Ch11. Sustainable development. SDG 7: Energy

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Spring 2022 - NHH

Chapter outline

In this chapter we will focus on the analysis of the Sustainable Development Goal 7: Energy. In particular, we focus on **four points**: Access to electricity; access to clean fules and technologies for cooking; renewable energy; and energy efficiency. We will stablish bridges between SDG7 and other Sustainable Development Goals. The **chapter is organized as follows**:

- **Access to electricity**
- Access to **clean fuels** and **technologies for cooking**
- **Renewable energy**
- Energy **efficiency**
- **Questions** to summarize the chapter

This chapter is based on the document "Tracking SDG 7: The energy progress report 2020."

Access to electricity. Global trend

The share of the world's population having access to electricity grew **from 83 percent in 2010 to 90 percent in 2018**. An increase of more than a billion people

During the period 2010-2018, the number of people **without access to electricity** fell from about 1.2 billion to 789 million, outpacing the overall increase in population

Trends from 2016 to 2018 show **accelerated electrification** (with the average annual rate of electrification increasing to 0.82 percentage points) compared with 2010–16 (0.77 points)

Access to electricity. Global trend

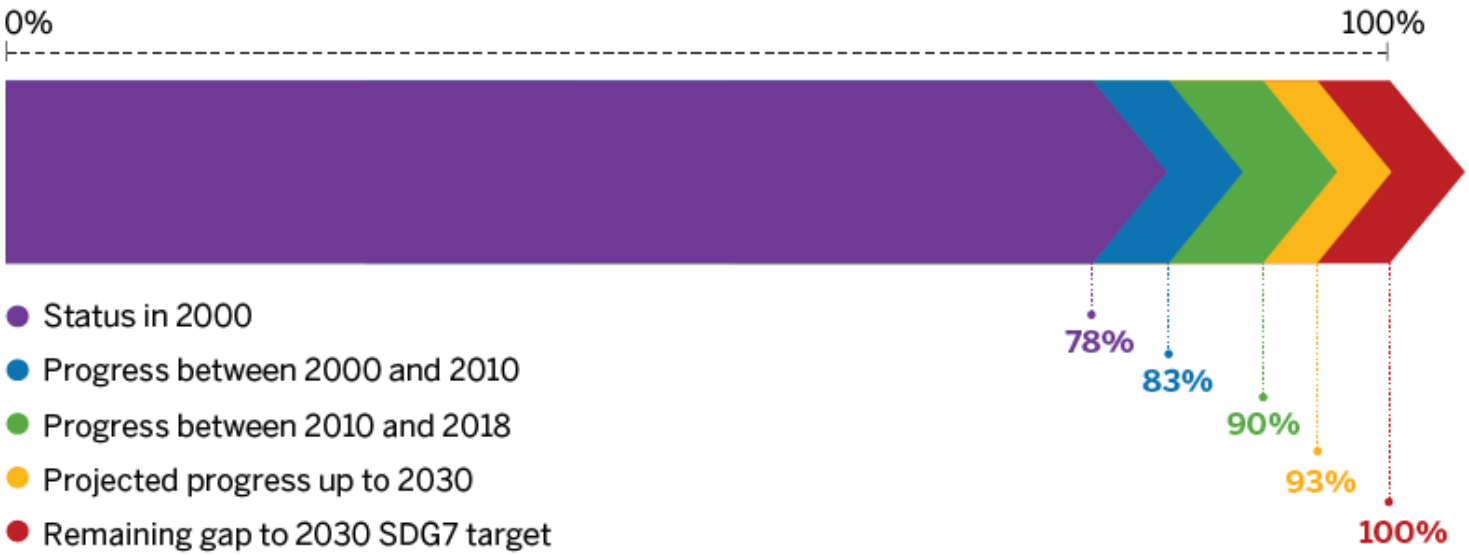
Despite accelerated progress in recent years, the world **will fall short of SDG indicator 7, which aims for 100 percent access to electricity by 2030**, if the current rate is maintained

Due to the many challenges facing access-deficit countries, **the latest projection shows that about 620 million people would still lack access to electricity in 2030** (figure next slide)

To close the gap, the **annual rate of electrification** would have to rise from the current 0.82 percentage points to 0.87 percentage points for the years 2019 to 2030

Access to electricity. Global trend

Figure: Percentage of population with access to electricity



Access to electricity. Regional highlights

The global advance in access to electricity since 2010 masks unequal progress across regions, with attention now focusing on **Sub-Saharan Africa**

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 access by 2018

Access to electricity. Regional highlights

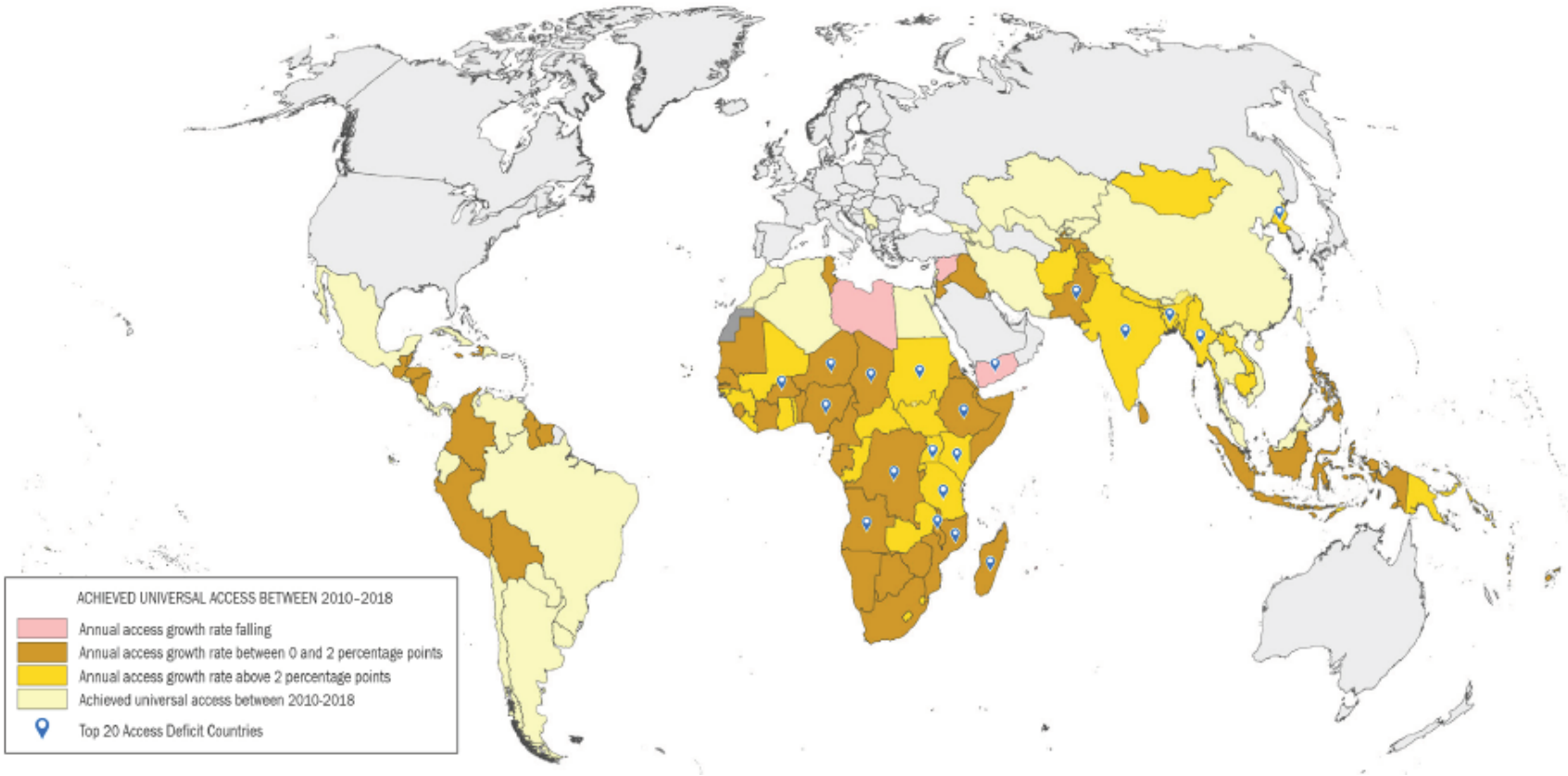
The world's access deficit is increasingly concentrated in **Sub-Saharan Africa**, which, in 2018, was home to about 548 million people who lacked access—more than half of the region's population and nearly 70 percent of the global population without access After 2010, access advances in

