CHAPTER 5

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

MAIN MESSAGES

- **Global trends:** Tracking of Sustainable Development Goal (SDG) indicator 7.a.1 shows that international public financial flows[1] in support of clean energy in developing countries were declining even before the COVID-19 pandemic. In 2019, they amounted to USD 10.9 billion—a 23 percent drop from 2018. This was 25 percent less than the 2010–19 decade-long average, and less than half the 2017 peak of USD 24.7 billion. Except for large fluctuations in 2016 for solar energy and in 2017 for hydropower, flows remained within the range of USD 10–16 billion every year between 2010 and 2019. Looking at a five-year moving average trend, annual commitments decreased for the first time since 2008 by 5.5 percent—from USD 17.5 billion in 2014–18 to USD 16.6 billion in 2015–19. The level of financing remains far below what is needed to reach SDG 7, in particular for the least-developed countries, landlocked developing countries, and small island developing states.
- **The target for 2030:** Although there is no quantitative target for international public financial flows under indicator 7.a.1, the fact that the world is not on track to meet the larger target of SDG 7.a points to the continued importance of international cooperation. This is evident when comparing current flows with those needed for an energy transition that would limit the global temperature increase to 1.5°C, with parameters set out in the United Nation's *Global Roadmap for Accelerated SDG7 Action in Support of the 2030 Agenda for Sustainable Development and the Paris Agreement on Climate Change* (UN 2021a). Directing international public flows toward clean energy solutions has become even more difficult since 2020, as public resources are increasingly reallocated toward recovery from the COVID-19 pandemic. The amount of funding for non-renewables, and the overwhelming concentration of flows for clean energy on a few countries, underscores the need for greater action toward SDG target 7.a, ensuring no one is left behind. The challenges are not to be underestimated: amid reduced fiscal space in many developing countries, it is critical that the recovery from the COVID-19 pandemic be both rapid and sustainable.
- **Technology highlights:** International public financial flows decreased across all renewable energy technologies between 2018 and 2019 for the second year in a row. In 2019, hydropower attracted 26 percent of commitments, followed by solar energy at 21 percent and wind energy at 12 percent. Geothermal energy reached a little over 3 percent of commitments. The remaining portion (37 percent) went to other renewables. Compared to 2018, the share of wind energy commitments increased by 6 percentage points while the shares of other technologies decreased. Those decreases reflect the fact that commitments increasingly fall into a "multiple/other renewables" category populated by energy funds, green bonds, and other government-led programs to support renewables, energy efficiency, and electricity access. In other words, growing numbers of new commitments are not specific to any one technology.
- **Regional highlights:** All regions saw a decrease in international public flows in 2019 except Oceania, where they increased by 72 percent (USD 55.1 million). Comparatively, decreases were less significant in Sub-Saharan Africa, which saw a drop of only 1.7 percent to USD 4.0 billion, sustaining the interest of public donors. Similarly, in Western Asia and Northern Africa flows decreased by 22.3 percent to USD 1.8

1 International public financial flows include official development assistance (ODA) and other official flows that are transferred internationally to developing countries. Almost 65 institutions or donors, which included over 215 agencies, produced the commitments during the 2000–19 period. More information can be found in the "Methodology" section of this chapter.

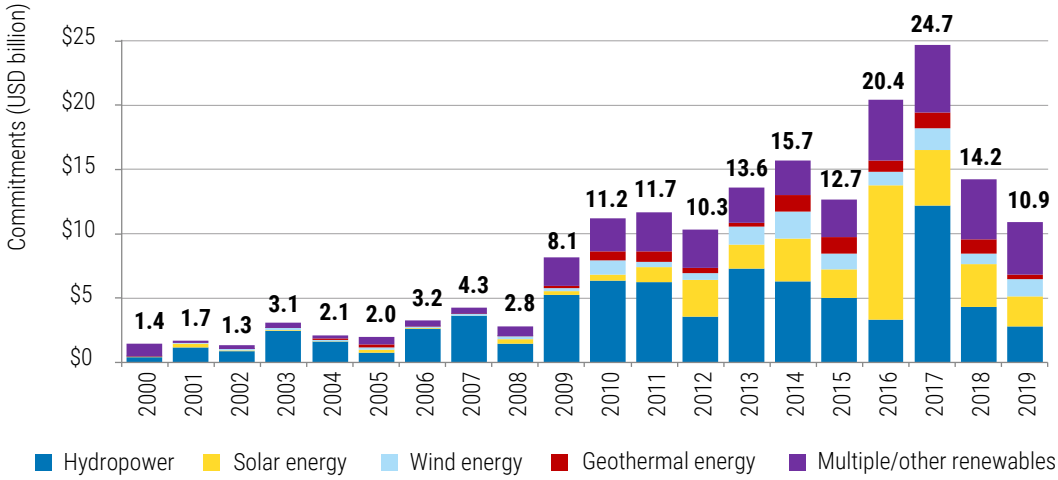
billion. The bulk of the reductions was concentrated in Eastern and South-eastern Asia, with a drop of 66.2 percent; in Latin America and the Caribbean the drop was 29.8 percent; and in Central and Southern Asia, 24.5 percent. Public financial flows continue to be concentrated in a few countries. Excluding those commitments that could not be easily categorized, 80 percent of the 2019 flows were directed to 22 countries, the region of Sub-Saharan Africa, and "unspecified developing countries."

- **Country highlights and distribution:** Public financial flows continue to be concentrated in a few countries, with 30 countries receiving 80 percent of all commitments. **Nigeria**, **Guinea**, and **India** were the top receiving countries in 2019, attracting one-quarter of commitments. Least-developed countries received 25.2 percent of commitments in 2019—but this increase from 21 percent in 2018 hides a 9 percent decrease in amount from USD 3.0 billion to USD 2.7 billion. The share of flows to landlocked developing countries increased marginally, from 14.1 percent of total flows in 2018 to 14.7 percent in 2019, while decreasing in amount by 20 percent from USD 2.0 billion to USD 1.6 billion. Commitments to small island developing states went up from 1.5 percent in 2018 to 2.9 percent in 2019, which amounted to a 45 percent increase from USD 214 million to USD 312 million.
- **Financing instruments highlights:** The mix of financial instruments that support clean energy is changing. The share of debt instruments (standard loans, concessional loans, and other debts) from public financing sources consistently decreased to 75 percent between 2016 and 2019. The shift was compensated by an increase in grants, followed by equity and guarantees on a percentage basis.

ARE WE ON TRACK?

Public international financial flows to developing countries in support of clean energy research and development and renewable energy production (together referred to as "renewables" throughout this chapter) decreased for the second year in a row. In 2019 they amounted to USD 10.9 billion—a 23 percent decrease compared to 2018 (figure 5.1). This was 25 percent less than the 2010–19 decade-long average, and less than half of the 2017 peak of USD 24.7 billion. This contraction occurred before COVID-19, indicating that the world was not on track to enhance these flows even before the pandemic.

FIGURE 5.1 • Annual international public financial flows toward renewables in developing countries, by technology, 2000–19



Source: IRENA and OECD 2022.
Note: Multiple/other renewables includes 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 activities, energy efficiency programs, and other infrastructure supporting renewable energy.

The public international flows in 2019 (USD 10.9 billion) were as low as those in 2012, and down by USD 3.4 billion compared to 2018. Except for large fluctuations in 2016 for solar energy and in 2017 for hydropower, flows remained in the range of USD 10–16 billion per year after 2010.

The **solar energy** boom of 2016 is explained by larger investment projects and a spike in the volume of commitments. Investments per commitment reached USD 24.7 million in 2016, almost twice as much as the 2010–19 average of USD 13.6 million. At the time, 421 commitments for solar energy had been made (1.8 times more than the 2010–19 average), led almost entirely by solar photovoltaic projects financed by the International Finance Corporation.

Historically, **hydropower** investments per commitment are notably larger—by almost three times—than for any other technology. In 2017, hydropower commitments were 5.8 times greater than those directed toward other technologies, driven by the Ex-Im Bank of China's investments of USD 5.0 billion for the Mambilla Hydroelectric plant in Nigeria, USD 1.7 billion for the Pak Lay Dam in the Lao People's Democratic Republic, and USD 1.4 billion for the Suki Kinari Hydroelectric Plant in Pakistan.

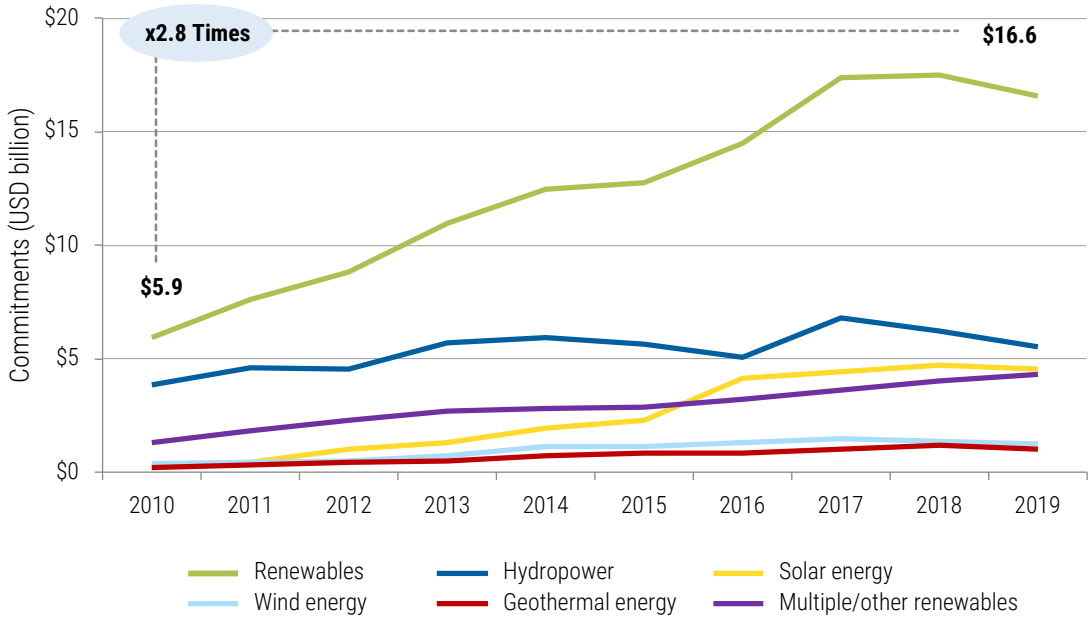
Although **wind energy** and **geothermal energy** did not experience similar trends, there were some notable investments in recent years. In 2015 and 2017, the China Development Bank committed USD 252 million to the

Thatta (Jhimpir) UEP 100 MW wind farm, followed by a commitment of USD 230 million to the Three Gorges second and third wind farms, both in Pakistan. Similarly, in 2016–17, the Japanese International Co-operation Agency committed USD 566 million and USD 420 million to the Laguna Colorada geothermal power plant in Bolivia and the Olkaria V geothermal power development project in Kenya, respectively.

The rest of the commitments were directed to projects involving **multiple or other renewables**. These included investments directed to renewable energy programs; combined renewables and energy efficiency projects or support platforms, green bonds, climate change frameworks, or facilities; and other refinancing schemes that indirectly supported renewables, such as those reducing environmental pollution. However, a focus on financial data over technology-specific details may end up misclassifying commitments in this category. For instance, solar rooftop programs that would otherwise be classified as solar energy commitments appear in this category in the Organisation for Economic Co-operation and Development's (OECD's) Creditor Reporting System (CRS), one of the two main sources of information behind the SDG 7.a.1 indicator. This highlights the importance of exercises to ensure that investments are classified under the right technologies.

