

Investing in cleaner energy

Increasing investments in clean energy will help steer Africa's energy sector towards a sustainable, inclusive, and green pathway. In Côte d'Ivoire, our support for expanding power generation using modern combined cycle technology is improving Ivoirians' access to electricity while increasing efficiency and reducing carbon emissions.

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Chapter 1
Light up and power Africa

Africa cannot achieve sustainable development without access to reliable, affordable, and sustainable energy. Energy is needed to drive the businesses that will create jobs for Africa's growing population. Energy underpins access to better health, education, and water, and it makes it possible for households and communities to improve their quality of life. Generating electricity sustainably means that the quality of life of future generations of Africans is not put at risk. Despite promising steps in recent years towards making access to electricity universal, Africa still has some way to go to meet its energy needs. Yet the continent's abundant natural resources, improving policy environment, and growing institutional capacity are a good foundation for progress. The Bank is building on this progress by investing in electricity generation, transmission and distribution systems, leveraging other investments in renewable and decentralised energy solutions, and providing technical support to build local capacity for the development and operation of the energy sector.

Energy is at the heart of Africa's development

Access to modern forms of power is vital to improving the health and education of Africa's people and makes it possible for African countries to develop skills and create jobs.

> *Unless trends change, Africa will be home to 90% of the world's people living without electricity by 2030*

There are a number of ways in which access to modern forms of energy improves health outcomes. An estimated half a million premature deaths each year in Africa result from household air pollution, often linked to dirty cooking fuels. Many health facilities across the continent lack access to reliable electricity: this constrains their use of modern equipment and their ability to store vaccines and medicines. Power is also required to operate water treatment, storage, transmission and distribution facilities effectively, so that Africa's growing cities and towns can access clean water.

Power also enhances learning at school and at home. In 2016, around half of Africa's lower secondary schools and 57% of upper secondary schools had no access to electricity. This undermines the quality of education in many ways, among other things by making it difficult to teach children to use information and communication technologies (ICT). Households, especially women and girls, spend significant time collecting biomass for energy, which limits the time they have available to attend school. Studies have also found that access to electricity at home can increase the time that children spend reading and doing schoolwork.

At the level of businesses, access to electricity is vital to function, prosper, and create jobs. In a recent survey, 41% of firms identified electricity as a major constraint to their operations, the highest of any region in the world. On average, African enterprises report that electricity access issues cause them to lose 25 days of economic activity per year.

One of the sectors most affected is manufacturing. As countries continue to improve the climate for doing business, increasing the reliability and accessibility of electricity will be a key driver for expanding Africa's manufacturing sector.

> *Affordable, reliable electricity is key to expanding manufacturing, and the fourth industrial revolution will create significant opportunities—if access to electricity is extended*

Limited access to electricity is also a significant constraint on the uptake and use of ICT by African entrepreneurs and businesses. A lack of affordable electricity hampers entrepreneurship. A 2019 report by the Bank suggests that the fourth industrial revolution will create significant opportunities for Africa on condition that access to electricity is extended.

Africa's power generation infrastructure is gradually improving. In 2019, Africa reached 209 GW in **total installed electricity capacity**, with **renewable capacity** contributing 43 GW of this amount. The Bank's recent commitments in support of power generation projects, such as two gas-powered plants in Côte d'Ivoire and a

