EXECUTIVE SUMMARY

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OVERVIEW

Since its inception in 2018, *Tracking SDG 7: The Energy Progress Report* has become the global reference point for information on the realization of SDG 7. It is produced annually by five of the custodian agencies responsible for tracking global progress toward Sustainable Development Goal 7 (SDG 7), which is to "ensure access to affordable, reliable, sustainable, and modern energy for all." The custodians developing the report are the International Energy Agency (IEA), the International Renewable Energy Agency (IRENA), the United Nations Statistics Division (UNSD), the World Bank, and the World Health Organization (WHO).

The report offers the international community a global summary of progress on energy access, energy efficiency, renewable energy, clean cooking, and international cooperation to advance SDG 7. It presents updated statistics for each of the indicators and provides policy insights on priority areas and actions needed to spur further progress on SDG 7, as well as related SDGs. Figure ES.1 offers an updated snapshot of the primary indicators for the most recent year.

Despite some progress across the indicators, the current pace is not adequate to achieve any of the 2030 targets. As in previous years, rates of progress vary significantly across regions, with some regions making substantial gains and some slowing their progress or even moving backward. Among the major economic factors impeding the realization of SDG 7 globally are the uncertain macroeconomic outlook, high levels of inflation, currency fluctuations, debt distress in a growing number of countries, lack of financing, supply chain bottlenecks, tighter fiscal circumstances, and soaring prices for materials. The effects of the COVID-19 pandemic and the steady rise in energy prices since summer 2021 are expected to be a further drag on progress, particularly in the most vulnerable countries and those that were already lagging behind.

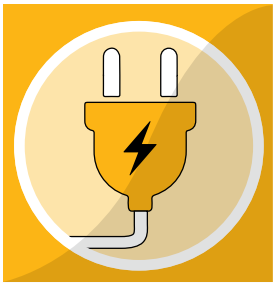
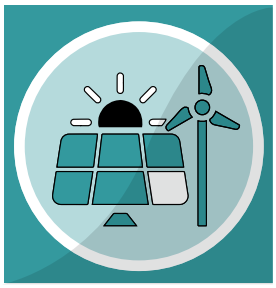
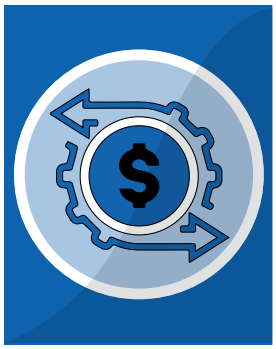
Although certain policy responses to the global energy crisis appear likely to improve the outlook for renewables and energy efficiency, other necessary policy actions, as well as financial flows, continue to lag. This particularly concerns lacking universal access to electricity and clean cooking in developing economies, with projections indicating that SDG 7 will not be reached by 2030.

This year marks the mid-point of the implementation of the UN 2030 Agenda for Sustainable Development. The picture on progress since the adoption of the Agenda in 2015 is mixed. Target 7.1 on ensuring universal access to affordable, reliable, and modern energy services is off track, with an estimated 675 million people still without access to electricity and 2.3 billion without access to clean cooking in 2021. Current trends suggest that the world's shot on the target will fall very wide of the mark in 2030.

The uptake of renewable energy (target 7.2) has grown since 2010, but efforts must be scaled up to substantially increase the share of renewables in total final energy consumption. Likewise, despite steady progress, the rate of improvement in energy efficiency (target 7.3) is not on track to double by 2030, with the current trend of 1.8 percent falling short of the targeted increase of 2.6 percent each year between 2010-2030. To make up for the lack of progress, improvements would need to accelerate further from now to 2030.

Finally, progress on target 7.a—to increase international public financial flows supporting clean energy in developing countries—began to decline even before the onset of the COVID-19 pandemic, with financial resources more than a third lower since 2020 than the average of the previous decade (2010–19). As financial flows have contracted for the third year in a row, they have become increasingly concentrated in a small number of countries. The decreasing trend in international public financial flows may delay achievement of SDG 7, especially for the least-developed countries (LDCs), landlocked developing countries, and small island developing states.

FIGURE ES.1 • Primary indicators of global progress toward the SDG 7 targets

	INDICATOR	2010	LATEST YEAR
	7.1.1 Proportion of population with access to electricity	**1.1 billion** people without access to electricity	**675 million** people without access to electricity (2021)
	7.1.2 Proportion of population with primary reliance on clean fuels and technology for cooking	**2.9 billion** people without access to clean cooking	**2.3 billion** people without access to clean cooking (2021)
	7.2.1 Renewable energy share in total final energy consumption	**16%** share of total final energy consumption from renewables	**19.1%** share of total final energy consumption from renewables (2020)
	7.3.1 Energy intensity measured as a ratio of primary energy and GDP	**5.53 MJ/USD** primary energy intensity	**4.63 MJ/USD** primary energy intensity (2020)
	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	**11.9 USD billion** international financial flows to developing countries in support of clean energy	**10.8 USD billion** international financial flows to developing countries in support of clean energy (2021)

ACCESS TO ELECTRICITY (SDG INDICATOR 7.1.1)

Recent progress is not on track to reach universal access by 2030. Globally, access to electricity grew by an annual average of 0.7 percentage points between 2010 and 2021, **rising from 84 percent of the world's population to 91 percent**. The number of people without electricity almost halved during the period, from **1.1 billion in 2010 to 675 million in 2021**. The pace of annual growth slowed during 2019–21 to 0.6 percentage points.

To bridge the gap, especially for people living in poor and remote regions, the annual rate of growth in access must be 1 percentage point per year from 2021 onward—almost twice the current pace. If no additional efforts and measures are put in place, some 660 million people, mostly in Sub-Saharan Africa, would still be unserved in 2030 (IEA 2022a). Policies for energy access should demonstrate political commitment and maximize the socioeconomic benefits of access, keeping the most vulnerable populations at the forefront of efforts to close the access gap.

CLEAN COOKING SOLUTIONS (SDG INDICATOR 7.1.2)

The global population lacking access to clean cooking fell from **2.9 billion in 2010 to 2.3 billion in 2021**, but the goal of universal access by 2030 remains elusive: some **1.9 billion people would still be without access to clean cooking in 2030**. If current trends continue, almost six out of ten people without access to clean cooking in 2030 would reside in Sub-Saharan Africa.

With the ongoing impact of COVID-19 and soaring energy prices, the IEA estimates that 100 million people who recently transitioned to clean cooking may revert to using traditional biomass (IEA 2022a). Eastern Asia and Latin America and the Caribbean were the only regions to sustain progress in access to clean cooking between 2019 and 2021 (ESMAP 2022). Unless efforts are rapidly scaled up today, polluting cooking fuels and technologies will continue to claim millions of lives each year while perpetuating gender inequity, deforestation, and climate damage. Integrating clean cooking into broader energy planning, improving affordability, and devising better delivery mechanisms are some of the key policy levers to drive clean cooking. If such efforts are paired with sustained financing at an adequate level, the world can get back on track to making clean cooking a reality for all.

RENEWABLE ENERGY (SDG INDICATOR 7.2.1)

Universal access to affordable, reliable, sustainable, and modern energy depends on faster deployment of renewable energy in electricity, heat, and transport. But unless the pace quickens, the share of renewable energy in total final energy consumption (TFEC) will remain sluggish. **In 2020, the share of renewable energy in TFEC stood at just 19.1 percent** (or 12.5 percent if traditional use of biomass is excluded), not much more than the 16 percent a decade earlier.

If the world is to be on track to limit the temperature rise to less than 1.5°C throughout the century, the share of renewables must reach 33–38 percent by 2030 (In the power sector, renewables would need to account for 60-65 percent of electricity generation.). Much greater effort is needed to increase the use of renewables in transport and heating, both directly (through the use of bioenergy, solar thermal and geothermal, and ambient heat) and indirectly (through electrification), while progressing on energy conservation.

Enhancing renewables-based electricity supply in developing countries deserves particular attention. Positively, developing countries saw a record-breaking renewable capacity growth in 2021 (+9.8 percent year-on-year), with cumulative installations reaching 268 watts per capita. Yet this growth is unevenly distributed, and further action is required in the least developed countries.

ENERGY EFFICIENCY (SDG INDICATOR 7.3.1)

SDG target 7.3 calls for doubling the global rate of improvement in energy intensity over the average rate during 1990–2010—which means improving energy intensity by 2.6 percent per year between 2010 and 2030.[1] **Yet progress between 2010 and 2020 averaged only 1.8 percent**. To make up for lost ground, improvement in energy intensity **must now exceed 3.4 percent globally from 2020 to 2030**—twice the rate achieved in the past decade. An even greater improvement would be needed to be on track to limit the end-of-century temperature rise to less than 1.5°C.

The needed improvements will require more aggressive efficiency mandates—including bans on the sale of the most inefficient equipment—and codes requiring that new buildings meet net-zero standards.

INTERNATIONAL PUBLIC FINANCIAL FLOWS (SDG INDICATOR 7.A.1)

International public financial flows in support of clean energy in developing countries began to drop before the onset of the COVID-19 pandemic and continued to fall through 2021. **In 2021, these flows amounted to USD 10.8 billion, an 11 percent drop from 2020**, 35 percent less than the 2010–19 average and only about 40 percent of the 2017 peak of USD 26.4 billion. Commitments remain heavily concentrated in a handful of countries. It is expected that the downward trend in public investments continued in 2022. Data released in 2022 and 2023 will provide a clearer picture of the effects on public financial flows of the energy crisis in Europe sparked by the war in Ukraine.

