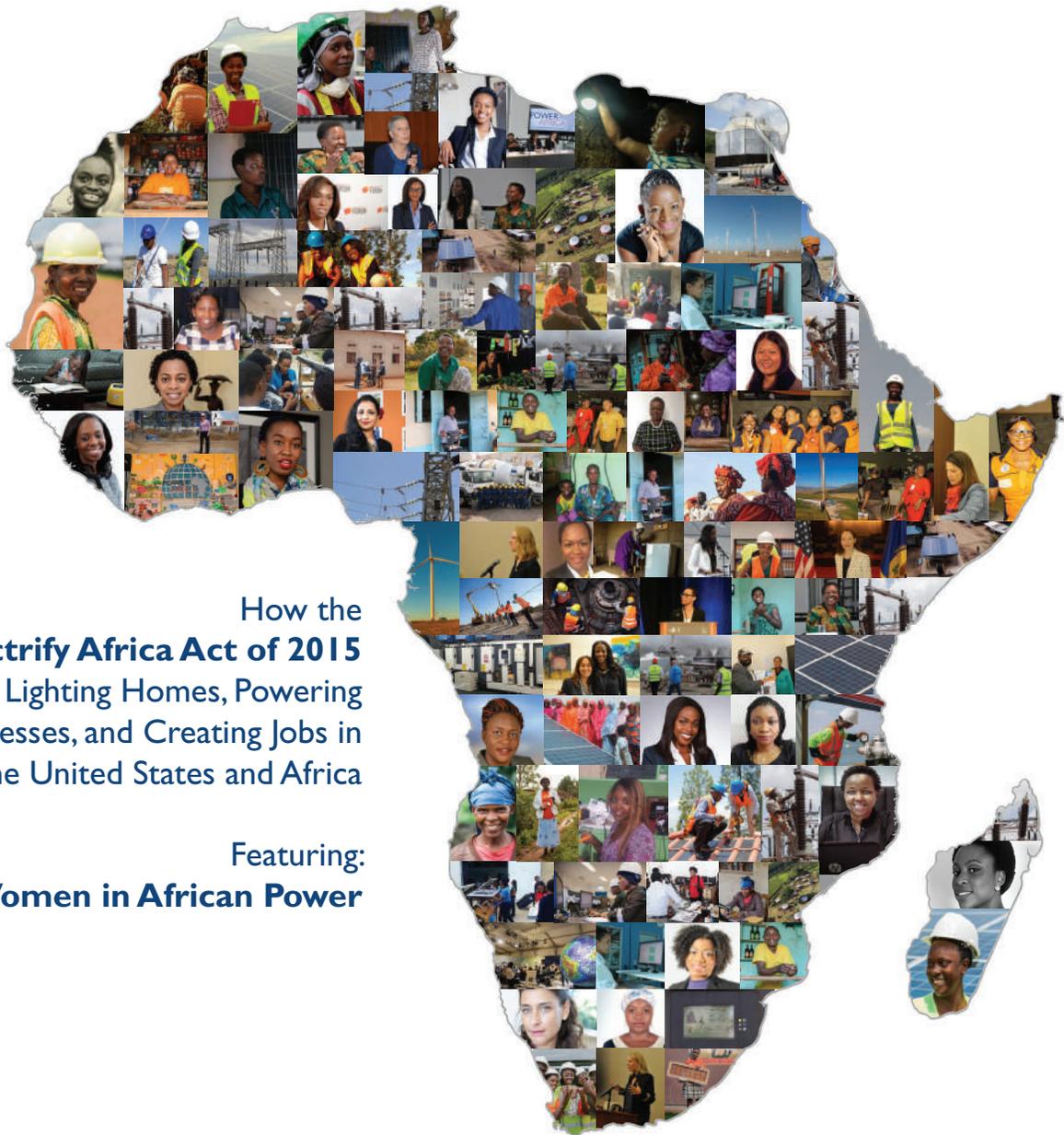


# ANNUAL REPORT AUGUST 2017



How the  
**Electrify Africa Act of 2015**  
is Lighting Homes, Powering  
Businesses, and Creating Jobs in  
the United States and Africa

Featuring:  
**Women in African Power**

Power Africa has facilitated the financial close of power transactions expected to generate more than **7,200 MW**, and supported private-sector companies and utilities in connecting a total of **10.6 million homes and businesses.**

Power Africa is delivering results for American firms. Applying U.S. Government resources in support of U.S. business growth in Africa, Power Africa has a hand in developing multi-million and billion dollar projects that are **producing returns** for U.S. investors and **supporting job growth** at home.

80 Power Africa transactions valued at more than **\$14.5 billion** are now either online, under construction, or have reached financial close, and 26 of these deals currently involve the U.S. private sector.

Power Africa transactions and other U.S. Government-supported energy-sector projects in sub-Saharan Africa that are at or near completion are projected to include more than **\$500 million** in U.S. exports.

Power Africa's pipeline includes more than **100 additional transactions** and projects involving the U.S. private sector that are projected to support approximately **\$7 billion in export opportunities.**

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## Message from the Administrator of the United States Agency for International Development (USAID)



Power Africa has great potential to transform the continent, while also creating new and expanded opportunities for U.S. companies. As I have said before, the purpose for foreign assistance should be ending its need to exist. The progress that Power Africa is making shows that this is possible. Its efforts and American leadership have resulted in significant international momentum towards tackling Africa's energy crisis. Power Africa is now among the largest public-private partnerships for development in history, having mobilized more than \$54 billion in commitments towards achieving its goals. Its projects are sustainably providing rural communities with affordable electricity. Power Africa is also creating incentives for Partner governments to adopt market-based energy policies and transparent and accountable regulatory regimes. All of this means that there are children who are able to study at night for the first time, farmers who are

irrigating their fields with greater ease, and doctors who now know that they have reliable access to all of their equipment, not just some of it. Each day, Power Africa's efforts provide an important hand up, and allow more people to craft their bright futures. I'm confident that its success will continue, and I am eager to see what we will accomplish in the next year.

A handwritten signature in black ink, appearing to read 'Mark Green'.

Mark Green,  
Administrator of USAID

## Letter from the United States Coordinator for Power Africa



Electricity is the cornerstone of economic development. In this *Annual Report*, we see how Power Africa is advancing the goals of the Electrify Africa Act of 2015 to catalyze small businesses, power industry, and bring electricity to millions of people for the first time, while leveraging expertise and financing of U.S. businesses. Expanding electricity access in Africa is a win-win proposition that creates economic opportunity on both sides of the Atlantic. In advancing Power Africa's goals, we will drive billions of dollars of growth in U.S. exports, and support thousands of American jobs through 2030.

Over the next year, Power Africa will work with more than 100 U.S. companies, our African partners, other donors, and the private sector to harness the technology, ingenuity, and political will to bring the benefits of modern energy to even the remotest African village and promote economic growth across the African continent. Our intent is to expand beyond our initial focus on solar lanterns and renewable energy to support more on-grid power projects in natural gas and other sources, as our funding allows.

Power Africa's approach recognizes that the public sector alone cannot solve the immense challenge of expanding electricity access in Africa; rather, it is essential that we strategically use limited public funding to leverage large amounts of private capital and create enabling environments that will encourage continued investment for decades to come. This year, Power Africa facilitated the first-ever African pension fund investment in an African power generation company — mobilizing more than \$23 million of African capital from one country to invest in another African country's development.

Women play a critical role in advancing sub-Saharan Africa's growing energy sector; as policy-makers within national and regional governments, as executives of private sector partners, as managers within power sector utilities, as energy sector entrepreneurs, and as employees of generation plants and transmission and distribution systems. This *Annual Report* features many of those women who are changing the African continent in partnership with Power Africa through our Women in African Power group.

A handwritten signature in black ink, appearing to read 'Andrew M. Herscowitz'.

Andrew M. Herscowitz  
United States Coordinator for Power Africa

## Executive Letter



The energy needs in Africa are enormous, yet so is the potential — the potential to harness our vast natural resources to generate electricity, the potential for economic growth, and the potential for political and economic collaboration among the African countries and the rest of the world to increase security and lift nations out of poverty. Power Africa is working with African governments like Uganda to harness all that potential.

In Uganda, Power Africa has worked through the U.S.-based National Rural Electric Cooperative Association (NRECA) to help our Rural Electrification Agency deliver on-grid connections. We aim to add 1.5 million new connections by 2022. Power Africa also has helped multiple small hydroelectric projects reach financial close, adding 53 megawatts (MW) of generation capacity. We hope that working with Power Africa and its partners, Uganda will add 1,000 MW of new power generation by 2020 through many types of energy technology.

Power Africa does not just invest in projects, but invests in people too. When I speak about Africa's potential, I include in that the enormous talent of our people. As an engineer and the Minister of Energy and Minerals in Uganda, I stand proud to be part of Power Africa's "Women in African Power" — a networking group that brings together students, solar-home-system entrepreneurs, government officials, lawyers and financiers to achieve Power Africa's goals. More importantly, though, we learn from another, do business together, and get things done! This year, at African Utility Week, more than half the winners for its annual awards were members of Power Africa's Women in African Power.