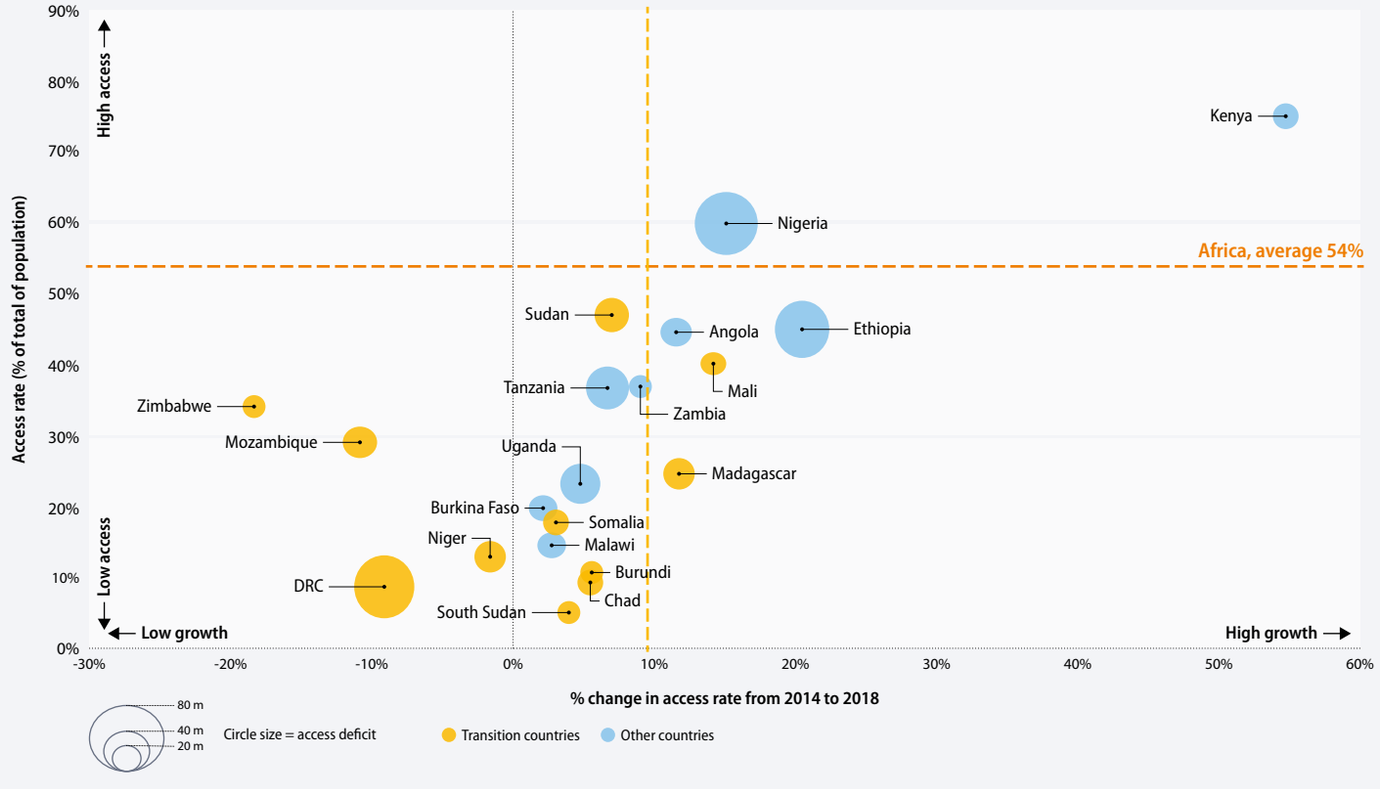
Table 1 **Africa is making steady progress towards universal energy access (Level 1)**

INDICATOR	AFRICA		ADF COUNTRIES		TRANSITION STATES	
	Baseline 2015	Latest 2019	Baseline 2015	Latest 2019	Baseline 2015	Latest 2019
Share of population with access to electricity (% population)	42	54	24	37	22	29
Total installed electricity capacity (GW)	168	209	31	38	13	15
Installed renewable capacity (GW)	33	43	20	23	8	9
Share of population with access to clean cooking solutions (% population)	32	29	10	12	9	12
Electricity losses through transmission, distribution and collection (%)	15.0	17.1	16.8	16.6	15.4	16.9

Improvement over baseline Stability Deterioration

Figure 2 **Access to electricity remains low in Africa**

Top 20 countries with highest deficit in electricity access, 2014–2018



Source: International Energy Agency

solar-powered plant in Chad, will support further expansion in coming years. But investments remain below the levels needed to sustain economic growth.

