

POWER
AFRICA

A U.S. GOVERNMENT-LED PARTNERSHIP



2024

REPORT TO CONGRESS
ON POWER AFRICA'S
ENERGY SOURCE ANALYSIS

under the Department of State, Foreign Operations,
and Related Programs Appropriations Act, 2024





The U.S. Agency for International Development (USAID), in consultation with the U.S. Department of State, submits this report pursuant to Section 7019(e) of the Department of State, Foreign Operations, and Related Programs Appropriations Act, 2024 (Div. F, P.L. 118-47), the accompanying Joint Explanatory Statement, and House Report 118-146, which states:

From the FY 2024 Joint Explanatory Statement:

“Power Africa. Pursuant to subsection (g), the USAID Administrator shall submit the report required under this heading in the House report regarding sources of energy included in paragraph (8) of section (3) of the Electrify Africa Act of 2015 (Public Law 114-121). Such report shall also include detail on support from USAID in fiscal years 2020 through 2023, and planned support in fiscal year 2024, provided through the Power Africa program, disaggregated by source of energy, and detail on program outcomes that are required in order to double access to electricity in sub-Saharan Africa pursuant to the goals of the Power Africa program.”

From H. Report 118-146:

“Not later than 90 days after the date of enactment of this Act, the Committee directs the Administrator of USAID to submit a report to the appropriate congressional committees that provides science-based analysis of large-scale power production currently in use for each of the energy sources cited in paragraph (8) of section 3 in the Electrify Africa Act (Public Law 114–121). The report shall also include the potential benefit each source has for power generation in Africa, including to meet Power Africa’s goal of making 60,000,000 new home and business connections and bringing 30 gigawatts of new power generation in sub-Saharan Africa to financial close by 2030.”



Less than ten years after the signing of the bipartisan *Electrify Africa Act* in 2016, Power Africa continues to make substantial progress in helping the people of Africa realize the benefits of electricity. Since passage of the Act, Power Africa has supported 152 projects to reach financial close, representing 14,252 megawatts (MW) of generation capacity, enough to power more than 28 million households and businesses in sub-Saharan Africa. Of these projects, 104 are now commissioned and producing electricity for more than 16 million households and businesses, with nearly 8,000 MW of utility-scale power.

These achievements are the direct result of Congressional bipartisanship to invest in Africa. As envisioned by former House Foreign Affairs Committee Chairman Ed Royce (R-CA), to address Africa's massive energy shortages, Power Africa must embrace "an all-of-the-above energy strategy that allows African countries to develop energy sources that will work best for them." Chairman Royce also said the high cost of energy makes producing goods for export almost impossible, and that it is in the United States' interest to help Africa become one of the world's great trading partners. Representative Brendan Boyle (D-PA) agreed, stating, "Mr. Speaker, sometimes the right thing to do is also in our strategic interest as a country."¹

In the *FY 2024 State, Foreign Operations and Related Programs Act*, Congress called upon the USAID Administrator to report on the extent to which Power Africa continues to support an "all-of-the-above" energy strategy. As stated in the *Electrify Africa Act*, it is the policy of the United States to "promote an all-of-the-above energy development strategy for sub-Saharan Africa that includes the use of oil, natural gas, coal, hydroelectric, wind, solar, and geothermal power, and other sources of energy."² This report presents the metrics that capture how Power Africa has supported this strategy and continues to achieve the objectives of the *Electrify Africa Act* and serve African nations and their citizens.

¹ Voice of America, "Congress Passes 'Electrify Africa Act' to Help Millions Get Access to Power"

² *Electrify Africa Act* 2015

104

Online projects

8,000

Megawatts added

16MIL

Households and
businesses powered

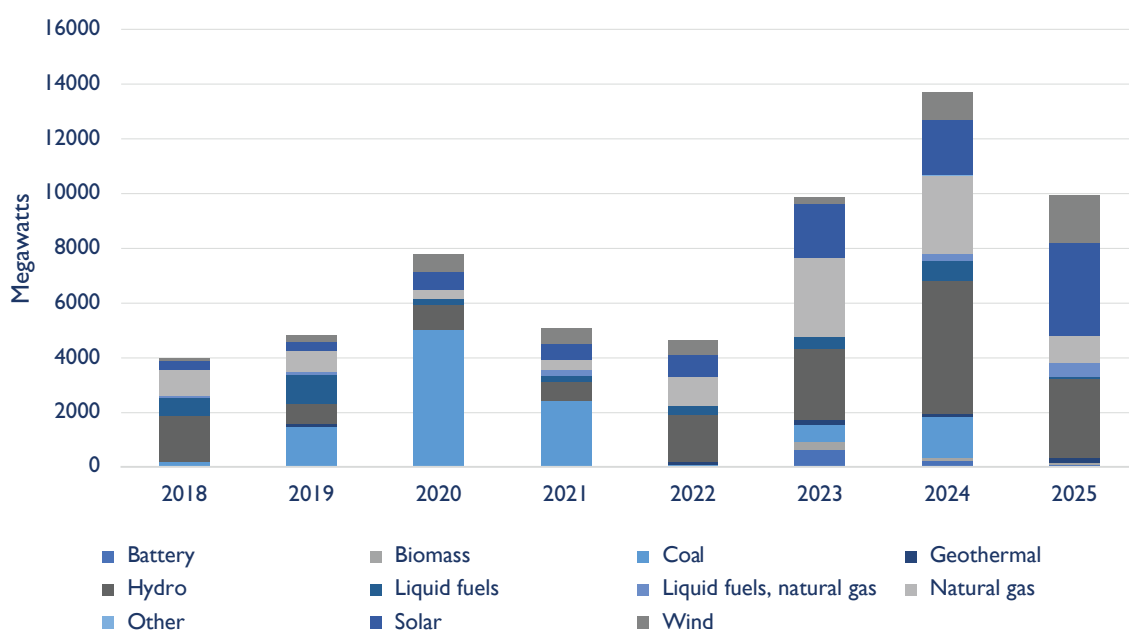
This report contains three sections:

- **Section 1: Energy Use in sub-Saharan Africa** -- An overview and analysis of energy sources utilized in sub-Saharan Africa by region;
- **Section 2: Power Africa's "All-of-the-Above" Approach** -- Details on the extent to which Power Africa has supported various sources of energy between FY 2020 - FY 2023, as requested, as well as Power Africa-supported projects expected to reach financial close in FY 2024;
- **Section 3: Power Africa's Development Impact** -- A summary of Power Africa's impact on the sub-continent.

ENERGY USE IN SUB-SAHARAN AFRICA

POWER AFRICA PROJECTS THAT REACHED COMMISSIONING

Figure I. Sub-Saharan Africa Capacity Additions + Pipeline.



Source: [Africa Energy Database](#) ⁴

Figure I depicts all sub-Saharan African energy projects that have been or will be commissioned, starting in 2018 (including those that Power Africa has not been involved with). ³

The 2024 and 2025 data reflect projects with anticipated commissioning dates that have been publicly announced. This chart shows a mix of energy sources, including significant additions from solar, hydroelectric, natural gas, and coal, although coal

projects are decreasing, and renewables and natural gas are increasing in the last three years. There is also a significant decrease in overall added capacity for the 2021 - 2022 period mostly due to the COVID-19 pandemic and subsequent supply chain slowdowns, increasing debt distress, and political instability. There has been a renewed commitment to increasing capacity beginning in 2023.

³ This chart includes all energy projects commissioned on the sub-continent inclusive of both Power Africa and non-Power Africa projects

⁴ The Africa Energy database is an independent, third-party data source, established in 1998, under contract to the Financial Times

CENTRAL AFRICA INSTALLED CAPACITY

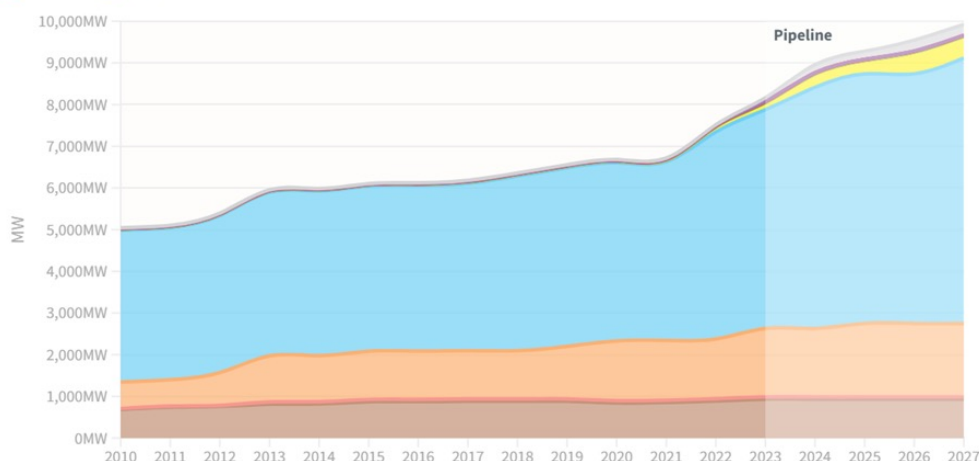
Figure 2 illustrates the total installed electricity generating capacity in Central Africa.⁵

As the chart indicates, total installed capacity is expected to reach 9,900 MW by 2027, up from 7,500 MW at the end of 2022 (a 24 percent increase).

Central Africa installed capacity by fuel, 2010-2027

2.4GW of power is expected online by 2027

Liquid fuels Liquid fuels, natural gas Natural gas Hydro Solar Wind Biomass
Battery Cogeneration Other



Source: [Africa Energy Database](#)

While hydroelectric power is clearly the main generation source, at 43 percent of the energy mix (or 4,300 MW), and will be continuing to grow, the current pipeline also suggests that gas, as well as clean energy sources, will contribute to the growth. For example, solar capacity is expected to increase from 122 MW at the end of 2022 to 520 MW by 2027, as new generating plants across the region become fully operational.

The current pipeline also suggests that gas, as well as clean energy sources, will contribute to the growth.

⁵ The Central Africa region includes Chad, Central African Republic, Cameroon, Equatorial Guinea, Sao Tome & Principe, Gabon, Republic of Congo, and Democratic Republic of Congo.