In this *Annual Report*, Power Africa is sharing its success to date and hopes for the future. Many of these stories involve Women in African Power — women who are getting innovative deals across the finish line; training African government lawyers how to negotiate fair deals; steering Ministries; leading donor efforts, and, ultimately, delivering electricity to people and communities across the continent. These women are transforming Africa's energy sector, and the sector is stronger for their talent and contributions.

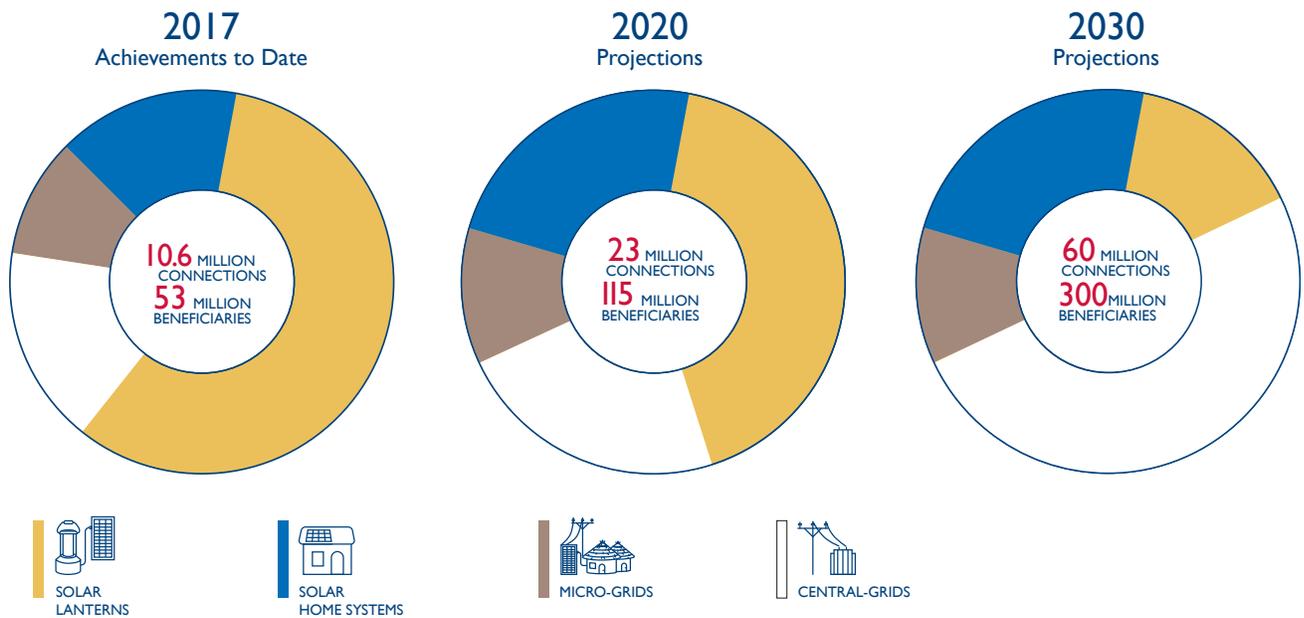
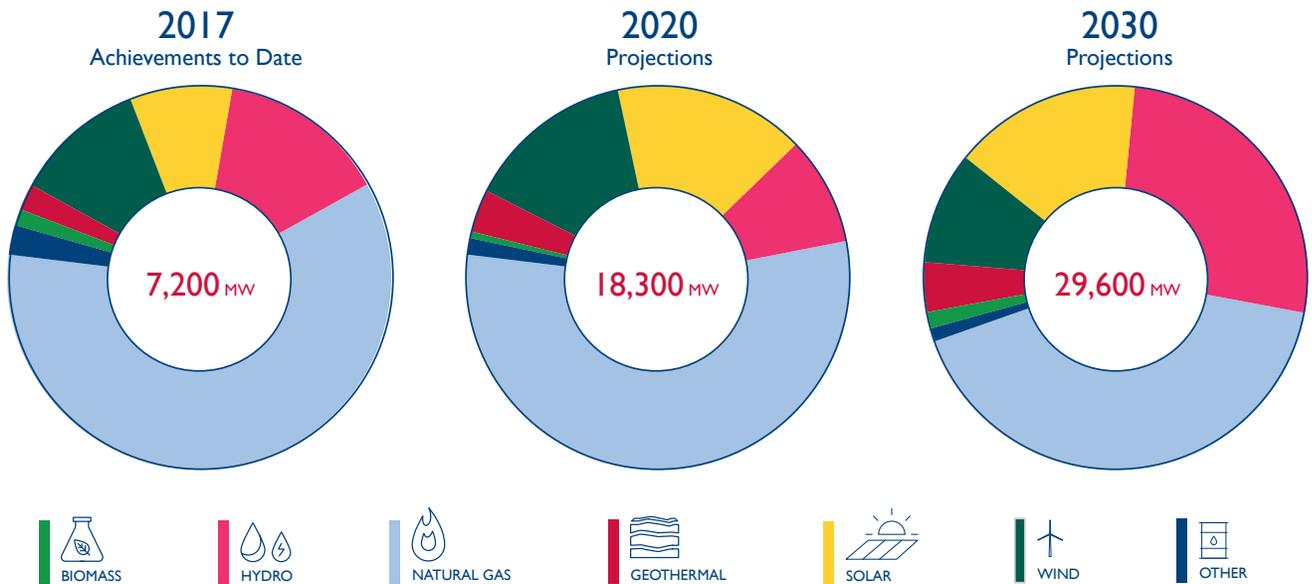
As we look to the future of Power Africa, Uganda is ready to tap into all of its resources, including human resources along with the water, wind, sun, gas, and steam that will power our economy. We appreciate the partnership of the U.S. Government, and welcome the investment from outside developers and investors.



The Honourable Eng. Irene Muloni (MP)  
Minister of Energy and Mineral Development

# Progress towards Power Africa's 2020 and 2030 Goals

In June 2013, Power Africa launched with the goal of doubling access to electricity in sub-Saharan Africa by increasing installed generation capacity by **30,000 megawatts (MW)** while adding **60 million new household and business connections by 2030**. In February 2016, the U.S. Congress passed the Electrify Africa Act of 2015, which charges Power Africa with increasing installed generation capacity by **20,000 MW, while adding first-time energy access for 50 million beneficiaries by 2020** — an effort that directly supports and complements Power Africa's original goal.



As the off-grid market matures, Power Africa will further prioritize our support to larger solar home solutions and micro-grids. Power Africa will also continue to support central grid connections, particularly in urban and peri-urban areas.

# Power Africa's Public-Private Partnership Model

Power Africa is a U.S. Government-led initiative comprised of 12 U.S. Government Departments and Agencies, and a diverse coalition of more than 140 public- and private-sector partners, including bilateral and multilateral partners, international organizations, civil-society organizations, and more than 130 private sector companies.

## POWER AFRICA'S INNOVATIVE MODEL

- 1 Leveraging public-private partnerships** to accelerate and maximize development impact, while minimizing the cost to American taxpayers and African governments
- 2 Supporting the private sector's work at all stages of power-project development,** removing obstacles that cause projects to derail
- 3 Supporting African governments, utilities, and regulators** to develop laws and policies that attract private investment and growth

Power Africa is now among the largest public-private partnerships for development in history, having mobilized more than **\$54 billion** in commitments towards achieving Power Africa's goals from its more than **140 public and private sector** partners.

To date, the U.S. Government has disbursed approximately **\$500 million**, and made more than **\$2.6 billion** in financial commitments towards Power Africa's goals.

