

Renewable capacity highlights

31 March 2021

HEADLINE FIGURES

2 799 GW

Global renewable generation capacity at the end of 2020

10.3%

Growth in renewable capacity during 2020

261 GW

Net increase in global renewable generation capacity in 2020

64%

Share of new renewable capacity installed in Asia in 2020

91%

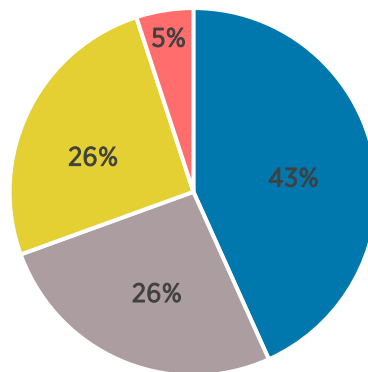
Wind and solar share of new capacity in 2020

82%

Share of renewables in net capacity expansion in 2020

IRENA's renewable energy statistics can be downloaded at: www.irena.org/statistics

Renewable generation capacity by energy source

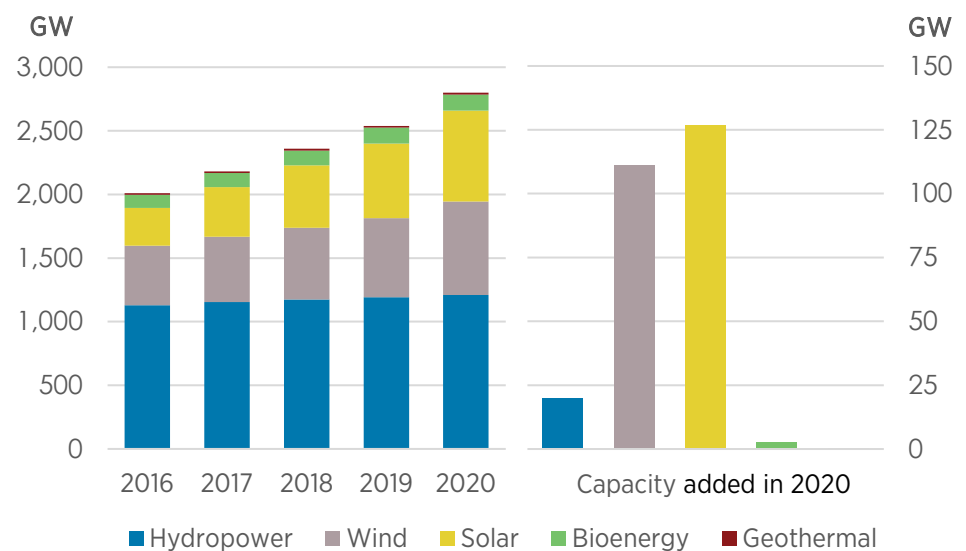


■ Hydro ■ Wind ■ Solar ■ Others

At the end of 2020, global renewable generation capacity amounted to 2 799 GW. Hydropower accounted for the largest share of the global total, with a capacity of 1 211 GW.*

Wind and solar energy accounted for equal shares of the remainder, with capacities of 733 GW and 714 GW respectively. Other renewables included 127 GW of bioenergy and 14 GW of geothermal, plus 500 MW of marine energy.

