



Large Infrastructure

Access to electricity

Jakkie Cilliers and Blessing Chipanda

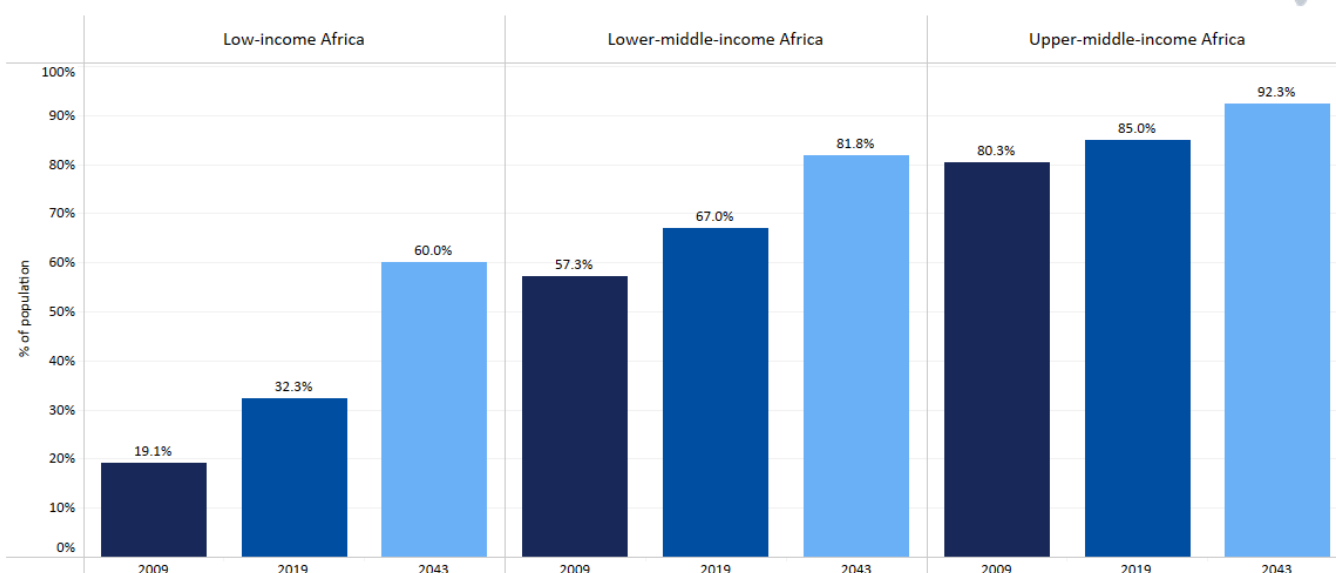
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Access to electricity

Electricity infrastructure is lacking in Africa, with the disparities between urban and rural access rates continuing to persist. About 45.4% of Africa's population had no access to grid electricity in 2019, and only four African countries (Egypt, Mauritius, Seychelles and Tunisia) had universal access. The situation in rural areas is much worse. Only 19.6% of low-income Africans residing in rural areas had access to electricity in 2019. In rural lower-middle-income Africa, this figure was approximately 52.2%, while in rural upper-middle-income Africa, it reached nearly 73% (see Chart 3). Fourteen African countries have less than 10% rural electricity access and some, such as the Central African Republic, Sierra Leone and the Democratic Republic of Congo (DR Congo), do not even reach 2%.

Limited access to and insufficient supply of electricity in Africa, particularly in sub-Saharan Africa, create substantial limitations for modern economic activities, public service provision, quality of life and the adoption of new technologies. These constraints affect various sectors including education, health, trade and finance. Approximately 1.75 million public health centres and schools lack reliable electricity supply in Africa, while one healthcare facility in four lacks electricity and three in four lack reliable power. About 80% of businesses in Africa (except in North Africa and, until recently, South Africa) experience outages, compared to 66% in South Asia and 38% in Europe. Furthermore, electricity load-shedding durations tend to be far longer in Africa than in Asia and Europe.[1]

Chart 3: Access to electricity: total, urban & rural in Africa by income groups, 2009, 2019 & 2043

