

Renewable capacity highlights

31 March 2020

HEADLINE FIGURES

2 537 GW

Global renewable generation capacity at the end of 2019

7.4%

Growth in renewable capacity during 2019

176 GW

Net increase in global renewable generation capacity in 2019

54%

Share of new renewable capacity installed in Asia in 2019

90%

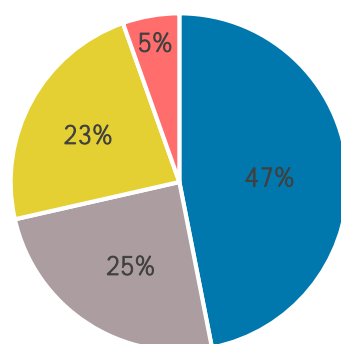
Wind and solar share of new capacity in 2019

72%

Share of renewables in net capacity expansion in 2019

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

Renewable generation capacity by energy source

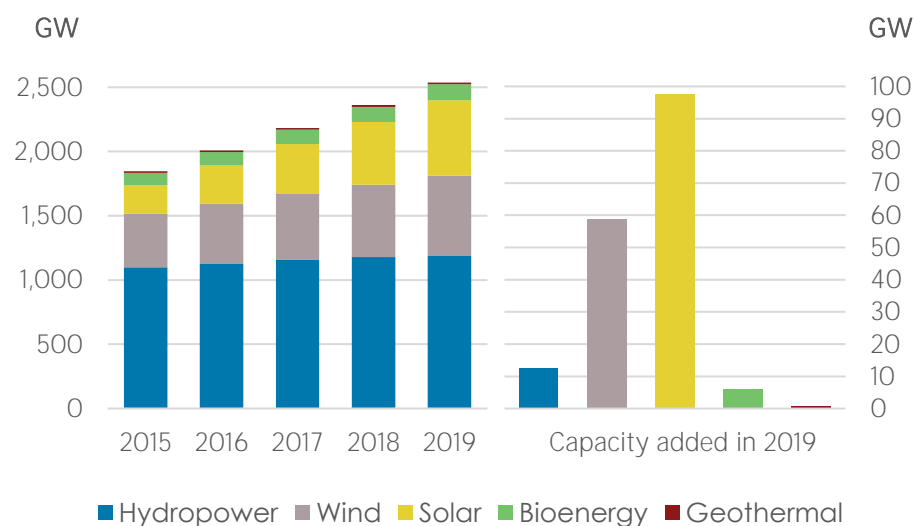


■ Hydro ■ Wind ■ Solar ■ Others

At the end of 2019, global renewable generation capacity amounted to 2 537 GW. Hydropower accounted for the largest share of the global total, with a capacity of 1 190 GW.*

Wind and solar energy accounted for most of the remainder, with capacities of 623 GW and 586 GW respectively. Other renewables included 124 GW of bioenergy and 14 GW of geothermal, plus 500 MW of marine energy.