Because of the year-on-year fluctuation of international public flows, we analyze temporal trends using a five-year moving average (referred to as MA5) of commitment amounts. Figure 5.2 illustrates technological trends in addition to the total flows.

FIGURE 5.2 • Commitments based on the five-year moving average against the 2010 baseline, by technology, 2010–19



Source: IRENA and OECD 2022.

Over the 2010–19 decade, commitments increased from USD 5.9 billion in 2010 to USD 16.6 billion in 2019, almost tripling in value. In real terms, even with the 2019 slowdown, this decade-long growth indicates enhanced collaboration to support clean energy in developing countries.

In 2019, the five-year moving average of international public financial flows committed to clean energy decreased for the first time since 2008, by 5.5 percent—from a peak of USD 17.5 billion in 2018 to USD 16.6 billion. The decrease occurred across all technologies, indicating a slowdown in international public flows, also confirmed by the year-on-year comparison of these moving averages.

As of 2020, the impacts of COVID-19 were likely to depress international public flows. That, combined with the lack of large investments in 2018 and 2019, would bring down the MA5 for 2020 and potentially for 2021. It may take a few years of increased investments to make up for these lower commitments.

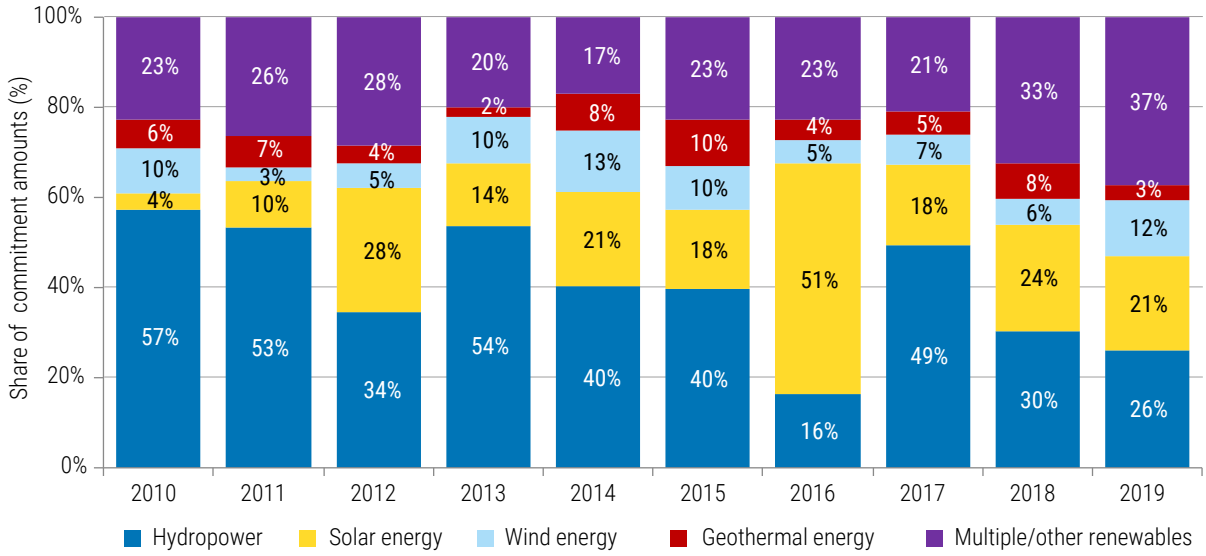
LOOKING BEYOND THE MAIN INDICATORS

Having multiple ways to look at the 7.a.1 indicator helps us identify the directions of international public flows in terms of technologies, geographical regions, countries, and financial mechanisms, as summarized below.

TECHNOLOGICAL TRENDS

International public flows toward clean energy are often categorized by the type of renewable energy involved: hydropower, solar, wind, or geothermal.[2]

FIGURE 5.3 • Share of annual commitments by technology, 2010–19



Source: IRENA and OECD 2022.

The distribution of flows by technology in 2019 was similar to that of the previous year. Hydropower attracted 26 percent of flows, followed by solar energy at 21 percent and wind energy with 12 percent. Geothermal energy received a little over 3 percent of commitments. Compared to 2018, the share of wind energy commitments increased by 6 percentage points. The remaining portion (37 percent) of commitments went to the multiple/other renewables category, with increased interest in energy funds, green bonds, and other government-led programs that supported multiple renewable technologies, energy efficiency, and electricity access.

There were remarkable differences in the distribution of flows by technology between 2016 and 2017 due to several commitments that were substantially greater than the rest, and large shares of investments that shifted to solar in 2016 and hydropower in 2017 (box 5.1). During 2018 and 2019, however, there were no significantly large single-project commitments to shift the technology mix and skew the flows. The trends observed in 2018 and 2019 therefore provide clearer insights into the annual investments across technologies. In the decade-long trend, as shown in figure 5.3, we see a constant decrease of hydropower in the mix and an increase of solar energy.

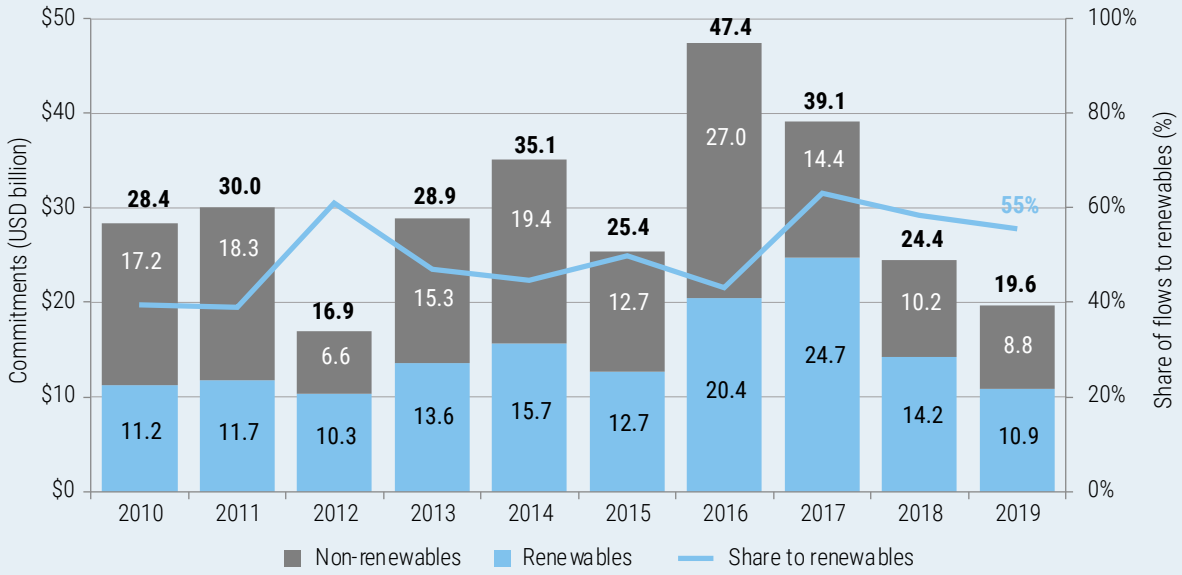
2 The "multiple/other renewables" category includes commitments targeting more than one technology (with no breakdown of the financial details for each technology) or targeting an alternate source of renewable energy that receives negligible commitments.

BOX 5.1 • The big picture: international public flows to both renewables and nonrenewables

Several public institutions have recently announced that they would be ending direct public support for unabated fossil fuels—particularly coal power plants. Since 2020, many multilateral development banks as well as donor countries have pledged to stop funding such projects. A look at the past decade shows that these efforts are long overdue given the climate and broader sustainability imperatives.

Figure B5.1.1 shows that international public flows from the same donors tracked for the 7.a.1 indicator[a] supported nonrenewable energy in slightly larger amounts than renewable energy in 2010–19.

FIGURE B5.1.1 • Annual commitments by energy type: renewables and nonrenewables, 2000–19



Source: IRENA and OECD 2022.

Cumulatively, nonrenewables attracted USD 149.8 billion (or 2.9 percent more than renewables at USD 145.5 billion) between 2010 and 2019. On average, nonrenewables received USD 14.9 billion per year, slightly more than the USD 14.5 billion for renewables. Figure B5.1.1 shows that renewables attracted more public financial flows each year after 2017, but significant public flows still went toward nonrenewable energy technologies. This stresses the importance of international public donors considering immediate changes to their investment strategies by redirecting public flows from nonrenewables to renewables, especially considering the scarcity of public resources and their importance in mobilizing private finance.

Because of the large overlap of donors participating in both renewables and nonrenewables, it is within their scope to adjust their portfolios to a greener strategy. For example, alternative renewable investments that gained popularity in the 2015–19 period, such as green bonds, can become a staple financial mechanism. A World Bank study shows that investment portfolios with green bonds are less volatile than those that consist exclusively of conventional and fossil-fuel-based bonds (Semmler and others 2021). They also attract private investors—a much-needed leverage for public funds—and lower financial market barriers to green investments (IRENA 2020a).

Yet, even if all international public flows to nonrenewables are converted to renewables, the overall investment amounts would still be be substantially lower than what is required to overcome the funding gaps in developing countries. This is especially the case for least-developed countries, landlocked developing countries, and small

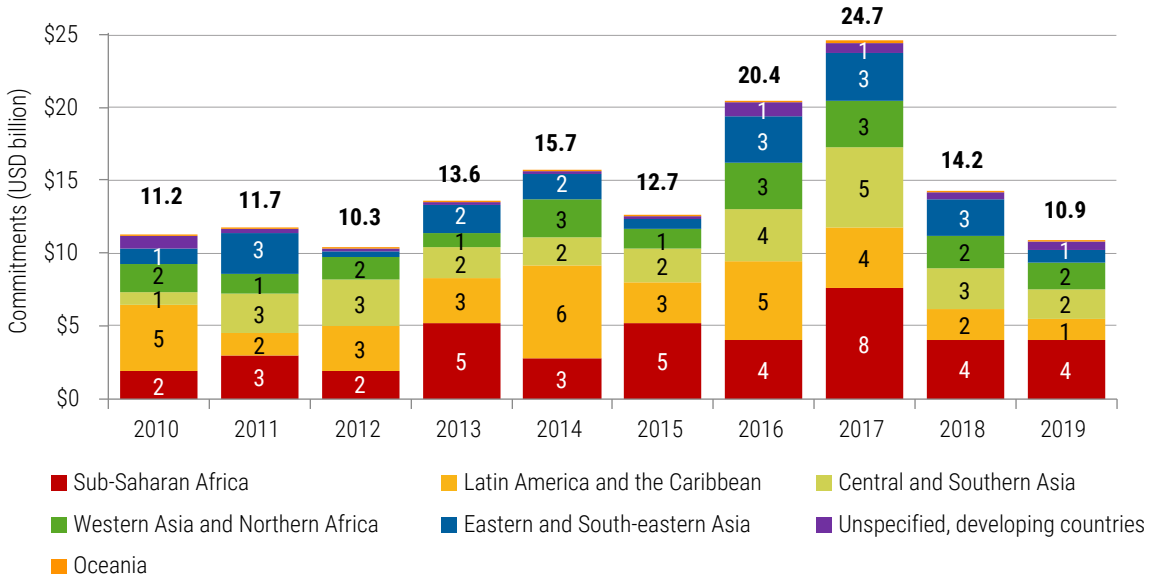
island developing states, which have been traditionally skipped in the international public finance space and often have larger deficits in the ratio of their current account balance to gross domestic product (World Bank 2021b), potentially making international debt an ever-increasing challenge to their development. In 2012, overall international public flows to energy were USD 16.9 billion, less than those directed to renewables in 2016 and 2017. In the peak year of investment, overall international public flows to renewables amounted to USD 47.4 billion. This amount is dwarfed by many other financing targets. One, for instance, is the USD 117.6 billion of public funds directed to support fossil fuels in countries of the Organisation for Economic Co-operation and Development in 2019 (OECD 2021).

a Not all the donors tracked by SDG 7.a.1 had investments in both renewables and nonrenewables. Kazakhstan and Qatar directed their flows solely to nonrenewables, whereas 17 donors directed them exclusively to renewables; 48 donors invested across all energy types.