Sub-Saharan Africa outpaced population growth, but the trend has reversed recently

Between 2016 and 2018, the number of people in the region lacking access remained almost stable (figure next slide).

Access to electricity. Regional highlights

Figure: Annual increase in access to electricity, 2010-18



Access to electricity. Urban-rural access

Rural populations made up about 85 percent (668 million people) of the global access deficit in 2018

But, since 2010, they have seen **more progress** than the urban deficit populations (figure below):

- The access rate in **rural areas** grew from about 70 percent in 2010 to 80 percent in 2018
- During the same period, the rate of **urban electrification** grew from 95 to 97 percent

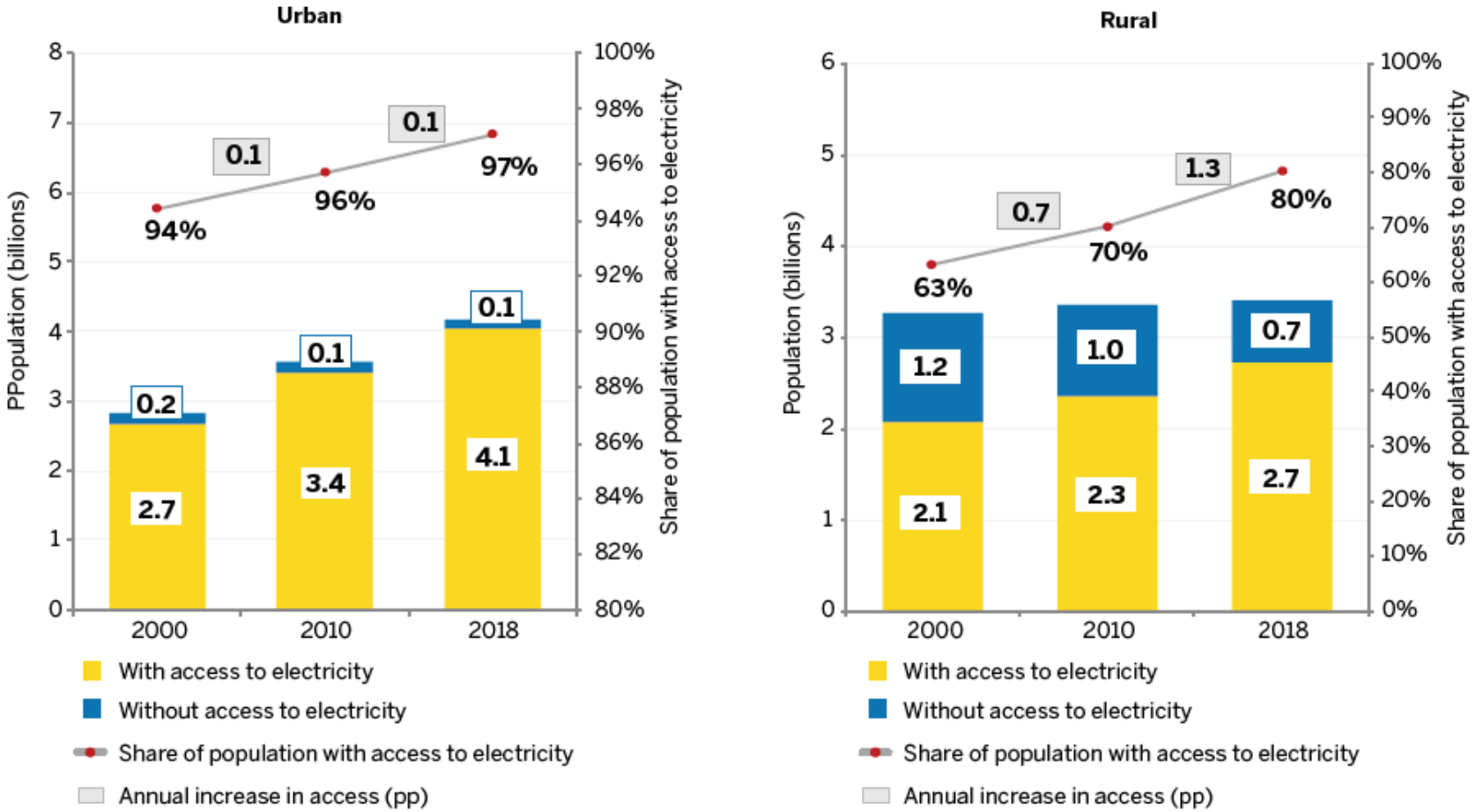
Access to electricity. Urban-rural access

While approaching universal access, **urban electrification** nevertheless faces policy and **technical challenges**

- The obstacles to supplying electricity to surging urban populations have slowed gains since 2010
- Unstable distribution networks have made it difficult to **connect pockets of people in urban cores** and in sprawling settlements that ring large cities

Access to electricity. Urban-rural access

Figure: Gains in electricity access in urban and rural areas, 2000, 2010, and 2018



Access to electricity. Energizing women

Access to electricity plays a critical role in **poverty reduction for women and girls**

Women's **employment** and **leisure** will improve with increased access to electricity

Poor electricity supply was pinpointed as the biggest obstacle to growth by 25 percent of **female-headed enterprises** surveyed in Tanzania and 19 percent in Ghana

Statistical data from these countries show a positive relationship between the **productive use of electricity and women's economic empowerment**

Access to electricity. Energizing women

Use of electrical appliances allowed for **diversification in products** for sale and helped female entrepreneurs attract more customers

The provision of electric light **amplifies time savings** by increasing efficiency and adding flexibility in the scheduling of household tasks

Freeing up women's time is a **prerequisite for investments in their education and life choices**, encouraging them to seize economic opportunities and participate in economic, political, and social life