While there is no quantitative target for this indicator, IEA and IRENA scenarios estimate that staying in line with international climate and energy goals requires annual investments in renewable electricity generation and related infrastructure of USD 1.4–1.7 trillion through 2030. Investments will be needed not only in technologies, but also in policy interventions and international cooperation. Although the private sector finances most renewable energy investments, the public sector remains a critical source of finance, particularly for many developing countries. Overall, redirecting investments from fossil fuels, increasing aid commitments, introducing structural reforms in international public finance, innovating funding mechanisms, and improving the transparency of commitment reporting are all necessary steps.

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As the path to realizing SDG 7 and related SDGs by 2030 narrows, the SDG 7 custodian agencies also emphasize the need for stronger and more tangible commitments to close the gaps in access to electricity and clean cooking fuels and technologies; the need for a fundamental transformation of the global energy system as a precondition for sustainable development and global energy security; and the importance of international cooperation and financing to deliver on the vast promise of the energy transition.

Continued improvements on data and the tracking of global SDG 7 targets will be critical to ensure evidenced-based decision and policy making. The custodians will further enhance the global dashboard now freely accessible online and continue to refine this annual report, which has strengthened institutional, organizational, and sectoral collaboration.[2] Results emerging from the joint work of the custodians have included joint publications (including analytical guidebooks), capacity-building actions, and coordinated dissemination efforts.

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1 Energy intensity is the ratio of the total energy supply to the annual GDP created—in essence, the energy used per unit of wealth created.

2 The global dashboard is available online here: https://trackingsdg7.esmap.org/

The custodian agencies further urge the international community and policy makers to safeguard the gains made toward achieving SDG 7; to advance structural reforms to overcome obstacles to action on affordable, reliable, sustainable, and modern energy for all; and to maintain a strategic focus on the vulnerable countries needing the most support.

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The remainder of this summary is devoted to the major SDG 7 target areas: access to electricity, access to clean fuels and technologies for cooking, renewable energy, energy efficiency, and international public financial flows to developing countries in support of clean energy.

ACCESS TO ELECTRICITY

Access to electricity is expected to improve through 2030, after the difficult economic conditions created by the COVID-19 pandemic and the war in Ukraine have stabilized. However, variations across countries will persist, and many countries will not reach universal access by 2030 unless much more is done. Even then, progress may be limited for countries with weak energy access–related institutions and policies. The outlook is better for countries with strong institutional and policy support for access, most of which have already made historic progress in bringing the benefits of electricity to their population.

According to IEA's Net Zero by 2050 Scenario, annual investment of USD 30 billion will be required to achieve universal access to electricity by 2030.

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Globally, access to electricity (SDG 7.1.1) grew on average by 0.7 percentage points each year between 2010 and 2021, rising from 84 percent of the world's population to 91 percent and raising the number of people with an electricity connection by more than a billion. Over the past decade, access improved steadily, reducing the number of people without access from 1.1 billion in 2010 down to 675 million in 2021, despite a growing population. The recent slowdown in growth is leaving the poorest and hardest-to-reach people without access. In 2019–21, the number of people with access increased by 114 million per year, fewer than the 129 million who had access each year between 2010 and 2019.[3]

To reach universal access by 2030, the world will have to scale up annual growth in electrification to 1 percentage point per year from 2021 onward through investments and policy support, instead of the 0.6 percentage point pace recorded between 2019 and 2021. If no additional efforts and measures are put in place, some 660 million people—560 million in Sub-Saharan Africa and 70 million in Developing Asia—will remain unserved in 2030 (IEA 2022a).[4] Because of the continued negative impacts of COVID-19 on the global and national economies, compounded by the war in Ukraine and the related energy crisis, urgent actions must be taken to prevent setbacks in access.

Globally, the number of unserved people fell steadily between 2010 and 2021. However, the trend differs across regions (figure ES.2). Fifty-one countries in the developing world have achieved universal access, 17 of them in Latin America and the Caribbean. Another 95 countries, concentrated in Sub-Saharan Africa, were still short of the target in 2021, despite progress in about one-quarter of them—including half of the 20 countries with the largest access deficits (defined as the population lacking access to electricity). In Sub-Saharan Africa, the number of people without access was roughly the same in 2021 as in 2010.

Most of the decline in the unserved population came in Asia. The number of people without access plummeted in Central and Southern Asia, falling from 414 million in 2010 to 24 million in 2021, with much of the improvement occurring in Bangladesh, India, and other populous countries. The number without access to electricity in Eastern and South-eastern Asia declined from 90 million to 35 million during the same period. In Northern Africa and Western Asia, the unserved population decreased less markedly—falling from 37 million in 2010 to 30 million in 2021.

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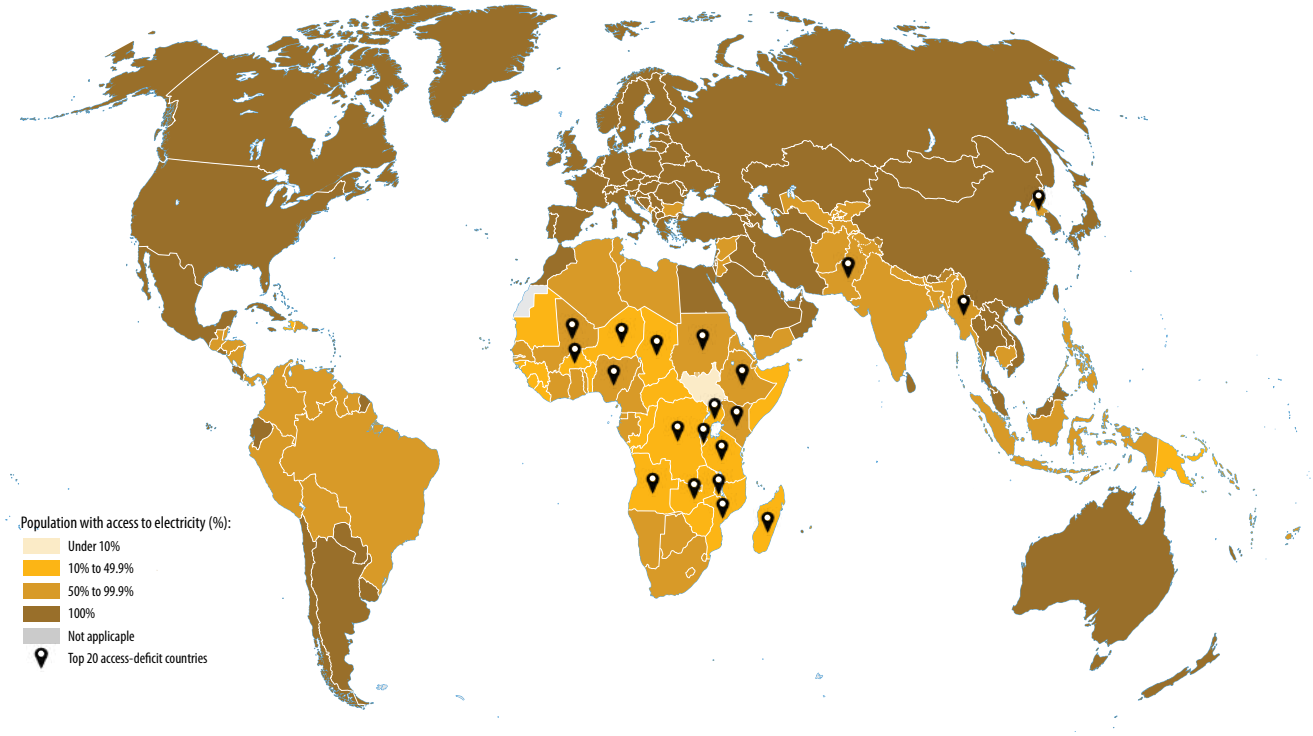
3 The annual change in access is calculated as the difference between the access rate in year 2 and the rate in year 1, divided by the number of years: (Access Rate Year 2 – Access Rate Year 1)/(Year 2 – Year 1).

4 The projected access rate of 92 percent in 2030 was calculated based on the UN population database and IEA World Energy Outlook (2022).

