

# EXECUTIVE SUMMARY

## ECONOMIC LETTER OF EAST AFRICA AND THE INDIAN OCEAN (EAIO)

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### The Electricity Sector in the EAIO

#### In concise...

**Despite the progress made in regards to electricity access, nearly 95 million people in East Africa are still left out. Electricity capacity (19.3 GW, i.e., 13.3% of French capacity) is steadily increasing, but a number of constraints are weakening power systems (limited capacity and dilapidated networks, illegal connections) and operators' financial capability. Interconnection projects are being developed, enabling exporting countries (Ethiopia, Uganda in particular) to sell their hydroelectric surpluses at affordable prices to their neighbors.** The intervention of donors remains essential both for the financing of such networks' infrastructure, and also in power generation. **The AFD is active in most countries in the zone, and across the entire value chain, including technical assistance.** Despite the difficulties, the sector, which has already attracted a number of French companies, offers a wealth of opportunities, be it for independent power producers, equipment suppliers, engineering firms or providers of off-grid renewable energy solutions.

#### In detail ...

Despite the progress made in electricity access in the EAIO, the sector still faces many challenges

**Electricity access rates, though rising steadily in recent years, vary across the region.** While most Indian ocean islands have universal access or are approaching this level (Seychelles, Mauritius, Comoros), other countries still have a long way to go (Tanzania is at 42.7 % for example), while Burundi and South Sudan stand out with particularly low access rates (10.7 % and 7.7 % respectively). Improving access to affordable electricity, particularly in rural areas, for the 95 million people in East Africa (51.7 % of the total population) who have no access to electricity, is a major social and economic development challenge especially at a time when population growth remains strong (2.9 % per year in Tanzania).

**With a total installed capacity of 19.27 GW across the region (or 13.3 % of installed capacity in France), the EAIO power system remains relatively underdeveloped.** While all EAIO countries have set targets for diversifying and decarbonizing their energy mix, the approach required to achieve these differ. Hydroelectricity production is significant in the region, but the electricity mix of many countries remains dominated by fossil fuel thermal sources (Indian Ocean islands, Eritrea, Djibouti, Somalia, Tanzania, Sudan, South Sudan and

Rwanda), **with major energy transition challenges**. The share of electricity in national energy mixes remain relatively low (Figure 1), fluctuating between 2 % and 9 %, with the exception of Mauritius, where it is close to 30 %, demonstrating the importance of the challenges of electricity access, electrification of domestic and production uses and, more broadly, industrialization.

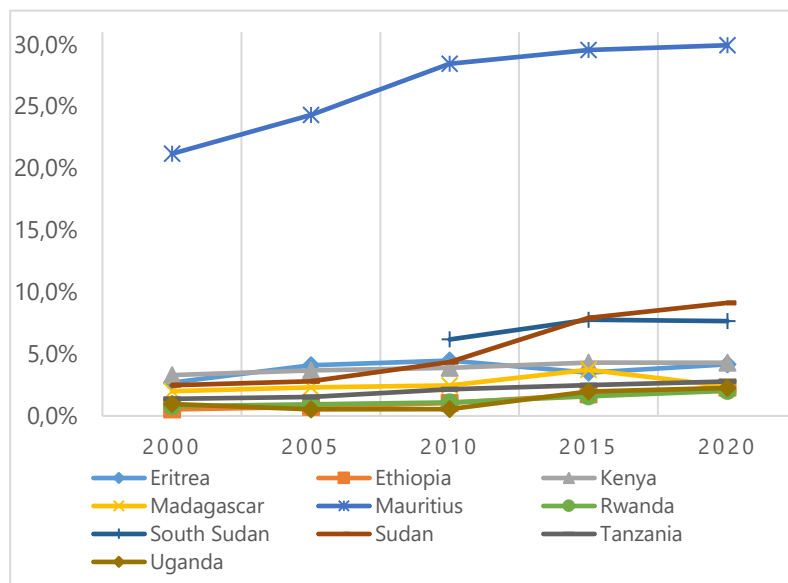


Figure 1: Share of electricity in final energy consumption (IEA, 2020).  
Data unavailable for Burundi, Comoros, Djibouti, Somalia

**Electricity systems in the EAIO region continue to face a number of difficulties, linked to the capacity of transmission networks or their obsolescence**, the reliability and quality of distribution networks which are often ageing, vandalism or illegal connections, all of which cause numerous technical and commercial losses. These losses, which are often high (23 % in Ethiopia), can exacerbate the financial difficulties of public or non-public companies in charge of network management. In Tanzania, Tanesco estimates that it loses around 7 MUSD per month due to inefficiency, power loss, technical and non-technical problems.

