The Sustainable Development Goals Extended Report 2025

Inputs and information provided as of 30 April 2025

7 AFFORDABLE AND CLEAN ENERGY

Note: This unedited 'Extended Report' includes all indicator storyline contents as provided by the SDG indicator custodian agencies as of 30 April 2025. For instances where the custodian agency has not submitted a storyline for an indicator, please see the custodian agency focal point information for further information. The 'Extended Report' aims to provide the public with additional information regarding the SDG indicators and is compiled by the Statistics Division (UNSD) of the United Nations Department of Economic and Social Affairs. Storylines presented in this document may slightly differ from figures cited in the SDG Report 2025 text due to the timing of the submission and the subsequent updates received upon finalizing the Report.

Contents

Target 7.1 By 2030, ensure universal access to affordable, reliable and modern energy services

Indicator 7.1.1 Proportion of population with access to electricity

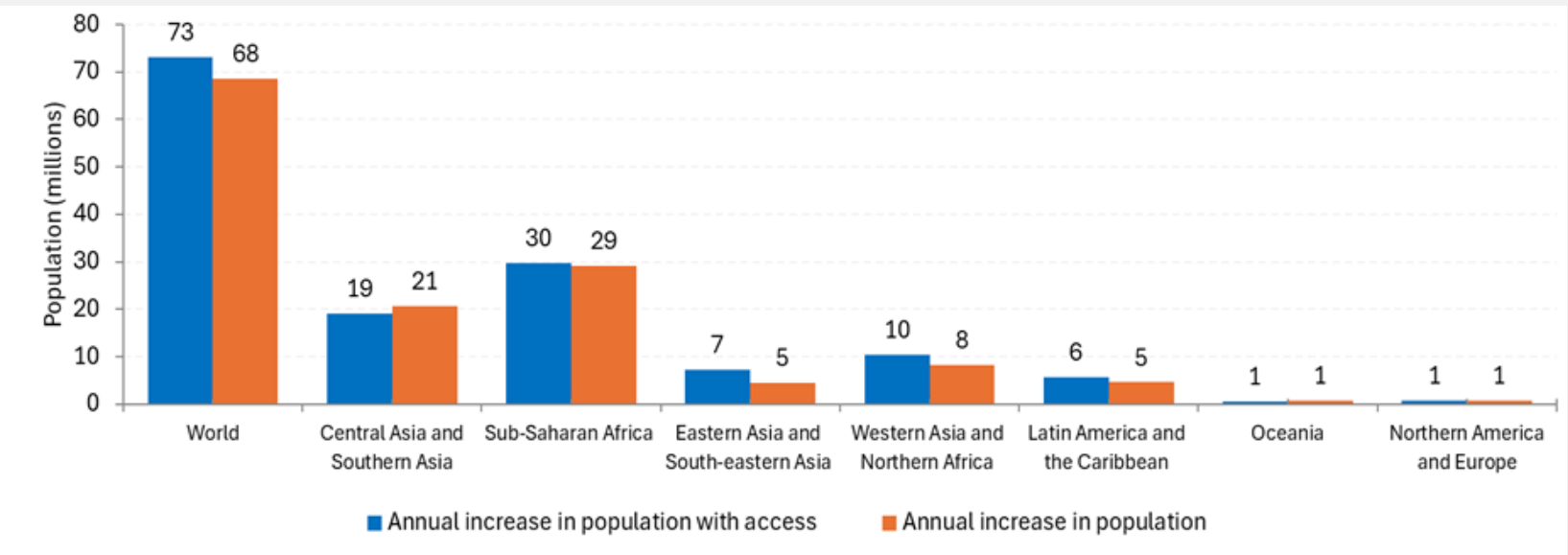
Global electricity access rate reached 92% in 2023, yet Sub-Saharan Africa (SSA) now represents 85% of the world's population without electricity. Off-grid solar solutions offer a cost-effective pathway to electrify 41% of those still lacking access by 2030. However, achieving this target requires $95 billion in investments to accelerate deployment and close the access gap.

In 2023, progress in expanding electricity access resumed after a setback in 2022. Once again, new connections outpaced population growth, raising the global electricity access rate to 92% and reducing the number of people without power to 666.4 million, 18.8 million fewer than the previous year. Disparities in electricity access between regions continue to widen, with Sub-Saharan Africa now accounting for 85% of the global population without electricity, up from 50% in 2010. While Central and Southern Asia have made remarkable strides, reducing their unconnected population from 414 million in 2010 to just 27 million in 2023, Sub-Saharan Africa has seen little progress. The region's unconnected population slighlty decrease at 565 million, compare to 566 million in 2010, as new connections have struggled to keep pace with population growth.