FIGURE ES.2 • Share of global population with access to electricity in 2021



Source: World Bank 2023.
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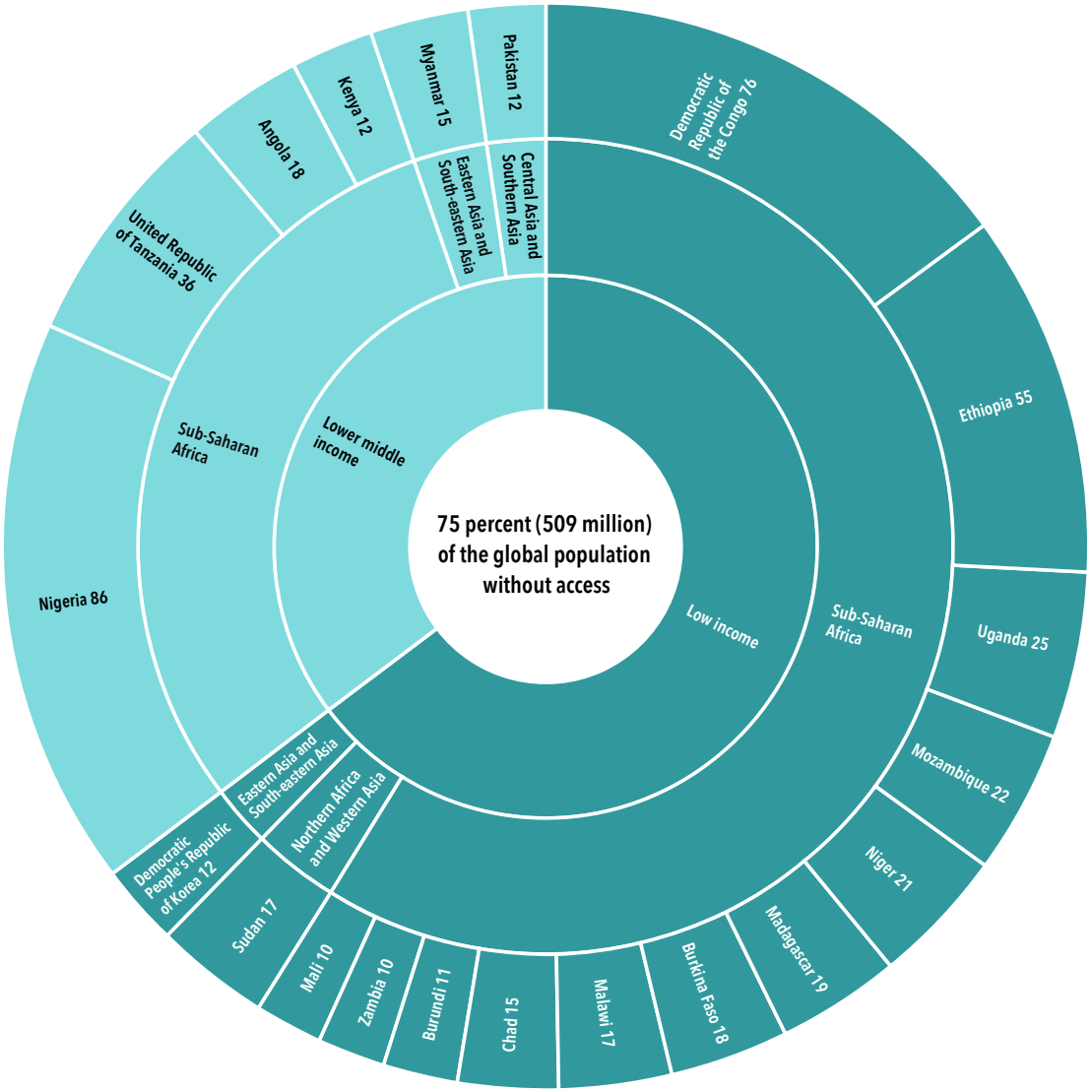
In 2021, the 20 countries with the largest access deficits accounted for 75 percent of the world's people lacking electricity access (figure ES.3). The countries with the largest numbers without access were Nigeria (86 million), the Democratic Republic of Congo (76 million), and Ethiopia (55 million). In 2021, these top three countries are the same as in the previous edition of this report. India and South Sudan dropped out of the top 20, and Zambia and Mali joined it. Increases in electrification did not keep up with population growth in the Democratic Republic of Congo between 2019 and 2021. As a result, the access deficit there increased by about 2 million people. In contrast, the number of people without access in Nigeria and Ethiopia decreased by 2 million each year between 2019 and 2021, although those countries are still in the top 3 in terms of unserved population. During the same period, as in Ethiopia, Kenya increased its access rate by more than 3 percentage points, and its unserved population declined by about 2 million a year.

FIGURE ES.3 • The 20 countries with the largest access deficits in 2021 by region and income levels



Source: World Bank 2023.

Differences are also seen in urban versus rural access to electricity. In 2021, 98 percent of those living in urban areas of the world had access to electricity, contrasted with just 85 percent in rural areas. Between 2019 and 2021, however, the pace of electrification was rapid in rural areas, where the number of people with access grew by 33 million a year, significantly outpacing population growth. This trend was driven by Central and Southern Asia. In Sub-Saharan Africa, by contrast, rural electrification progress lagged behind population growth, with more than 80 percent of the 524 million people in rural areas living without access to electricity in 2021. Meanwhile, annual growth in the number of connected rural dwellers slowed in Eastern and South-eastern Asia, a result of a steady decline in the overall rural population. In Northern Africa and Western Asia, expansion of rural access kept pace with population growth.

Narrowing the gap between rural and urban access requires a better understanding of electricity end uses and greater mobilization of public financing to make electricity more affordable and electricity infrastructure more resilient.

Compared with the global average, the LDCs saw a relatively rapid increase in electrification, connecting about 32 million people a year in 2019–21 and bringing the rate of access up 3 percentage points from 53 percent in 2019 to 56 percent in 2021, still leaving 481 million LDC residents without access. A gap of more than 30 percentage points persists in access rates between LDCs and the global average. In countries marked by fragility, conflict, and violence, access increased from 55 percent to 58 percent, leaving 421 million people still unserved in 2021.[5]

At the current pace of electrification, most people without access by 2030 will live in LDCs and countries affected by fragility, conflict, and violence. Dedicated financial and regulatory support should be strengthened to increase electrification in these settings.

Stand-alone off-grid solutions hold potential for closing the access gap in remote and rural areas of Sub-Saharan Africa, where weak utility creditworthiness and other challenges, such as the absence of infrastructure and low population densities, have impeded progress in grid electrification (ESMAP 2022a).

In the face of the COVID-19 pandemic, mini-grid systems continued to expand access between 2019 and 2021 through support from policy makers, private investors, and end users (IRENA 2022). The number of people connected to mini-grids powered by solar, hydro, and biogas technologies reached 11 million in 2021.[6] Solar mini-grids, which served about a third of those connected, have become the least-cost way of bringing reliable electricity to communities living far from the grid or experiencing regular power cuts (ESMAP 2022b). Even so, the number with access to stand-alone off-grid solar solutions dropped from 107 million in 2019 to 101 million in 2021.[7] To close the access gap by 2030, however, off-grid renewable electrification will have to be scaled up rapidly through dedicated policies and strong financial schemes.

Specific policies to expand infrastructure, upgrade technology, and achieve modern and sustainable energy service targets under a given regulatory framework vary by country, but all countries need to establish an enabling environment that de-risks investments, supports innovation, promotes transparency and accountability, and offers benefits to local economies. Technological innovation and digitalization offer the prospect of reducing costs, providing efficiencies across the value chain, and improving accountability (thus encouraging the required investment and spurring large cross-sectoral effects). Public financing will continue to play an important role in ensuring affordable access for all and supporting the development of enabling environments through investments in skills and capacity building, planning, and market linkages for productive uses of electricity.

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5 The list of countries affected by violent conflict is based on the World Bank classification. The list is updated annually and this report refers to the list published in July 2022: https://thedocs.worldbank.org/en/doc/69b1d088e3c48ebe2cdf451e30284f04-0090082022/original/FCSList-FY23.pdf

6 According to ESMAP (2022b), 48 million people were connected to around 21,500 mini-grids powered by solar photovoltaic (PV), followed by hydro and fossil fuels in 2021.

7 The figure of 101 million people with current access is calculated based on sales from GOGLA and its affiliates, which include GOGLA members, companies with Verasol-certified products, and companies working with the Low Energy Inclusive Appliances program.

ACCESS TO CLEAN FUELS AND TECHNOLOGIES FOR COOKING

The world is not on track to achieve universal access to clean cooking by 2030. Even though an estimated 71 percent of the global population had access to clean cooking fuels and technologies in 2021—an increase of 2 percentage points since 2020 and 14 points since 2000[8]—2.3 billion of the world's people still use polluting fuels and technologies for their cooking. This continues to put household members, particularly women and children, at greater risk of chronic diseases, while also contributing to climate change, perpetuating gender inequity, and compromising actions for sustainable development. Efforts to accelerate the achievement of universal access to clean cooking by 2030 are urgently needed. Sustained development aid and financing in low- and middle-income countries will be necessary to ensure universal access to clean cooking fuels and technologies, alongside a long-term transition from LPG to electricity that will require substantial investments in infrastructure and changes in cooking practices.

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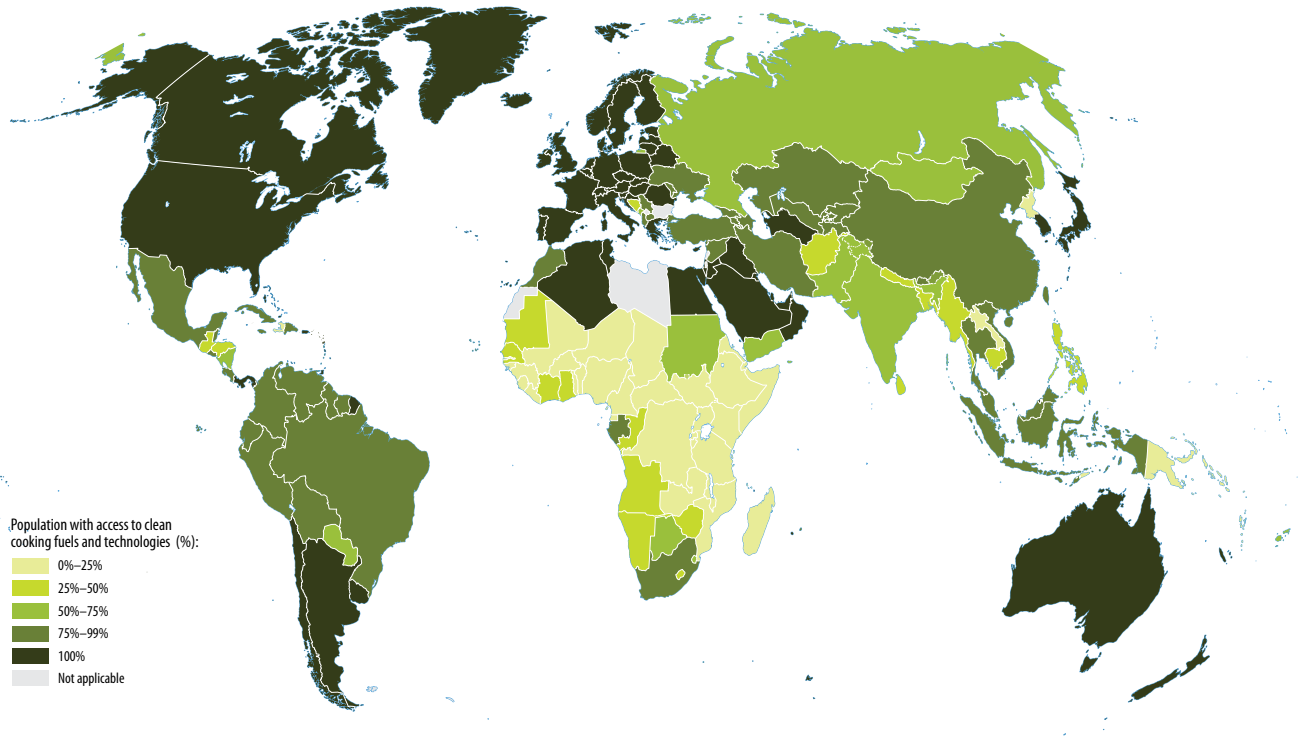
On a global scale, the number of people with access to clean cooking has risen consistently over the last two decades. The total number of people lacking access to clean cooking—a measure of the number exposed to the damaging health and socioeconomic effects of polluting fuels and technologies—began to fall substantially only after 2010, dropping from its historic level of around 3 billion people in that year to 2.3 billion people in 2021.