Amongst the challenges in expanding electricity access are inefficiencies in power systems. **Electricity loss rates through transmission, distribution, and collection** systems were estimated to be 17% in 2019, up from 15% in 2015. In Guinea, the Bank's support to the Conakry Electricity Network Rehabilitation and Extension Project helped reduce the loss rate from 49% to 15% in twelve districts. It also supported the introduction of smart meters, which have pushed up billing and collection rates.

A key means of improving African electricity systems and markets, is effective regulation. The 2019 Electricity Regulatory Index for Africa suggests that most African countries have appropriate legal frameworks to govern their electricity sectors. But it also reports that in most African countries, measures to protect the independence of regulators are inadequate, and regulatory actions and decisions may not be enforceable. This results in ineffective regulation and poor sector performance. Other governance issues

concern the transparency of operations, the rationalising of energy pricing policies, and unnecessary regulatory barriers. In practice, therefore, most African countries still have some way to go to ensure that their electricity systems are well governed by independent regulators.

Expanding regional trade in electricity can augment electricity access and promote efficiency in transmission and distribution systems. Although four power pools have been established and others are being developed, cross-border power trade in Africa is limited. Ambitions to expand regional power systems further and coordinate them more efficiently are held back by a lack of infrastructure at the regional level, weaknesses in national power strategies, limited technical capacity, and governance issues.

Access to electricity for households

In recent years, Africa has made significant progress in expanding the proportion of its population with **access to electricity**. This proportion increased to 54% in 2019 from 42% in 2015. North Africa achieved close to universal access in that period, and for the rest of Africa an additional 20 million people per year gained access to electricity during 2014–2018—more than double the average increase than during 2000–2013. With Africa's fast-growing population, however, access to electricity in Africa remains low, especially in low-income ADF countries (37%) and transition countries (29%). Africa is home to more than two-thirds of the world's people living without electricity (Figure 2), and the current trajectory suggests that this figure will increase to 90% in 2030. Meeting Sustainable Development Goal 7 on access to energy will require significantly scaling up investments in Africa.

Mini-grid and standalone grids are likely to prove the most cost-effective way for reaching the two-thirds of Africa's population that is unconnected (International Energy Agency 2019). Advances in solar technology as well as in storage will make it possible to install increasingly reliable mini-grid systems in remote areas. To date, however, investment in mini-grid systems in Africa has been very limited.

The **share of the population with access to clean cooking solutions** in Africa has remained stubbornly low, falling from 32% in 2015 to 29% in 2019 as population growth outpaces efforts to widen access. This leaves over 900 million people reliant on biomass and other forms of dirty fossil fuels such as kerosene. Access is especially low in low-income ADF countries (12%) and transition countries (12%). These results significantly hamper efforts to improve health outcomes, mitigate climate change, and promote climate-resilient development.

The Bank's impact on the drive for universal energy

In its Ten-Year Strategy, the Bank committed to closing the infrastructure gap and scaling up infrastructure finance for Africa, including for energy. The Bank's New Deal on Energy aims to achieve universal access by 2025.

To this end, the Bank has invested in a wide range of projects, working closely with African governments and the private sector. These projects are helping to rehabilitate and expand vital energy infrastructure; to develop infrastructure projects, plans, and management capacity; and to drive investments in renewable energy. For most African countries, the long-term financing provided by development finance institutions such as the Bank is essential.

In 2019, we delivered 432 km of **new or rehabilitated power transmission lines**, compared to 69 km in 2015. We also continued to support significant increases in the number of **people with new electricity connections**, with 468 000 people newly connected through our support—almost half of whom were women—compared to 73 000 in 2015, but well below our 2019 target of 2.4 million. Almost all of the new connections were in low-income ADF countries. In Uganda, the Bank's Electricity Transport project delivered the 160 km Mbarara-Nkenda 132 kV transmission line, enabling several new hydro plants (47 MW) to be connected to the grid and expanding connections from 300 000 to 1.3 million over 2008–2018.