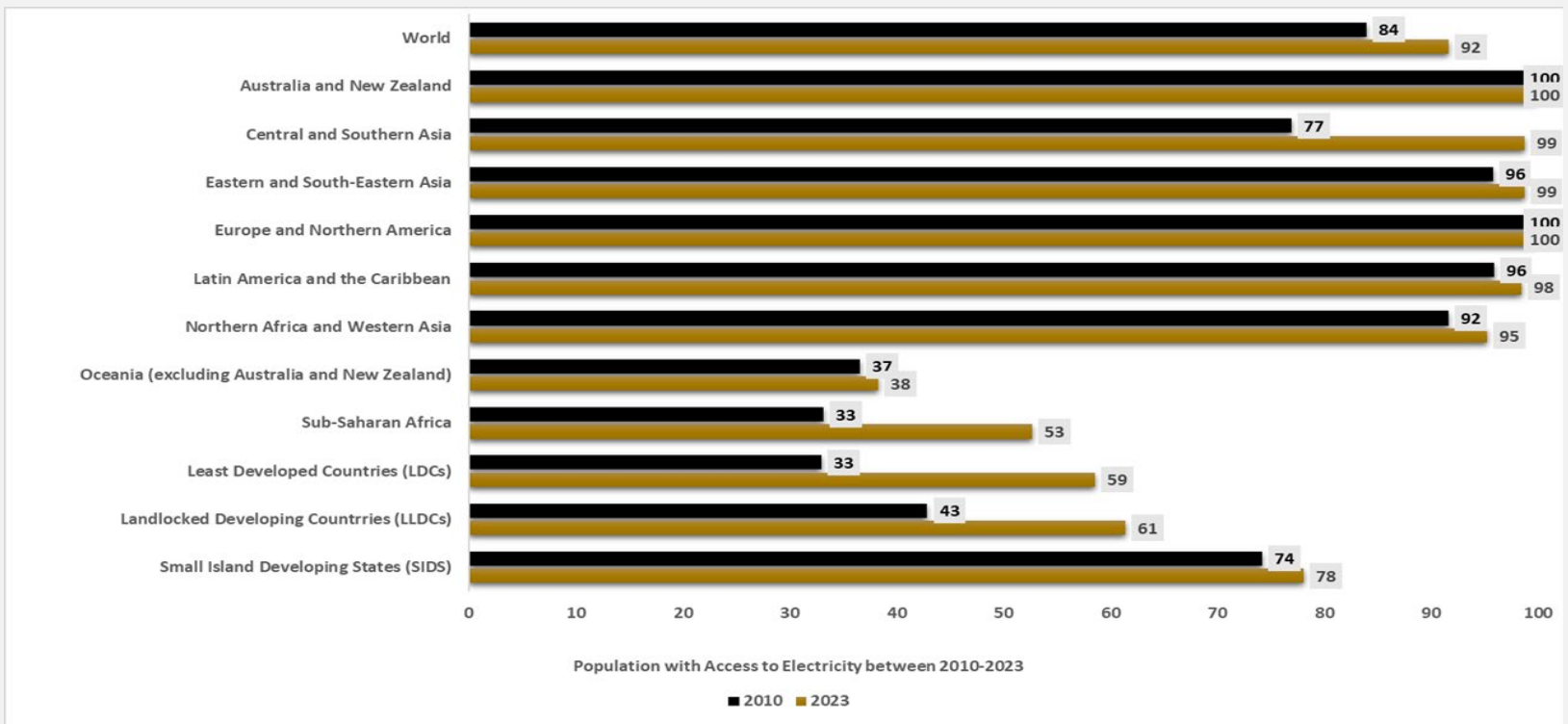
Eighteen of the twenty countries with the largest electricity access deficits in 2023 are in Sub-Saharan Africa. The deficits in Nigeria (86.8 million), the Democratic Republic of the Congo (79.6 million), and Ethiopia (56.4 million) alone accounting for roughly a third of the entire global deficit. All three countries are in the World Bank's FY24 list of Fragile and Conflict-Affected Situations (FCS). Thus, a greater portion of the remaining populations lacking access are likely to suffer from lack of institutional capacity due to FCS, be in harder to reach remote areas and/or have low incomes, compared to those connected over the last decade. These significant hurdles, alongside the short remaining period till 2030 puts pressure on the achievement of SDG7 goal of universal access. Initiatives like Mission 300 aim to accelerate electrification in Sub-Saharan Africa, addressing the urgent need for faster progress. While this marks a return to positive momentum, progress remains slow. This shift underscores the growing need for decentralized energy solutions to reach the most underserved communities.

Off-grid solar solutions will be a critical driver of electricity access expansion. By 2023, these solutions had reached over 560 million people globally and accounted for 55% of new electricity connections in Sub-Saharan Africa between 2020 and 2022. Despite challenging macroeconomic conditions, the sector has shown strong resilience, with over 50 million off-grid solar products sold in 2022–23. Looking ahead, off-grid solar remains the most cost-effective solution to provide electricity to 41% of those still without access by 2030 (398 million people). However, bridging this gap will require substantial investment $95 billion to scale electrification and support complementary markets such as solar water pumps, cold storage, and MSME solutions. In 2022–23, the sector attracted $1.2 billion in financing, primarily through debt, but much more is needed to meet future demand.

Annual Increases in Electrification and Population, 2020 – 2023, by region



Proportion of population with access to electricity, 2010 and 2023 (percentage)



Additional resources, press releases, etc. with links:

- Tracking SDG7: The Energy Progress Report; Link: https://trackingsdg7.esmap.org/downloads
- Classification of Fragility and Conflict Situations (FCS) for World Bank Group Engagement https://thedocs.worldbank.org/en/doc/fb0f93e8e3375803bce211ab1218ef2a-0090082023/original/Classification-of-Fragility-and-Conflict-Situations-FY24.pdf

Storyline authors(s)/contributor(s): World Bank is contributing agency

Custodian agency(ies): World Bank

Indicator 7.1.2 Proportion of population with primary reliance on clean fuels and technology

The world is not on track to achieve SDG 7.1.2 unless urgent action is taken

In 2023, an estimated 74 percent of people worldwide had access to clean cooking fuels and technologies—like stoves powered by electricity, LPG, natural gas, biogas, solar, or alcohol—marking a substantial 35-percentage-point increase since 2015 (Figure 1). Yet, despite these advancements, about 2.1 billion people—nearly a quarter of the global population—still rely on polluting fuels for cooking. At current rates, the world is not on track to achieve universal access by 2030: only 78 percent of the global population is expected to have clean cooking solutions by then, leaving 1.8 billion people behind.

The situation is especially pressing in Sub-Saharan Africa, where the absolute number of people without access to clean cooking continues to rise. Currently, only 21.2 percent of the region's population has access to clean cooking solutions, leaving 955.3 million people dependent on polluting fuels and technologies. While some countries have introduced policy measures and innovative strategies, rapid population growth often outpaces these efforts. In contrast, access deficits have steadily declined across Eastern and Southeastern Asia, Central Asia, and Southern Asia, but they still fall short of meeting the overarching targets of the 2030 Agenda.

