

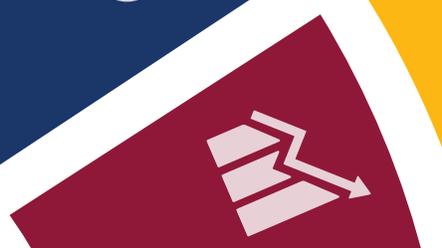
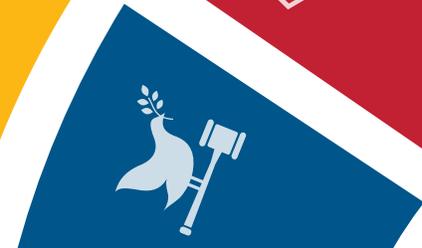


ACCELERATING SDG 7 ACHIEVEMENT

POLICY BRIEF 2

A 4-YEAR STOCK-TAKING AND WAY FORWARD FOR SDG 7 WITH A FOCUS ON ACCESS, RENEWABLES AND EFFICIENCY

7 AFFORDABLE AND CLEAN ENERGY



POLICY BRIEF #2

A 4-YEAR STOCK-TAKING AND WAY FORWARD FOR SDG 7 WITH A FOCUS ON ACCESS, RENEWABLES AND EFFICIENCY

Developed by

The International Energy Agency (IEA), the World Bank, IRENA, the UN Statistics Division, and the World Health Organization (WHO)

In collaboration with

REN21, European Commission and UN Environment

Key Messages

Significant progress has been recorded towards all SDG 7 targets, but additional targeted engagement is needed across all regions and sectors. Recent improvements in electrification rates and energy efficiency are very promising, while proven technologies are showing great potential for providing access to clean cooking and increasing deployment of renewables.

Access to electricity

Since 2010, there has been significant progress in increasing access to electricity, driven largely by accelerated electrification in Asian countries, with a global increase from 83 per cent in 2010 to 89 per cent in 2017. Nonetheless, about 840 million people remain without access to electricity, primarily in sub-Saharan Africa. Adopting comprehensive regulatory frameworks, leveraging private sector financing, and harnessing the potential of decentralised renewable energy solutions are three priority actions that could foster electrification in the remaining period.

Access to clean cooking technologies

About 3 billion people (39 per cent) still rely on cooking solutions that are both highly polluting and harmful. This represents an improvement over the 43 per cent level in 2010, but progress has decelerated since 2008. Significant challenges remain, particularly in sub-Saharan Africa and developing Asia. The incremental gains seen in recent years are not enough to achieve the goal of universal access by 2030. More rapid progress will require particular attention to behavioural patterns, cultural norms, and regional variations, as there is no one-size-fits-all solution when it comes to clean cooking. This is because cooking practices are heavily dependent upon culture, cuisine, household dynamics, and gender roles, as well as the availability of socially acceptable and affordable fuels and technologies.

Renewables

While renewables accounted for 17.5 per cent of total global energy consumption in 2016, up from 16.6 per cent in 2010, progress is projected to fall short of the significant increase pledged by SDG 7.2. Optimistically, however, the latest estimations indicate continued growth in renewables 2017 and 2018. Renewables have been increasing rapidly in electricity generation, driven by the fast expansion of wind and solar technologies, but have made less progress in the heat and transport sectors. Renewables in the heating and transport sectors represented 9 per cent and 3.3 per cent respectively in 2016. Long-term targets and predictable policies are key to ensuring investor confidence and continued growth of renewable energy technologies in all end uses, including electricity, heat, and transport. A combination of policies is recommended for creating an enabling environment, incentivising greater cost-competitiveness, and tackling non-economic barriers and infrastructure challenges.

Energy efficiency

The total primary energy supply per unit of GDP improved at an annual rate of 2.3 per cent between 2010 and 2016. However, this progress falls slightly short of the SDG 7.3 target rate of 2.6 per cent. Reaching SDG 7.3 would require the target rate of improvement to increase to at least 2.7 per cent, in order to compensate for this historic gap. Unfortunately, the latest estimations suggest that the pace instead decelerated for 2017 and 2018, with a rate of progress of only 1.3 per cent in 2018, suggesting that efforts need to be increased even further. Concerted government policy action will continue to be essential for realising the additional energy intensity improvements required to meet the target.