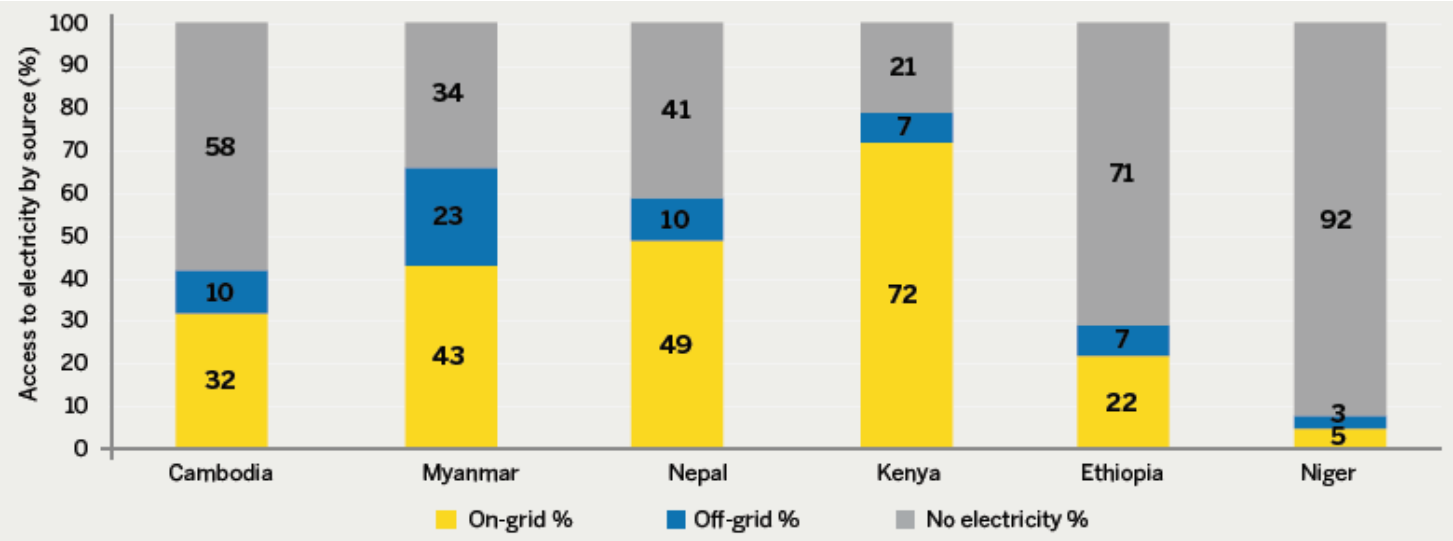
Access to electricity. Education and health

Providing electricity to schools and health centers offers broad benefits that will assist in reaching objectives codified in a range of SDGs, most directly **SDG 3 (health)** and **4 (education)** but also **SDG 5 (gender)** and **SDG 8 (work and economic growth)**

The Multi-Tier Framework (MTF) team collected information from public institutions including health and education facilities as a part of the household survey (figures below)

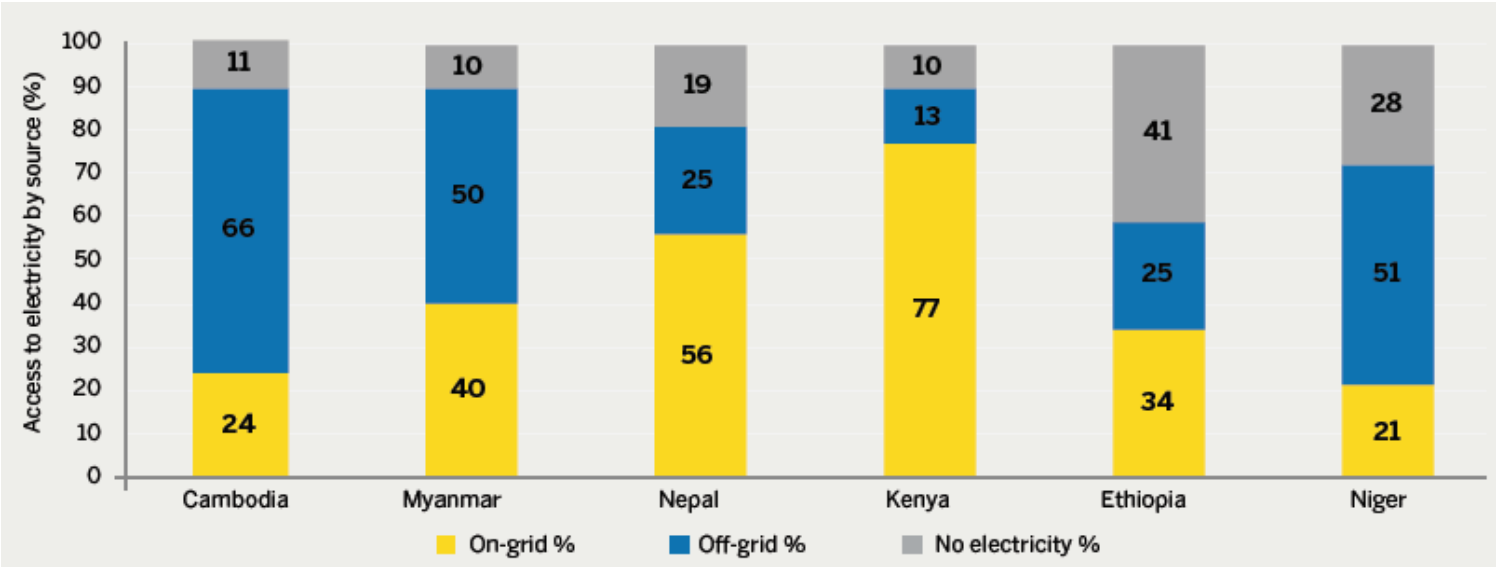
Access to electricity. Education facilities