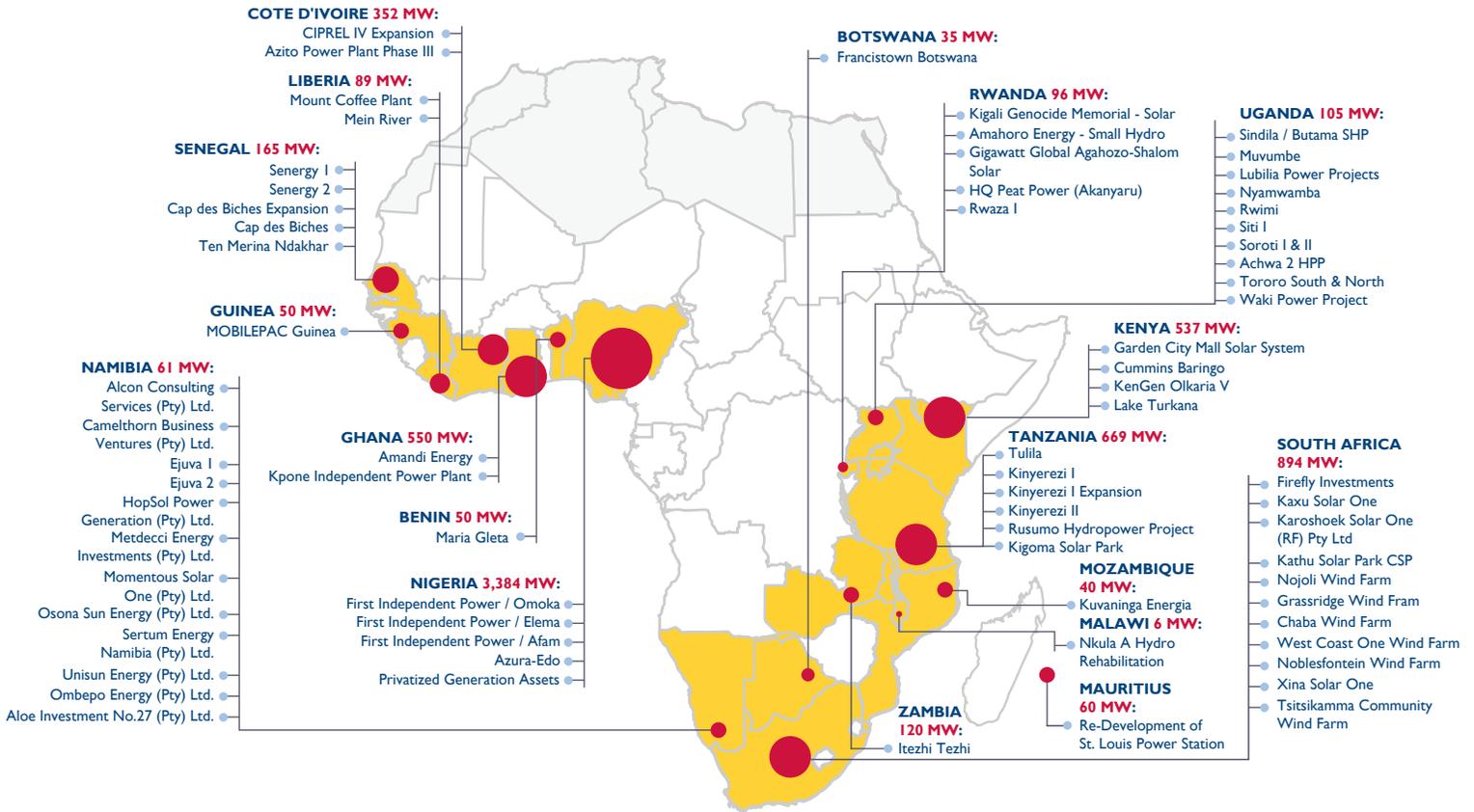
### MEGAWATTS RESULTS

To date, Power Africa has helped facilitate the financial close of 80 private-sector power transactions valued at more than \$14.5 billion, **that are generating or expected to generate more than 7,200 MW.**

### CONNECTIONS RESULTS

To date, Power Africa has supported private sector companies and utilities in connecting a **total of 10.6 million homes and businesses** to power solutions, which means approximately 53 million people (each household has five people on average) have access to electricity today who did not have access prior to Power Africa's launch.

# Power Africa Has Helped Facilitate the Financial Close of 80 Private-Sector Power Transactions that are Generating or Expected to Generate More Than 7,200 MW\*



  
**WIND TECHNOLOGY**  
**810 MW**  
Financially Closed Transactions: 9

  
**NATURAL GAS TECHNOLOGY**  
**4315 MW**  
Financially Closed Transactions: 19

  
**HYDRO TECHNOLOGY**  
**1030 MW**  
Financially Closed Transactions: 18

  
**DIESEL TECHNOLOGY**  
**35 MW**  
Financially Closed Transactions: 1

  
**BIOMASS TECHNOLOGY**  
**89 MW**  
Financially Closed Transactions: 3

  
**GEOHERMAL TECHNOLOGY**  
**158 MW**  
Financially Closed Transactions: 1

  
**SOLAR TECHNOLOGY**  
**628 MW**  
Financially Closed Transactions: 25

  
**HEAVY FUEL OIL TECHNOLOGY**  
**196 MW**  
Financially Closed Transactions: 4

\*Power Africa's transactions that have reached financial close include qualified permanent and temporary power solutions. Temporary power solutions are added and subtracted to the aggregate Power Africa public financial close number based on the terms of a contract between a supplier and a host government.

# Power Africa has Supported Private Sector Companies and Utilities in Connecting a Total of 10.6 million Homes and Businesses

Power Africa has made significant progress toward its connections goals. Sales of off-grid system sales are increasing as companies scale in more established markets, enter new markets, and expand product offerings to meet customer demand.

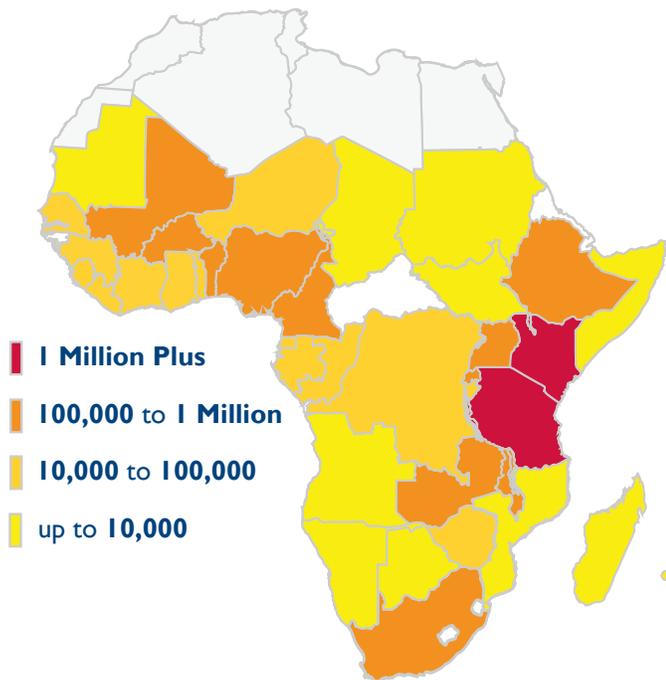
Power Africa assists these companies by refining and strengthening marketing and retail strategies, developing new partnerships with distribution and retail entities, analyzing project data to optimize operations, and providing business, network and distribution intelligence. Power Africa also supports larger-scale energy solutions by advancing micro-grid standards, piloting new micro-grid business models, and supporting expansion of and planning by utilities. Power Africa expects to see increased connections from these efforts in the coming years.

To date, Power Africa has supported private-sector companies and utilities in connecting a total of 10.6 million homes and businesses to power solutions — that is approximately 53 million people who have gained access

to electricity since 2013.<sup>1</sup> While Power Africa is proud of this achievement, our job is far from over. Approximately two-thirds of these connections are from solar lanterns, which provide basic access to a single light and mobile phone charging. For many households — particularly in remote and low income areas — gaining access to this kind of system represents a critical first step and results in dramatic livelihood improvements. However, larger systems — including solar home systems, micro-grids, and central grids — are required to provide people with the power they need to run major appliances and create businesses. To date, Power Africa has connected more than two million households and businesses to such solutions, which has provided more than 10 million people with higher levels of energy service.

<sup>1</sup> Based on an average of five persons per household in sub-Saharan Africa.

## TOTAL POWER AFRICA CONNECTIONS



Aggregate connections by Power Africa and our partners since our launch in 2013

### PARTNERING WITH THE NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION (NRECA)

NRECA was founded in the late 1930s to electrify the rural United States. Today, its member cooperatives serve 42 million Americans. NRECA is working with Power Africa to expand electricity access in sub-Saharan Africa through the following interventions:

- **Kenya:** Supported completion of Kenya’s National Electrification Strategy and geospatial planning framework;
- **Uganda:** Developing master plans for on- and off-grid connections in rural service territories;
- **Liberia:** Developed geospatial planning framework to help the utility to prioritize on- and off-grid investments;
- **Tanzania, Ghana, Benin and Sierra Leone:** Helped the Millennium Challenge Corporation prepare utility-reform aspects of its power compacts and threshold program.

# Micro-Grids: Expanding Access, Empowering Communities

Mugurameno, a small Zambian village on the Lower Zambezi River, offers a glimpse into the future of rural power. Over the past year, 32 homes and businesses in Mugurameno have been purchasing electricity from Regina Tembo, a 23-year-old single mother and Standard Microgrid manager.

Standard Microgrid, an innovative, off-grid utility, tailors energy services to individual customers. This approach starts with the local micro-grid manager, who works with customers to develop or adjust their plans, collect fees, and perform basic maintenance.

In Mugurameno, Regina has excelled in her new role, and become the face of energy and empowerment in a community. With no formal technical education beyond her one-day training with Standard Microgrid, Regina manages day-to-day operations, collects cash payments, and ensures customer satisfaction.

In addition to training micro-grid managers, Standard Microgrid further invests in the community by providing free lighting and power for educational tablets to the school in Mugurameno. For Standard Microgrid, this community presence, strengthened by the trust that Regina builds with her customers, is the foundation for a truly replicable and sustainable rural utility model.