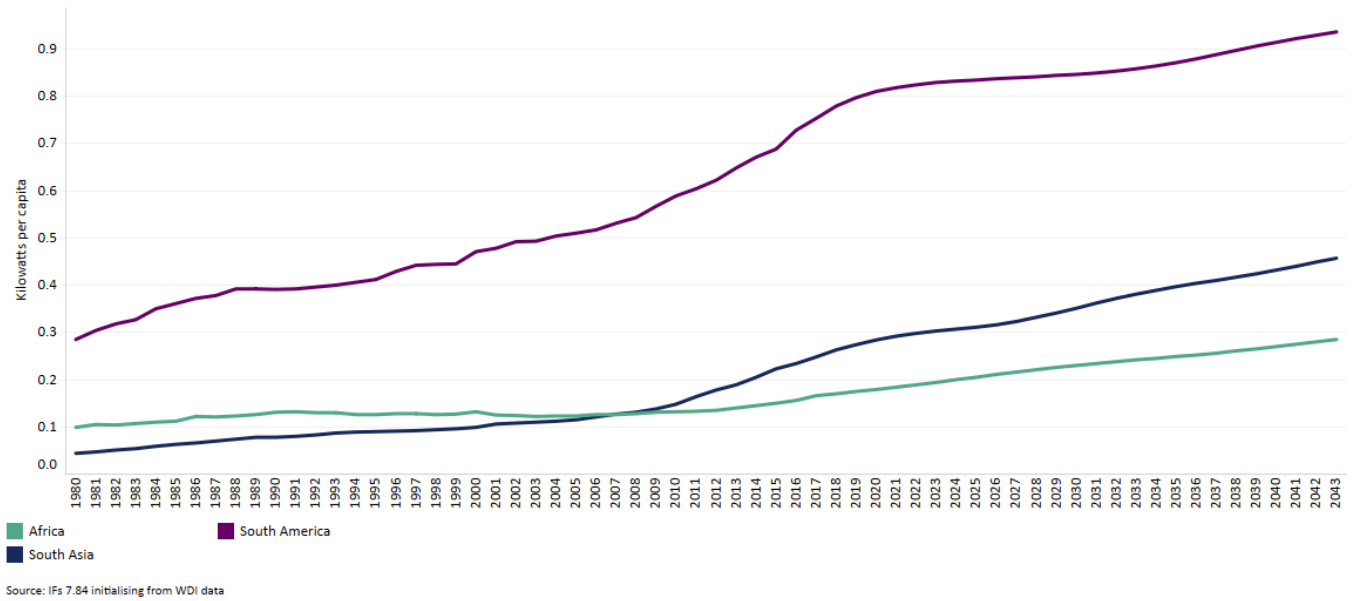


Source: IFs 7.84 initialising from WDI data

In the Current Path forecast, rates of access will increase but progress will likely be slow. In fact, the absolute number of Africans without access to electricity in both low- and low- middle-income countries will either remain static or increase modestly beyond 2030 as investment in infrastructure lags behind rapid population growth.

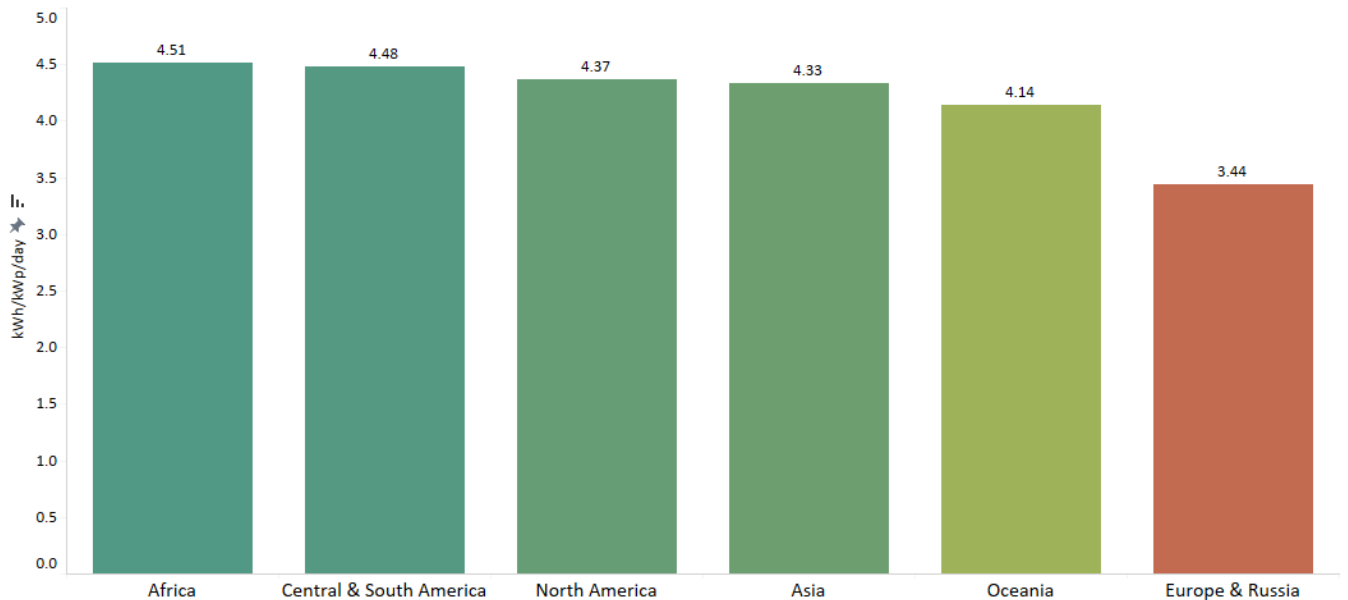
By 2043, electricity generation capacity in Africa (0.3 kW per capita) will also be lower than in South America and South Asia (see Chart 4). So, instead of catching up, Africa is falling further behind.

