

NOVEMBER 2023

# Who Finances Energy Projects in Africa?

Oyintarelado Moses





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Carnegie Endowment for International Peace  
Publications Department  
1779 Massachusetts Avenue NW  
Washington, DC 20036  
P: + 1 202 483 7600  
F: + 1 202 483 1840  
[CarnegieEndowment.org](http://CarnegieEndowment.org)

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## Acronyms

<b>AfDB</b>	African Development Bank
<b>DFI</b>	development finance institution
<b>ECA</b>	export credit agency
<b>FLNG</b>	floating liquefied natural gas
<b>FDI</b>	foreign direct investment
<b>G20</b>	Group of Twenty
<b>GDP</b>	gross domestic product
<b>LNG</b>	liquefied natural gas
<b>M&amp;A</b>	mergers and acquisitions
<b>MDB</b>	multilateral development bank





## Summary

Public and private energy finance to Africa from countries in the Group of Twenty (G20) and multilateral development banks (MDBs) from 2012 to 2021 totaled \$345.76 billion, according to this paper's findings. Amounting to an average of about \$35 billion per year, this finance was within the estimated \$31.5–\$45 billion range necessary to address Africa's annual energy finance gap. However, it was distributed unevenly, with ten countries receiving 77 percent of all finance over the ten-year period. Some inequity may be a consequence of differing domestic energy demands, investment environments, or natural resource endowments across countries. However, the resulting distribution of energy finance over the last decade was such that many African countries—home to hundreds of millions of people—were left with substantial gaps in their financing necessities.

This paper also shows that only a few countries and multilateral financing entities—including China, France, Italy, the United States, and the World Bank Group—supplied the majority of energy finance to Africa between 2012 and 2021. In many ways, this finding is unsurprising; however, it serves as a reminder that significant amounts of energy finance are subject to the policies and priorities of a small number of countries and institutions. To that point, this paper demonstrates a near total retrenchment of funding for coal projects beginning around 2018, reflecting the policy priority among these major funders to stop financing overseas coal projects.

Most of the \$345.76 billion in energy finance for African countries went to projects with gas/liquefied natural gas (LNG), mixed fossil fuels, and solar energy sources. Of the total energy finance, \$197.17 billion (57 percent) came from public institutions, while \$148.59 billion (43 percent) came from private corporations. The paper identifies some important similarities and differences between public and private finance. Both streams were highly concentrated in terms of senders and recipients, though the recipients differed slightly. For both streams, gas/LNG projects received the most or nearly the most finance. Public finance was directed to projects with more diverse energy sources, but less of the financing was directed to solar and wind projects. Most of the private finance was directed to fossil fuel projects, but when compared to public finance, a higher proportion of private finance supported solar and wind projects.

Overall, the average amount of energy finance commitments that flowed to Africa from 2012 to 2021 may have been within the range of estimated need, but the unequal distribution of this finance risked leaving many countries behind. The small number of major players on the supply side of energy finance also created the potential for volatility, as internal guidance on funding priorities among these senders could evolve over the coming years and decades. Policymakers in financing countries could therefore prioritize finance distribution based on annual demands from historically low-level recipients, diversify financiers by redirecting financing to African regional banks and investors, and use public finance to crowd in private finance to projects with high potential for energy access in Africa.

## Introduction

Energy infrastructure facilitates economic growth, generates jobs, increases productivity, and reduces the cost of doing business. Yet, many African countries experience a wide range of energy deficits, including low rates of electricity access and a lack of clean cooking fuels and technologies. About 600 million people—43 percent of Africa’s population—lacked access to electricity in 2021. Almost 98 percent of those people lived in sub-Saharan Africa.<sup>1</sup>

Yet, Africa has an abundance of energy potential. The continent uses only 11 percent of its hydropower potential and 0.01 percent of its wind potential; it also holds 60 percent of the world’s solar resources.<sup>2</sup> By 2050, it will hold 11 percent of the world’s gas/liquefied natural gas (LNG) market and will be the region with the second-highest growth supply of gas after the Middle East.<sup>3</sup> Given this resource potential, there is immense opportunity for African countries to increase their domestic energy access rates while also benefiting from energy exports.

The desire among African leaders and policymakers to harness the opportunities of the continent’s energy resource potential has led to high demands for energy finance. Africa requires between \$35 billion and \$50 billion in energy finance to reach the United Nations’ seventh Sustainable Development Goal: access to affordable and clean energy for all.<sup>4</sup> African governments and international financiers have played a role in contributing energy investments to address these needs. However, the continent attracts less than 5 percent of global energy investment.<sup>5</sup>

Despite the availability of aggregated statistics on the energy investment directed to Africa, there is a lack of comprehensive data and analysis on the estimated amount of funds external financiers have contributed to African energy projects. In general, data on finance for energy projects in Africa are dispersed across multiple databases. Some data provide total aggregates without much granularity by region or country. Other datasets separate sub-Saharan Africa and North Africa, which does not allow for comprehensive analysis of energy finance to the African continent.

This paper addresses this deficit by tracking committed public and private energy finance to Africa from Group of Twenty (G20) countries and multilateral development banks (MDBs) from 2012 to 2021. The paper incorporates data on finance from institutions such as export credit agencies (ECAs), development finance institutions (DFIs), and corporations in G20 countries where data are available.<sup>6</sup> The paper provides a landscape of the trends in public and private energy finance to Africa by discussing top recipients and financiers, financing types, the most financed energy sources, and gaps in energy finance in the region.

To better understand the data underpinning these findings, the following paragraphs describe the scope, concepts, and financial instruments used in energy finance and in this paper. Subsequent sections explore the overall landscape of energy finance and the similarities and differences between public and private finance for African countries. The paper concludes with takeaways describing challenges and opportunities for energy finance growth in Africa. For methodology and details about the datasets used in this paper, see the appendix.

## **What Is Public and Private Energy Finance?**

In this paper, finance is defined as concessional and commercial capital in the form of grants, loans, guarantees, insurance, and equity (both public and private). Public finance is mostly in the form of commitments, which means a financial agreement was signed. Private finance includes commitments based on public announcements and deal completion. These statuses indicate that a project was financed, but they do not fully reflect actual disbursement. In this paper, all amounts are referred to as finance instead of commitments for the purposes of simplicity. Table 1 provides an overview of the different finance types analyzed in this paper.

**Table 1. Types of Finance**

Finance Type	Definition
Grant	This is capital for the purpose of financing a development project or an idea. Grants differ from loans in that they are not required to be repaid.
Loan	This is capital for the purpose of financing a project, with the expectation it will be repaid. Terms of loans, such as interest rates and repayment periods, from public institutions are more generous or concessional than terms of loans from commercial banks, which tend to have shorter repayment periods and higher interest rates.
Guarantee	This is an agreement that assures lenders that they will be repaid should a borrower default on a loan. The guarantee-granting entity assumes responsibility for the debt payment up to a certain amount should a borrower not meet its obligations.
Insurance	This is an agreement that assures financiers that they will recover their losses. Insurance is typically tied to commercial or political risks (such as the breach of contract, currency inconvertibility and transfer issues, expropriation, or war and civil disturbance) that could impact an investor's ability to recover profits from their investment.
Equity	This is the capital a company provides to purchase or consolidate a share in a project (brownfield investment) or establish a new subsidiary or project that they own (greenfield investment). These two forms of equity finance can come from both public and private investors.

Public energy finance is defined as finance for energy projects from government-backed financial institutions in G20 countries and from MDBs. Government-backed institutions include a country's ECAs, DFIs as defined by the country, national development banks, aid agencies, and any other public institutions that provide finance. These institutions provide grants, loans, guarantees, insurance, and equity.

Private energy finance refers to foreign direct investment (FDI) from corporations in the form of greenfield investment and brownfield investment. Greenfield FDI indicates private sector companies' willingness to finance new energy projects in Africa, and brownfield FDI in the form of mergers and acquisitions (M&A) indicates investors' willingness to turn around existing companies for a profit. FDI is valuable because it plays an important role in public-private partnerships, which are finance mechanisms governments use to build public infrastructure by attracting private sector finance and services.<sup>7</sup> African governments have expressed interest in such partnerships and have sought more capital from nonpublic sources, such as capital markets, making FDI a prospective area of new investment growth in the future.<sup>8</sup> Loans from large commercial banks, such as Citibank and Hongkong and Shanghai Banking Corporation (HSBC), are omitted from private energy finance in this paper because of the lack of comprehensive open-sourced data on commercial finance to Africa. These loans would typically be smaller in size and less concessional when compared to public

financiers. Many commercial loans to projects in developing countries are typically covered by public financing insurance and guarantees to help financiers mitigate any repayment risk. Therefore, public insurance and guarantees could be a proxy for commercial loans.

Using these concepts and financial terms, the next section provides an overview of the combined trends in public and private energy finance.

## Overall Trends in G20 and MDB Energy Finance to Africa

Public financing institutions and corporations from G20 countries, as well as MDBs, committed \$345.76 billion in public and private finance to energy projects in Africa from 2012 to 2021. This was \$35 billion on average per year, an amount that was within the range of Africa's estimated \$31.5–\$45 billion gap for energy finance. Public energy finance amounted to \$197.17 billion, or 57 percent of the total, and private energy finance amounted to \$148.59 billion, or 43 percent of the total.

This finance was spread across various energy sources. Gas/LNG projects received the highest amount (\$83.51 billion), followed by mixed fossil fuel projects (\$60.04 billion), solar projects (\$37.52 billion), oil projects (\$27.98 billion), nuclear projects (\$26.14 billion), hydropower projects (\$25.77 billion), coal projects (\$20.15 billion), wind projects (\$12.75 billion), biomass projects (\$2.34 billion), and geothermal projects (\$1.87 billion). Projects without a designated energy source received \$47.67 billion; those included transmission and distribution lines with mixed or unknown energy sources, batteries, hydrogen, and other unclear energy types.

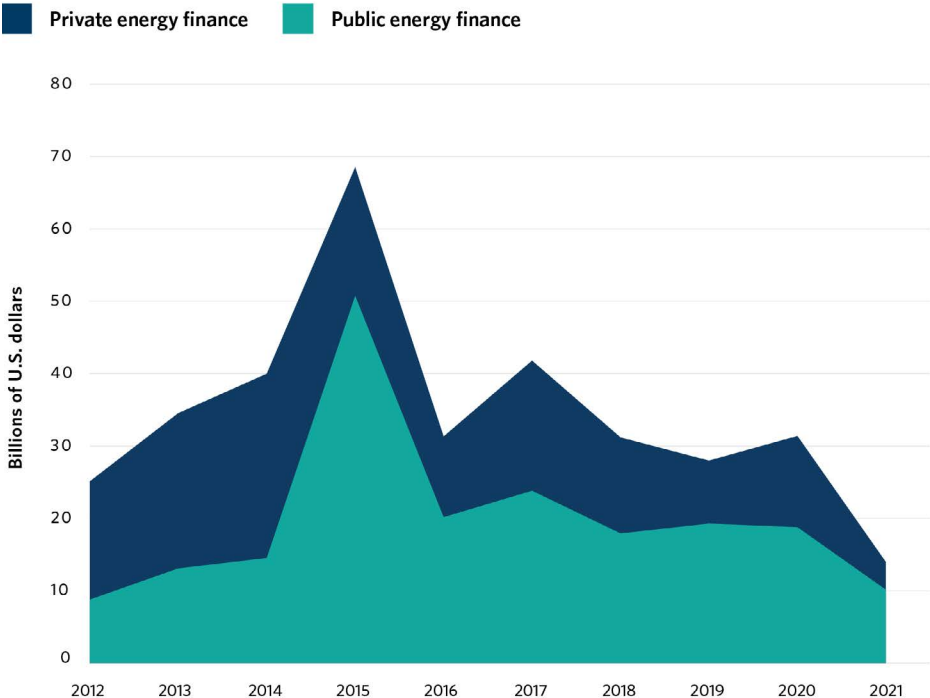
Projects that involved only coal or oil saw financing largely dwindle after 2018, whereas projects from the mixed fossil fuel sector—which includes coal, among other fuels—did continue to receive finance after 2018. Financing for gas/LNG, mixed fossil fuels, solar, and hydropower projects remained relatively stable over the years.

