



TRACKING **SDG 7**

THE ENERGY PROGRESS REPORT

2020



A joint report of the custodian agencies



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PARTNERS

The development of the Energy Progress Report was made possible by the exceptional collaboration between the five SDG 7 custodian agencies, specially constituted in a Steering Group:

- International Energy Agency (IEA)
- International Renewable Energy Agency (IRENA)
- United Nations Statistics Division (UNSD)
- World Bank (WB)
- World Health Organization (WHO)

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EXECUTIVE SUMMARY

The 2020 edition of *Tracking SDG 7: The Energy Progress Report* monitors and assesses attainments in the global quest for universal access to affordable, reliable, sustainable, and modern energy by 2030. The latest available data and select energy scenarios are set forth in this year's report, which finds that although the world continues to advance toward SDG 7, its efforts fall well short of the scale required to reach the goal by 2030.

The data and analyses presented in these pages were prepared before the covid-19 pandemic and must be viewed in the light of this unprecedented crisis. Like most grave crises, the covid-19 pandemic shows how an unforeseen global calamity can disrupt trends and policies of long standing, with outcomes both expected and unpredictable, dire and surprising. With its widespread impact on societies and economies at all levels, including plummeting oil prices, disrupted supply chains, and the limited ability of many households and businesses to pay for electricity services, the pandemic is certain to affect the energy transition and progress toward SDG 7. At the same time, the crisis is pointing to the urgent need for access to reliable, affordable, sustainable, and modern energy—for hospitals and health facilities to treat patients, for schools to prepare children for the digital economy, for communities to pump clean water, and for people to gain access to information. The full impact of the covid-19 pandemic on energy access, energy efficiency, renewable energy deployment, and the full energy transition remains to be seen.

In response to the pandemic, countries around the world will have to take exceptional measures to bring the health emergency under control, limit its human toll, and avoid deep recession. Under such circumstances, countries have an opportunity to consider options for economic stimulus that not only respond to the immediate crisis, but also ensure longer-term social, economic, and environmental sustainability. At the heart of such objectives is access to modern energy, with its immense potential to spur the achievement also of other Sustainable Development Goals and global climate objectives. The SDG 7 custodian agencies—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)—therefore urge the international community and policy-makers to safeguard the gains already attained for SDG 7 and not lose sight of the need to continue action on affordable, reliable, sustainable, and modern energy for all.

According to the custodian agencies, the latest data on progress toward SDG 7, before the onset of the pandemic, demonstrated that stepped-up efforts toward all targets were urgently required if SDG 7 was to be met within the coming decade. Even greater efforts will be needed to meet the SDG 7 targets in a post covid-19 world.

Universal access. SDG target 7.1 is universal access to affordable, reliable, sustainable, and modern energy services; with 7.1.1 focusing on access to electricity and 7.1.2 focusing on access to clean cooking solutions. Recent years have seen rapid growth in access to electricity after an accelerated deployment of affordable electrification options, including on- and off-grid solutions. As a result, the global population lacking access to electricity dropped to 789 million in 2018, from 1.2 billion in 2010 (Figure ES.1). By contrast, the global population without access to clean cooking solutions remained largely unchanged during the same period, standing at close to 3 billion. The rate of increase in access to clean cooking has even decelerated since 2012, falling behind population growth in some countries. Increased efforts are needed to ensure universal access to both electricity and clean cooking, consistent with SDG target 7.1.

Renewable energy. Target 7.2 aims to increase substantially the share of renewable energy in the global energy mix. That share continued to increase in 2017 (+ 0.1 percentage points), although at a slower pace than the year before (+ 0.2 percentage points), reaching 17.3 percent of total final energy consumption (TFEC) in 2017, up from 17.2 percent in 2016 and 16.3 percent in 2010. Solar PV and wind are key drivers behind the fast-growing share of renewables in the generation of electricity. But renewables' share in the heating and transportation sectors lags far behind its potential. An acceleration of renewables in all sectors will be needed to achieve target 7.2.

FIGURE ES.1 • Latest data on primary indicators of global progress toward SDG 7 targets



Energy efficiency. SDG target 7.3 is to double the global rate of improvement in energy efficiency by 2030, over the trend observed between 1990 and 2010, which was 1.3 percent. Global primary energy intensity, defined as total primary energy supply per unit of GDP, reached 5.0 megajoules per USD dollar in 2017, equivalent to a 1.7 percent rate of improvement from 2016—the lowest since 2010. Preliminary estimates for 2018 (1.3 percent) and 2019 (2 percent) suggest that the improvement rate would reach approximately 2.1 percent between 2010-2019 which is lower than the required 2.6 percent annual target rate for the years between 2010 and 2030. Consequently, achieving the goal will require an energy intensity improvement rate of at least 3 percent per year from now through to 2030—a challenging proposition.

International public finance. Finally, target 7.A is to promote access to technology and investments in clean energy, with 7.A.1 focusing on international public financial flows to developing countries in support of clean and renewable energy. Total flows reached USD 21.4 billion in 2017, double the level of 2010. Although this is a promising increase, only 12 percent of financial flows in 2017 reached the least-developed countries, which are the furthest from achieving the various SDG 7 targets. Increased efforts are needed to make sure finance reaches the countries most in need.

* * *

In addition to reviewing progress toward SDG 7 targets, this report identifies best practices, policies, and measures to accelerate progress while supporting the achievement of other SDGs. The chapters that follow include boxes that identify the linkages between SDG 7 and other SDGs. The report also describes the results of global modeling exercises conducted by IEA and IRENA to determine whether current—which is to say, pre-covid-19—policy ambitions are sufficient to meet the SDG 7 targets and, if they are not, what additional actions are needed for success. The final chapter of the report contains an overview of indicators and suggests ways to further improve the underlying data and the tracking of advances.