The health consequences of household air pollution are stark and tragic. The use of inefficient stoves paired with solid fuels and kerosene releases air pollution that puts household members, particularly women and children, at greater risk of chronic disease. According to WHO (2022), 3.2 million deaths are attributable to household air pollution created through the use of polluting fuels and technologies for cooking, including 240,000 pneumonia deaths in children under the age of five (WHO 2021). Failure to reach the target of universal access to clean cooking fuels and technologies will continue to claim millions of lives each year. The lack of access to clean fuels and modern energy systems for cooking has impacts beyond health, preventing many from living life to the fullest. The drudgery posed by reliance on inefficient stoves and fuels (which must often be foraged) falls disproportionately on women and children, particularly girls.

Improvement in the global access rate has been driven by progress in the most populous low- and middle-income countries. Rapid progress in China, India, Indonesia, Brazil, and Pakistan, where the combined access rate rose from 49 percent in 2010 to 77 percent in 2021, stands in sharp contrast to the minimal progress in other countries (48 percent in 2010 to 52 percent in 2021). Large regional variability exists (figure ES.4), as good progress in the largest countries may obscure the lack of progress in a great many smaller countries. India alone accounts for the largest share of the access deficit, with 505 million people lacking access, followed by China at 296 million.

8 Clean fuels and technologies include stoves powered by electricity, liquefied petroleum gas (LPG), natural gas, biogas, solar, and alcohol. Clean fuels and technologies are as defined by the normative technical recommendations in the WHO Guidelines for Indoor Air Quality: Household Fuel Combustion (WHO 2014).

FIGURE ES.4 • Share of population with access to clean cooking fuels and technologies, 2021 (percent)



Source: WHO 2023; Stoner and others 2021.
Disclaimer: This map was produced by the Geospatial Operations Support Team of the World Bank based on the Cartography Unit of the World Bank. The boundaries, colors, denominations, and other information shown do not imply any judgment on the part of the custodian agencies concerning the legal status of or sovereignty over any territory or the endorsement or acceptance of such boundaries.

In 2000, four in ten people lacking access to clean cooking lived in Central Asia and Southern Asia; another four in Eastern Asia and South-eastern Asia; and two in Sub-Saharan Africa. By 2021, four in ten people without access lived in Sub-Saharan Africa, as the access deficit shrank in the two Asian regions and grew sharply in Sub-Saharan Africa. If current trends continue, almost six in ten people without access will reside in Sub-Saharan Africa by 2030. The number of people without access in that region is growing at a rate of almost 20 million people per year as gains in access fail to keep pace with population growth. The growing access deficit in Sub-Saharan Africa could undermine increasing trends in global access.

Large urban-rural discrepancies in access to clean cooking fuels and technologies are found worldwide. Urban areas enjoy greater access to clean cooking than rural areas, but the gap is narrowing. The percentage of people with access in urban areas rose only slightly in the past decade—from 82 percent in 2010 to 86 percent in 2021, owing to a higher baseline. Over the same period, the percentage with access in rural areas rose from 31 percent to 51 percent. Between 2000 and 2010, the difference in access to clean cooking between urban and rural areas stood at around 50 percentage points. By 2021 the gap had fallen to 35 percentage points; it is expected to narrow to 23 percentage points in 2030 if current trends continue.

There is an ongoing shift in the fuel mix. Unprocessed biomass, once the most commonly used fuel in low- and middle-income countries, was overtaken by gas in around 2010 with the rapid growth of LPG programs in India, Indonesia, and Peru, among other countries. However, in rural areas, biomass was still the principal cooking fuel of 49 percent of people (1.5 billion) in 2021, more than any other type of fuel. Use of unprocessed biomass may be decreasing in both urban and rural areas, but primary reliance on charcoal persists and is increasing in some areas, particularly urban areas of Sub-Saharan Africa, where it was used by 30 percent of people or 140 million people in 2021.

In rural areas (and overall), the share of people who use gas as their primary fuel is rising more quickly than those who use electricity, whereas the use of electricity is rising more quickly in urban areas. Among low- and middle-income countries, the use of electricity is highest in Eastern and South-eastern Asia, at 24 percent.

Given current trends, the pledge made at the UN's 2021 High-level Dialogue on Energy to ensure that an additional 1 billion people would gain access to clean cooking solutions by 2025 will not be reached.[9] Only 39 of the 128 countries still lacking universal access to clean cooking have set clean cooking targets, and less than half of those aim to achieve universal access by 2030 (IEA 2022a). Current policy ambitions are therefore far from the targets of SDG 7.

Focusing on the near term, the number of people with access to clean cooking is expected to increase by only 510 million people from 2021 to 2025. The expected access deficit is largely concentrated in Sub-Saharan Africa, where almost 60 percent of the population is projected to still lack access to clean cooking in 2030. Because of the ongoing impact of the COVID-19 pandemic and soaring energy prices, 100 million people who recently transitioned to clean cooking are expected to revert to using cheaper traditional biomass (IEA 2022a). Between 2019 and 2021, Eastern Asia and Latin America and the Caribbean were the only regions to sustain progress in access to clean cooking (ESMAP 2022a).

Considering the significant benefits of clean cooking for the health of people and the planet, it should be at the top of the sustainable development agenda. Without immediate and sustained political action, the world will arrive at 2030 with 1.9 billion people still using polluting stove and fuel combinations for most of their cooking, harming the environment, impeding economic development, and compromising human health, particularly among women and children. Scaling up clean cooking still faces supply-side challenges, including a lack of resources and infrastructure, while, on the demand side, cost remains a deterrent and behavioral inertia persists. However, there are known solutions, and a growing number of countries are exploiting them. The time is ripe to take action to keep the universal target in reach.

9 Pledge made during the High-level Dialogue on Energy in 2021, as part of the Global Roadmap for Accelerated SDG 7 Action in Support of the 2030 Agenda for Sustainable Development and the Paris Agreement on Climate Change (United Nations 2021).

RENEWABLE ENERGY

SDG target 7.2 for 2030 is "increasing substantially the share of renewable energy in the global energy mix." In 2020, the TFEC declined by 4.7 percent year-on-year as the COVID-19 pandemic and policy responses disrupted social and economic activities worldwide. In this context of declining energy demand, renewable energy consumption, including traditional use of biomass, continued to progress at a modest pace, growing 2.6 percent year-on-year globally, and increasing its share of TFEC to 19.1 percent. Yet the current trend is neither in line with the ambition of the target nor with internationally agreed climate objectives, and the uptake of renewable energy must be accelerated.

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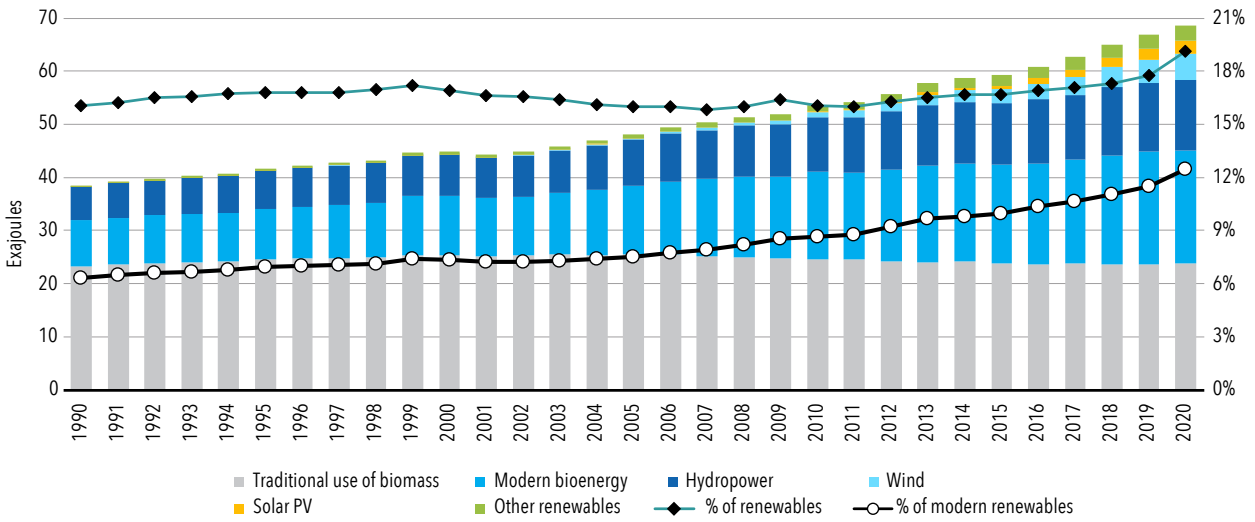
The share of renewable sources in TFEC has remained relatively steady globally over the past three decades, with a slow upward trend in recent years (+3 percentage points over the past ten years), owing mostly to the accelerated deployment of renewable electricity technologies. In 2020, to slow the spread of the pandemic, governments across the world imposed restrictions on most social and economic activities, curtailing transport, industrial production and services, and causing a significant dip in energy demand. At the same time, global renewable energy consumption expanded to 68.6 exajoules (EJ) in 2020, pushing the share of renewables in TFEC to 19.1 percent, up from 17.7 percent in 2019 (figure ES.5).