Power Africa, through the U.S. Trade and Development Agency (USTDA), is helping Standard Microgrid expand to 150 additional sites to provide affordable power to remote customers through financially viable mini-grids. A grant from USTDA will identify and prioritize new micro-grid sites, meet regulatory requirements, and develop community engagement standards, which will create opportunities for micro-grid managers like Regina and the communities where they live across Zambia.

“Being a Standard Microgrid Manager has increased my status in the community, and enabled me to share knowledge with people in different countries.”

– Regina Tembo



Regina Tembo and Audrey Kamtembe train to use the Standard Microgrid Manager mobile application, which allows them to resell energy to their community. Photo: Chuck Chastain, Empowered by Light

# Strengthening the Enabling Environment for Private Sector Investment

Power Africa's ultimate success depends on creating an enabling environment that attracts and accelerates private investment. In collaboration with host-government partners, Power Africa works to establish the necessary investment climate, including regulatory clarity and predictability, fair and transparent procurement and project development processes, and commercially viable utilities.

**LIBERIA | MCC, USAID, WORLD BANK**  
Improving the solvency and efficiency of Liberia's utility by implementing a private sector management contract at the Government of Liberia's request.

**GHANA | MCC, USAID**  
Supporting Integrated Resource and Resilience Planning, which will optimize energy resources, enhance affordability, and provide greater medium to long-term clarity to private-sector investors.

**NIGERIA | USAID, USTDA**  
Helped four distribution companies reduce commercial and technical losses by up to 17.6 percent and increase revenue-collection by up to 33 percent, improving their financial viability and introducing U.S. technology to improve system reliability.

**UGANDA | USAID**  
Finalized master electrification plans for two rural territories, clarifying opportunities for both the utility and off-grid companies and identifying potential for more than 125,000 new connections and over 100 mini-grids.

**RWANDA | STATE, USTDA, USAID**  
The U.S. Ambassador, with support from State, USAID and USTDA, worked directly with high-level government officials to secure key project agreements for two micro-hydro projects. The team also advocated for and helped design the Government's Rural Electrification Strategy, which has already more than doubled off-grid electricity access.

**KENYA | USAID, WORLD BANK**  
Supporting an inclusive and integrated National Electrification Strategy by convening public-private dialogues and creating opportunities for participation by mini-grid developers.

**MALAWI | MCC, USAID, WORLD BANK**

## MALAWI: DRIVING REFORM, CREATING OPPORTUNITY

In Malawi, Power Africa supported a series of reforms that collectively helped the Government improve conditions for private-sector investment in the energy sector, including launching the country's first competitive tender.

### LEGAL AND REGULATORY FRAMEWORK

MCC supported the Government of Malawi in passing the Electricity Act Amendment into law in 2016, thereby strengthening the legal framework for private sector participation in the power sector.

### COST REFLECTIVE TARIFFS

In support of the Government's commitment to transition to cost-reflective tariffs by 2018, MCC is conducting a cost-of-service study to calculate an appropriate tariff, which will be critical to ensuring the long-term viability of key institutions in the power sector and attracting independent power producers.

### GENDER EQUALITY

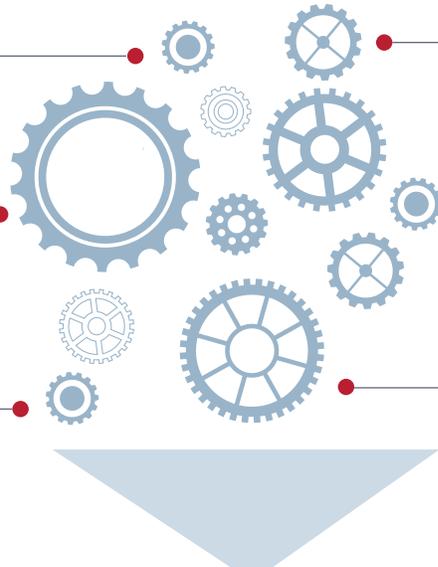
MCC supported ESCOM's development of a Social and Gender Inclusion and Anti-Sexual Harassment Policy, which aims to affirm ESCOM's commitment to achieving gender equality and eradicating gender-based discrimination.

### CREDIT WORTHY OFF-TAKER

In February 2016 and again in December 2016, the Electricity Supply Corporation of Malawi (ESCOM) which received a BBB investment-grade rating, signaling to the market its creditworthiness as an off-taker and making private-sector investment in power generation in Malawi more attractive. The MCC-supported Electricity Law Amendment also partially unbundled ESCOM by creating a new generation utility, the Electricity Generation Company of Malawi, and establishing a single electricity buyer within ESCOM, increases the utility's efficiency and commercial viability.

### INTEGRATED POWER SECTOR PLANNING

The World Bank is supporting the development of an integrated resources plan, which will create a roadmap for Malawi to meet its energy demand and inform responsible private-sector investment in the sector.



In December 2016, the Government of Malawi launched the country's **first-ever competitive tender** in the power sector by using the procurement framework developed with support from MCC. **Twenty-one international companies submitted bids** to develop 70 MW of new solar capacity. This achievement sets Malawi on a path to diversify its generation mix, bring down costs, and open its door for future rounds of private investment.

# Promoting Women in the Electric Utility Workforce

As a child, Omowunmi Akintunde spent hours working alongside her father in his neighborhood electrical workshop. As they worked together repairing generators, radios, televisions and local milling machines, Omowunmi showed a keen interest in electrical engineering. It came as no surprise when Omowunmi announced that she wanted to become an Electrical Engineer. While her father would have preferred for her to become a nurse, he could not deny her passion for the field.

Today Omowunmi is a Protection, Control and Metering Officer at Nigeria's Ibadan Electricity Distribution Company (IBEDC), one of several electric utilities that is working with the Power Africa-supported Engendering Utilities program to create opportunities for women's advancement in the energy sector.

A growing body of evidence exploring the correlation between workforce diversity and performance demonstrates that companies that invest in women outperform their peers. Characterized by a male dominated workforce, electric utilities are implementing efforts to create a more-diverse workforce. With USAID support in Ethiopia, Kenya and Nigeria, and MCC support in Benin, Ghana and Malawi, utilities are creating work environments that provide equal opportunities for women and men. Initiatives include encouraging women to enter into technical positions; eliminating discriminatory practices in recruitment, training and promotion; and encouraging young women's interest in science, technology, engineering, and mathematics fields.

Omowunmi hopes to inspire young women in her local community to pursue their professional aspirations, and is pleased to see that IBEDC and other utilities are acknowledging the valuable contributions that women can make to their workforce.



Photo: IBEDC

## Women in African Power

Launched by Power Africa, the Women in African Power (WiAP) network aims to elevate the presence and strengthen the participation of women in Africa's energy sector. WiAP convenes leaders and emerging talented women, connecting women to business and professional development opportunities. Through media outlets and at major energy sector events, WiAP mainstreams the message that women are critical to the growth and sustainability of Africa's energy sector. At this year's African Utility Week, one third of the nominees for its annual awards, and more than one half of the winners were members of the WiAP network. Power Africa understands that supporting the professional development of women in the sector will strengthen the sector; and help us achieve our goals.



Panelists provide remarks at a Women in African Power event at the Africa Energy Forum 2017. Photo: Peter Blaes