Energy finance to Africa was unevenly distributed across country recipients. Ten African countries received the bulk of the finance (\$267.40 billion, or 77 percent of the total). They are, in decreasing order, Egypt, Mozambique, Nigeria, South Africa, Angola, Morocco, Ghana, Uganda, Kenya, and Ethiopia. Ten bilateral and multilateral financiers provided the bulk of the finance (\$283.84 billion, or 82 percent). They are China, in decreasing order, the World Bank Group, Italy, France, the United States, Russia, the United Kingdom, Japan, India, and the African Development Bank (AfDB).

Energy finance peaked in 2015, eight years after the start of the global financial crisis in 2007 and two years after China announced its Belt and Road Initiative. Other key milestones contextualize this peak. In 2015, 196 parties adopted the Paris Agreement on climate change. Also that year, public finance was committed to Egypt to support a nuclear power plant that, if completed, would be Africa’s second such plant. After the 2015 peak, finance showed no consistent trend. Finance sharply declined and then rebounded in 2017 and 2020, only to decline again in 2021, likely due to the impacts of COVID-19 pandemic on African economies (see figure 1).

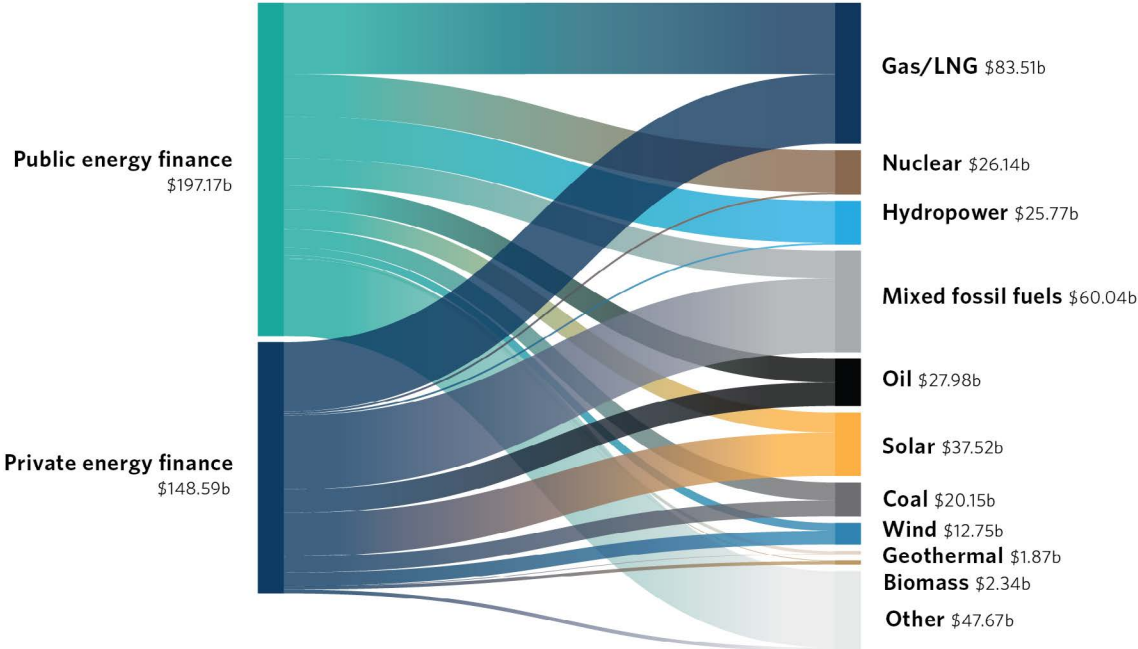
The energy sources to which this finance was directed were largely diversified. Financiers directed \$191.69 billion, or 55 percent of overall finance, to fossil fuel energy projects (gas/LNG, mixed fossil fuels, oil, and coal). Gas/LNG projects received \$83.51 billion, or 24 percent, of the total finance, the highest amount allocated to projects with one energy source. Nuclear projects received \$26.14 billion, or 8 percent. Hydropower projects received a similar amount: \$25.78 billion, or 7 percent. Solar and wind projects received \$50.27 billion, amounting to 15 percent of the total finance. Biomass and geothermal projects received \$2.34 billion and \$1.97 billion, respectively, at about 1 percent of the finance each. Other projects—including transmission and distribution with mixed or unknown energy sources, batteries, and hydrogen—received \$47.67 billion, or 14 percent of the finance (see figures 2a and 2b).

**Figure 1. Public and Private Energy Finance to Africa, 2012-2021**



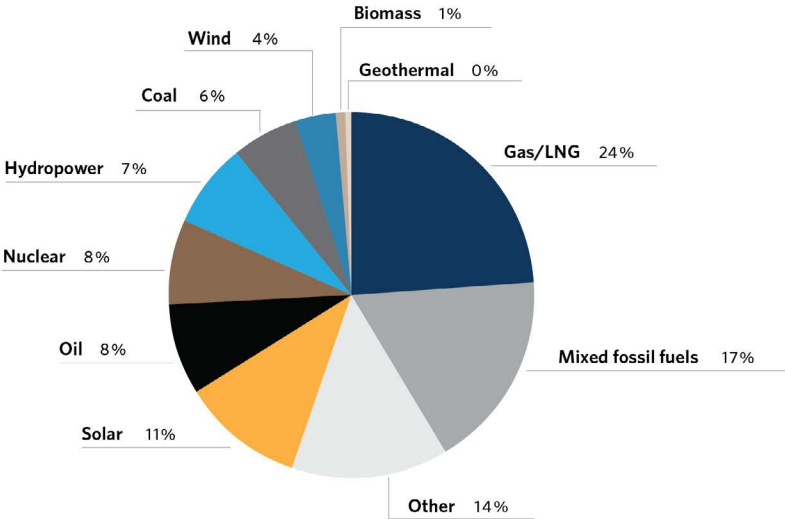
Source: Author’s calculations based on the Public Finance for Energy Database, fDi Markets’ database, and Dealogic’s M&A dataset.

**Figure 2a. Breakdown of Finance to Africa by Energy Source**



Note: Data are for the 2012-2021 period.  
 Source: Author's calculations based on the Public Finance for Energy Database, fDi Markets' database, and Dealigic's M&A dataset.

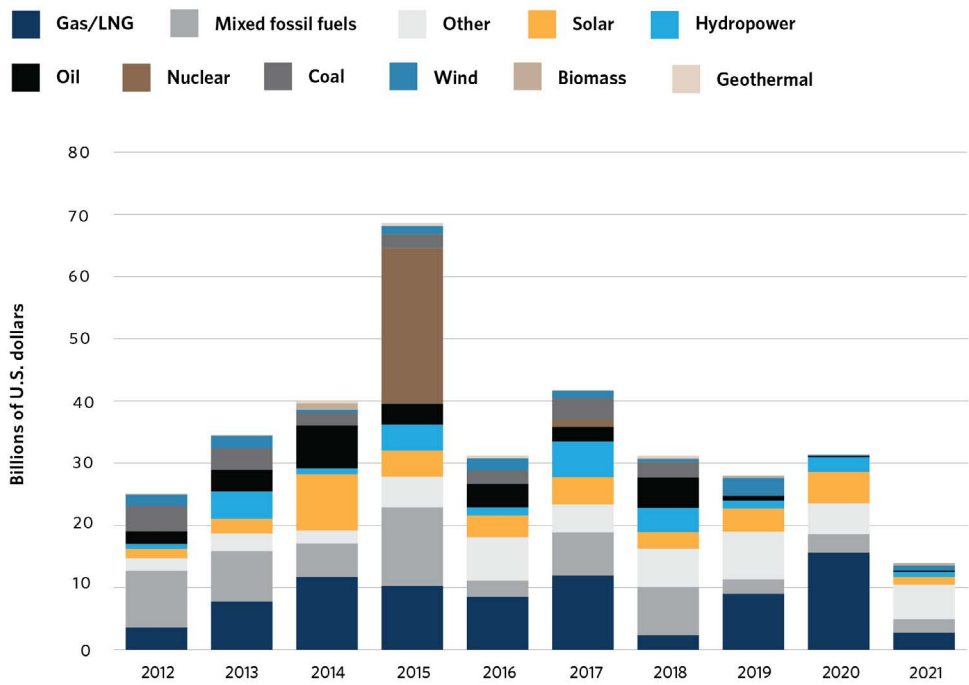
**Figure 2b. Share of Finance to Africa by Energy Source**



Note: Data are for the 2012-2021 period.  
 Source: Author's calculations based on the Public Finance for Energy Database, fDi Markets' database, and Dealigic's M&A dataset.



**Figure 3. Finance to Africa by Energy Source, 2012-2021**



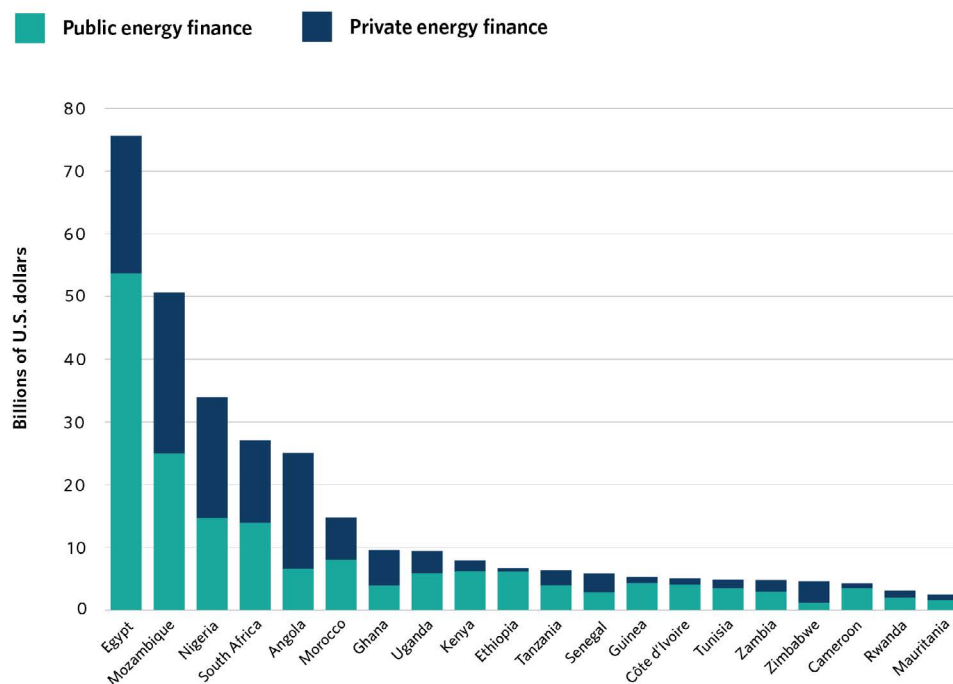
Source: Author's calculations based on the Public Finance for Energy Database, fDi Markets' database, and Dealigic's M&A dataset.