Latest analyses of the way towards SDG 7

SDG 7 was endorsed in 2015 as a global objective in order to ensure that energy is available to support inclusive and sustainable development across the world. Thanks to global support, this goal has attracted a lot of attention, guiding many projects and programmes.

The Tracking SDG7 Report, jointly produced by the SDG 7 custodian agencies (the International Energy Agency, International Renewable Energy Agency, United Nations Statistics Division, World Bank, and World Health Organization), provides annual tracking and analysis of the most recent progress for each sub-goal: SDG 7.1 on energy access (7.1.1 on electrification and 7.1.2 on clean cooking technologies and fuels), SDG 7.2 on renewable energy, and SDG 7.3 on energy efficiency. The latest estimates reveal that the world is making good progress but is still far from achieving SDG 7 by 2030 (see Figure 1). Maintaining and extending the pace of progress in all regions and energy use sectors will require much higher efforts across all goals, if we are to reach universal access to affordable, reliable, sustainable, and modern energy by 2030. Nonetheless, recent efforts in electrification and energy efficiency are very promising in terms of possibilities for quick improvement, while proven technologies show great potential for providing access to clean cooking and increasing the deployment of renewables, despite slow past progress.

Figure 1: Latest data for primary indicators of global progress towards SDG 7 targets

840 million people without electricity access	3 billion people without clean cooking
17.5% total final energy consumption from renewables	5.1 MJ/USD primary energy intensity

Source: IEA, IRENA, World Bank, WHO and UNSD, 2019

SDG 7.1.1 : Access to electricity

Recent progress

The global share of population with access to electricity rose from 83 per cent in 2010 to 89 per cent in 2017, at an average annual electrification rate of 0.8 percentage points. The global population without access to electricity fell from about 1.2 billion in 2010 to around 840 million in 2017. Encouragingly, 2015 to 2017 showed an increased rate of electrification at over 1 percentage point, or 153 million people electrified annually. Over the period, the population without access to electricity has fallen across all unserved regions, with sub-Saharan Africa emerging as the largest access deficit region in 2017. About 78 per cent, or 655 million, of those without electricity live in 20 countries, and progress (or lack thereof) there has a major influence on global SDG 7.1.1 outcomes. India, the Democratic Republic of the Congo, Ethiopia, Nigeria, and Pakistan all have over 50 million people without access to electricity. Although electrification in terms of population reached was greater in cities compared to rural areas between 2010 and 2017, the share of population with access levelled off at 97 per cent for the urban population, but improved from 70 per cent in 2010 to 79 per cent in 2017 for the rural population.

Are we on track for 2030?

The yearly average increase of electrification since 2010 falls short of the target rate needed to reach universal access by 2030. To make up ground, the electrification rate needs to increase globally to 0.86 pp annually from 2018 to 2030. If the access deficit countries sustain the accelerated pace of electrification seen between 2015 and 2017, universal access could be reached by 2030. However, 650 million people are projected to remain without access to electricity in 2030, and 9 out of 10 of them are in sub-Saharan Africa.

Key challenges

As electricity reaches different pockets of the world and global electrification inches closer to universal access, connecting remaining unserved populations becomes increasingly challenging. Governments must cope simultaneously with population growth and densification in urban settings while achieving the last mile in rural electrification and responding to increased climate risks and vulnerability. In addition, access to electricity does not maximise expected socio-economic benefits if the service is not clean, sustainable, reliable and affordable. It is therefore imperative to identify success factors that have enabled progress in electrification since 2010 and better target the instruments and levers that can pave the path to universal access to electricity that is affordable, sustainable, reliable and modern.

SDG 7.1.2: access to clean cooking

Recent progress

The share of the global population with access to clean fuels and technologies for cooking increased from 57 per cent [51 per cent and 62 per cent, respectively] in 2010 to 61 per cent [54 per cent and 67 per cent, respectively] in 2017. However, due to population growth outpacing annual access gains, the total population without access remained stagnant at around 3 billion between 2016 and 2017, showing only a 2.3 per cent increase since 2000. From 2010 onwards, global improvements were driven by gains in both Central and Southern Asia, and Eastern and Southeastern Asia, with an average annual increase of 1.2pp and 0.9pp, respectively. In Latin America, the proportion of people with access to clean fuels and technologies remained unchanged from 2016 to 2017, at around 88 per cent, with an average annual increase of 0.4pp [-0.1, 1] between 2010 and 2017. This increase was in large part due to expansion of the LPG and electricity infrastructure driven by national policy initiatives. In sub-Saharan Africa, the access-deficit population in the region increased from less than 750 million in 2010 to around 900 million in 2017.

