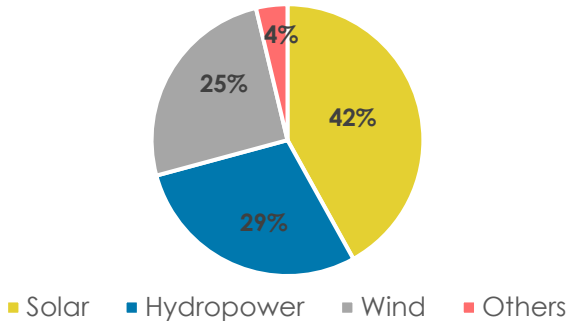
Renewable Capacity Highlights

26 March 2025

2024 Headline Figures

Renewable power capacity **4 448** GW	Renewables share of total capacity **46.4%** YoY growth of renewable power capacity **15.1%**	Variable renewable share of total capacity **31.3%** YoY growth of variable renewable power capacity **23.2%**	2030 Target **11.17** TW Base year (2022) **3.38** TW End of 2024, cumulative **4.45** TW Needed to reach target **6.72** TW
Solar **1865** GW	Hydro **1283** GW	Wind **1133** GW	
Bioenergy **151** GW	Geothermal **15** GW	Marine **1** GW	

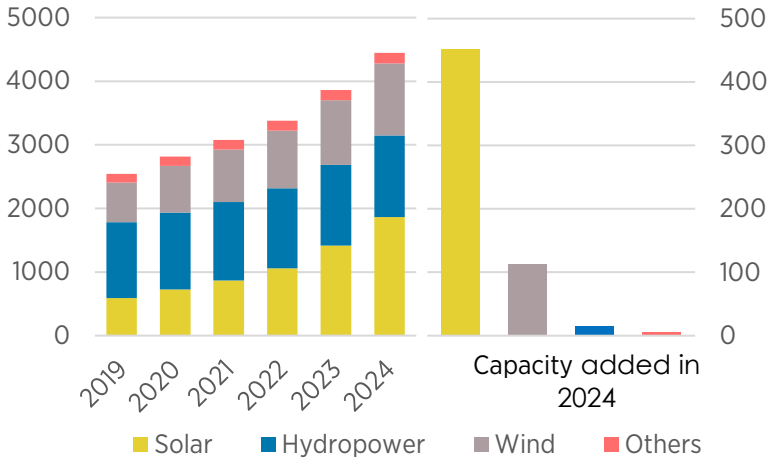
Renewable power capacity by energy source



At the end of 2024, global renewable power capacity amounted to 4 448 GW. Solar, in line with the previous year, accounted for the largest share of the global total, with a capacity of 1865 GW.

Renewable hydropower[1] and wind energy accounted for most of the remainder, with total capacities of 1283 GW and 1133 GW, respectively. Other renewable capacities included 151 GW of bioenergy and 15 GW of geothermal, plus 0.5 GW of marine energy.

Renewable power capacity growth (GW)