As figure 3 shows, although financing for coal projects and oil projects largely dwindled after 2018, the mixed fossil fuel sector, which has projects that use coal, continued to receive finance after 2018. Finance for gas/LNG, mixed fossil fuels, solar, and hydropower projects remained relatively stable over the years.

While public energy finance largely went to electric power generation, transmission, and distribution, private finance funded more exploration and extraction projects, especially around fossil fuels. About half of private finance had an end usage of exploration and extraction for the purpose of exports, compared to 12 percent of public finance. The end usage of projects receiving the most public finance was electricity generation, at 47 percent, compared to 37 percent of private finance. The rest of public and private energy finance was for a mixture of other purposes, such as refinement, manufacturing, petrochemicals, capital for domestic energy finance funds, technical assistance, and other mixed or unidentifiable uses. Such trends are not only indicative of the motivations behind external energy finance but also reveal the mandates of different types of financiers involved in Africa's energy finance landscape.

A small group of African countries received most of the finance, as shown in figure 4. Twenty African countries received \$307.91 billion, or 89 percent of the finance. Egypt, Mozambique, Nigeria, South Africa, Angola, Morocco, Ghana, Uganda, Kenya, and Ethiopia altogether received \$267.40 billion, or 77 percent. Southern Africa, which has three countries in the top five recipients, received the most finance, at 34 percent, while

**Figure 4. Top Twenty African Recipients of Energy Finance**



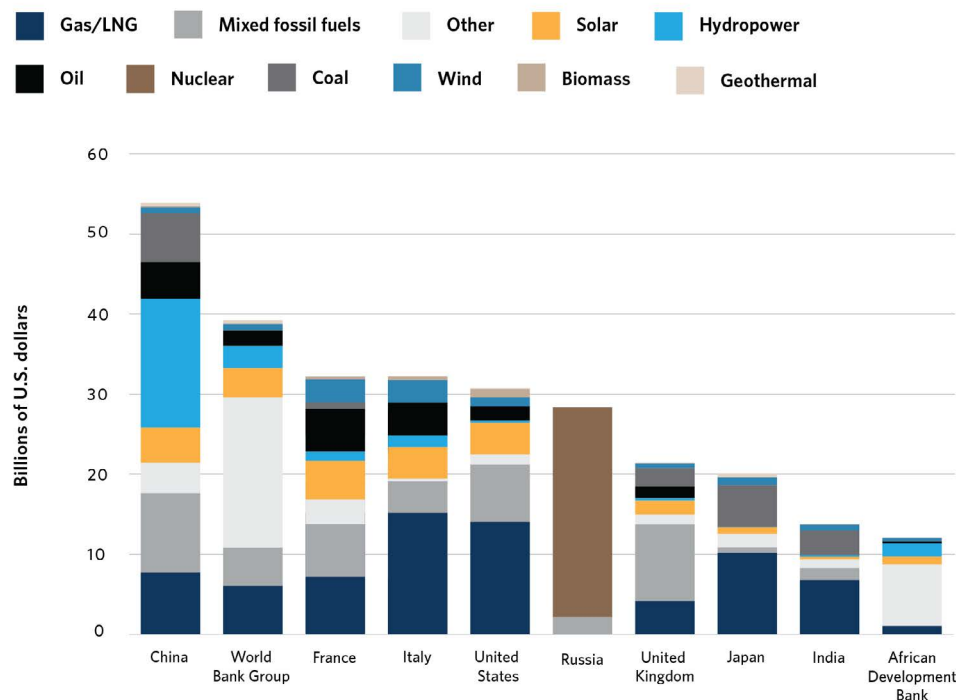
Note: Data are for the 2012-2021 period.

Source: Author's calculations based on the Public Finance for Energy Database, fDi Markets' database, and Dealogic's M&A dataset.

North Africa received the second highest amount of finance, at 29 percent. West Africa (21 percent), East Africa (11 percent), Central Africa (3 percent), and regional Africa (2 percent) received finance in that order. Regional Africa refers to groups of multiple countries that span more than one region. Egypt, Mozambique, Nigeria, South Africa, Angola, and Morocco were in the top ten recipients list for both public and private finance.

China, France, Italy, the United States, Russia, the United Kingdom, Japan, and India were the top energy bilateral financiers from 2012 to 2021 (see figure 5). The World Bank Group and the AfDB also provided significant amounts of finance. These ten countries and institutions committed \$283.84 billion, or 82 percent of total finance, to African countries. Not only do these countries have active public finance institutions, but large corporations from the fossil fuel sectors of these countries also bolstered the amount of finance committed to the continent. Most of the top ten financiers largely supported a diverse group of sectors, with a few exceptions. China supported all energy sources except nuclear. Russia primarily supported mixed fossil fuel sectors and provided a large amount of public finance for one nuclear project in Egypt. All countries examined, except Russia, provided support for solar projects.

**Figure 5. Top Ten Providers of Energy Finance to Africa by Energy Source**



Note: Data are for the 2012-2021 period.

Source: Author's calculations based on the Public Finance for Energy Database, fDi Markets' database, and Dealogic's M&A dataset.

## Energy Finance Gaps Remain

Climate Policy Initiative estimates that \$277 billion is needed annually between 2020 and 2030 for African countries to fully implement their plans under the Paris Agreement, known as nationally determined contributions, to reduce greenhouse gas emissions and adapt to climate impacts.<sup>9</sup> Generally, African governments have committed 10 percent to this amount through domestic financing, leaving about \$250 billion needed from external sources.<sup>10</sup> Roughly \$35 billion of the \$277 billion is required for energy development and access.<sup>11</sup> Underscoring this amount, the AfDB estimates that Africa's annual finance gap for energy and power projects ranges from \$35 billion to \$50 billion needed to reach the seventh UN Sustainable Development Goal: access to affordable and clean energy for all.<sup>12</sup> Assuming African governments provide an average of 10 percent of the finance needed for energy development and access, there is an estimated annual energy finance gap between \$31.5 billion and \$45 billion.

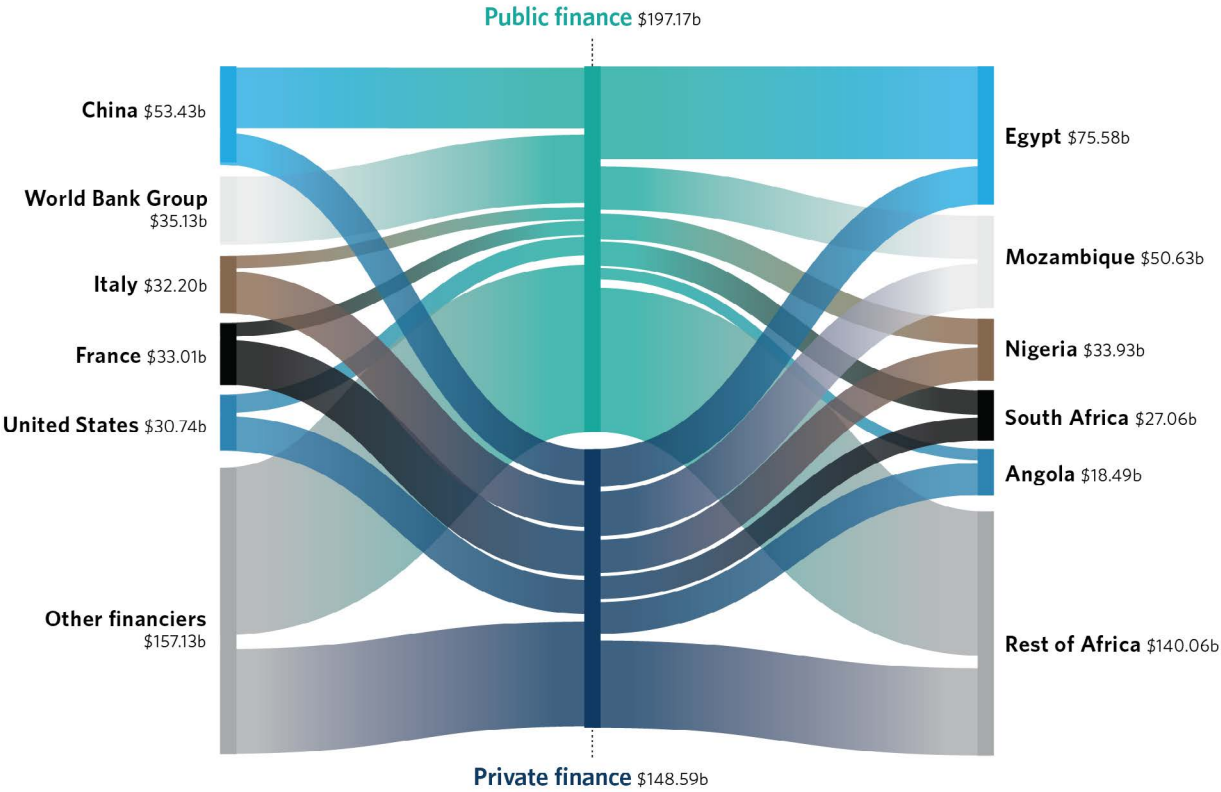
This paper estimates that public financing institutions and corporations in G20 countries and MDBs committed \$345.76 billion in energy finance to Africa from 2012 to 2021. While this finance is not evenly distributed across years, the overall amount averages to \$35 billion per year. This average amount appears to address the annual gap. However, this paper's analysis shows this finance is not evenly distributed across recipients.

### Unequal Distribution of Energy Finance

Egypt, Mozambique, Nigeria, Angola, South Africa, Morocco, Ghana, Uganda, Kenya, and Ethiopia received 77 percent of all energy finance between 2012 and 2021, leaving 23 percent of finance for Africa’s remaining forty-four countries. These top recipient countries represent seven of Africa’s top ten economies in terms of gross domestic product (GDP).<sup>13</sup> They also represent four of Africa’s top ten oil producers (Angola, Nigeria, Egypt, and Ghana), four of Africa’s top ten countries with the most natural gas reserves (Nigeria, Mozambique, Egypt, and Angola), and four of Africa’s top five countries with the largest clean energy potential when including hydropower (Mozambique, Ethiopia, Kenya, and Ghana).<sup>14</sup> In fact, the top five recipient countries received a majority (61 percent) of the finance, leaving the rest of Africa’s forty-nine countries with just 39 percent.

Meanwhile, the majority (82 percent) of public and private energy finance came from ten financiers, as already seen in figure 5. China, the World Bank Group, France, Italy, and the United States were the top five financiers, and they directed 54 percent of the finance. As a result, five major financiers were directing finance primarily to just five recipients (see figure 6).

**Figure 6. Flows of Energy Finance From Top Providers to Top African Recipients**



Note: Data are for the 2012-2021 period.  
 Source: Author’s calculations based on the Public Finance for Energy Database, fDi Markets’ database, and Dealogic’s M&A dataset.

