



# MOZAMBIQUE



**DEVELOPMENT  
REIMAGINED**

February 2024

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# 1 Mozambique's Renewable Energy Potential and Country Overview

Strategically located in Southeastern Africa, Mozambique shares land borders with six countries while on the east it borders by the Indian Ocean providing therefore direct sea access to the landlocked countries in the region. Regarding its renewable energy potential, Mozambique offers a lucrative renewable energy investment opportunity due to its untapped sources including hydro, solar and wind. In 2022, the country's population exceeded 30 million, about 1.37 times the population of Beijing (21.84 million) with an estimated growth rate of 32.7%<sup>1</sup> while its GDP was worth USD 17.85 billion with a forecasted increase to USD 35.71 billion by 2028.<sup>2</sup> Beijing's renewable capacity stands at 2181 MW, slightly higher than Mozambique's 2316 MW. This suggests that Mozambique may have made significant investments in renewable energy infrastructure to meet the energy needs of its population. Regarding the country's debt situation, recent assessments indicate a decline in total public debt, suggesting sustainable levels in the foreseeable future. Mozambique's economy is classified as low-income, while agriculture has traditionally been the backbone of its economy, employing more than 80% of the population. However, both the agriculture sector and the nation at large face significant vulnerability to the impacts of climate change, including events such as droughts and floods. These challenges, coupled with limited access to high-quality inputs and technologies, pose substantial challenges to long-term development. In response, the government has set clear targets to help mitigate the consequences of climate change and accelerate investments in its renewable energy sector. In its updated National Determined Contribution (NDC) (2021), Mozambique committed to a series of mitigation actions that aim to achieve a reduction of greenhouse gas emissions equivalent to 40 million tCO<sub>2</sub> between 2020 and 2025.<sup>3</sup> Moreover, several government initiatives have also resulted in fostering a positive environment for foreign investors, leading to a notable influx of foreign investment, particularly in natural resource sectors like coal and natural gas. These investments hold the potential to significantly impact Mozambique's economic growth.

Figure 1: Location of Mozambique within Africa








<sup>1</sup> World Bank. World Development Indicators, <https://databank.worldbank.org/source/world-development-indicators>

<sup>2</sup> Statista. Mozambique: Gross domestic product (GDP) in current prices from 1988 to 2028.

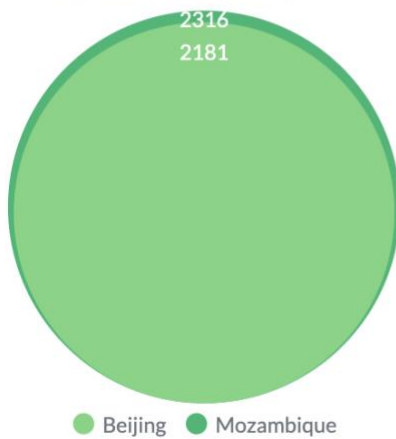
<https://www.statista.com/statistics/507322/gross-domestic-product-gdp-in-mozambique/>

<sup>3</sup> UNDP Climate Promise, Mozambique. <https://climatepromise.undp.org/what-we-do/where-we-work/mozambique>

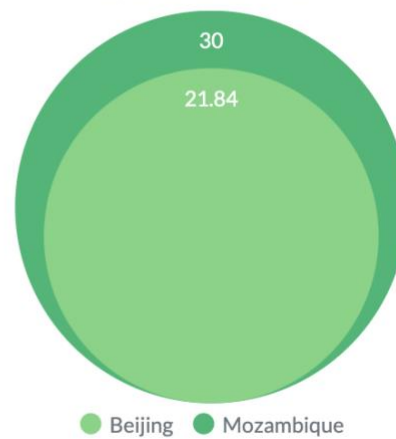
Table 1: Summary of Mozambique’s Overall Renewable Energy Potential by Resource

Renewable Energy Resource		Mozambique	China
	Solar Photovoltaic (PV) Power Output potential (kWh/kWp/day)	4.16-4.79	2.21-5.82
	Wind resource potential (Wind speed range, metre per second)	4.76-7.08	5.96-10.21
	Biomass Potential (GW)	2	30
	Hydro Potential (MW)	12,000	542,000
	Geothermal Potential (MW)	N/A	1500
Electric Price (USD/kWh)	Households	0.127	0.076
	Businesses	0.080	0.089

Installed RE Capacity (MW)



Population (Million)



## 1.1 Renewable Energy Sector

While Mozambique's renewable energy potential (indicated by the average of its wind power density at 100 meters and its solar PV potential) falls slightly below the continent's average potential (see Figure 2), the country has substantial untapped renewable resources. Hydropower stands out as a key contributor with 85% of the total electricity generation in 2021 coming from hydro and marine power (84%). Additionally, Mozambique benefits from high solar irradiance, making solar energy a viable and increasingly tapped resource. Solar projects have been implemented to bring electricity to both urban and rural areas, contributing to a more inclusive and resilient energy infrastructure. Wind energy potential is also promising, particularly in the coastal areas and elevated regions. Figure 3 shows Mozambique’s renewable energy consumption by sector in 2020.