Are we on track for 2030?

To reach universal access to clean cooking by 2030 and to outpace population growth, especially in sub-Saharan Africa, the average annual increase in the proportion of households with access would need to increase from the 0.5 per cent rate observed between 2010 and 2017 to around 3 per cent. Under current and planned policies, as highlighted in the IEA's New Policies Scenario, 2.2 billion people are projected to be relying on polluting fuels and inefficient technologies in 2030 (IEA, 2018a).

Key challenges

Challenges, such as financing and the lack of demand or supply, remain in the three largest access-deficit regions: Central and Southern Asia, Eastern and Southeastern Asia, and sub-Saharan Africa. Each of these areas contains around one third of the total population without access. Progress will require particular

attention to behavioural patterns, cultural norms, and regional variations, as there is no one-size-fits-all solution when it comes to clean cooking (IRENA/IEA/REN21, 2018). In many places around the world, for example, a single clean cooking device fails to meet all the cooking needs of a household due to issues with affordability, cultural acceptability, or availability (World Bank, 2016). Cooking practices are heavily dependent upon culture, cuisine, household dynamics, and gender roles, as well as the availability of socially acceptable and affordable fuels and technologies. Because women are typically responsible for cooking, they often have a comparative advantage in reaching out to other end users of clean cookstoves (IRENA, 2019a).

SDG 7.2: renewable energy

Recent progress

The share of renewables in final energy consumption increased from 16.6 per cent in 2010 to 17.5 per cent in 2016, after a period of stagnation during the 2000s. In absolute terms, renewable energy consumption has grown by 14 per cent since 2010. The share of renewables in heat consumption remained the highest and reached 24 per cent in 2016, an increase of 0.5 per cent year-on-year. However, this includes the 'traditional uses of biomass'¹. Excluding those, the share of modern renewables reached 10.2 per cent in 2016, up from 8.6 per cent in 2010. Out of three end-use sectors, the fastest growth continued to be in electricity where renewables increased by one percentage point to 24 per cent in 2016, thanks to the rapid expansion of wind and solar PV. The share of modern renewables in heat remained at only 9 per cent in 2016. The share of renewables in transport consumption remained the lowest at 3.3 per cent, although it has been steadily increasing since 2010.

Are we on track for 2030?

Based on the current trend, the share of renewables in total final energy consumption is expected to fall short of the substantial increase called for in the SDG target, which is also crucial for achieving SDG13 and others. Recent estimates from the IEA's Global Energy and CO₂ Status Report show that the annual growth in renewables demand increases in 2017 and 2018 (IEA, 2019). Similar to past trends, growth was led by use of renewables in electricity generation. IRENA's latest statistical data on capacity show a growth of 8 per cent per year in renewable capacity over the same period.

Renewable deployment in electricity should increase significantly by 2030 thanks to continued strong policy support, digital technologies and improving cost competitiveness for solar PV and wind technologies; however, electricity accounts for only one fifth of total energy consumption today. In the IEA's New Policies Scenario, which analyses current and planned policies, modern renewables use would increase only slightly in heat and transport end uses, to reach 10 per cent and 5 per cent respectively. Total renewables (including traditional use of biomass) would reach 21 per cent by 2030, with modern renewables moderately increasing to 15 per cent, leaving important untapped potential (IEA, 2018a). As a benchmark, the share of renewables in total energy consumption by 2030 in the IEA's Sustainable Development Scenario is 22 per cent, while the IRENA REmap Case scenario indicates an even higher share of 28 per cent (IRENA, 2019c).