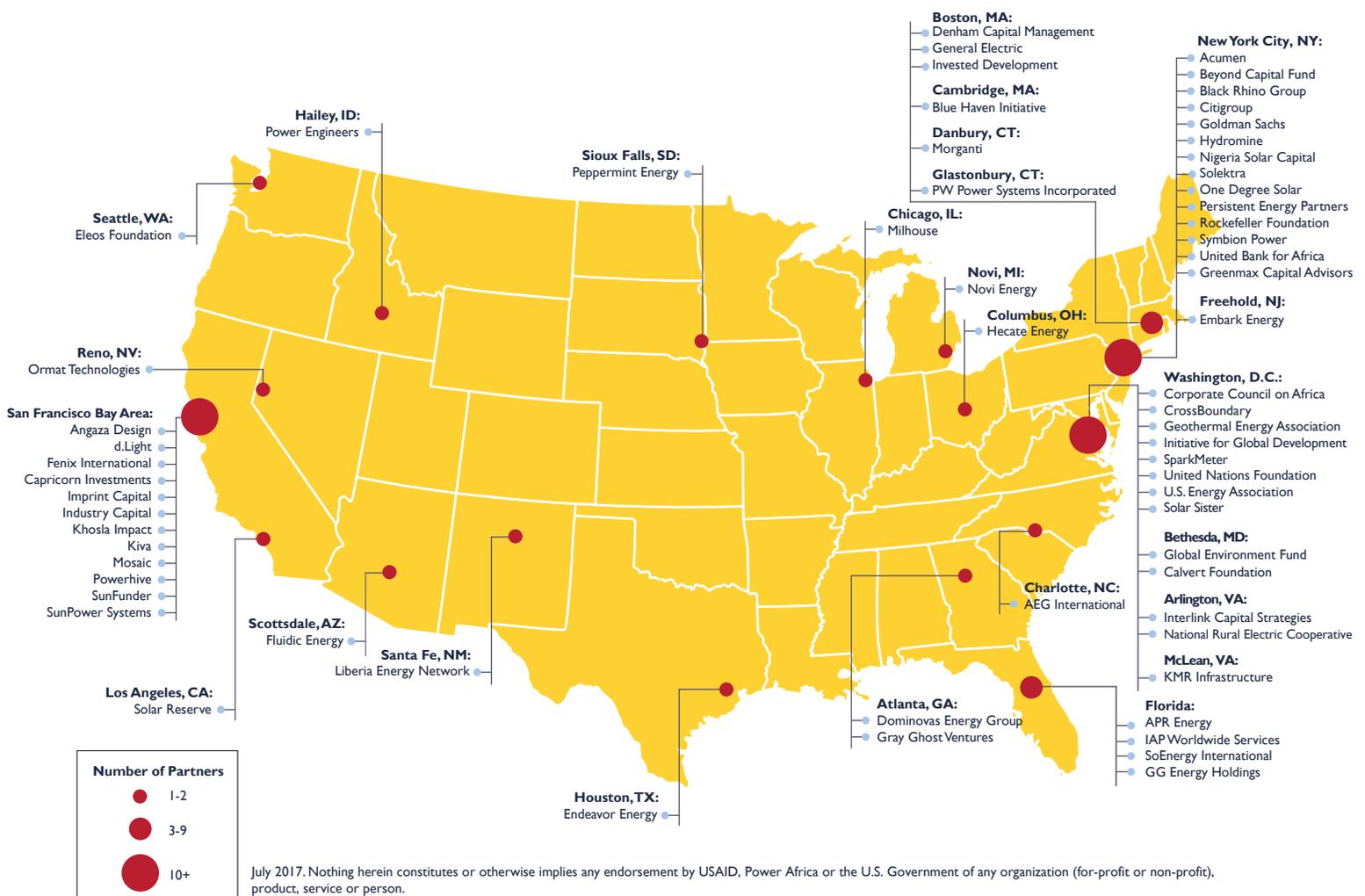
# U.S. Businesses and U.S. Investment

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- Power Africa's pipeline includes more than **100 additional transactions** and projects involving the U.S. private sector that are projected to support approximately **\$7 billion** in export opportunities.

## U.S. PRIVATE-SECTOR PARTNERS: 64 PARTNERS ACROSS 22 STATES

Additionally, the U.S. supply chain for Power Africa projects includes another 60 U.S. companies and growing which has extended Power Africa's domestic network to 33 states.



## Connecting U.S. Businesses to African Markets

Through USTDA, Power Africa offers critical support to small and medium-sized U.S. companies that are new to the African market. Our boots-on-the-ground approach provides expanded market intelligence, opens relationships with African stakeholders, and helps develop new opportunities for U.S. commercial partnerships in some of the fastest growing markets in the world.

**Rickly Hydrological** is a small, family-run business in Columbus, Ohio, that has been manufacturing equipment for hydropower projects since the early twentieth century. Their core business is water-flow instrumentation; however, they also manufacture small hydroelectric turbines. Through USTDA, Power Africa is helping Rickly expand into sub-Saharan Africa, the world's leading marketplace for new greenfield hydropower development opportunities.

USTDA introduced the Rickly team to buyers in Tanzania. As a result, Rickly is now filling its first order for a complete hydropower plant in Africa. Under contract to a developer in Tanzania, Rickly is conducting a front-end engineering design study and manufacturing turbines for a set of small projects near the village of Ilundo, Tanzania.

“Africa is an important part of our business plan; and Power Africa’s support helps us be successful.”

– Mike Rickly, CEO, Rickly Hydrological

**Langson Energy, Inc.**, based in Carson City, Nevada, has developed exceptionally efficient power-conversion systems. This specialized equipment uses pressure in natural gas, wet steam, dry steam, and geothermal fluids, and converts it into power. Until recently, Langson had not deployed its technology in Africa.

The geothermal wells in the Olkaria field in Kenya’s Great Rift Valley produce two phase fluids at a wide range of pressure regimes. Some of these wells are either cyclic or operate at low pressures that are inadmissible to



Ryan Cook, Tom Hardy, and Mike Rickly discuss the rehabilitation of a Pelton turbine in Rickly’s machine shop. Photo: David Riposo, USTDA

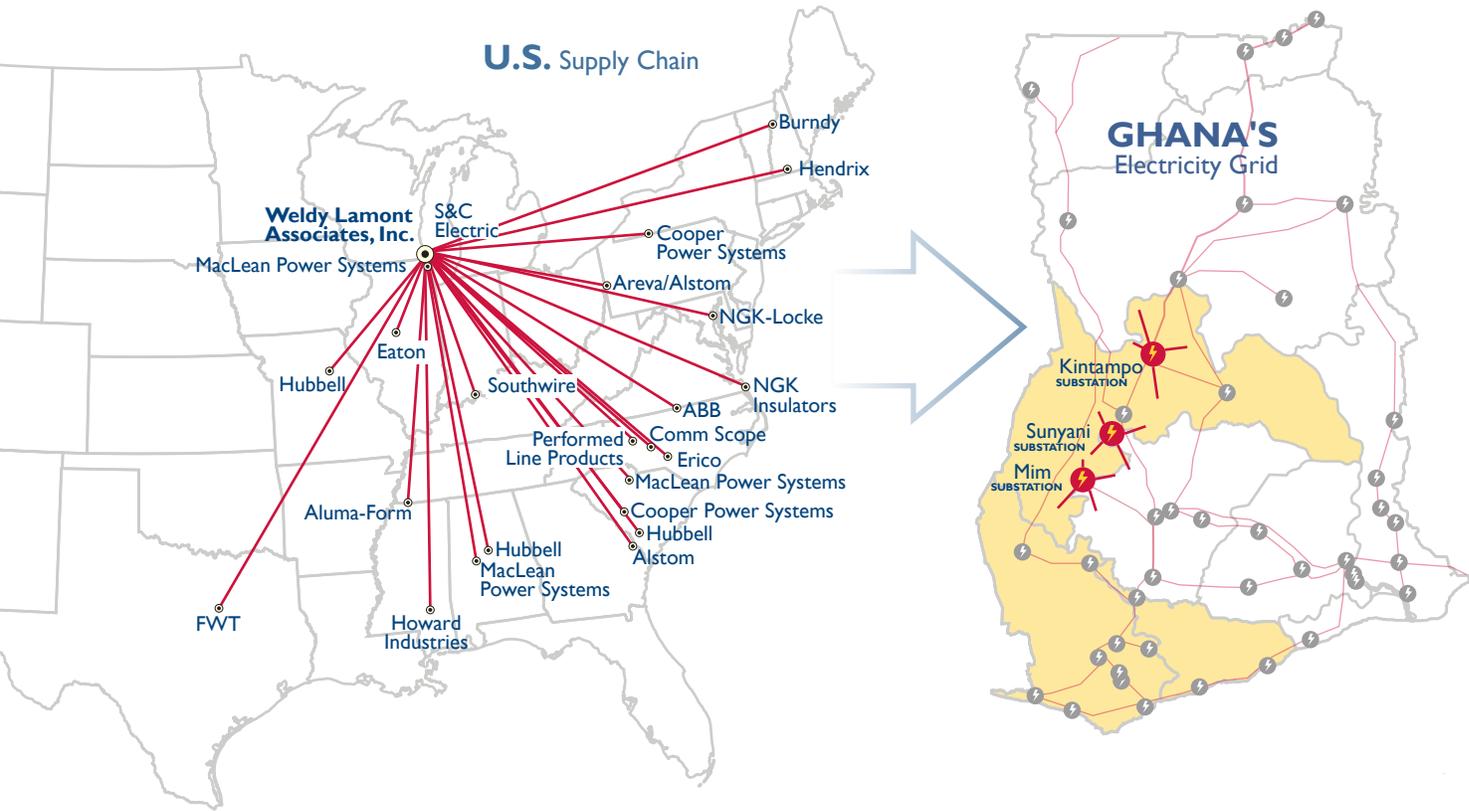
conventional power plants and yet offer significant flow rates. Through a USTDA feasibility study, Power Africa is supporting the deployment of a Langson Total Flow Unit to capture this unused energy to generate up to five MW of additional clean power. Since the Kenya Electricity Generating Company operates more than 300 geothermal well sites, the scale-up potential is profound.

“With support from Power Africa, Langson is expanding into new marketplaces in Africa’s geothermal sector.”

– Chris Cote, Langson Energy Executive Vice President

# U.S.-Africa Business Nexus, the Energy Supply Chain

Through the Export Import Bank of the United States, Power Africa supports **Weldy Lamont Associates, Inc.**, a U.S. small business, to build out Ghana's electricity grid via the Ghana Self-Help Electrification Program — a partnership that demonstrates how Power Africa is great for both Africa and U.S. businesses.



With Power Africa support, Chicago-based Weldy Lamont has extended Ghana's electric grid to connect more than **67,000** rural households (335,000 people) as part of the Government of Ghana's Self-Help Electrification Program, while generating a combined **\$57 million** in exports for over **20** U.S. companies.