In 2000, Sub-Saharan Africa represented 20 percent of the global population without access to clean cooking, while Central and Southern Asia, Eastern and Southeastern Asia, and the rest of the world together accounted for 80 percent. By 2023, half of those lacking access lived in Sub-Saharan Africa, one-third in Central and Southern Asia, and less than 23 percent in the rest of the world, highlighting widening disparities and the urgent need for scaling up targeted, evidence-based and inclusive solutions to support the world's most vulnerable (Figure 2).

This gap in clean cooking disproportionately affects poorer households, which often face greater financial and infrastructural challenges. As a result, women and girls continue to spend significant time gathering fuel and cooking on inefficient stoves, compromising their health, education, and economic opportunities. Accelerating sustainable, inclusive, and science-driven solutions is crucial to closing these persistent gaps and fulfilling the commitment to "leave no one behind."

Figure 1 Global population with access to clean cooking fuels and technologies and pathway to universal access, per cent (2000-2030)

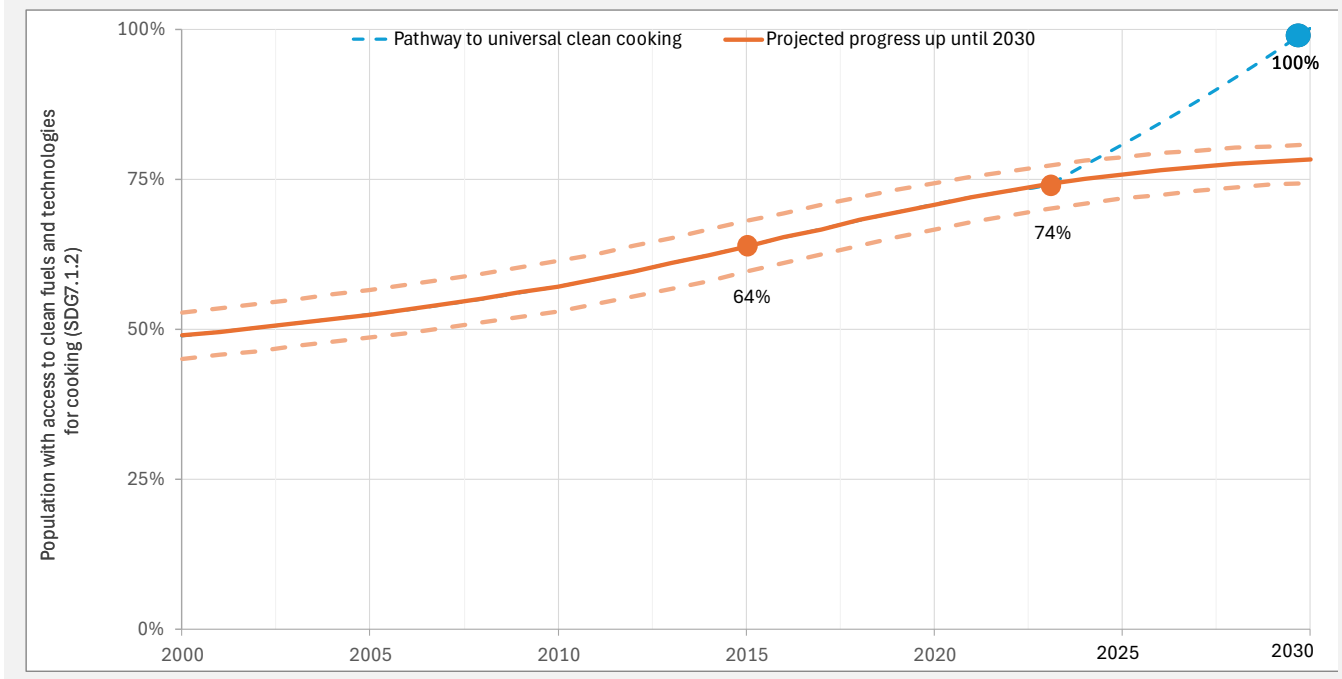
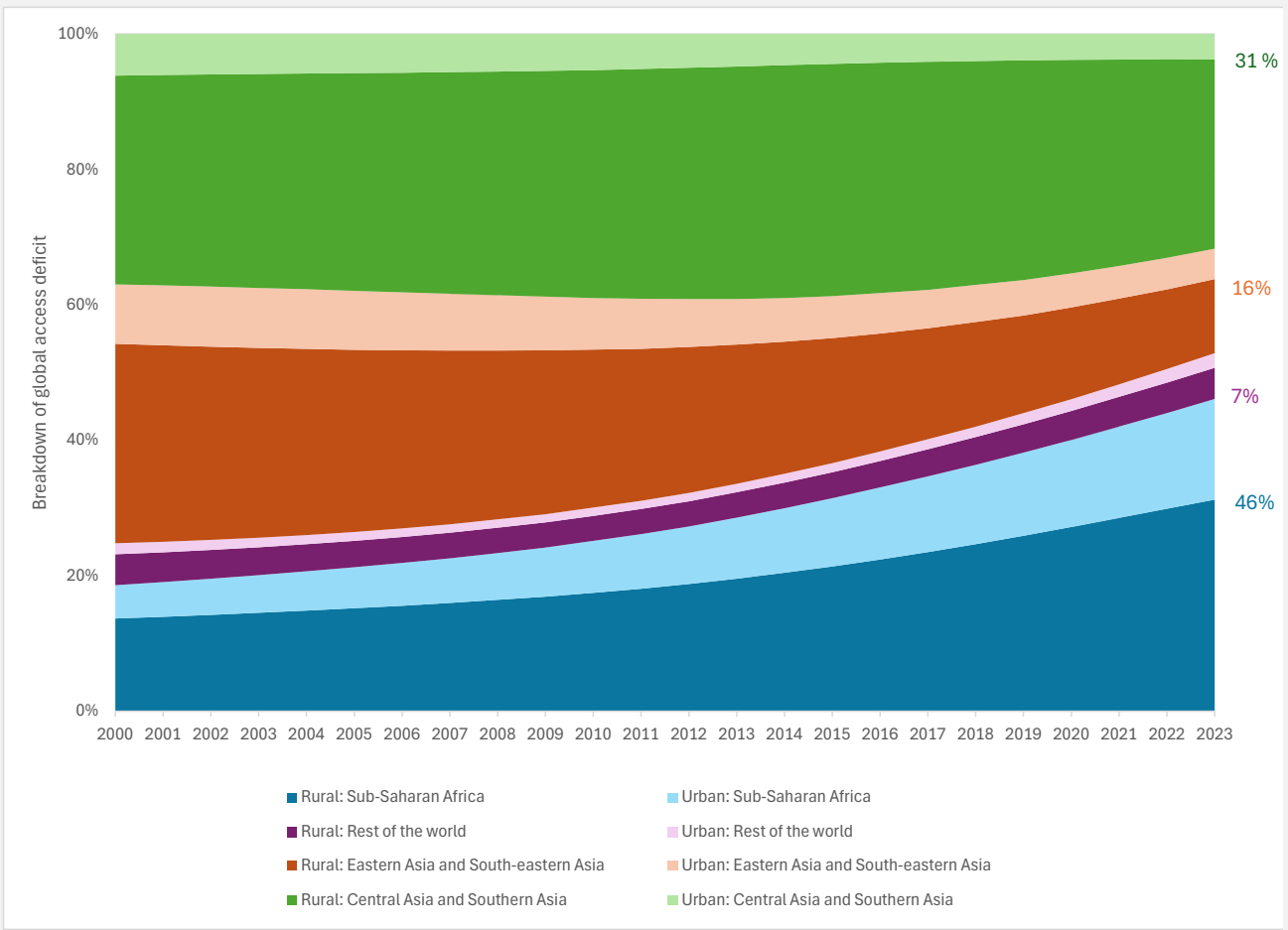