REGIONAL TRENDS

Geographically, all regions saw a decrease in international public flows in 2019—a 23.6 percent drop from 2018 (figure 5.4). Only Oceania and "unspecified developing countries"[3] saw an increase in flows, of 72 percent (USD 55.1 million) and 27 percent (USD 123.9 million), respectively.

FIGURE 5.4 • Annual commitments by region, 2010–19



Source: IRENA and OECD 2022.

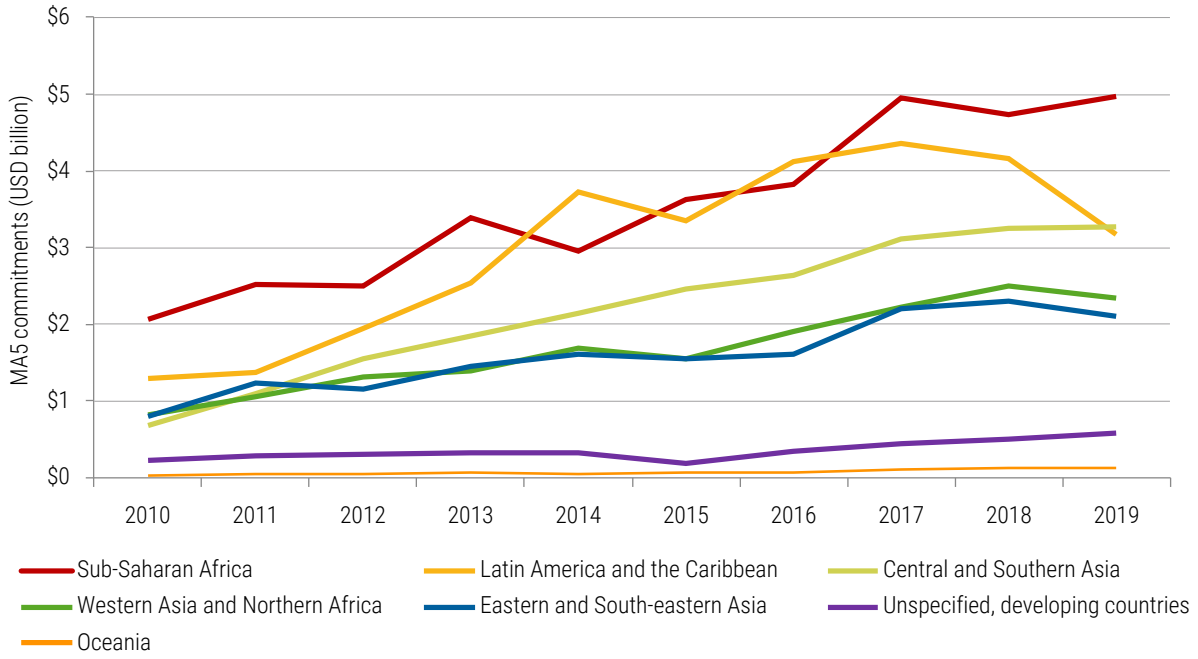
In 2019, Sub-Saharan Africa saw a minor decrease of 1.7 percent to USD 4 billion compared to 2018, indicating that the region had continued to sustain the interest of public donors. Other researchers, such as the Africa-EU Energy Partnership, also observed a strong inflow of commitments to the region, especially grid transmission and distribution investments from Europe (AEEP 2021). Compared to 2018, flows dropped by more than 22 percent in Western Asia and Northern Africa, by 25 percent in Central and Southern Asia, and by 30 percent

3 "Unspecified developing countries" is a new category added this year for commitments directed to multiple developing countries, not directed at a specific geographical region, and not including any developed countries.

in Latin America and the Caribbean in 2019, whereas Eastern and South-eastern Asia saw the most significant drop at 66.2 percent.

Overall, the MA5 for all regions (figure 5.5) shows that while growth has slowed, the regions attracted more investments in recent years than they did in 2010 and some remained on an upward trend. However, Latin America and the Caribbean saw a sharp drop in 2019, followed by Western Asia and Northern Africa, and Central and Southern Asia. Across developing countries average annual commitments decreased by 5.5 percent in 2019, from USD 17.5 billion in 2018 to 16.6 billion in 2019.

FIGURE 5.5 • Annual commitments by region based on a five-year moving average, 2010–19



Source: IRENA and OECD 2022.
MA5 = 5-year moving average

Sub-Saharan Africa attracted the largest flows across regions in 2019—amounting to USD 4 billion, slightly lower than in 2018.[4] The region alone received 37 percent of all developing countries' commitments. Considering the entire decade of 2010–19, it received a total of USD 39.6 billion, also the largest total among other regions. According to the MA5, average annual commitments increased by 5.3 percent in 2019, indicating the region's resilience amid a global downward trend. These commitments more than doubled between 2010 and 2019, due to the region's hydropower projects (which attracted big investors, especially China) and notable commitments to solar energy (which averaged USD 612 million in 2010–19 but are no longer on the rise).

Commitments received by **Central and Southern Asia** decreased by 24.5 percent (from USD 2.8 billion in 2018 to USD 2.1 billion in 2019), mostly due to a halving of commitments toward solar energy (from USD 1.0 billion to USD 511 million). Average annual commitments remained consistent in 2019 considering the MA5 but increased almost fivefold between 2010 and 2019 (more than other regions during the decade) due to steady increases in solar and wind energy flows. However, hydropower held the largest share of commitments across the decade, at USD 11.3 billion, owing largely to the USD 6.5 billion directed to projects in Pakistan.

4 The Africa-EU Energy Partnership reports that European institutions and Member States sent USD 2.3 billion in public flows to Africa in 2019.

Western Asia and Northern Africa received USD 1.8 billion in flows during 2019, down 22.3 percent from the USD 2.3 billion in 2018, largely due to reduced commitments toward solar energy (from USD 1.0 billion to USD 460 million). Considering the MA5, average annual commitments tripled between 2010 and 2019 (in line with an average increase of 2.8-fold across developing countries) but decreased by 6.3 percent in 2019. The region attracted USD 8.1 billion for investments in solar energy— concentrated mainly in **Morocco** (USD 3.3 billion), the **Arab Republic of Egypt** (USD 1.8 billion), and **Turkey** (USD 1.1 billion).

Latin America and the Caribbean received commitments of USD 1.5 billion in 2019, 29.8 percent less than the USD 2.1 billion in 2018 and as low as 2011 levels. The region's average annual commitments decreased the most in 2019, by 23.6 percent, considering the MA5. While they more than doubled between 2010 and 2019, the region had the second-lowest growth over the decade. Hydropower commitments proliferated in Latin America and the Caribbean, amounting to USD 12.7 billion over the 2010–19 decade, followed by USD 8.2 billion for solar energy and USD 7.4 billion for multiple/other renewables. In 2019, most flows went toward wind (USD 449 million) and solar energy (USD 363 million), while multiple/other renewables attracted a majority of the balance. **Argentina** received the most at USD 475 million, primarily due to large wind and solar projects awarded through renewable energy auctions. **Mexico** was next at USD 339 million, with a focus on solar energy and to a lesser degree wind energy. **Colombia** was third at USD 152 million, almost all of which was directed to the National Program to Ensure Sustainable and Efficient Energy Supply, Phase II.

Commitments in **Eastern and South-eastern Asia** were slashed by two-thirds to USD 845 million in 2019, a steep drop from the USD 2.5 billion received in 2018. Average annual commitments decreased by 8.4 percent in 2019 considering the MA5, having tripled between 2010 and 2019. Half of all international public flows during 2010–19 went to hydropower projects in the region. The **Lao People's Democratic Republic** alone received USD 6.1 billion for hydropower projects during this period, but only USD 0.1 million in 2019. Across the region, hydropower projects received only USD 0.8 million in 2019, signifying a large decrease in commitments and the vulnerability of these countries to attract investments outside of large-scale hydropower.

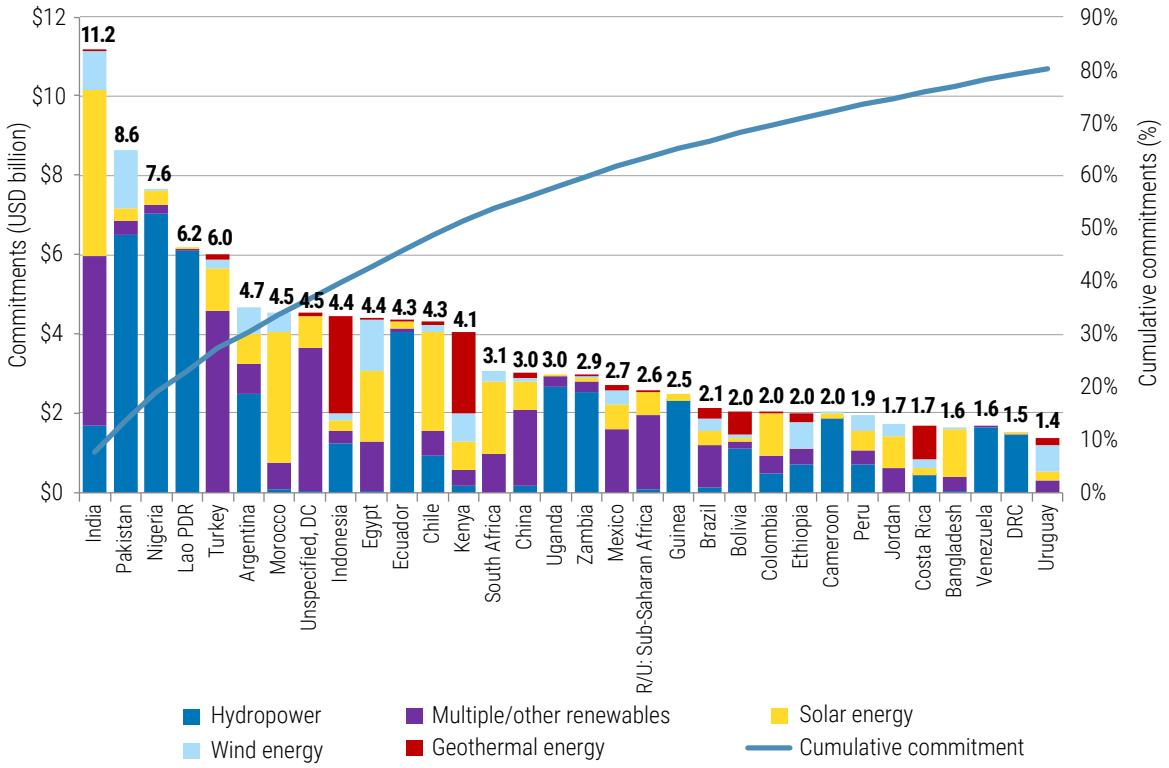
A total of USD 587 million went to **unspecified, developing countries** in 2019, 26.7 percent more than the USD 464 million in 2018. Some of these commitments were directed to multiple regions or countries simply because their underlying financial mechanisms are by design allocated to multiple recipients (e.g., green bonds, regional funds, and international grants). Other commitments in this category were directed to a single country that remained unidentified in the financial data. Across the period 2010–19, 36 percent of these flows were grants, followed by 27 percent concessional loans, 18 percent common equity and shares in collective investment vehicles, and 18 percent loans; the rest were guarantees and other instruments. This is contrary to the global trend of public donors preferring loans for a majority of their commitments, both during the 2010–19 decade and in 2019.