WEST AFRICA INSTALLED CAPACITY

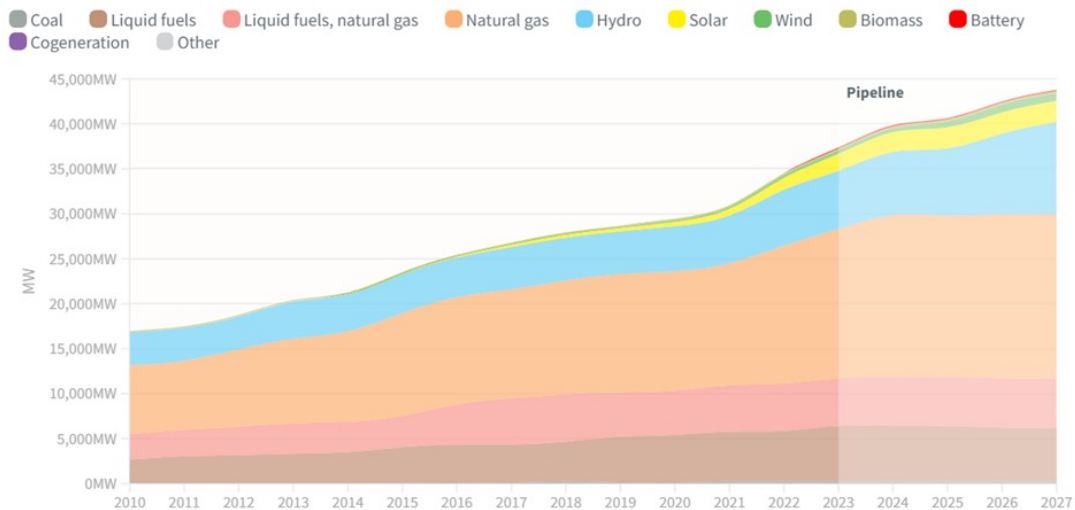
Figure 3 illustrates the total installed electricity generating capacity for West Africa.⁶

As the chart indicates, total installed capacity is expected to reach 43,000 MW by 2027, up from 31,000 MW at the end of 2021 (a 28 percent increase).

Projects with published commissioning dates in this period are expected to add another 9,200 MW of capacity, 3,500 MW of which will be fueled by natural gas or liquid fuels. The current pipeline suggests that at least 1,000 MW of solar and 510 MW of wind are planned to be added to the energy mix.

West Africa installed capacity by fuel, 2010-2027

9.2GW of power is expected online by 2027



Source: [Africa Energy Database](#)

Many of these capacity additions are planned for Nigeria, where power supply is sporadic and the grid is inadequate. Adding capacity will only be feasible if Nigeria can sell its electricity. For this to happen, the country's limited transmission

and distribution network must be improved. Between 2022 and 2023, Nigeria experienced more than half a dozen grid surges, some of which caused country-wide outages.

⁶ The West Africa region includes Mauritania, Mali, Burkina Faso, Niger, Cabo Verde, Senegal, The Gambia, Guinea-Bissau, Guinea, Sierra Leone, Liberia, Côte d'Ivoire, Ghana, Togo, Benin, and Nigeria.

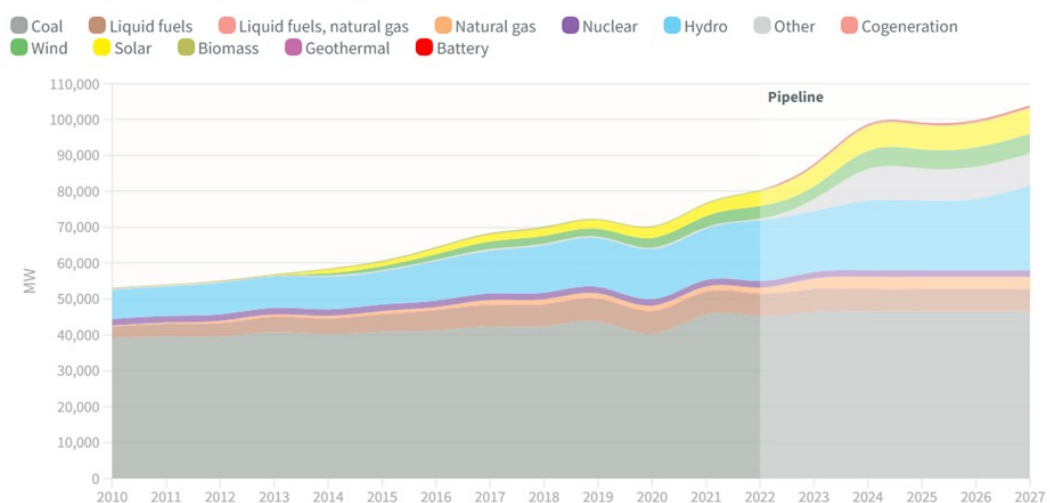
SOUTHERN AFRICA INSTALLED CAPACITY

Figure 4 shows the installed capacity in Southern Africa.⁷

As the chart indicates, total installed capacity is expected to increase to 100,200 MW by 2027, a 30 percent increase over the 2021 installed capacity of 76,800 MW. A majority of the region's current capacity is located in South Africa (59,700 MW, or 78 percent of the region's capacity). Likewise, more than half, or 12,700 MW, of the added capacity will operate in South Africa.