Figure 2: Comparing Mozambique's and Africa's average REP

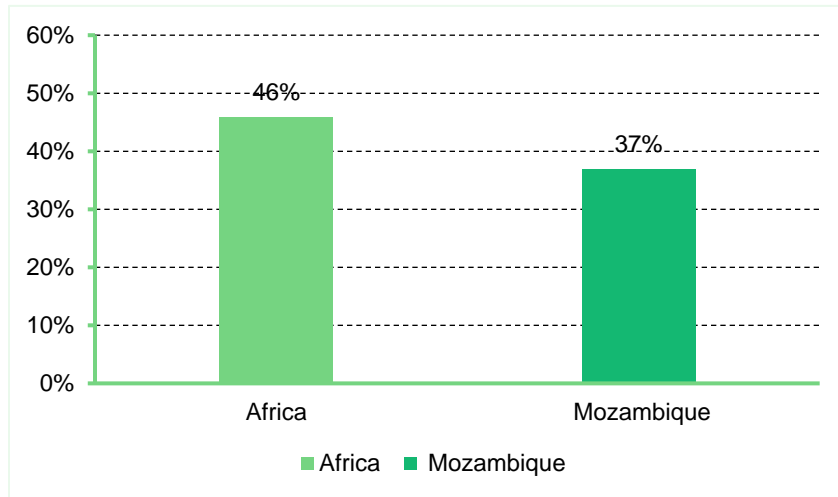
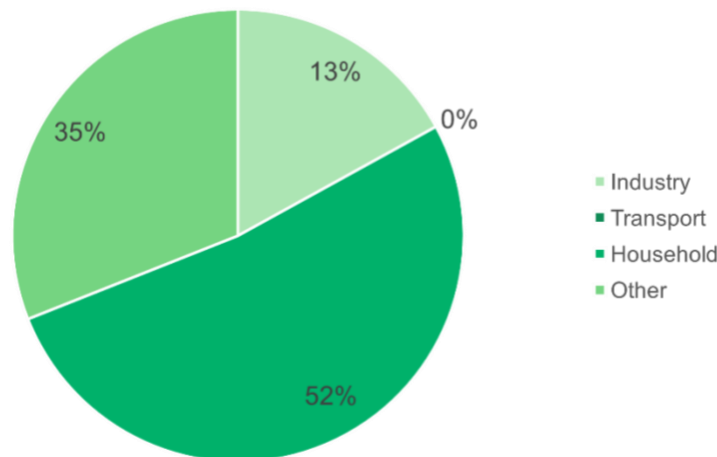


Figure 3: Mozambique's renewable energy consumption by sector



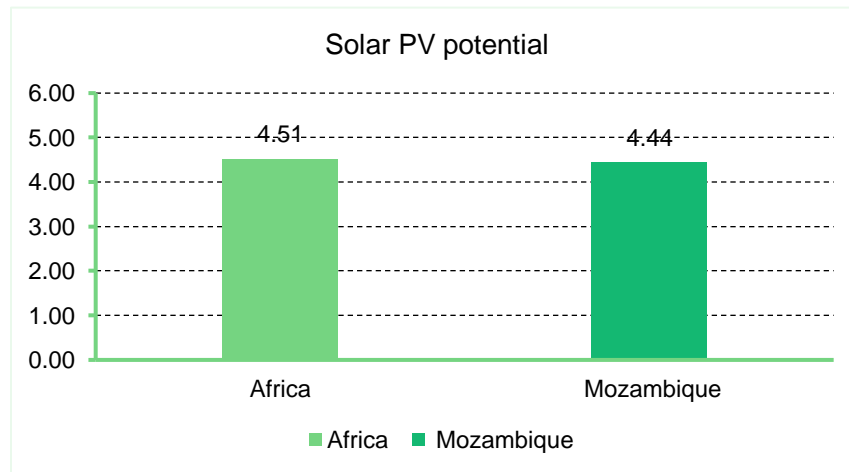
To support potential Chinese investors interested in exploring opportunities in Mozambique's renewable energy sector, a breakdown of each renewable energy resource as well as potential investment opportunities within each area is provided below.

