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**Economic Commission for Africa**  
**Africa Regional Forum on Sustainable Development**  
Ninth session

Niamey (hybrid), 28 February–2 March 2023

Item 7 (c) of the provisional agenda\*

**Parallel meetings for an in-depth review of progress made  
and peer learning on the sub-themes of the Regional Forum:  
industry, innovation and infrastructure****Achieving Sustainable Development Goal 7 –  
affordable and clean energy – in Africa****I. Introduction**

1. Affordable, reliable, sustainable and modern energy services are a critical development enabler for Africa, because they create solutions to the climate crisis and are essential for the overall implementation of the Sustainable Development Goals set out in the 2030 Agenda for Sustainable Development and, in particular, the goals set out in Agenda 2063: The Africa We Want, of the African Union. Specifically, energy is a development enabler and a pathway towards addressing social, environmental and economic challenges through an integrated approach by: providing equal energy access and consumption levels; leapfrogging the dirty fuels of the past with the development of clean, renewable energy; and balancing the demand and supply of energy, notably through energy efficiency programmes, to enhance economic growth.

2. The global energy crisis caused by the overlapping of the war between the Russian Federation and Ukraine (resulting in inflation in prices for food, energy and other commodities), the coronavirus disease (COVID-19) pandemic and the growing impacts of climate change have strained African economies and energy systems and have even reversed positive trends of improving access to modern energy. To illustrate this, 4 per cent more people were living without electricity in 2021 compared with in 2019.<sup>1</sup>

3. Africa has abundant energy resources – both fossil fuels and renewable sources. With regard to renewable energy resources, the continent has more than 350 GW of hydropower, more than 100 GW of wind power, about 15 GW of geothermal power,<sup>2</sup> abundant solar power with over 60 per cent of the global solar power resources,<sup>3</sup> abundant biomass and even some marine energy potential. With regard to fossil fuel resources, Africa accounts for 7 per cent (12.9 trillion m<sup>3</sup>), 6.4 per cent (257.5 billion m<sup>3</sup>) and 4.1 per cent (164.4 billion m<sup>3</sup>) of global natural gas proven reserves, production and consumption, respectively. The continent's share of global

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\* ECA/RFSD/2023/1.

<sup>1</sup> International Energy Agency, *Africa Energy Outlook 2022* (Paris, International Energy Agency, 2022).

<sup>2</sup> African Development Bank Group, "Why Africa is the next renewables powerhouse", 7 December 2018.

<sup>3</sup> International Energy Agency, *Africa Energy Outlook 2022*.



proven crude oil reserves, production and consumption are 7.2 per cent (125.1 billion barrels), 8.1 per cent (7.3 million barrels per day) and 4.2 per cent (3.9 million barrels per day), respectively.<sup>4</sup> Yet, the continent remains the least energized region, accounting for close to 589 million (80 per cent) of the 733 million people globally who are without access to electricity and 970 million (39 per cent) of the approximately 2.4 billion people without access to clean cooking solutions.<sup>5</sup>

4. The continent accounts for about 17 per cent of the global population but only 3.4 per cent of global consumption of primary energy (which is just under that of Japan and can be compared with, for example, a 45 per cent share for the Asia-Pacific region, 25 per cent for China and 6 per cent for India). The continent's total installed electricity capacity is about 250 GW, which is only about 3 per cent of the global installed electricity capacity of about 8,100 GW and is just under 11 per cent of the capacity of China (2,370 GW), about 62 per cent of the capacity of India (404 GW) and 26 per cent of the capacity of the European Union (963 GW). The African share of the installed global renewable power capacity of just over 3,000 GW is only 1.8 per cent, while the continent accounts for only 3.2 per cent of the 28,500 TWh of electricity generated globally, 1.3 per cent of the non-hydro global renewable power generation of 3,657 TWh, 3.6 per cent of the global hydropower generation of 4,274 TWh, 2.3 per cent of the global renewable power generation of 7,500 TWh and 3 per cent of the global total energy consumption in industry.<sup>6</sup> Regarding electricity consumption, the average per capita electricity consumption for Africa is about 600 kWh per year (about 200 kWh when South Africa and North African countries are excluded), which is unacceptably low when compared with 7,800 kWh for Japan, 4,600 kWh for China, 1,000 kWh for India and 2,100 kWh for Central and South America.

5. Africa needs access to plenty of affordable and reliable modern energy services to close the huge economic and social development gaps on the continent, recover better from the COVID-19 pandemic, industrialize, trade, and respond to population growth, rapid urbanization and the increasing impacts of climate change. Energy demand on the continent is expected to grow substantially over the next decade and beyond.

6. In its report entitled *Africa Energy Outlook 2022*, the International Renewable Energy Agency has modelled and analysed what it would mean to fully meet the targets under Sustainable Development Goal 7 in Africa by 2030 in what it calls the sustainable Africa scenario, in which it is assumed that all of the energy-related targets are achieved in Africa. In this scenario, among other things: (a) the modern primary energy supply rises by one third between 2020 and 2030; (b) the use of traditional bioenergy for cooking is eradicated; (c) the demand for electricity increases by 75 per cent to over 1,180 TWh; (d) energy intensity (the amount of energy used per unit of gross domestic product (GDP)) decreases by 5 per cent per year; (e) the final consumption of modern fuels increases by 5 per cent per year; (f) oil and gas production continue to increase, but exports and associated revenues fall while domestic consumption increases; (g) natural gas continues to dominate in the power mix well beyond 2030, while solar photovoltaic and wind power increase dramatically; and (h) annual investments total about \$80 billion up to 2030, mainly from the private sector, and in particular from the private sector in Africa itself. However, over the past decade, less than 2 per cent of global clean energy investments have been invested in Africa (and those have been mainly invested in just a handful

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<sup>4</sup> Compiled from various sources, including British Petroleum and the Organization of the Petroleum Exporting Countries.

<sup>5</sup> World Bank and others, *Tracking SDG7: the Energy Progress Report 2022* (Washington, D.C., International Bank for Reconstruction and Development and World Bank, 2022).

<sup>6</sup> Compiled from various sources, including the International Energy Agency, the International Renewable Energy Agency and British Petroleum.

of countries), even though Africa remains the final frontier for transformative clean energy investment.

7. Against the background of: (a) a changing climate that is costing African economies on average 5 per cent of their GDP annually, and even triple that amount in some cases; (b) a huge energy access deficit to close, which must be done urgently and at scale, in order to achieve the Sustainable Development Goals; (c) abundant energy resources – both renewable energy sources and fossil fuels; (d) limited public resources and low levels of private sector investment in energy transformation in Africa; and (e) limited support for recovery from the impacts of the COVID-19 pandemic and energy prices that have skyrocketed owing to the war between the Russian Federation and Ukraine, African policymakers have some difficult choices to make regarding their energy future.

8. The energy situation in Africa thus calls for a paradigm shift and transformative action to rethink energy on the continent, along with urgent action to address the continent's chronic energy access challenges if it is to meet the development objectives set out in the 2030 Agenda and the wider goals set out in Agenda 2063.

## II. Trends and progress

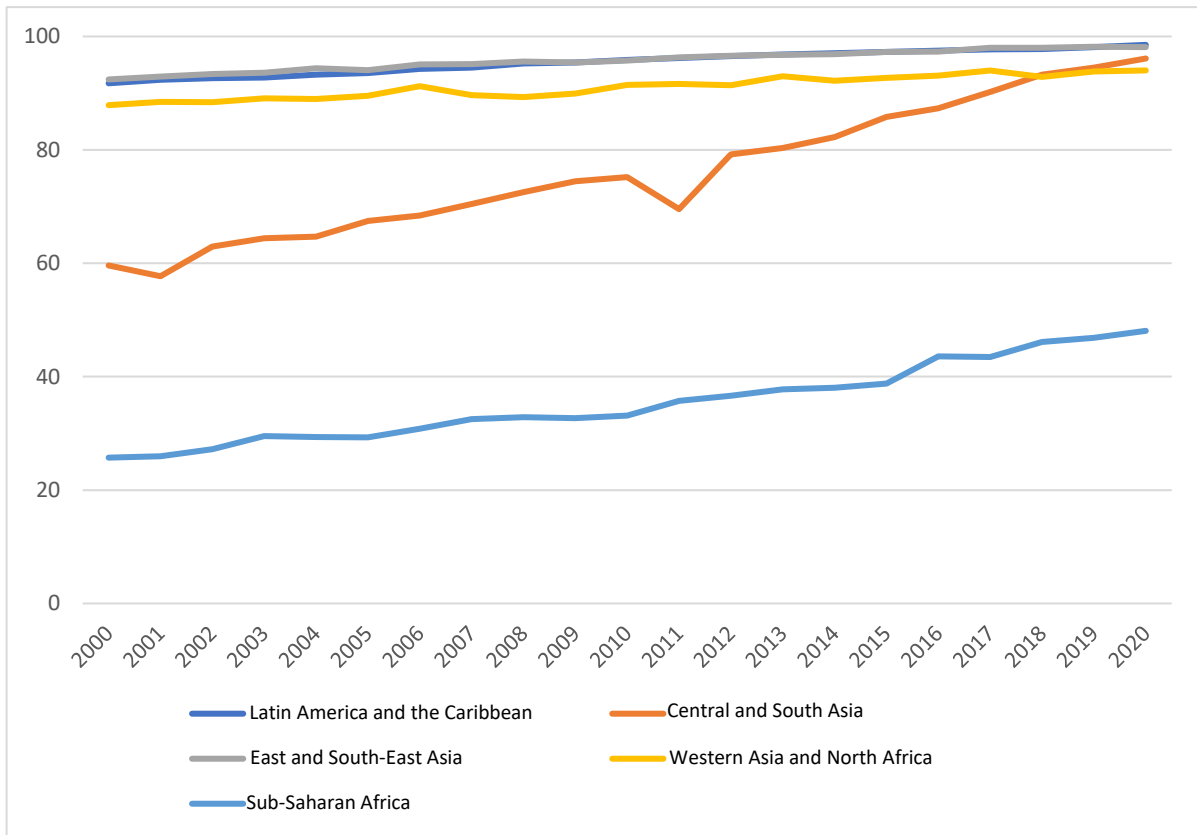
9. Most of Africa is not on track to meet the targets under Sustainable Development Goal 7 on ensuring access to affordable, reliable, sustainable and modern energy for all. This has knock-on effects on progress towards attainment of all the other Goals, as access to affordable and reliable modern energy services is a critical requirement.

### A. Indicator 7.1.1: access to electricity

10. Indicator 7.1.1 is aimed at ensuring universal access to affordable, reliable, sustainable and modern energy services from electricity. It is a measurement of the proportion of the population with access to electricity. The Energy Progress Report 2022<sup>7</sup> indicates that most African countries are not on track to achieve universal access to electricity by 2030. According to that report, Africa remains the least electrified region (see figure 1, figure 2 and figure 3), accounting for 589 million (80 per cent) of the 733 million people globally who are without access to electricity (see figure 4). Some 80 per cent of those without access to electricity live in 23 countries, 19 of which are in Africa (see figure 5). The number of people globally without access to electricity fell from 1.2 billion to 733 million between 2010 and 2020, driven by major electrification efforts in Asia. During the same period, even though the average electrification rate in Africa increased from 44 per cent to 56 per cent, the net increase of people without access to electricity on the continent was about 5 million, mainly because of population growth and weak efforts to increase electrification in many countries.

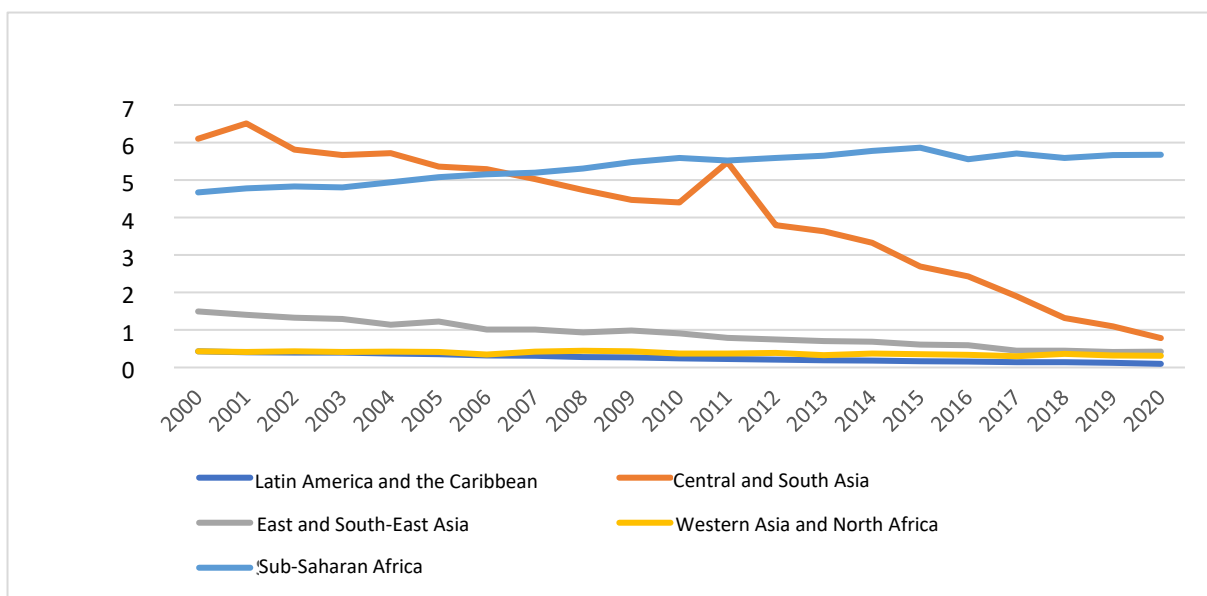
<sup>7</sup> World Bank and others, *Tracking SDG7*.