This uneven distribution presents challenges to effectively addressing African countries' energy finance gaps. The energy finance gaps span the entire continent, with high concentrations in sub-Saharan Africa. Since 2000, the Democratic Republic of the Congo, Ethiopia, Nigeria, Tanzania, and Uganda have constituted nearly half of all people on the African continent without access to electricity or clean cooking.<sup>15</sup> The rest of the need is spread throughout Africa, with comparatively fewer people lacking access in North Africa and Southern Africa, as of 2022.<sup>16</sup> However, Africa's top recipient of energy finance is in North Africa, and three of the other top five recipients are in Southern Africa. Although there is some overlap between recipients' needs and where finance is directed, this overlap appears to be minimal. Other challenges, such as capital flight from Africa, may also be impeding the effective transfer of financing commitments to energy development and access.<sup>17</sup>

These aggregate trends provide insight into when, where, and with what tools G20 countries direct finance to African countries. In the next two sections, trends will be broken down by finance types to highlight specific characteristics of public and private energy finance in Africa.

## Trends in Public Energy Finance to Africa

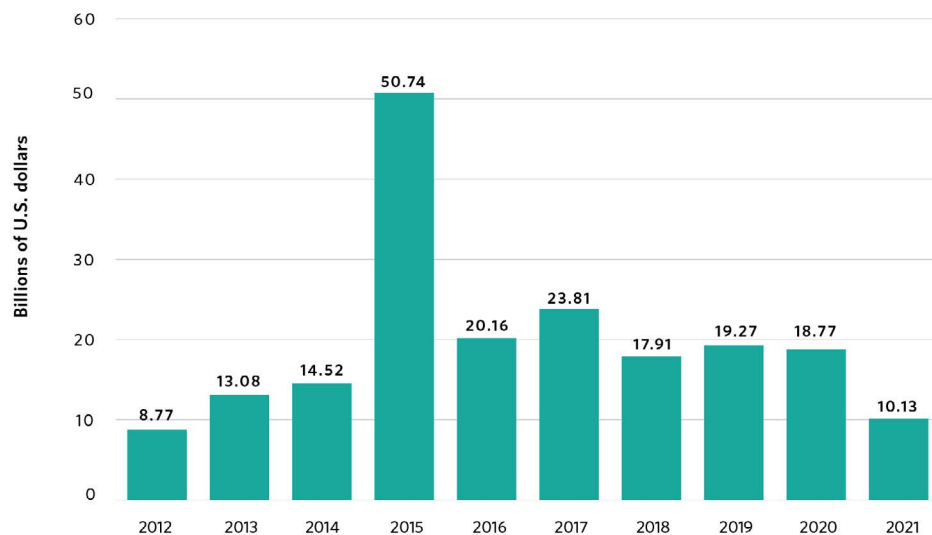
- From 2012 to 2021, G20 countries and MDBs committed an estimated \$197.17 billion for energy projects to African countries.
- Public energy finance mostly came from loans (77 percent), followed by guarantees and insurance (19 percent), then grants (3 percent), equity (2 percent), and other finance (0.1 percent).
- This finance was spread across various energy sources. Gas/LNG projects received the highest amount (\$42.43 billion), followed by nuclear (\$25 billion), hydropower (\$24.72 billion), mixed fossil fuels (\$16.20 billion), oil (\$13.96 billion), solar (\$11.92 billion), coal (\$10.66 billion), wind (\$4.63 billion), geothermal (\$1.77 billion), and biomass (\$0.41 billion). Projects without a designated energy source received \$45.46 billion. Those projects included transmission and distribution lines with mixed or unknown energy sources, batteries, hydrogen, and other unclear energy types.
- Public finance for coal projects stopped after 2019, with no known finance in 2020 or 2021, and public finance for oil projects also decreased from 2016 to 2021. Finance for mixed fossil fuel projects—consisting of coal, oil, and gas—also decreased from a peak in 2015 to a low in 2021. Finance for gas/LNG remained stable and increased between 2018 and 2020.

- Ten African country recipients received the bulk (73 percent) of the public finance. They were Egypt, Mozambique, Nigeria, South Africa, Morocco, Angola, Kenya, Ethiopia, Uganda, and Guinea. Ten financiers provided the bulk (86 percent) of the finance. They were the World Bank Group, China, Russia, Japan, the AfDB, the United States, the Islamic Development Bank, Italy, Germany, and France.

From 2012 to 2021, commitments from public bilateral institutions of G20 countries and MDBs for energy projects across Africa averaged roughly \$20 billion a year. The MDBs, including the World Bank Group, AfDB, Islamic Development Bank, European Investment Bank, European Bank for Reconstruction and Development, New Development Bank, and Asian Infrastructure Investment Bank provided \$72 billion, or 37 percent of the finance. The public bilateral institutions committed \$125.05 billion, or 63 percent of the finance.<sup>18</sup>

Public energy finance to Africa reached or surpassed \$20 billion in 2015, 2016, and 2017 (see figure 7). These were the years when the Paris Agreement was signed (2015) and entered into force (2016); when Chinese loans to Africa peaked (2016); and when Russia signed financing commitments to El Dabaa Nuclear Power Plant in Egypt (2015) (see box 1).<sup>19</sup> Since 2017, public finance appeared to remain stable, until it fell by almost half in 2021. Despite the COVID-19 pandemic, stable amounts in 2020 may reflect the closing of several deals that were already in the pipeline for many years prior, including finance commitments to LNG projects in Mozambique. The 2021 dip could be largely explained by the lack of known Chinese energy finance to Africa that year.<sup>20</sup>

**Figure 7. Public Energy Finance to Africa, 2012-2021**



Source: Author's calculations based on the Public Finance for Energy Database and Oil Change International's dataset.

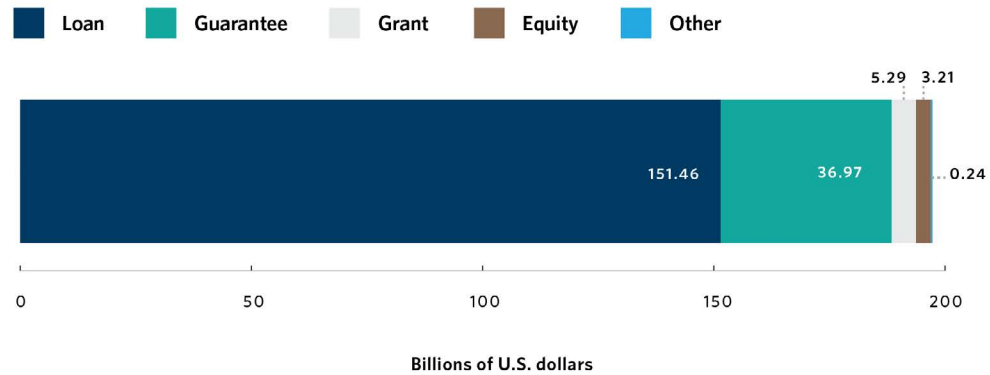
### **Box 1: Background on Russia's \$25 Billion Commitment to Egypt's El Dabaa Nuclear Power Plant**

Egypt will become the second African country after South Africa to have a nuclear power plant when El Dabaa Nuclear Power Plant, which has been financed by Russia, comes online. Notably, the public energy finance dataset used in this paper does not contain comprehensive amounts on finance from Russia's development banks, which are currently difficult to publicly access. However, this paper identified a loan commitment for El Dabaa Nuclear Power Plant from Russia's Ministry of Finance to Egypt. This financial commitment is included as public energy finance because information about it was publicly available and the finance itself essentially performed as an export credit. The commitment also represents a major investment to build what could be Africa's second nuclear power plant.

In 2015, Egyptian President Abdel Fattah el-Sisi and Russian President Vladimir Putin signed an intergovernmental agreement that Russia would support the construction and financing of El Dabaa Nuclear Power Plant.<sup>21</sup> Subsequently, in 2016, Egypt's Ministry of Electricity and Renewable Energy signed the engineering procurement and construction contract with Russian state-owned company Rosatom State Nuclear Corporation to build, operate, and maintain the project for ten years.<sup>22</sup> Russia committed a \$25 billion loan with a 3 percent interest rate, repayable over twenty-two years from 2029, to cover 85 percent of the construction cost.<sup>23</sup> In 2017, notices to implement the contract were signed, and the contract entered into force.<sup>24</sup> Egypt committed to raising the remaining 15 percent of the finance from the private sector. The plant will have four VVER-1200 reactors for the ultimate purpose of addressing Egypt's energy needs. The project is currently in implementation, with 2030 as the goal of full capacity operation.<sup>25</sup>

Loans accounted for 77 percent of public energy finance to Africa, amounting to \$151.46 billion (see figure 8). The trend of loans making up the largest portion of public energy finance aligns with conventional lending practices in Africa—loans from ECAs, DFIs, and MDBs often cover large-scale projects, such as power plants. Many public financiers also tend to engage in lending to governments through central government ministries, state-owned enterprises, joint ventures, and special purpose vehicles with government ownership. These loans are most likely concessional. According to the Africa Debt Database at the Kiel Institute for the World Economy, MDB loan finance to Africa has an average maturity of thirty years and interest rate of 0.8 percent, compared to a twenty-two-year maturity and 2 percent interest rate for bilateral loans for non-LIBOR plus rates. These terms are highly concessional compared to that of bondholders, which provide on average a fourteen-year maturity at 6 percent interest rates.<sup>26</sup>

**Figure 8. Public Energy Finance to Africa by Finance Type**



Note: Data are for the 2012-2021 period.

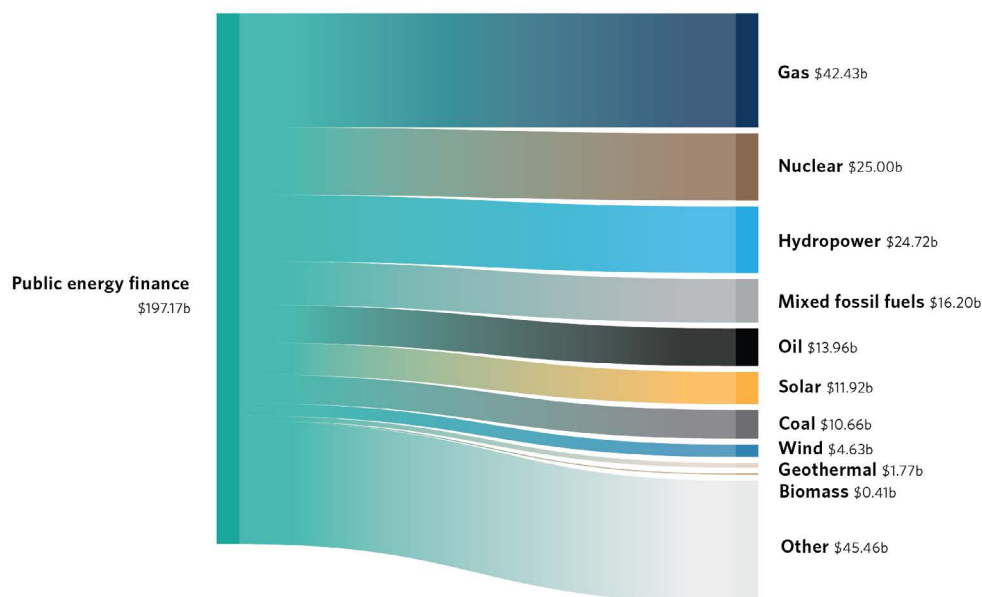
Source: Author's calculations based on the Public Finance for Energy Database and Oil Change International's dataset.

Other types of financing tools were utilized for energy projects in Africa. Guarantees and insurance provided by ECAs and DFIs represented 19 percent, or \$36.97 billion. Public financing institutions from G20 countries supported public and commercial bank finance and investors through guarantees and insurance on energy deals in Africa. Guarantees and insurance are often used to derisk investment or enhance the credit of equity and loan products. Grants represented 3 percent, or \$5.29 billion, mostly provided by the World Bank Group (\$3.41 billion). Equity represented 2 percent, or \$3.21 billion, and other types of finance represented 0.1 percent, or \$242 million. (See the appendix for access to the dataset with specific financing, project, and financier information.)