Figure: Electrification of schools, by source



Access to electricity. Health centers

Figure: Electrification of health centers, by source



Access to clean fuels. Global trend

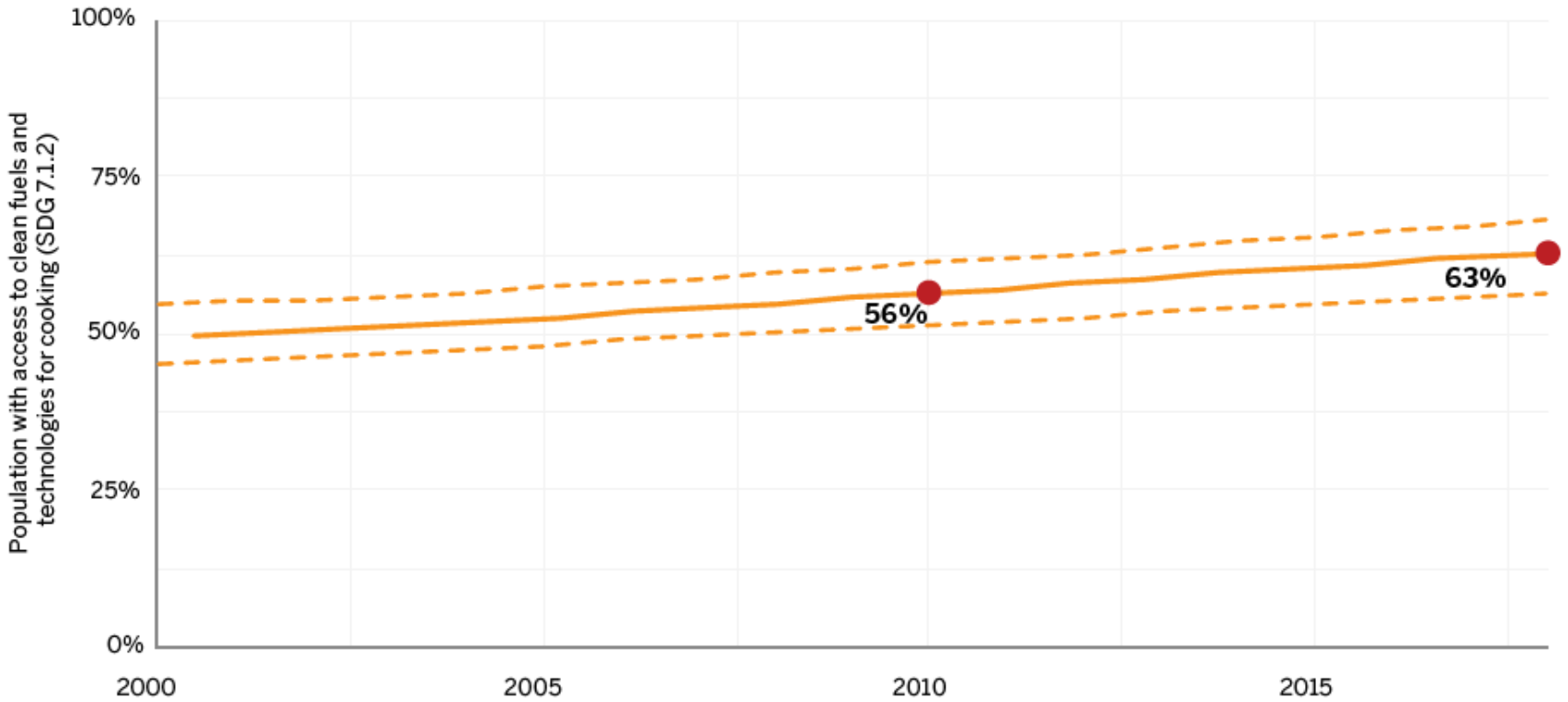
In 2018, 63 percent of the global population had access to clean cooking fuels and technologies; **the global population without access was 2.8 billion people** (figure below)

Without prompt action, **universal access will fall short of SDG goals by almost 30 percent**

Meanwhile, exposure to household air pollution will continue to contribute to millions of deaths from noncommunicable diseases (including heart disease, stroke, and cancer) and pneumonia

Access to clean fuels. Global trend

Figure: The global population with access to clean cooking (in percentages)



Access to clean fuels. Regional highlights

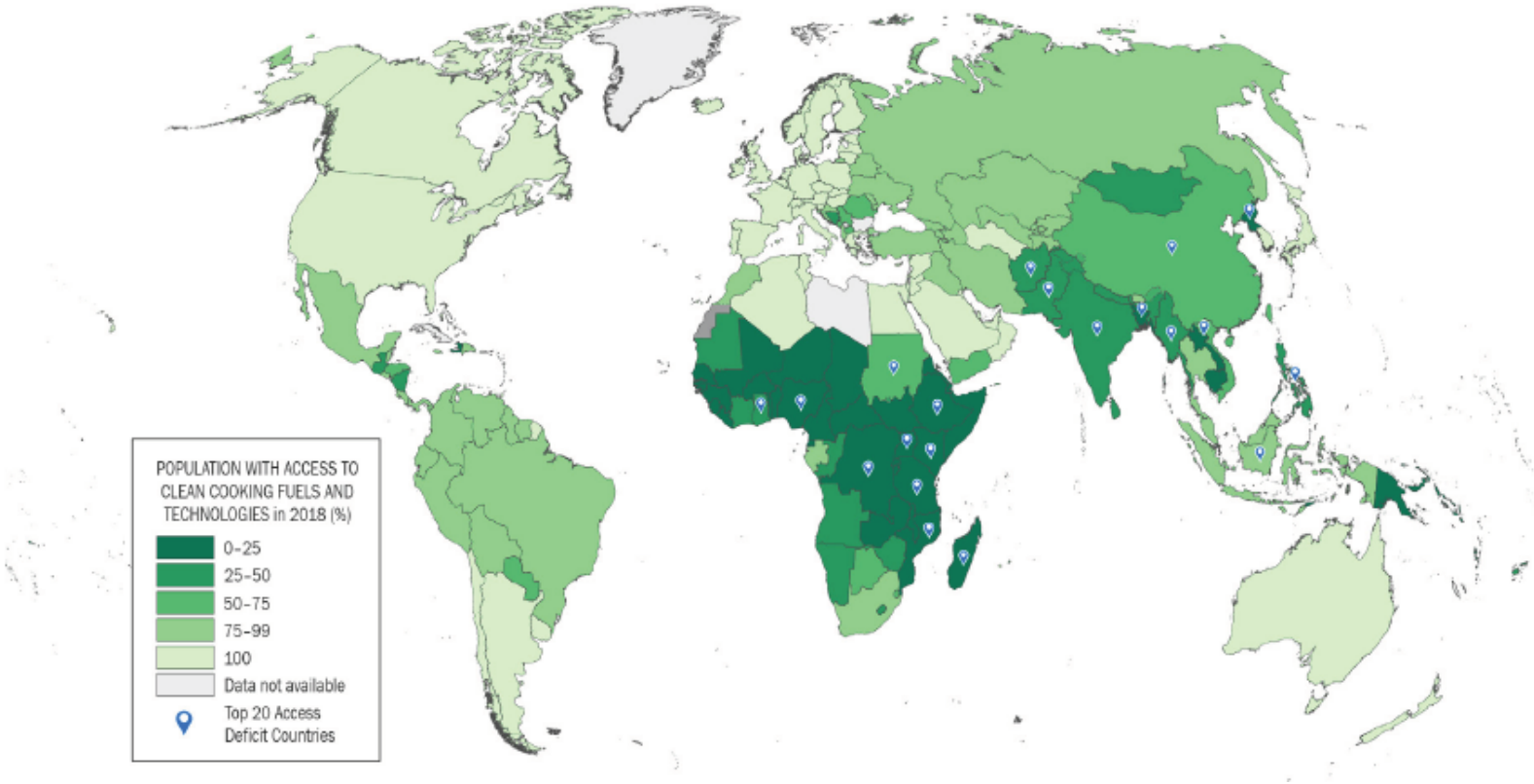
Greater access to clean cooking was achieved largely in **two regions of Asia**

- From 2010 to 2018, **Eastern Asia and South-eastern Asia** saw annualized increases in access of 1.6pp—while the numbers of people lacking access fell from 1.0 billion to 0.8 billion
- **Central Asia and Southern Asia** also saw improved access to clean cooking, with annualized increases of 1.5pp. The 1.11 billion people without access dropped to 1.0 billion

In **Sub-Saharan Africa**, meanwhile, a stagnant access rate (annualized increase of 0.4pp) combined with rapid population growth have meant that the numbers of people without access have risen from 750 million people to 890 million people (figure below)