Figure 1  
**Indicator 7.1.1: Proportion of population with access to electricity, by region**  
 (Percentage)



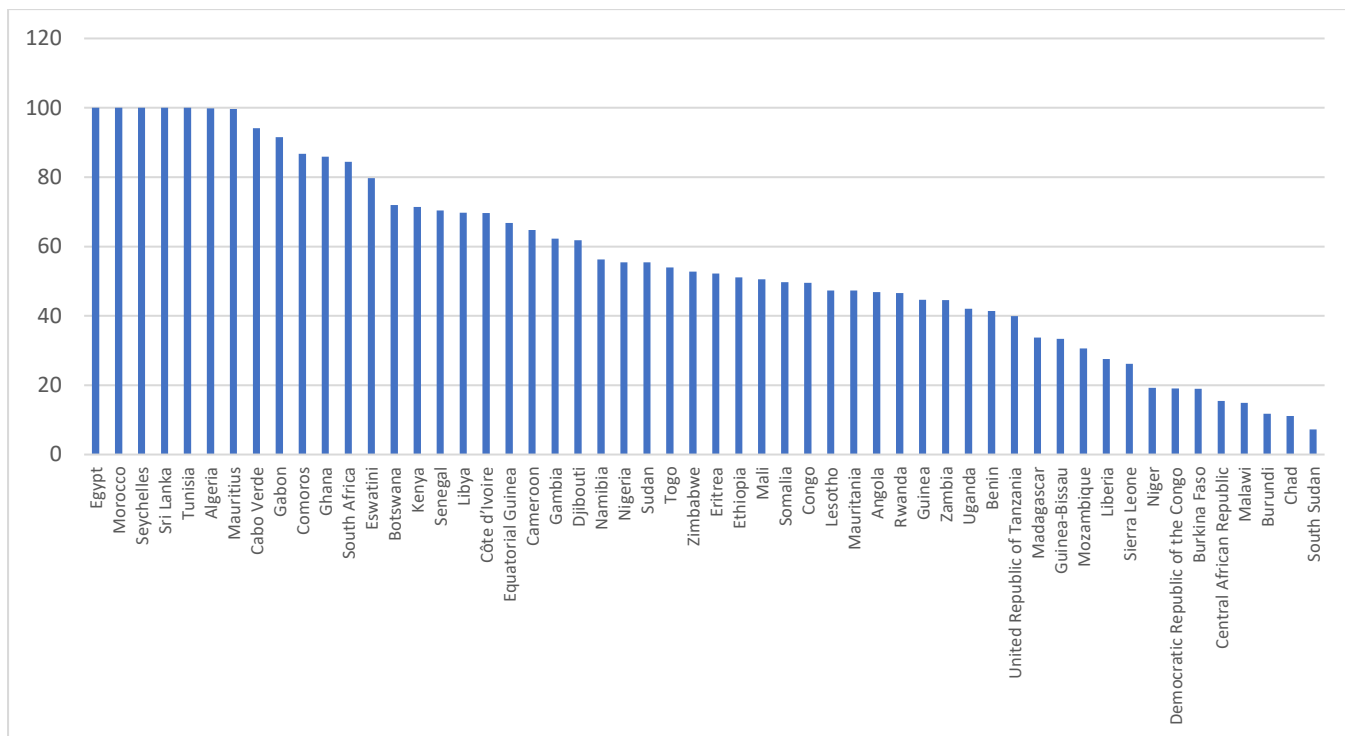
Source: World Bank and others, “Access to electricity”, Tracking SDG 7 Database, available at <https://trackingsdg7.esmap.org/> (accessed on 30 December 2022).

Figure 2  
**Indicator 7.1.1: Population without access to electricity**  
 (Millions)



Source: World Bank and others, “Access to electricity”, Tracking SDG 7 Database, available at <https://trackingsdg7.esmap.org/> (accessed on 30 December 2022).

Figure 3  
**Proportion of population with access to clean cooking solutions in 2020**  
 (Percentage)



Source: World Bank and others, “Access to electricity”, Tracking SDG 7 Database, available at <https://trackingsdg7.esmap.org/> (accessed on 30 December 2022).

Figure 4  
**Population without access to electricity in 2020, by region**  
 (Millions)

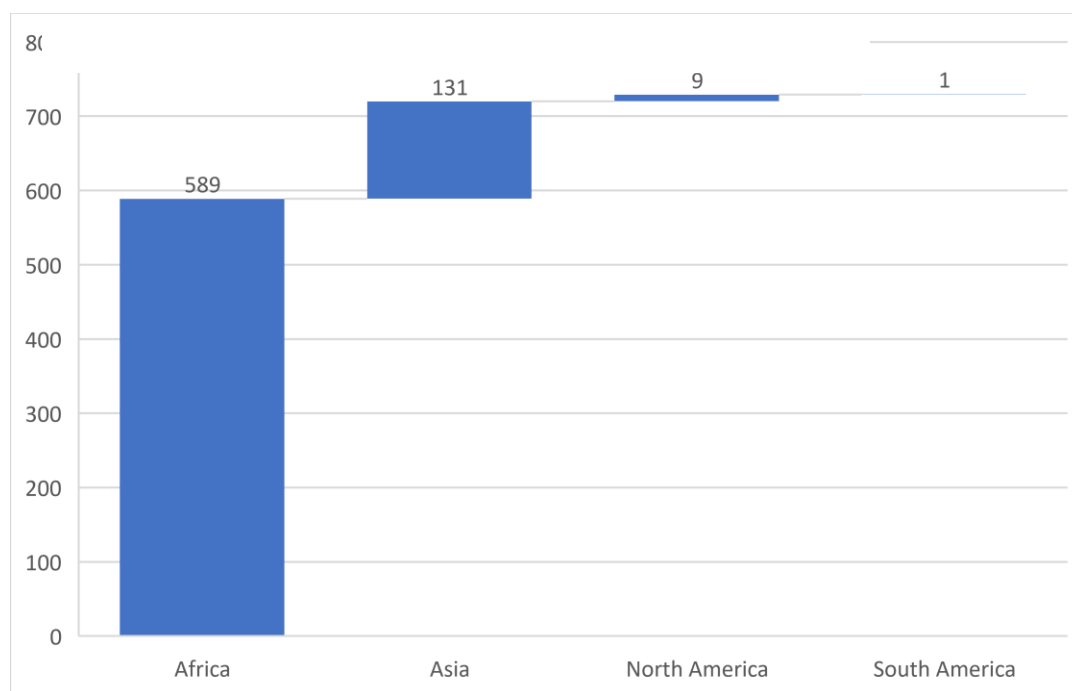
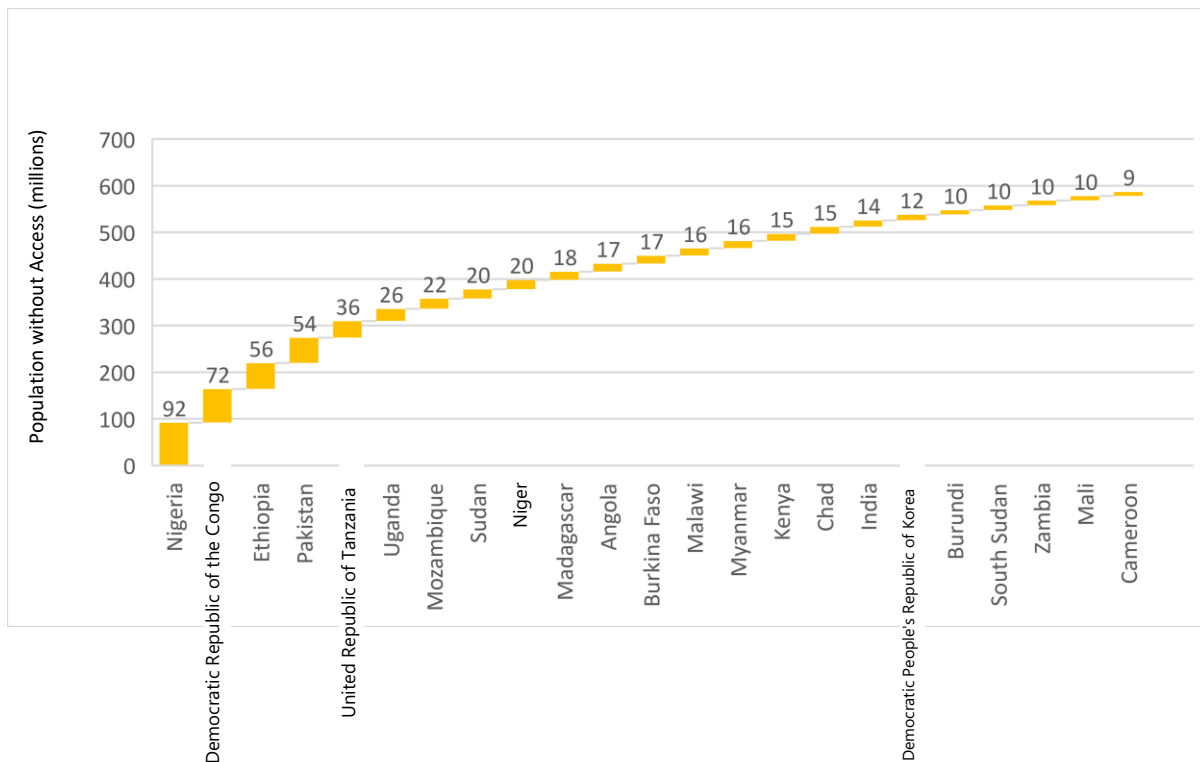


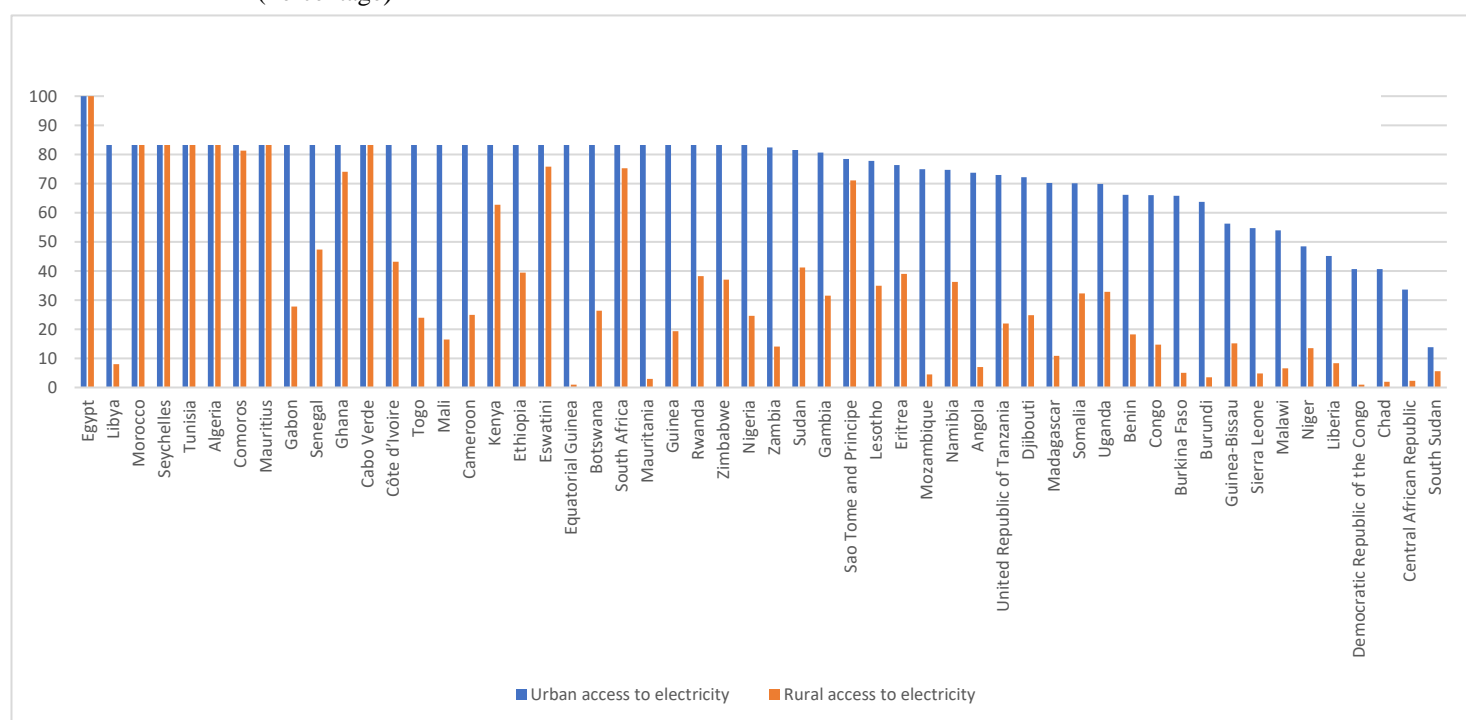
Figure 5  
**Population without access to electricity in 2020 in the countries accounting for 80 per cent of the global population without access**  
 (Millions)



Source: Sustainable Energy for All; and World Bank and others, “Access to electricity”, Tracking SDG 7 Database, available at <https://trackingsdg7.esmap.org/> (accessed on 30 December 2022).

11. Rural electrification remains a major challenge for most African countries, despite the many efforts being undertaken at the national level in some of these countries. A significant rural/urban divide persists (see figure 6), with an average 82 per cent electrification rate (78 per cent for sub-Saharan Africa) in urban areas compared with 37 per cent (28 per cent for sub-Saharan countries) in rural areas. Electricity access in Africa is mainly in tier 1 according to the multi-tier framework for measuring energy established by the World Bank, meaning that it does not positively contribute to economic development. Electricity access means obtaining adequate electricity that is available when needed, reliable, high-quality, affordable, legal, convenient, healthy and safe for all required electricity needs across households and community institutions.