Southern Africa installed capacity by fuel, 2010-2027

23.4GW of power is expected online by 2027



Source: [Africa Energy Database](#)

As evidenced in the figure, coal dominates the region, with 45,000 MW of installed capacity at the end of 2021. Solar and wind power stood at 3,300 MW and 3,000 MW, respectively, at the end of 2021 after receiving substantial public

support, particularly in South Africa. Excluding South Africa, hydroelectric power has the highest installed capacity across the region at 10,600 MW.

⁷ Southern Africa region includes Angola, Namibia, Botswana, Zambia, Zimbabwe, Malawi, Mozambique, Eswatini, Lesotho, and South Africa.

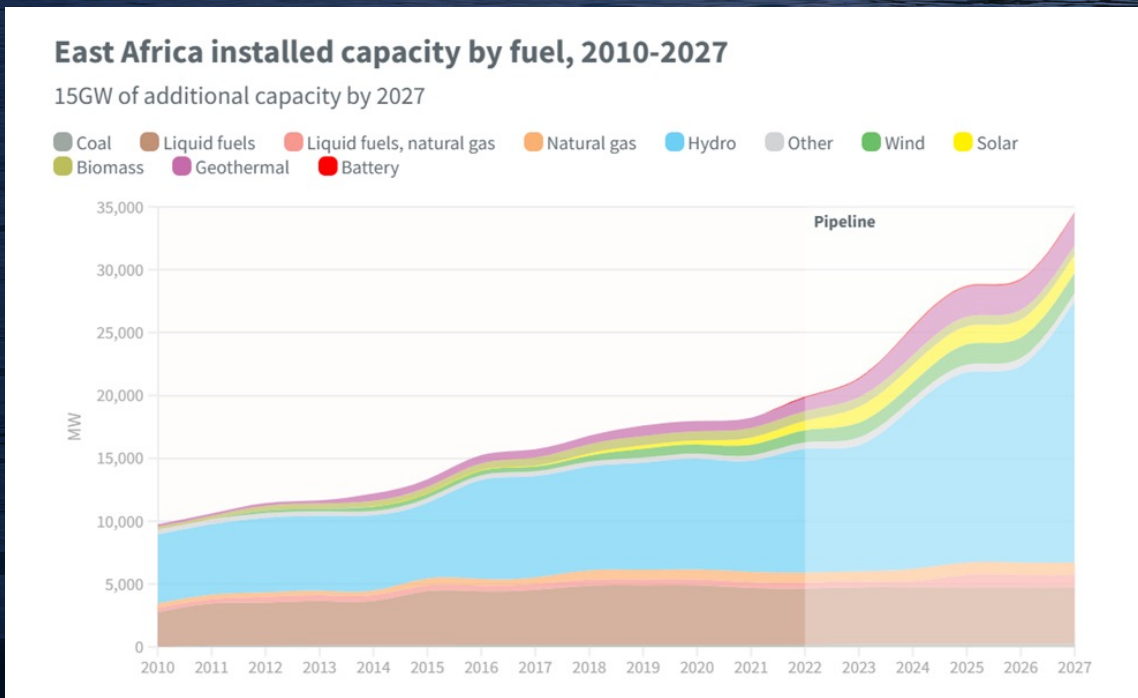
EAST AFRICA INSTALLED CAPACITY

Figure 5 illustrates the installed capacity in East Africa.⁸

As the chart indicates, total installed capacity is expected to increase to 34,500 MW by 2027, up from 19,800 MW at the end of 2022 (a 43 percent increase). This increase is mostly driven by hydroelectric, solar, wind, and geothermal sources. About 8,700 MW of hydroelectric power is expected to be commissioned by 2027. Two of the three mega-hydroelectric schemes, the 5,150 MW Grand Ethiopian Renaissance Dam and the 2,200 MW Gilgel Gibe IV (Koysha) projects, are in Ethiopia. Both are anticipated to be fully operational in 2027 and 2024, respectively.

The current pipeline suggests that non-hydroelectric, grid-connected energy will add up to 2,750 MW of installed capacity across East Africa between 2023

and 2027, with geothermal energy adding just over 1,400 MW; wind, 671 MW; and solar, 667 MW.



Source: [Africa Energy Database](#)