FIGURE ES.5 • Renewable energy consumption and share in total final energy consumption, by technology, 1990-2020



Source: IEA (2022c), UNSD (2022).

Ensuring access to affordable, reliable, sustainable and modern energy for all implies a substantial increase in the share of renewable energy sources not only in the generation of electricity, but also in transport and heat.[10]

10 In 2020, the three categories accounted for 22 percent, 29 percent, and 49 percent of TFEC, respectively.

The share of renewables in final consumption is greatest for **electricity**, rising from 26.2 percent in 2019 to 28.3 percent in 2020. Renewable electricity accounts for a third of global renewable energy consumption, including traditional uses of biomass, and half of modern uses. It also accounts for about 90 percent of the year-on-year increase in the share of renewables in the energy mix, driven by continuous expansion of capacity in wind and solar PV.

Heat is the largest energy end-use worldwide, accounting for half of global final energy consumption (175 EJ). The sector remains heavily dependent on fossil fuels, which meet more than three-quarters of global heat demand. Renewable sources accounted for just 24 percent of the energy used for heat, and more than half of that is represented by traditional uses of biomass, which increased 1 percent in 2020 in response to higher prices for modern forms of renewable energy. Despite its dominant share in final energy consumption, the heat sector has received limited policy attention and support until very recently.

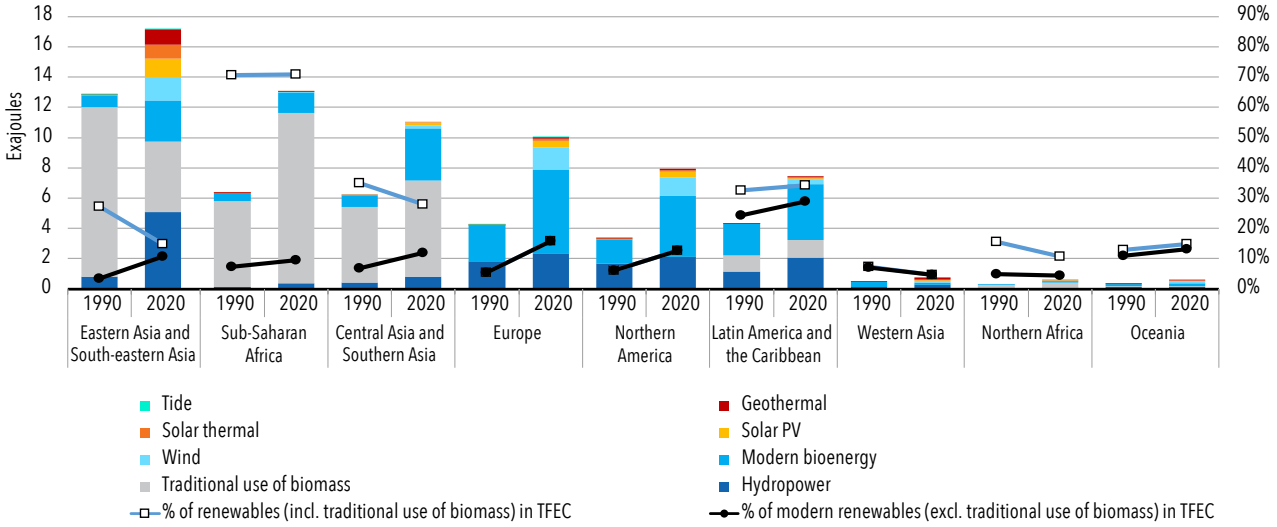
The **transport** sector is the end-use sector with the lowest renewable energy penetration, at only 4 percent of final energy consumption in 2020 and only 9 percent of worldwide consumption of modern forms of renewable energy. Liquid biofuels represented 90 percent of the renewable energy consumed for transport, with most of the remainder coming from renewable electricity for vehicles and trains, which expanded by 0.02 EJ year-on-year in 2020. A fraction of this growth is attributable to the growing number of electric vehicles on the road—from 7.1 million in 2019 to 11.3 million in 2020, while the electricity that powers these vehicles comes increasingly from renewable sources.

The **agri-food** sector also has substantial linkages with renewable energy. About 30 percent of the world's energy is consumed within agri-food systems, from production to food consumption.[11] The majority of that energy is fossil fuel–based (IRENA and FAO 2022). A joint approach to the renewable energy transition and the transformation of agri-food systems is necessary to meet their demand for electricity, heating, cooling, processing, and transport while advancing the SDGs and the Paris Agreement on Climate Change (IRENA and FAO 2022).

There are strong **regional disparities** in the share of renewables in the energy mix (figure ES.6). In 2020, almost half of the global year-on-year increase in modern renewable energy consumption came from Eastern Asia, owing primarily to the deployment of wind, hydropower and solar PV. Europe accounted for more than a quarter of the year-on-year growth in modern renewable energy use, due to favorable conditions for hydropower and the expansion of wind and solar PV capacity. The share of renewables in TFEC grew fastest in Latin America and in Europe (respectively +2.8 and +1.5 percentage points in 2020), supported in both cases by significant declines in TFEC (-7.7 percent and -5.5 percent, respectively—the largest declines after Northern America). Modern use of bioenergy declined 8 percent year-on-year in North America, owing partly to reduced consumption by the pulp and paper industry and in the residential heating sector due to a mild winter in 2019–2020. While traditional use of biomass continued to decline in Eastern and South-eastern Asia, this was offset by increasing consumption in Sub-Saharan Africa, partly driven by population growth.

11 The energy used in agri-food systems includes direct energy for primary production as well as shares of the energy demands for fertilizer manufacturing, food processing, storage, and other inputs.

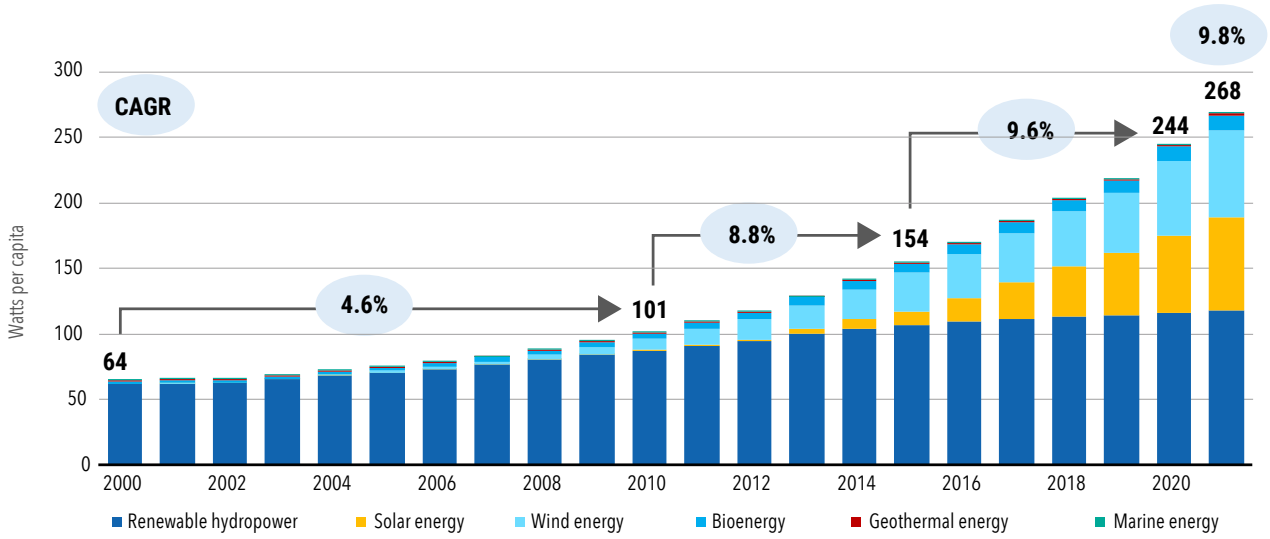
FIGURE ES.6 • Renewable energy consumption and share in total final energy consumption, by region, 1990 and 2020



Source: IEA (2022c), UNSD (2022).

Progress on SDG indicator 7.b.1, which tracks renewables-based generating capacity in developing countries, has been on the rise since 2007, when the share of renewables-based capacity stood at 24.8 percent. In 2021, that share reached a record high of 38 percent, with 268 watts per capita of cumulative renewable capacity installed (figure ES.7), close to the world average of 38.3 percent. Additions of renewables-based capacity in developing countries peaked in 2020, with 186 GW added, before contracting to 174 GW in 2021.