Figure 2 Proportion of the total global access deficit in the three largest access-deficit regions and the rest of the world, 2000- 2023



Additional resources, press releases, etc. with links:

- All indicators relevant to clean cooking in the context of exposure to household air pollution are available on dedicated WHO Global Health Observatory webpage: https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/gho-phe-household-air-pollution-exposure
- Tracking SDG7 The Energy Progress Report website (the new edition of the report is usually released in June/July): https://trackingsdg7.esmap.org
- Country Profiles for SDG 7.1.2 are also available on Tracking SDG7 The Energy Progress Report website: https://trackingsdg7.esmap.org/countries

Storyline authors(s)/contributor(s): WHO Health and Energy Team

Custodian agency(ies): WHO

Target 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix

Indicator 7.2.1 Renewable energy share in the total final energy consumption

Renewable energy deployment needs to scale up rapidly and substantially to keep global energy and climate objectives in reach, improve energy access and ensure inclusive development

The global share of renewable energy sources in total final energy consumption (TFEC) increased modestly from 15.6 percent in 2015 to 17.9 percent in 2022. Renewable energy consumption saw a 3.7 percent year-on-year rise in 2022, with TFEC increasing by 1.8 percent. Excluding traditional biomass use, the share of modern renewable energy sources in TFEC expanded gradually, rising from 10.2 percent in 2015 to 13 percent in 2022.

In 2022, traditional uses of biomass accounted for slightly over a fourth of total renewable energy consumption, with their share in TFEC continuing the declining trend.

Renewable energy solutions remain a key enabler for achieving the wider SDG agenda, such as progress towards SDG8 on economic growth and employment, SDG5 on gender equality and SDG7 on health. Addressing the renewable component of SDG7 is central to this effort, as it tackles inequities in energy access and clean cooking and unlocks opportunities for sustainable development. Thus, integrated policymaking is required, including clear long-term targets and plans, coupled with supporting policies to promote renewable energy deployment.

Progress varies across different end-use sectors. Particularly, renewable electricity boasts the highest share among end-use categories, with renewables amounting to almost 30 percent of power generation. Hydropower remains the predo, while wind and solar PV demonstrated the largest absolute growth, with their combined consumption more than 3 times higher in 2022 than in 2015.minant source of renewable electricity globally

In 2022, renewable sources accounted for around 21 percent of global energy use for heat. Notably, almost half of this renewable heat stemmed from use of traditional biomass, of which more than 90 percent is concentrated in Sub-Saharan Africa and Asia. The share of modern renewables in final heat consumption progressed marginally, by 1.4 percentage points, since 2015.