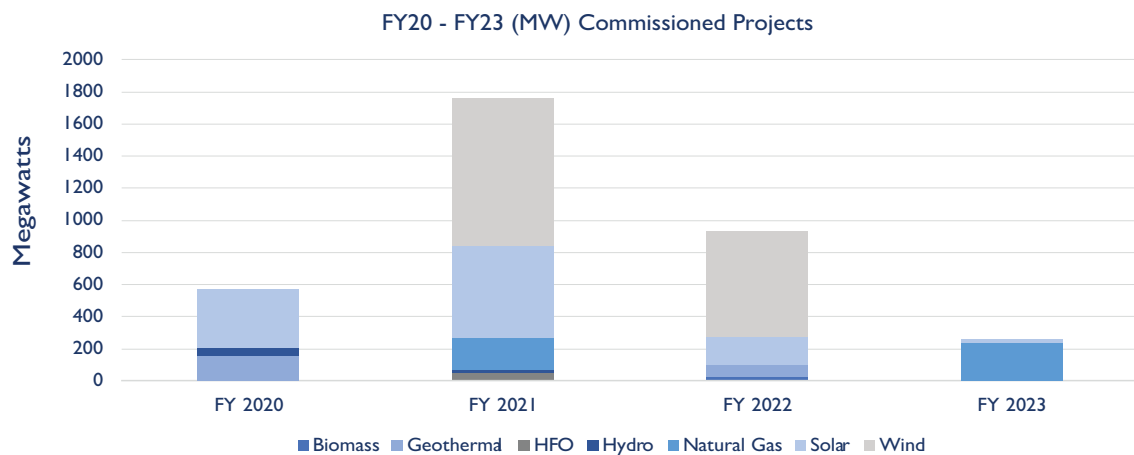
⁸ The East Africa region includes Sudan, South Sudan, Eritrea, Ethiopia, Djibouti, Somalia, Uganda, Rwanda, Burundi, Kenya, Tanzania, Seychelles, Comoros, Mauritius, and Madagascar.



POWER AFRICA'S "ALL-OF-THE-ABOVE" APPROACH

POWER AFRICA PROJECTS THAT REACHED COMMISSIONING

Figure 6. Projects That Were Commissioned.



Source: PATT

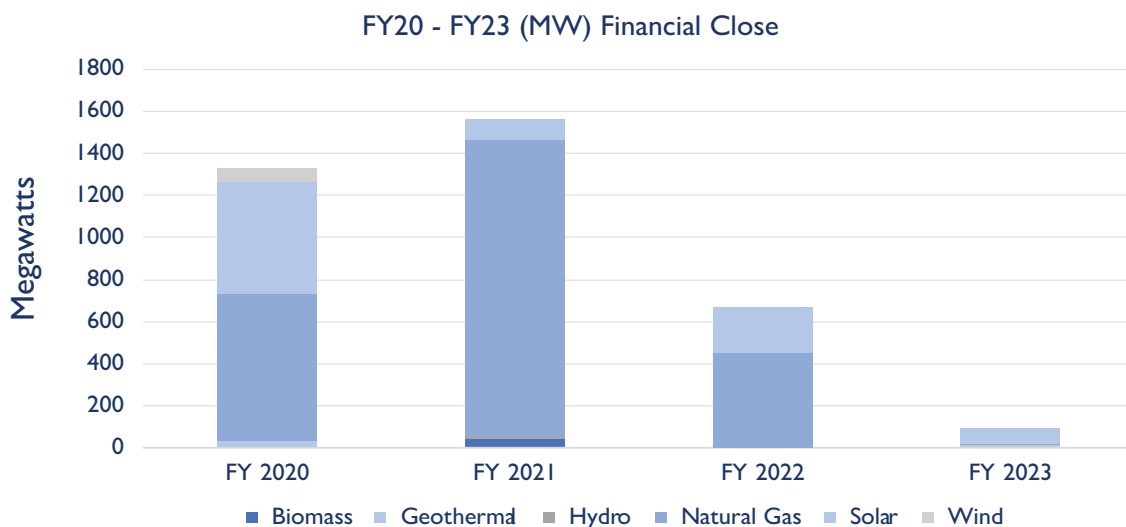
Commissioned projects are those that are fully constructed, operating, and delivering electricity to customers. Projects are usually commissioned from two to five years after financial close, depending on the energy source. Figure 6 depicts Power Africa-supported projects that were commissioned during the period covered by this report. Power Africa focuses on helping projects reach financial close, as that milestone is the hardest to achieve. While the projects depicted in the figure were recently

commissioned, Power Africa's support started in prior years, dating back as far as 2014. Power Africa continues to track supported projects through the commissioning process. This chart also shows a mix of energy sources, the largest portion of which is wind power. Most of these wind projects were commissioned in South Africa, providing more than 1,000 MW of power.

Power Africa continues to track supported projects through the commissioning process.

POWER AFRICA PROJECTS THAT REACHED FINANCIAL CLOSE

Figure 7. Projects That Reached Financial Close.



Source: PATT

A project reaches financial close when all documents are signed, and legal conditions are met to allow the transfer of funds from lender to borrower. After financial close, construction can begin. Figure 7 shows the Power Africa-supported energy projects that reached financial close between FY 2020 and 2023. The figure clearly shows that a majority of financial close MW is from natural gas. This is mostly due to Power Africa’s largest-to-date supported transaction: the 987 MW Afam project in Nigeria, which achieved financial close in FY 2021. Once fully commissioned, Afam will power nearly two million households and businesses.

The figure also shows a significant drop in natural gas projects since FY 2021, which, as mentioned

previously, mirrors the major drop in generation capacity additions across the sub-continent, mostly due to the COVID-19 pandemic and flow-down effects.⁹ As of 2024, Power Africa has launched new, follow-on Energy Programs covering East, Central, and Southern Africa, as their predecessor awards ended between 2023-24. By the end of FY 2024, the West Africa and Nigeria Energy Program awardees are anticipated to be in place, as well. These additions are expected to generate a significant ramp-up of Power Africa-supported projects that reach financial close between 2024 and 2030.

⁹ Power Africa expects FY 2023 data to increase as there is a data lag due to required confirmation of IP attribution documents, including quarterly reporting. In addition, predecessor regional awards came to an end between 2023-24.