Figure ES.7 • Growth in renewable energy-generating capacity per capita by technology across regions, 2010–21



Source: IRENA (2022a).
Note: CAGR = compound annual growth rate.

But the positive global and regional trends hide the fact that the countries most in need of support are being left behind, even within the broader category of developing countries. Closing the gap in the deployment of renewables-based generating capacity will require tailored policies and investments to ensure that the energy transition is just and sustainable in the long term. More needs to be done to meet the SDG target 7.b: to "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."

The ambitious deployment of renewables-based generating capacity across regions is crucial to avoid locking in unsustainable and polluting energy choices and investing scarce fiscal resources in assets that are likely to become stranded. Long-term commitments to renewable energy from policy makers—supported by well-designed targets, comprehensive plans, and timelines for the short, medium, and long term—are needed to set clear directions around which stakeholders can plan their activities. The more detailed, specific, and credible the target, the more it can catalyze public and private investments and support. Renewable energy targets also need to be ambitious enough to break free of historical trends and align renewable energy deployment with international climate ambitions. The targets then need to be implemented through a range of instruments, including regulations, fiscal incentives, and behavioral measures. These policies to support the ramp-up of renewable energy must be underpinned by structural changes, as countries endeavor to transform entire energy systems through the use of sustainable sources of energy to power economies and improve lives and livelihoods.

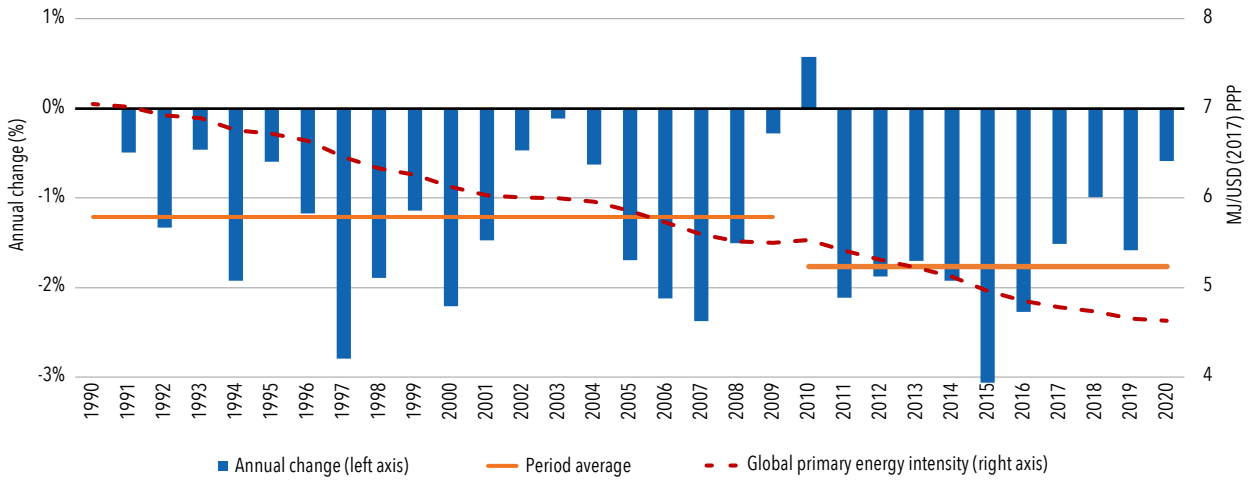
ENERGY EFFICIENCY

Progress on energy efficiency is measured by tracking the year-on-year percentage change in "energy intensity"– the energy used per unit of economic output. Initially, the United Nations recommended an annual improvement rate of 2.6 percent between 2010 and 2030 to achieve the target, but global progress has been slower than that in all years except 2015.[12] For 2020, in fact, the annual improvement in energy intensity was just 0.6 percent, the lowest figure since 2010, mainly affected by the COVID-19 pandemic restrictions. The poor showing to date means that global energy intensity must now improve from 2020 to 2030 at an annual rate of no less than 3.4 percent (up 0.2 percent from last year's recommendation) to reach SDG target 7.3 and 4.2 percent to reach the International Energy Agency's (IEA's) Net Zero Emissions by 2050 Scenario (IEA 2021a).

* * *

Globally, energy intensity has improved gradually since 1990 (figure ES.8). But it improved only 0.6 percent in 2020, to 4.63 MJ/USD (2017 PPP [purchasing power parity]), in the context of the COVID-19 crisis, as GDP and total energy supply fell by 3.2 and 3.8 percent, respectively (IEA 2021b). The COVID-19 crisis worsened an already undesirable trend, with the 2020 result well below the average annual growth of 1.2 percent recorded during 1990-2010, and 1.8 percent achieved between 2010 and 2020. Historical GDP and energy intensity data suggest that large declines in GDP, such as those occurring in 2020, tend to be followed by declines in future energy intensity improvement rates (IEA 2020a).

Figure ES.8 • Global primary energy intensity and its annual change, 1990–2020



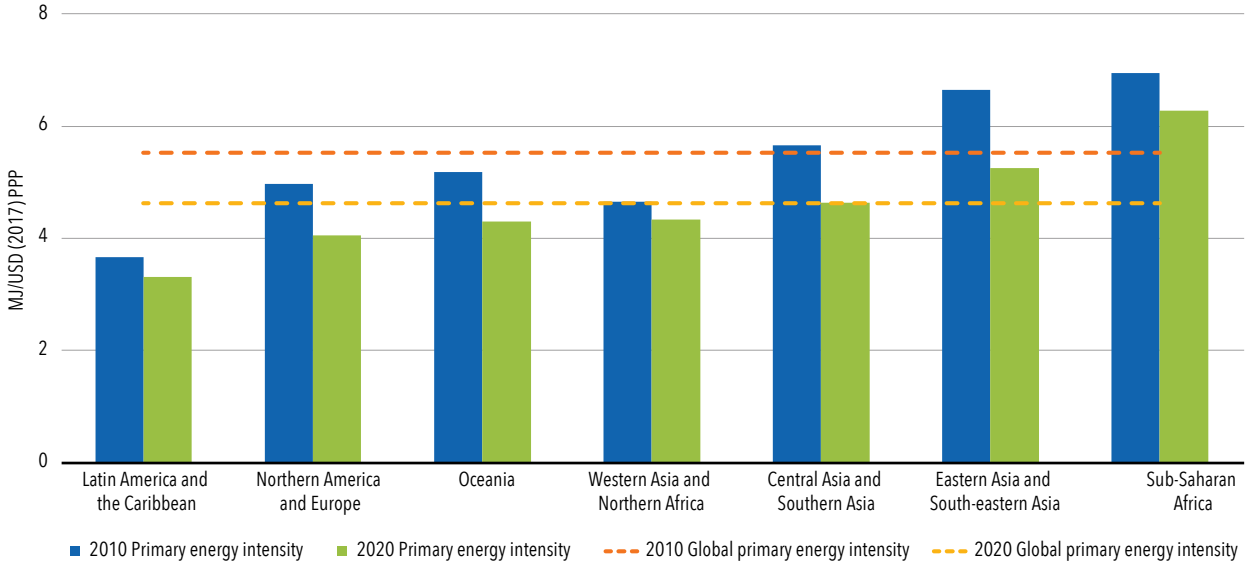
Source: IEA, UNSD, and World Bank. The energy data for the figures in this section come from a joint data set built by the International Energy Agency (https://www.iea.org/data-and-statistics/) and the United Nations Statistics Division (https://unstats.un.org/unsd/energystats/). GDP data are sourced from the World Bank's World Development Indicators database (http://datatopics.worldbank.org/world-development-indicators/).
MJ = megajoule; PPP = purchasing power parity.

At the regional level, Latin America and the Caribbean, Western Asia and Northern Africa, and Sub-Saharan Africa recorded the smallest average gains in energy intensity improvement over the period 2010–20 (1 percent per year

12 The 2.6 percent rate was calculated based on a goal of doubling the global rate of improvement in energy intensity between 2010 and 2030 over the average rate achieved during 1990–2010.

or less). However, trends differed across these regions. In Latin America and the Caribbean, total energy supply decreased slightly, and GDP growth was among the lowest worldwide. The region also consumes the least energy in the world, at 3.3 MJ/USD (2017 PPP) (figure ES.9). On the other hand, total energy supply and GDP in Western Asia and Northern Africa, and in Sub-Saharan Africa, grew at rates higher than the global average.[13] Three regions—Eastern Asia and South-eastern Asia, Latin America and the Caribbean, Western Asia and Northern Africa—saw energy efficiency improvements double in 2010–20 compared with 1990-2010.

FIGURE ES.9 • Primary energy intensity at a regional level, 2010 and 2020



Source: IEA, UN, and World Bank (see note to figure ES.8).
MJ = megajoule; PPP = purchasing power parity.