Access to clean fuels. Regional highlights

Figure: Regional populations, by rate of access to clean cooking fuels and technologies, 2018



Access to clean fuels. Urban-rural

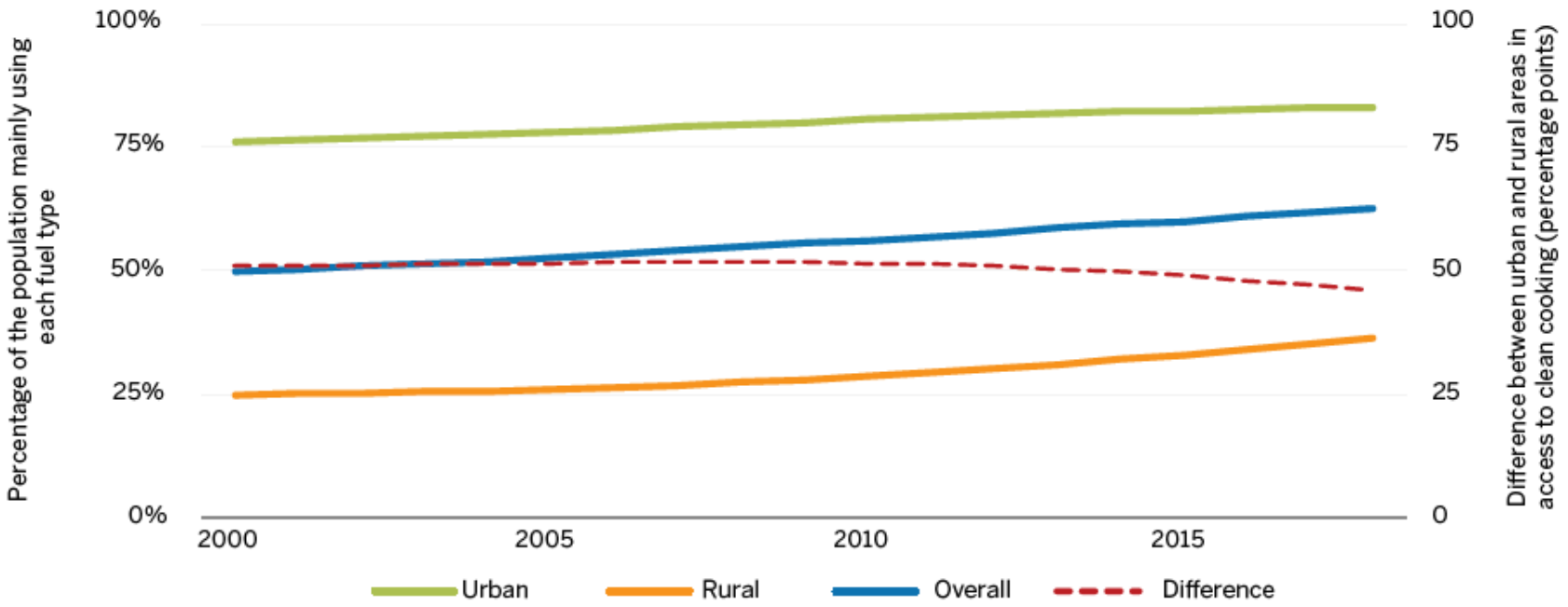
There are urban-rural discrepancies worldwide in access to clean cooking fuels and technologies: **83 percent of the people living in urban areas** have access to clean fuels and technologies, compared with **37 percent of those living in the countryside**

These **discrepancies have been shrinking since 2010 owing**

- First, to **increased access in rural areas**
- Second, to **population growth in the cities** that is beginning to **outpace access**

Access to clean fuels. Urban-rural

Figure: Clean cooking access in urban areas, rural areas, and overall



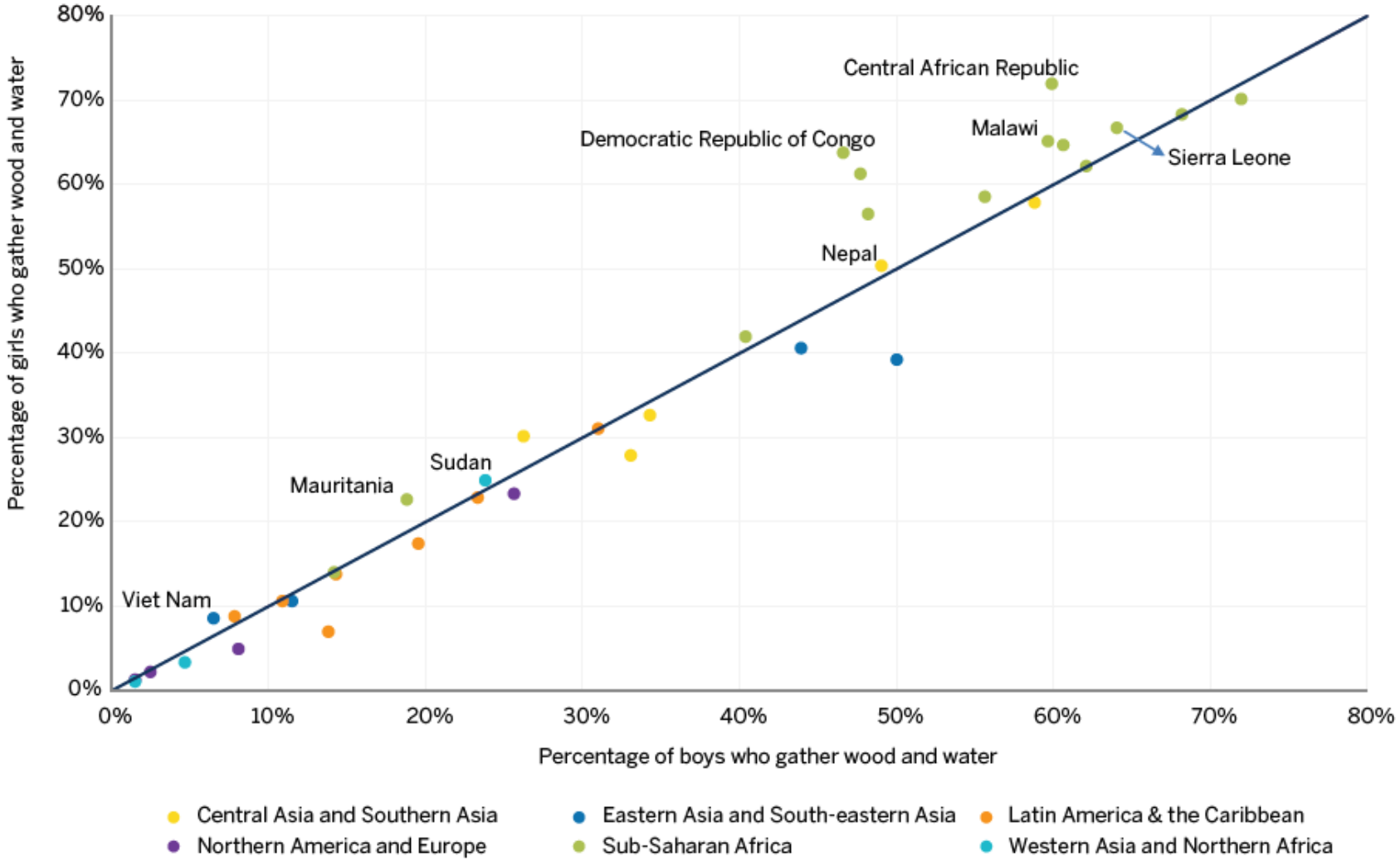
Access to clean fuels. Youth, gender, and other SDGs