ACCESS TO ELECTRICITY

The share of the global population with access to electricity increased from 83 percent in 2010 to 90 percent in 2018, enabling more than a billion people to gain access during the period. The population still without access to electricity was 789 million in 2018, down from 1.2 billion in 2010.

The global advance of electrification accelerated slightly in recent years, rising from an average of 0.77 percentage points annually between 2010 and 2016 (127 million people/year) to 0.82 percentage points between 2016 and 2018 (136 million people/year). These numbers nevertheless fall short of the gains needed to achieve the goal of universal access to electricity by 2030. Annual increases of at least 0.87 percentage points would be required to meet the target. Under current and planned policies before the start of the COVID-19 crisis, it is estimated that about 620 million people will remain without access in 2030, 85 percent of them in Sub-Saharan Africa.

The global advance in access to electricity since 2010 masks unequal progress across regions (Figure ES.2). Latin America and the Caribbean and Eastern Asia and South-eastern Asia approached universal access, exceeding 98 percent access to electricity by 2018. In Central Asia and Southern Asia, more than 92 percent of the population had gained access to electricity by 2018. The world's access deficit is increasingly concentrated in Sub-Saharan Africa, where the access rate climbed from 34 percent in 2010 to 47 percent in 2018. After 2010, access advances in Sub-Saharan Africa outpaced population growth, but the trend reversed recently. Between 2016 and 2018, the number of people in the region lacking access remained almost stable.

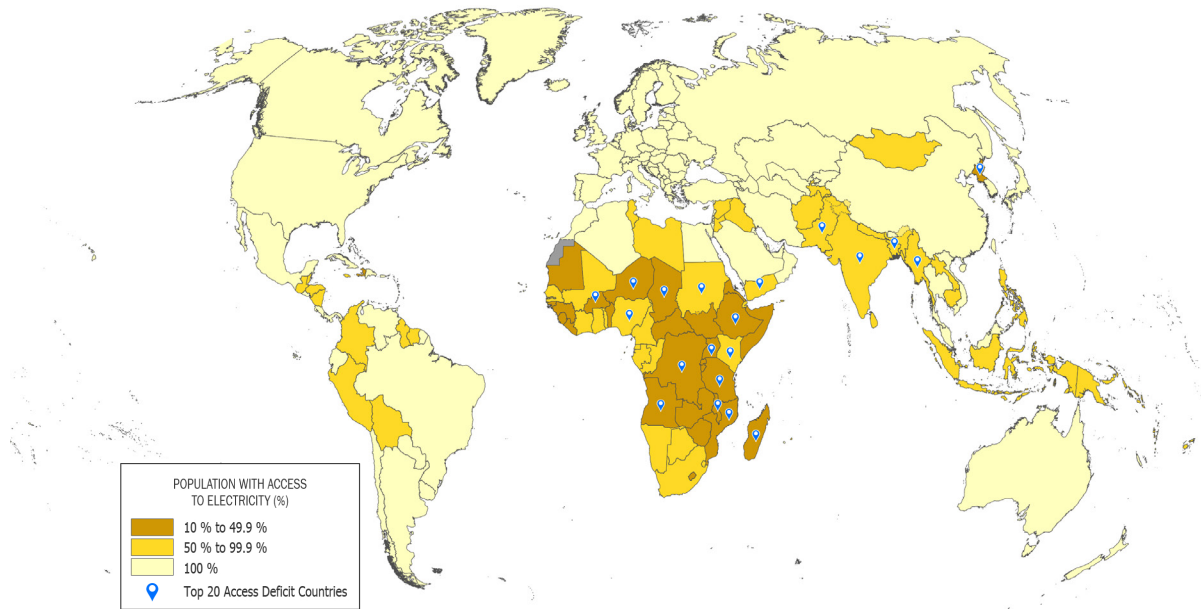
At the country level, the 20 countries with the largest access deficits accounted for 78 percent of the total population without access to electricity in 2018 (Figure ES.3). Nigeria, the Democratic Republic of Congo (DRC), and India had the three largest deficits: 85 million, 68 million, and 64 million people, respectively. Among the 20 countries with the largest access deficits, Bangladesh, Kenya, and Uganda showed the greatest improvement since 2010, thanks to average annual electrification growth rates in excess of 3.5 percentage points. These three countries were among eight of the 20 countries where the expansion of access to electricity kept pace with population growth between 2010 and 2018. The other five were India, Democratic People's Republic of Korea, Myanmar, Sudan, and Tanzania.

Major disparities in access to electricity are also seen between urban and rural areas. In 2018, the unserved rural population of 668 million made up 85 percent of the global access deficit. Between 2010 and 2018, access to electricity in rural areas grew from 70 percent to 80 percent. In urban areas, access is already close to universal (97 percent in 2018), but growth in access barely kept up with population growth.

In several countries, expanded off-grid solutions have brought improved access to rural areas. By 2018, renewable off-grid technologies were providing below Tier 1 electricity services to 136 million people around the world, compared with about 1 million people in 2010. These services were provided primarily through standalone home systems and solar lighting, with mini grids having grown from a niche solution to being widely deployed in off-grid areas that offer sufficient demand.