Figure 9 displays the allocation of public finance to various energy sources. Fossil fuel projects—consisting of gas/LNG, mixed fossil fuels, oil, and coal—received \$83.25 billion, or 42 percent of the public finance to Africa, over the ten-year period. Public finance for coal projects stopped after 2019, with no known finance in 2020 or 2021, likely due to the G20 agreement to stop overseas financing for unabated coal power plants by the end of 2021.<sup>27</sup> Finance for oil projects also decreased, from \$3.79 billion in 2016 to \$232 million in 2021. Finance for mixed fossil fuel projects decreased as well, from a peak of \$3.59 billion in 2015 to \$667 million in 2021. Finance for gas/LNG projects largely outpaced finance to other energy sources, as seen in figure 9, with 2020 seeing the recent peak of public finance to gas/LNG projects to Africa, largely due to finance for the Mozambique LNG project (see figure 10).



**Figure 9. Public Finance to Africa by Energy Source**



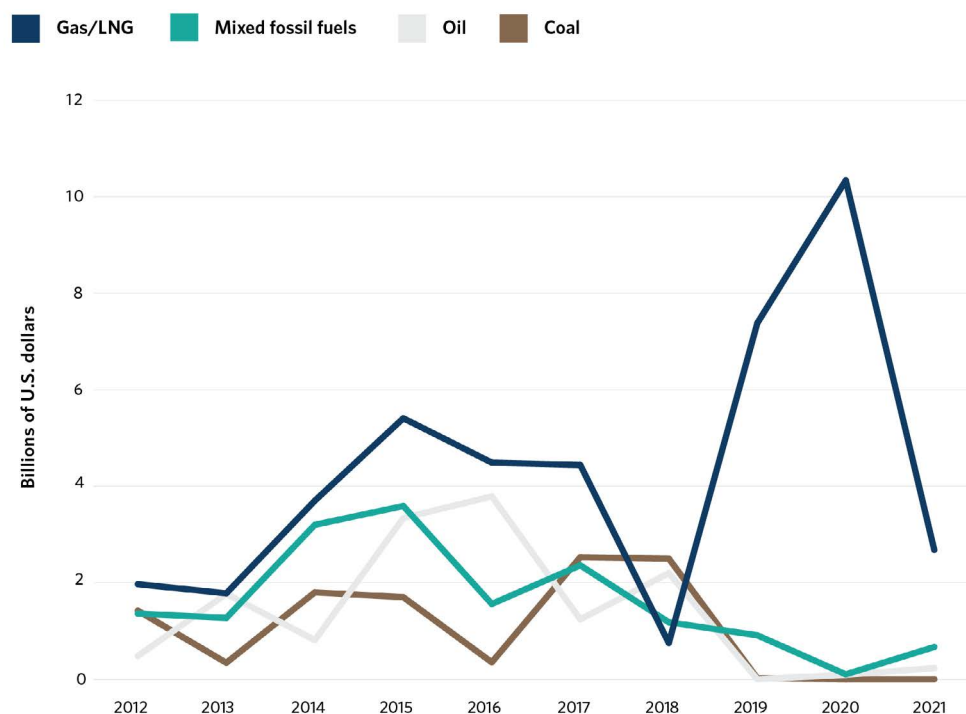
Note: Data are for the 2012-2021 period. The “other” category includes finance for transmission and distribution lines, batteries, hydrogen, biofuels, and other unclear energy types.  
 Source: Author’s calculations based on the Public Finance for Energy Database and Oil Change International’s dataset.

Gas/LNG projects had the highest amount of allocated finance, at \$42.43 billion for 137 projects. Loan, guarantee, and insurance finance for LNG projects in Mozambique accounted for about half of the total finance for gas/LNG projects. These projects included Mozambique LNG and the Rovuma LNG projects (see box 2).

Hydropower projects received the third highest amount of finance, at \$24.72 billion for 152 large projects and 18 small projects. Nigeria, Uganda, and Guinea received the most finance for hydropower, at \$6.95 billion, \$4.26 billion, and \$3.23 billion, respectively. The Export-Import Bank of China, the AfDB, and Servizi Assicurativi del Commercio Estero were the dominant financiers of hydropower for projects, such as the Gurara Hydropower Project in Nigeria and the Koysha Hydroelectric Power Project in Ethiopia.

Financiers committed over \$16.56 billion to 375 wind and solar projects, accounting for 8 percent of total public finance. Solar projects received significantly more finance (\$11.92 billion) than wind projects (\$4.63 billion). Morocco was the top recipient of solar finance, receiving \$3.03 billion; the European Investment Bank provided a \$441 million loan to the country for the Noor Midelt CSP-PV Plant Stage I project. The Japan International Cooperation Agency extended a \$430 million wind loan to Egypt for the Gabal El Zeit Wind Farm.

**Figure 10. Public Finance to Fossil Fuel Projects in Africa, 2012-2021**



Source: Author's calculations based on the Public Finance for Energy Database and Oil Change International's dataset.

### Box 2. Gas/LNG Projects in Mozambique

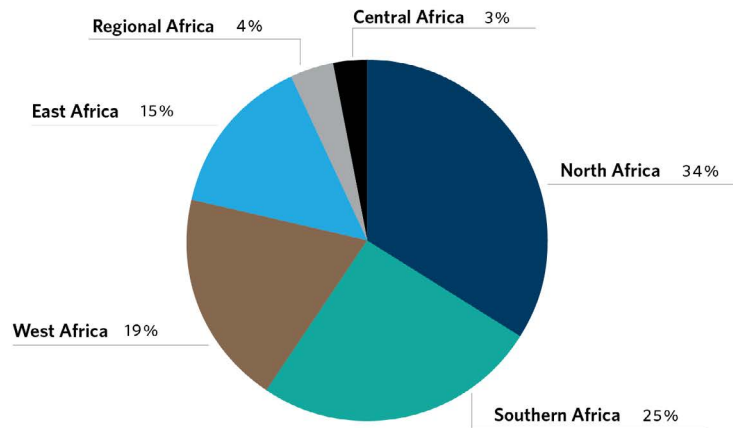
Mozambique has the third highest amount of recoverable gas in Africa, after Nigeria and Algeria. The Rovuma Basin LNG and the Mozambique LNG projects hold 14 percent of the continent's recoverable gas.<sup>28</sup> In 2011 and 2014, the Italian oil and gas company Eni discovered high quantities of gas reserves in the Rovuma Basin's Area 4, a section Eni had acquired as an operator in 2006.<sup>29</sup> The area was split into three sections: Coral South, Mamba, and Agulha. Eni (owning 25 percent), ExxonMobil (25 percent), China National Petroleum Corporation (20 percent), Korea Gas Corporation (10 percent), Galp Energia (10 percent), and state-owned Mozambican Empresa Nacional de Hidrocarbonetos (10 percent) formed a sponsor consortium to develop the gas fields.<sup>30</sup> Eni took charge of the upstream operations, extraction, and production in a portion of the Coral gas field through the Coral South floating liquefied natural gas (FLNG) terminal, while ExxonMobil took charge of the midstream onshore production facilities of the Rovuma Basin. Under Eni's management, the sponsors aimed to extract gas from the Coral gas field within Area 4 to then transform it into LNG through the Coral South FLNG terminal for the purpose of exporting, while the onshore facilities would mainly produce LNG from the Mamba gas field under ExxonMobil's management. The Coral South FLNG project was Africa's first FLNG facility. For this purpose, the companies raised finance through forming a special purpose vehicle that entities could lend to, called the Rovuma LNG S.A.<sup>31</sup> In 2017, ECAs and development banks

from China, Italy, and South Korea contributed a combined \$4.7 billion to the Coral FLNG project through direct loans and guarantees on commercial bank loans.<sup>32</sup> Additional commercial bank finance contributed to the debt finance to add up to \$4.68 billion. In 2021, the U.S. International Development Finance Corporation provided a \$1.5 billion guarantee for the onshore facilities that ExxonMobil was running.<sup>33</sup> This project is currently in operation, and the LNG is planned to be sold to British oil and gas company BP under a twenty-year contract with a ten-year extension clause.<sup>34</sup>

The Mozambique LNG project is in the northern province of Cabo Delgado, where TotalEnergies, a French oil and gas company, discovered high quantities of gas off the coast in 2010.<sup>35</sup> This discovery led to the formation of a sponsor consortium to extract and produce LNG for the purpose of exporting, estimated to contribute \$67.1 billion to Mozambique's GDP by providing exports to mainly Asia and Europe.<sup>36</sup> The consortium consisted of TotalEnergies (26.5 percent); Japan's Mitsui (20 percent); India's ONGC Videsh (16 percent), Bharat Petroleum (10 percent), and Oil India (4 percent); and Thailand's PTT Exploration and Production (8.5 percent). Mozambique's Empresa Nacional de Hidrocarbonetos also holds 15 percent of shares in the project.<sup>37</sup> The project is financed through a combination of \$7.4 billion in equity and at least \$15.8 billion in debt financing commitments, which were finalized in 2019 and 2020 from nineteen commercial bank facilities and several DFIs and ECAs.<sup>38</sup> Loan and guarantee financiers include the Export-Import Bank of the United States, the Japan Bank for International Cooperation, the Japan Organization for Metals and Energy Security, the Export-Import Bank of Korea, Servizi Assicurativi del Commercio Estero, UK Export Finance, Cassa Depositi e Prestiti S.P.A (CDP), the Export-Import Bank of Thailand, Atradius, and the AfDB.<sup>39</sup> South Africa's Export Credit Insurance Corporation, the Industrial Development Corporation, and Development Bank of Southern Africa also provided finance toward the project. In 2021, insurgent attacks from extremist groups affiliated with al-Shabab increased security tensions, and a humanitarian crisis in the Afungi region led TotalEnergies to temporarily withdraw staff from the site and declare force majeure, an inability to fulfill its contract obligations due to unforeseen circumstances. This effectively put the project on hold. Reports in 2023 stated that contractors, such as Saipem, were willing to start the project again in July.<sup>40</sup>

As seen in figure 11, 34 percent of public energy finance commitments (\$66.98 billion) were directed to North Africa. Southern Africa received 25 percent of finance commitments (\$50.32 billion), and West Africa received 19 percent (\$38.02 billion). East Africa received 15 percent (\$28.67 billion), and Central Africa received 3 percent (\$5.65 billion). Notably, finance for regional projects was higher than finance to Central Africa, at 4 percent (\$7.52 billion).