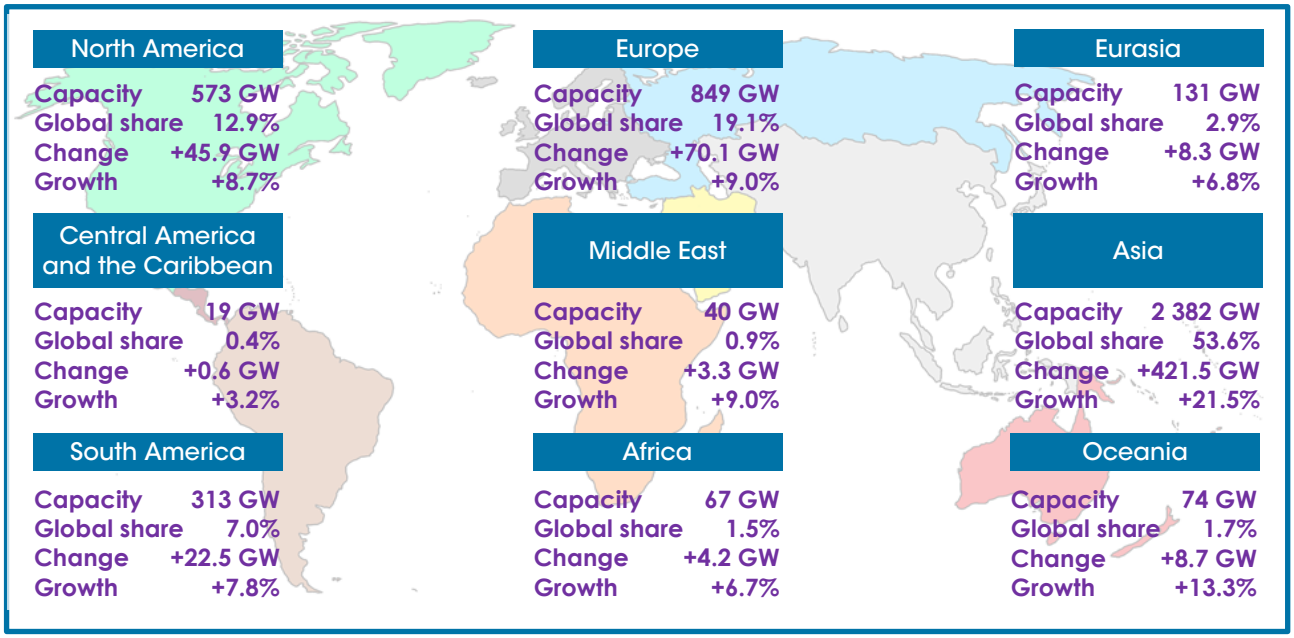


Renewable power capacity increased by 585 GW (+15.1%) in 2024. Over three-quarters of the capacity expansion was due to solar energy which witnessed an increase of 452 GW (+32.2%); this was followed by wind energy with additions of 113 GW (+11.1%). Renewable hydropower capacity increased by 15.0 GW (+1.2%), bioenergy by 4.6 GW (+3.2%), and geothermal energy by 0.4 GW (+2.5%).

Solar and wind energy continued to dominate renewable capacity expansion, jointly accounting for 96.6% of all net renewable additions in 2024. And 2024 marks the highest annual increase in renewable generation capacity and the highest growth on record in percentage terms, mainly solar

[1]Note: these figures exclude pure pumped storage hydropower. At end-2024, this was an additional 142 GW, giving a total hydropower capacity of 1 425 GW.

Renewable power capacity by region



For the complete dataset see: IRENA (2025) Renewable capacity statistics 2025, available at: www.irena.org/Data/Statistical-publications/Yearbooks

Even though 2024 marks the largest increase in renewable energy capacity and growth, significant disparities exist amongst countries and regions. Asia accounted for the majority of new capacity in 2024 (72.0%), increasing its renewable capacity by 421.5 GW to reach 2 382 GW (53.6% of the global total). The majority of this increase occurred in China (+373.6 GW). In 2024, Europe's capacity expanded by 70.1 GW (+9.0%) with Germany contributing significantly to this growth, adding more than 18.8 GW. Ukraine experienced a notable decline, with its capacity decreasing by more than 7.5 GW in 2024.

Meanwhile, North America expanded by 45.9 GW (+8.7%) driven by installations in the United States. Africa continued to grow steadily with an increase of 4.2 GW (+6.7%) driven primarily by Egypt, Ethiopia and South Africa. Oceania's installed capacity increased by 8.7 GW (+13.3%), largely due to additions in Australia; and South America continued on an upward trend, with a capacity expansion of 22.4 GW (+7.8%). The Middle East recorded a 3.3 GW increase in newly commissioned capacity in 2024 (+9.0%) with Saudi Arabia accounting for more than half of the total expansion.

Renewable power capacity for SIDS, G7 and G20 Countries

SIDS	G7	G20
Capacity 9 GW	Capacity 1 055 GW	Capacity 3 601 GW
Global share 0.2%	Global share 23.7%	Global share 80.9%
Change +0.7 GW	Change +83.5 GW	Change +528.5 GW
Growth +9.3%	Growth +8.6%	Growth +17.2%

By end of 2024, G7 countries (excluding the European Union) comprised 23.7% of the global capacity share, with a total of 1 055 GW. The G20 countries (excluding the European Union and African Union) accounted for 80.9% of the global share, with a modest total capacity of 3 601 GW. The G7 and G20 countries, respectively, accounted for 14.3% and 90.3% of new capacity in 2024.

Small Island Developing States (SIDS) [2] accounted for a modest 0.2% of the global cumulative capacity share with a total capacity of 8.8 GW. In 2024, SIDS added 0.7 GW of new capacity, marking a decline from the 1.1 GW increase in 2023 and representing just 0.1% of global capacity additions. Over three quarters of this growth came from two countries: the Dominican Republic (+0.4 GW) and Singapore (+0.2 GW).

[2] SIDS grouping is based on the United Nations "*Standard Country or Area Codes for Statistical Use*" commonly referred to as the M49 standard prepared by the Statistics Division of the United Nations Secretariat https://unstats.un.org/unsd/methodology/m49/.

Highlights by technology

Solar energy: Solar photovoltaic (PV) power accounted for almost all the increase in solar power with 451.9 GW of total capacity added in 2024.

