qualify for an initial allowance of 20% if construction began on or after 1 July 2000.

Taxes and duties<sup>4</sup>

- Under the VAT Act 1996, plant and machinery from licensed manufacturers may be imported duty- and tax-free;
- Under the VAT (Amendment) Bill, photosensitive semi-conductor devices, including PV devices, whether they are assembled into modules or panels, and solar water heaters are exempt from VAT, as are specialised vehicles, plant and machinery, feasibility studies, engineering designs and consultancy services, and civil works related to hydro power. The basic rate of VAT on goods and services is 18%.
- In a 2016 amendment, solar generation is no longer exempt from VAT and is subject to the standard rate at 18%. Solar power producers can thus charge VAT to recover operating costs. However, the bill also extends the exemption of supplies to contractors and subcontractors of hydro power projects to now also include solar and geothermal power projects. Consequently, VAT will not

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<sup>4</sup> recently VAT exemption for renewable energy products until in Uganda was stopped.

apply to the construction and pre-operation costs of these power projects, up until plants begin operating. Most renewable energy generation projects are thus on a level playing field.

- In a 2017 amendment, deep-cycle batteries were exempt from VAT.

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