**Figure 11. Share of Public Energy Finance to Africa by Region**

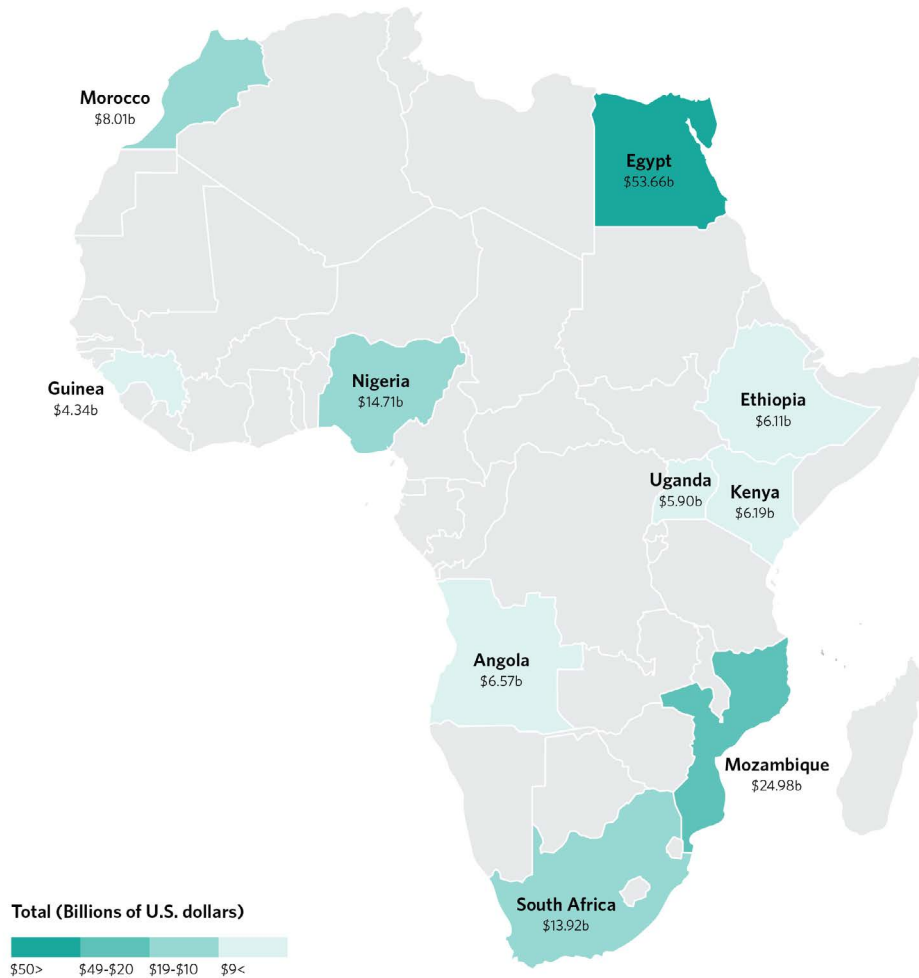


Note: Data are for the 2012-2021 period.

Source: Author's calculations based on the Public Finance for Energy Database and Oil Change International's dataset.

The top ten recipients of public energy finance to Africa received \$144.41 billion (73 percent of total public finance), as seen in figure 12. These countries represented all regions except for Central Africa. They also included some of the largest economies across Africa by GDP and across regions. Egypt received the most finance by more than double the amount of the next top recipient, Mozambique. Even after subtracting the \$25 billion commitment for El Dabaa Nuclear Power Plant, Egypt is still the top African recipient of public finance.

**Figure 12. Top Ten African Recipients of Public Energy Finance**

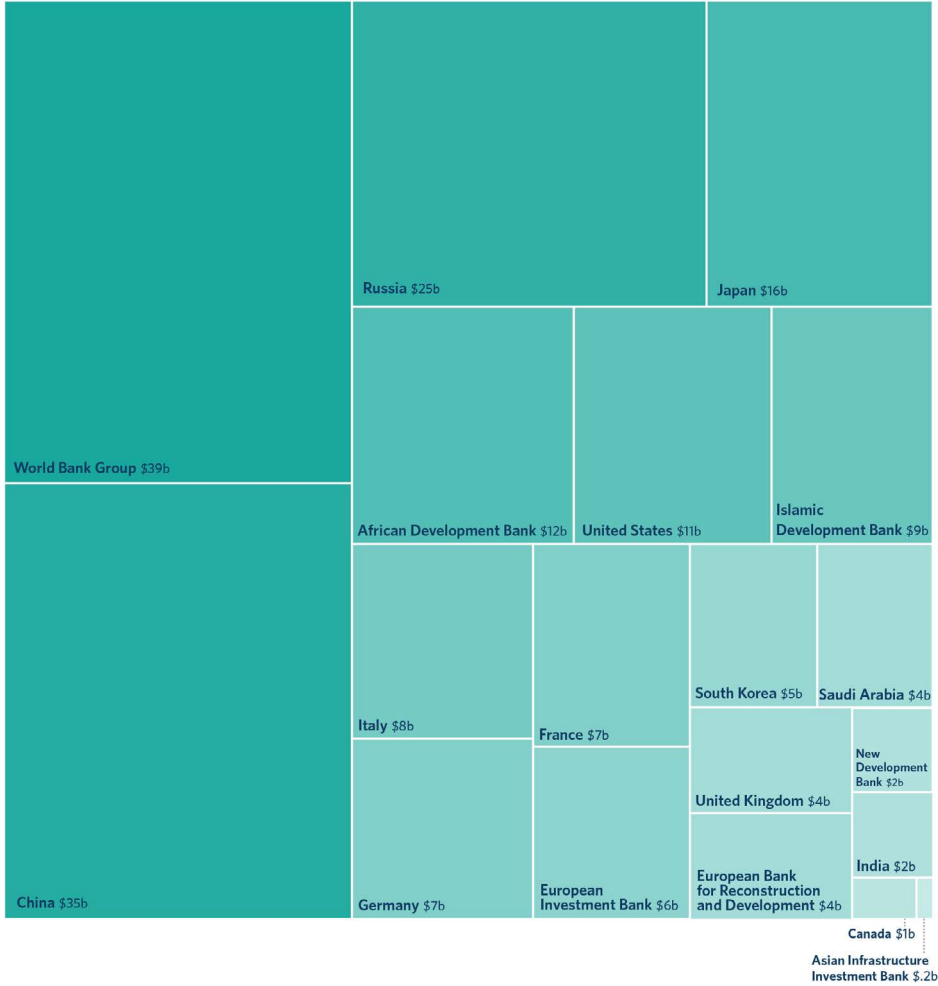


Note: Data are for the 2012-2021 period. The countries represented on the map are the African Union's officially recognized 55 member states.  
 Source: Author's calculations based on the Public Finance for Energy Database and Oil Change International's dataset.

With regards to financier types, global and regional MDBs committed 37 percent of public energy finance to Africa, or \$72.12 billion, and bilateral institutions, including DFIs as defined by the Organisation for Economic Co-operation and Development, committed 32 percent, or \$63.79 billion. ECAs provided 31 percent, or \$61.26 billion.

The World Bank Group committed the most public finance to Africa, at \$39.24 billion (20 percent). Chinese public financing institutions committed \$35.13 billion (18 percent), making China the second highest financier collectively and the country that committed the largest amount. Russia, Japan, and the AfDB committed \$25 billion, \$16.02 billion, and \$12.09 billion, respectively (see figure 13). The United States, the Islamic Development Bank, Italy, Germany, and France were the next five financiers. These top ten financiers provided 86 percent of the public finance to Africa, at \$170.01 billion.

**Figure 13. Top Providers of Public Energy Finance to Africa**



Note: Data are for the 2012-2021 period.  
 Source: Author’s calculations based on the Public Finance for Energy Database and Oil Change International’s dataset.

## Trends in Private Energy Finance to Africa

From 2012 to 2021, corporations based in G20 countries committed an estimated \$148.59 billion in greenfield and brownfield FDI to energy sectors in African countries.

This finance was spread across various energy sources. Mixed fossil fuel projects received the highest amount (\$43.84 billion), followed by gas/LNG (\$41.08 billion), solar (\$25.60 billion), oil (\$14.02 billion), coal (\$9.49 billion), wind (\$8.11 billion), biomass (\$1.93 billion), nuclear (\$1.14 billion), hydropower (\$1.05 billion), and geothermal (\$100 million). Projects without a designated energy source received \$2.21 billion, and those included transmission and distribution lines with mixed or unknown energy sources, batteries, hydrogen, biofuels, and other unclear energy types.

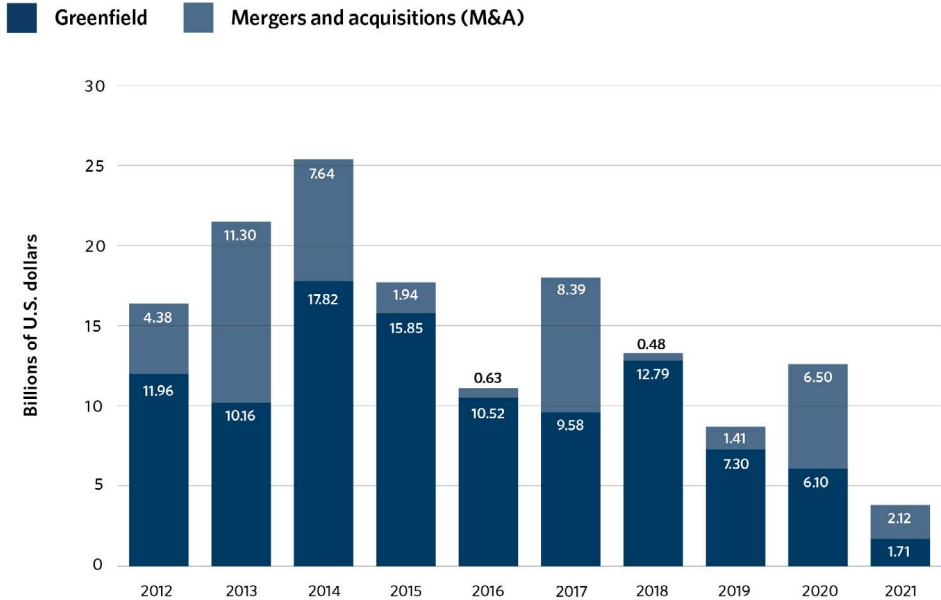
Private energy finance was less varied across multiple energy sources when compared to public energy finance. Fossil fuel projects (mixed fossil fuels, gas/LNG, oil, and coal) received the highest amount in private energy finance commitments, at \$108.44 billion (73 percent). Comparatively, public energy financiers allocated \$83.25 billion, or 42 percent, toward fossil fuel projects. Solar and wind projects received \$33.71 billion (23 percent) of total private energy finance, a higher amount than the \$16.56 billion of public energy finance that went toward renewable projects.

Ten African countries received the bulk of the private finance (81 percent). They were Mozambique, Egypt, Nigeria, Angola, South Africa, Morocco, Ghana, Zimbabwe, Senegal, and Tanzania. Corporations within ten countries provided the bulk of the finance (92 percent). They were France, Italy, the United States, China, the United Kingdom, India, Canada, Japan, Russia, and Germany.

From 2012 to 2021, corporations based in G20 countries committed an estimated \$148.59 billion in greenfield and brownfield M&A FDI to energy sectors in African countries. Greenfield finance in the form of commitments made up 70 percent of private energy finance, while M&A finance in the form of completed deals made up 30 percent. The total amount of private finance was 75 percent of the amount of public finance, and it roughly averaged \$15 billion a year.

As shown in figure 14, private finance to Africa peaked in 2014, at \$25.46 billion, and has shown no consistent trend since. This inconsistency may be due to the cyclical nature of equity finance, where investors often buy, hold, and sell to make profits after a certain number of years.