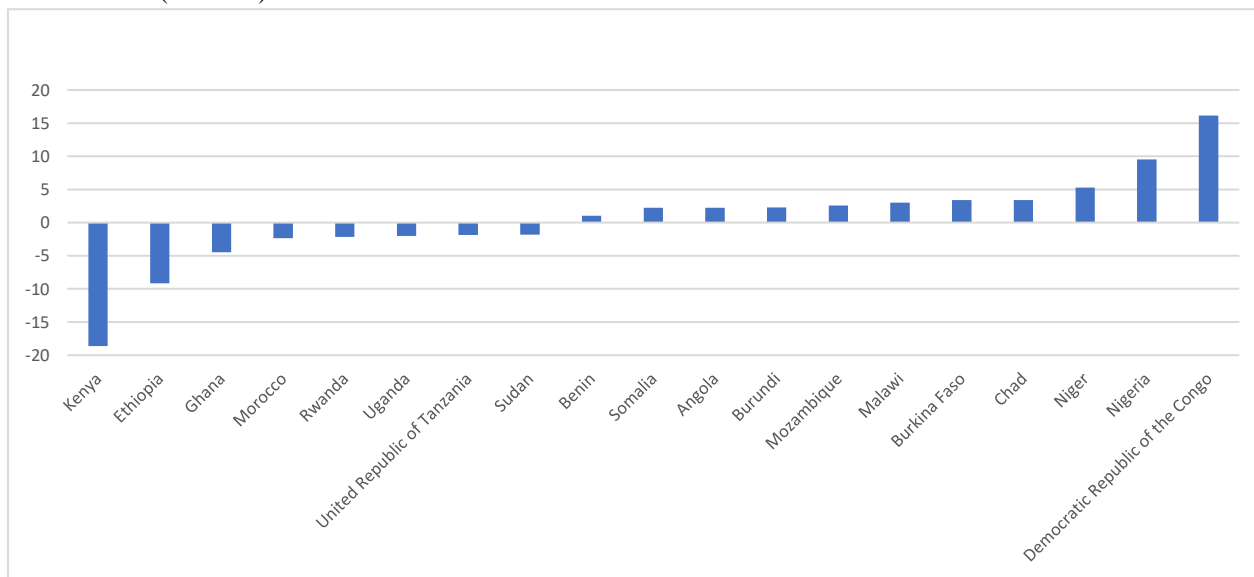
Figure 6  
**Share of rural/urban population with access to electricity in 2020, by country**  
 (Percentage)



Source: World Bank and others, “Access to electricity”, Tracking SDG 7 Database, available at <https://trackingsdg7.esmap.org/> (accessed on 30 December 2022).

12. Algeria, Cabo Verde, Egypt, Mauritius, Morocco, Seychelles and Tunisia have achieved or are close to achieving universal access to electricity, while some countries – notably Ethiopia, Ghana, Kenya, Rwanda and Uganda – are making good progress in increasing electrification. Of the greatest concern are Malawi, Burkina Faso, Chad, the Niger, Nigeria and the Democratic Republic of the Congo, which, in increasing order, were the countries with the highest increase in population without access to electricity between 2010 and 2020 (see figure 7). Continuing with current policies and levels of ambition will only worsen the situation on the continent. Under such a scenario, it is projected in the Energy Progress Report 2022 that about 610 million people in Africa (out of 679 million people globally) will still lack access to electricity in 2030. Achieving the maximum impact with regard to significantly increasing the number of people with access to electricity in Africa will require focusing on the Democratic Republic of the Congo, Ethiopia and Nigeria, while to ensure that no one is left behind the focus will need to be on such countries as Burkina Faso, Burundi, Chad, Malawi, the Niger and South Sudan.

Figure 7  
**Increase in population without access to electricity between 2010 and 2020, by country**  
 (Millions)



Source: World Bank and others, “Access to electricity”, Tracking SDG 7 Database, available at <https://trackingsdg7.esmap.org/> (accessed on 30 December 2022).

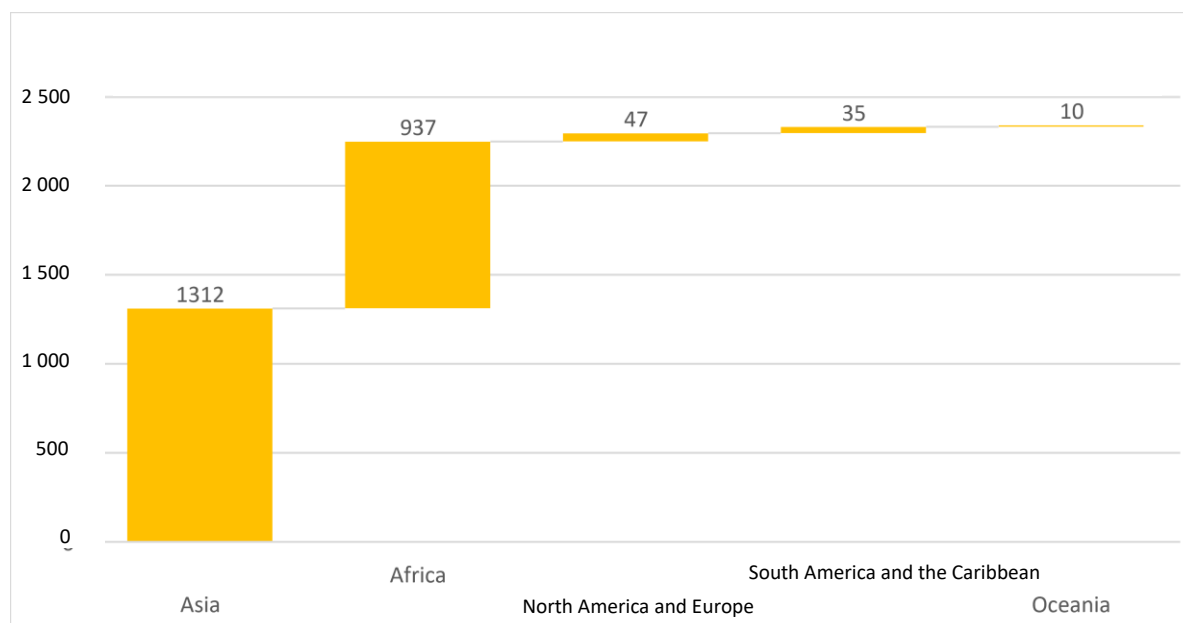
**B. Indicator 7.1.2: access to clean fuels and technologies for cooking**

13. Indicator 7.1.2 is aimed at ensuring universal access to affordable, reliable, sustainable and modern energy services from clean fuels and technologies for cooking. It is a measurement of the proportion of the population with a primary reliance on clean fuels and technologies. Most African countries are not on track to achieve universal access to clean cooking fuels and technologies.<sup>8</sup> Globally, 69 per cent of people had access to clean cooking fuels and technologies in 2020. The number of people without access has decreased at a sluggish rate, from 3 billion people in 2010 to 2.4 billion in 2020. The African share of this global population without access to clean cooking solutions was 739 million people (39 per cent) in 2020, as shown in figure 8, with African countries constituting 11 of the 23 countries that, together, accounted for 80 per cent of the global population without access to clean cooking solutions (see figure 9). The number of people without access to clean cooking solutions in Africa increased by 170 million to about 937 million between 2010 and 2020, owing to population growth and a low level of investment in solutions to the issue, while the number of people with access increased by 131 million to 402 million. Only 11 African countries, including Algeria, Egypt, Morocco, South Africa and the Sudan, made significant improvements in the number of people gaining access, while in 41 African countries, including the Democratic Republic of the Congo, Ethiopia, Nigeria, Uganda and the United Republic of Tanzania, the number of people without access increased substantially, driven by population growth and weak investments in clean cooking solutions. Figure 10 shows the top countries in both of these categories.

<sup>8</sup> The World Health Organization defines clean cooking fuels and technologies at the point of use as solar, electric, biogas, natural gas, liquefied petroleum gas and alcohol fuels, including ethanol.

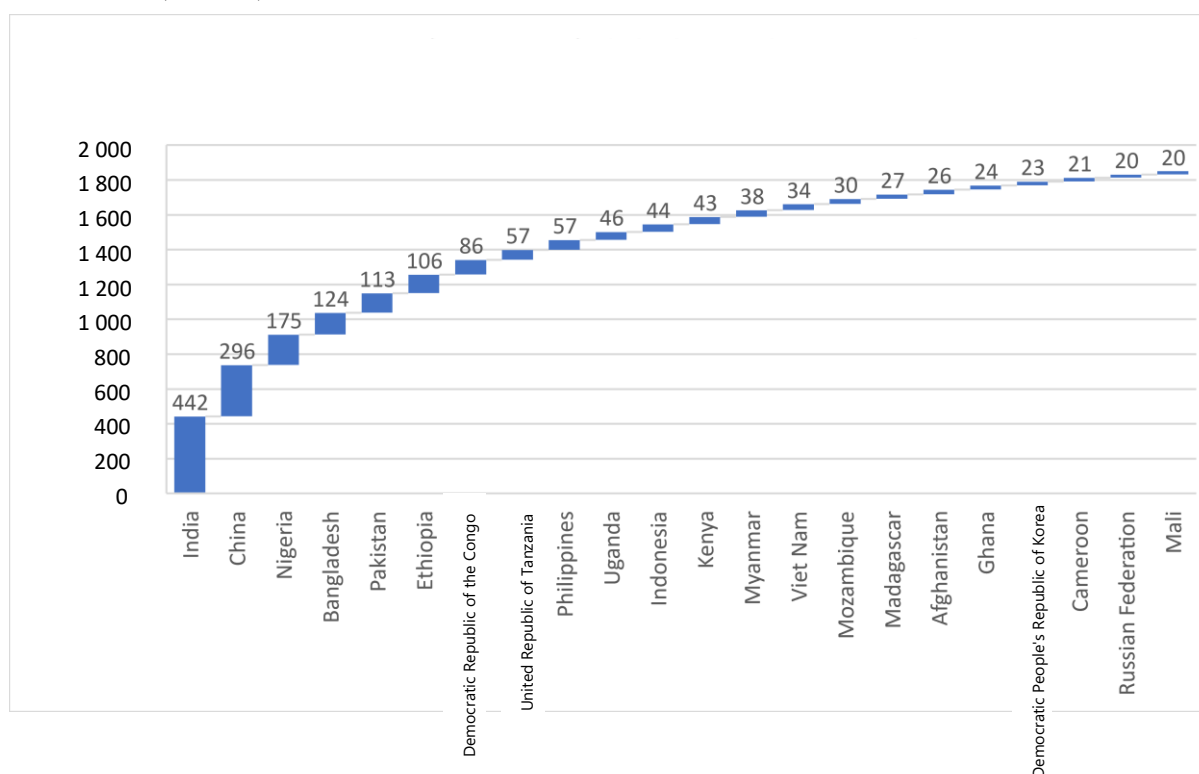


Figure 8  
**Population without access to clean cooking solutions in 2020, by region**  
 (Millions)



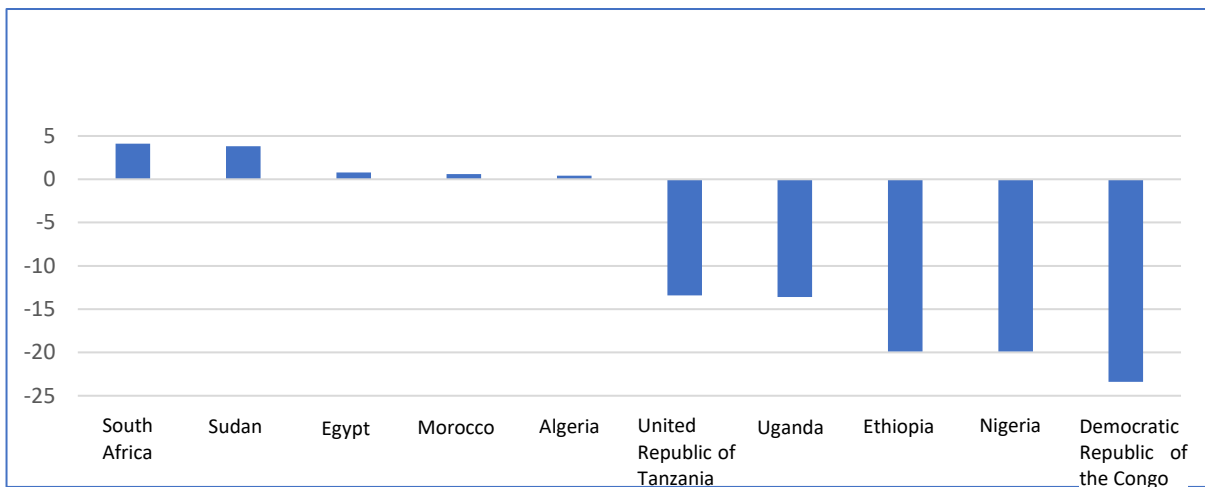
Source: World Bank and others, “Access to electricity”, Tracking SDG 7 Database, available at <https://trackingsdg7.esmap.org/> (accessed on 30 December 2022).

Figure 9  
**Population without access to clean cooking solutions in 2020 in the countries accounting for 80 per cent of the global population without access**  
 (Millions)



Source: World Bank and others, “Access to electricity”, Tracking SDG 7 Database, available at <https://trackingsdg7.esmap.org/> (accessed on 30 December 2022).

Figure 10  
**Increase in the number of people with access to clean cooking solutions between 2010 and 2020**  
 (Millions)



Source: World Bank and others, “Access to electricity”, Tracking SDG 7 Database, available at <https://trackingsdg7.esmap.org/> (accessed on 30 December 2022).

14. Apart from Oceania, Africa compares poorly with other regions, with over 80 per cent of the population depending on the use of traditional biomass for cooking (see figure 11 and figure 12), resulting in more than 500,000 deaths per year that are attributable to indoor pollution.<sup>9</sup> The chronic lack of access to clean cooking solutions in Africa is worse in rural areas, and the rural/urban divide remains a major challenge to overcome in most African countries (see figure 13).

<sup>9</sup> International Energy Agency, *Africa Energy Outlook 2022*.