Distribution lines running to a village in the Brong Ahafo region of Ghana. Photo: Weldy Lamont Associates, Inc.

# Strengthening U.S. Investment in Africa's Energy Sector

## SUPPORTING EAST AFRICA'S GEOTHERMAL MARKET

The geothermal potential for the East Africa region exceeds 15,000 MW, and represents a \$40 billion investment opportunity. Power Africa is supporting a pipeline of more than 20 geothermal energy projects across East Africa, which represents more than 2,300 MW of potential generation capacity, and approximately \$9 billion in investments. The United States is a world leader in the geothermal industry, with more than 100 companies active in the sector. **Power Africa's East Africa Geothermal Partnership via the U.S. Energy Association (USEA) has more than quadrupled the number of U.S. companies active in East Africa's geothermal sector.**

### Kenya's Geothermal Market

The eighth largest producer of geothermal power in the world. Power Africa is supporting 15 geothermal projects that total more than 1,000 megawatts of potential generation capacity, and represent a combined estimated value of approximately \$3.6 billion.

### Ethiopia's Geothermal Market

Ethiopia holds the potential to generate up to 10,000 MW of power from its geothermal sources. Power Africa is supporting five geothermal projects in Ethiopia that total more than 1,200 MW of potential generation capacity, and represent a combined estimated value of more than \$5 billion.



KenGen's Geothermal Reservoir Management department surveys the Olkaria geothermal field in Naivasha, Kenya with members of a Power Africa-led team from the U.S. Department of Energy, Lawrence Berkeley National Laboratory, and the USEA. Photo: Caity Smith, USEA

## UNLOCKING POTENTIAL IN SENEGAL'S SOLAR SECTOR

Senegal is emerging as a clean energy leader in West Africa. USAID worked with the Ministry of Energy and Renewable Energies Development and Senegal's national utility company, Senelec, to develop a master plan for generation and transmission that enhances the Government's ability to make investment decisions in the sector. USAID hosted a series of workshops for Senelec dispatchers and other stakeholders on the integration of renewable power and optimal network performance. Power Africa's work clarified Senegal's capacity to integrate and manage effectively more than 400 MW of grid-connected solar power, which has opened the doors to future investment.

An early investor in Senegal's solar sector, Power Africa partner GreenWish has developed the first solar independent power project to be connected to the grid in West Africa. With an installed capacity of 20 MW, the Senergy 2 solar PV plant will feed the grid with clean power at a cost 50 percent lower than the current energy mix, which has resulted in a \$4.9 million yearly savings for the Government of Senegal over the 20 years of the power purchase contract. An impressive 45 percent of the project company is held by Senegalese investors, which retains a major part of the project's revenues locally. Additional local benefits include provisions to allocate 40 percent of all jobs created to local community members, with a strong focus on women's employment.

“Senergy 2 symbolizes the dawn of a new era. Solar power will accelerate electrification in a sustainable, responsible and competitive manner. We look forward to working with Power Africa on future transformative deals.”

– Charlotte Aubin Kalaidjian, Greenwish Chief Executive Officer

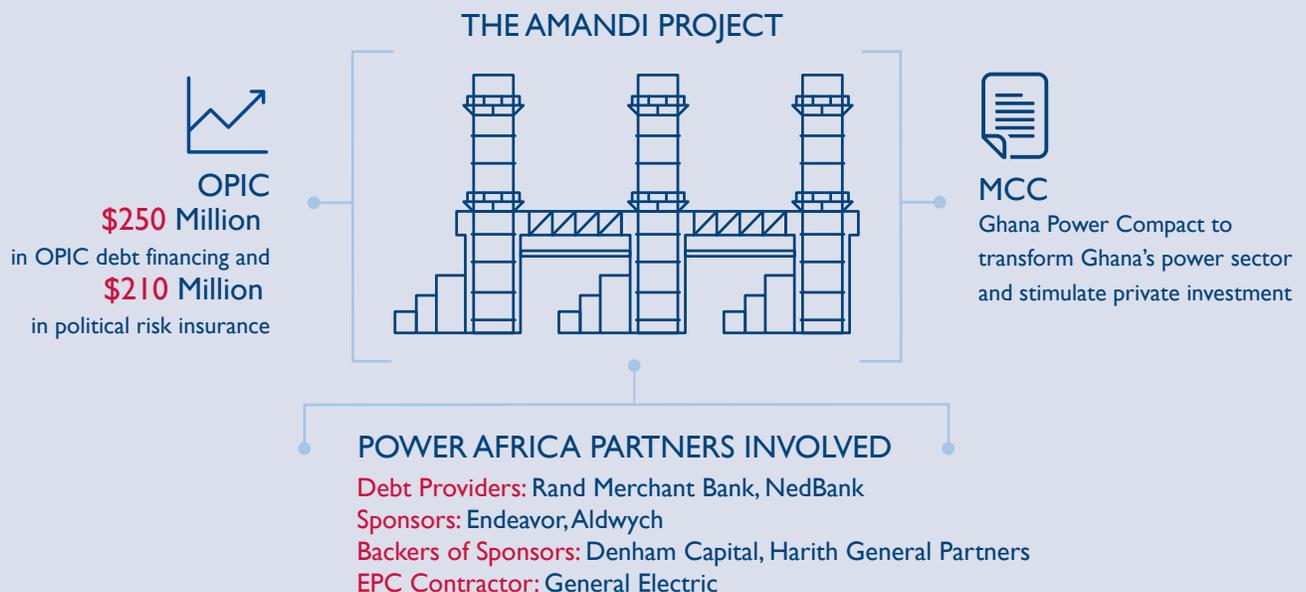
# Power Africa Partners Toolbox

Power Africa offers an effective one-stop shop for businesses to access the tools and assistance of the U.S. Government. In March 2017, Power Africa's 12 U.S. Government Departments and Agencies and 14 development partners released the Power Africa Partners Toolbox, which brings together 160 different tools designed to remove obstacles facing private sector power deals in sub-Saharan Africa.



## THE TOOLBOX IN ACTION

In December 2016, the Amandi Energy Limited project reached financial close, and began construction of a \$552 million, 200 MW combined cycle, dual-fuel power plant in Aboadze, Ghana. The Amandi transaction is an example of how Power Africa partners can work effectively together to advance energy transactions in sub-Saharan Africa. "Project Finance International" named Amandi the "African Power Deal of the Year," and specifically recognized OPIC for playing a pivotal role in the transaction.



**Expected Impact:** The first Independent Power Producer (IPP) to close in Ghana in three years, Amandi will create local jobs and move Ghana closer to its goal of doubling electricity generation from 2014 levels, to 5,000 MW.

## PEOPLE BEHIND THE PROJECTS

Aldwych and OPIC teamed up for the third time to bring the Amandi gas project in Ghana to financial close. Aldwych and OPIC have previously worked together on the Lake Turkana Wind Project (Kenya) and the Azura gas project (Nigeria). These deals are moving forward thanks to tenacious leadership at both organizations.

**Helen Tarnoy**, Managing Director of Aldwych International Ltd., leads one of the most successful independent power producers in sub-Saharan Africa. Helen has been committed to the African Power market since 1997, when she was named Senior Project Director of AES Corporation before co-founding Aldwych International in 2004. In total, Helen has worked to develop more than 15 projects across 10 sub-Saharan African countries, which advanced more than 3,000 MWs of projects to financial close and raised several billion dollars in financing. In recognition of her leadership and dedication to the African Power sector, Helen won the 2017 Multilateral Investment Guarantee Agency (MIGA) Annual Gender CEO Award, and also received the African Utility Week Industry Lifetime Award.

As part of a commitment to Power Africa, Aldwych is co-developing the 200 MW Amandi gas to power project

in Ghana. Aldwych played a critical role in the development and financing of Amandi; Aldwych and its partners, Amandi Founder Group and Endeavor Energy, raised equity of \$134 million towards the total project cost of \$542 million.



Helen Tarnoy visits the 90 MW Rabai Power Plant in Mombasa, Kenya.  
Photo: Aldwych International



Nancy Rivera. Photo: Peter Blaes

**Nancy Rivera**, OPIC Managing Director for Structured Finance, has worked for more than 20 years to finance developing market power projects. She has recently focused much of her work to advance Power Africa by negotiating projects in South Africa, Senegal, Ghana, Mali, Nigeria, and Zambia.

Working to build a successful power project involves negotiating not only terms of construction, but also agreements with off-takers, such as a country's government, to ensure pricing will be fair and viable and risks are at a level acceptable to investors.

OPIC provides financing and political risk insurance to projects, and its participation often serves to bring additional private investors into the project. Rivera and her team worked on the Amandi project for almost two years, and ultimately committed \$250 million in OPIC financing and \$210 million in political-risk insurance. This work was instrumental in obtaining the agreement as the Government of Ghana agreed to provide a sovereign guaranty to the project, which helped bring risk down to more acceptable levels and bring in additional sources of financing to the project.