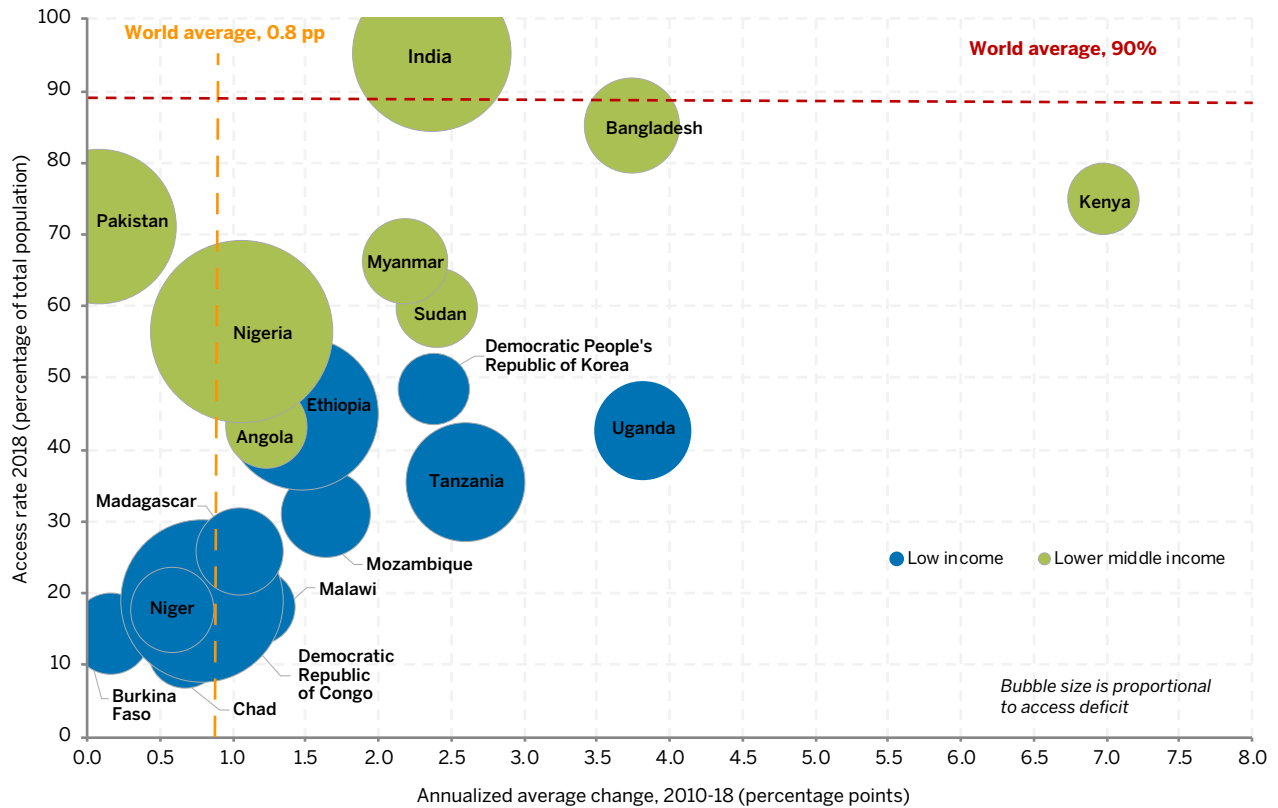
Closing the access gap, particularly in Sub-Saharan Africa, will require concerted efforts. Policy frameworks will require consistent updates and enforcement to support innovation, such as off-grid solutions and newer business models. Geospatial analysis undertaken to determine how universal access can be achieved at the least cost show the need for integrated policies embracing both centralized and decentralized solutions. With significant potential to advance on other SDGs—such as on gender, health, and education—access strategies will succeed only if the technical elements outlined above take an inclusive approach that leaves no one behind and maximizes the socioeconomic benefits of electricity. While the world is coping with the covid-19 pandemic, it is critical to ensure that past gains in electrification are safeguarded. It might require collective support for utilities, mini grid and off-grid service providers to continue serving their current clients and allow for future expansion.

FIGURE ES.2 • Share of population with access to electricity in 2018



Source: World Bank.

FIGURE ES.3 • The 20 countries with the largest access deficit, 2010–18



Source: World Bank.

Note: A country's "access deficit" is the number of people in the country who lack access to electricity.