## 1.2 Solar Energy

With an average solar power output potential of 4.44 kWh/kWp per day which, as seen in Figure 4, is only slightly less than the continent's total average (4.51 kWh/kWp per day) Mozambique has significant potential to become a leader in harnessing solar energy as the entire country and particularly the central and southern parts experience high levels of solar irradiance.<sup>4</sup>

<sup>4</sup> Global Solar Atlas 2.0. (n.d.). [Data/information/map] obtained from the "Global Solar Atlas 2.0, a free, web-based application developed and operated by the company Solargis s.r.o. on behalf of the World Bank Group, utilizing Solargis data, with funding provided by the Energy Sector Management Assistance Program (ESMAP). For additional information: <https://globalsolaratlas.info>

Figure 4: Comparing Mozambique's and Africa's average Solar PV Potential



Solar energy has the capacity to play a significant role in diversifying Mozambique's energy mix, increasing access to electricity, and reducing the nation's dependency on fossil fuels. For this reason, the government of Mozambique has already initiated numerous solar energy projects to tap into this potential. For example, in August 2019, the first grid-ready solar power station, the 40 megawatts Mocuba Solar Power Station in the Zambezia Province was developed through a public and private partnership between local and European stakeholders and achieved commercial commissioning. Since then, there have been numerous other solar power installations which vary in power generation capacity and are operated by different actors.

### 1.3 Wind Energy

Mozambique has a potential wind capacity of 4.5 GW, with about 25% potential for immediate connection to the existing grid.<sup>5</sup> According to the World Bank's global wind atlas, the regions with the best wind resources and higher mean power density are located in the central part of Tete and at the border between the Nampula and Zambezia provinces.<sup>6</sup> Similarly, the model simulations of the Wind Atlas Analysis and Application Programme (WASP) indicated that Mozambique's coastline, especially along the Indian Ocean, exhibit favorable wind conditions that make them promising sites for the establishment of wind farm. Currently, there are two wind projects planned for a total of 170 MW of installed capacity, including a 50 MW plant to be located in the Inhambane province and another one located in Namaacha, close to Maputo, expected to launch between 2023 to 2024.<sup>7</sup>

<sup>5</sup> Recurso Eólico accessed 24 June 2021, <https://www.funae.co.mz/index.php/pt/recursos/recurso-eolico>

<sup>6</sup> Mozambique. (2023). [Data/information/map] obtained from the Global Wind Atlas 3.0, a free, web-based application developed, owned and operated by the Technical University of Denmark (DTU). The Global Wind Atlas 3.0 is released in partnership with the World Bank Group, utilizing data provided by Vortex, using funding provided by the Energy Sector Management Assistance Program (ESMAP). For additional information: <https://globalwindatlas.info>

<sup>7</sup> ALER. Renováveis Em Moçambique, 2021, [https://www.lerenovaveis.org/contents/lerpublication/aler\\_mar2021\\_resumo-renovaveis-em-mocambique-2021.pdf](https://www.lerenovaveis.org/contents/lerpublication/aler_mar2021_resumo-renovaveis-em-mocambique-2021.pdf)

## 1.4 Hydro Power

Mozambique maintains one of the highest hydropower potentials in Africa, estimated at more than 12,000 MW. In particular, Mozambique is the host country for Africa’s second large-scale plant (the Cahora Bassa plant) which has a capacity of 2075 MW, contributing to more than 80% of the country’s energy potential. Exportation of electricity generated in Cahora Bassa is already a regular business, which makes Mozambique a critical supplier of electricity to neighboring countries and an area of interest for further electricity commerce.

In addition to the Cahora Bassa plant, there are also 12 other major river basins in the nation all of which have potential for all types of projects from mini to large scale hydropower.<sup>8</sup> The feed-in-tariff, established in 2014, supports power purchase agreements (PPA) for small hydropower initiatives ranging from 10 kW to 10 MW. This incentive is anticipated to stimulate investment in smaller projects, with the goal of generating more job opportunities, extending electricity access to rural homes and public facilities, and catalyzing economic growth in local rural communities.<sup>9</sup> Looking forward, there have been ongoing plans since 2021 to expand the Cahora Bassa by a 1,245 MW while a new power plant with an installed capacity of 1,500 MW (Mphanda Nkuwa) will be commissioned in 2028.<sup>10</sup> In addition, as evident in Table 2 below, a number of other feasibility studies are currently underway to assess the possibility and hydro power potential of other areas which underscores a notable opportunity for Chinese investors to engage in these ventures.

Table 2: List of Feasibility Studies Undertaken to Explore Hydro Power Potential (2022)<sup>11</sup>

Project name	Location	Size	Status (as of 2022)
Cahora Bassa North Bank	Tete	1245 MW	Sustainability Assessment
Mphanda Nkuwa	Tete	1500 MW	African Development Bank will serve as an advisor for this project and the project aims to reach financial close by end -2024 and commissioning is foreseen for 2031. The project is expected to cost USD 4.5 billion. <sup>12</sup> Currently, the Government is looking for private sector investment.
Lupata	Sofala	600-650 MW	Feasibility
Boroma	Tete	200-400 MW	Feasibility
Lurio	Cabo Delgado	120 MW	Feasibility