Universal access to clean cooking fuels and technologies would also help attain other SDGs. The benefits of access to clean fuels and technologies include: **better health and well-being** (SDG 3), **education** (SDG 4), **fewer gender inequalities** (SDG 5), **affordable and clean energy** (SDG 7), **economic growth** (SDG8), **sustainable cities and communities** (SDG 11), and **climate action** (SDG 13)

In access-deficit countries in **Sub-Saharan Africa**, a sizable percentage of **children** spend time gathering fuels. In addition, based on WHO statistics, the **procurement of fuels is predominantly done by girls over boys** (figure below)

Access to clean fuels. Youth, gender, and other SDGs

Figure: Percentages of girls and boys who gather wood and water



Access to clean fuels. Youth, gender, and other SDGs

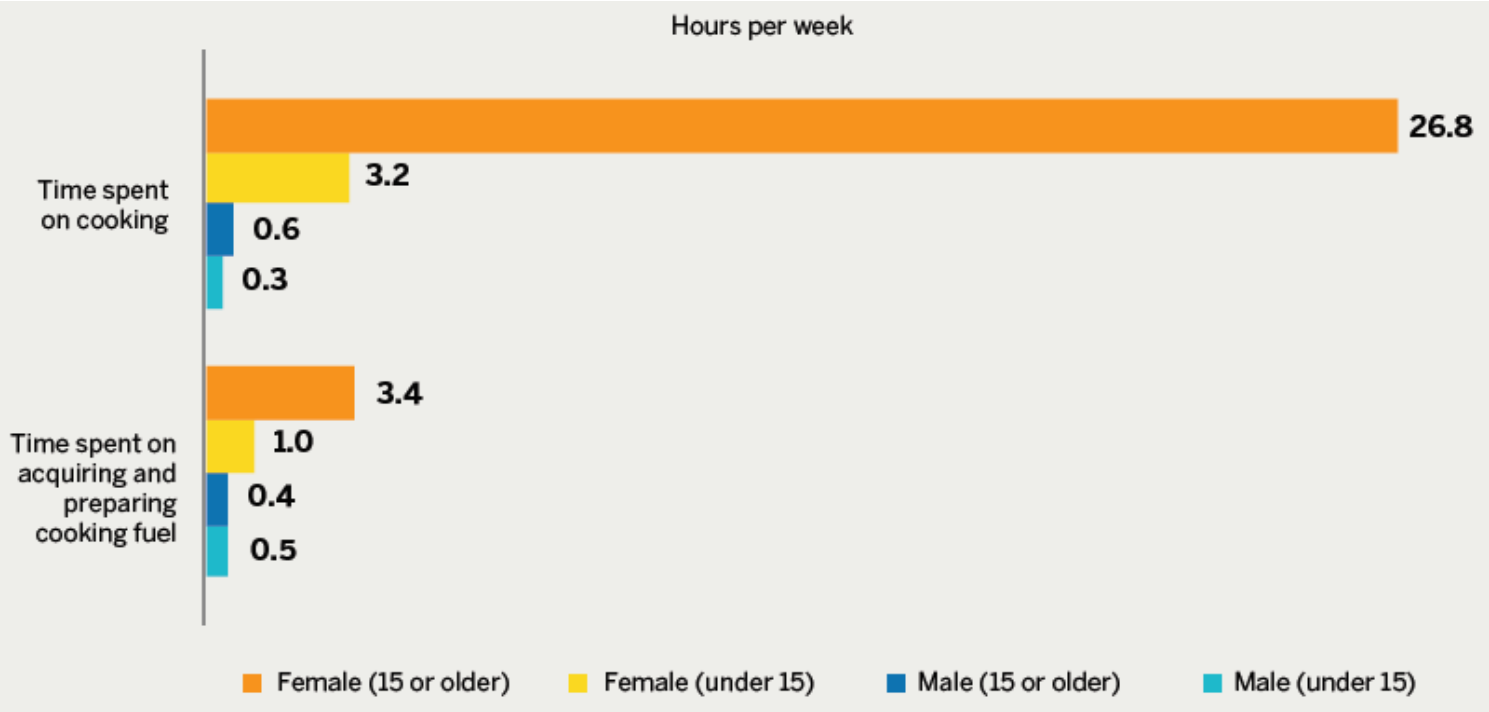
In Uganda, women (15 years and older) spend on average 3.8 hours per day **cooking**, and girls spend close to 30 minutes. In contrast, men and boys are virtually not involved in cooking

Female household members will often spend much more time **acquiring and preparing fuel** than men and boys. In Uganda, women spend 3.4 hours per week in cooking fuel acquisition and preparation—over 7.5 times more time than men (figure below)

In Kenya, households working with improved cookstoves saw **the time spent collecting fuel drop from an average of 12 hours per week to 5 hours**—and most participants reported using the time saved for economically productive tasks

Access to clean fuels. Youth, gender, and other SDGs

Figure: Time spent acquiring fuel and preparing food, by gender



Renewable energy

We have studied this topic in detail in the second block. In the manual, I present the main results in World Bank (2020a), since those results are based on the simulations done by the **International Energy Agency**, and they complement the analysis done in the second block

Energy efficiency. Definition energy intensity

Energy intensity is a measure of the energy inefficiency of an economy. It is calculated as units of **energy per unit of GDP**.

- **High energy intensities** indicate a high price or cost of converting energy into GDP.
- **Low energy intensity** indicates a lower price or cost of converting energy into GDP.

High energy intensity means high industrial output as portion of GDP. Countries with low energy intensity signifies labor intensive economy.

For more information about energy intensity, visit:

- Wikipedia (link 1).
- American Energy Department (link 2).