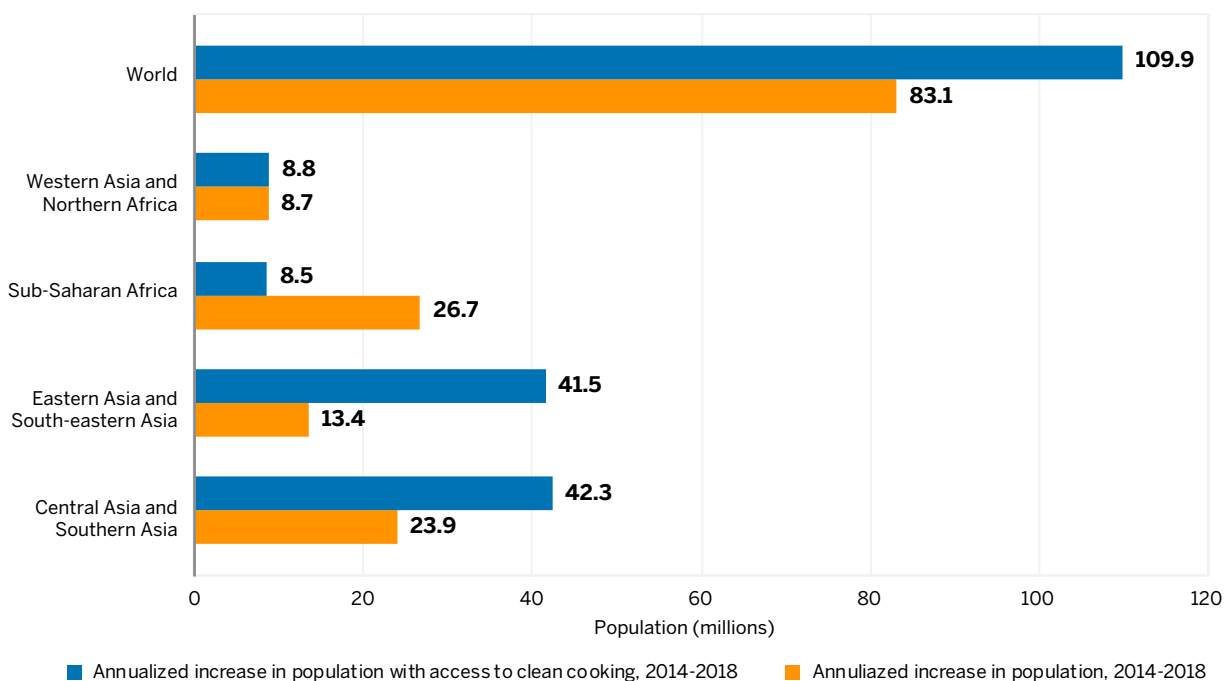
ACCESS TO CLEAN COOKING SOLUTIONS

The share of the global population with access to clean fuels and technologies for cooking increased from 56 percent in 2010 (uncertainty interval 52–61 percent) to 63 percent in 2018 (56–68), leaving approximately 2.8 billion people without access.¹ That number has been largely unchanged over the past two decades owing to population growth outpacing the number of people gaining access to clean cooking solutions.

To achieve the goal of universal access to clean fuels and technologies for cooking, increases of at least 3 percentage points annually would have been needed between 2010 and 2030. Between 2010 and 2018, however, access expanded at an annualized average of just 0.8 percentage points (–0.2, 1.7) and has steadily slowed since 2012 (to 0.7 percentage points in 2017 and 2018)—far from the numbers needed to reach the target.

The stagnation in the number of people lacking access to clean cooking globally masks regional trends (Figure ES.4). Promising improvements were made in Eastern Asia and South-eastern Asia, and in Central Asia and Southern Asia, but Sub-Saharan Africa moved in the opposite direction, as population growth between 2014 and 2018 outstripped growth in access by an average of 18 million people a year.

FIGURE ES.4 • Annualized increase in population and in the number of people having access to clean cooking over the period 2014–18, by region



Source: WHO; UN population estimates were used.

The top 20 countries with the largest populations lacking access to clean cooking fuel and technologies accounted for 82 percent of the global population without access between 2014 and 2018.² Nineteen of the top 20 countries with the lowest access shares are among the world’s least-developed countries, and most of them are in Africa. These countries increased access by less than 0.1 percentage points annually; in some, access shrank. These trends have combined to cause access to stagnate in Sub-Saharan Africa, with annualized increases of just 0.4 percentage points for the

1 Fuels and technologies considered clean are determined based on the 2014 WHO guidelines for indoor air pollution from household fuel combustion. These include electricity, liquefied petroleum gas (LPG), natural gas, biogas, solar, and alcohol fuel stoves.

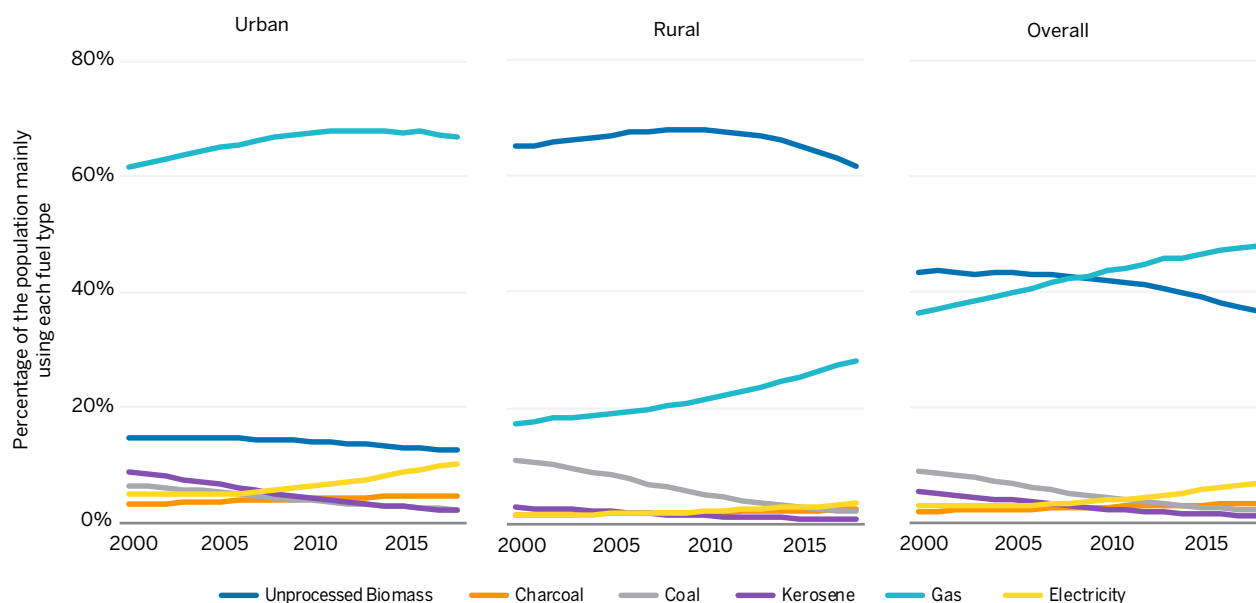
2 The top 20 access-deficit countries are the 20 countries with the highest access-deficit population: Afghanistan, Bangladesh, China, Democratic People’s Republic of Korea, Democratic Republic of the Congo, Ethiopia, Ghana, India, Indonesia, Kenya, Madagascar, Mozambique, Myanmar, Nigeria, Pakistan, Philippines, Sudan, Uganda, United Republic of Tanzania, and Viet Nam.

region between 2010 and 2018. Comparatively, the most significant progress in access to clean cooking fuels was seen in Asia, where annualized increases stood at 1.6 percentage points for Eastern Asia and South-eastern Asia, and 1.5 percentage points for Central Asia and Southern Asia.