This said, in 2019 the Bank was unable to sustain recent rapid increases in new power generation and distribution infrastructure. Outcomes fell significantly from 2018 and were well below targets. In 2019, the Bank **installed 291 MW of new power capacity**, compared to 447 MW in 2018 and 490 MW in 2015. In 2019, the Bank **installed or improved 435 km of power distribution lines**, a significant drop from 2430 km in 2018 and well below the Bank's target of 3520 km.

> *For most African countries, the long-term financing provided by development finance institutions like ours is essential*

As for the generation of renewable energy, the Bank has significantly scaled up its support in recent years. In 2019 we **installed 174 MW of new renewable power capacity**, contributing 60% of all new power capacity installed, up from 44% in 2018. During 2016–2019, the period following the launch of the Bank's Strategy for the New Deal on Energy, around 83% of the Bank's investments in power generation were in renewable energy, compared to 67% during 2012–2015.

We are working hard to connect household to off-grid systems and are exploring more opportunities for investing in decentralised energy systems (Box 1). For example, the Jumeme project in Tanzania supported by the Sustainable Energy Fund for Africa is connecting 10 islands on Lake Victoria through off-grid installations. We also recently approved a $20 million loan for a mini-grid tender program in the Democratic Republic of Congo, which will connect 20 000 people in the off-grid cities of Bumba, Genema, and Isiro. We participate in the distributed energy services company (DESCO) program, a joint initiative with the European Union that provided over $53 million to increase local currency financing to DESCOs.

Furthermore, the Facility for Energy Inclusion off-grid fund, set up and co-funded by the Bank, reached final close in 2019 and approved its first three projects. Finally, as per our commitment to promote the growth of clean cooking solutions, the Bank recently launched a pilot technical assistance project on clean cooking in Cameroon, Ghana, and Kenya. Overall, we **provided 2000 people with clean cooking access** in 2019.

Box 1 **Expanding energy access and generation with the Sustainable Energy Fund for Africa**

Through the Sustainable Energy Fund for Africa (SEFA), the Bank approved several technical assistance projects to structure bankable projects/funds to expand energy access and energy generation. These include the Nigeria Energy Access Fund, a scale-up of the Green Mini-Grid Market Development Program, the Ethiopia Renewable Energy Program, and support for a Burundi hydropower project. With SEFA's support, the Bank is also revamping its involvement in energy efficiency by establishing a regional, multiphase program designed to reduce barriers to energy efficiency investments by delivering a range of quickly deployed, complementary technical assistance and capacity development measures to public and private sector stakeholders.

Most of the new power generation capacity installed in 2019 through Bank support was in middle-income countries. In contrast, virtually all newly installed or improved power lines were in low-income ADF countries and fragile countries. The Bank's support for redeveloping the St Louis Power Station in Mauritius helped increase the station's capacity from 634 MW in 2013 to 847 MW in 2018. This has allowed Mauritius to increase its reserve power capacity and improve the reliability of energy supply for the population while supporting its transition to a low-carbon economy.

The Bank's efforts to Light Up and Power Africa are helping improve Africans' quality of life by increasing access to education, health, and water services, while promoting sources of sustainable energy and transitioning Africa to a green growth pathway. The recently completed Zimbabwe Emergency Power Infrastructure Rehabilitation Project has improved water treatment facilities' access to electricity, benefiting 4000 customers. In addition, the newly approved Benin Rural Electrification project will subsidise the connection of 35 schools to the national electricity grid and boost access to water supplies.

The Bank's energy investments have an important regional dimension. In East Africa, the Bank's regional electricity projects are supporting the interconnection of the electricity grids of five Nile equatorial lakes countries (Burundi, Democratic Republic of Congo, Kenya, Rwanda, and Uganda). We have also completed feasibility studies that will pave the way to connect national grids in West Africa Power Pool countries (Benin, Burkina Faso, Niger, Nigeria, and Togo) and Southern Africa Power Pool countries (Botswana, Namibia, Zambia, and Zimbabwe).