Energy efficiency. Global trend

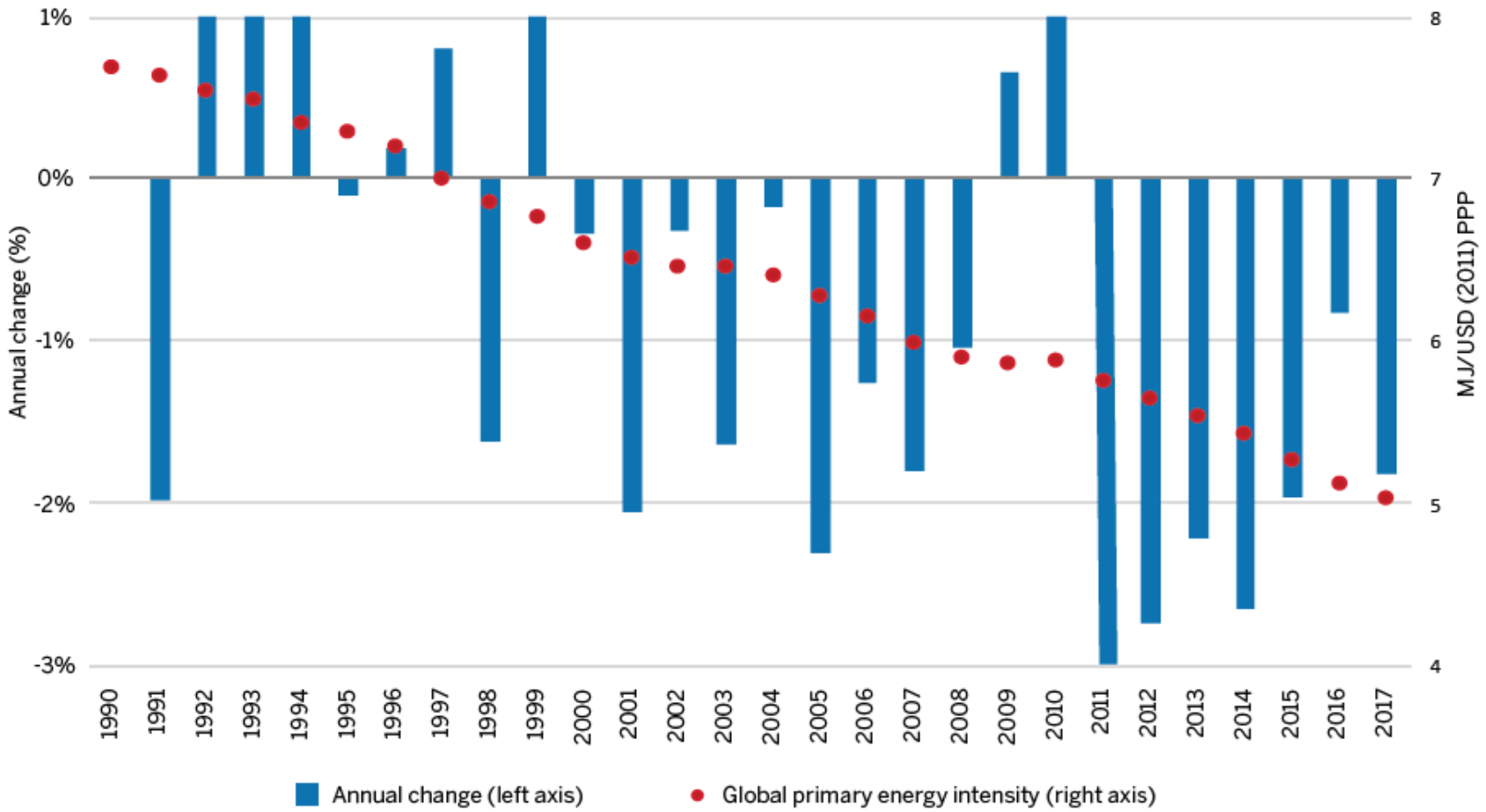
After a period of **relative stability,** the rate of global primary energy intensity—defined as the percentage decrease in the ratio of global total primary energy supply per unit of gross domestic product (GDP)— **has slowed in recent years**

Global primary energy intensity was 5.01 megajoules (MJ) per U.S. dollar (2011 PPP [purchasing power parity]) in 2017, a 1.7 percent improvement from 2016. This was the lowest rate of improvement since 2010 (figure below)

Annual improvement until 2030 will now need to **average over 3 percent** to meet the target set in SDG 7

Energy efficiency. Global trend

Figure: Global primary energy intensity and its annual change, 1990–2017



Energy efficiency. Regional highlights

Asia is where more robust, continuous improvements are seen in energy intensity than in any other world region

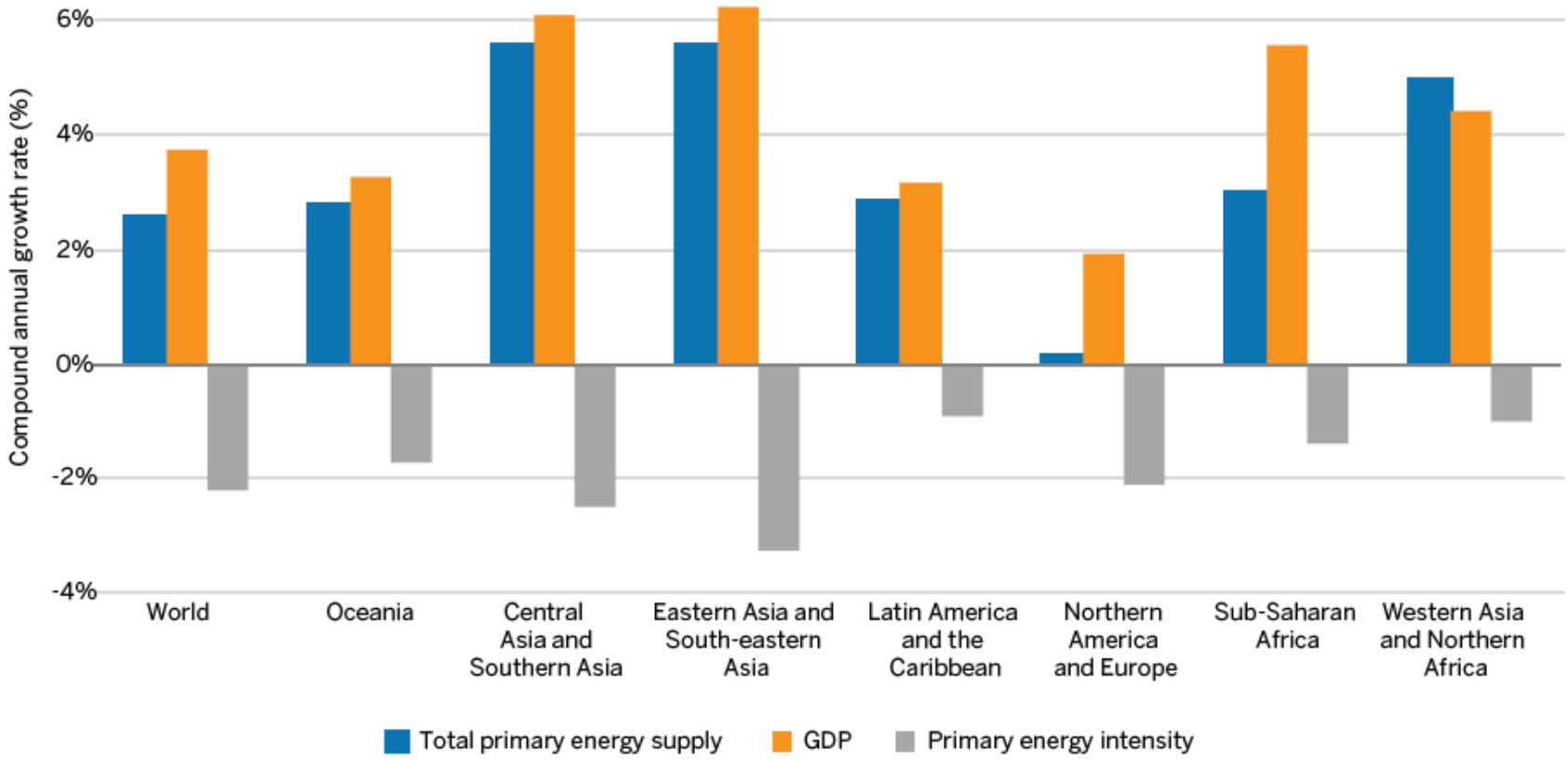
Between 2010 and 2017, primary energy intensity in **Eastern Asia and South-eastern Asia** improved by an annual average rate of 3.3 percent