Renewable power capacity growth

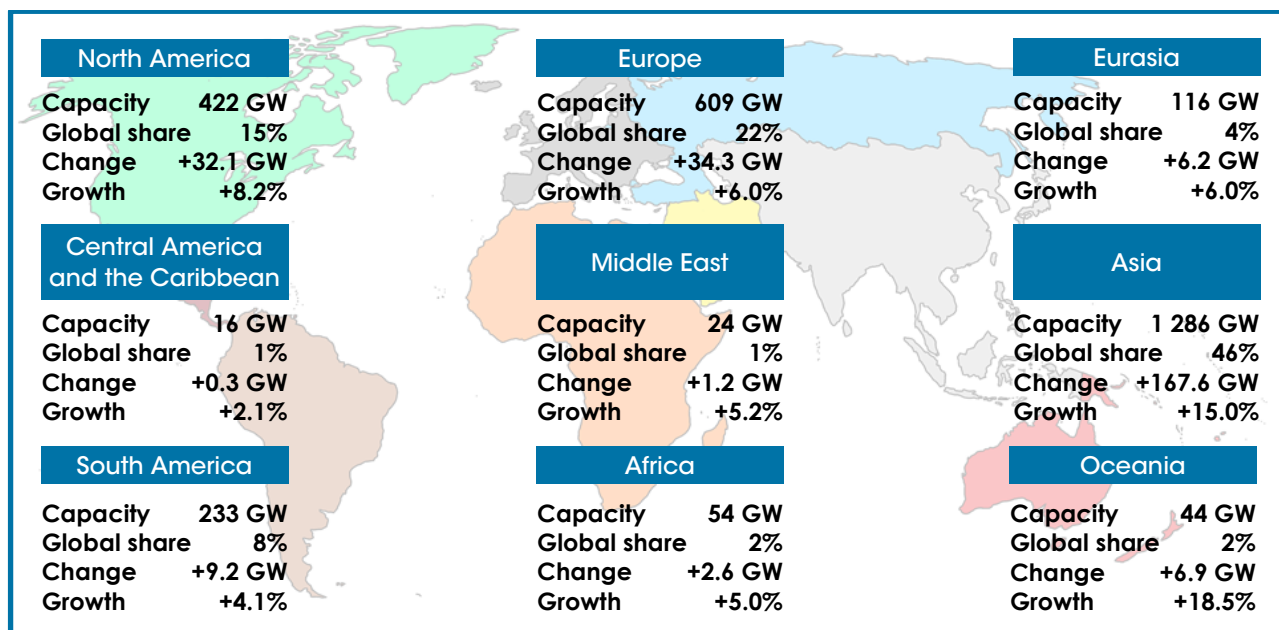


Renewable generation capacity increased by 261 GW (+10.3%) in 2020. Solar energy continued to lead capacity expansion, with an increase of 127 GW (+22%), followed closely by wind energy with 111 GW (+18%). Hydropower capacity increased by 20 GW (+2%) and bioenergy by 2 GW (+2%). Geothermal energy increased by 164 MW.

Solar and wind energy continued to dominate renewable capacity expansion, jointly accounting for 91% of all net renewable additions in 2020. Along with the renewed growth of hydropower, this exceptional growth in wind and solar led to the highest annual increase in renewable generating capacity ever seen.

* Note: these figures exclude pure pumped storage. At end-2019, this was an additional 121 GW, giving a total hydropower capacity of 1 332 GW.

Renewable generation capacity by region



For the complete dataset see: IRENA (2021), Renewable capacity statistics 2021, available at: www.irena.org/publications.

Asia accounted for 64% of new capacity in 2020, increasing its renewable capacity by 167.6 GW to reach 1.29 TW (46% of the global total). A huge part of this increase occurred in China. Capacity in Europe and North America expanded by 34 GW (+6.0%) and 32 GW (+8.2%) respectively, with a notably large expansion in the USA. Africa continued to expand steadily with an increase of 2.6 GW (+5.0%), slightly more than in 2019. Oceania remained the fastest growing region (+18.4%), although its share of global capacity is small and almost all of this expansion occurred in Australia.

Highlights by technology



Hydropower: Growth in hydro recovered in 2020, with the commissioning of several large projects delayed in 2019. China added 12.1 GW of capacity, followed by Turkey with 2.5 GW.



Wind energy: Wind expansion almost doubled in 2020 compared to 2019 (+111 GW compared to +58 GW last year). China added 72.4 GW of new wind capacity, followed by the United States (+14.2 GW). Ten other countries increased their wind capacity by more than 1 GW in 2020.

While offshore wind remains a fairly small part of the sector, it continues to increase in importance each year and reached around 5% of total wind capacity in 2020.



Solar energy: With an increase in new capacity in all major world regions last year, total global solar capacity has now reached about the same level as wind capacity,

Expansion in Asia was 78 GW in 2020 (compared to +55 GW in 2019), with major capacity increases in China (+49.4 GW) and Viet Nam (+11.6 GW). Japan also added over 5 GW and India and Republic of Korea both expanded solar capacity by more than 4 GW.

Outside Asia, the United States added 14.9 GW of solar capacity in 2020, Germany and Australia both added over 4 GW and the Netherlands and Brazil added more than 3 GW.



Bioenergy: Net capacity expansion fell by half in 2020 (+2.5 GW compared to +6.4 GW in 2019). Bioenergy capacity in China expanded by over 2 GW, but total net expansion in Asia was less than this due to reduced use of bioenergy in Japan and Republic of Korea. Europe was the only other region with significant expansion in 2020, adding 1.2 GW of bioenergy capacity, a similar amount to 2019.