In 2019, **Oceania** attracted the smallest overall investment of all regions, a position it had held for at least the previous two decades. Still, the USD 132 million it received in 2019 indicates a substantial increase of 71.8 percent from the USD 77 million received in 2018. Average annual commitments to the region increased slightly by 4.8 percent in 2019 considering the MA5 (amid a drop in commitments across other regions) and almost quadrupled between 2010 and 2019. These were mostly directed toward solar energy. In 2019 the region received USD 49 million exclusively in grants for electrification, solar power development projects, and renewable energy expansion in the islands.

COUNTRY TRENDS

It bears reiterating that cumulative international public flows during the 2010–19 decade were concentrated in 30 countries (figure 5.6),[5] signaling a slight improvement from the 29 countries receiving commitments in 2010–18.

FIGURE 5.6 • Total commitments by top recipients, 2010–19



Source: IRENA and OECD 2022.
DRC = Democratic Republic of Congo; DC = developing countries; R/U = residual/unallocated official development assistance.

TOP RECEIVING COUNTRIES

In 2019 alone, 24 countries received 80 percent of all commitments. These included Sub-Saharan African countries and unspecified, developing countries. **Nigeria**, **Guinea**, and **India** were the top recipients, attracting one-quarter of all commitments. While India and Nigeria were consistently at the top across the years 2010–19, Guinea stood out only at the end of the period, due to the USD 1.1 billion commitment to the Souapiti Hydro Project received in 2018 and 2019.

As in 2018, many developing countries did not receive any international public financial flows in 2019, or in the entire decade of 2010–19. Many of these are small territories or high-income economies[6] such as **Bahrain**, **Singapore**, and the **United Arab Emirates**. Seven countries did not attract any flows in 2019 but received commitments in 2018 (albeit small ones that did not exceed USD 1 million, with the exception of the Iran (Islamic Republic of), the **Venezuela (Bolivarian Republic of), Eritrea, Gabon, Botswana, Kiribati, the Syrian Arab Republic**, and **Iran (Islamic Republic of).** On the other hand, 13 countries did not receive any commitments in 2018 but received a total of USD 130.8 million in 2019: **Uruguay, Tajikistan, Azerbaijan, Mauritius, Cabo Verde, Chad, Nauru, Eswatini, Tokelau, Timor-Leste, Palau, Grenada,** and **Niue.**

5 "Country," as used in this chapter, also refers, as appropriate, to a territory, area, or other unspecified location.

6 Countries with a per capita gross national income of USD 12,536 or more are classified as high-income economies: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups.

Nigeria attracted USD 1.2 billion in 2019, almost 11 percent of all commitments across developing countries. At USD 1 billion, the Gurara II hydropower project financed by the Exim Bank of China was a crucial project attracting international flows. Most other projects were directed toward solar energy and multiple renewables. The Green Climate Fund committed USD 100 million to the Nigeria Solar Independent Power Producer Support Program, and the French Development Agency (AFD) USD 33 million to support various renewable energy and energy efficiency projects. Multiple grants (amounting to USD 50,000 each) were provided by the African Development Foundation in the United States, and the governments of the United Kingdom, the Republic of Korea, Hungary, and the Netherlands to support off-grid renewables.

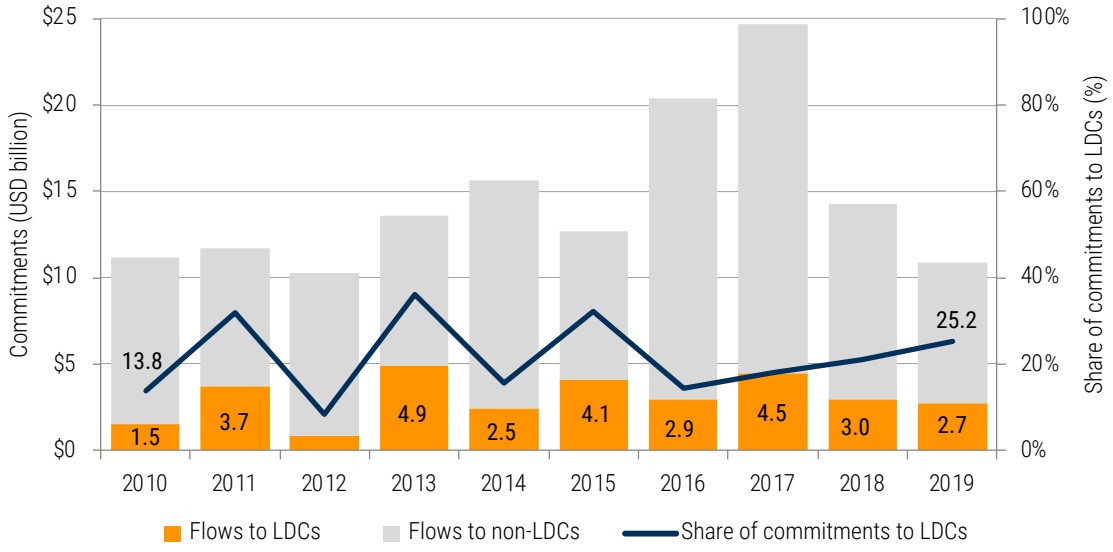
Guinea received USD 820 million in commitments during 2019, the largest share of which went to the 294 MW Koukoutamba hydropower plant. The project received USD 812 million from the Exim Bank of China, showing for a second year in a row that even a least-developed country (LDC) can attract significant funding. This increased support helped the country expand its 368 MW of installed hydropower capacity, which had remained the same since 2015.

India was the third-largest recipient of international public financial flows in 2019 (with flows reaching USD 786 million) as well as the largest recipient of flows during the decade (at USD 11.2 billion). The commitments of 2019, however, were directed toward a more varied portfolio of projects and programs than those of the previous decade. The largest commitment was a USD 224 million concessional loan to the Renewable Energy Financing Facility II, funded by Germany's KfW. Other notable ones included a USD 100 million loan to the L&T Green Infrastructure On-Lending Facility and a USD 65 million loan to the Rajasthan 250 MW solar project Hero Future Energies, both by the Asian Infrastructure Investment Bank, and two USD 75 million loans to wind and solar energy innovation technologies by the International Bank of Reconstruction and Development.

REACHING THOSE FURTHEST BEHIND

Last year we highlighted the difference in flows directed to emerging markets in developing countries and those furthest behind as categorized by the United Nations, namely the LDCs, landlocked developing countries (LLDCs), and small island developing states (SIDS).[7] During 2021, there were no changes in these lists of countries, but commitments to them varied considerably (figure 5.7).

FIGURE 5.7 • Annual commitments to LDCs and non-LDCs in support of clean energy, 2010–19



Source: IRENA and OECD 2022.
LDCs = least-developed countries.

7 The classification of countries included in each group follows the United Nations M49 regional classification: https://unstats.un.org/unsd/methodology/m49/.

Least-developed countries received 25.2 percent of commitments in 2019, an increase from 21 percent in 2018. They continued their upward trend from 2016, which hides a 9 percent decrease from USD 3.0 billion to USD 2.7 billion in absolute amounts. Of the 46 LDCs, **Eritrea, Sao Tome and Principe,** and **Kiribati** were the only ones that did not receive any flows in 2019; **Chad** and **Timor-Leste** received flows after not attracting any in 2018.

The group of 30 **landlocked developing countries** considered face trade and development challenges related to their lack of sea access and their geographical remoteness.[8] The share of flows to them increased marginally from 14.1 percent in 2018 to 14.7 percent in 2019, while the absolute amounts decreased by 20 percent from USD 2.0 billion to USD 1.6 billion. Amid the decrease, all LLDCs except **Botswana** received some sort of commitment in 2019.

The 53 **small island developing states** considered are especially vulnerable to the adverse effects of climate change, have remote geographies, and depend highly on external markets for goods to compensate for their narrow resource base. SIDS attracted 2.9 percent of commitments in 2019, up from 1.5 percent in 2018, with a 45 percent increase from USD 214 million to USD 312 million. Over the period 2010–19, however, 12 SIDS did not receive any commitments at all, whereas 6 countries attracted half of the total.

Reaching those furthest behind will entail providing universal access to affordable, reliable, and modern energy for all, under the SDG 7.a target. A separate analysis of international public financial flows to 20 high-impact countries for electricity access,[9] showed that commitments increased by 34 percent (USD 12.6 billion) in 2019 compared to the previous year. Investments for clean cooking totaled USD 133.5 million, of which international public financial flows made up half. However, this still falls significantly short of the USD 4.5 billion required in annual investment to achieve universal access to clean cooking (SEforAll, 2021).[10]

DISTRIBUTION OF FINANCIAL FLOWS TO DEVELOPING COUNTRIES

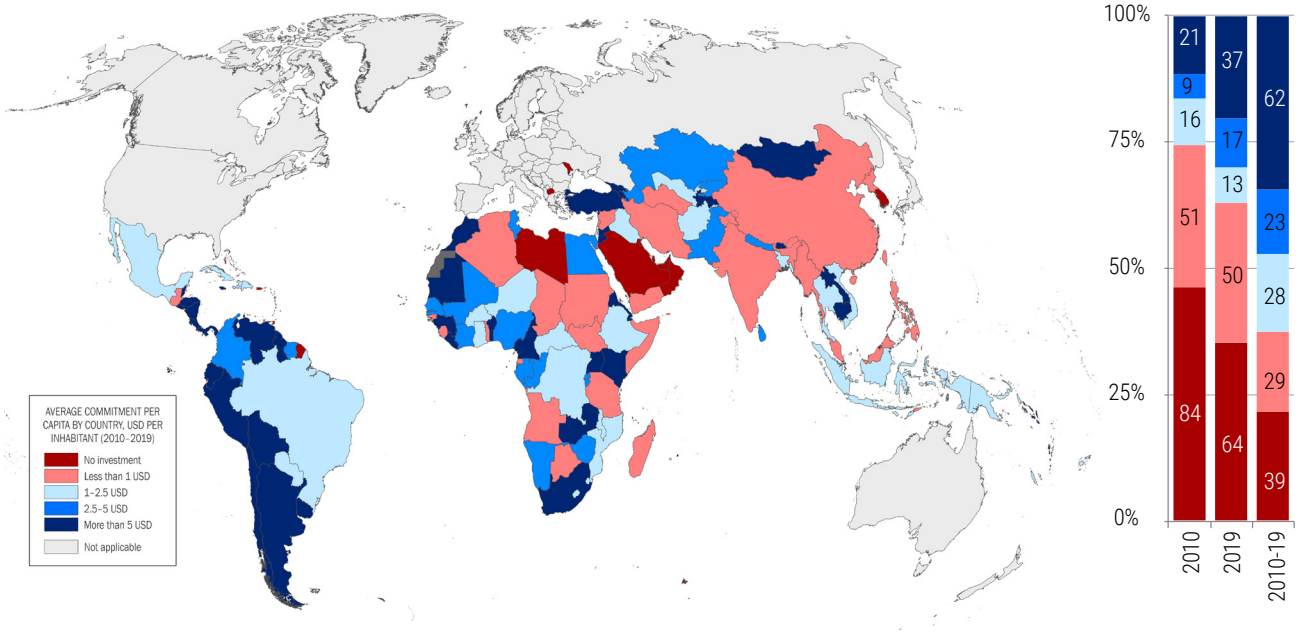
Figure 5.8 outlines the distribution of international public financial flows to developing countries over the 2010–19 decade. To account for population size, the map shows the decade-long average of commitment amounts per capita. This is visualized in a range of colors depending on financing commitments per capita on average. Dividing the flows by population for each country helps to compare the real impact of international public financial flows on developing countries. Since larger countries would likely attract larger investments, many disparities are hidden when only observing flows received by an individual country. While the map shows 186 developing countries, commitments directed to regions or to unspecified countries are excluded.