Energy and climate change

Climate and energy are intrinsically linked, and changes in one are likely to affect the other. Climate change affects energy resource endowments, production, infrastructure, and transportation. Droughts or floods can severely affect water inflows, which can have a knock-on effect on the power generation capacity of energy production units. Climate concerns impose a new set of conditions on the design, operation, and maintenance of energy infrastructure, whether planned or existing. The predominant use of non-renewable energy, such as oil and coal, and traditional wood-based energy, such as charcoal and biomass, produces CO_2 emissions that contribute to climate change.

> *Climate change imposes new conditions on energy infrastructure. We are mainstreaming climate change and green growth into our operations*

Significant progress has been made under the New Deal on Energy for Africa and the Bank's second Climate Change Action Plan for 2016–2020, which guide our efforts to mainstream climate change and green growth into our energy operations. The Bank's consideration of the climate when designing its energy investments enhances climate resilience and results in the use of low-carbon technologies. In 2019, our renewable energy investments **reduced CO_2 emissions** by 678 000 tonnes, up from 17 300 tonnes in 2015. Furthermore, over the last two years, 156 energy sector projects were screened and reviewed for climate change and green growth considerations: a reduction of about 385 103 $ktCO_2eq$ is expected to result.

During 2016–2019, the energy sector was amongst the sectors that made the most use of the Bank's climate finance resources. From 2016 to 2019, the sector received 39% of the Bank's total climate finance—a total of $3.8 billion that accounted for nearly two-thirds of the energy portfolio. In 2019, the Bank allocated 33% of its $3.6 billion in climate finance to the energy sector.

New programmes to support power for all

Expanding and improving energy generation and access in Africa remains a significant priority for the Bank, and we recently approved a range of new projects to help sustain progress towards energy for all.

Recently approved Bank energy generation projects include Côte d'Ivoire's gas-fired combined-cycle thermal power plant, hydropower projects in Liberia and Madagascar, and three projects under the Bank's Desert to Power Initiative: Chad's first solar independent power producer project, solar generation projects in Burkina Faso, and solar-powered irrigation pumps in Sudan's West

Table 2 **Light Up and Power Africa indicators (Level 2)**

INDICATOR	AFRICA			ADF COUNTRIES		TRANSITION STATES	
	Baseline 2015	Actual 2019	Target 2019	Baseline 2015	Actual 2019	Baseline 2015	Actual 2019
New renewable power capacity installed (MW)	24	174	560	20	6	4	0
People with new electricity connections[1] (thousands)	73	468	2400	73	464	36	148
—of whom women	36	218	1200	36	216	16	67
People provided with clean cooking access (thousands)	0	2	3200	0	2	0	0
—of whom women	0	1	1600	0	1	0	0
New or improved power transmission lines (km)	69	432	576	69	394	18	0.1
Emissions reduction in energy (thousand tons CO_2)	17.0	678.0	1800.0	10.0	597.0	1.1	0
New total power capacity installed (MW)	490	291	880	80	21	4	0
New or improved power distribution lines (km)	875	435	3 520	875	402	381	402

Achieved 95% of 2019 target Achieved less than 95% of 2019 target Achieved less than the baseline

1 There are different definitions for assessing the number of people with new electricity connections. The one used here is consistent with the definition provided in the Bank Group's Results Measurement Framework and the New Deal on Energy: it measures the number of people connected to electricity by distribution lines only.

Kordofan and North Kordofan states (these help phase out diesel-fuelled pumps). In Mozambique, the Bank has recently approved support for building an integrated liquefied natural gas plant, including a liquefaction facility.

As for electricity transmission and distribution, we recently approved projects in Angola and Tunisia to strengthen electricity transmission and distribution infrastructure, and in Gambia to connect households, small business, and public institutions to the electricity grid. ■