### Electric systems seeking financial balance are increasingly opening up to the private sector

**The organization of the electricity sector is generally based on two main models: i) the integrated public monopoly**, which covers all or part of the value chain (generation, transmission, distribution) (Burundi, Tanzania, Mauritius); ii) **unbundling**, which consists of separating the management of the various segments into several private or public entities (Kenya, Uganda).

**The difficulties linked to the power system, mentioned above, weigh on the state of companies in the electricity sector** (KPLC in Kenya, for example) and are passed on to consumers, who are faced in many countries with high electricity prices. They are particularly high in Somalia (between 80 and 100 ct USD/kWh), a country that relies mainly on small diesel generators for its electricity production, while in Ethiopia low-cost hydroelectric production (94 % of production in 2021) and implicit subsidies keep tariffs very low.

**Certain segments are gradually being opened up to the private sector, notably the electricity generation segment, which is by far the most advanced segment in this field.** Governments have put in place the regulations and incentives needed to attract private investment: frameworks for the deployment of PPPs and power purchase agreements, incentives for investment in renewable energies (feed-in tariffs, for example), but these are tending to diminish, particularly for solar and wind power. In Burundi, only the power generation stage is opened up, with several independent power producers (IPPs) present. PPP transmission line projects have been hinted at in some countries (Kenya, Uganda), but no concrete projects have been implemented to date, due to the lack of a regulatory and financial framework enabling the implementation of profitable PPP projects.

### The role of interconnections between countries to offset reductions in electricity production and enhance access to cheaper electricity

**Interconnections can reinforce network resilience, and ultimately improve the competitiveness of the electricity sector** (thus leading to lower prices for consumers). They are also a way for countries with major hydroelectric production ambitions (Ethiopia, Uganda) to position themselves as regional exporters. **This shared desire to develop interconnections was initially formalized by the creation of the Eastern Africa Power Pool (EAPP) back in 2005.** The development of interconnections also serves the export ambitions of certain countries, such as Ethiopia, Rwanda and Tanzania.

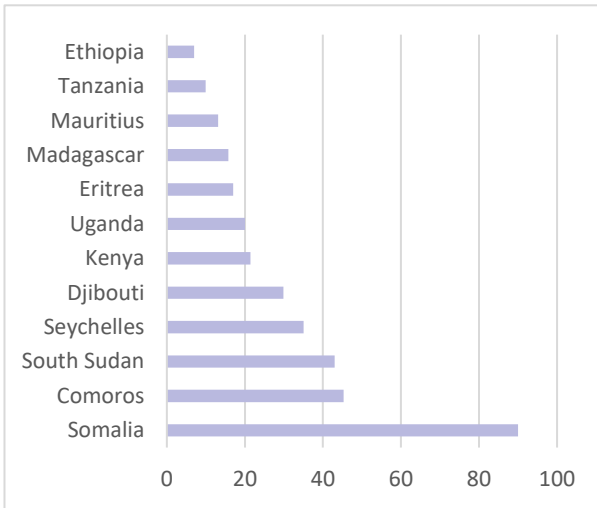


Figure 2: Average electricity prices in EAIO (ct USD/kWh)  
Data unavailable for Burundi & Rwanda

**Although actual implementation has lagged behind initial timelines, several projects have been launched and some completed.** The most notable of these is the Ethiopia-Kenya line, completed in 2022, destined to enable the transmission of 500 kV (2,000 MW substations) over more than 600 km using HVDC direct current. Ethiopia signed a PPA with Kenya for the purchase of electricity over 25 years at a low price (0.065 USD/kWh) at the end of 2022, following this commissioning.