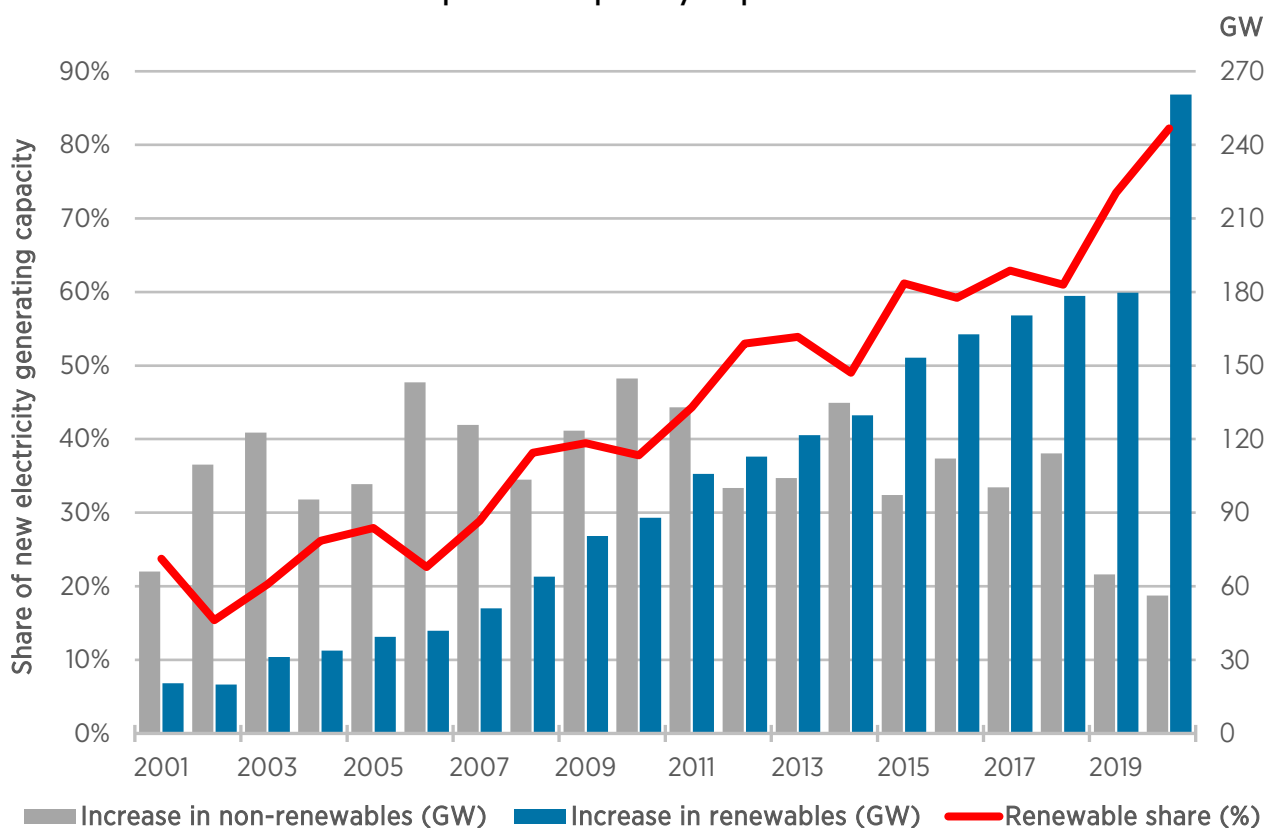


Geothermal energy: Very little geothermal capacity was added in 2020. Turkey increased capacity by 99 MW and some small expansions also occurred in New Zealand, the United States and Italy.



Off-grid electricity: Off-grid capacity grew by 365 MW in 2020 (+2%) to reach 10.6 GW. Bioenergy capacity fell slightly to 4.6 GW, due to grid connection of some plants. Solar expanded by 250 MW to reach 4.3 GW and hydro remained almost unchanged at about 1.8 GW.

Renewable share of annual power capacity expansion



In 2020, renewable generating capacity expanded by far more than in recent years and well above the long-term trend. However, most of this increase in expansion occurred in China and, to a lesser extent, the United States. Most other countries continued to increase renewable capacity at a similar rate to previous years.

The surge in renewable capacity expansion in 2020 increased the share of renewables in total capacity expansion, which reached 82% in 2020 compared to a figure of 73% in 2019. The renewable share of total generation capacity also rose by two percentage points from 34.6% in 2019 to 36.6% in 2020.

The upward trend in these shares reflects not only the rapid and increasing growth of the use of renewables

but also the declining expansion of non-renewable capacity. At the global level, the latter is also affected by the large amount of net decommissioning that has occurred for many years in some regions.

In 2020, non-renewable capacity continued to expand in Asia, the Middle East and Africa (but with a much lower expansion in Africa), while net decommissioning continued in Europe and North America and also occurred for the first time in Eurasia.

An energy transition requires that the use of renewables expands by more than the growth in energy demand, so that less non-renewable energy needs to be used. Many countries still have not reached this point, despite dramatic increases in their use of renewables for generating electricity.

Latest figures compared to previous estimates

Compared to the capacity statistics published in March 2019, the figures here have been revised upwards very slightly. Total renewable capacity in 2019 was reported as 2 537 GW last year and the new figure for 2019 is 2 538 GW (+0.06%).

As noted last year, most revisions can be explained by imprecise early reporting of distributed solar power generation in a few countries (which is often overstated). Upward revisions were also made this

year for a few countries where data were not available and estimates were made last year.

The other main revision has been an increase in the time-series for off-grid generation, where new figures have been found. Given the importance of increasing energy access and the widespread use of solar power for this purpose, countries are encouraged to continue expanding the collection of off-grid data for monitoring their national energy goals and targets.