Figure 11  
**Proportion of population with access to clean cooking fuels and technologies in Africa in 2020, by country**  
 (Percentage)

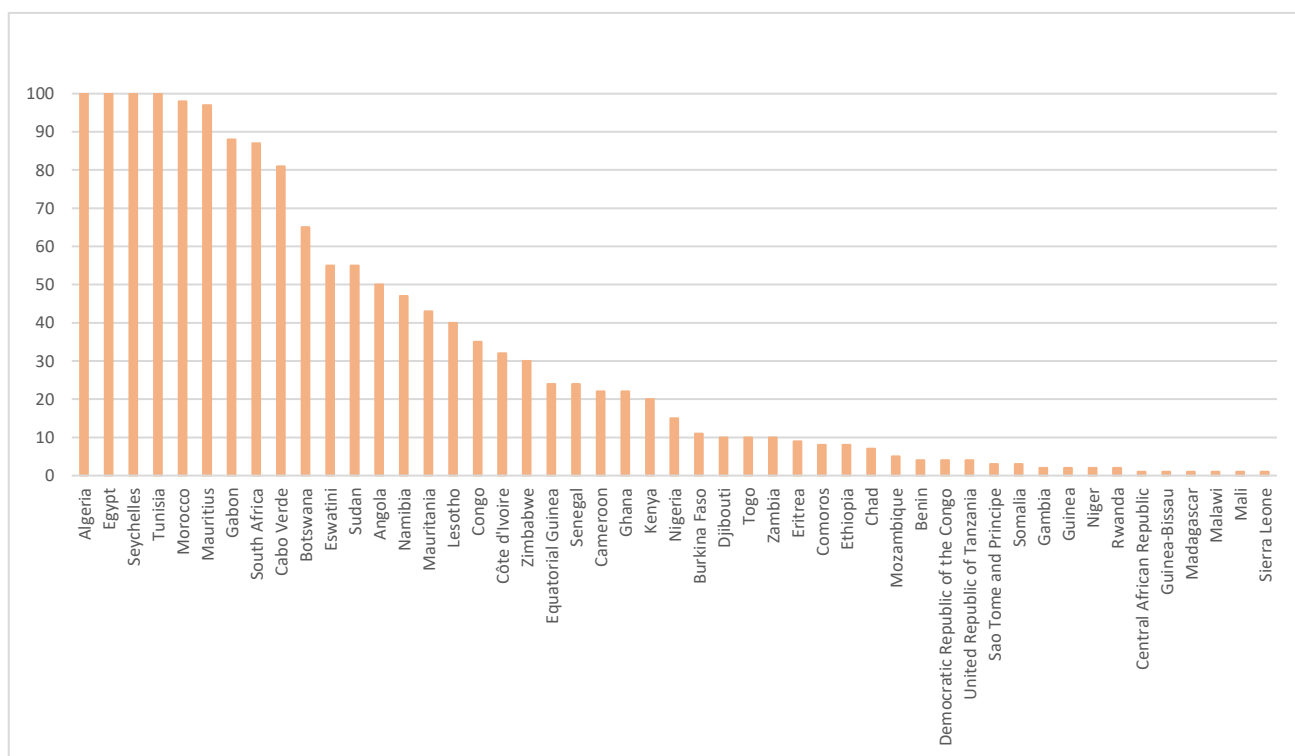
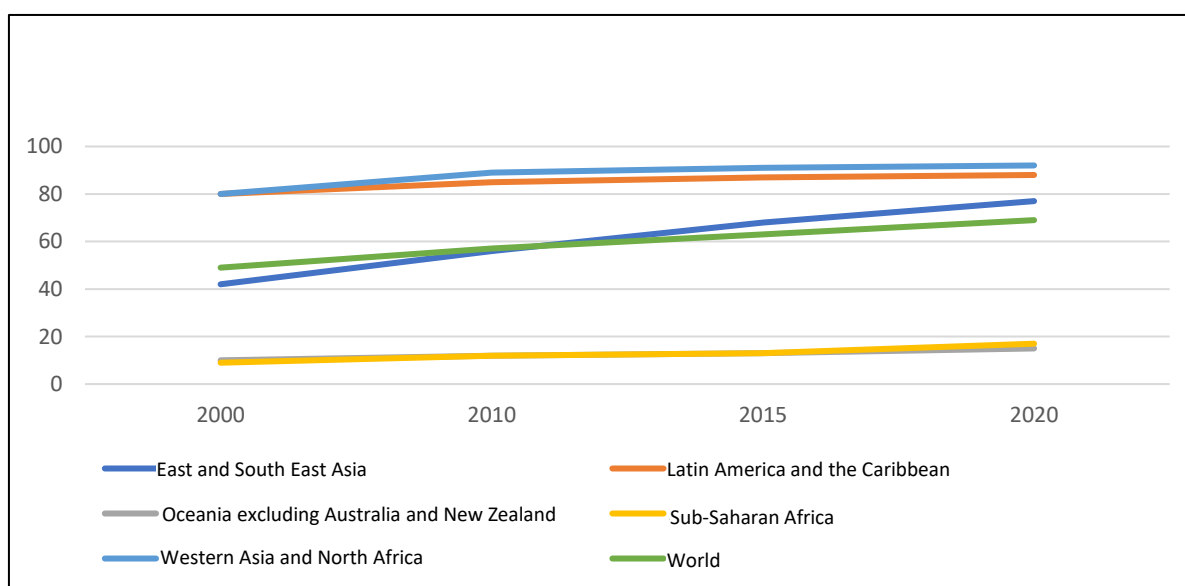
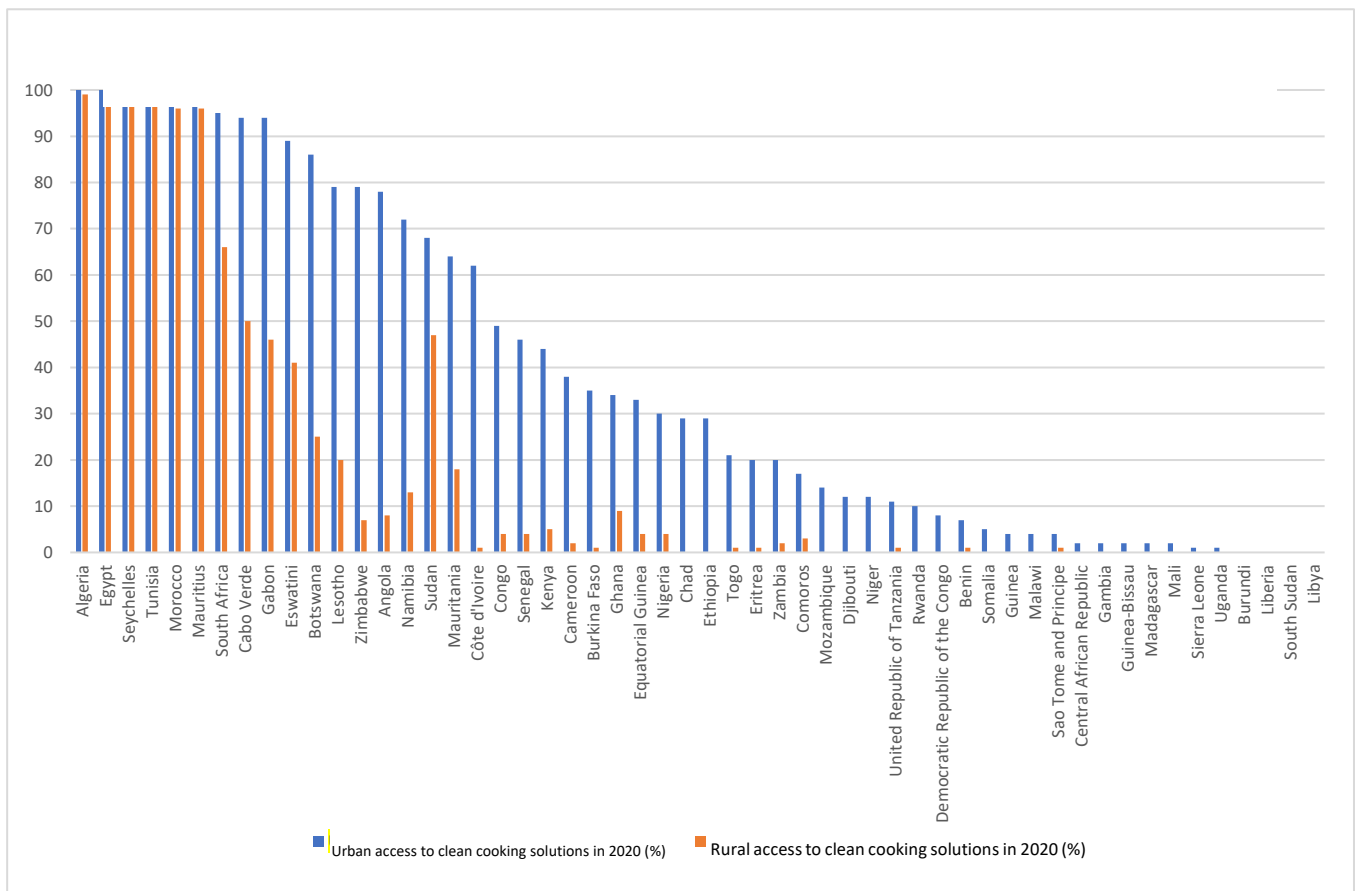


Figure 12  
**Proportion of population with access to clean cooking fuels and technologies, by region**  
 (Percentage)



Source: World Bank and others, “Access to electricity”, Tracking SDG 7 Database, available at <https://trackingsdg7.esmap.org/> (accessed on 30 December 2022).

Figure 13  
**Rural/urban divide in access to clean cooking solutions in Africa in 2020,**  
**by country**  
 (Percentage)

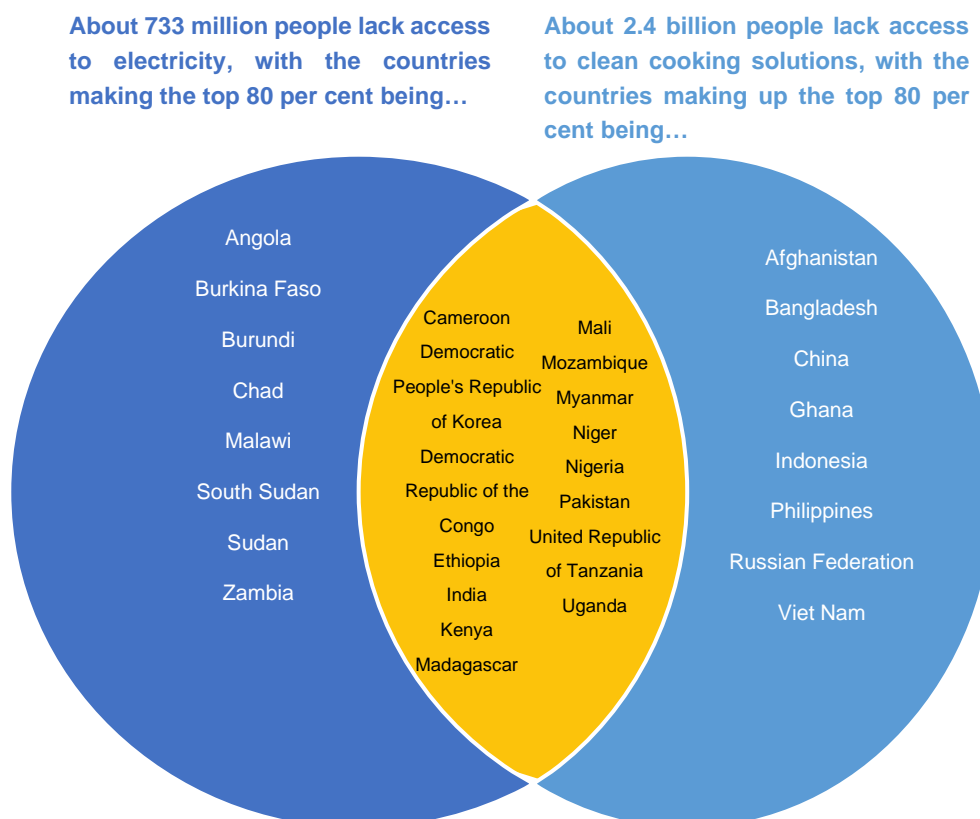


Source: World Bank and others, “Access to electricity”, Tracking SDG 7 Database, available at <https://trackingsdg7.esmap.org/> (accessed on 30 December 2022).

15. According to an analysis conducted by Sustainable Energy for All, there is a significant overlap between the lack of access to electricity and the lack of access to clean cooking solutions. For example, the countries representing 80 per cent of the challenges in achieving both indicators under target 7.1 and their overlap have not changed much over the years (see figure 14). This indicates persistent difficulties in achieving both indicators in these countries.

Figure 14

**Overlap of countries with high populations without access to electricity and countries with high populations without access to clean cooking solutions**

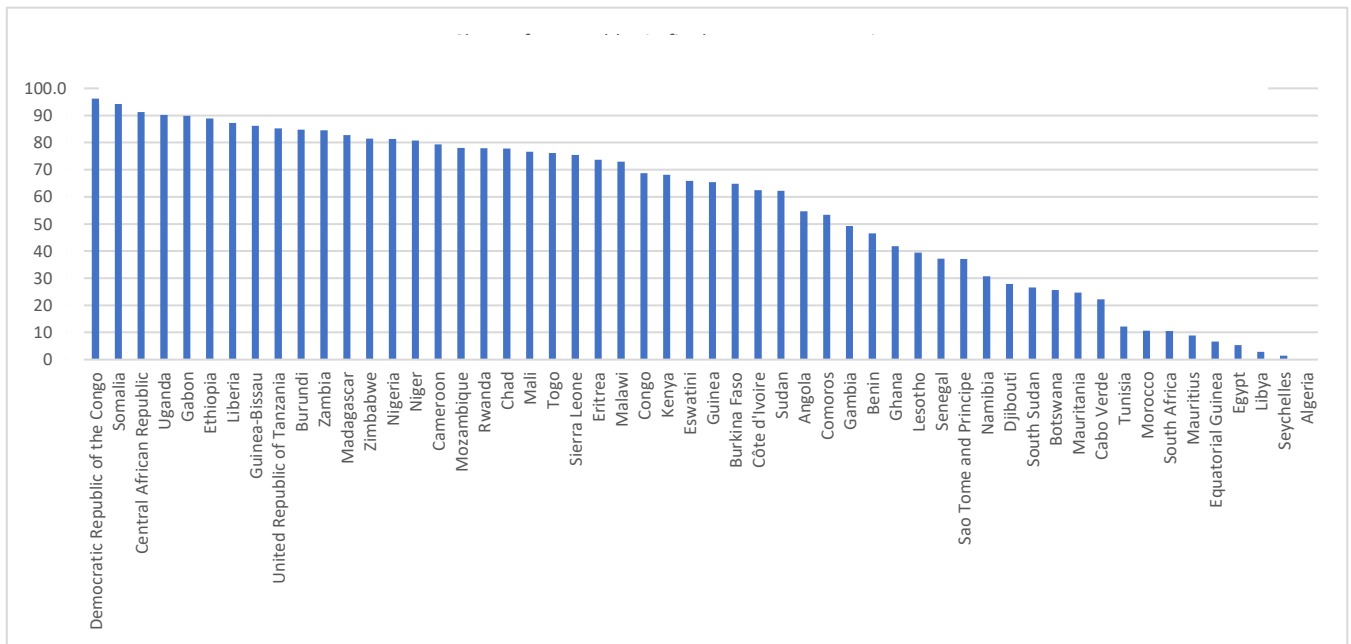


Source: Sustainable Energy for All.