<sup>8</sup> Kameshnee Naidoo and Christiaan Loots, 'Mozambique / Energy and the Poor – Unpacking the Investment Case for Clean Energy', 2020, [https://sun-connect-news.org/fileadmin/DATEIEN/Dateien/New/2021-01-29\\_UNDP-UNCDF-Mozambique-Energy-and-the-Poor.pdf](https://sun-connect-news.org/fileadmin/DATEIEN/Dateien/New/2021-01-29_UNDP-UNCDF-Mozambique-Energy-and-the-Poor.pdf)

<sup>9</sup> Energypedia. Mozambique renewable energy potential, 2021. [https://energypedia.info/wiki/Mozambique\\_Renewable\\_Energy\\_Potential](https://energypedia.info/wiki/Mozambique_Renewable_Energy_Potential)

<sup>10</sup> Bullock, A. and Hülsmann, S., Strategic Opportunities For Hydropower Within The Water-Energy-Food Nexus In Mozambique, n.d., 71.

<sup>11</sup> Energypedia. Mozambique renewable energy potential, 2021. [https://energypedia.info/wiki/Mozambique\\_Renewable\\_Energy\\_Potential](https://energypedia.info/wiki/Mozambique_Renewable_Energy_Potential)

<sup>12</sup> AfDB. 2022. "Mozambique: African Development Bank to serve as advisor for development of 1500 MW Mphanda Nkuwa hydropower project." <https://www.afdb.org/en/news-and-events/press-releases/mozambique-african-development-bank-serve-advisor-development-1500-mw-mphanda-nkuwa-hydropower-project-51829>

Mavuzi 2&3	Manica	60 MW	Feasibility study
Malema	Nampula	60 MW	Pre-Feasibility
Massingir	Gaza	25-40 MW	Pre-Feasibility

## 1.5 Biomass Energy

Mozambique holds extensive biomass resources, with about 50% of the country under forest cover. Biomass energy accounts for about 80% of the total energy consumed. Overall, Mozambique has a rich biomass potential of over 2GW with biomass energy accounting for about 80% of the total energy consumed. The primary source for electricity production from biomass lies in the utilization of forest resources (wood etc.), as well as industrial and agro-industrial residues. This includes residues from various industrial processes, such as those in the paper and sugar industries.<sup>13</sup> Urban solid waste and biogas also play a significant role in contributing to the overall energy mix. However, the widespread and ineffective utilization of traditional biomass has led to issues like forest overexploitation, environmental degradation, challenges for end-users, and elevated carbon emissions.

To ensure sustainable biomass production, the National Directorate of New and Renewable Energy in Mozambique, in cooperation with the European Union developed the Biomass Energy Strategy in 2012 which identified specific regions such as the Niassa, Zambezia, Tete, and Cabo Delgado region with considerable potential for the development of biomass energy. In these areas there have been several efforts towards harnessing the biomass resources in an environmentally responsible and sustainable manner.<sup>14</sup>

### 1.5.1 ENERGY SECTOR

Mozambique possesses ample energy resources ready for utilization. In 2021, the country secured the top position in energy potential among all Southern African Power Pool (SAPP) nations, boasting an estimated capacity of 187,000 MW. The diverse array of energy sources available includes coal, hydroelectricity, natural gas, solar energy, and wind power. As of September 2020, 81% of the total energy supply came from renewable energy resources, mainly bioenergy (85%) and hydro / marine (15%) while the remaining share was covered by oil (13%) and gas (7%) (see Figure 5 and Figure 6).

<sup>13</sup> GET.invest, Renewable Energy Potential – GET.Invest, <https://www.get-invest.eu/market-information/mozambique/renewable-energy-potential>

<sup>14</sup> European Union Energy Initiative. Mozambique Biomass Energy Strategy, 2012. <https://www.greengrowthknowledge.org/sites/default/files/downloads/policy-database/MOZAMBIQUE%29%20Mozambique%20Biomass%20Energy%20Strategy.pdf>

Figure 5: Total Energy Supply (2020)

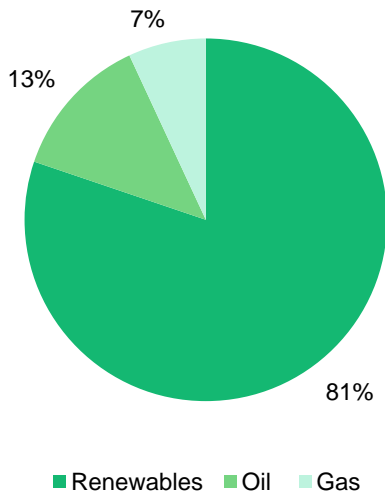
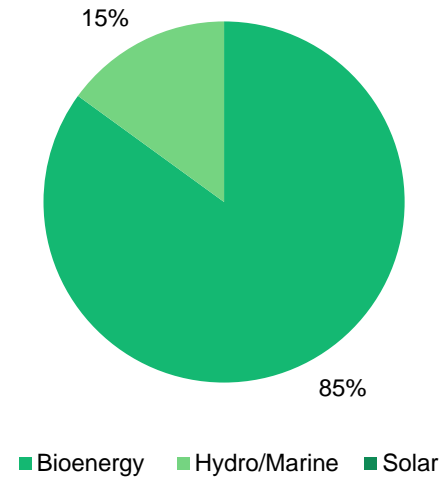