Asia has more than doubled its installed solar power since 2022, with 247.9 GW added in 2023 and 327.1 GW added in 2024. However, the largest capacity increases occurred in China (+278.0 GW) and India (+24.5 GW). South Korea followed, delivering a significant increase compared to previous years with 3.1 GW of added solar capacity.

Outside Asia, the United States added 38.3 GW of solar capacity in 2024 - a 54.0% increase to that of its 2023 value - followed by Brazil (+ 15.2 GW) and Germany (+15.1 GW).

Hydropower: Renewable hydropower has seen a rise of 15.0 GW in added capacity, a notable rebound from the all-time low of 11.3 GW in 2023. However, 96.0% of the increase comes from China. Other countries where capacity increased by more than 0.5 GW were: Pakistan, Ethiopia, Viet Nam, Tanzania, Indonesia and Nepal.

Wind energy: Wind energy saw a slight decline from the record numbers seen in 2023, with 113.2 GW added in 2024. China led the expansion, contributing to more than two-thirds of the total capacity added (+79.9 GW), while the United States saw an increase of 5.1 GW. Other countries with significant capacity growth included Brazil, India, Canada, Türkiye and several European countries.

Offshore wind accounted for about 1.8% of total renewable power capacity and 7.0% of total wind capacity.

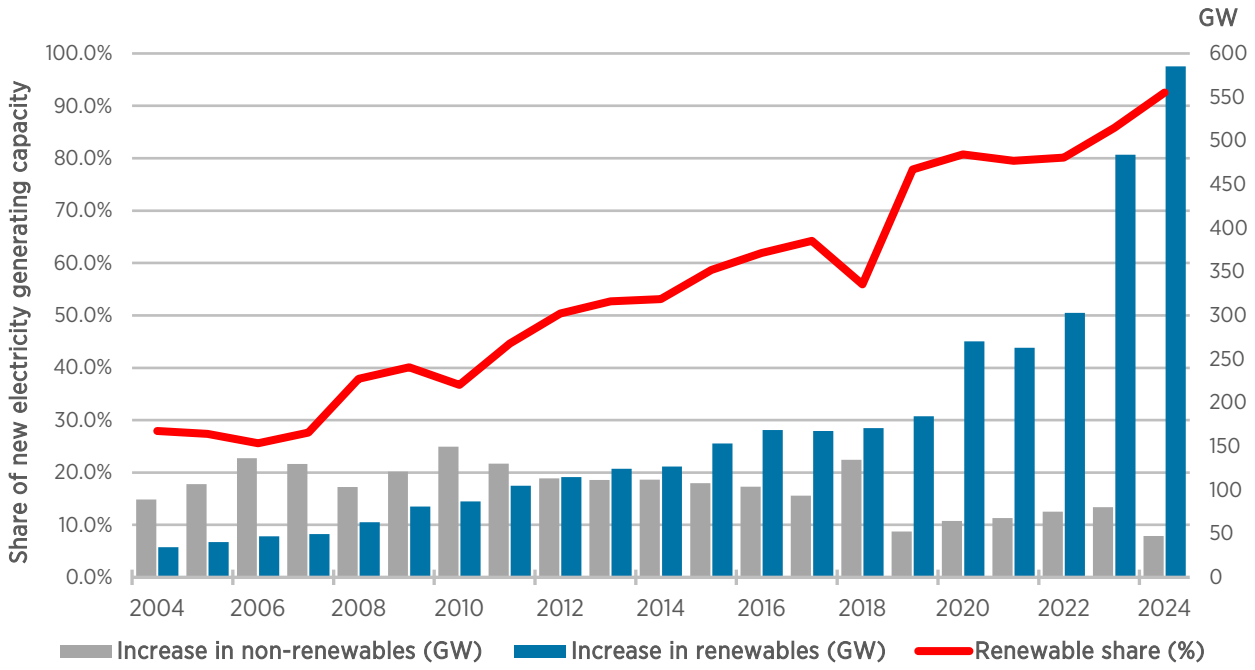
Bioenergy: Bioenergy capacity expansion picked up again in 2024, with 4.6 GW added compared to +3.0 GW in 2023. This growth was primarily driven by a significant increase in France, which expanded its bioenergy capacity by 1.3 GW, in stark contrast to the 31.0 MW increase in 2023. However, China remained the global leader in bioenergy expansion, also adding 1.3 GW. Other countries with major increases were India (+0.5 GW), Japan (+0.4 GW) and Brazil (+0.3 GW).

Geothermal energy: Geothermal capacity saw a similar level of growth as in the previous year, with an additional 0.4 GW in 2024. About 60% of this expansion came from New Zealand (+0.2 GW) followed by Indonesia, Türkiye, and the United States.