Similarly, in **Central Asia and Southern Asia and Oceania**, the average annual improvement rate of 2.5 percent between 2010 and 2017 was above the global average (2.2 percent) and an improvement on historic trends

Rates of improvement were just below the global average in **Northern America and Europ**e (2.1 percent), with the lowest rates of improvement in **Sub-Saharan Africa** (1.3 percent), **Western Asia and Northern Africa** (1 percent), and **Latin America** (0.9 percent) (figure below)

Energy efficiency. Regional highlights

Figure: Growth rate of GDP, primary energy demand, and regional energy intensity, 2010–17



Energy efficiency. Sectors

Although **global energy intensity improved across all sectors** during the period 2010–17, the rate differs by sector

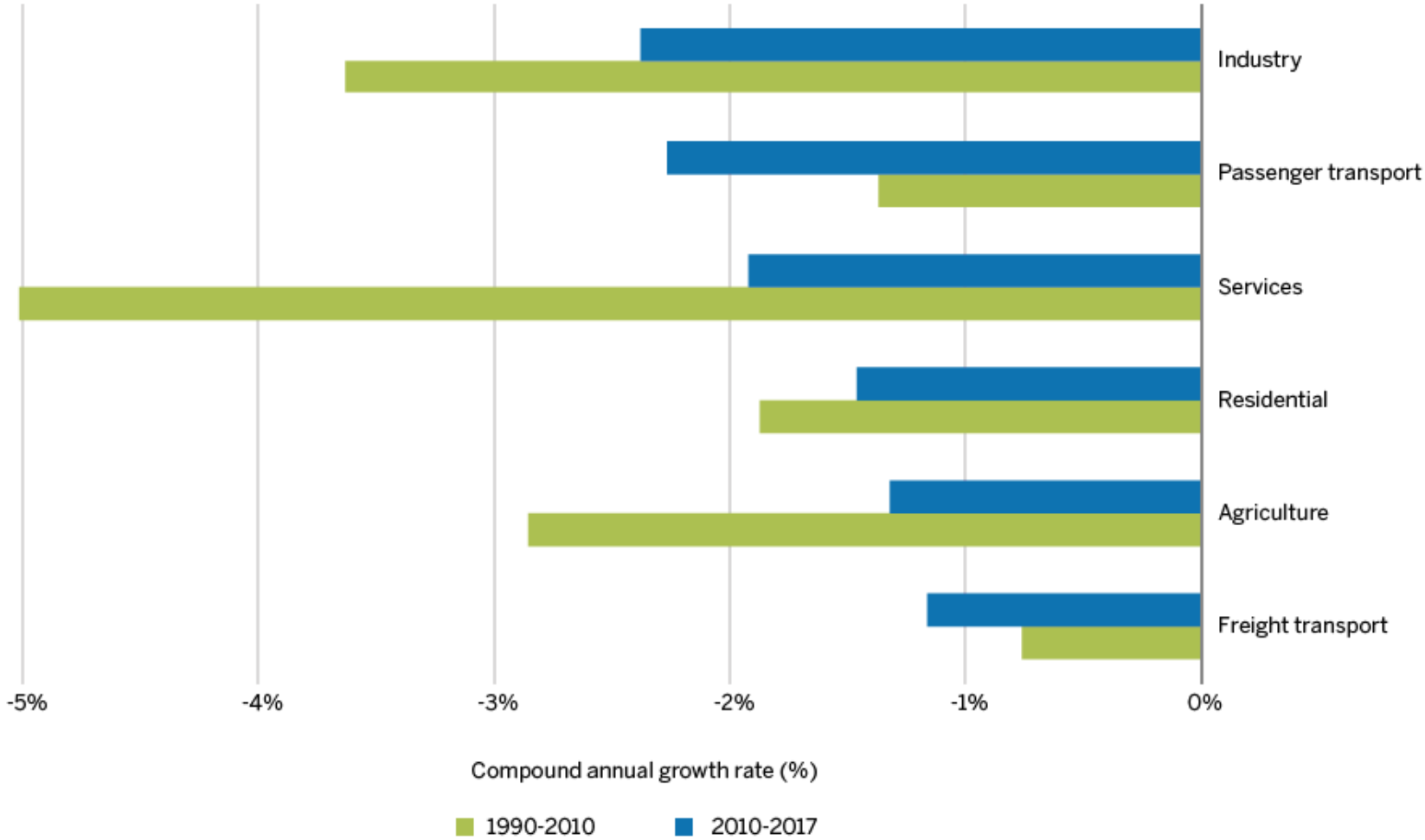
Using different intensity metrics, **the rate of improvement declined** compared with the period 1990–2010 in all sectors except transport, where fuel-efficiency standards drove improvements

The decline in the rate of improvement from one period to the other is **most noticeable** in services, agriculture, and, to a lesser extent, industry

All three of these sectors were strongly influenced by **emerging economies**, which experienced rapid improvements in energy intensity during the period 1990–2010 as they mechanized production and shifted to higher-value goods and services (figure below)

Energy efficiency. Sectors

Figure: Growth rate of energy intensity by sector, 1990–2010 and 2010–17



Questions to summarize the chapter

1. Access to electricity. Which population percentage does not have access to electricity in 2018? How many million people is that percentage?
2. Access to electricity. Which is the access to electricity **objective of the SDG7 by 2030**? How many million people will not have access to electricity in 2030?
3. Access to electricity. At a regional level, which regions has achieve **universal access** and which ones are struggling to achieve that objective?
4. Access to electricity. Which is the percentage of population living in **rural areas** with universal access to electricity and in **urban areas**?
5. Access to electricity. Women suffer particularly the lack of access to electricity. Can you enumerate some of the positive effects of guaranteeing **women universal access to electricity**?
6. Access to electricity. Which is the relation between SDG7 and **other SDGs**? In particular, can you explain briefly how SDG7 affects to **education** and **health facilities**?

Questions to summarize the chapter

7. Access to clean fuels. Which population percentage does not have access to clean fuels in 2018? How many million people is that percentage?
8. Access to clean fuels. Which is the access to clean fuels **objective of the SDG7 by 2030**? For which percentage that objective will be short in 2030?
9. Access to clean fuels. At the regional level, could you explain the access to clean fuels in **Asia** and **Africa**?
10. Access to clean fuels. Which percentage of the people living in **urban areas** and in **rural areas** have access to clean fuels and technologies?
11. Access to clean fuels. The percentage of girls allocating time to procurement of fuels and cooking is larger than the percentage of boys. Could you **quantify that difference**? In which countries that difference is larger? In the case of **Uganda**, could you determine the number of hours a week that girls spend gathering fuels and cooking?

Questions to summarize the chapter

12. Energy efficiency. Can you define the **concept of the energy intensity**?
13. Energy efficiency. Can you explain the **evolution of the energy intensity** from 1990 to 2018?
14. Energy efficiency. Can you explain the **evolution of the energy intensity** at a regional level?
15. Energy efficiency. Can you explain the **evolution of the energy intensity** by sectors?