¹ The "traditional uses of biomass" refers to the use of local solid biomass resources by low-income households that do not have access to modern cooking and heating fuels or technologies. Solid biomass, such as wood, charcoal, agricultural residues and animal dung, is converted into energy through basic techniques, such as a three-stone fire, for heating and cooking in the residential sector, which is often inefficient and associated with negative impacts on human health and the environment. For this section, solid biomass consumption in the residential sector in developing countries is assumed to be used traditionally. Modern renewable energy consumption is total renewables consumption excluding the traditional uses of biomass.

Key challenges

Renewables still face persistent barriers related to technology, awareness and capacity, cost, finance, infrastructure and public acceptance, in addition to policy, regulatory, institutional and administrative ones. Policies have so far mostly focused on renewable electricity, while fewer countries have implemented policies on use of renewables for heating and transport. Greater ambition is still required to increase the share of renewables in the global energy mix to meet sustainable development goals.

Another challenge in tracking progress towards SDG 7.2 is that the current indicator includes traditional uses of biomass, which should be phased out as rapidly as possible due to their significant negative impacts on air quality, health, and the environment. In the future, countries may also consider setting quantitative targets for modern renewables, which would allow more targeted policy actions and facilitate monitoring progress.

SDG 7.3: energy efficiency

Recent progress

Global primary energy intensity, defined as the total primary energy supply per unit of global gross domestic product, was 5.1 MJ/US\$ (2011) PPP in 2016. This was an improvement of 2.5 per cent over 2015 levels, but less than the 2.9 per cent rate of improvement observed in 2015. Since 2010 global primary energy intensity has improved at an annual rate averaging 2.3 per cent, a more sustained rate of progress than 1990 to 2010, when annual improvements averaged 1.3 per cent. However, this falls short of the 2.6 per cent average annual rate of improvement targeted by SDG 7.3.

The latest estimates from the IEA show that the slowing rate of global primary energy intensity improvement observed in 2016 is continuing, with progress of 1.9 per cent in 2017 and 1.3 per cent in 2018 (IEA, 2019), suggesting that energy efficiency engagement needs a greater policy push.

Rates of primary energy intensity improvement are variable across regions, with improvements in Asia now central to global progress. As a result of energy efficiency policy actions and changes in economic structure, the annual rate of primary energy intensity improvement since 2010 has risen in 16 of the world's 20 largest energy-using economies; China, India, Indonesia, Japan, and United Kingdom are leading the improvements.

In terms of end uses, industry and passenger transport have seen rates of improvement exceeding 2 per cent since 2010, while the services, agriculture, and residential sectors showed more than 1.5 per cent improvement. Freight transport lags behind, but a changing policy landscape following the implementation of fuel economy standards for trucks signals potential future progress.

Improvements in the efficiency of power generation, as well as reductions in electricity transmission and distribution losses, will also contribute to reaching the SDG 7.3 target. Increased gas-fired generation, deployment of more efficient coal generation, and grid modernisation in the world's largest electricity producing countries, including China and India, are leading to improvements.

Are we on track for 2030?

Due to the rate of primary energy intensity improvement since 2010 being below 2.6 per cent, improvement rates now need to average over 2.7 per cent until 2030 to meet the SDG 7.3 target. Looking forward, with current policy ambitions, energy intensity improvements are likely to fall short of the SDG 7.3 target, leaving a large portion of cost-effective energy efficiency potential untapped. Between 2017 and 2030, energy intensity improvements are projected to average 2.4 per cent per year given current and planned policies

(IEA, 2018a).

Key challenges

The major challenge to realising the potential benefits from energy efficiency is the slow progress on energy efficiency policy. Economic growth and subsequent increases in living standards will continue to drive demand for energy services (lighting, heating, transportation, etc.) and subsequently put upwards pressure on energy demand. Energy efficiency policies, including regulations, incentives, and information and capacity building measures, have been critical to limiting energy demand growth without compromising economic growth and improved living standards.

Global progress on energy efficiency policy has stalled in recent years. Nearly 65 per cent of global energy use is not covered by mandatory energy efficiency codes or standards, with growth in policy coverage driven overwhelmingly by existing policies rather than new measures. Similarly, many countries drive efficiency gains by placing an obligation on utilities to meet energy saving targets. These targets have not changed since 2014 in over half of the obligation schemes globally, further illustrating the slowdown in efficiency policy.