8 While categorized as LLDCs, the Republic of North Macedonia and the Republic of Moldova are not considered "developing" by the United Nations and are therefore excluded from the scope of the indicator and this analysis.

9 These countries are home to 76 percent of the global population without electricity access.

10 These figures include commitments to both renewables and nonrenewables. In 2019, overall finance to grid-connected renewables made up 36 percent of the total USD 32 billion.

FIGURE 5.8 • Average commitment per capita by developing country [left] and number of countries by range of commitment per capita [right], 2010–19



Source: The data on international public financial flows to developing countries in support of clean energy underlying this map were drawn from IRENA and OECD (2022).
Note: All USD amounts are adjusted to constant prices and 2019 exchange rates.
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 on any map in this work 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.

With 2019 commitments included in the decade averages of 2010–19, not much has changed from the map published in last year's report based on the 2010–18 averages. During the decade, developing countries received an average of USD 2.24 per capita, a slight decrease (of 3.8 percent) from the 2010–18 average of USD 2.33 per capita.

The right side of figure 5.8 shows this distribution by number of countries for the years 2010, 2019, and the entire decade of 2010–19. In 2010, 84 countries did not receive commitments at all, while in 2019 this number decreased to 64 countries—a welcome trend toward zero although still representing over one-third of developing countries. Even so, across the decade, 39 countries did not receive commitments. While the map shows many countries receiving less than USD 1 per capita, these are just 29 countries out of the 181. Most developing countries received more than USD 5 per capita on average during the decade but are not shown due to their small geographical size.

These distributions reveal the fluctuating nature of international public financial flows. One year may bring millions to a specific country, and the next year none at all. Only when reviewing multiple years can we assess the distributions of these flows. Table 5.1 summarizes the decade-long flow distribution across developing countries, LDCs, LLDCs, and SIDS.

TABLE 5.1 • Distribution of international public financial flows by population trend and special country groups

	Flow distribution (USD per capita)			Population trend (% change)	
Country group	2010–19	2018	2019	2010–19 to 2019 (%)	2018–19 (%)
Developing countries	2.24	2.10	1.47	-34.5	-30
Least-developed countries	3.30	2.97	2.65	-19.7	-10.8
Landlocked developing countries	5.24	3.98	3.11	-40.6	-21.9
Small island developing states	3.62	3.12	4.49	+43.9	+24

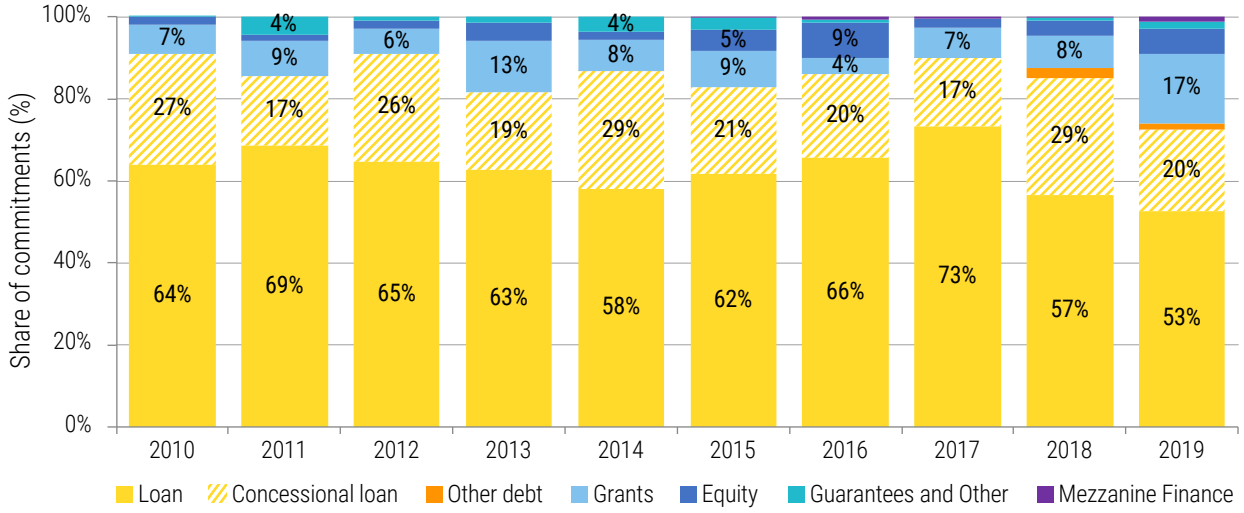
Source: Source: IRENA and OECD 2022..

According to the year-on-year change and at the country level, countries received larger commitments in 2019 than in 2010. However, 2019 marked a clear decline in distribution of flows with developing countries receiving USD 1.47 per capita, 30 percent less than in 2018 and more than one-third less than the decade's average. Fortunately, this decline was not prevalent in countries most in need of public flows. LLDCs were the worst hit, with a 21.9 percent decrease from USD 3.98 per capita in 2018 to USD 3.11 per capita in 2019. LDCs had 10.8 percent less distribution, from USD 2.97 per capita in 2018 to USD 2.65 per capita in 2019. SIDS, on the other hand, had a positive change and the largest distribution of flows across population, reaching USD 4.49 per capita in 2019, more than triple the developing countries' average. The trend is supported by a combination of the largest flows being directed to the largest SIDS (**Cuba, Haiti, the Dominican Republic,** and **Papua New Guinea**) and a large number of SIDS with small populations. Yet, all these groups received a fairer than average distribution of flows across populations.

INVESTMENTS BY FINANCING INSTRUMENTS

This year, we present a more detailed distribution of flows by financial instrument and a refined categorization for commitments, based on the OECD's types of finance, flow types, and the concessional loans and credit line classifications of the International Renewable Energy Agency (IRENA). Figure 5.9 shows the main instruments used for financing international public flows to developing countries.

FIGURE 5.9 • Shares of annual commitments by financial instrument, 2010–19



Source: IRENA and OECD 2022.

The financial instrument mix that supports clean energy has been changing in recent years. The share of debt instruments from public financing sources (standard loans, concessional loans, and other debts) consistently decreased, to about 75 percent in 2019 from 90 percent in 2017. The shift was compensated by the increasing share of grants followed by equity and guarantees.

Standard loans reached USD 5.7 billion in 2019, despite a 29 percent decrease from 2018. While they made up more than half of all commitments, these loans declined to the smallest share in the 2010–19 decade—almost as low as 46 percent of the mix they represented in 2008 during the global financial crisis. Eighty percent of loans in 2019 were directed to hydropower (39 percent), solar energy (22 percent), wind energy (16 percent), and geothermal energy (5 percent), while multiple/other renewables received the balance (18 percent). Capitalize loans are legal debt obligations assumed by the recipient, composed of transfers in cash or in kind (the creditor also acknowledges the nontradability of obligations should any claim arise from nonpayment). Because these flows come from public financial institutions, they have better lending terms than loans provided by private financial institutions (e.g., commercial banks), including longer payment terms, lower interest rates, and low or negligible grant elements. As such, these loans are not necessarily "market-rate" loans.[11] Engaging in these loans should be carefully evaluated during the postpandemic recovery, especially by LDCs, LLDCs, and SIDS, to avoid stressing fiscal policies as this could lead countries into an unsustainable external debt situation. Standard loans financed various solar projects, many of which almost halved in size—from USD 11 million per commitment in 2018 to USD 6 million per commitment in 2019. This decrease is partly attributed to lower capital expenses needed per megawatt of installed capacity, which means loans do not need to be as large as before. Other reasons include a larger volume of smaller projects being funded by international public donors, an uptake in co-financing of projects with the private sector as technologies mature, and the uptake of other instruments and risk mitigation over project financing.

Concessional loans,[12] the second-most-used financial instrument in 2019, accounted for 20 percent of commitments and amounted to USD 2.2 billion, down by almost half from the 2018 figure of USD 4.1 billion and almost as low as concessional loans committed in 2011. In 2019, USD 937 million or 43 percent of total concessional loans were directed toward rural electrification programs, renewable energy/energy efficiency, direct investing in private companies, financing facilities, and risk mitigation programs—all of which are classified as multiple/other renewables. Technology wise, solar energy, at USD 563 million, attracted most of the concessional loans across 17 countries, followed by USD 393 million to hydropower and a highly concentrated USD 242 million for wind energy (as USD 224 million of this went to Morocco alone). Geographically, Morocco, India, and Sudan attracted most of these loans at USD 308 million, USD 227 million, and USD 197 million, respectively. Ideally, the value and share of these loans in the financial instrument mix should increase in the future so developing countries can avoid large external debt and developed countries can meet the official development assistance (ODA) requirements of public donors.

Grants reached a record of USD 1.8 billion in 2019, making up 17 percent of the financial instrument mix and signaling an increase of debt-free instruments that support developing countries without increasing their external debt burdens. Since 2013, at least USD 1 billion in grants were committed annually, averaging USD 1.4 billion every year of the 2013–19 period. This uptake of grants was recently allocated to regional programs. Of the grants worth USD 1.8 billion in 2019, USD 330 million were distributed through regional programs. Three notable recipients were Colombia with USD 153 million, Mozambique with USD 106 million, and Panama with USD 90 million.

---

11 In cases where no concessional information was found for commitments, we categorize them as standard loans, not concessional loans.

12 Concessional loans are those that meet the ODA criteria of at least a 45 percent grant element for LDCs, LLDCs, and SIDS; 15 percent for lower-middle-income countries; and 10 percent for upper-middle-income countries and multilateral development banks within the OECD CRS database; or those loans that are specified as "concessional" by the public donor itself within the IRENA Public Investments database. Recipients could also incur external debt from concessional loans after receiving transfers in cash or in kind, although at a significantly lower interest rate than what developed countries could get from commercial banks or private financial institutions.