Renewable power capacity growth

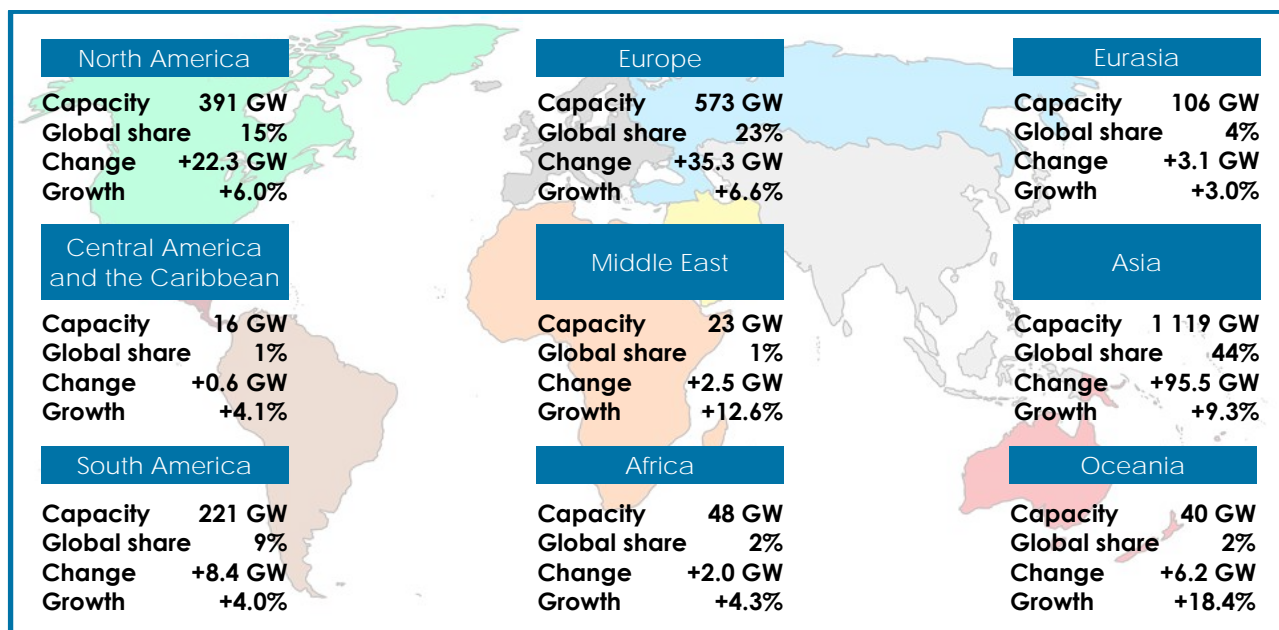


Renewable generation capacity increased by 176 GW (+7.4%) in 2019. Solar energy continued to lead capacity expansion, with an increase of 98 GW (+20%), followed by wind energy with 59 GW (+10%). Hydropower capacity increased by 12 GW (+1%) and bioenergy by 6 GW (+5%). Geothermal energy increased by just under 700 MW.

Solar and wind energy continued to dominate renewable capacity expansion, jointly accounting for 90% of all net renewable additions in 2019. However, this unusually high share may reflect the very low expansion of hydropower last year.

* Note: these figures exclude pure pumped storage. At end-2019, this was an additional 121 GW, giving a total hydropower capacity of 1 310 GW.

Renewable generation capacity by region



For the complete dataset see: IRENA (2020), *Renewable capacity statistics 2020*, available at: www.irena.org/publications.

Asia accounted for 54% of new capacity in 2019, increasing its renewable capacity by 95.5 GW to reach 1.12 TW (44% of the global total). Capacity in Europe and North America expanded by 35 GW (+6.6%) and 22 GW (+6.0%), respectively. Oceania and the Middle East were the fastest growing regions (+18.4% and +12.6% respectively), although their share of global capacity is small. Africa has a similar amount of renewable capacity, but this only increased by 2.0 GW (+4.3%). Compared to 2018, capacity growth in Asia and Africa was somewhat lower than in 2019, but higher in Europe and North America.

Highlights by technology



Hydropower: Growth in hydro was unusually low in 2019, possibly because some large projects missed their expected completion dates. As in many previous years, China and Brazil accounted for most of the expansion, each adding more than 4 GW.



Wind energy: Wind performed particularly well in 2019, expanding by nearly 60 GW. China and the United States continued to dominate, with increases of 26 GW and 9 GW respectively (higher than the year before). Another eight countries expanded their wind capacity by more than 1 GW each.



Solar energy: Asia continued to dominate global solar capacity expansion with a 56 GW increase (about 60% of the total in 2019), but this was lower than in 2018. China, India, Japan, Republic of Korea and Viet Nam were the countries with most new capacity in 2019. Other major increases were in the United States, Australia, Spain, Ukraine and Germany.

Spain, Ukraine and Viet Nam stood out as places with notably more expansion than in previous years. Chinese Taipei, Mexico and the United Arab Emirates also added more than 1 GW of solar in 2019.



Bioenergy: Expansion of bioenergy capacity remained modest in 2019. China accounted for half of all new capacity (+3.3 GW). Germany, Italy, Japan and Turkey also saw some expansion.