Significant variations in access to clean cooking also exist between urban and rural areas owing to disparities in infrastructure and in availability of clean fuels and technologies. In 2018, access to clean cooking solutions stood at 83 percent (76–87) in urban areas, and at 37 percent (30–45) for rural areas. A slight convergence has been observed, with disparity falling from 52 percentage points in 2010 to 46 percentage points in 2018. This can be attributed to accelerated progress in access in rural areas (in particular in Asia), in conjunction with population growth outpacing access growth in urban areas, particularly in Africa).

As illustrated in Figure ES.5, in low- and middle-income countries, gas (LPG, natural gas, and biogas) has overtaken unprocessed biomass as the dominant fuel since 2010, reflecting its predominance in urban areas. In urban areas, the use of electricity for cooking has also risen. In rural areas, unprocessed biomass remains dominant, though its share is falling.

FIGURE ES.5 • Percentage of people using each cooking fuel type in low- and middle- income countries, for urban areas, rural areas, and overall, 2000–18



Source: WHO Global Household Energy Model.

Among all the SDG 7 targets, slow progress toward clean cooking perhaps presents the greatest cause for concern. Under current and planned policies, 2.3 billion people would still be deprived of access to clean cooking fuels and technologies in 2030, relying instead on traditional uses of biomass, kerosene, or coal as their primary cooking fuel. This means that nearly a third of the world’s population will continue to be exposed to harmful household air pollution, and many will still be spending many hours gathering fuel. As cooks and fuel gatherers, women and their children are disproportionately susceptible to these negative effects.

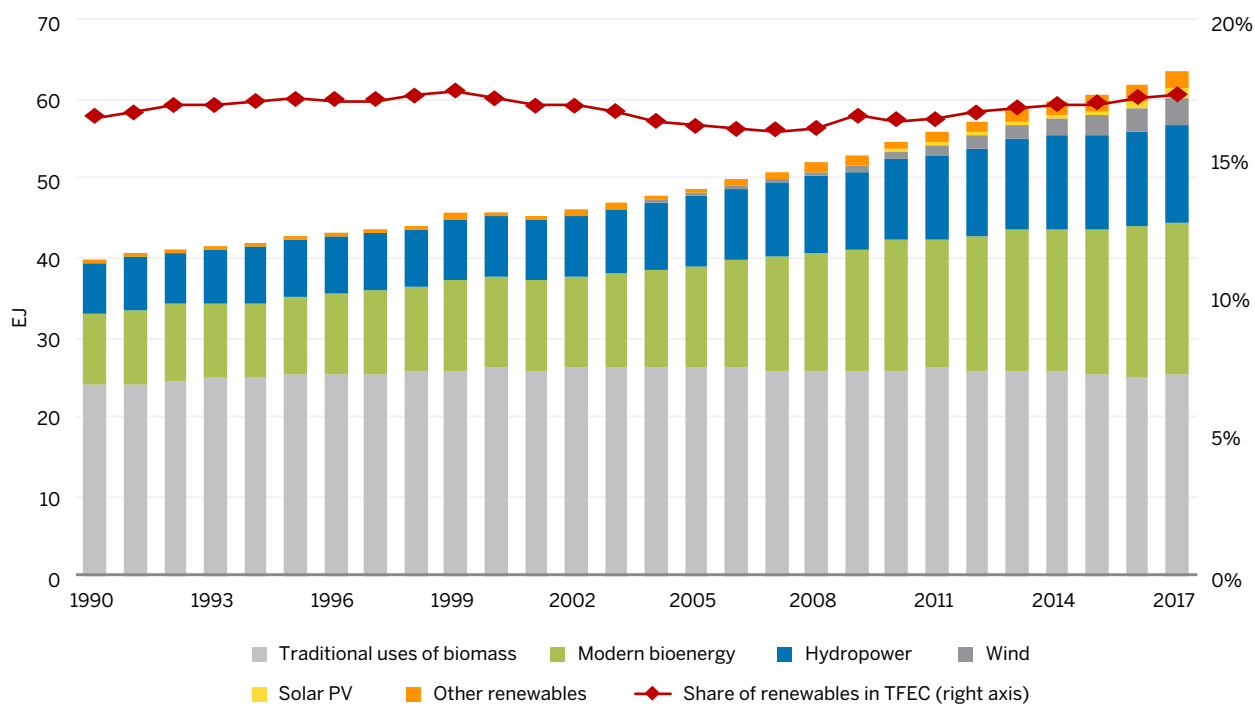
Acceleration of access to clean cooking solutions will require high-level political commitment, ambitious national and subnational strategies, and an urgent mobilization of investment. Designing and implementing successful commitments and strategies in turn requires a detailed understanding of the current state and patterns of household energy use. To achieve this, household surveys must become more comprehensive. In addition to gathering data on grid connectivity, they should cover off-grid options, impacts on children and women, and all the household fuels and technologies in use for cooking, space heating, and lighting. In recognition of these shortcomings, and to support countries in this process, WHO and ESMAP at the World Bank have developed a new set of household survey questions. Designed and tested, these survey questions are available for countries to use to better assess the attributes and impacts of household energy use for evidence-based decision-making and effective monitoring of household energy use.

RENEWABLE ENERGY

The share of renewable energy in TFCF reached 17.3 percent in 2017, up from 17.2 percent in 2016 and 16.3 percent in 2010 (Figure ES.6).³ This indicates that global use of renewables has grown faster (at 2.5 percent in 2017) than overall global energy consumption (1.8 percent in 2017), extending a trend seen since 2011. The growth of renewables is driven primarily by increased consumption of modern renewables (that is, renewables other than traditional uses of biomass). Modern renewables commanded a 10.5 percent share of TFCF in 2017, up from 10.3 percent in 2016 and 8.6 percent in 2010.