Chart 4: Electricity generation capacity per capita in Africa compared with South America and South Asia, 1980-2043



Little progress has been made in per capita electricity generating capacity in the past decades, although the continent has the potential to generate 4.51 kWh/kWp/day,[2] the highest in the world (see Chart 5). This is more than double the average use now.

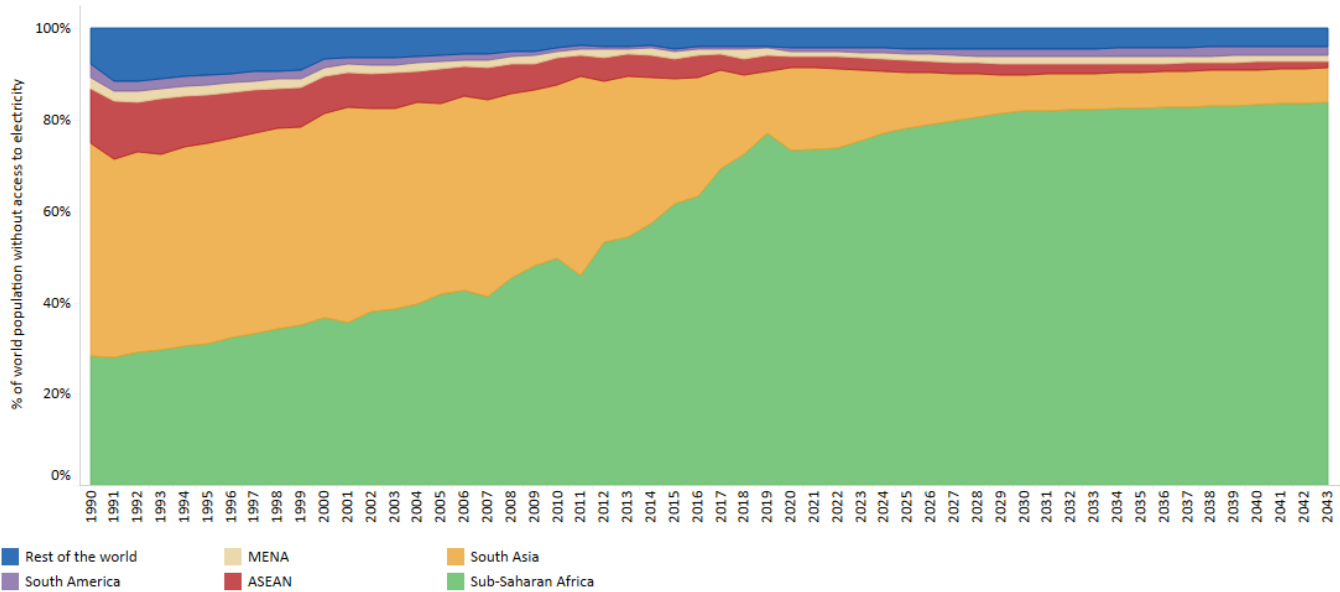
Chart 5: Average long-term practical potential solar energy output, by world region



Source: World Economic Forum, 2022

Furthermore, Africa has the potential to generate 350 GW of hydroelectricity, 110 GW of wind power and 15 GW of geothermal power.[3] However, about 592.3 million Africans had no access to electricity in 2019—accounting for nearly 77.8% of the world population without access to electricity, with the larger percentage being in sub-Saharan Africa (see Chart 6).