Equity is the third set of instruments: it amounted to USD 678 million in 2019, up 22 percent from the USD 556 million received in 2018. Common equity attracted USD 762 million each year during the period 2015–19. Shares in collective investing vehicles (e.g., investment funds) grew significantly from USD 5.5 million in 2015 to USD 191.3 million in 2019. More growth is expected as these instruments are more widely used by public finance institutions.

Guarantees, the fourth group of financial instruments, amounted to USD 184 million in 2019, less than 2 percent of the total flows. Guarantees/insurance and credit lines have the potential to leverage off commercial lending (ratio above 1 for private/public, debt/equity indicators), creating a new pull for untapped capital pools to mobilize additional funds for renewable projects. Guarantees have not seen their share of the financial mechanism mix increase, as the process of obtaining them is slow (since they are multilateral by nature) and they require a better enabling environment (regulations, fiscal policies, etc.).

POLICY INSIGHTS

International public flows need to increase substantially to meet SDG 7 and SDG 13[13] as well as to support the postpandemic recovery in developing countries.

Existing models show a significant gap between current investment levels and those needed to achieve the energy transition in line with climate and sustainable development imperatives. For instance, global investments in renewable power generation need to reach between USD 1 trillion (IEA 2021b) and USD 1.7 trillion (IRENA 2021b) annually by 2030.[14] To put this into perspective, only USD 366 billion was committed to renewable energy projects in 2021 (BNEF 2022).

The increased funding is expected to come from the private sector, continuing a global trend: 85 percent of investments in new renewable energy projects were provided by private investors between 2013 and 2018. Investors are increasingly limiting their exposure to assets not aligned with global climate actions and are channeling their funds to green assets.

Nevertheless, public finance institutions and international donors still have a major role to play, beyond direct investments in renewable assets. This is especially so in developing countries, where real or perceived risks contribute to the high costs of financing, resulting in increased electricity prices for end consumers or projects not seeing the light of day. In this context, aligning policies and the funds of public finance providers is key to creating an enabling environment for private investments, developing the needed infrastructure, and addressing perceived risks and barriers to attract private capital to bring new markets to maturity. In addition, funding will be needed to implement policies that ensure a just and inclusive energy transition (e.g., capacity building, education and retraining, and industrial policies).

While advanced economies are best positioned to mobilize public financing to reinforce the energy transition, stronger international collaboration is necessary to channel such funding to the rest of the world. Emerging economies benefit from international cooperation supporting renewable energy deployment. Commitments to support renewable energy financing in developing countries were made during COP26[15] (box 5.2), and several development finance institutions (DFIs) are funding renewable energy deployment, but more needs to be done.

13 SDG target 13.a is to implement the commitment undertaken by developed countries that are parties to the United Nations Framework Convention on Climate Change to jointly mobilize USD 100 billion annually by 2020 to address the needs of developing countries in the context of meaningful mitigation actions and transparency of implementation and to fully operationalize the Green Climate Fund through its capitalization as soon as possible.

14 For more on investments needed to reach SDG 7, see chapter 6.

15 The 26th session of the Conference of the Parties.

BOX 5.2 • Announcements on public climate finance at COP26

The 26th session of the Conference of the Parties (COP26) was underpinned by several landmark commitments to meet the climate objectives of the Paris Agreement and to realize SDG 7.

With multiple countries pledging additional climate financing to developing countries, it is estimated that the USD 100 billion per year target could be met by 2023. Driven by the imperative to achieve a better balance between mitigation and adaptation financing, countries also committed to double global adaptation finance by 2025. This will be operationalized through a two-year work program (UNFCCC n.d.).

Yet, current commitments stand in stark contrast to the USD 3.5 trillion required annually to limit warming to 1.5°C (S&P Global 2021). The annual adaptation costs of developing countries are expected to be in the range of USD 140 billion to USD 300 billion by 2030 (Independent Expert Group on Climate Finance 2020). This exceeds the overall climate financing target, which comprises both mitigation and adaptation support. This target may not only be met in 2023 but even exceeded according to the Climate Finance Delivery Plan led by Germany and Canada and launched ahead of COP26. Although this is a welcome sign, an unprecedented scaling up of climate finance is needed, with greater transparency, accountability, and equity in fund disbursements.

Additionally, 39 signatories (including countries and multilateral development banks) committed to prioritize support for the clean energy transition and to largely cease public finance for unabated fossil fuel energy (defined as fossil fuel energy without pollution control measures such as carbon capture and storage) by the end of 2022 (COP26 Presidency 2021). This follows earlier pledges made by key funders of overseas development (e.g., China, France, Germany, Japan, the Republic of Korea, and the United Kingdom) to halt the financing of coal power plants. Just China's pullout from financing coal power abroad could free up USD 130 billion worth of investments for clean energy, impacting 44 countries across Asia and Africa (Global Energy Monitor 2021).

Several initiatives to enhance strategic public financing were announced during COP26, including the Energy Transition Accelerator Financing Platform, a new USD 1 billion global climate finance facility to accelerate the transition to renewable energy in developing countries, managed by the International Renewable Energy Agency.

COP26 also saw the launch of the International Just Transition Partnership—a USD 8.5 billion deal to support the decarbonization of South Africa's energy sector. This sector uses coal for more than 70 percent of its energy needs and is the 16th-highest emitter of greenhouse gases globally. Supported by France, Germany, the United Kingdom, and the United States, this model of international cooperation could act as a template, for developed and developing countries alike, on progressing toward the global climate goal.

Source: IRENA 2021a.

These findings are also echoed by the 2021 UN High-Level Dialogue on Energy, which stresses the role of international cooperation to catalyze public and private finance and investment to accelerate the energy transition. This is particularly important for developing countries and SIDS as COVID-19 exacerbated their financial constraints, limiting their ability to recover from the pandemic and realize the 2030 Agenda (box 5.3).

BOX 5.3 • Financing the energy transition and the UN High-Level Dialogue on Energy

In September 2021, the UN High-level Dialogue on Energy, the first leader-level meeting on energy held under the auspices of the UN General Assembly in 40 years, took place. One of its key outcomes was a global roadmap for accelerated SDG 7 action, issued by UN Secretary-General António Guterres. The report's milestones for financing include:

- An increase in annual investment of USD 35 billion for access to electricity and of USD 25 billion for clean cooking by 2025.
- Tripling of annual investment for renewable energy and energy efficiency globally by 2030.

The roadmap emphasizes that shifting subsidies from fossil fuels to renewables and carbon pricing are crucial for accelerating the energy transition (UN 2021a).

At the margins of the dialogue, governments and private sector actors announced a range of commitments to realize SDG 7 in the form of energy compacts. As of October 2021, this included commitments to invest USD 439 billion on top of the USD 1,490 billion from catalytic partnerships across 46 compacts (UN 2021d).

THE IMPACT OF THE COVID-19 PANDEMIC

The effects of the pandemic rippled through economies and societies in 2020–21, with the world gross domestic product contracting by 4.3 percent and a first rise in extreme poverty rate since 1998 (UN 2021c). In response to the economic and social impacts of COVID-19, governments across the world committed around USD 20.6 trillion of fiscal stimuli to COVID-19 by the end of 2021, out of which an estimated USD 3.8 trillion was dedicated to pandemic recovery efforts, 28 percent (USD 1.1 trillion) to green recovery (O'Callaghan et al. 2022). The IEA (2021a) estimates that the recovery involves USD 470 billion for clean energy measures across more than 50 major economies.

Analyses have highlighted the potential of using stimulus response measures to shape more inclusive, sustainable, and resilient economies and societies. For instance, IRENA finds that focusing on an accelerated energy transition, underpinned by a comprehensive framework, could help boost sustainable growth and create much-needed jobs, while closing the energy access gap (IRENA 2020b). More broadly, green recovery spending was associated with a two to seven times larger income multiplier than that of non-eco-friendly spending (Batini et al. 2021). Yet, while developed economies were able to mobilize and borrow money to finance ambitious recovery programs, the same fiscal flexibility was lacking in developing countries (Georgieva 2021).

Even before the pandemic, many developing countries, especially LDCs, faced challenges to mobilize financing for critically needed energy projects ranging from electrifying health clinics to powering industry and development. Their fiscal space for recovery and sustainable development efforts was further hampered by a premature phaseout of current fiscal support measures, difficulties in accessing finance, limited public and private investments, and continuing debt service obligations (UN 2021b). In 2020 alone, low- and middle-income countries paid an estimated USD 130 billion to service their debt (Stiglitz and Rashid 2020), underscoring challenges of unsustainable debt burdens (World Bank 2021a).

This is reflected in the stimulus packages to date in developing countries, which are smaller and often less focused on sustainability than those of advanced economies (Lüpke et al. 2020). There is concern that the recovery pathways of advanced and developing economies could diverge (IMF 2021b). Without further action, developing countries might be excluded from the opportunity to participate in and benefit from the move toward green economies.

As such, strong international cooperation, increased public financing, and strategic use of public funds are needed to ensure transformative investments that simultaneously address the recovery, SDG 7, and long-term socioeconomic and climate goals.

STRATEGIC USE OF PUBLIC FINANCE AND ENHANCED INTERNATIONAL COOPERATION

Public investments should be scaled up significantly and used strategically and efficiently to support a broad spectrum of areas, from emerging technologies and solutions and infrastructure projects to holistic measures that enhance the policy, regulatory, and financial environment. It is critical to create an enabling environment to scale up energy investments, as investor concerns about the perceived or real risks of investing in emerging and developing markets pose a significant barrier for many energy projects.

Risk-mitigation instruments such as guarantees, letters of comfort or intent, hedges against currency risks, letters of credit, and insurance products provide solutions but may not be easily accessible or affordable to market participants. Greater efforts are needed by DFIs and other providers of public capital to enhance the availability of such instruments (IRENA 2020c). Sharing of risks, returns, and financial expertise, along with greater pooling of capital, can also be encouraged through blended finance initiatives (OECD 2020). The participation of DFIs in blended finance structures has been found to lower perceived risks of third-party investors as well as the overall cost of capital (CFLI, 2019). Box 5.4 discusses the main interventions enabling private investments in renewables in Africa. While developing countries can adopt various measures to improve their domestic investment conditions, actions should be guided by each country's priorities. Ultimately, climate-safe energy transition efforts and a sustainable recovery require a concerted global effort. Key considerations for moving forward include the following:

- Fresh financing combined with debt relief measures are needed for developing countries to have enough fiscal space to recover from the pandemic (UN 2021b).
- Donors should seek at a minimum to meet their ODA and climate finance commitments as well as provide fresh financing for developing countries to enable inclusive growth and sustainable development, especially among LDCs and SIDS. Climate finance is particularly important in light of the close interlinkages between realizing SDG 7, tackling the climate emergency, and ensuring a sustainable recovery.
- Given the critical role of multilateral, regional, and national development banks and international financial institutions, accelerating the timetable for replenishing funds is essential for LDCs and emerging economies. Without adequate resources, donors are not able to fulfill their role of addressing investment gaps and market failures, mitigating risks, as well as providing long-term and countercyclical financing. Improving the efficiency and effectiveness of DFIs' fund disbursement will be critical to financing a sustainable recovery (UN 2021b). Tracking real disbursement to ensure that the funds reach developing countries in a timely manner as well as strengthening accountability should be prioritized.
- Policy making could enable a larger ecosystem for accessing and harnessing untouched pools of capital. Developing innovative instruments and digital platforms to attract capital and reorganize risks could unleash additional financial flows to help close funding gaps where public finance is constrained. National development institutions, international financial institutions, and Fintech and Insurtech companies in least-developed and middle-income countries could further develop and explore opportunities created by these new instruments. Market authorities could encourage financial sandboxes to adapt regulations to further test and scale up these instruments.