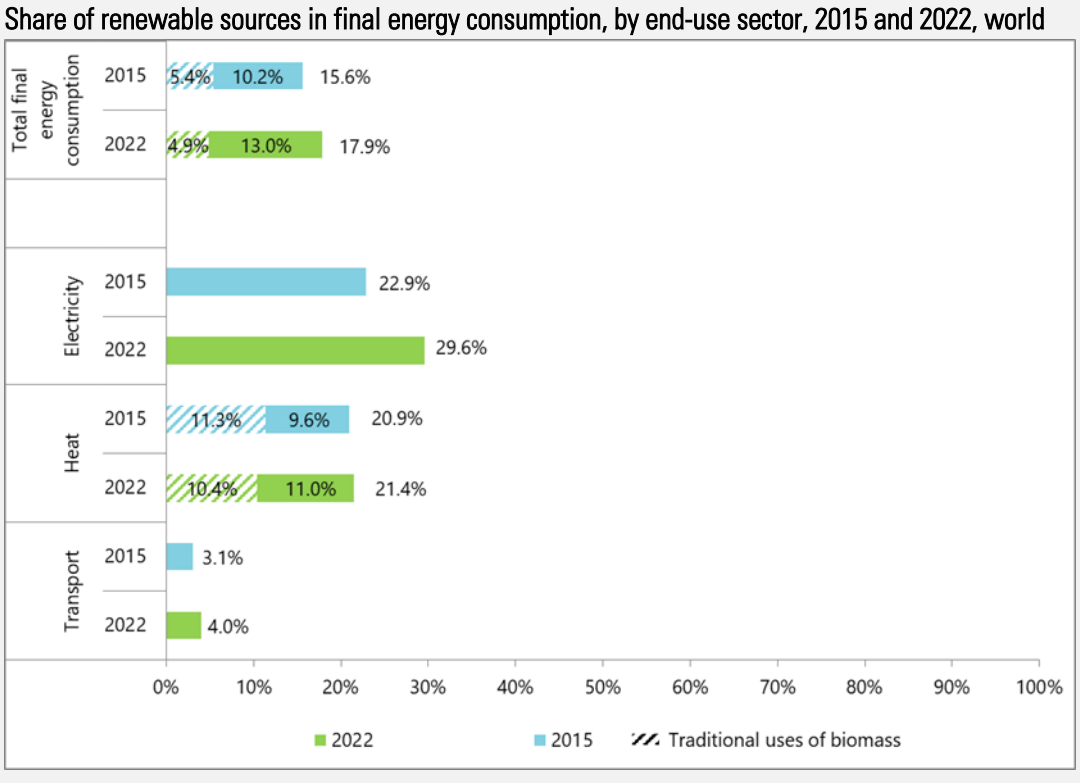
The share of renewable energy in transport TFEC rose to 4 percent in 2022, up from 3.1 percent in 2015. TFEC in transport increased by around 4 percent in 2022, almost reaching 2017 levels after the sharp downturn in 2020. Biofuels (almost 90 percent) dominated the renewable energy use in transport, with 5 percent year-on-year increase in 2022. Remarkably, renewable electricity used in vehicles and trains almost doubled compared to 2015, driven by the rise in electric vehicle sales and a higher proportion of renewables in transport-related electricity.

Excluding traditional use of biomass, Latin America and the Caribbean exhibited the highest share of modern renewable energy in TFEC. This is attributed to significant hydropower generation and the consumption of bioenergy in industrial processes and for transport. In 2022, almost half of the global year-on-year increase in modern uses of renewable energy was in Eastern Asia and South-Eastern Asia —mainly China— where wind and solar PV dominated growth. Northern America and Latin America and the Caribbean followed in 2022, each accounting for around 20 percent of the year-on-year increase in modern uses of renewable energy.

Nevertheless, global efforts need to be scaled up to address the uneven deployment of renewable energy, with a particular focus on support to LDCs, SIDS, and LLDCs which are at risk of being left behind. Tailored action is required, spanning a wide range of policy interventions, including technology and knowledge exchange, capacity building, and access to adequate financing to enable equitable energy access and foster economic development.

In turn, it is crucial to realise that SDG7 also requires prioritising inclusive workforce development, since skills shortages are already impeding the acceleration of the energy transition. Closing the skills gap will require proactive policymaking and close coordination amongst different actors including governments, educational institutions, trade unions and the private sector.

Share of renewable sources in final energy consumption, by end-use sector, 2015 and 2022, world



Additional resources, press releases, etc. with links:

- IEA (2024), Renewables 2024, IEA, Paris https://www.iea.org/reports/renewables-2024
- IEA, IRENA, UNSD, World Bank, World Health Organization. 2025. Tracking SDG7: The Energy progress Report 2025

Storyline authors(s)/contributor(s): Vasilios Anatolitis, IEA; Trevor Criswell, IEA; Juha Köykkä, IEA; Mirjam Reiner, IRENA; Leonardo Souza, UNSD; Jessica Ying Chan, UNSD; Costanza Giovannelli, UNSD

Custodian agency(ies): UNSD, IEA, IRENA

Target 7.3 By 2030, double the global rate of improvement in energy efficiency

Indicator 7.3.1 Energy intensity measured in terms of primary energy and GDP

Energy intensity progress accelerates in 2022, partly driven by the global energy crisis, but the world is not yet on track to achieve SDG 7.3.1

Primary energy intensity (defined as the ratio of total energy supply to purchasing power parity gross domestic product) improved—that is, decreased—by 2.1 percent in 2022. This is more than quadruple the rate in 2021, when energy intensity improved by a weak 0.5%. In 2022, global energy intensity stood at 3.87 Megajoules (MJ) per U.S. dollar (2021 PPP). However, the accelerated progress in energy efficiency in 2022 was driven in part by the global energy crisis that caused significant shocks to energy demand in many regions. As a result of high energy prices, many consumers and business cut back in their energy use.

SDG 7.3.1 calls for a doubling of the global rate of energy intensity improvement relative to the 1990–2010 average, with a target of improvement of 2.6% per year between 2015 and 2030. Because global progress has been slow in recent years, the required improvement in the energy intensity of the global economy is now on average 4.0 percent per year between 2022 and 2030. This is in line with the goal of doubling the global average annual rate of energy efficiency improvement by 2030 as agreed during the 2023 United Nations Climate Change Conference (COP28), as well as the IEA Net Zero Emissions by 2050 Scenario.