### C. Target 7.2: share of renewable energy

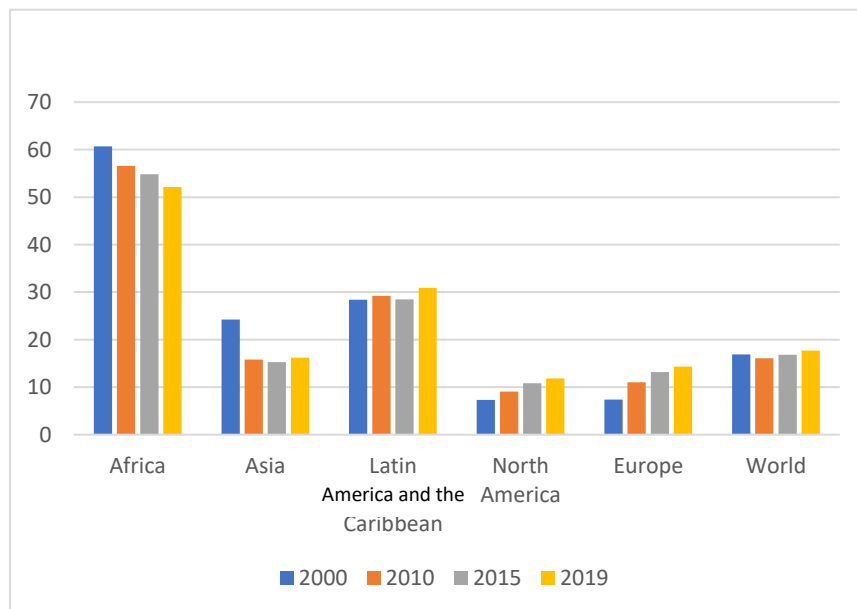
16. Target 7.2 is aimed at substantially increasing the share of renewable energy in the global energy mix by 2030. It is tracked by measuring the share of renewable energy in total final energy consumption. Globally, the increase in the share of renewable energy sources in total final energy consumption has been very slow, increasing by only 1.6 per cent between 2010 and 2019 to reach 17.7 per cent. As a result of overdependence on the use of solid biomass in Africa, the continent's share of renewable energy in total energy consumption has consistently been the highest in the world over the years, declining only slightly from 56.6 per cent in 2010 to 52.1 per cent in 2019, which is still well above the global average of 17.7 per cent (see figure 15). Regarding the share of modern renewable energy sources in final energy consumption, the global rate increased from 8.7 per cent in 2010 to 11.5 per cent in 2019. Latin America and the Caribbean had the highest share in 2019, at just over 26 per cent, while the African share of 7.6 per cent is well below the global average and is the lowest compared with other regions (see figure 16).

Figure 15  
**Share of renewable energy in total final energy consumption in Africa in 2019,**  
**by country**  
 (Percentage)



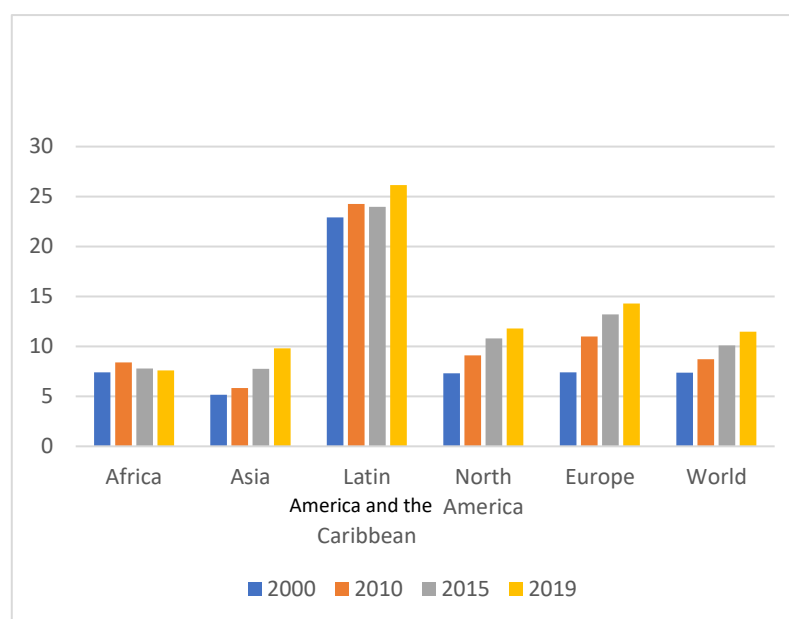
Source: World Bank and others, “Access to electricity”, Tracking SDG 7 Database, available at <https://trackingsdg7.esmap.org/> (accessed on 30 December 2022).

Figure 16(a)  
**Share of renewable energy sources in total final energy consumption, by region**  
 (Percentage)



Source: World Bank and others, “Access to electricity”, Tracking SDG 7 Database, available at <https://trackingsdg7.esmap.org/> (accessed on 30 December 2022).

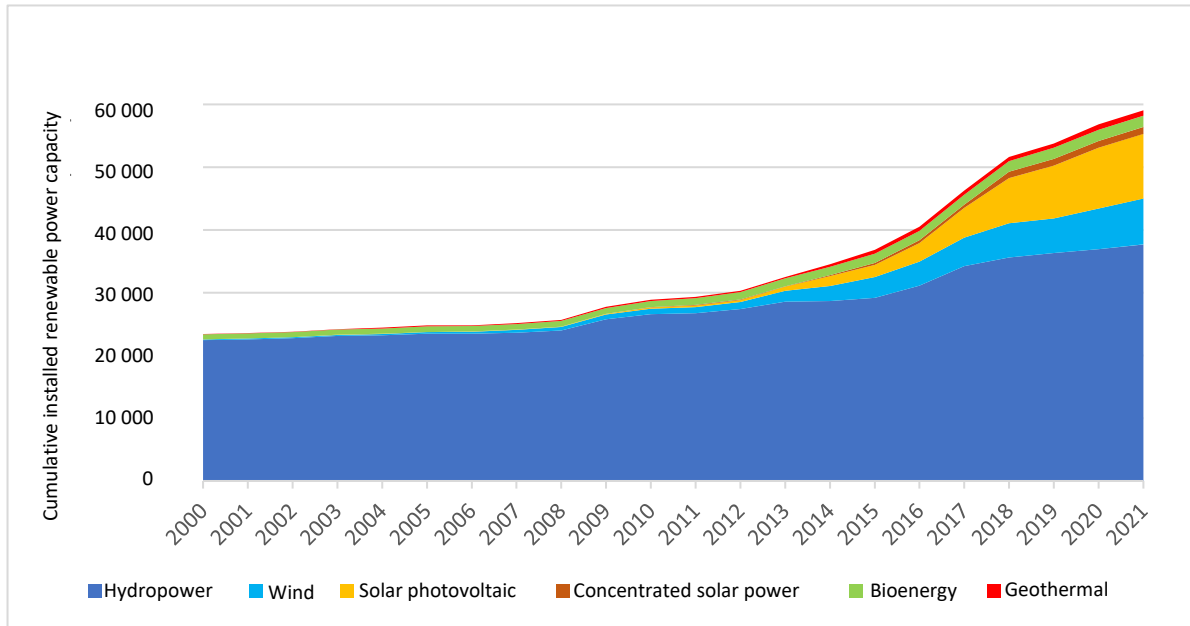
Figure 16(b)  
**Share of modern renewable energy sources in total final energy consumption, by region**  
 (Percentage)



*Source:* World Bank and others, “Access to electricity”, Tracking SDG 7 Database, available at <https://trackingsdg7.esmap.org/> (accessed on 30 December 2022).

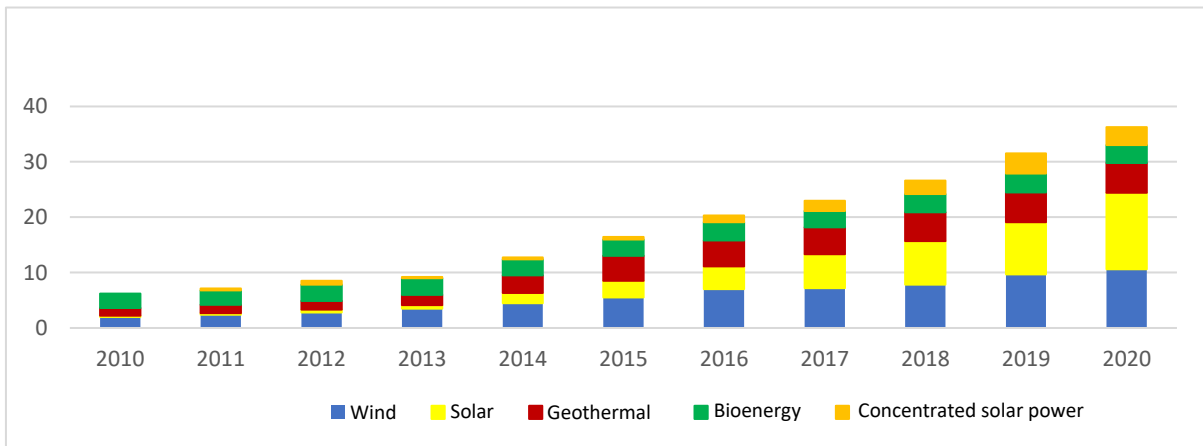
17. With regard to renewable electricity, the total installed renewable power capacity (including hydropower) increased 107 per cent in Africa, from 27 GW in 2010 to 56 GW in 2021, while at the global level it increased by over 150 per cent during the same period, from 1,224 GW to 3,068 GW. The generation of electricity from both hydro and non-hydro renewable sources has increased dramatically since 2010 (see figure 17). Both the installed capacity and the generation from non-hydro renewable sources have been led by wind and solar power, with solar power capacity having increased from a mere 194 MW in 2010 to 10.3 GW in 2021, while wind power increased from 865 MW to 7.3 GW over the same period (see figure 18). The share of renewable energy in the African power mix, which is dominated by natural gas and coal (see figure 19), increased from 19.5 per cent in 2010 to 23.1 per cent in 2021 in terms of installed capacity and from 16.2 per cent to 21.2 per cent during the same period in terms of generation capacity. These shares remain very small compared with other regions (see figure 20).

Figure 17  
**Growth of installed renewable power capacity in Africa**  
 (Megawatts)



Source: International Renewable Energy Agency, 2022.

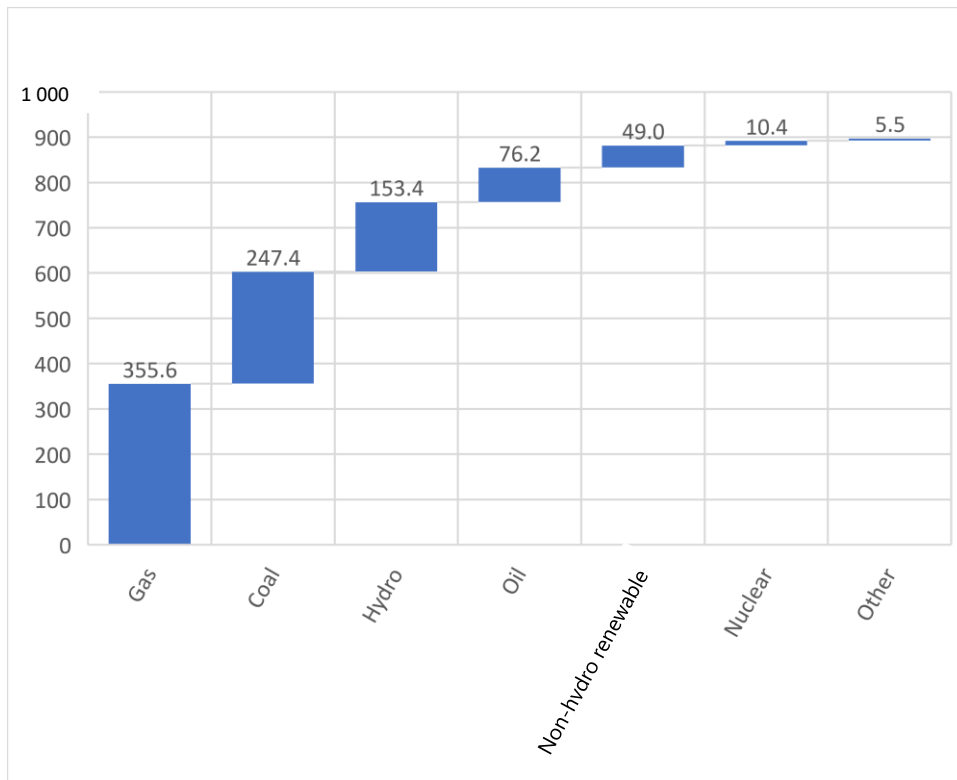
Figure 18  
**Share of renewable energy in electricity generation in Africa**  
 (Percentage)



Source: International Renewable Energy Agency, 2022.