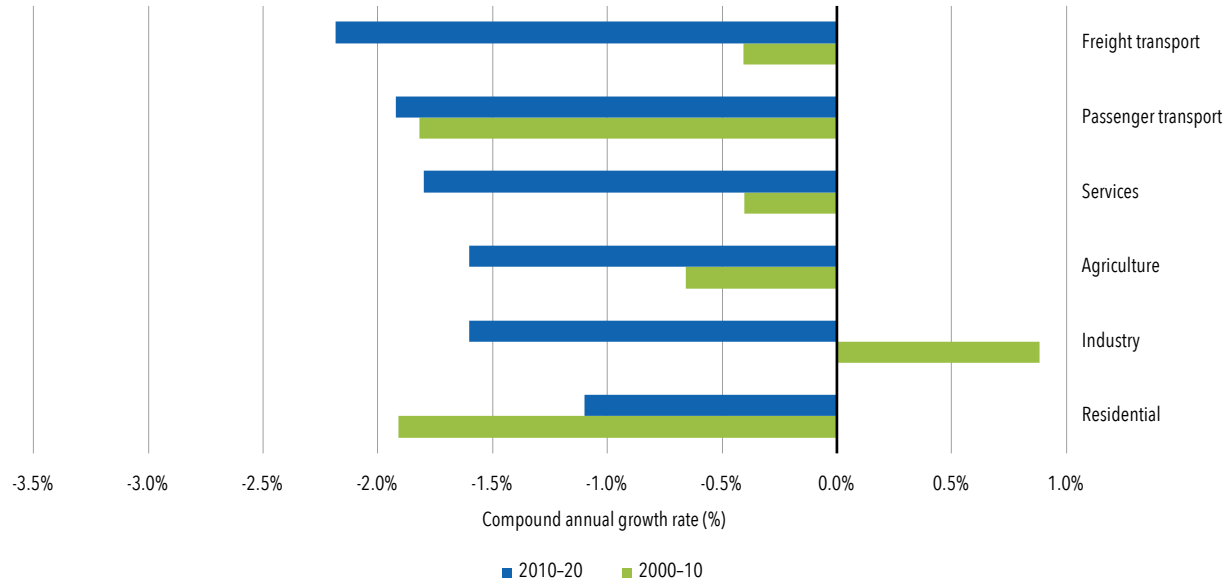
Improving energy intensity in the top 20 energy-consuming countries is central to meeting SDG target 7.3, in view of the fact that they account for approximately three-quarters of global GDP and energy consumption. Over the period 2010–20, 14 of the 20 achieved faster improvements in energy intensity than in the previous decade, although only five (China, the United Kingdom, Indonesia, Japan, and Germany) exceeded the level of 2.6 percent originally thought to be sufficient to achieve SDG 7.3. In addition, intensity improvement doubled in six countries in 2010–20 compared with 1990–2010; these are Mexico, France, Indonesia, Japan, Türkiye, and Italy. That these groups of high achievers include both developed economies and major developing economies shows that all countries can double their energy efficiency improvement rates, despite differences in their starting improvement levels.

In the context of end-use trends, a variety of metrics can be used to examine energy intensity across key sectors, such as industry, transport, buildings, and agriculture.[14] Over the period 2010–20, energy intensity improved at an accelerated rate across all sectors, except residential buildings (figure ES.10).

13 Sub-Saharan Africa is highly energy intensive, at 6.3 MJ/USD (2017 PPP). The figure for Western Asia and Northern Africa was 4.3 MJ/USD (2017 PPP).

14 The measures for energy intensity used for individual sectors (e.g., in figure ES.10) differ from those applied to global primary energy intensity. Energy intensity for freight transport, for example, is defined as final energy use per metric ton-kilometer. For passenger transport, it is final energy use per passenger-kilometer. For residential use, it is final energy use per square meter of floor area. In the service, industry, and agriculture sectors, energy intensity is defined as final energy use per unit of gross value-added (USD 2017 PPP). In the longer term, it would be desirable to develop more refined sectoral and end-use-level indicators to examine energy intensity by industry (e.g., cement, steel) or end use (e.g., heating, cooling). Doing so will not be possible without more disaggregated data and statistical collaboration with relevant energy-consuming sectors.

Figure ES.10 • Compound annual growth rate of energy intensity by sector, 2000–10 and 2010–20



Sources: IEA, UNSD, and World Bank (see note to figure ES.8).
Note: The measures for energy intensity used here for individual sectors differ from those applied to global primary energy intensity (see footnote 12).

Chemicals, nonmetallic minerals, and metals lowered their energy intensity at an annual average rate of 1–2 percent over 2010–20; less-intensive manufacturing did so by 2–4 percent per year over the same period (IEA 2022b). Energy intensity fell the fastest in freight transport, at 2.2 percent annually, a drop much steeper than the 0.4 percent annual decrease observed between 2000 and 2010. In the services sector, energy intensity improved by 1.8 percent annually between 2010 and 2020. It also improved significantly for agriculture—from 0.7 percent a year in 2000–10 to 1.6 percent between 2010 and 2020 due to the sector's economic output outpacing growth in energy demand. A backward trend was observed in the residential sector, which accounts for nearly a third of global energy consumption. Energy intensity improvements in the sector fell from 1.9 percent in the first decade of the new century to 1.1 percent annually between 2010 and 2020.

The technology and resources needed to double energy efficiency by 2030 are all available, including digitalization, which is already reshaping the energy landscape and facilitating progress toward improved energy efficiency. Wide-scale data collection, analysis, and application can help direct energy efficiency measures to where they can have the greatest impact. More refined sectoral and end-use-level indicators would make it possible to examine energy intensity by industry (e.g., cement, steel) or end use (e.g., heating, cooling). But developing those indicators will not be possible without more disaggregated data and statistical collaboration with energy-consuming sectors.

For the time being, the slow pace of improvement in energy efficiency is a major missed opportunity for the global community. Making energy efficiency a priority in policies and investments over the coming years can help achieve SDG target 7.3, promote economic development, improve health and well-being, and ensure universal access to clean energy.

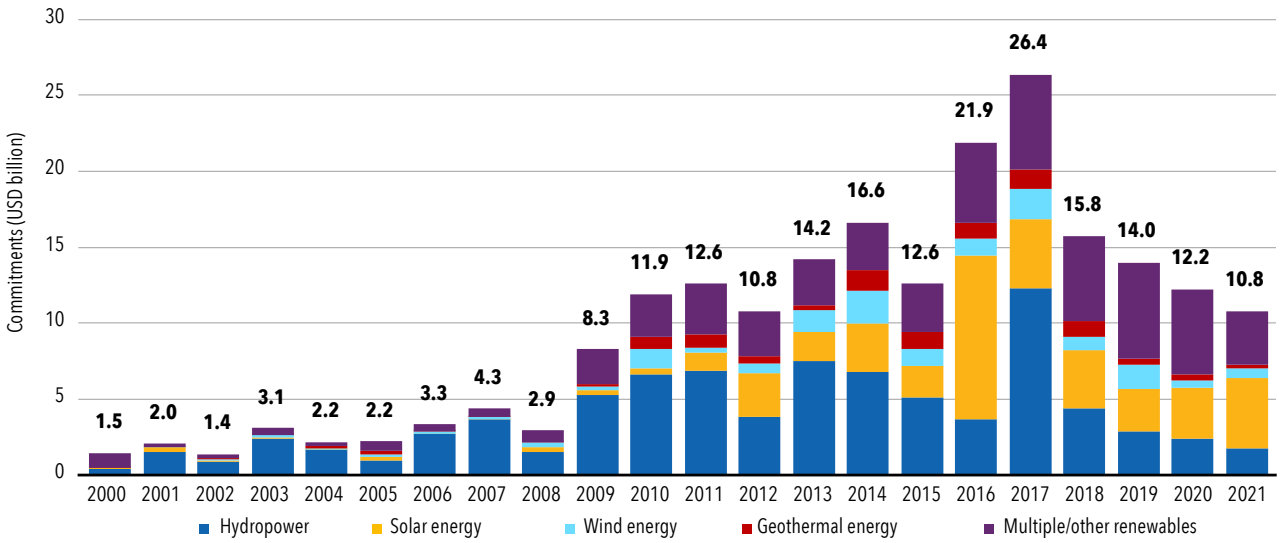
INTERNATIONAL PUBLIC FINANCIAL FLOWS TO DEVELOPING COUNTRIES IN SUPPORT OF CLEAN ENERGY

International public financial flows supporting clean energy in developing countries began dropping before the COVID-19 pandemic and continued through 2021. While there is no quantitative target for such flows under indicator 7.a.1, their dwindling may delay achievement of SDG 7, especially for LDCs, landlocked developing countries, and small island developing states. International public flows must increase substantially and be targeted at countries most in need of financial aid.[15]

* * *

The volume of public international financial flows to developing countries in support of clean energy research and development and renewable energy production (together referred to as renewables) decreased over 2020–2021. In 2021, these flows totaled USD 10.8 billion, down 11 percent from 2020 (figure ES.11). The 2021 figure was equal to that of 2012 and among the lowest levels recorded over the past 10 years. It is 35 percent lower than the average of USD 16.7 billion for 2010–19 and only 40 percent of the 2017 peak of USD 26.4 billion.