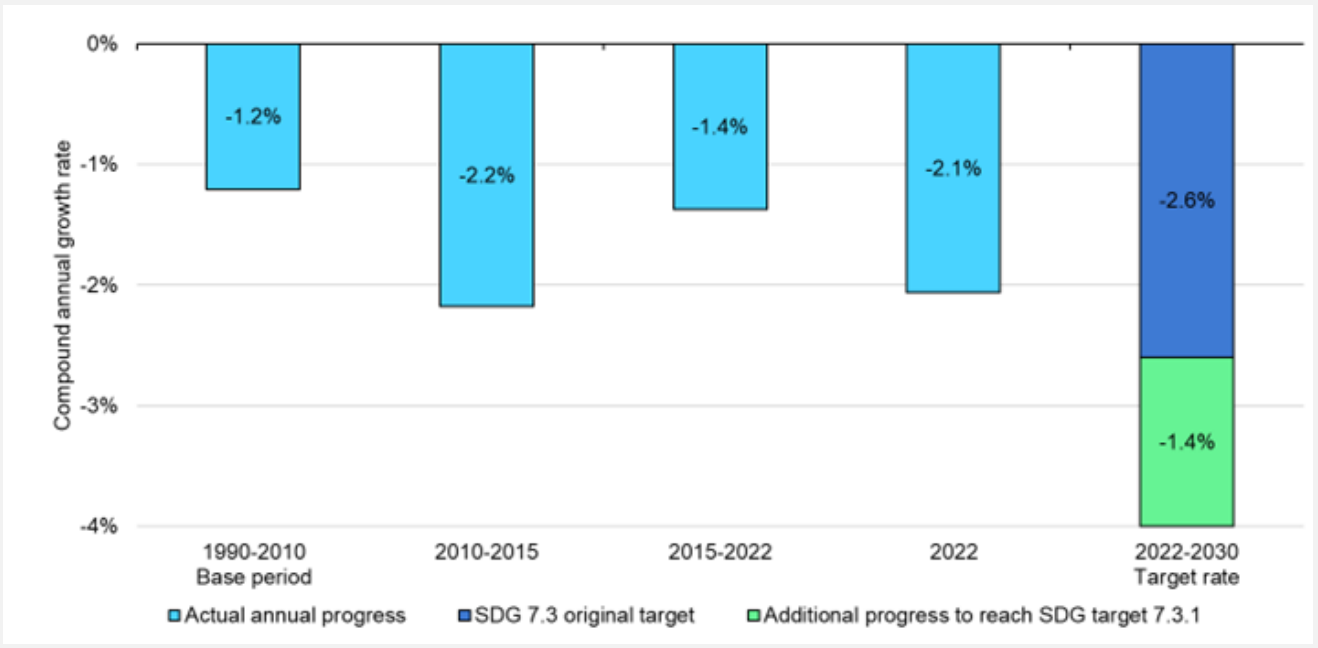
As a result of the economy growing at a faster pace than energy demand, energy intensity improved in all major regions in 2022, albeit at different speeds. Northern America and Europe posted a decrease in energy intensity of over 4%, while Oceania improved its energy intensity by almost 6%. East and Southeast Asia saw the slowest progress in energy intensity, posting an improvement rate of less than 1%. Other major regions saw energy intensity improve at a rate similar to the global average, at around 2%.

The top 20 countries with the largest total energy supply have a big impact on global efficiency progress. Between 2010 and 2022, 15 of these countries accelerated progress on energy efficiency their energy intensity rates relative to baseline period for SDG 7.3 from 1990 - 2010. Nine countries (Australia, France, Italy, Japan, Republic of Korea, Mexico, Saudi Arabia, Thailand and Türkiye) more than doubled their average annual energy intensity improvement rate in the period 2010–22 compared to the period 1990–2010. However, only China, France, Germany and the United Kingdom exceeded the 2.6 percent improvement rate required for the SDG 7.3 target.

Between 2010 and 2022, progress on energy intensity across end-use sectors has improved compared to the previous decade. The average annual improvement rate for buildings increased slightly from 1.2% to around 1.6%. The average industrial energy intensity improvement rate went from around 0% to nearly 1.5%. Passenger vehicles experienced a similar step up in efficiency, seeing its energy intensity move from around 0.7% to 1.8%, while heavy-duty trucks posted a change in energy intensity progress from around 0.4% per year on average to 0.6%.

Between 1990 and 2010, electricity generation efficiency increased from around 40% to around 42%. Between 2010 and 2022, this number rose to around 46%, meaning in almost half the number of years, electricity generation efficiency improved twice as fast. This is largely driven by the integration of renewable energy to generate electricity. In 2022, the efficiency of coal and gas power generation remained largely flat.

Average annual change in global primary energy intensity, by period, 1990-2022, and required rate until 2030 to achieve SDG7.3.1



Additional resources, press releases, etc. with links:

- https://www.iea.org/reports/energy-efficiency-2024
- https://www.iea.org/reports/energy-efficiency-2023
- https://www.iea.org/reports/energy-efficiency-2022
- https://www.iea.org/data-and-statistics/data-product/energy-efficiency-indicators

Storyline authors(s)/contributor(s): Lucas Boehlé, IEA; Juha Köykkä, IEA

Custodian agency(ies): UNSD, IEA

Target 7.a By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology

Indicator 7.a.1 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 in support of clean energy in developing countries are on an increasing growth trajectory in 2023, yet more progress is needed to ensure a more equitable distribution of flows to those furthest behind