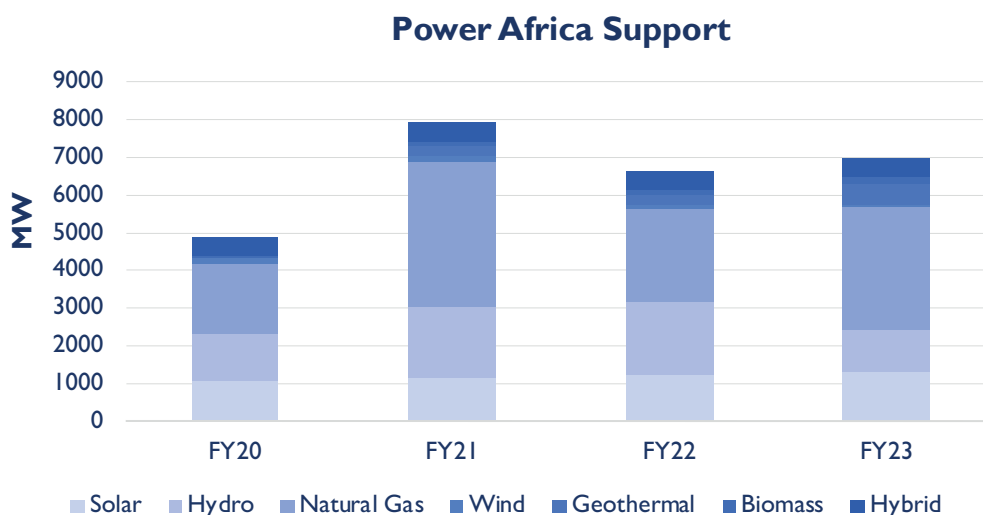
GENERATION CAPACITY SUPPORTED BY POWER AFRICA

Power Africa’s goals include supporting the financial close of 30,000 MW of generating capacity by 2030. As of December 2023, Power Africa has supported 152 projects to reach financial close, for a total generation capacity of 14,252 MW. The energy mix for these projects is a near equal split between renewable (e.g., wind, solar, hydro) and conventional (fossil fuel) sources. Of the 152 projects that reached financial close, 104 are commissioned and have added 7,917 MW of utility-scale power.

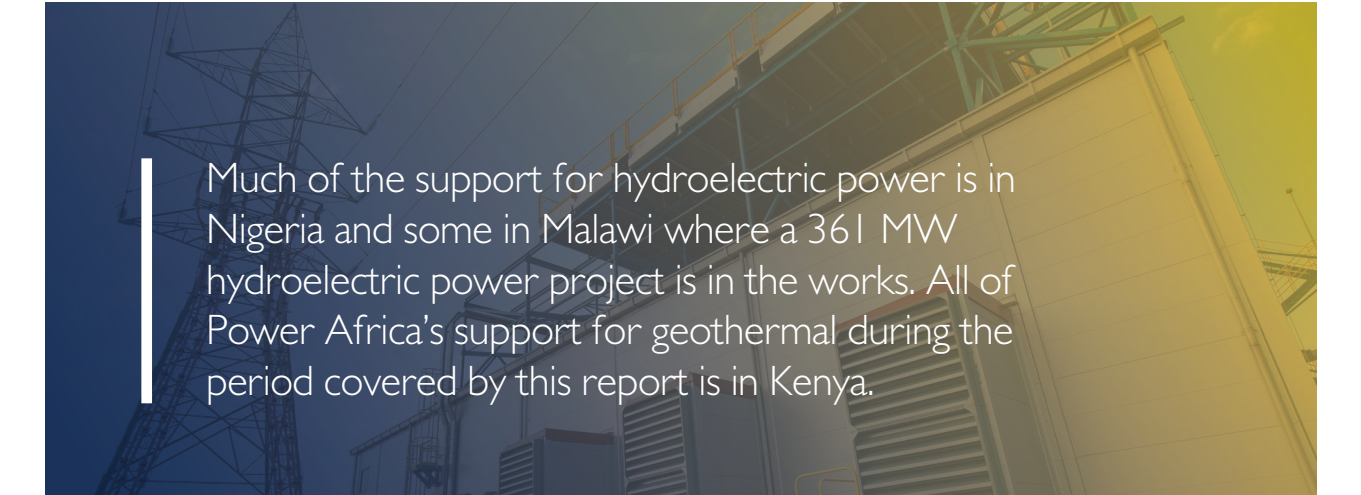
Of the 104 commissioned projects, 62 percent (or 4,925 MW) are from renewable energy sources.

From FY 2020 to 2023, Power Africa funded four awards that supported regional energy projects across sub-Saharan Africa: Nigeria Power Sector Program, East Africa Energy Program, West Africa Energy Program, and Southern Africa Energy Program. As part of performance monitoring, each project awardee (or implementing partner) uploaded the respective transactions to the Power Africa Tracking Tool (PATT), which is reviewed quarterly by Power Africa staff. Figure 8 shows the amount of continued support, by MW per year, that Power Africa has provided.

Figure 8. Generation Capacity Supported by Power Africa.