The largest increase in the use of renewables has come in the power sector, where their share of global electricity consumption reached 24.7 percent in 2017, surpassing the share of renewables in the heating sector for the first time. The growth rate of almost 6 percent year-on-year was driven primarily by solar PV and wind energy. Lower hydropower output (and other factors) slowed the growth rate in 2017, sending it below the record 8 percent growth reached in 2016. The share of renewables in the heating sector reached 23.5 percent of total final heat consumption in 2017. This growth can be primarily attributed to uses of modern renewable energy; traditional uses of biomass remained relatively unchanged in 2017, still accounting for around 14 percent of global heat consumption. In the transport sector, the share of renewables remained at 3.3 percent in 2017, the majority of which was consumed in the form of liquid biofuels, predominantly crop-based ethanol and biodiesel. In 2017, the consumption of renewable electricity in the transport sector represented only 0.3 percent of the sector's total energy consumption worldwide.

FIGURE ES.6 • Renewable energy consumption by technology and share in total final energy consumption (TFCF), 1990–2017



Source: International Energy Agency (<https://www.iea.org/data-and-statistics>) and United Nations Statistics Division (<https://unstats.un.org/unsd/energystats/>).

³ The share of renewables in TFCF was previously previously stated as 17.5 percent in 2016. This has been amended to 17.2 percent in this report. Data revisions by countries in 2020 reflected a fall in solid biomass and charcoal consumption between 2000 to 2016, resulting in a decline in the share of renewables globally in the historical time series.

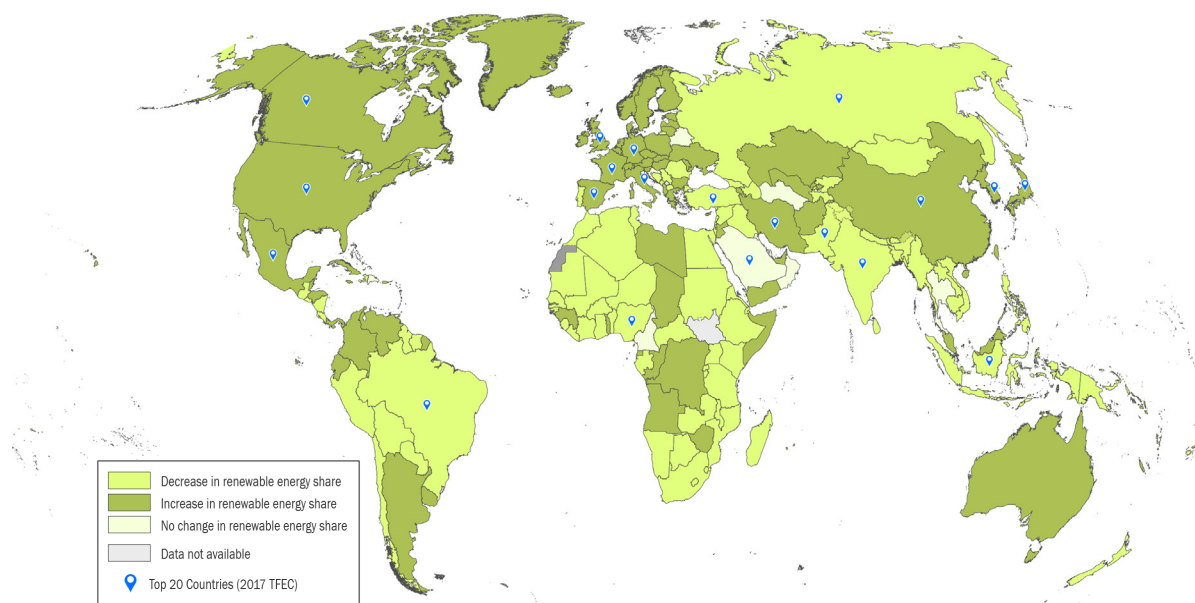
Important regional differences should be noted. Sub-Saharan Africa had by far the highest share of renewable energy in TFEC for 2017. However, reliance on traditional uses of biomass in the region accounts for almost 85 percent of its renewable energy consumption and, as already observed, is associated with adverse health and environmental effects. Owing to the extensive use of modern bioenergy across the power, heat, and transport sectors, in addition to the region's reliance on hydropower to generate electricity, Latin America and the Caribbean had the largest share of modern renewables among all regions.

At the national level, the share of renewable consumption in TFEC varies widely, depending on resource availability, policy support, and the impact of energy efficiency on growth in energy demand. Between 2010 and 2017, 13 of the world's 20 largest energy consumers expanded their share of renewables (including traditional uses of biomass) (Figure ES.7). The United Kingdom tripled its renewable share in its TFEC. Among the largest 20 energy consuming countries, Brazil was the leader, with a 45 percent share of modern renewables, followed by Canada at 23 percent. China remains by far the largest consumer of renewables in absolute terms; its share in 2017 stood at 13 percent. In several countries, the decrease in total renewable energy share was also driven by reduced traditional uses of biomass.

To boost the share of renewables in energy consumption to a level sufficient to achieve SDG 7 by 2030 and to meet global climate objectives, most long-term energy scenarios point toward decarbonization of all end uses, particularly through increased electrification of the heat and transport sectors. With the right policy support, IEA's Sustainable Development Scenario shows that modern renewables could reach a share of 23 percent of TFEC by 2030, supplying 50 percent of electricity generation. IRENA's Transforming Energy Scenario for 2030 lays out a path toward even higher shares of modern renewables: 28 percent overall and 57 percent of electricity generation.