**Figure 14. Greenfield and M&A Private Energy Finance to Africa, 2012-2021**

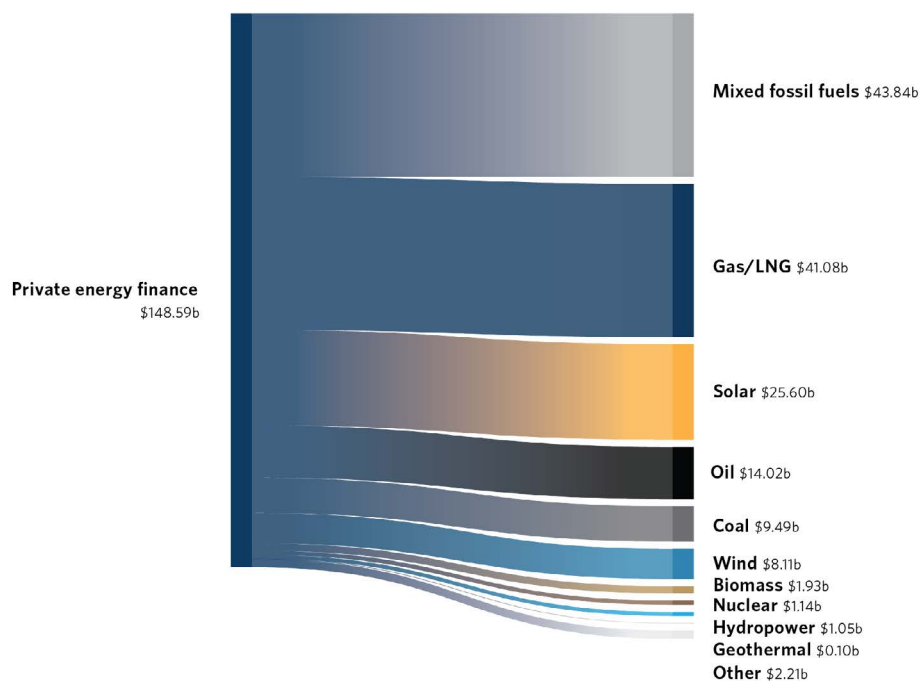


Source: Author’s calculations based on fDi Markets’ database and Dealogic’s M&A dataset.

Finance in 2014 mostly came from large fossil fuel deals: two oil and gas M&A deals in Mozambique by India’s Oil & Natural Gas Corporation totaling \$5.12 billion, a \$1.52 billion M&A oil and gas deal in Angola by the China National Petroleum Corporation, a \$4.8 billion greenfield investment deal from France’s TotalEnergies to an oil project in Angola, and a \$2.01 billion greenfield investment deal from Germany’s RWE to a gas/LNG project in Egypt.<sup>41</sup> Significant commitments were also made to renewable energy deals in 2014: a \$5 billion greenfield investment commitment from Canada’s SkyPower in Nigeria and a \$2 billion commitment from China’s Shanghai Electric in Morocco.<sup>42</sup> Large greenfield and M&A FDI finance commitments to oil and gas projects also explained high investment amounts in 2015 and 2017.

Overall, corporations in G20 countries leaned toward financing fossil fuel projects in Africa (see figure 15). Fossil fuel projects (mixed fossil fuels, gas/LNG, oil, and coal) received the highest amount in private energy finance commitments at \$108.44 billion (73 percent). Comparatively, \$83.25 billion (42 percent) in public energy finance went toward fossil fuels. The commitments of large oil and gas companies that develop and finance projects in Africa explain why private energy finance for fossil fuel projects was relatively higher. Many large corporations tend to be involved in exploration and extraction. Half of private finance was directed to exploration and extraction, while 37 percent was directed to electricity production. From 2015 to 2017, private energy finance for oil and gas/LNG projects remained relatively stable, while finance for coal appeared to have stopped after 2019.

**Figure 15. Private Finance to Africa by Energy Source**



Note: Data are for the 2012-2021 period. The “other” category includes finance for transmission and distribution lines, batteries, hydrogen, biofuels, and other unclear energy types.  
 Source: Author’s calculations based on fDi Markets’ database and Dealogic’s M&A dataset.

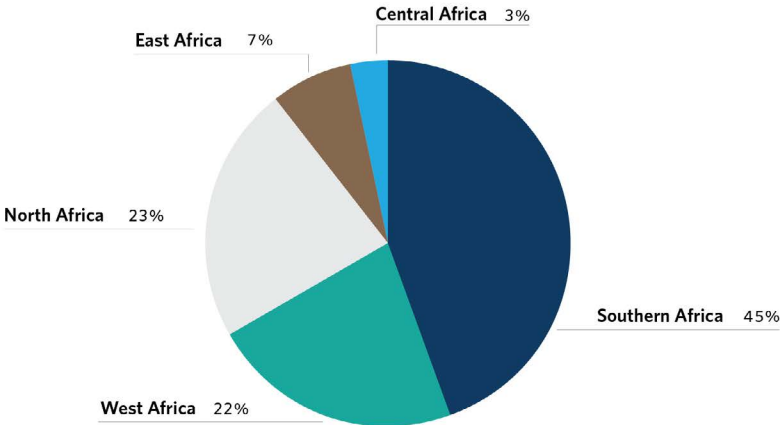


Solar and wind projects received \$33.71 billion (23 percent) of total private energy finance in Africa, a greater amount than the \$16.56 billion in public energy finance for renewables. Notably, finance for wind projects received \$8.11 billion in greenfield FDI, slightly more than the \$7.48 billion in greenfield FDI commitments for coal projects. Greenfield FDI finance for solar and wind expanded in 2019 and 2020 and teetered off in 2021, likely due to the COVID-19 pandemic. Based on these statistics, the value of private energy finance for renewable energy projects was higher than the value of public renewable energy finance in Africa.

Corporations in G20 countries primarily directed energy finance to Southern Africa, which received \$66.09 billion (45 percent). North Africa was the second highest regional recipient, collecting \$33.52 billion (23 percent). Meanwhile, West Africa received \$33.33 billion (23 percent), East Africa received \$11.03 billion (7 percent), and Central Africa received \$4.61 billion (3 percent). This breakdown largely follows the pattern for public finance flows for African subregions, except for Southern Africa’s and North Africa’s rankings (see figures 11 and 16).

Private finance to the top ten African recipients largely drove this regional allocation breakdown, as these top countries received \$119.63 billion, or 81 percent of total finance (see figure 17). Although six of the countries on this list are the same as the top ten recipients of public finance—Mozambique, Egypt, Nigeria, Angola, South Africa, and Morocco—the other four, Ghana, Zimbabwe, Senegal, and Tanzania, only appear on the private finance top recipients list. Mozambique’s place as the top recipient country can be explained by the M&A FDI that poured into the country in 2013 and 2014. This private finance paved the way for public energy finance to support new energy projects (see box 2).

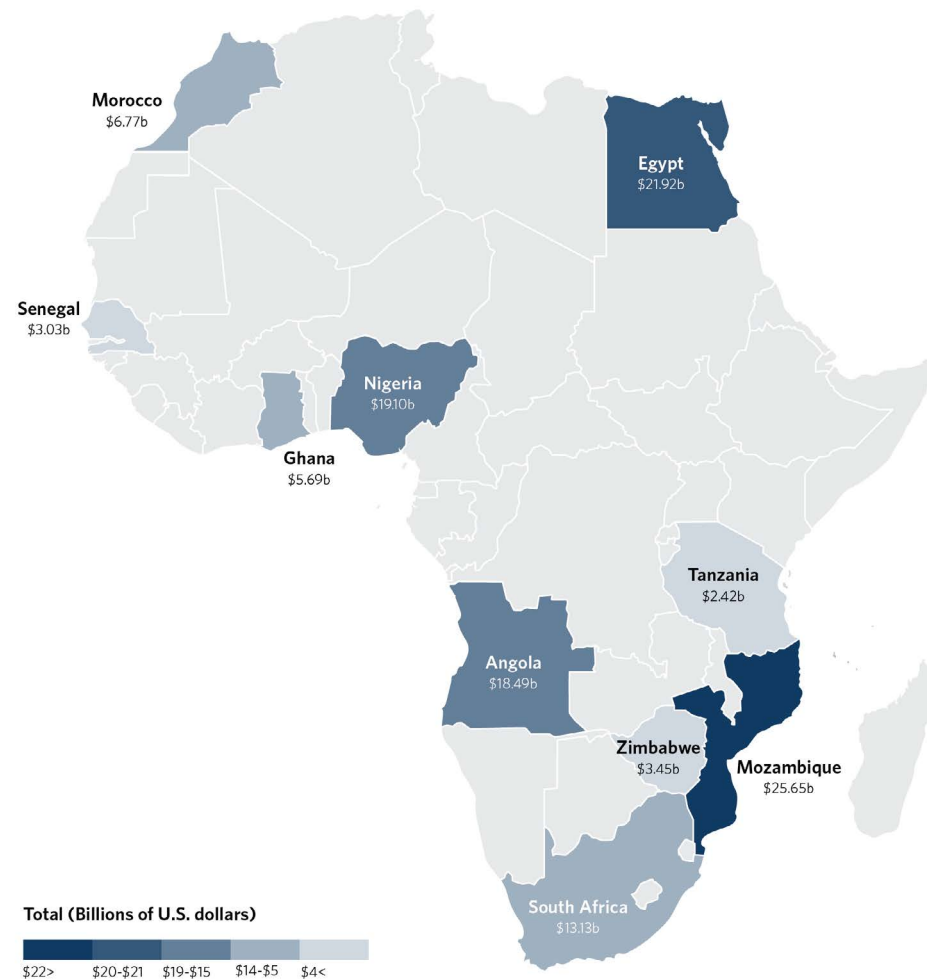
**Figure 16. Share of Private Energy Finance to Africa by Region**



Note: Data are for the 2012-2021 period.  
 Source: Author’s calculations based on fDi Markets’ database and Dealogic’s M&A dataset.

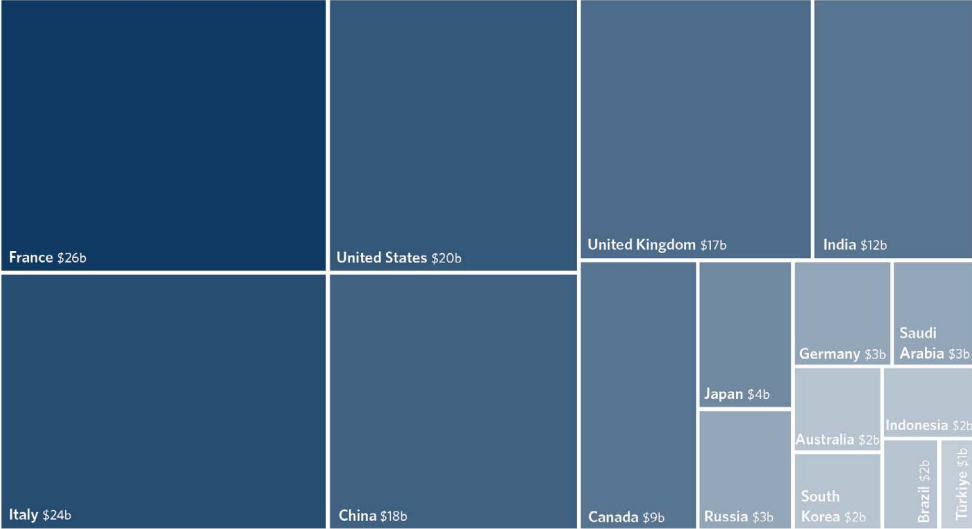
Nigeria, Egypt, South Africa, and Morocco were the top countries with significant private finance commitments for solar and wind projects. South Africa received the most finance for solar, including for projects such as the Redstone solar project supported by Saudi Arabia’s ACWA Power and the Karusa, Soetwater, Oyster, Garob Wind Farms supported by Italy’s Enel Green Power.<sup>43</sup> Such high renewable energy investments were most likely driven by South Africa’s Renewable Independent Power Producer Programme, established in 2011 to attract private-sector investment for renewable energy projects.<sup>44</sup>

**Figure 17. Top Ten African Country Recipients of Private Energy Finance**



Note: Data are for the 2012-2021 period. The countries represented on the map are the African Union’s officially recognized 55 member states.  
 Source: Author’s calculations based on fDi Markets’ database and Dealogic’s M&A dataset.