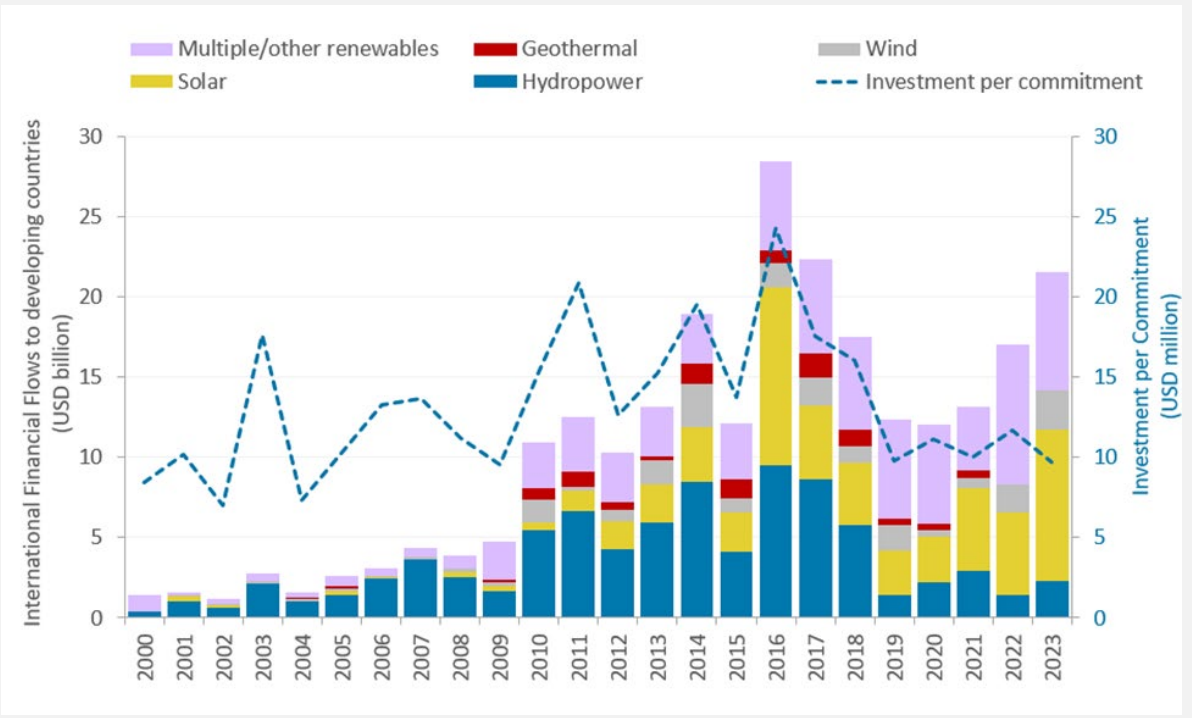
International financial flows to developing countries in support of clean and renewable energy continued to rebound, reaching USD 21.6 billion in 2023, an increase of 27 percent from 2022. Despite this third consecutive year of growth since 2021, the 2023 flows amounted to only about three-quarters of the 2016 peak of USD 28.4 billion and was mainly captured by major developing economies. Overall financial support lags far behind the actual needs of developing countries, particularly among least developed (LDCs), landlocked developing countries (LLDCs), and small island developing states (SIDS). To enable global progress towards SDG7, it will be crucial to accelerate this growth trajectory while ensuring a more equitable distribution of flows to those furthest behind.

In terms of technology trends, financial flows toward solar energy drove majority of the growth in 2023. Support for solar increased by 84 percent to reach USD 9.4 billion, accounting for 44 percent of flows– their highest ever share in a single year. Similarly, flows to wind and hydropower grew by 41 percent and 61 percent to reach USD 2.4 and USD 2.3 billion respectively in 2023, but still remained well below their respective peaks in 2016. Bioenergy, geothermal and marine energy collectively received around 2 percent of the flows in 2023.

Flows to most of the regions saw an increase in international public flows in 2023 compared to 2022. The largest increase came from Central Asia and Southern Asia and Sub-Sahran Africa, which collectively received more than 52 percent of total flows in 2023. Central Asia and Southern Asia attracted recordhigh flows of USD 5.6 billion, a more than 2.5-fold increase between 2022-2023, driven by an increase in commitments for solar energy projects in India and Uzbekistan. Sub-Saharan Africa remains the largest beneficiary of grants receiving USD 822 million. Developing countries in Northern America and Europe also reached a record high, surpassing USD 1 billion for the first time since 2000, with most support concentrated in Serbia, North Macedonia, Ukraine and Montenegro. Western Asia and Northern Africa; Eastern Asia and South-eastern Asia saw a substantial increase in international public flows between 2022-2023 but remain well below their peak levels. On the other hand, Latin America and the Caribbean, and Oceania experienced a decline after experiencing substantial growth in the year prior dropping to USD 3.5 billion and USD 64 million respectively.

In 2023, 80 percent of commitments were distributed among 29 countries compared to 25 countries in 2022. This is the highest number of countries and/or territories receiving 80 percent of commitments in a single year. Collectively, these countries represent around 50 percent of the population, and 38 percent of the GDP among the countries analysed for SDG7.a.1, indicating a relatively wide distribution in commitments. Flows to LDCs have rebounded to pre-pandemic levels but still represent around only 35 percent of the 2016 peak level. LLDCs attracted more finance than LDCs in 2023 to reach USD 3.6 billion, a 33 percent increase from 2022. Meanwhile, flows to SIDS increased by 32 percent to reach USD 401 million in 2023.

International public financial flows (commitments) to developing countries in support of clean energy, 2000–23, by technology (at 2022 prices and exchange rates)



Additional resources, press releases, etc. with links:

- More analysis will be published in the annual Tracking SDG 7 report

Storyline authors(s)/contributor(s): Nazik Elhassan, IRENA; Julian Prime, IRENA

Custodian agency(ies): OECD, IRENA

Target 7.b By 2030, expand infrastructure and upgrade 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

Indicator 7.b.1 Installed renewable energy-generating capacity in developing and developed countries (in watts per capita)

Installed renewable energy-generating capacity is on a continuous rise, yet significant disparities persist

In 2023, global installed renewable energy-generating capacity per capita reached an all-time high, mainly driven by growth in populous developing countries including China, Brazil and India. Global installed renewable energy-generating capacity per capita grew 13.0 percent from 423 watts per person in 2022 to 478 in 2023, a record-high compound annual growth rate (CAGR) of 9.4 percent over five-year periods. Developed countries saw smaller growth of 8.1 percent, increasing from 1,074 watts per person in 2022 to 1,162 in 2023. Continuing on a similar trend as in 2022, global growth of renewable installed capacity per capita in 2023 was driven by a 17.0 percent increase in developing countries which stood at 341 watts per person. Yet, greater efforts are needed to expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries.