Policies and measures to support the deployment of renewable energy are becoming increasingly common around the world. In particular, the use of auctions to set electricity tariffs competitively has gained popularity since 2014, owing chiefly to the ability of well-designed auctions to procure renewables-based electricity at the lowest price while also fulfilling other social and economic aims of the sponsoring country such as job creation and development of a local industry. By 2018, more than 106 countries had held a renewable energy auction at some point in time. With the right policies in place, a hike in renewables would be instrumental in advancing not only SDG 7 but also other SDGs, such as SDG 8 on decent jobs. IRENA's analysis shows that the number of renewable energy jobs worldwide expanded from 7.3 million in 2012 to 11 million in 2018; and may further triple by 2030.

FIGURE ES.7 • Change in share of renewable energy in total final energy consumption between 2010 and 2017



TFEC = Total final energy consumption.

Source: International Energy Agency (<https://www.iea.org/data-and-statistics>) and United Nations Statistics Division (<https://unstats.un.org/unsd/energystats/>).

ENERGY EFFICIENCY

Rates of improvement in global primary energy intensity (total primary energy supply per unit of gross domestic product) have fallen in the past few years, following a period of relative steady growth. Global primary energy intensity in 2017 was 5.01 megajoules per USD dollar, equivalent to a 1.7 percent rate of improvement since 2016, the lowest rate since 2010. Nevertheless, recent progress has been greater than historical trends, thanks in part to a range of energy efficiency policies adopted around the world. The average annual rate of improvement in global primary energy intensity between 2010 and 2017 was 2.2 percent, more than the historical rate of 1.3 percent between 1990 and 2010. To reach the SDG 7.3 target (by doubling the historic improvement trend), the annual improvement to 2030 would need to average 3 percent in the years between 2017 and 2030.

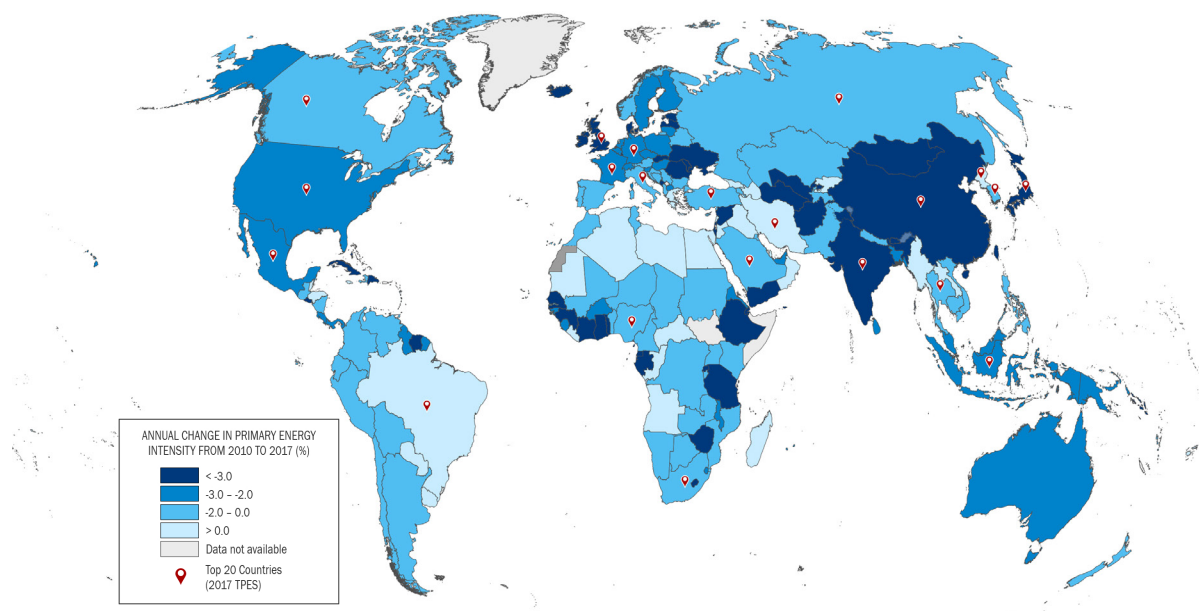
Although energy intensity across all end-use sectors improved in aggregate over the 2010–17 period, improvement rates varied by sector. It is possible to examine the intensity of the sectors using other intensity metrics. These intensity figures show that transport (freight and passenger) improved during 2010–17, whereas the other sectors show a decrease in intensity improvement over the previous period (1990–2010). The decline in the rate of improvement is most noticeable in the services and agriculture sectors, where the rate of improvement in energy intensity more than halved. The industrial sector's rate of improvement dropped by about a third. Driving this pattern are the substantial improvements in energy intensity recorded in emerging economies between 1990 and 2010, which slipped between 2010 and 2017.

Significant geographical differences also exist in energy intensity and recent improvements. Sub-Saharan Africa is the most energy-intensive region; Latin America and the Caribbean the least. Between 2010 and 2017, energy-intensity improvements continued to be highest in Asia; most countries in the region saw rates of improvement in energy intensity that were higher than during 1990–2010 and well above the global average (e.g., 3.3 percent in Eastern Asia and South-eastern Asia). The lowest rates of improvement were found in Latin America and the Caribbean (0.5%), Northern Africa (0.4 percent) and the Middle East (0.3 percent) (Figure ES.8).

With the recent slowdown in the rate of improvement of energy intensity, the world is slackening the pace required to meet the SDG 7.3 target, which is to double the global rate of improvement in energy efficiency by 2030. As such, it is forgoing various benefits. For example, if the world had stayed on track for the target, it could have consumed less energy or generated more economic value. And if the world had achieved the target level of intensity for the energy consumed between 2011 and 2017, global GDP would have been USD 2 trillion per year higher.