BOX 5.4 • Investment landscape and measures to de-risk private investment in Africa

Public financing dominated the investment landscape over the past two decades in Africa, while private investments in renewable energy have only recently begun to increase, particularly in the power sector. However, the distribution of capital flows remains heavily skewed toward a handful of economies.

Countries offering better risk-return prospects owing to their relatively developed policy and institutional environments, regulations, access to finance, and market characteristics (e.g., size, prospects, and stability) are better able to crowd in private capital. Those with a low prevalence of these enabling factors face significant political, financial, legal, operational, and credit risks that deter private investment.

Policy support in the form of structured procurement programs (feed-in-tariffs, auctions, etc.) mitigated uncertainty and transactional and industry-level risks, attracting a surge of private capital in the past 10 years (IRENA 2022). However, projects still rely on cofinancing and guarantees from development finance institutions (DFIs) (IMF 2021a), given their real and perceived risks. About 30 percent of the USD 61 billion committed for African independent power producers over 2010–20 was arranged by DFIs, who leveraged capital from private equity partners and commercial debt providers and also provided technical assistance (e.g., prefeasibility studies) and derisking instruments.

DFIs have a vital role to play in renewable energy investments in Africa, as they improve the bankability of projects by offering liquidity support, partial risk guarantees in lieu of sovereign guarantees, and security packages, among other solutions. For investors—and in particular lenders—to be comfortable with the risks involved, additional credit enhancement and risk mitigation cover is required.

International efforts are ongoing to enhance risk mitigation. The World Bank Group is the most prominent provider of credit enhancement and risk mitigation in Africa, in particular through the Sustainable Renewables Risk Mitigation Initiative (SRMI), launched at the 24th session of the COP in partnership with the Agence Française de Développement, the International Solar Alliance, the International Renewable Energy Agency, and Sustainable Energy for All (SEforAll). The initiative supports governments in developing and implementing sustainable and bankable renewable energy programs, by addressing the developmental and operational risks of privately financed renewable energy power plants. To date, SRMI enabled 2 gigawatts of solar PV, supported by USD 1 billion of approved World Bank investment, and successfully fundraised USD 650 million of climate financing that aims to cover various risks. It provides: (1) technical assistance to support competitive selection of private investors to reduce the risk of procurement; (2) public financing to improve grid reliability and reduce the risk of curtailment; and (3) risk mitigation instruments to cover the demand uptake risk for large-scale mini-grid projects or utility liquidity risks. To benefit fragile and coal-heavy countries, a new facility combining instruments to mitigate critical residual risks perceived by the private sector is being developed.

Facilities such as the Regional Liquidity Support Facility, GuarantCo, and European Fund for Sustainable Development-plus (EFSD and EFSD+) are providing additional liquidity cover. In addition, the use of blended financing approaches encompassed in initiatives such as the COVID-19 Off-Grid Recovery Platform, SPARK+ Africa Clean Cooking Ecosystem Fund, the Energy Access Relief Fund, and Climate Investor One (CI1) through the Climate Finance Lab helped leverage private capital.

Finally, emerging business and financing models such as green bonds, contract standardization, and project bundling are helping attract different investor classes. Other models such as results-based financing, pay-as-you-go, and crowdfunding are being increasingly employed in the off-grid sector, often successfully bringing in additional private investments.

Source: IRENA 2022.

METHODOLOGY

DATA SOURCES

The SDG indicator 7.a.1 uses two databases to account for international public financial flows. First is the CRS of the OECD's Development Assistance Committee (DAC), and second is IRENA's Renewable Energy Public Finance Database.

In the CRS, ODA and other official flows to developing countries together constitute the public financial support that donors provide to developing countries for renewable energy. These flows are defined as the sum of official loans, grants, and equity investments that "DAC countries" (ODA recipients listed by the DAC) receive from foreign governments and multilateral agencies for clean energy research to develop and produce renewable energy (including in hybrid systems). The OECD consolidates and categorizes these figures as self-reported by donors. For the purposes of our analysis, these figures were extracted from the OECD/DAC CRS as bulk downloads starting in the year 2000 and then filtered to reflect public investments in clean energy by excluding commitments with blanks or zeroes. Then, the purpose codes were filtered to include clean energy investments:

- 23210: Energy generation, renewable sources—multiple technologies. These are renewable energy generation programs that cannot be attributed to one single technology (codes 23220 through 23280 below). (Fuel wood/charcoal production should be included under forestry 31261.)
- 23220: Hydroelectric power plants—including energy-generating river barges.
- 23230: Solar energy for centralized grids.
- 23231: Solar energy for isolated grids and stand-alone systems.
- 23232: Solar energy—thermal applications.
- 23240: Wind energy—for water lifting and electric power generation.
- 23250: Marine energy—including ocean thermal energy conversion, tidal and wave power.
- 23260: Geothermal energy—use of geothermal energy for generating electric power or directly as heat for agriculture, and so on.
- 23270: Biofuel-fired power plants—use of solids and liquids produced from biomass for direct power generation. Also includes biogases from anaerobic fermentation (e.g., landfill gas, sewage sludge gas, fermentation of energy crops, and manure) and thermal processes (also known as syngas); waste-fired power plants making use of biodegradable municipal waste (household waste and waste from companies and public services that resembles household waste, collected at installations specifically designed for its disposal with recovery of combustible liquids, gases, or heat). (See code 23360 for nonrenewable waste-fired power plants.)
- 23410: Hybrid energy electric power plants.
- 23631: Electric power transmission and distribution (isolated mini-grids).

Finally, private donor flows (mostly from philanthropic organizations) were removed from the data sample (https://stats.oecd.org/Index.aspx?DataSetCode=crs1).

The flows covered by IRENA are defined as all additional loans, grants, and equity investments received by developing countries from all foreign governments, multilateral agencies, and additional DFIs (including export credits, where available) for the purpose of clean energy research and development and renewable energy production, including in hybrid systems. These additional flows cover the same technologies and other activities (research and development, technical assistance, renewable electricity distribution infrastructure, etc.) as listed above and, to avoid duplication of data, exclude all flows extracted from the CRS.

METHODS AND CLASSIFICATIONS

Deflating nominal USD prices to constant prices and exchange rates

Commitments are measured in millions of US dollars at constant prices for a base year. The base year for the constant prices and exchange rates is updated every year and usually reflects a two-year lag in the publication cycle (e.g., the 2020 cycle will report 2018 constant prices).

International finance flows expressed in nominal terms are deflated to remove the effects of inflation and exchange rate changes so that all flows, from all donors and years, are expressed as the purchasing power of a US dollar in a recent year (2019 in this report). This is done using a combination of the OECD DAC deflators for the DAC donors and deflators calculated by IRENA for other international donors not included in the CRS database. The formula below converts the nominal investment amounts in current USD to USD at constant prices and exchange rates:

$$USD_{constant,n,m} = \frac{USD_{Current,n}}{DAC\ Deflator_{n,m}}$$

where *n* is the current year (nominal) and *m* the constant year (real).

The OECD publishes DAC deflators for each donor. (More information can be found at https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/informationnoteonthedacdeflators.htm.)

Regional aggregations and classifications

These data are for commitments directed to developing countries, defined as countries in developing regions, as listed in the UN M49 classification of regions.[16] Where commitments could not be categorized under specific countries or territories, the following classifications are used:

- Residual/unallocated ODA: Central Asia and Southern Asia
- Residual/unallocated ODA: Eastern and South-eastern Asia
- Residual/unallocated ODA: Latin America and the Caribbean
- Residual/unallocated ODA: Oceania excluding Australia and New Zealand
- Residual/unallocated ODA: Sub-Saharan Africa
- Residual/unallocated ODA: Western Asia and Northern Africa
- Unspecified, developing countries

These classifications are expanded in chapter 7.

16 While the UN system does not have an agreed-upon definition of developing and developed countries, it introduced a distinction in the standard country or area codes for statistical use (known as M49) in 1996. The concept was removed in December 2021 to reflect that the distinction had increasingly become outdated and did not reflect the reality in many countries. Yet, in line with guidance from UN statistics, the concept may continue to be applied as a historic concept including for specific SDG 7 indicators (https://unstats.un.org/unsd/methodology/m49/).

Measuring financial flows through commitments

Financial flows in this context are recorded as donors' commitments. A commitment is defined as a firm obligation, expressed in writing and backed by the necessary funds. Bilateral commitments are recorded in the full amount of expected transfers for the year in which commitments are announced, irrespective of the time required for the completion of disbursements, which may occur over several weeks, months, or years. Tracking financial commitments can yield very different results compared with approaches that consider financial disbursements. Although disbursement information would provide a more accurate picture of the actual financial flows to renewable energy each year, consistent data on disbursements are often limited or not available. The focus on commitments allows for a more comprehensive and granular analysis of financial flows and ensures methodological consistency across different data sources. Measuring commitments, however, may produce large annual fluctuations in financial flows when large projects are approved. In addition, financial commitments may not always translate into disbursements, as contracts may be voided, canceled, or altered. Any changes must be reflected in annual values.

Financial instruments

The financial instruments used by public financial institutions were categorized based on the OECD list of financial types and the IRENA classifications for concessional loans and credit lines. The full taxonomy of financial instruments is shown in table 5.2. Note that not all these instruments have commitments allocated to them yet. This taxonomy excludes debt-relief mechanisms.