The development of electricity infrastructure (generation, transmission and distribution) requires substantial investment. **The support of multilateral (World Bank, ADB, EU) and bilateral (AFD, KfW) donors remains essential in this respect to support national electricity sectors. A notable exception is Ethiopia, which financed the GERD dam entirely from its own resources.**

### Donor support is essential to offset the lack of investment in the sector

Donors are particularly involved in major regional generation projects, such as the Ruzizi III project, major **project for electricity generation in Burundi and, more broadly, for regional integration** between the 3 stakeholder countries of Burundi, Rwanda and the DRC. This 202 MW hydroelectric dam (initially estimated at 650 MEUR) has been under development since 2015. Although the financial close was scheduled for end of 2022, with a pool of several donors including the ADB, EIB, AFD and KfW, and commissioning scheduled for 2027, regional tensions have slowed it down considerably.

**Other public-sector projects can be financed via bilateral partnerships with tied funding.** In Burundi, for example, the Kaburantwa hydroelectric project (20 MW) was financed by a sovereign loan from *the Exim Bank of India* (80 MUSD), with construction underway by an Indian company. China is also active in the region. In Uganda, the *Exim Bank of China* financed the Karuma mega power plant project (600 MW) to the tune of 85 % of the project amount (USD 1.7 billion).

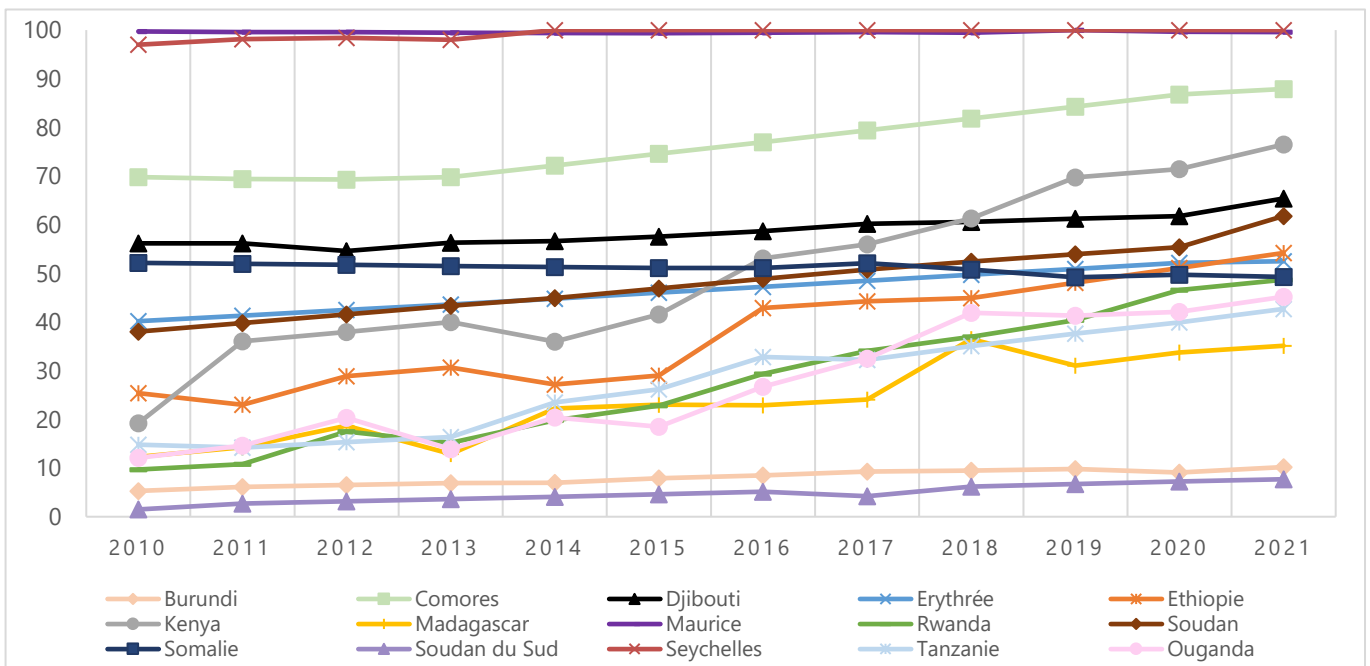


Figure 3 : Evolution of electricity access rate (% of the population) per country (World Bank)

**AFD is a major donor in the energy sector, covering the entire electricity value chain.** It is the leading bilateral donor to the sector in Kenya with over 1 billion EUR in financing over the past 10 years. This figure rises to 500 MUSD in Tanzania. AFD also supports the sector through technical assistance to public enterprises. In

Ethiopia, a project with RTE was approved in September 2023 and aims to provide technical assistance to EEP to optimize and improve the operation of the existing network, while EDF Hydro is also supporting Kengen in Kenya in the optimization of hydropower production, both cases entail FEXTE financing.