Figure 6: Renewable Energy Mix (2020)



Nevertheless, Mozambique's energy landscape is undergoing a transformative shift. Projections indicate that natural gas-based power stations are anticipated to contribute 44 percent to the overall energy generation between 2020 and 2030, illustrating a noteworthy evolution in the country's energy mix.

### 1.5.2 ELECTRICITY SECTOR

Mozambique has undertaken significant efforts in recent years to electrify the country. The electrification rate has increased from 24% in 2017 to 31% in 2020. Access to electricity, however, remains low and is mainly focused on urban areas. In 2020, approximately 75% of the urban population enjoyed electricity access, while only around 5% of the rural population had similar privileges. This stark urban-rural disparity poses a significant challenge to the goal of achieving nationwide electrification by 2030, particularly given that the majority of Mozambique's population resides in rural areas.

Regarding the country's installed electricity capacity, it has been estimated that Mozambique reached a total installed capacity of 2,799 MW by the end of 2022, from which 78% corresponded to hydropower, 16% to gas, 4% to heavy fuel oil, and 2% to solar.<sup>15</sup> However by 2030, solar plants are expected to provide 266 MW of installed capacity as projected in the Power Sector Master Plan.<sup>16</sup> In terms of electricity from renewable energy sources, in 2021 Mozambique's total renewable electricity generation was 18,461 GWh of which 85% was sourced from renewable sources (mainly hydro and marine).

<sup>15</sup> ALER and AMER. GET.invest. 2022 Briefing: Renewables in Mozambique. [https://mocambique.lerenovaveis.org/contents/lerpublication/a4\\_resumo\\_renov\\_moz\\_2022\\_vfinal.pdf](https://mocambique.lerenovaveis.org/contents/lerpublication/a4_resumo_renov_moz_2022_vfinal.pdf)

<sup>16</sup> ALER and AMER. GET.invest. 2021 Briefing: Renewables in Mozambique. [https://www.lerenovaveis.org/contents/lerpublication/aler\\_mar2021\\_resumo-renovaveis-em-mocambique-2021.pdf](https://www.lerenovaveis.org/contents/lerpublication/aler_mar2021_resumo-renovaveis-em-mocambique-2021.pdf)



## 2 INSTITUTIONAL AND REGULATORY FRAMEWORK

The government of Mozambique has played a crucial role in advancing the renewable energy sector, recognizing the country's substantial potential in this field. Over recent years, there has been a deliberate focus on prioritizing electricity production through renewable sources while a number of legislative changes, such as the Electricity Law and Regulation for the Allocation of Concessions for Mini-grids, have been introduced to regulate and enhance the attractiveness of the sector for investment. The government's involvement in key energy entities, including Hidroeléctrica Cahora Bassa, S.A., Electricidade de Moçambique, E.P., and solar power plants, further underscores its commitment to advancing renewable energy initiatives. The Mozambique Renewable Energy Auction Programme (PROLER), supported by the European Union, has played a significant role in attracting private investment and securing financing for renewable energy projects, contributing to the overall growth and sustainability of Mozambique's energy sector. To support potential investors in better understanding the governance of Uganda's renewable energy sector, Table 2 below provides an overview of the key relevant actors (including government authorities and private sector companies) as well as a list of relevant regulatory frameworks and legislations.

Table 3: Mozambique's Renewable Energy Sector: Key Actors and Regulatory Framework<sup>171819</sup>

Institutional and Regulatory Actors	Details
<b>Ministry of Natural Resources and Energy (MIREME)</b>	Governmental entity responsible for proposing measures to adapt the legal framework to the current dynamics of the development of renewable energies, increasing their contribution to the national energy matrix and in the preservation of the environment; promoting the sustainable use of new and renewable energies for rural development; approving research and development projects for the exploitation and use of renewable energy; licensing new and renewable energy activities and infrastructure
<b>Energy Regulatory Authority (ARENE)</b>	The national energy regulator. It sets and approves energy tariffs (including off-grid), monitors competition and enforces the terms and conditions pertaining to licences and concession contracts.
<b>Investment Promotion Agency (APIEX)</b>	A recently established public institution, endowed with legal personality, with administrative, financial and patrimonial autonomy, supervised by the Minister who oversees the area of Industry and Commerce. Some of the responsibilities include: Dissemination of the country's image and economic potential; Insurance of investment permits; Provision of institutional support services to investors and exporters; Inter-institutional articulation of analysis, approval and implementation of investment projects; Provision of follow-up and monitoring services for approved investment projects; Promoting of business links between small, medium and large investment projects.
<b>Empresa Nacional de Hidrocarbonetos de Moambique</b>	It is a Mozambican Government company whose principal activity is the exploration of oil and gas by researching, prospecting, producing and marketing petroleum products and representing the state in petroleum operations.