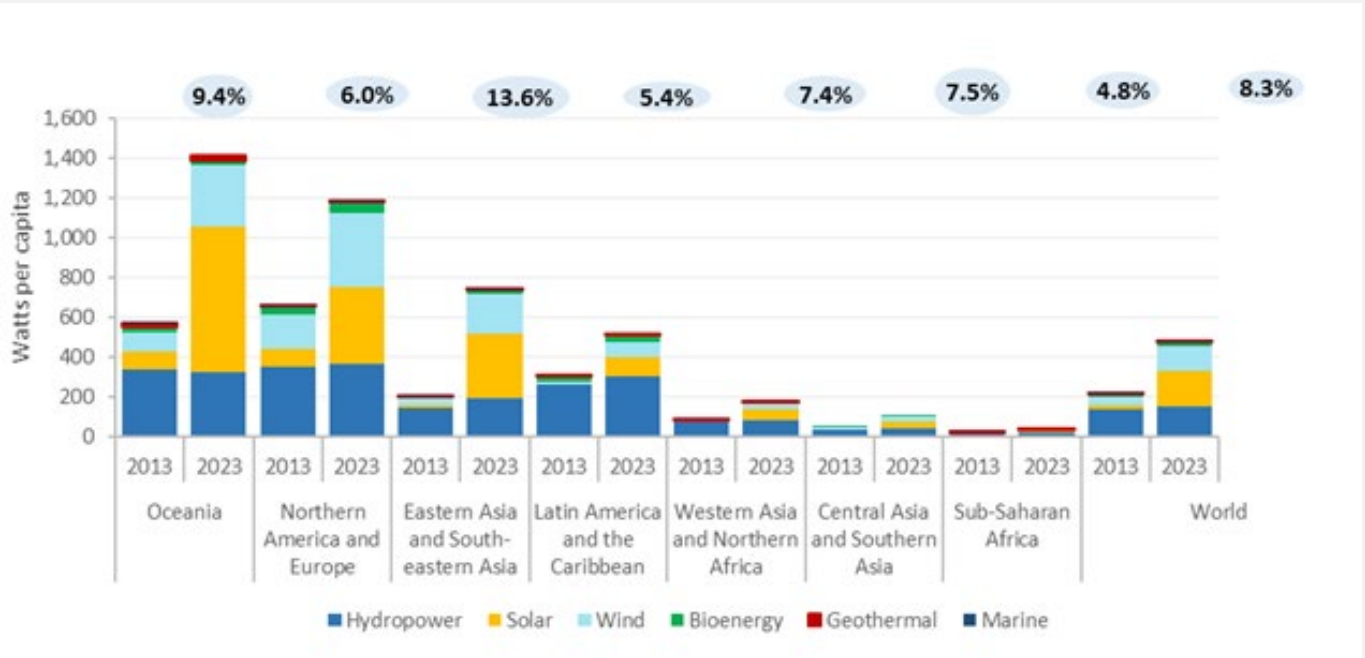
Driven by increased installations in solar and wind, the share of installed renewable energy generating capacity in developing countries continues to rise in 2023, reaching 43.5 percent, surpassing that of developed countries (42.3 percent). While the share of renewables is relatively similar across these groups, the difference in renewable wattage per capita is significant.

With an average of 1,162 watts per person in 2023, developed countries had almost three times more renewable energy capacity per capita than developing countries, highlighting significant variations in the extent to which renewable electricity covers the needs of populations in developing countries. While this disparity has contracted since 2015, when developed countries had 4.5 times more renewable energy capacity per capita than developing countries, greater efforts are needed to close this gap and align with the SDG7 targets by 2030.

The greatest growth over the last decade occurred in Eastern Asia and Southeastern Asia with a CAGR of 13.6 percent, increasing over threefold from 207 to 741 watts per person between 2013 and 2023. Meanwhile, Oceania, Central Asia and Southern Asia, and Western Asia and Northern Africa have each more than doubled their installed renewables per capita in the same period. Across regions, Sub-Saharan Africa is particularly at risk of being left furthest behind in the global energy transition, with the region seeing the lowest growth rate over the same period, with a 4.8 percent CAGR and 40 watts installed per person as of 2023. Accelerating the deployment of cost-effective renewable energy solutions can help close the energy access gap and fostering sustainable development.

Similarly, the varying growth rates across different groups of countries point to notable inequalities, with small island developing states (SIDS), least-developed countries (LDCs), and landlocked developing countries (LLDCs) lagging even behind other developing countries. In 2023, SIDS reached 110 watts per person, LLDCS at 105 watts per person while LDCs stood at 40 watts per person of renewable electricity. These regions are seeing an increasing divide compared to the rest of the world. At current rates, LDCs would need almost 46 years, LLDCs would need 36 years, and SIDS would need 11 years to achieve a level of deployment similar to that currently achieved in developing countries on average in 2023.

Renewable capacity per capita growth across regions (2013-2023)



Additional resources, press releases, etc. with links:

- More analysis will be published in the annual Tracking SDG 7 report

Storyline authors(s)/contributor(s): Nazik Elhassan, IRENA; Julian Prime, IRENA

Custodian agency(ies): IRENA