FIGURE ES.11 • Annual international public financial flows toward renewables in developing countries, by technology, 2000-21

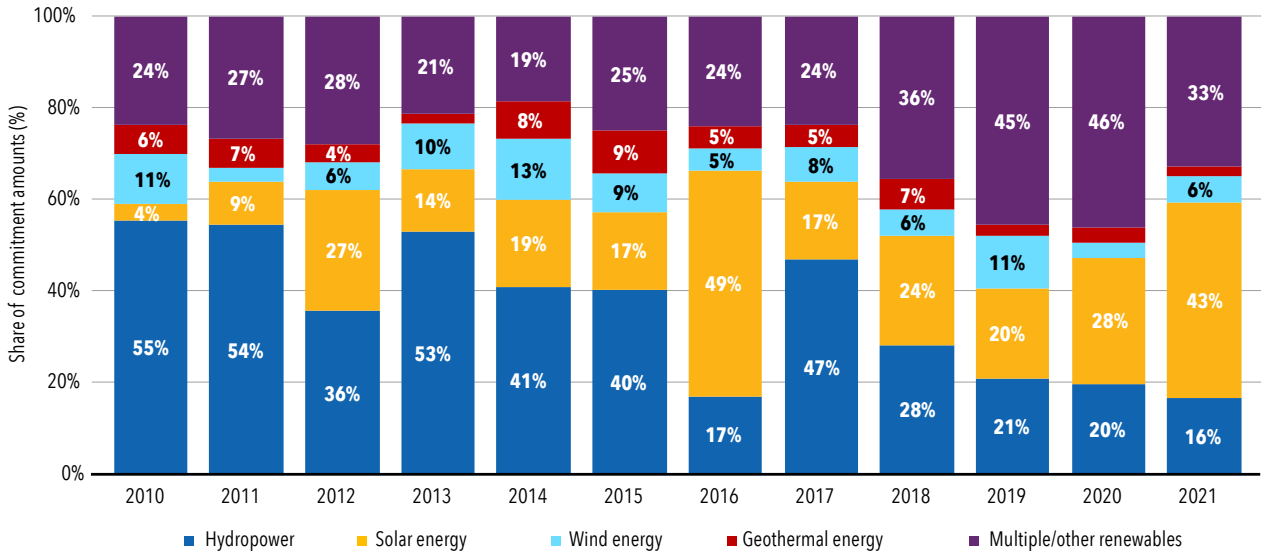


Source: IRENA and OECD 2023.
Note: Multiple/other renewables include commitments whose descriptions are unclear in the financial databases; commitments that target more than one technology with no details specifying the financial breakdown for each; bioenergy commitments, which are almost negligible; multipurpose financial instruments such as green bonds and investment funds; and commitments targeting a broad range of technologies. Examples of the latter include renewable energy and electrification programs, technical assistance, energy efficiency programs, and other infrastructure supporting renewable energy.

15 International public financial flows include official development assistance and other official flows that are transferred internationally to other countries. Referred to as flows, commitments, or financing in this summary, they are reported when committed, not when disbursed. Sixty-eight institutions or donors made commitments through 236 agencies during the years between 2000 and 21. Unless stated otherwise, all commitment amounts are expressed in US dollars in 2020 constant prices and exchange rates. Constant amounts are adjusted for changes in the inflation rate in the country in which the commitment was made, as well as changes in exchange rates between the provider's currency and the US dollar over the same period.

Figure ES.12 reveals that commitments continued to shift from hydropower to solar energy in 2021. Solar attracted the largest share of flows (43 percent), followed by multiple/other renewables (33 percent) and hydropower (16 percent); wind and geothermal energy received less than 10 percent of total flows. Since 2018, an increasing share of commitments has fallen into the multiple/other renewables category, which includes energy funds, green bonds, and other government-led programs to support renewables, energy efficiency, and electricity access. This category is growing in importance, as interest grows in funding mechanisms that target multiple energy technologies at once.

FIGURE ES.12 • Share of annual public flows by technology, 2010-21



Source: IRENA and OECD 2023.

Note: Multiple/other renewables are defined in the note to figure ES.11.

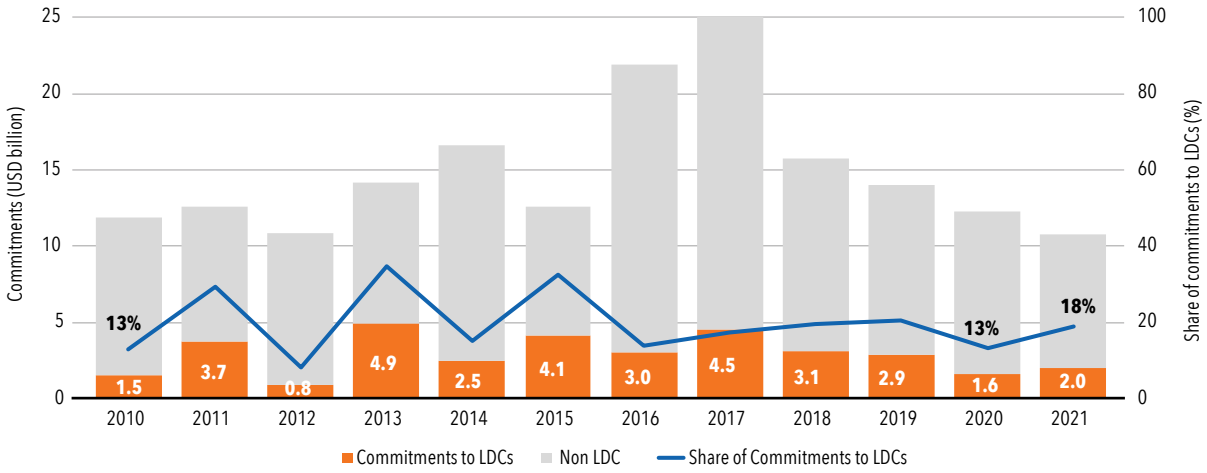
While international public flows decreased overall, several regions saw increases in 2021. Flows to Northern America and Europe rose 81 percent (USD 180 million); flows to Sub-Saharan Africa rose 45 percent (USD 1,213 million); flows to Eastern Asia and South-eastern Asia rose 23 percent (USD 251 million); and flows to "unspecified countries" rose 4 percent (USD 21 million).[16] Meanwhile, flows to other regions declined: Latin America and the Caribbean experienced the largest drop in international public finance, with a decrease of 62 percent (USD 2,295 million; Western Asia and Northern Africa fell by about 59 percent (USD 582 million); Oceania fell 42 percent (USD 9 million); and Central Asia and Southern Asia fell 8 percent (USD 232 million).

Although the distribution of flows has widened over the years, international public financial flows remain highly concentrated among a small group of countries, with 23 countries receiving 80 percent of all commitments in 2020. In 2021, the number of countries receiving most of the commitments was even smaller, with only 19 countries receiving the bulk of flows. For 2020–2021, India was the top recipient of for the past two years (USD 2.9 billion, with 66 percent for solar energy); followed by Pakistan (USD 1.7 billion, with 82 percent for hydropower); Brazil (USD 1.4 billion for infrastructure); and Mexico (almost USD 900 million, mainly for solar energy and modernizing hydropower plants).

16 "Northern America and Europe" is included as a region for the first time this year. It captures flows to eight countries in Europe (Albania, Belarus, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, Moldova, Serbia, and Ukraine). No data were included for Northern America. The region is nevertheless referred to as Northern America and Europe, following the United Nations' M49 regional classification. "Unspecified countries" refers to commitments to multiple countries or commitments not directed to a specific region. Regional bonds and funds and umbrella loans for multiple projects usually fall into this category.

Historically, the world's 46 LDCs have received a small share of international public flows, as illustrated in figure ES.13. Flows to LDCs decreased in the past two years, dropping to USD 1.6 billion in 2020 and USD 2 billion in 2021.

FIGURE ES.13 • International public financial flows to LDCs and non-LDCs for renewables, 2010-21



Source: IRENA and OECD 2023.
Note: LDCs = least developed countries.

Given the importance of off-grid renewable energy solutions in closing the energy access gap, it is encouraging that flows for these solutions reached a record USD 558 million in 2021 (IRENA and CPI 2023). Although these investments still represent a small portion of the overall financing of energy access and renewables, they are a crucial, and cost-effective, part of the effort to close the access deficit.

In 2021, the combined public and private flows to renewable energy reached an estimated USD 430 billion (IRENA and CPI 2023). Even so, the current level of investment falls far short of the investments required to limit the rise in the average global temperature to 1.5°C by the end of the century while closing the energy gap and advancing development imperatives. To meet the 1.5°C goal, at least USD 1.3 trillion a year in current prices must be directed to renewable power and the direct use of renewables between 2021 and 2030, and at least USD 2 trillion a year is needed for broader power sector investments, including power grids and flexibility (IRENA 2022; IEA 2022a).

Redirecting investments from fossil fuels, increasing official development assistance, innovating funding mechanisms, harmonizing the reporting of commitments, and introducing structural reforms in international public finance will also be necessary steps to elicit greater volumes of international public financial flows and to make the most of them. Taking these steps will require strong political will and collaboration among global stakeholders. Happily, momentum is building for reform, as evidenced by the Bridgetown Initiative headed by Barbados (UN 2023).

TRACKING PROGRESS ACROSS TARGETS: INDICATORS AND DATA

Monitoring progress toward the SDG 7 goals depends on a robust framework of indicators backed by statistical data. Since this effort began back in 2013, improvements in reporting, advances in countries' statistical capacities, and enhanced models have raised the quality, reliability, and consistency of data. The custodian agencies and international community have spurred efforts to further improve data collection, analysis, and reporting. The definition of 232 initial indicators (since expanded to 248) was an important step (UNSTATS n.d.). These indicators have resulted in a common language and framework, aligning the efforts of governments, civil society, and the private sector toward shared goals.

These statistical tools and methods make it possible to track national, regional, and global progress based on collaboration between national statistical offices and international and regional organizations using optimized and standardized data-collection resources. For example, household surveys can be designed to support tracking across SDG 7 targets and even other SDG targets, such as health, air pollution, and quality of life.

Nonetheless, examination of each SDG 7 indicator reveals the need for additional information. The custodian agencies emphasize the need to strengthen resources for enhanced national data collection within current and planned international programs on energy transitions. Domestic statistical capacities, too, must be reinforced. To this end, the World Bank and the WHO have prepared a guidebook to integrate energy access questions into existing national household surveys (World Bank and WHO 2021). The custodial agencies responsible for this report also host webinars for statistical agencies, produce statistical guidance and reports on data collection, and regularly consult with national statistical offices about the estimates they provide. Continuing efforts by the World Bank, WHO, and other custodians to mainstream energy access questions into national household surveys are an important form of support for those offices.

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