<sup>17</sup> Africa Energy Portal. Mozambique. <https://africa-energy-portal.org/aep/country/mozambique>

<sup>18</sup> Global Legal Insights. Energy Laws and Regulations 2023 Mozambique: <https://www.globallegalinsights.com/practice-areas/energy-laws-and-regulations/mozambique>

<sup>19</sup> GET.invest. Mozambique's energt sector, <https://www.get-invest.eu/market-information/mozambique/energy-sector/>

<b>Eletricidade de Moçambique (EDM)</b>	Public utility company, owned by the Mozambican State, responsible, among others, for the transformation, transportation, distribution and commercialisation of electric energy in the national territory; and for the importing and exporting of electrical energy.
<b>Energy Fund, FP. (FUNAE, FP.)</b>	The public entity responsible for promoting the use of renewable energy through the implementation of photovoltaic solutions, hydro, wind and mini-grid solutions, and monitoring the procurement process of contractors, service providers and suppliers of goods; carrying out surveys to identify the potential for the use of renewable energies, implementing and managing electrification projects based on renewable energy solutions and partnerships with the private sector; and implementing equipment certification.
<b>Hidroeléctrica de Cahora Bassa (HCB) (Cahora Bassa hydro power)</b>	It is the company that owns and operates the Cahora Bassa hydro project. The company is jointly owned by the Mozambican government and Redes Energéticas Nacionais, a Portuguese company. The Mozambican government owns a majority stake. It sells around two-thirds of the generated power to South Africa, while the remainder is sold to both the northern regions of the country and to neighbouring Zimbabwe.
<b>Relevant Regulatory Frameworks and Legislation</b>	<ul style="list-style-type: none"> <li>• The New Electricity Law (Law 12/2022, of July 11)</li> <li>• Decree no. 58/2014 of 17 October 2014 (regulation establishing the Tariff Regime for New and Renewable Energy)</li> <li>• New and Renewable Energy Development Strategy (EDENR) – 2011 to 2025;</li> <li>• The Energy for All programme</li> <li>• Mozambique Renewable Energy Integration Program (MREP)</li> </ul>

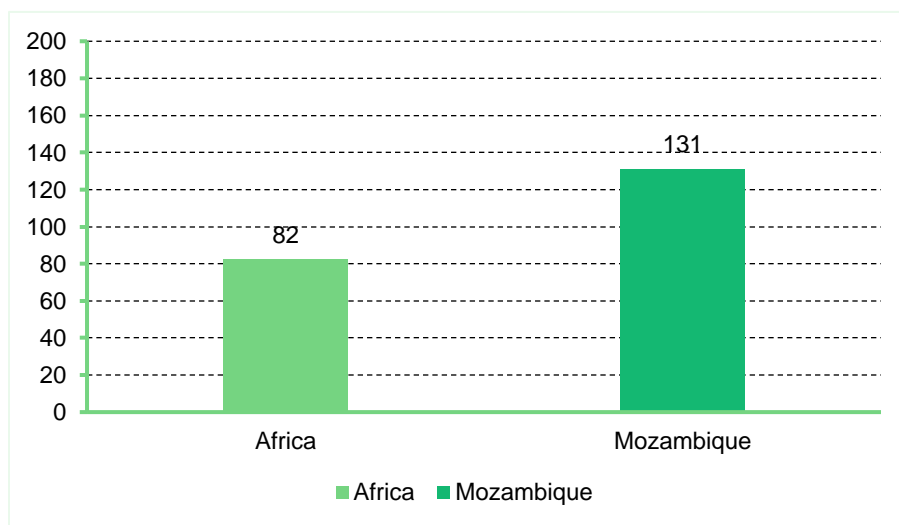
### 3 FOREIGN RENEWABLE ENERGY INVESTMENTS AND COLLABORATIONS

#### 3.1 Chinese Investment in Mozambique’s Energy Sector

China ranks among Mozambique's top 10 foreign investors, with 166 projects approved in Mozambique between 2017 and 2022 which have created over 19,000 jobs. The total investment value reached USD 1.3 billion of which over USD 700 million is direct investment.<sup>20</sup> Most of this investment was in the industrial sector, followed by services and construction such as construction of airports, roads and bridges. In comparison to the average Chinese FDI received by all other African nations between 2017 and 2021, Mozambique’s intake is significantly higher (see Figure 7) which suggests a unique and intensified economic engagement between the two nations.