“Increasingly, OPIC political-risk insurance has been the defining factor to enable these deals to actually move forward.”

– Nancy Rivera

# Seamless Interagency Coordination

Power Africa mobilizes the full suite of U.S. Government resources towards national interests and clearly defined development objectives.

## HIGH LEVEL INTERAGENCY RESULTS TO DATE

- **The U.S. Agency for International Development (USAID)** Development Credit Authority has mobilized nearly \$219 million in private finance in support of power projects, and has a pipeline of more than \$300 million in new projects representing 490 MW of new generation capacity and nearly 500,000 new connections.
- **The Overseas Private Investment Corporation (OPIC)** has committed \$2.3 billion in financing and insurance to support 10 utility-scale power plants, seven off-grid and small-scale renewable projects, and four micro-finance and investment facilities. These OPIC commitments have mobilized more than \$3.8 billion in additional investment, and are expected to create 1,750 MW of new generation capacity.
- **The Millennium Challenge Corporation (MCC)** has committed \$1.5 billion in the power sector in sub-Saharan Africa as it has implemented compacts in Malawi, Liberia, Ghana, and Benin, as well as a power sector threshold program in Sierra Leone. MCC is also developing a power-sector compact with Senegal.
- **The U.S. Trade and Development Agency (USTDA)** has committed project-preparation assistance for 61 Power Africa activities across the continent with the potential to install 1,353 MW of new generation capacity and provide electricity for up to 2.6 million homes. USTDA's early project interventions will help leverage an anticipated \$7.6 billion in financing from public and private sources, while supporting an estimated \$3.2 billion in export opportunities for U.S. companies. In addition, more than 300 U.S. companies, business associations, and universities have participated in USTDA-funded "reverse trade missions."
- **The U.S. African Development Foundation (USADF)**, along with USAID and GE Africa, have awarded 70 grants worth \$7 million to local entrepreneurs through the Power Africa Off-Grid Energy Challenge, and created more than 16,500 new connections to renewable energy in remote areas of nine countries, which leverages more than \$4.5 million in private investments. They aim to create more than 43,000 new connections through these 70 grants as the projects are completed.
- **The U.S. Department of Energy (DOE)** Offices of International Affairs and Fossil Energy with assistance from the U.S. Energy Association and USAID published the "LNG Handbook," *Understanding Natural Gas and LNG Options*. The book looks at factors to be considered when exporting or importing gas and Liquefied Natural Gas (LNG) and helps guide natural gas and LNG development in general.
- **The U.S. Department of State** established a partnership with the Edison Electric Institute in 2017 to launch the African Utility Power Sector Exchange (AUPSE), which facilitates dialogue and shared learning between utility leadership from Africa and the United States. AUPSE will focus on the challenges African utilities face, ranging from setting cost-reflective tariffs to implementing modern energy technologies.
- **The Export-Import Bank of the United States (EXIM)** has pledged \$5 billion in support of U.S. exports for the development of power projects across sub-Saharan Africa. The bank supported two additional Power Africa transactions in the last year, which brings the total to nine projects and \$131.6 million authorized for power sector transaction in sub-Saharan Africa.
- **The U.S. Department of Commerce (DOC)** advances export and investment opportunities for U.S. firms by providing market intelligence, trade counseling, and business matchmaking through the work of the International Trade Administration and the Foreign Commercial Service. Additionally, the DOC's Advocacy Center coordinates U.S. Government interagency efforts on behalf of U.S. exporters that bid on public-sector contracts overseas. Since the start of Power Africa, the Advocacy Center has had six contract wins in sub-Saharan Africa's power sector, with project values that total \$379 million, including \$250 million in U.S. export content.



# The Power Africa Interagency At Work

## THE U.S.AFRICA DEVELOPMENT FOUNDATION (USADF) INVESTS IN AFRICAN INNOVATIONS

Microelectronics engineer Netsanet Kinde, developed the first solar home system designed for Ethiopians, by Ethiopians. She determined that off-grid systems, independent of the national grid, were an essential part of the solution for rural electrification. Using her electrical engineering background, Netsanet designed a solar home system which included two lamps and a charging system for devices, such as mobile phones and radios.

USADF, a Power Africa partner, invests in engineers who are finding solutions to local challenges. Last year, Netsanet won a \$100,000 grant from the Power Africa Off-Grid Energy Challenge. With this funding, Netsanet plans to sell and install at least 1,100 units in the next year, which will benefit more than 5,000 people in one year alone. Along with Netsanet, USADF has funded more than 70 off-grid energy innovators and entrepreneurs in nine countries in Africa. This investment has resulted in more than 16,500 connections that benefit more than 82,000 people.



Netsanet Kinde works on one of the solar home systems that she designed in her workshop in Addis Ababa. Photo: NBK Electrical Consulting Engineers

**In 2016, USADF launched its first Women in Energy Challenge to promote the advancement of enterprising women like Netsanet. The Women in Energy Challenge highlights the need to support technologies created by African women innovators.**

“For many of these rural families, they would never have seen an alternative to kerosene power in their lifetimes. Now they can.”

– Netsanet Kinde



Nkula A Hydropower Plant in Malawi. Photo: MCC

## MCC SUPPORTS THE REHABILITATION OF THE NKULA A HYDROPOWER PLANT IN MALAWI

Nearly 95 percent of the power in Malawi is generated by hydropower. Nkula A, the nation's first hydropower plant, was commissioned in 1966, and is in need of crucial upgrades and repairs. In April 2017, construction began to rehabilitate Nkula A, a project supported by MCC's Malawi Compact. The refurbishment includes installing new generators and turbines, switch gear, and mechanical and auxiliary systems. These investments will increase the plant's generation capacity from 24 MW to up to 36 MW, as well as extend the plant's working lifespan. Recommissioning of the plant is anticipated in 2018.

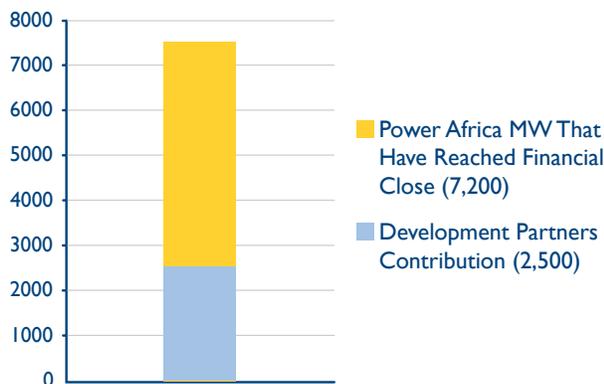
# Power Africa's Development Partners

Power Africa works with like-minded development partners to support a competitive, dynamic, and transparent power sector market that adheres to international social, environmental, and labor standards.

These 14 bilateral and multilateral partners include the World Bank; the African Development Bank; the European Union; the Governments of Canada, France, Japan, Norway, Sweden, and the United Kingdom; as well as the Industrial Development Corporation (South Africa), the Development Bank of Southern Africa, the International Renewable Energy Agency (IRENA), the African Union's New Partnership for Africa's Development (NEPAD), and the United Nation's Sustainable Energy for All Initiative (SEforALL).

Development partners have collectively committed \$14.85 billion towards advancing Sub-Saharan Africa's energy sector. Since the launch of Power Africa, partners have mobilized \$10.58 billion of this pledge, demonstrating remarkable commitment to the sector.

## DEVELOPMENT PARTNERS HAVE SUPPORTED 35 PERCENT OF THE POWER AFRICA MW THAT HAVE REACHED FINANCIAL CLOSE



## 2016 HIGHLIGHTS

Our partners currently are supporting more than 200 transactions, which are expected to deliver at least 17,000 new MW, both on- and off-grid, across the continent. The

U.S. Government works with these partners on some of these deals, and many receive support from multiple partners.

**ElectriFI supports NextGen Solar in Tanzania:** The European Union's ElectriFI facility launched in 2016 with €115 million in funding, including \$10 million in support from Power Africa. ElectriFI provides risk capital to developers and investors involved in growing Africa's renewable energy sector; focusing primarily on rural electrification. Over the past year, ElectriFI has held two calls for proposals, and has received hundreds of applications. In March 2017, ElectriFI announced support for NextGen Solawazi's five MW Kigoma Solar Power project, an isolated mini-grid that supports rural electrification in Tanzania. ElectriFI will provide financing to update the engineering assessment and grid-load study to verify the technical viability of the project.

**Norway and IFC support Mozambique's first large-scale solar plant:** This year, both the IFC and KLP Norfund Investments provided financing support to the 40 MW Mocuba solar-power plant in Mozambique, led by Scatec Solar, a leading renewable energy developer. Construction of the grid-connected solar plant began in 2017, and is expected to meet the energy needs of 175,000 households, with an expected investment of \$80 million.

**Power Africa partners with the Government of Japan** to coordinate the development of power projects across sub-Saharan Africa — with a focus on the geothermal deals in East Africa. Japan's \$408 million financing agreement with the Government of Kenya was critical to the advancement of the 158 MW Olkaria V Geothermal Plant\* that broke ground in April 2017 and is expected to connect to the national grid in 2019.