Chart 6: History and forecast shares in world population without access to electricity by region, 1990-2043



Source: IFs 7.84 initialising from WDI data

In sub-Saharan Africa, the number of people without electricity has risen due to population growth outpacing electrification progress. In 2019, sub-Saharan Africa had the highest number of people without access to electricity in Africa, 587.4 million people—accounting for about 99.2% of Africa’s population without access to electricity. At the same time, South America had only 1.6 million and South Asia had 102.8 million people without access.

The infrastructure gap in sub-Saharan Africa cuts national economic growth by two percentage points every year and reduces productivity by as much as 40%.^[4] Despite efforts to narrow this gap, sub-Saharan Africa still falls behind. For example, India connected an additional 29.2 million people to grid electricity between 2017 and 2022, compared to just 19.1 million achieved by the whole of sub-Saharan Africa. This has led to electricity generation capacity per person in Togo, Malawi, Uganda, Rwanda, Burkina Faso, Sierra Leone, Niger and Lesotho being less than 10% of that of South Asia and less than 4% of that of South America average in 2019. Furthermore, in the Current Path forecast, the unmet electricity demand in sub-Saharan Africa countries will increase by 5.5% between 2022 and 2033.

It is not only that access to electricity in Africa is low, but electricity is also much more expensive than in other regions. The AfDB estimates that electricity costs in Africa are three times more than in other developing regions, and most manufacturing firms operating in East and West Africa heavily rely on expensive backup generators as their primary energy source, which negatively affects their productivity and profit margins.^[5]

High electricity costs in Africa is largely driven by the lack of investment in generation capacity and in the associated distribution networks. Ironically, several African countries export substantial quantities of energy, including coal, and unrefined oil and gas, but they end up importing refined fuels. Citizens and businesses in many countries in sub-Saharan Africa then often have to rely on generators to supplement their electricity supply due to frequent outages.^[6]

The continuous increase in demand for electricity in Africa is expected to be four times higher in 2040 than it was in 2010.^[7] Improving the supply and distribution of electricity infrastructure is a priority, considering Africa’s vast and environmentally friendly electricity generation potential. Africa has numerous sites for generating wind, solar and

hydropower, though it currently uses less than 10% of its hydroelectric capacity.[8] As Africa seeks both to grow and to industrialise, green energy should enable it to leapfrog past a heavy and environmentally catastrophic dependence on fossil fuels into a future of renewable energy. See the theme on [energy and climate change](#).

Endnotes

1. African Development Bank, African Economic Outlook 2022: Supporting climate resilience and a just energy transition in Africa, 25 May 2022.
2. World Economic Forum, Africa leads the world in solar power potential, September 2022.
3. F Ngile, Financing Africa's \$100 billion annual infrastructure gap just got trickier, Quartz, 20 July 2022.
4. Engineering News, Infrastructure challenges Africa Business Forum to provide solutions for Africa's socio-economic, July 2018.
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6. African Development Bank, African Economic Outlook 2018, 2018
7. K Lakmeeharan, Q Manji, R Nyairo and H Poeltner, Solving Africa's infrastructure paradox, McKinsey & Company, 6 March 2020.
8. African Development Bank, African Economic Outlook 2018, 2018.

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About the authors

Dr Jakkie Cilliers is the ISS's founder and former executive director. He currently serves as chair of the ISS Board of Trustees and head of the African Futures and Innovation (AFI) programme at the Pretoria office of the Institute. His 2017 best-seller *Fate of the Nation* addresses South Africa's futures from political, economic and social perspectives. His three most recent books, *Africa First! Igniting a Growth Revolution* (March 2020), *The Future of Africa: Challenges and Opportunities* (April 2021), and *Africa Tomorrow: Pathways to Prosperity* (June 2022) take a rigorous look at the continent as a whole.

Dr Blessing Chipanda joined the African Futures and Innovation (AFI) programme in January 2023. Before joining the ISS he worked as an assistant lecturer/research assistant at the University of Pretoria, Department of Economics. He is particularly interested in tasks within the wider realm of international trade, development economics, public policy, monetary policy, and econometric modelling. Equally interested in economic and socio-economic activities that impact social welfare. Blessing has a PhD in economics from the University of Pretoria, South Africa.

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