How to fill the gap to achieve Sustainable Development Goal 7:

Energy sector investment related to the SDG 7 targets will need to more than double from today's level in order to achieve its goals. Between 2018 and 2030, annual average investment needs to reach approximately US\$ 55 billion for energy access, of which around 51 billion is required for universal electricity access and 4 billion for universal clean cooking access (IEA, 2018a). Additional investment should target sub-Saharan Africa, where projected investments are far less than what is needed. Investment in energy efficiency needs to reach around US\$ 600 billion per year, an effort for which the policy landscape will be essential. According to scenarios by both IEA and IRENA, renewable energy sector investment will need to reach between US\$ 660 and 730 billion per year (IEA, 2018a; IRENA, 2019c). While cost competitiveness of solar PV and wind will continue to stimulate renewable investments, strong policy measures will also play a major role in attracting investors.

Additional efforts will be essential in ensuring progress towards not only SDG 7, but also in eradicating poverty and meeting the broader sustainable development agenda. In particular, SDG 7 and climate change (SDG 13) are closely related and complementary, as well as the energy-food-water nexus.

Policy implications and recommendations

Policies will continue to play a key role in achieving SDG 7 as a whole, and in particular: political commitment and long-term sustainable energy planning to meet strategic goals (e.g energy access, poverty reduction, reduced pollution, climate change adaptation), stepped-up private financing, and adequate fiscal incentives to motivate faster deployment of existing sustainable technology options. Specific recommendations can also be put forward for each sub-goal:

- **Access to electricity:** Moving forward, the reinforcement of data-driven decision making through, for instance, a more detailed understanding of end user demand and geospatial planning, will help to better inform electrification strategies and policies. It is equally important to address the challenges posed to a resilient electricity system from climate change, stranded-assets and non-sustainable investments. To leverage private sector financing and increase investment flows, it is necessary to promote an enabling business environment with regulatory certainty, investment safeguards, and affordable

financing options. Harnessing the potential of decentralised renewable energy solutions which are fuelling a disruptive transformation of the power sector could enable further acceleration in scaling up electrification.

- **Access to clean cooking:** Clean cooking policies need to be integrated into the national policy landscape, thereby scaling up solutions, increasing public and private investment in clean cooking, and enhancing multisectoral collaboration. Furthermore, extending programmes to reach rural communities is critical to success. This is especially important given that the majority of people in sub-Saharan Africa reside in rural areas and lack the necessary infrastructure for clean cooking access. Clean cooking programmes have proven to be particularly successful when they focus on training women in the design, use, and marketing of clean cooking technologies. This is further complemented by programmes tailored to address behavioural patterns, cultural norms, and regional variations.
- **Renewable energy:** Long-term targets and predictable policies are key to ensuring investor confidence and continued growth of renewable energy technologies in all end uses, with stronger policy focus needed on heat and transport. As renewables become mainstream, policies need to cover the integration of renewables into the broader energy system and take into account socio-economic impacts affecting the sustainability and pace of the transition without leaving anyone behind. A wide combination of policies creating an enabling environment, incentivising greater cost-competitiveness by creating a level playing field, tackling non-economic barriers and infrastructure challenges is recommended. Direct incentives to de-risk investment and facilitate affordable financing are needed, as well as policies that issue clear signals to stakeholders (e.g., clearly defined long-term targets, environmental and climate policies, and regulations) and level the playing field for renewables (e.g., phasing out fossil fuel subsidies and introducing carbon pricing). Policies should consider technology and market maturity, which depends on the country situation. They should prioritise system integration of increased shares of wind and solar PV, ensure development of relevant infrastructure (e.g., transmission & distribution networks, smart EV charging, and district heating and cooling) and promote sector coupling. In addition, policies need to address sustainability, support labour-market needs for new skills, and address social acceptance challenges in all end uses. Policies should be inclusive, taking into account gender considerations in energy sector frameworks, education and training (IRENA, 2019a).
- **Energy efficiency:** The key actions that governments can take to realise the cost-effective energy efficiency potential that exists today include: strengthening mandatory energy efficiency policies, providing targeted fiscal or financial incentives, leveraging market-based mechanisms, and providing high quality information about energy efficiency. The spread of digital technologies will also create an active area of new ways to harness efficiency improvements—through improved devices and business models.

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