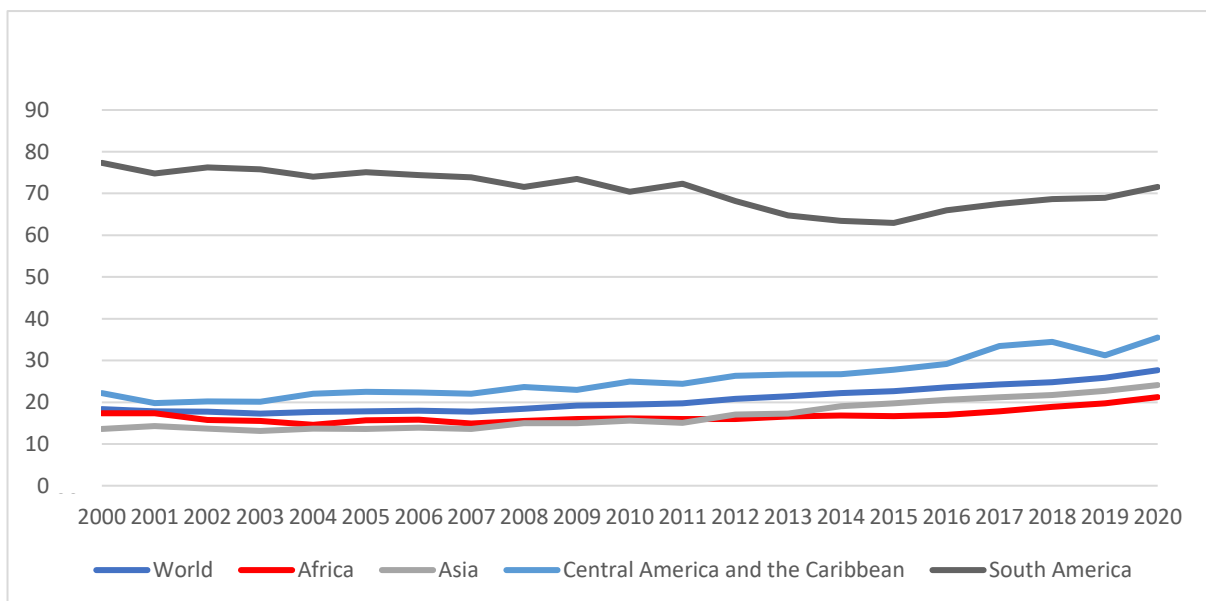


Figure 19  
**Power generation mix in Africa in 2020**  
 (Terawatt-hours)



Source: British Petroleum, 2022.

Figure 20  
**Share of renewable energy in electricity generation, by region**  
 (Percentage)

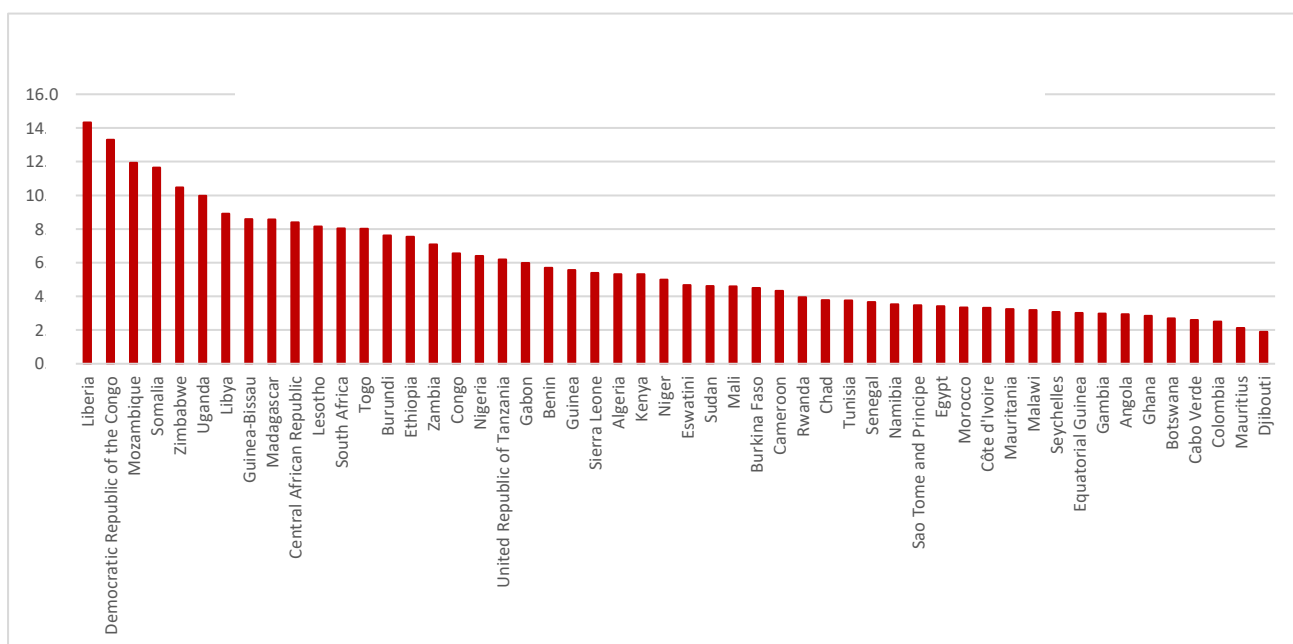


Source: International Renewable Energy Agency, 2022.

### D. Target 7.3: improvement in energy efficiency

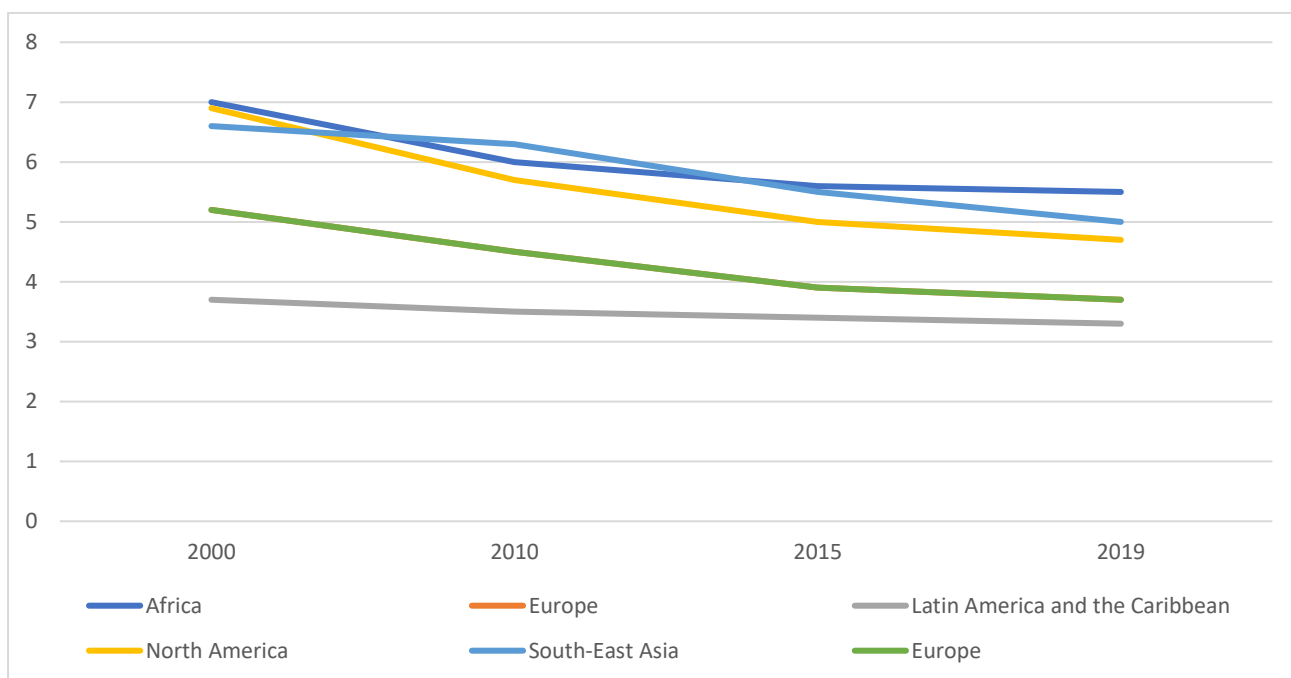
18. Target 7.3 is aimed at doubling the global rate of improvement in energy efficiency through a sustained reduction in the primary energy consumption intensity of the economy. It is tracked through energy intensity measured in terms of primary energy and GDP. The attainment of this target is not on track, in particular for Africa, where most countries have a very high energy intensity (see figure 21). Global energy intensity (see figure 22) decreased from 5.6 megajoules per United States dollar of GDP in 2010 to 4.7 megajoules per United States dollar of GDP in 2019, resulting in an improvement rate of only 1.9 per cent compared with the initial target of 2.6 per cent. Africa, followed by Asia, is the least efficient region (see figure 22), with a very small decline in its energy intensity, falling from 5.95 megajoules per United States dollar of GDP in 2010 to 5.52 megajoules per United States dollar of GDP in 2019 – that is, an average improvement of only 0.83 per cent during that period. The high energy intensity in Africa is partly a result of the continent’s overdependence on the traditional use of biomass for households – a sector that dominates the continent’s consumption of primary energy consumption (see figure 23), followed by industry and transport, whereas globally, and in most regions, the greatest share of primary energy consumption is in industry (see figure 24).

Figure 21  
**Energy intensity in Africa, by country**  
 (Megajoules per United States dollar of GDP)



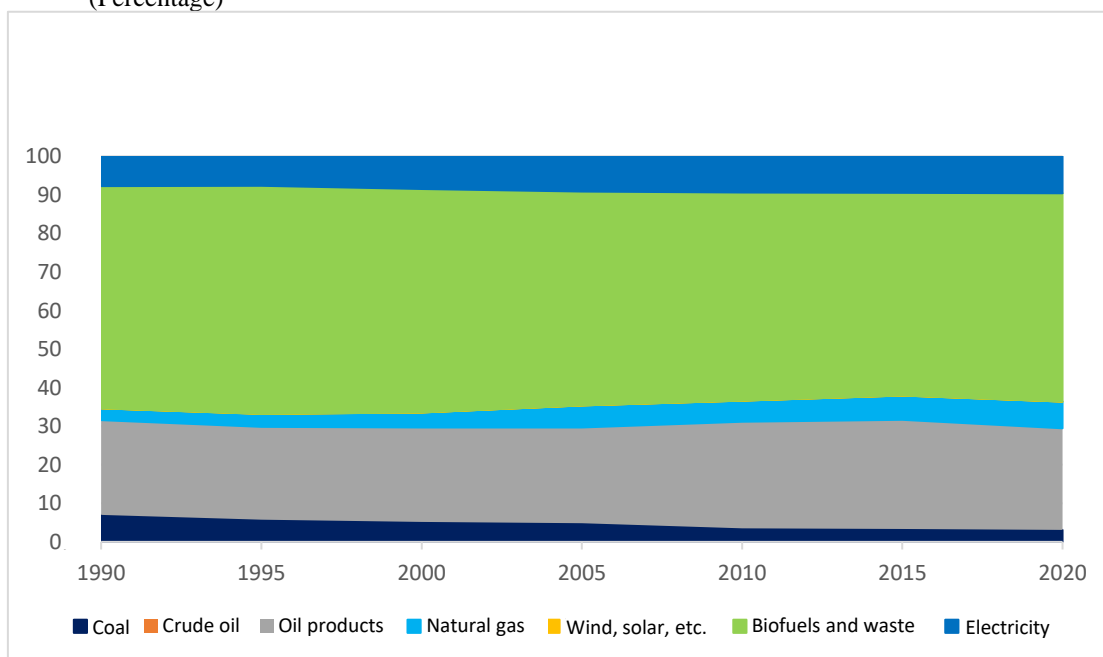
Source: World Bank and others, “Access to electricity”, Tracking SDG 7 Database, available at <https://trackingsdg7.esmap.org/> (accessed on 30 December 2022).

Figure 22  
**Energy intensity, 2000–2019, by region**  
 (Megajoules per United States dollar of GDP)



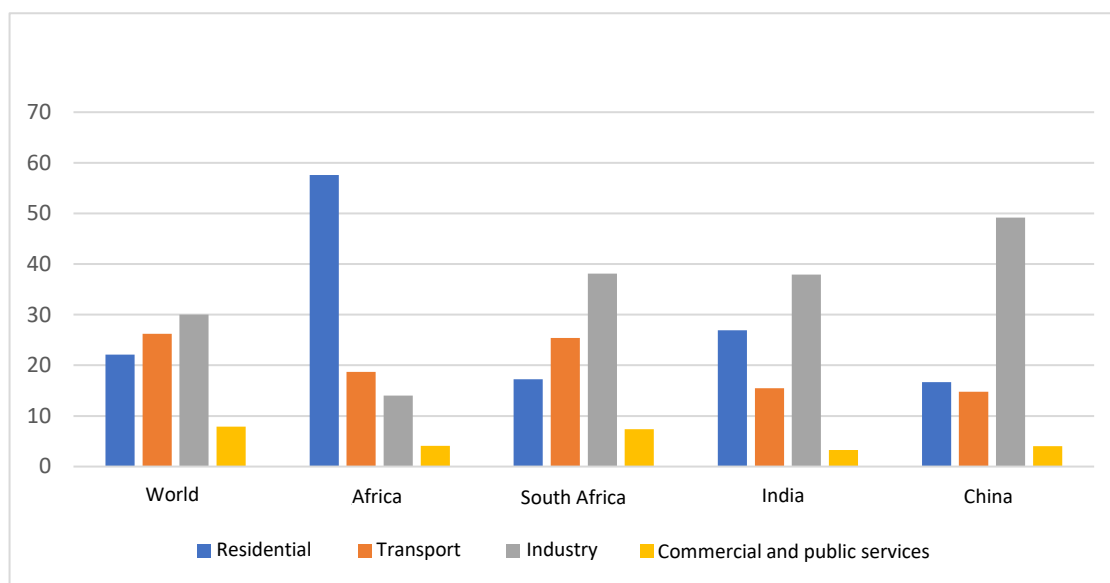
Source: World Bank and others, “Access to electricity”, Tracking SDG 7 Database, available at <https://trackingsdg7.esmap.org/> (accessed on 30 December 2022).

Figure 23  
**Share of total final energy consumption in Africa, by source**  
 (Percentage)



Source: International Energy Agency Energy, Energy Statistics Data Browser, available at [www.iea.org/data-and-statistics/data-tools/energy-statistics-data-browser](http://www.iea.org/data-and-statistics/data-tools/energy-statistics-data-browser) (accessed on 30 December 2022).