Off-grid electricity: Off-grid capacity* expansion nearly tripled in 2024, rising by 1.7 GW to reach 14.3 GW. Solar power dominated this growth, accounting for 90.2% of the expansion with an increase of 1.6 GW, bringing its total off-grid capacity to 6.3 GW. The remaining capacity increase came from a broad range of different types of bioenergy, while off-grid hydro capacity remained relatively similar to 2023 values.

* Note: these figures exclude Eurasia, Europe and North America.

Renewable share of annual power capacity expansion



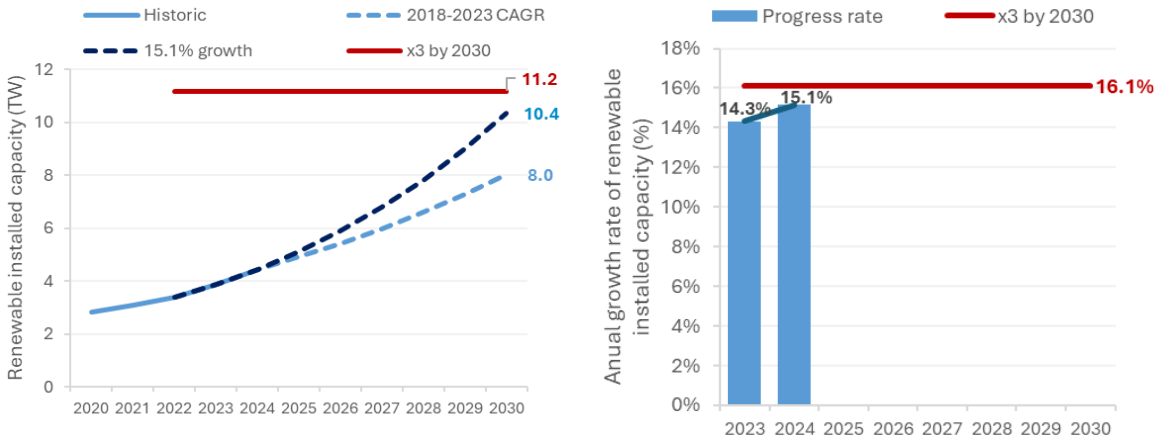
In 2024, renewable power capacity expansion increased compared to 2023 and remained well above the long-term trend. As in previous years, most of this expansion occurred in China and, to a lesser extent, the United States. However, most other countries also increased their expansion of renewable capacity in 2024 compared to 2023.

The share of renewables in total capacity expansion has increased significantly in 2024 and reached 92.5%, compared to 85.8% in 2023. The renewable share of total installed power capacity also rose by more than three percentage points from 43.1% in 2023 to 46.4% in 2024.

The upward trend in these shares continues to show both the rapid and increasing growth in the use of renewables and the declining expansion of non-renewable capacity. At the global level, the latter is partly due to the large amount of net decommissioning that has occurred for many years in some regions. However, more still needs to be done to achieve the global goal adopted at COP28 to triple installed renewable power capacity by 2030 to reach over 11 TW.

Reaching the global tripling target of 11.174 TW by 2030

In 2024, 585 GW of renewable capacity was added, representing a 15.1% annual growth rate - an increase of 0.8 percentage points compared to the 14.3% growth reported in 2023. This marks the highest annual increase since 2000. Despite this progress, the growth still falls short of the pace required to achieve the target to triple global installed renewable power capacity to more than 11 TW by 2030. Maintaining the growth rate seen in 2024 would yield only 10.4 TW of renewables by 2030, falling 0.8 TW (7.2%) short of the target.



In the five-year period from 2018 to 2023, global renewable energy capacity expanded at a compound annual growth rate (CAGR) of 10.4%. If this historical trend were to continue, it would result in 8.0 TW of installed renewable capacity by 2030 — falling 3.1 TW (or 27.9%) short of the target.

Achieving the target by 2030 would have required maintaining a minimum annual growth rate of 16.1% from 2022 onwards. However, since both 2023 and 2024 both fell short of this rate, renewable capacity must now expand even faster (by 16.6% each year during the remaining six years).

Latest figures compared to previous estimates

Compared to the capacity statistics published in July 2024, the figures here have been revised slightly downwards. Total renewable capacity in 2023 was reported as 3 864 GW last year and the new figure for 2023 is 3 863 GW (-0.04%).

As noted in previous years, most revisions can be explained by imprecise early reporting of capacity and the unavailability of data to the year-end in some cases, so it may be expected that data for 2024, and for previous years, could be revised again in July 2025.