\*Tender issued for 140 MW, increased to 158 MW at time of award.

## POWER AFRICA PARTNERS WITH FRANCE

In November 2016, Power Africa welcomed its newest partner, the Government of France. This partnership brings with it a wealth of energy-related technical expertise and resources to support additional deal flow. France and Power Africa signed a Declaration of Intent that highlights areas for collaboration and commits France to \$2.15 billion through its work with the African Renewable Energy Initiative.

## POWER AFRICA'S PARTNERSHIP WITH THE AFRICAN DEVELOPMENT BANK (AfDB)



Toyin Ojo, the African Development Bank

Since Power Africa's inception, the AfDB has been a critical partner by leading efforts to finance on- and off-grid projects, and working with Power Africa to identify technical assistance and financing gaps at the country level.

The AfDB's African Legal Support Facility (ALSF)

aims to build sustainable power systems by providing quality legal assistance to African governments and private sector partners on the negotiation of complex commercial transactions. The ALSF is supported by multiple donors in addition to USAID, including the United Kingdom's Department for International Development (DFID), Canada, Norway, the Netherlands, France, KfW-Germany, and India. The Facility has so far supported at least 38 African countries and its services are in high demand.

Oluwatoyin (Toyin) Ojo, Senior Legal Advisor for ALSF, facilitates Power Africa partners and African governments access to legal assistance. When intractable legal and policy impediments have stalled the development of power projects, Toyin's capacity to draw in the best of the international legal community has led to meaningful resolutions. ALSF's support has resulted in strengthening the quality of project agreements and accelerating projects' progress toward financial close. Toyin has also been involved in the authorship of two Power Africa handbooks, *Understanding Power Purchase Agreements* and *Understanding Power Project Financing*. Since their release, more than 20,000 copies have been distributed on the African continent, and countless electronic copies downloaded and shared.

## SCALING OFF-GRID ENERGY

The Scaling Off-Grid Energy Grand Challenge for Development (SOGE) will accelerate growth in the off-grid energy market with the target of providing 20 million households in sub-Saharan Africa with access to modern, clean, and affordable electricity. Launched in 2016, this partnership between USAID's Global Development Lab, Power Africa, AfDB, DFID, and the Shell Foundation, is spurring a vibrant marketplace of enterprises that provide off-grid energy solutions to meet the needs of low-income consumers across the African continent. To date, SOGE initiatives have invested more than \$33 million in off-grid energy enterprises to reach new communities and have launched an innovation prize to spur the development of low-cost, off-grid refrigeration solutions that will help drive household connections.



Representatives from all fourteen Development Partners gathered in Washington D.C. in March 2017 for Power Africa's Annual Development Partners meeting.

# Power Africa Transaction Advisors

A team of field-based regional and country-focused Transaction Advisors, professionals with experience in both the energy and investment sectors, work across sub-Saharan Africa to help governments prioritize, coordinate, and expedite the implementation of power projects. These transaction advisors work as impartial advisors to African partner governments, and in direct coordination with officials from various U.S. Power Africa Departments and Agencies in each country.



Eme Kponu offers a presentation on the benefits and use of off-grid solar to textiles entrepreneurs in Jankara market Lagos Island. Photo: PATRP

## EME KPONU

As a Power Africa Transaction Advisor, Eme Kponu's work has been critical to scaling the solar market in Nigeria. Eme has leveraged her 15 years of experience in the Nigerian banking sector to encourage financial institutions to provide loans for solar products for the first time, as well as increase the effectiveness of existing loan products. She trains bank staff, women entrepreneurs, and people in rural communities; to enable them to access loans for solar technologies to meet their energy needs. Trainings involve physical demonstration on the use of solar lanterns and the potential benefits to customers upon switching to this form of power.

“As I go through each day seeing the relief and satisfaction on the faces of the rural women, it gives me great joy, because I believe that every family deserves the opportunity to a better life and that opportunity is here and now with these solar solutions.”

- Eme Kponu



Wangeci Wanyahoro

## WANGECI WANYAHORO

As a Power Africa Transaction Advisor, Wangeci Wanyahoro aims to position Kenya as a leader in the African renewable-energy market. An attorney by training, Wangeci works with developers, investors, lenders, and state-owned entities on transactions that will help bring a more reliable power supply to her native country. Her role on power projects ranges from raising capital to reviewing national legal and regulatory frameworks to facilitating project development. Recently, Wangeci was involved in the development of Power Africa's *Guide to Community Engagement for Power Projects* in Kenya, where she assisted in identifying the national policies, and legal and regulatory frameworks, that govern community land rights and participation in power projects. The guidelines are formulated to assist developers to understand how to engage communities where their power projects are located, thereby benefiting both the local community as well as serving the goal of providing electricity to the country.

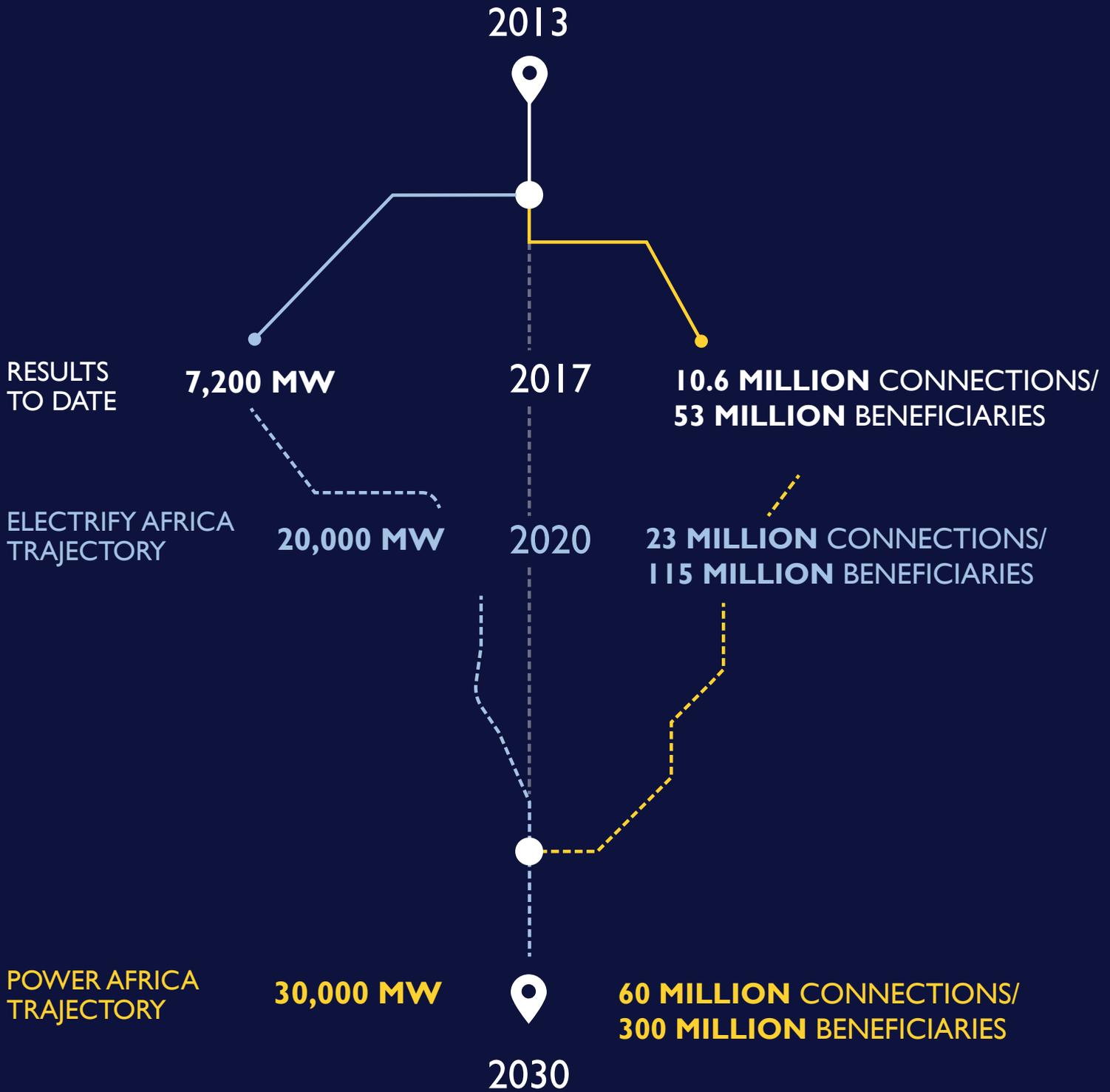
“It's a privilege to work in the energy sector and the Kenyan market, which is dynamic, intricate, and challenging. I know the work we do is making a difference.”

- Wangeci Wanyahoro

This report is dedicated to the memory of Ellen Dragotto, whose commitment to promoting women's participation in the energy sector inspired her colleagues at USAID, and set Power Africa on its path to empowering women.



# THE POWER AFRICA ROADMAP



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