TABLE 5.2 • Taxonomy of financial instruments

Financial group/type	Financial instrument	Description
Debt	Standard loan	Legal debt obligations assumed by the recipient, composed of transfers in cash or in kind (the creditor also acknowledges the nontradability of obligations should any claim arise from nonpayment). Since payment obligations on standard loans are senior obligations—that is, creditors are entitled to receive payments against their claims before anyone else—they are also referred to as senior loans. These loans have better lending terms than those of private financial institutions, including longer payment terms, lower interest rates, and low or negligible grant elements. As such, these loans are not necessarily "market-rate" loans. In cases where no concessional information is found for commitments, we categorize them as loans, not concessional loans.
	Concessional loan	Loans that meet the official development assistance criteria of at least a 45 percent grant element for least-developed countries, landlocked developing countries, and small island developing states; 15 percent for lower-middle-income countries; and 10 percent for upper-middle-income countries and multilateral development banks within the Creditor Reporting System database. Or when loans that are specified as "concessional" by the public donor itself within the International Renewable Energy Agency Public Investments database. Recipients could incur external debt after receiving transfers in cash or in kind through concessional loans, although at a significantly lower interest rate than what developed countries could get from commercial banks or private finance institutions.
Debt	Bonds	Fixed-interest debt instruments, issued by governments, public utilities, banks, or companies that are tradable in financial markets.
	Asset-backed securities	Securities whose value and income payments are derived from and backed by a specific pool of underlying assets.
	Reimbursable grant	A contribution provided to a recipient institution for investment purposes, with the expectation of long-term reflows on conditions specified in the financing agreement. The provider assumes the risk of total or partial failure of the investment; it can also decide if and when to reclaim its investment.
	Other debt securities	

Grant	Standard grants	Grants are transfers in cash or in kind for which no legal debt is incurred by the recipient.
	Interest subsidy	A payment to soften the terms of private export credits, or loans or credits by the banking sector.
	Capital subscription on deposit basis	Payments to multilateral agencies in the form of notes and similar instruments, unconditionally encashable at sight by the recipient institutions.
	Capital subscription on encashment basis	Payments to multilateral agencies in the form of notes and similar instruments, unconditionally encashable at sight by the recipient institutions.
Mezzanine finance	Subordinated loan	A loan that, in the event of default, will be repaid only after all senior obligations are satisfied. In compensation for the increased risk, mezzanine debt holders require a higher return on their investment than secured or more senior lenders.
	Preferred equity	Equity that, in the event of default, will be repaid after all senior obligations and subordinated loans are satisfied and will be paid before common equity holders. It is a more expensive source of finance than senior debt, and a less expensive source than equity.
	Other hybrid instruments	Including convertible debt or equity.
Equity	Common equity	A share in the ownership of a corporation that gives the owner claims on the residual value of the corporation after creditors' claims are met.
	Shares in collective investment vehicles	Collective undertakings through which investors pool funds for investment in financial or nonfinancial assets or both. These vehicles issue shares (if a corporate structure is used) or units (if a trust structure is used).
	Reinvested earnings	This item is applicable only to foreign direct investment. Reinvested earnings on foreign direct investment consist of the retained earnings of a direct foreign investment enterprise which are treated as if they were distributed and remitted to foreign direct investors in proportion to their ownership of the equity of the enterprise and then reinvested by them in the enterprise.
Guarantees	Guarantees/ insurance	A promise of indemnification up to a specified amount in the case of default or nonperformance of an asset, for example, a failure to meet loan repayments or to redeem bonds, or expropriation of an equity stake. Guarantees typically cover political and/or commercial (e.g., credit, regulatory/contractual) risks that investors are unwilling or unable to bear.
	Credit line	An arrangement between a bank and a borrower establishing a maximum loan balance that the bank will permit the client to maintain. Guarantees that funds will be made available, but no financial assets exist until funds are advanced.

Changes to the data

This year's public investments database had several revisions: most significantly, a historic revision of investments for 17 donor agencies, cancelled commitments, and reclassified commitments to different years (table 5.3. Furthermore, the US dollar amounts were updated to reflect 2019 prices and exchange rates. The largest differences correspond to a USD 1.3 billion loan recategorized from 2015 to 2017 and the cancellation of a USD 1.5 billion loan from 2015.

TABLE 5.3 • Magnitude of 2022 revisions to public investment figures for 2000–18

Year	Figure prior to revision (2018 USD millions)	Figure after revision (2019 USD millions)	Difference (2019 USD millions)
2000	1,414	1,424	10
2001	1,674	1,668	-6
2002	1,288	1,321	33
2003	3,178	3,097	-81
2004	2,194	2,116	-78
2005	1,925	1,961	36
2006	3,278	3,238	-40
2007	3,638	4,272	635
2008	2,573	2,778	205
2009	8,137	8,145	8
2010	10,552	11,171	618
2011	11,574	11,689	115
2012	10,813	10,294	-520
2013	13,808	13,580	-228
2014	16,978	15,691	-1,286
2015	15,111	12,660	-2,451
2016	20,093	20,410	318
2017	21,881	24,657	2,776
2018	13,972	14,244	272

REFERENCES

AEEP (African-EU Energy Partnership). 2021. European Financial Flows on SDG7 to Africa: 2021 Report. Bonn: AEEP. https://sdg7.africa-eu-energy-partnership.org/wp-content/uploads/2021/08/AEEP-European-Financial-Flows-on-SDG7-to-Africa-2021-Report.pdf.

Batini, N., M. di Serio, M. Fragetta, G. Melina, and A. Waldron. 2021. "Building Back Better: How Big Are Green Spending Multipliers?" Working Paper 2021/087, International Monetary Fund, Washington, DC.

BNEF (Bloomberg New Energy Finance). 2022. Energy Transition Investment Trends 2022. London: BNEF. https://about.bnef.com/energy-transition-investment/.

CFLI (Climate Finance Leadership Initiative). 2019. Financing the Low-Carbon Future: A Private-Sector View on Mobilizing Climate Finance. New York: CFLI.

COP26 Presidency. 2021. "Statement on International Public Support for the Clean Energy Transition." https://ukcop26.org/statement-on-international-public-support-for-the-clean-energy-transition/.

Georgieva, K. 2021. "Giving People a Fair Shot—Policies to Secure the Recovery." Interview, March 30, 2021. https://www.imf.org/en/News/Articles/2021/03/25/sp033021-SMs2021-Curtain-Raiser.

Global Energy Monitor. 2021. "China's End to Overseas Coal Finance Could Free-Up $130 Billion for Clean Energy Investments." Global Energy Monitor, September 28, 2021. https://globalenergymonitor.org/press-release/1953/.

IEA (International Energy Agency). 2021a. Sustainable Recovery Tracker. Paris: IEA. https://www.iea.org/reports/sustainable-recovery-tracker.

IEA. 2021b. Net Zero by 2050. Paris: IEA. https://www.iea.org/reports/net-zero-by-2050.

IMF (International Monetary Fund). 2021a. Private Finance for Development: Wishful Thinking or Thinking Out of the Box? Washington, DC: IMF. https://www.elibrary.imf.org/view/journals/087/2021/011/article-A001-en.xml.

IMF. 2021b. World Economic Outlook: Managing Divergent Recoveries. Washington, DC: IMF. https://socialprotection.org/discover/publications/world-economic-outlook-managing-divergent-recoveries.

Independent Expert Group on Climate Finance. 2020. Delivering on the $100 Billion Climate Finance Commitment and Transforming Climate Finance. New York City: United Nations. https://www.un.org/sites/un2.un.org/files/100_billion_climate_finance_report.pdf.

IRENA (International Renewable Energy Agency). 2020a. "Renewable Energy Finance: Green Bonds." Renewable Energy Finance Brief 03, IRENA, Abu Dhabi. https://www.irena.org/publications/2020/Jan/RE-finance-Green-bonds.

IRENA. 2020b. The Post-COVID Recovery: An Agenda for Resilience, Development and Equality. Abu Dhabi: IRENA. https://www.irena.org/publications/2020/Jun/Post-COVID-Recovery.

IRENA. 2020c. Mobilising Institutional Capital for Renewable Energy. Abu Dhabi: IRENA. https://www.irena.org/publications/2020/Nov/Mobilising-institutional-capital-for-renewable-energy.

IRENA. 2021a. NDCs and Renewable Energy Targets in 2021. Abu Dhabi: IRENA. https://www.irena.org/publications/2022/Jan/NDCs-and-Renewable-Energy-Targets-in-2021.

IRENA. 2021b. World Energy Transitions Outlook 2022. Abu Dhabi: IRENA. https://www.irena.org/publications/2022/Mar/World-Energy-Transitions-Outlook-2022.

IRENA. 2022. Renewable Energy Market Analysis: Africa and Its Regions. Abu Dhabi: IRENA. https://www.irena.org/publications/2022/Jan/Renewable-Energy-Market-Analysis-Africa.

IRENA and OECD (Organisation for Economic Co-operation and Development). 2022. "Renewable Energy Public Investments Database" (based on OECD and IRENA data). https://www.irena.org/Statistics/View-Data-by-Topic/Finance-and-Investment/Renewable-Energy-Finance-Flows.

Lüpke, H. v., G. V. Breviglieri, C. Yamahaki, ... and S. Primadev. 2020. The Socio-Economic Impacts of COVID-19 and How to Deploy ICF in the Context of Green Stimulus Packages. Berlin: DIW Berlin. https://climatestrategies.org/wp-content/uploads/2021/05/snapfi_report_synthesis_deploying_icf_5.pdf.

O'Callaghan, B., N. Yau, E. Murdock, ... and L. Heeney. 2022. "Global Recovery Observatory." Oxford University Economic Recovery Project, Oxford. https://recovery.smithschool.ox.ac.uk/tracking/.

OECD (Organisation for Economic Co-operation and Development). 2020. Blended Finance in the Least Developed Countries 2020: Supporting a Resilient COVID-19 Recovery. Paris: OECD. https://www.oecd.org/dac/blended-finance-in-the-least-developed-countries-57620d04-en.htm.

OECD. 2021. "OECD Inventory of Support Measures for Fossil-Fuels." Accessed on February 25, 2022. https://stats.oecd.org/Index.aspx?DataSetCode=FFS_INDICATOR_DETAILED&_ga=2.14663223.1848988715.1645771186-1352592563.1637678670.

S&P Global. 2021. "On One End, Trillions of Dollars to Invest in Climate. On the Other, Huge and Urgent Need. How Do We Connect the Dots?" S&P Global, November 12, 2021. https://www.spglobal.com/esg/insights/on-one-end-trillions-of-dollars-to-invest-in-climate-on-the-other-huge-and-urgent-need-how-do-we-connect-the-dots.

SEforAll (Sustainable Energy for All). 2021. Energizing Finance: Understanding the Landscape 2021. Vienna: SEforAll. https://www.seforall.org/system/files/2021-10/EF-2021-UL-SEforALL.pdf.

Semmler, W., J. P. Braga, A. Lichtenberger, M. Toure, and E. Hayde. 2021. Fiscal Policies for a Low-Carbon Economy. Washington, DC: World Bank. https://openknowledge.worldbank.org/handle/10986/35795.

Stiglitz, J., and H. Rashid. 2020. "A Global Debt Crisis Is Looming—How Can We Prevent It?" The Guardian, August 3, 2020. https://www.theguardian.com/business/2020/aug/03/global-debt-crisis-relief-coronavirus-pandemic.

UN (United Nations). 2021a. "Global Roadmap for Accelerated SDG7 Action in Support of the 2030 Agenda for Sustainable Development and the Paris Agreement on Climate Change." High Level Dialogue on Energy, United Nations, New York. https://www.un.org/sites/un2.un.org/files/hlde_outcome_-_sdg7_global_roadmap.pdf.

UN. 2021b. "Liquidity and Debt Solutions to Invest in the SDGs: The Time to Act Is Now." United Nations, New York. https://unsdg.un.org/sites/default/files/2021-03/sg-policy-brief-on-liquidity-and-debt-solutions.pdf.

UN. 2021c. World Economic Situation and Prospects. New York: United Nations. https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/WESP2022_web.pdf.

UN. 2021d. "Energy Compact Overview." High Level Dialogue on Energy, United Nations, New York. https://www.un.org/sites/un2.un.org/files/energy_compact_overview.pdf.

UNFCCC (United Nations Framework Convention on Climate Change). N.d. "COP26 Outcomes: Finance for Climate Adaptation." Accessed in January 2022. https://unfccc.int/process-and-meetings/the-paris-agreement/the-glasgow-climate-pact/cop26-outcomes-finance-for-climate-adaptation#eq-2.

World Bank. 2021a. "COVID 19: Debt Service Suspension Initiative." Brief, World Bank, Washington, DC, March 10. https://www.worldbank.org/en/topic/debt/brief/covid-19-debt-service-suspension-initiative.

World Bank. 2021b. "Current Account Balance (% of GDP)." Accessed February 25, 2022. https://data.worldbank.org/indicator/BN.CAB.XOKA.GD.ZS.