Source: PATT



Much of the support for hydroelectric power is in Nigeria and some in Malawi where a 361 MW hydroelectric power project is in the works. All of Power Africa's support for geothermal during the period covered by this report is in Kenya.

This chart shows how Power Africa support remains all-of-the-above, including significant support for natural gas, solar, hydroelectric, and increasingly geothermal. Support for solar power is more prevalent in Southern, Eastern, and Central Africa, mostly in the countries of Malawi, South Africa, Botswana, Democratic Republic of The Congo, Somalia, Kenya, and Tanzania. Support for natural gas is highest in West Africa, especially in Senegal, Côte d'Ivoire, and Nigeria, reflecting more than 4,000 MW of generating capacity. Much of the support for hydroelectric power is in Nigeria and some in Malawi where a 361 MW hydroelectric power project is in the works. All of Power Africa's support for geothermal during the period covered by this report is in Kenya.

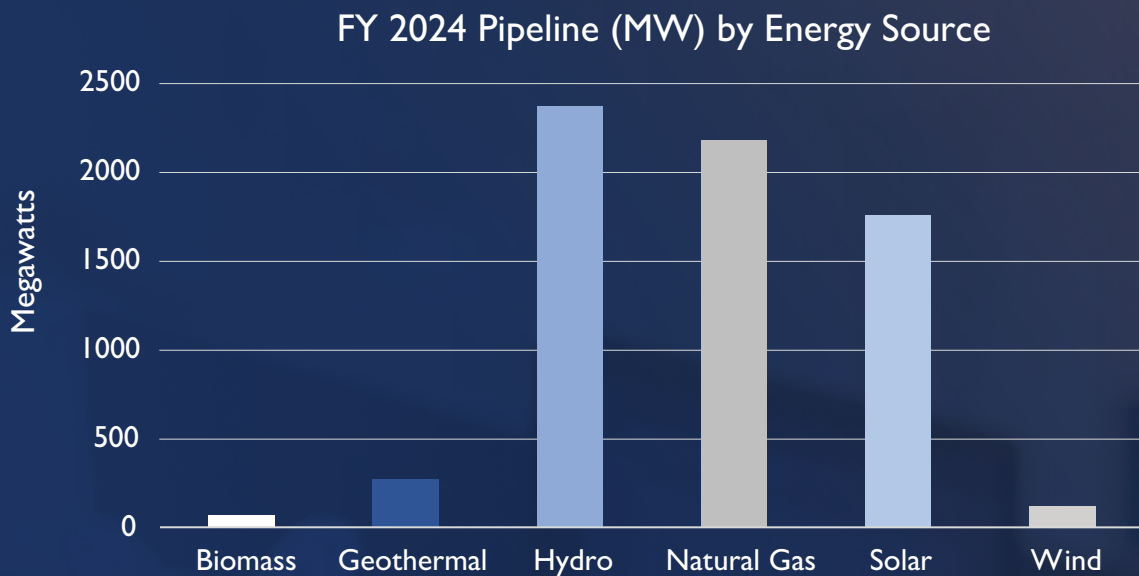
Power Africa employs a transaction-centered approach to accelerate financial close. Support includes facilitating the project's bankability with financing and risk mitigation and providing technical and transactional support that ensures the project is planned and negotiated with best practices and development considerations. Specifically, Power Africa, directly with its funding, supports feasibility studies, due diligence reports, and environmental and sustainability assessments; connects developers with bankers; and conducts regulatory reviews and financial modeling. Power Africa also provides support directly to governments, including through co-located advisors, and collaborates on the preparation and review of procurements that are more open and transparent. It is critical to note that Power Africa's expanded partnership includes other US government agencies,

development partners and private sector who are actively working in this space and who are benefitting from our coordination, information sharing and advocacy, but who are not necessarily receiving direct support under one of Power Africa's projects. These efforts are not reflected in this report but are essential to Power Africa achieving the aspirational goals of the initiative, which goals were purposely set with broad partnership collaboration in mind.

Power Africa's all-of-the-above approach inherently means that it does not target specific sources of energy, nor does it attempt to equally support each type of energy source. Power Africa is responsive to private-sector, market, and African partner government demand. Power Africa actively engages with private-sector entities as they progress toward financial close and only engages when the private sector is in need of support. Further, Power Africa support also responds to country-level energy planning and least-cost principles, both of which are critical to long-term sector sustainability.

POWER AFRICA PROJECTS FY 2024 PIPELINE

Figure 9. Power Africa Projects in the Pipeline.



Source: PATT

Figure 9 shows the Power Africa-supported projects that are expected to reach financial close in FY 2024, the majority of which are hydroelectric, natural gas, and solar projects. The hydroelectric projects include three 100+ MW investments in Malawi, Angola, and Madagascar. The natural gas projects are in Nigeria (1,261 MW), Senegal (655 MW), Gabon (227 MW),