Figure 24  
**Share of total final energy consumption in 2020, by sector**  
 (Percentage)

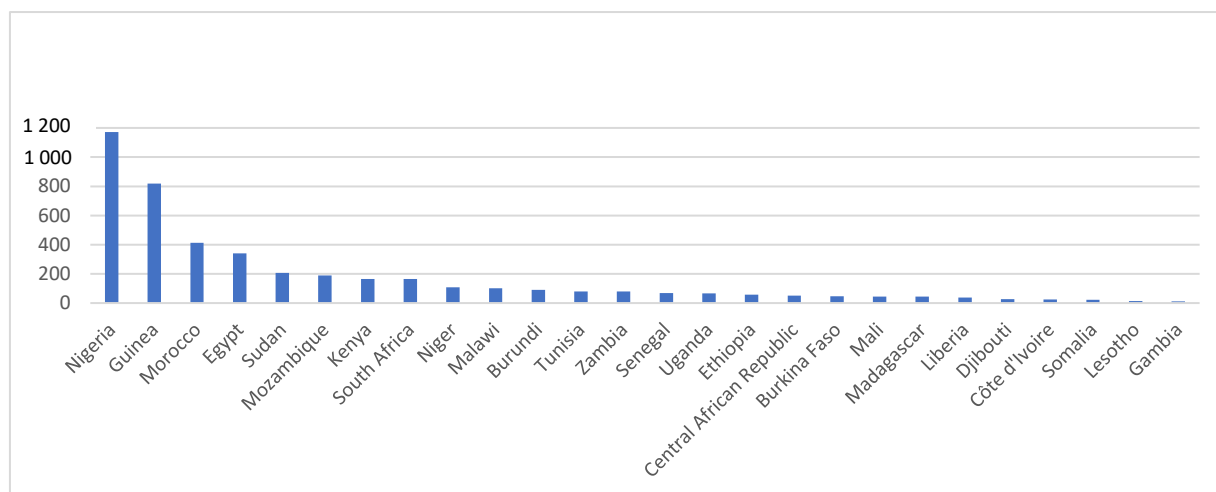


Source: International Energy Agency Energy, Energy Statistics Data Browser, available at [www.iea.org/data-and-statistics/data-tools/energy-statistics-data-browser](http://www.iea.org/data-and-statistics/data-tools/energy-statistics-data-browser) (accessed on 30 December 2022).

## E. Target 7.a: enhanced international cooperation

19. Target 7.a is aimed at enhancing international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promoting investment in energy infrastructure and clean energy technology. It is tracked by measuring international financial flows to developing countries in support of clean energy research and development and renewable energy production, including in hybrid systems. International public financial flows to support clean and renewable energy investment in developing countries have been very inadequate compared with the scale of need. Investments in 2019 amounted to only \$11 billion, which was the lowest level since 2015 and well below the high value of nearly \$25 billion in 2017. The distribution of international public financial flows in Africa in 2019 is shown in figure 25. Between 2015 and 2019, Central, South, East and South-East Asia combined received \$27 billion, while sub-Saharan Africa received \$25 billion, followed by Latin America and the Caribbean with \$16 billion (see figure 26). With regard to technologies supported over the same period, hydropower received \$28 billion, followed by solar energy at \$23 billion and other technologies at \$21 billion (see figure 27).

Figure 25  
**International public finance flows for clean energy investments in Africa in 2019**  
 (Millions of United States dollars)



Source: World Bank and others, “Access to electricity”, Tracking SDG 7 Database, available at <https://trackingsdg7.esmap.org/> (accessed on 30 December 2022).

20. Investments from all sources of financial flows for clean energy have increased by close to \$70 billion since 2015, reaching \$366 billion in 2021. They have been dominated by investments in solar energy (56 per cent) and wind energy (40 per cent), and mainly in China, Europe and the United States of America (see figure 28). Over the past decade or so, the African share of these investments has been less than 2 per cent, and even so investments have been made in only a handful of African countries. However, the continent is the final frontier for meaningful investment in renewable energy and climate action.

Figure 26  
**International public finance investments in clean energy, by region**  
 (Millions of United States dollars)

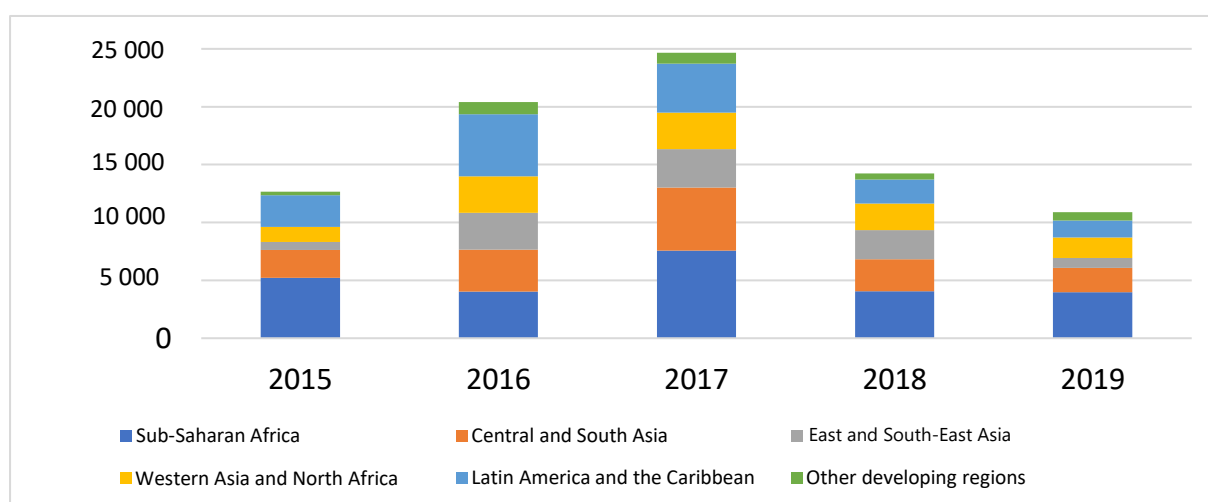
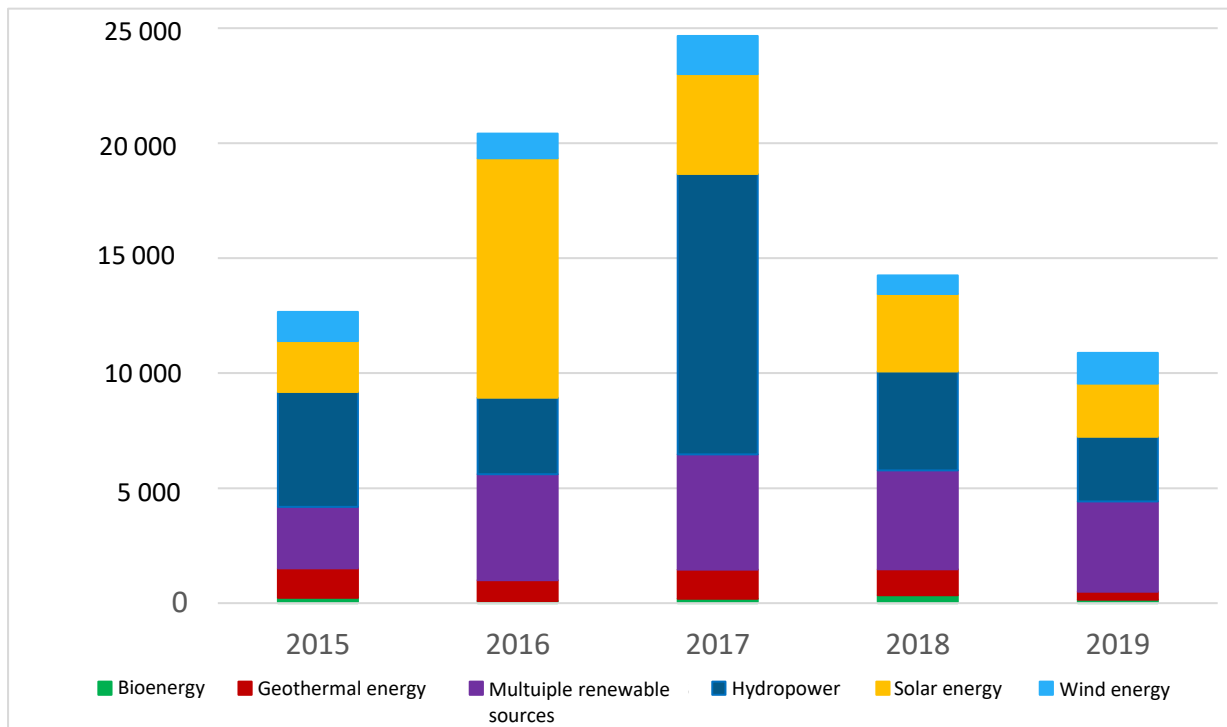
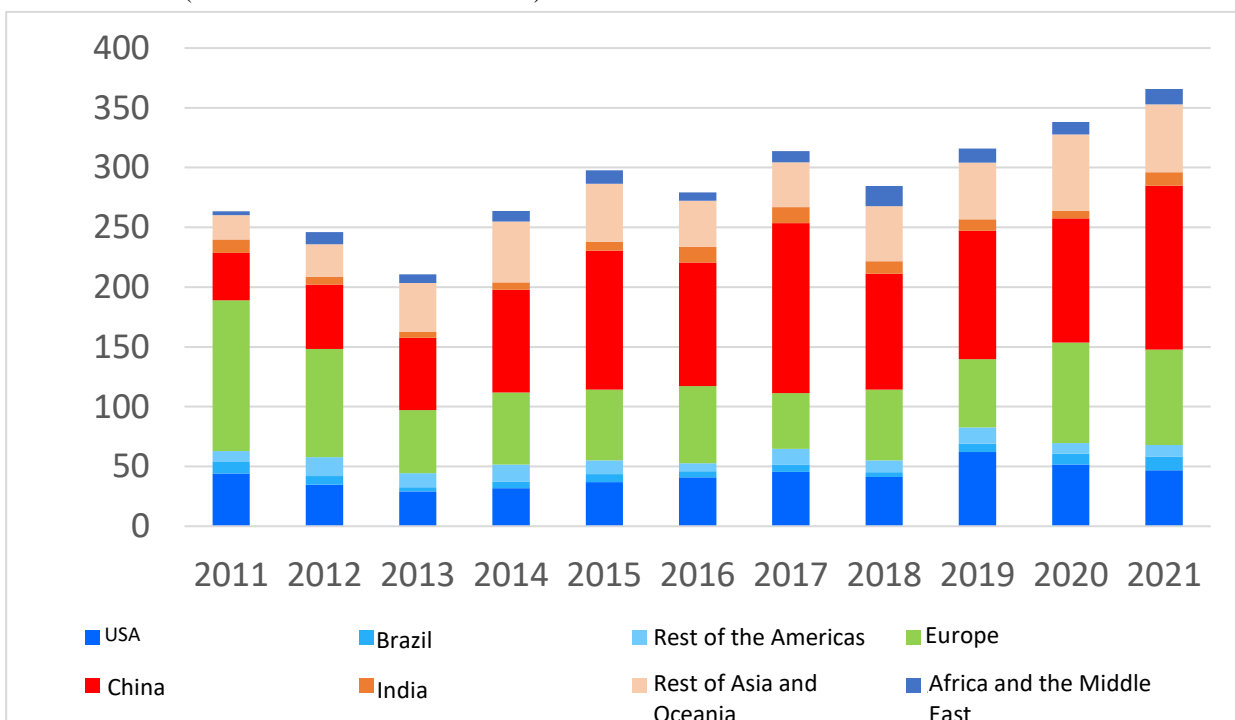


Figure 27  
**International public finance investments in clean energy, by technology**  
 (Millions of United States dollars)



Source: World Bank and others, “Access to electricity”, Tracking SDG 7 Database, available at <https://trackingsdg7.esmap.org/> (accessed on 30 December 2022).

Figure 28  
**Global investments in renewable energy**  
 (Billions of United States dollars)



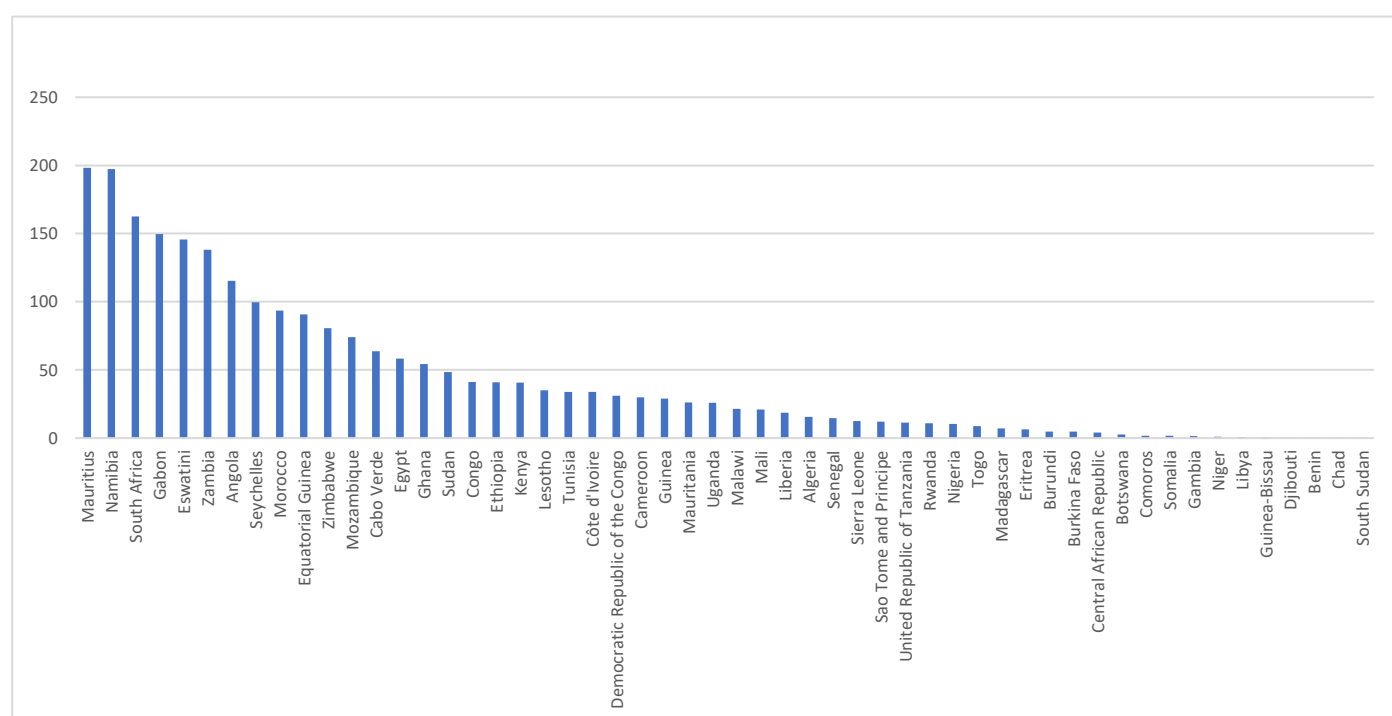
Source: REN21 Renewables Now, *Renewables 2022 Global Status Report* (Paris, REN21 Secretariat, 2022).