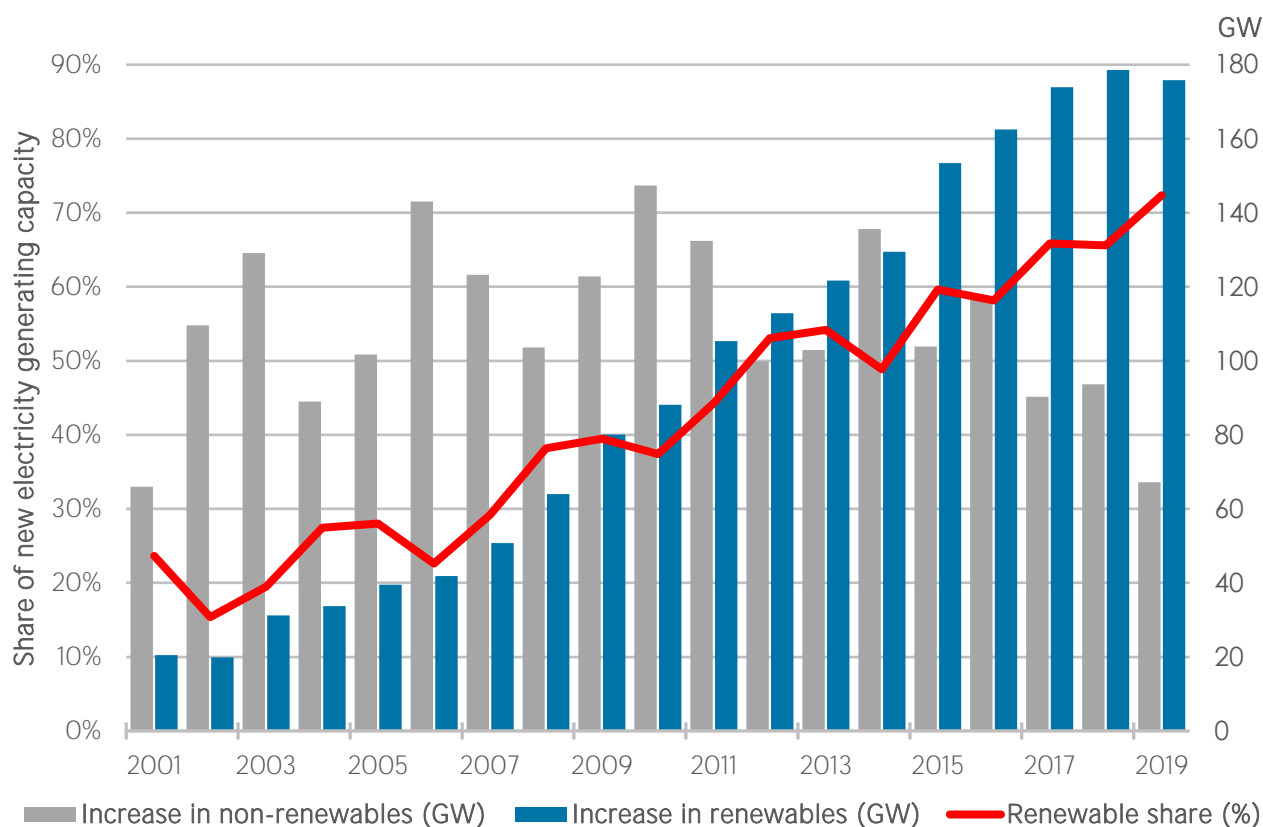
Geothermal energy: Geothermal power capacity grew by 682 MW in 2019, slightly more than in 2018. Again, Turkey led with an expansion of 232 MW, followed by Indonesia (+185 MW) and Kenya (+160 MW).



Off-grid electricity: Off-grid capacity grew by 160 MW (+2%) to reach 8.6 GW in 2019. Bioenergy accounts for 40% of off-grid capacity, but it is growing relatively slowly. In 2019, off-grid solar PV increased by 112 MW and hydropower grew by 31 MW, compared to growth of only 17 MW for bioenergy.

Developments in off-grid solar PV capacity continue to reflect a mix of contrasting underlying trends. Retailers of solar lights and home systems are moving into new markets and consumers in some existing markets are switching to larger systems. However, mini-grids continue to face challenges raising funding, while grid expansion is reducing demand for off-grid power in some places.

Renewable share of annual power capacity expansion



A longer-term perspective of the world's transition to renewable power generation is seen in the figure above. Notably, 2019 is the first year when expansion of renewables is seen to slow down. However, total power capacity expansion in 2019 was also well below average and non-renewable capacity expansion was remarkably low.

Consequently, the share of renewables in capacity expansion continued its upward trend to reach 72% in 2019. Similarly, the renewable share of total generation capacity rose from 33.3% in 2018 to 34.7% in 2019.

At the regional level, non-renewable capacity expansion in 2019 continued to follow long-term trends, with net growth in Asia, the Middle East and Africa, but net decommissioning in Europe and North America and little change in other regions.

However, renewables still accounted for at least 70% of total capacity expansion in almost all regions in 2019. The two exceptions were Africa and the Middle East, where renewables accounted for only 52% and 26%, respectively, of net additions.

Latest figures compared to previous estimates

From a statistical perspective, most of the time-series for renewable capacity used here have noticeably been adjusted (upwards) compared to a year ago. This is due to many countries revising their data.

This time last year, for example, IRENA found renewable capacity to have reached 2 351 GW in 2018, with an addition of +171 GW. In June 2019, those figures were revised to 2 356 GW and +175 GW, respectively (4-5 GW more than initially seen). Now, with final, officially verified data from most countries, the figure for 2018 stands at 2 361 GW and +179 GW (8-10 GW more than reported a year ago).

While the impact of such revisions on total capacity is minimal, they have a far bigger impact on annual changes.

For instance, the adjustment to total renewable power capacity in 2018 only amounts to +0.3%, whereas net additions have changed by +4.7%.

IRENA's annual capacity statistics are mainly based on official data from regulators, grid operators and incentive schemes. They are produced to give an initial indication of developments in the previous year, before the much longer process of official data collection and validation with countries is completed.

With the rise of decentralised power generation, auto-production and deregulation of energy markets, the possibility exists that some of these sources may not be able to report all capacity installed in a country until later in the year. This should be taken into account when using the statistics presented here.