<sup>20</sup> FOCAC. 2023. “Mozambique eyes closer trade, investment ties with China.” [http://www.focac.org/eng/zfzs\\_1/202310/t20231023\\_11165767.htm#:~:text=Source%3Axinhua%202023%2D10%2D,in%20central%20China%27s%20Hubei%20Province.](http://www.focac.org/eng/zfzs_1/202310/t20231023_11165767.htm#:~:text=Source%3Axinhua%202023%2D10%2D,in%20central%20China%27s%20Hubei%20Province.)

Figure 7: Comparing Chinese FDI received by Mozambique and all other African countries on average from 2017–2021 (million)<sup>21</sup>



In addition to the industrial sector however, there has been an increasing mutual desire to bolster cooperation in sectors such as energy, agriculture, tourism, and more. Regarding the energy sector, there have been several actions taken by Chinese stakeholders to support Mozambique’s green transition. In June 2023, Tsingshan Holding Group signed a strategic contract with the Mozambican government agreeing on Tsingshan’s investment in a plethora of projects including the construction of the largest green industrial park, port and terminals as well as Africa’s Great Corridor. This industrial park will be the largest economic zone and industrial duty-free zone in Mozambique and aims to support infrastructure such as solar photovoltaic plants while at the same time developing and utilising clean energy such as solar, wind and hydropower.<sup>22</sup> Table 4 below provides a sample list of Chinese companies operating in Mozambique as of 2023.

Table 4: Sample List of Chinese Companies in Mozambique (2023)

Companies	SOE or Private	Areas	Projects
Sieyuan Electric Co., Ltd	Private	Manufacturer of electrical equipment	EPC - Mozambique Energy Development and Access Project
China Electric Power Technology and Equipment Co.	SOE	R&D, manufacture, sales of power transmission and distribution equipment and systems	
Sinohydro Corporation Limited	SOE	Hydropower, renewable energy, hydroelectricity	
Power China Mozambique	SOE	Hydropower, renewable energy, hydroelectricity	

<sup>21</sup> China-Africa Research Initiative, School of Advanced International Studies. Dataset: Chinese Investment in Africa. Johns Hopkins University. Washington DC. 2023. [http://www.sais-cari.org/s/FDIData\\_April2023.xlsx](http://www.sais-cari.org/s/FDIData_April2023.xlsx)

<sup>22</sup> Seetao. 2023. <https://www.seetao.com/details/217937.html>

Jiangxi Water and Hydropower Construction Group Co. LTD	SOE	Hydropower, hydroelectricity	Corumana Hydropower Station
NORINCO International Cooperation Limited	SOE	Construction Engineering (metro, power construction, industry/agriculture)	PERIP Substation Rehabilitation Project

## 4 OTHER FOREIGN INVESTMENTS

Under the “Energy for All” programme, the Government of Mozambique has been working with multiple external stakeholders towards improving access to clean and affordable energy services for the entire population, particularly for the rural and underserved areas. By promoting public-private investment, the program focuses on various aspects, including electrification, renewable energy deployment, energy efficiency, and sustainable energy development. For example, the first utility-scale solar plant in Mozambique, the Mocuba 40 MW project, was inaugurated in April 2019 and its owned by a consortium of private investors and EDM (25% share). The leading Cahora Bassa hydropower is also jointly owned by the Mozambican government and Redes Energéticas Nacionais, a Portuguese company.

Furthermore, for the planned renewable energy investments and partnership engagements, there are various bilateral and multilateral stakeholders globally involved. The International Financial Corporation (IFC) and EDM signed an agreement in June 2022 to develop four solar PV power plants and battery storage facilities, with a total installed capacity of 50 MW. Meanwhile, EDF also signed a contract with the French Development Agency (AFD) to get technical knowledge and experience of electricity grid dispatch systems. The Sustainable Energy Fund for Africa (SEFA), managed by the African Development Bank, is providing USD 2.5 million to implement the Mozambique Renewable Energy Integration Programme (MREP), which includes technical and financial support to EDM to implement floating solar plant and energy battery storage system at 10 sites.

## 5 BARRIERS TO RENEWABLE ENERGY DEPLOYMENT IN MOZAMBIQUE

The development of renewable energy in Mozambique faces numerous challenges that span from infrastructure constraints to regulatory hurdles. Below are some of the key barriers:

- **Infrastructure Limitations:** Mozambique's existing energy infrastructure is underdeveloped and concentrated in urban areas, making it difficult to distribute renewable energy to rural and remote regions. Though there are policies to encourage off-grid projects in rural areas, it remains in the infancy stage for more foreign investment to bid on. Integrating renewable energy into the existing power grid can be complex, while also balancing supply and demand and ensuring grid stability are key challenges.
- **Economic Viability:** The economic viability of renewable energy projects in comparison to conventional fossil fuel options can be a barrier, especially when subsidies or incentives are lacking.
- **Provision of Guarantees:** The Mozambican government often faces challenges in providing to investors guarantees, particularly those related to political risks. This not only

impacts the project's financial viability but also influences investors' confidence in reaping profits and returns on their investments.