**Figure 18. Top Providers of Private Energy Finance to Africa**



Note: Data are for the 2012-2021 period.  
 Source: Author’s calculations based on fDi Markets’ database and Dealogic’s M&A dataset.

The top ten countries that provided private finance accounted for \$137.41 billion, or 92 percent, of the total private energy finance. The order of the top ten financing countries was different than that of the public energy finance, as shown in figure 18. Here, China was not the top financier; it was surpassed by France, Italy, and the United States. These countries have large energy corporations that finance and develop projects in their respective energy sectors. Large oil and gas companies, such as Italy’s Eni, France’s TotalEnergies, the United States’ Anadarko, and China National Petroleum Corporation, contributed private finance to oil and gas projects. Companies such as Italy’s Enel Green, China’s Shanghai Electric, France’s EDF Renewables, and the United States’ General Electric contributed private finance for solar and wind projects.

## Conclusion

This paper provides empirical evidence to inform energy finance to Africa based on ten years of data on public and private energy finance. Only data from 2012 to 2021 are assessed due to lack of reliable data from the early 2000s and from 2022 at the time of writing. However, the paper captures crucial dates that impact the amount of finance and energy sources that received finance. The 2012–2021 period includes, for example, the post–global financial

crisis era, the signing of the Paris Agreement in 2015, the announcement of China's Belt and Road Initiative in 2013, and the start of the COVID-19 pandemic in 2020. This period reveals significant trends in energy finance to Africa that could predict where finance could go in the future.

This paper estimates that public financing institutions and corporations in G20 countries, as well as MDBs, committed \$345.76 billion in public and private energy finance to African countries during the period analyzed. Of that total amount, \$197.17 constituted public finance and \$148.59 billion was private finance.

Most of the energy finance went to projects with gas/LNG (24 percent), mixed fossil fuels (17 percent), and solar energy sources (11 percent). However, public finance appeared to reach more diverse energy sector projects when compared to private finance. Fossil fuel projects (mixed fossil fuels, gas/LNG, oil, and coal) received the highest amount in private finance commitments, at \$108.44 billion or 73 percent, compared to \$83.25 billion or 42 percent in public energy finance for fossil fuels. Solar and wind projects received \$33.71 billion, or 23 percent of total private finance, which is higher than the \$16.56 billion or 8 percent in public finance for renewables. Loans made up the majority of public finance, followed by insurance and guarantees, grants, and other types of finance. Greenfield investment also surpassed M&A, making up 70 percent of private finance. During the 2012–2021 period, both private and public finance retrenched from coal projects, while there was a steady flow to gas/LNG and solar projects. These statistics indicate that gas/LNG and solar could be the energy sources in Africa that continue to receive finance in the future.

Considering future trends, this paper shows that effective policy toward Africa must address the uneven distribution of finance. Africa's energy finance gap is \$31.5–\$45 billion annually. Although the paper estimates that external actors provided an average of \$35 billion per year of finance commitments, the data show that the finance was not evenly distributed across Africa. The same ten financing countries and entities directed finance to the same ten recipient countries. China, the World Bank Group, France, Italy, and the United States gave 54 percent of public and private finance, while Egypt, Mozambique, Nigeria, South Africa, and Angola received 61 percent. When financing is only directed to a small pool of countries, the countries that receive less support are unable to close their energy finance gaps.

Policymakers in financing countries could prioritize distribution according to identified demands of historically low recipients of energy finance, diversify financiers by redirecting financing to African regional banks and investors, and use public finance to crowd in private finance to projects with high energy potential. Financing countries could set targets according to annual finance demands, not just project availability. In addition, finance is currently subject to the internal policies of financing countries and external MDBs, all of whom may undermine or ignore the policy priorities of African countries. G20 countries' public financing institutions could direct more financing to regional banks and investors via on-lending or equity investment to ensure financing is subject to the energy goals of African countries. For example, the AfDB, the African Export Import Bank, and the African

Finance Corporation could uphold regional priorities and expertise. Lastly, African countries' energy potential in relation to their energy access must factor into how finance is distributed. Although Africa only uses 0.01 percent of its wind potential and holds 60 percent of the world's solar resources, financing for projects with these energy sources is low. Public finance should provide more support for these sectors and attract private sector investors.

To be sure, finance totals in this paper are estimates based on publicly available information. Future researchers could incorporate commercial bank finance from G20 countries, as well as expand the financier scope to countries beyond the G20. Future years of financing could be assessed to observe whether financing to gas/LNG and solar projects is a stable or increasing trend. Additionally, more research is needed to investigate how the finance for these projects is disbursed and what benefits and consequences they bring to African economies and societies. This paper is a starting point for identifying future trends in energy finance to Africa.



## About the Author

**Oyintarelado (Tarela) Moses** is the data analyst and database manager for the Global China Initiative at the Boston University Global Development Policy Center. Her research covers Chinese loans to Africa, finance for development, and China's Belt and Road Initiative and its alternatives. She previously worked at the Export-Import Bank of the United States and the China Africa Research Initiative. Moses earned a MA in China studies and international economics from Johns Hopkins University School of Advanced International Studies, a certificate in Chinese and American studies from the Hopkins-Nanjing Center, and a BA in political science and Chinese language from Duke University.

### Acknowledgments

This paper was written with the generous support of Climateworks Foundation.





## Glossary

**Development finance institution (DFI):** a government-backed institution that offers loans, guarantees, insurance, and equity to countries for the purpose of development.

**Export credit agency (ECA):** a government-backed institution that offers loans, guarantees, and insurance to help a country facilitate exports.

**Grant:** capital for the purpose of financing a development project or an idea. Grants differ from loans in that they are not required to be repaid.

**Greenfield investment:** capital a company provides to establish a new subsidiary or project. It is also known as equity.

**Guarantee:** an agreement that assures lenders that they will be repaid should a borrower default on a loan. The guarantee-granting entity assumes responsibility for the debt payment up to a certain amount should a borrower not meet its obligations.

**Insurance:** an agreement that assures financiers that they will recover their losses. Insurance is tied to commercial or political risks (for example, breach of contract, currency inconvertibility and transfer issues, expropriation, or war and civil disturbance) impacting an investor's ability to recover profits from their investment.

**Loan:** capital given for the purpose of a project, with the expectation that it will be repaid. Terms of loans, such as interest rates and repayment periods, from public institutions are

more generous or concessional than terms of loans from commercial banks, which tend to have shorter repayment periods and higher interest rates.

**Multilateral development bank (MDB):** an institution established by more than one country that provides financial and technical support to developing countries for the purpose of development.

**Merger and acquisition (M&A):** capital a company provides to purchase or consolidate a share in a project. It is also known as brownfield investment or equity.

**National development bank:** a government-backed institution that provides finance (domestic or overseas) for the development of the domestic economy.

**Public energy finance:** finance for energy projects from government-backed financial institutions such as multilateral development banks.

**Private energy finance:** foreign direct investment in the form of greenfield and brownfield mergers and acquisitions equity from corporations.

# Appendix

## Data Sources and Methodology

This paper analyzes financial data from Oil Change International’s 2022 Public Finance for Energy Database, which tracks international energy finance from government-owned institutions in G20 countries and from multilateral institutions. The paper largely follows similar methodologies and scopes that were used to compile and analyze data in the China’s Global Energy Finance (CGEF) Database, managed by the Boston University Global Development Policy Center. This paper uses the same energy source allocations from the CGEF Database. To analyze public financing and investment data, it pulls from publicly available and purchased datasets. The data in this paper come from aggregated datasets that were assessed and transformed into the appropriate datasets needed for this analysis.

First, entries for African countries were extracted from the “Middle East and Northern African Region” category of the Public Finance for Energy Database. Each entry then received a subregional designation of North Africa, West Africa, East Africa, Central Africa, or Southern Africa, according to the African Union’s regional categories.<sup>45</sup> Each entry was given a calendar year based on when the finance commitment was signed or reached financial close. Then, only the entries with the visible category of “TRUE” in the Public Finance for Energy Database were assessed to ensure that only entries with approved finance were analyzed. To avoid double counting, any overlaps between loan and guarantee finance for the same project were removed to the author’s best ability. The paper also includes additional entries from the Public Finance for Energy Database that were from other public financing institutions (such as the U.S. Trade and Development Agency).

Additionally, this paper analyzes data from the fDi Markets database, a service of the *Financial Times*; Dealogic’s database on M&A deals; and the World Bank’s Private Participation in Infrastructure (PPI) database.<sup>46</sup> FDi Markets tracks greenfield equity investment, and Dealogic

tracks brownfield equity investment. For fDi Markets, all Africa entries within the energy and environmental technology clusters from 2012 to 2021 were extracted. For Dealogic, all Africa entries with energy-related North American Industry Classification System (NAICS) sectors from 2012 to 2021 were extracted. Each entry was given a calendar year based on the commitment year or acquisition completion year columns. Each entry received a subregional designation of North Africa, West Africa, East Africa, Central Africa, or Southern Africa. After compiling this list, nonestimated entries in fDi Markets were checked through an internet search of the project to assess that the capital investment for each entry was in line with the definition of equity investment from the company in the project. If the search showed that the company provided less equity to the project, the new investment amount found in the source was added in a separate column. If the capital investment appeared to be a loan that was provided by public institutions, that loan amount was searched in the public energy database dataset. If that loan was not in the public energy finance dataset, then the loan amount was added to overall public finance data. Finally, additional equity information was added from the World Bank's PPI Database. Entries were checked to make sure any equity finance that overlapped with entries from the other databases were not double counted.

Only entries from 2012 to 2021 in all the datasets were analyzed. Entries were also given new energy source categories based on the databases' assigned energy source or descriptions of the projects to provide comparable analysis of energy source destinations in both private and public energy finance. These energy sources align with the energy categories of the CGEF Database. They include coal, gas/LNG, oil, mixed fossil fuels, hydropower, solar, wind, mixed renewables, biomass, geothermal, and other.

## Data Limitations

While these datasets provide valuable insights into African energy finance, they do have limitations. First, these datasets were assembled using self-reported figures by companies and publicly available information in official documents and aggregator websites such as IJGlobal, a market intelligence dataset focused on project finance and infrastructure finance. The fDi Markets data were put together through news articles, and verification was attempted through publicly available, official, state-backed media and other media sources. Since the data depend primarily on publicly available information, the data are only as good as the level of transparency provided to researchers at the time of assembly. The data could underestimate or overestimate the amount of energy finance from G20 countries and MDBs that goes to Africa. Specifically, private data are not fully comprehensive; they are missing commercial bank data due to the proprietary nature of this data. However, the author assumes that guarantees and insurance may be a proxy for commercial bank data.

Despite these data limitations, these datasets provide sufficient information to begin discussing general trends in external energy finance to Africa. While these limitations emphasize a need for more transparency in international finance, this paper fills a gap in the transparent and systematic analysis on energy trends in Africa. This starting place could be a means for future researchers to build on, using this data to inform future policies of energy finance to African countries.

## Notes

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