## F. Target 7.b: expansion of infrastructure and upgrading of technology

21. Target 7.b is aimed at expanding infrastructure and upgrading technology for supplying modern and sustainable energy services for all in developing countries – in particular least developed countries, small island developing States and landlocked developing countries – in accordance with their respective programmes of support. It is tracked by measuring the installed renewable energy-generating capacity in developing countries (in W per capita). The global per capita installed renewable energy generation capacity increased substantially from 102 W in 2010 to 246 W in 2020. Notwithstanding this global growth at a year-on-year rate of 11.6 per cent, countries are mostly not on track to achieve net zero emissions by 2030. The performance of Africa regarding this target is very low (see figure 29), with the per capita installed renewable power capacity having increased from 26 W in 2010 to only 40 W in 2020 – compared with the increase in China from 170 W to 622 W, and similarly from 55 W to 130 W and from 285 W to 425 W in South-East Asia and in Latin America and the Caribbean, respectively.

Figure 29

### Distribution of installed renewable electricity generation capacity per capita in African countries in 2020 (W per capita)



Source: World Bank and others, “Access to electricity”, Tracking SDG 7 Database, available at <https://trackingsdg7.esmap.org/> (accessed on 30 December 2022).

## III. Challenges, constraints and emerging issues

22. Improvements and progress have been made in the past decade with regard to sustainable energy development. However, the speed of progress on energy access and renewable energy development falls far short of what is needed in order to achieve universal energy access for Africa by 2030. This situation can be attributed to major challenges, including the lack of clear and coherent policy, regulatory and institutional frameworks; inadequate information and technical capacity; inadequate

financing, investment, technology transfer and skills; and the lack of well-organized data on renewable energy resources.

23. **Weak energy access policies.** Such policies remain one of the largest barriers to meeting the needs and aspirations of African people with regard to achieving access to electricity and clean cooking solutions. Under the current stated policies, some 670 million people will still lack access to electricity in 2030, with about 600 million of these people living in Africa, mainly in the Democratic Republic of the Congo, Nigeria, the Sudan and Uganda. Similarly, with regard to access to clean cooking solutions, about 1 billion of the anticipated 2.1 billion people lacking access in 2030 will be in Africa. This poses serious challenges to the attainment of all the other Sustainable Development Goals and the development aspirations set out in Agenda 2063.

24. **Lack of clear, coherent and harmonized policies.** Maximizing energy production for use in various productive sectors, such as agriculture, health and education, will require the harmonization of policies across multiple ministries and sectors to ensure that they complement the amalgamation of these productive sectors with clean energy value addition. For example, to catalyse investment in clean-energy-powered value addition, agricultural policies will need to be aligned with industrial policies, energy policies, land policies and the needs of private investors to ensure that policies are relevant and cross-cutting and that they incentivize investment by both State and non-State stakeholders in plants and clean processing industries near agroproduction areas that have high potential.

25. **Inadequate and weak power grids.** The deployment of large-scale renewable energy projects in networks with poor transmission and distribution infrastructure poses a challenge to attaining access to electricity and increasing the shares of variable renewable sources, such as wind and solar. The technical state of many African electricity grids, sometimes coupled with design issues and the lack of preventive maintenance, results in high transmission and distribution losses, which have a negative impact on supply security. Off-grid technology options, such as mini-grids and individual home systems, are increasingly being considered as the main viable options to address rural electrification challenges. Strong policy support is needed, however, to make these systems economically viable.

26. **Impacts of the pandemic and the war in Ukraine.** Low rural electrification, weak grids and low baseload generation remain major hindrances to access. The overlapping economic impacts of the COVID-19 pandemic and the war between the Russian Federation and Ukraine are placing a serious constraint on the fiscal spaces of African countries, including reduced revenue for oil-exporting countries and balance-of-payments challenges for most African countries, as they rely heavily on imported, refined petroleum products. These challenges thus further reduce the availability of the already limited public resources required to leverage the huge amount of finance needed from the private sector to invest in closing the energy gap and other development gaps in Africa.

27. **Policy and regulatory barriers to investment.** Most of the financing needed to close the energy deficit in Africa will have to come from the private sector, which will require an enabling environment and enhanced investor confidence. For these circumstances to be achieved, there is an urgent need for countries to accelerate efforts to remove the policy and regulatory barriers to investment by ensuring that their electricity markets are open and attractive to, and ready for, private investment. Such efforts include policy support for investments in on-grid and off-grid power systems, transmission and distribution, as well as in clean cooking fuels and technologies. An enabling environment must also include innovative financing instruments, modern procurement practices (such as auctions and feed-in tariffs), financial guarantee schemes and financially sustainable power generators and system operators. These are very weak or mostly missing in Africa.



28. **Lack of cost-reflective tariffs.** Electricity tariffs in most African countries are below cost-reflective levels, that is, they are lower than the actual cost of generating, transporting and distributing electricity to consumers. Service providers (that is, utilities) are seldom fully compensated for this shortfall in revenue, leading to several adverse effects – a lack of incentives and financing to connect new consumers, high offtake risk for private electricity generators and, therefore, underinvestment in generation and in the grid.

29. **Geopolitics of the global just transition – balancing access, development and the transition.** As the momentum increases towards attaining net zero greenhouse gas emissions, driven by a clean energy transition, there are increasing calls on the one hand to rapidly phase out investments in fossil fuel resources. As a result, investments in energy access in Africa in the near term are likely to be even more limited. On the other hand, there are increasing calls from African countries – as set out in the African common position on energy access and just energy transition<sup>10</sup> issued by the African Union and in the Kigali communiqué on a just and equitable energy transition<sup>11</sup> – for a pragmatic approach that uses all energy resources on the continent to urgently close a chronic energy access deficit and development gaps, while ramping up efforts towards attaining a green energy future. In this regard, there are growing calls for investment in natural gas to strengthen base generation while providing liquefied petroleum gas to phase out traditional biomass in favour of clean cooking solutions. African countries need realistic time frames, as well as adequate and sustained financing, to implement policies that will allow them to achieve their energy security goals in a sustainable manner and in less carbon-intensive ways.

30. **Need for African private sector and capital.** Given that less than 2 per cent of global clean energy investments are flowing into Africa, in the light of the scale of finance needed, the African private sector and African capital need to be mobilized to lead the clean energy transition on the continent. To achieve this, African Governments must work with the private sector on the continent to leverage domestic and foreign resources to drive energy investments, including for clean cooking solutions. In this context, efforts are needed to develop and deepen domestic capital markets and to strengthen national and regional development banks.

31. **Need for a differentiated timeline.** African countries need to have differentiated timelines that are based on each of their economic realities and capacities in order to realistically meet global commitments while balancing the needs of their populations. Achieving a sustainable path to energy access will take time, especially given that African countries are not just looking to transition existing capacities to cleaner energy but rather to develop whole new energy generation capacities. It will take time to build up the right institutional and policy foundations before a well-functioning energy sector can be the cornerstone of economic development.

## IV. Opportunities and transformative actions

32. **Turning challenges into opportunities.** African countries have a very high energy access deficit and will face increasingly high demand for clean and affordable energy over the next few decades. The continent has abundant energy resources but lacks the needed investments. Starting from a very low base, and confronted by the multiple challenges of worsening climate change impacts and the continuing economic and social impacts arising from the COVID-19 pandemic and the war in

<sup>10</sup> African Union, “Africa speaks with unified voice as AU Executive Council adopted African common position on energy access and just energy transition”, 22 July 2022.

<sup>11</sup> Sustainable Energy for All, “Kigali communiqué: ensuring a just and equitable energy transition in Africa: seven transformative actions for SDG7”, available at [www.mininfra.gov.rw/index.php?eID=dumpFile&t=f&f=44024&token=c9d8a3e4e9ad4d22aa3c3b883055c9426760c584](http://www.mininfra.gov.rw/index.php?eID=dumpFile&t=f&f=44024&token=c9d8a3e4e9ad4d22aa3c3b883055c9426760c584).

Ukraine, Africa has a unique opportunity, if it has the right support, to turn these challenges into unprecedented development opportunities that can put the continent at the centre of the global energy transition.

33. **Leveraging decentralized, decarbonized, de-risked and digitalized energy services.** The transformative actions that are required to foster environmental solutions at the continental, subregional and national levels are the new energy paradigm of decentralized, decarbonized, de-risked and digitalized energy services that will enable Africa to reach universal energy access by 2030 in pursuit of fulfilling the 2030 Agenda and Agenda 2063. In lieu of using energy as a stand-alone resource, it is crucial to position clean and renewable energy as an enabler of: (a) income generation; (b) increased productivity; (c) green and decent jobs; and (d) economic growth as a whole.

34. **Climate action as an investment opportunity for development.** Climate action (both adaptation and mitigation) in Africa must be premised as an investment opportunity capable of producing financial and economic dividends. Ecosystem-based, adaptation-driven agriculture and its amalgamation with clean-energy-powered value addition are used to optimize agricultural value chains. This is an inclusive area that will foster the participation of the majority of people on the continent, including women and young people. It will ensure that food security and economic opportunities are created along the entire value chain, while simultaneously offsetting carbon emissions and conserving ecosystems to combat climate change.

35. **Huge opportunities to be at the centre of the global energy transition.** The global energy transition and drive for net zero emissions offer huge opportunities for Africa to be at the centre of the electric future. The continent has all the critical minerals needed for the transition. The Democratic Republic of the Congo, for example, accounts for over 70 per cent of the global supply of cobalt but captures only 3 per cent of its value. Leveraging the African Continental Free Trade Area, such countries as the Democratic Republic of the Congo, Madagascar, Morocco, South Africa, Zambia and Zimbabwe could put in place production facilities to transform critical minerals into battery precursors, and eventually into batteries, using the continent's abundant renewable energy resources. A study carried out by Bloomberg, the Economic Commission for Africa, the African Export-Import Bank, the African Development Bank and the Africa Finance Corporation has shown that battery precursors could indeed be produced in the Democratic Republic of the Congo with 30 per cent fewer emissions and lower production costs.<sup>12</sup>

36. **Natural gas and green hydrogen as a winning formula.** Africa has the highest potential for green hydrogen production, especially given the continent's abundant renewable power resources. The potential for green hydrogen makes the case for gas as a transition fuel for Africa even more compelling, especially in the context of base generation and clean cooking solutions, as it will be possible for well-designed gas power plants and related infrastructure to be phased out and adapted for green hydrogen.

37. **Opportunity to invest in African regional power pools.** An interconnected African power system can go a long way towards levelling the playing field of resource access and ensuring affordable and reliable energy for industrial use. Interconnecting the continent's power supply through power pools can efficiently integrate green energy into the continent's overall energy consumption by allowing countries to focus on off-grid and microgrid renewable energy solutions for household demands and to use the regional power pools to efficiently free up traditional grid energy for industrial uses.

38. **Benefit of green jobs and green energy as an attractive proposition for Africa.** Currently, less than 3 per cent of global renewable energy jobs are in Africa.

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<sup>12</sup> United Nations, Economic Commission for Africa, "Producing battery materials in the DRC could lower supply-chain emissions and add value to the country's cobalt", 24 November 2021.

Part of the solution to increasing this percentage is to invest in research in and development of Africa-centric new technologies to help develop the continent's renewable resources so as to build optimal energy mixes, taking into consideration the continent's unique natural resource endowments and development paths.

## V. Key messages

39. Countries should urgently put in place coherent policies and an enabling environment to leverage the limited public resources available in order to mobilize the investment necessary from the private sector, including from domestic resources, capitalizing on falling technology costs for renewable energy.

40. Countries and development partners should promote the sharing of good practices and experiences with both on-grid and off-grid systems, including business models and instruments to attract private sector investment.

41. Countries should step up efforts to tap into low-hanging fruit in energy efficiency in all sectors and to capitalize on quick wins in energy efficiency in cities, industries, buildings and transportation, recognizing that energy efficiency gains enhance access.

42. Countries should promote investment in strengthening the grid for greater efficiency and increased penetration of variable renewable power and promote cross-border interconnections to accelerate access to electricity through investments in African power pools.

43. The Economic Commission for Africa and other entities of the United Nations system and development partners should support member States in putting in place a comprehensive framework for facilitating a leading role for the African private sector and African capital to lead the investments in the continent's energy transition and transformation.

44. The Economic Commission for Africa and other United Nations entities and development partners should support member States in the development of energy transition plans and the enhanced implementation of nationally determined contributions with economically viable actions that promote the achievement of the targets under Sustainable Development Goal 7.

45. Development partners should support member States in the development and implementation of local content enhancement throughout the full renewable energy value chain as a catalyst for longer-term enhanced deployment of renewable energy with wider socioeconomic benefits.

46. Development partners should support member States in developing a continental framework for natural gas as a transition fuel that enhances access to clean cooking solutions and renewable energy sources, including the development of green hydrogen, while taking into consideration the risks of lock-in effects.