**EAIO is a region of interest for companies in the electricity sector, but many bottlenecks persist**

**The EAIO region has attracted several French independent power producers.** The Indian Ocean islands offer a wealth of opportunities: Innovent (Comoros), and Green Yellow (Mauritius) have developed several renewable energy projects, mainly solar, e.g., Qair's first floating solar power plant in the Seychelles. **However, a number of obstacles stand in the way of these projects: Electricity grids are often insufficient to integrate intermittent renewable energies.** The changing regulatory framework can be a major obstacle. Due to the financial fragility of state-owned companies in the sector (signing PPAs), a sovereign guarantee from the state is often essential, acting as an additional backing in addition to the partial guarantee instruments made available by donors (AFD, World Bank, ADB, etc.). In 2019, a moratorium on electricity purchase contracts was put in place in Kenya, which was finally lifted in March 2023, following a renegotiation of previously signed contracts. In addition, low feed-in tariff requirements – 5 ct USD/kWh in Uganda or 5-6 ct USD/kWh in Kenya for solar without storage complicate project development for IEPs, in a political or financial context that is far from risk-free, which also has an impact on financing costs.

**France is also well positioned in the specialized equipment supply segment.** In 2012, *GE HydroFrance* signed a contract with *MetEC*, responsible for supplying electromechanical equipment for GERD in Ethiopia, so as to supply the dam's first eight turbines. At the same time, *GE Grid Solutions France* is executing a contract for the supply of 16 generator circuit breakers for GERD. Finally, **French companies have engineering expertise** that enables them to win contracts for major generation projects in particular. In 2011, for example, Tractebel won the engineering contract for the GERD project in a consortium with Italy's *Electroconsult*. When it comes to reducing network losses, French expertise is also available in the form of engineering and consultancy firms and, to a lesser extent given the low-cost competition, in the supply of *smart meters*.

**Key figures - Electricity sector**

	Installed capacity	Share of renewables capacity	Electricity production	Share of renewable electricity production	Share of electricity in energy consumption	Electricity consumption per capita	Average electricity price
	<i>MW (2022)</i>	<i>% (2022)</i>	<i>GWh (2021)</i>	<i>% (2021)</i>	<i>% (2020)</i>	<i>MWh (2020)</i>	<i>ct USD/kWh</i>
<b>Burundi</b>	125,4	60,2	453,8	61,3			
<b>Comores</b>	27,1	20,1	50,1	0,0			45,3
<b>Djibouti</b>	143,0	14,2	198,0	35,4			29,9
<b>Eritrea</b>	218,0	5,3	441,1	5,0	4,2%	0,09	17,0
<b>Ethiopia</b>	5692,3	98,2	15817,3	100,0	2,3%	0,09	7,0
<b>Kenya</b>	3456,6	77,8	10964,9	88,1	4,3%	0,17	21,4
<b>Madagascar</b>	819,0	24,1	2000,4	42,8	2,4%	0,06	15,8
<b>Mauritius</b>	867,0	29,8	2999,0	21,6	29,9%	2,16	13,1
<b>Rwanda</b>	299,0	50,2	1022,1	58,3	2,0%	0,06	
<b>Seychelles</b>	130,1	18,7	444,2	4,5			35,0
<b>Somalia</b>	151,0	32,3	383,2	11,2			90,0
<b>South Sudan</b>	109,0	7,8	549,0	0,4	7,6%	0,05	43,0
<b>Sudan</b>	3806,0	49,2	16771,1	60,8	9,1%	0,30	
<b>Tanzania</b>	2000,1	34,2	7960,7	42,8	2,8%	0,12	9,9
<b>Uganda</b>	1348,0	92,4	4853,8	97,8	2,3%	0,07	20,0

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