By making energy-efficiency measures a policy and investment priority, governments can help the world achieve SDG 7.3 by 2030. There are numerous examples around the world of successfully implemented policies, ranging from minimum energy-efficiency standards, financial incentives, market-based mechanisms, capacity-building initiatives, and regulatory instruments. All of these encourage investment in efficiency measures and help to rebalance energy markets in favor of cleaner, more efficient operations. Analysis shows that regulatory measures that mandate energy savings cover only about a third of global energy use. Furthermore, effort will be needed to harness new digital technologies so that they increase energy efficiency rather than just add to global energy demand. With the right policies in place—ones that maximize the potential of energy efficiency—IEA's Sustainable Development Scenario shows that an annual average rate of improvement in energy intensity of 3.6 percent between 2017 and 2030 is indeed possible (Figure ES.9).

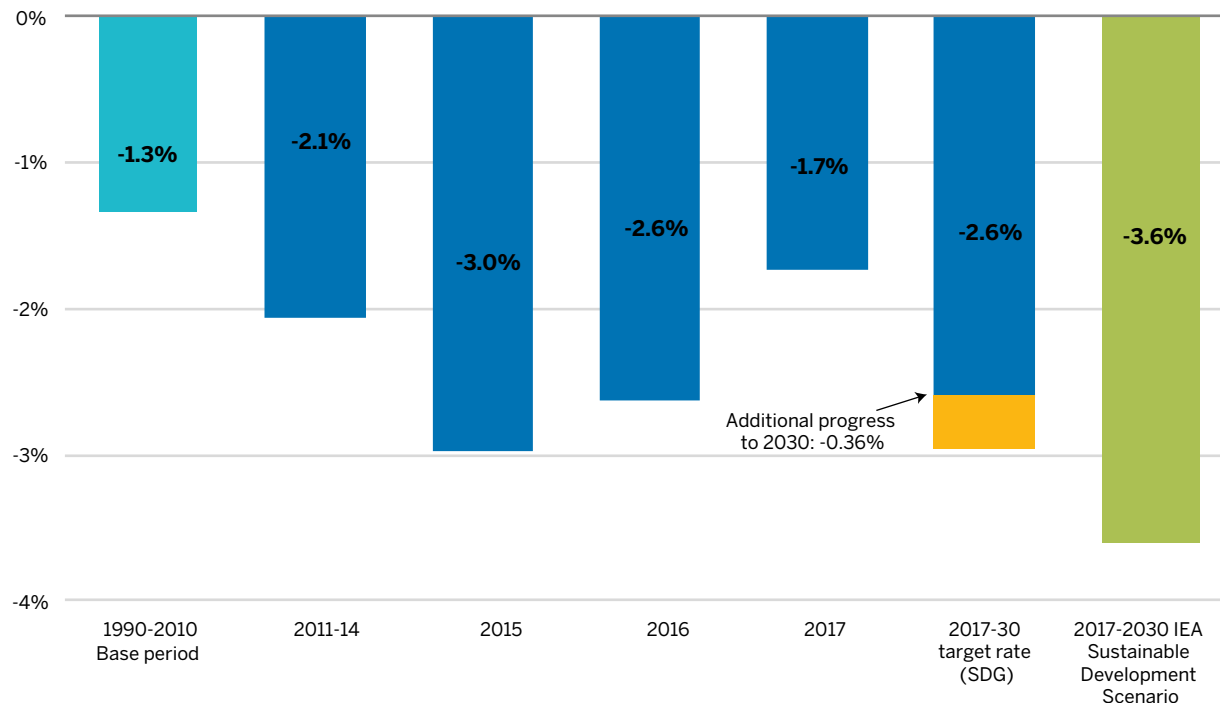
FIGURE ES.8 • Compound annual average growth rate of primary energy intensity, 2010–17



TPES = Total primary energy supply.

Source: International Energy Agency (<https://www.iea.org/data-and-statistics>) and United Nations Statistics Division (<https://unstats.un.org/unsd/energystats/>).

FIGURE ES.9 • Annual growth rate of primary energy intensity by period, target rate for 2017–30, and potential for 2017–30 in IEA Sustainable Development Scenario



Source: International Energy Agency (<https://www.iea.org/data-and-statistics>) and United Nations Statistics Division (<https://unstats.un.org/unsd/energystats/>).

TRACKING PROGRESS ACROSS TARGETS: INDICATORS AND DATA

Each target is monitored using one or more proxy indicators, in line with the SDG framework devised by the UNSD.⁴ For example, progress in access is monitored both through the proportion of the population having access to electricity and the proportion relying primarily on clean fuels and technologies. Similarly, progress in energy efficiency is monitored through the energy intensity of the economy, measured in terms of primary energy and GDP.

Chapter 6 provides the set of global SDG 7 tracking indicators by country for selected years, preceded by a brief description of the underlying data work of the custodian agencies. International organizations typically collect and validate data from national administrations; they then further elaborate the data into indicators, adopting consistent methodologies that ensure comparability across countries. (Indicators derived according to international methodologies represent global benchmark compilations and are not intended to replace national indicators.)

The work of tracking SDG 7 highlights once more the need for quality data to inform policy at the national, regional, and international levels, as well as the opportunity to enhance data quality through international cooperation to further strengthen national capacities. Through a variety of projects worldwide, the custodian agencies actively promote the development of statistical capacity across countries.

Finally, authors from the custodian agencies would like to acknowledge the work and dedication of all their colleagues working to collect energy data across national administrations worldwide. It is they who make possible the international tracking work reflected in this report.

⁴ The latest full list of targets, indicators, and custodian agencies is available at: <https://unstats.un.org/sdgs/files/Tier-Classification-of-SDG-Indicators-11-December-2019-web.pdf>