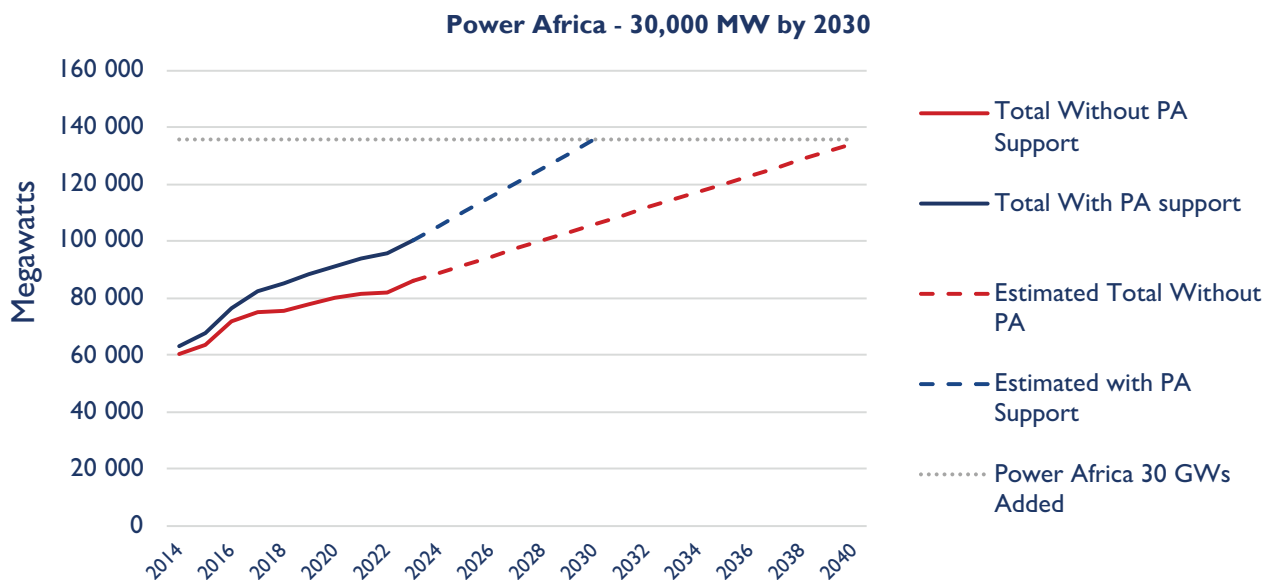
Sierra Leone (104 MW), and Benin (50 MW). The solar projects reflect more than 25 projects across sub-Saharan Africa, mostly in the 10-50 MW range, with four 100+ MW projects in Nigeria, South Africa, Botswana, and Mauritania.

Figure 9 shows the Power Africa-supported projects that are expected to reach financial close in FY 2024.



POWER AFRICA'S DEVELOPMENT IMPACT

Figure 10. Power Africa - 30,000 MW by 2030.



Source: [Africa Energy Database](#) + PATT

As shown in the previous chart, Power Africa has identified nearly 7,000 MW of projects expected to reach financial close by 2024. These additions alone will have a large impact in the region, powering as many as 14 million households and businesses. This increase in energy supply reflects a growing interest in investing in Africa, along with increased support from various stakeholders, including Congress. Figure 10 represents the total installed capacity in sub-Saharan Africa without Power Africa support (solid red line), and the total installed capacity with Power Africa support (solid blue line).

The dotted line extensions show future year data, based on the pipeline and current trends. The dotted blue line reflects projected results achieved as Power Africa reaches 30,000 MW by 2030. This chart indicates that without Power Africa's interventions it would take an additional eight years for the sub-continent to reach a similar amount of installed capacity.

Power Africa has identified nearly 7,000 MW of projects expected to reach financial close by 2024.

A utility worker wearing a red jacket, yellow hard hat, and red gloves is working on a power line tower. The worker is looking up at the power lines. The background is a clear blue sky. The image is framed by a dark blue border.

A few miles away, a Power Africa-supported, 83 MW geothermal plant is generating power, supplying energy to homes and businesses.

These results are possible because of Power Africa's partnership model. Power Africa brings together the power of the U.S. government, private-sector companies, international development agencies, African governments, and financial institutions to increase power generation and overcome barriers to electricity access. This public-private partnership model connects investors and entrepreneurs and expands market opportunities through technology, policy, financial, and social solutions that improve lives and drive economic growth. As envisioned by the *Electrify Africa Act*, Power Africa could only achieve these results with an all-of-the-above energy policy that allows flexible, market-driven, and locally responsive implementation.

It might be abstract to measure the impact Power Africa has on African communities, so sometimes it helps to visualize what the impact looks like on the ground. Envision a health clinic in a remote village in a sub-Saharan African country where a pregnant woman in labor heads to the nearby clinic for her delivery. A few miles away, a Power Africa-supported geothermal plant is generating power, supplying energy to homes and businesses in the region. The transmission and distribution lines

travel along the hills and local roads, making their way to an electrical wire that connects to the clinic, delivering power to an outlet on a clinic wall. A nurse plugs in the sterilizer, turns on the fetal monitor, adjusts the overhead light, and the doctor begins the exam. Hours into the night, a healthy newborn baby is born.

This is what a megawatt can mean. Beyond the development planning, partnerships, investment, construction, and commissioning, electrifying Africa with U.S. resources means a rural clinic can be fully operational at night, have properly sterilized equipment and functioning monitors, allow health care workers to attend to their patients more easily, and, most importantly, it means the chances of a healthy baby being born are dramatically improved. Or, as one member of Congress aptly said, "Sometimes the right thing to do is also in our strategic interest."

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