- **Hydropower Dominance:** Heavy reliance on hydropower, mainly on the Cahora Bassa Dam one the one hand makes the energy sector vulnerable to climate variability as water availability can impact energy production during periods of droughts and on the other hand restricts the exploration and integration of diverse energy alternatives into the national grid. This lack of diversification leaves the energy system vulnerable to the inherent variability of hydropower generation.
- **Limited Technological Expertise and Technical Capacity:** Building and maintaining renewable energy infrastructure requires specialized technical knowledge, a skilled personnel and access to affordable and high-quality renewable energy equipment and technology and therefore the lack of such factors can hinder the deployment of renewable energy deployment.
- **Policy and Regulatory Challenges:** The lack of specific legislation governing the renewable energy sector (especially with regard to the concession contract, which needs more specific and standardised treatment, regardless of the project's production capacity) as well as the length of time it takes to process tenders, public tenders and contracts for renewable energy projects can deter investors.
- **Currency Issues such as (in)convertibility:** The difficulties in converting foreign currency into Mozambican currency can impact the financial feasibility and attractiveness of investments in the country's renewable energy projects.

## 6 CONCLUSION AND RECOMMENDATIONS

This briefing offers a comprehensive analysis of Mozambique's renewable energy investment landscape, emphasizing the country's future potential in renewable energy, especially in solar and hydropower. While the government actively encourages renewable energy investments through various incentives to bolster energy security, there are certain barriers as outlined above, that affect the deployment of country-specific renewable energy investments.

The report concludes with targeted recommendations to Chinese investors who are interested in investing in Mozambique's renewable energy sector.

## 7 RECOMMENDATIONS

- **Leverage Feasibility Studies:** As aforementioned, there are currently a number of feasibility studies being undertaking exploring the possibility and hydro power potential of other areas in Mozambique (see Table 2). Taking this into account, Chinese investors should engage with stakeholders involved in these studies (e.g., local authorities, government, companies) in order to actively participate and contribute to the process and showcase their interest in supporting the completion of the study and potentially the delivery of the project. For example, Chinese investors interested in the hydropower sector could contact as a first step, the the Gabinete de Implementação do Projecto Hidroeléctrico de Mphanda Nkuwa which has been appointment as the entity to provide advisory services for the construction of the 1,500 MW Mphanda Nkuwa Hydropower Project in Mozambique.
- **Invest in Renewable Energy Clean Technology:** Drawing on their technical knowledge and experience in clean technologies, Chinese companies should seek opportunities in

establishing Chinese renewable energy clean technology manufacturing facilities in Mozambique. As a way of example, Central Electronics Ltd (CEL), an Indian company, is partnering with FUNAE to construct a factory dedicated to the production of solar panels. This facility is slated to be constructed in one of the districts of the Maputo province and will receive funding from the Indian government. Chinese investors are encouraged to contact FUNAE to further explore investment opportunities.

- **Rural Electrification:** China has been at the forefront of advancing off-grid renewable energy deployment in its extensive rural communities, positioning Chinese companies as well-equipped to seamlessly enter this market and supply the requisite equipment. Considering Mozambique's governmental support for off-grid solutions and decentralized renewable energy ventures in rural and remote regions, this creates a favorable opportunity for potential investors.
- **Leverage Government-to-Government Agreements and Existing Relationships:** Considering China's robust participation in Mozambique's infrastructure construction as well as the strong ties that China has with the government of Mozambique (which is evident from the significant amount of Chinese FDI received) Chinese companies should seek to work alongside the two governments to explore opportunities for private sector participation in the implementation of renewable energy initiatives. A starting point for Chinese investors to gain insights into which sectors are open to foreign investment could be by contacting the Embassy of Mozambique in China.
- **Focus on Mini Hydro and Biomass:** In both areas China has vast expertise. Both areas are further main interests for immediate actions by Mozambique. Also power generation is one of the most urgent priorities of Mozambique. FUNAE has identified a good pipeline of small hydro projects to which Chinese investment could contribute.
- **Facilitate the Trade of Renewable Energy Equipment:** Leveraging the sea access of Angola, Chinese companies can establish joint ventures to facilitate the efficient transportation and distribution of renewable energy technologies, such as solar panels and wind turbines. By tapping into the maritime routes available, Chinese companies can streamline the import and export processes, reducing logistical challenges. Additionally, collaborative efforts can include the establishment of renewable energy hubs near the coast, serving as distribution centres for equipment within the regions and neighbouring countries. The Ministry of Industry and Commerce is the key stakeholder that Chinese investors should get in touch with in order to discuss potential trade opportunities between the two countries.