Renewable capacity highlights

31 March 2019

HEADLINE FIGURES

2,351 GW

Global renewable generation capacity at the end of 2018

7.9%

Growth in renewable capacity during 2018

171 GW

Increase in global renewable generation capacity in 2018

61%

Share of new renewable capacity installed in Asia in 2018

84%

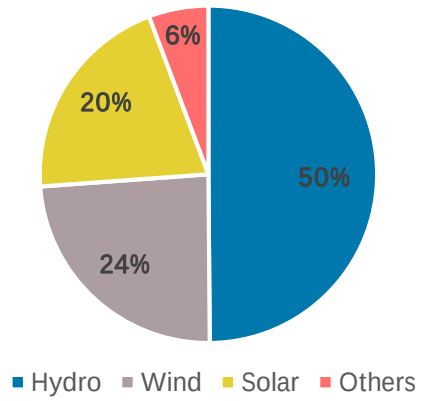
Wind and solar share of new capacity in 2018

63%

Share of renewables in net capacity expansion in 2018

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

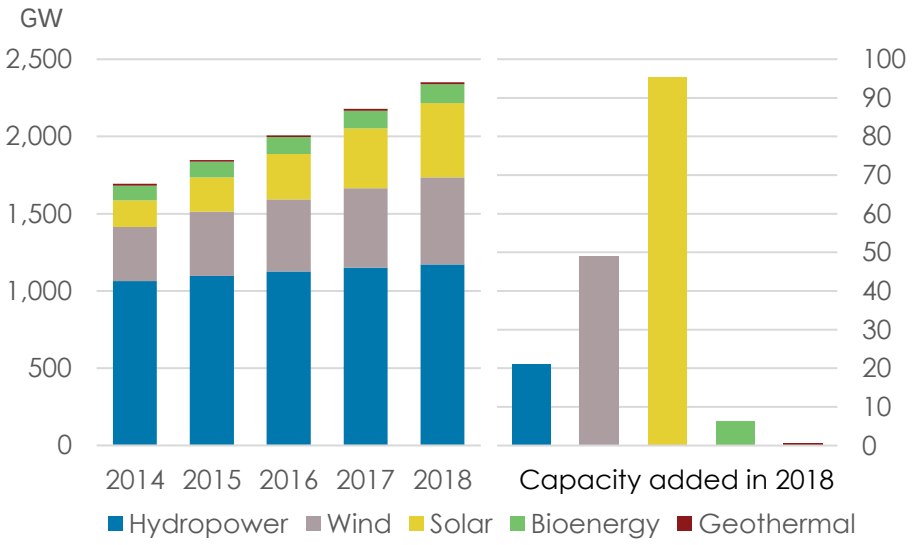
Renewable generation capacity by energy source



At the end of 2018, global renewable generation capacity amounted to 2 351 GW. Hydro accounted for the largest share of the global total, with an installed capacity of 1 172 GW.*

Wind and solar energy accounted for most of the remainder, with capacities of 564 GW and 486 GW respectively. Other renewables included 115 GW of bioenergy, 13 GW of geothermal energy and 500 MW of marine energy (tide, wave and ocean energy).

Capacity growth

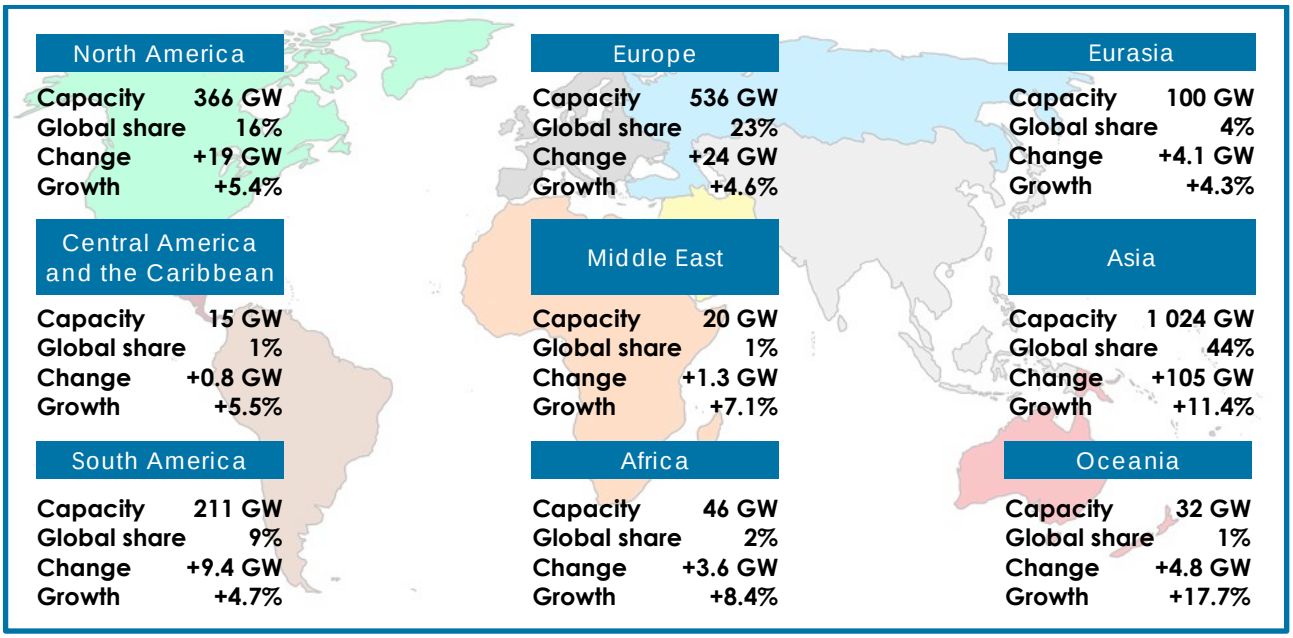


Renewable generation capacity increased by about the same amount as last year (171 GW or +7.9%). Solar energy continued to dominate, with a capacity increase of 94 GW (+24%), followed by wind energy with an increase of 49 GW (+10%). Hydropower capacity increased by 21 GW (+2%) and bioenergy by 6 GW (+5%). Geothermal energy increased by just over 500 MW.

Renewable capacity expansion continues to be driven mostly by new installations of solar and wind energy. These accounted for 84% of all new capacity installed in 2018, finally pushing the overall share of hydro to just under 50%.

* Note: these figures only include renewable hydropower and exclude pure pumped storage capacity. At end-2018, this was an additional 121 GW, giving a total hydro capacity of 1,293 GW.

Renewable generation capacity at the regional level



For the complete dataset see: IRENA (2019), Renewable capacity statistics 2019, available at: www.irena.org/publications.

Asia accounted for 61% of new capacity in 2018 (slightly below last year) and resulting in over one Terawatt of renewable capacity (44% of the global total). Asia and Oceania were also the fastest growing regions, with growth of +11.4% and +17.7% respectively. Europe expanded by the same amount as last year (+24 GW, a 4.6% increase). Expansion in North America recovered slightly, with an increase of 19 GW (+5.4%). Capacity growth in Africa was also a repeat of last year, with an increase of 3.6 GW (+8.4%).

Highlights by technology

Hydropower: Growth in hydro continued to slow, with only China adding a significant amount of new capacity in 2018 (+8.5 GW).

Wind energy: China and the USA continued to account for most expansion in wind energy, with increases of 20 GW and 7 GW respectively. Other countries expanding by more than 1 GW were: Brazil; France; Germany; India; and the UK

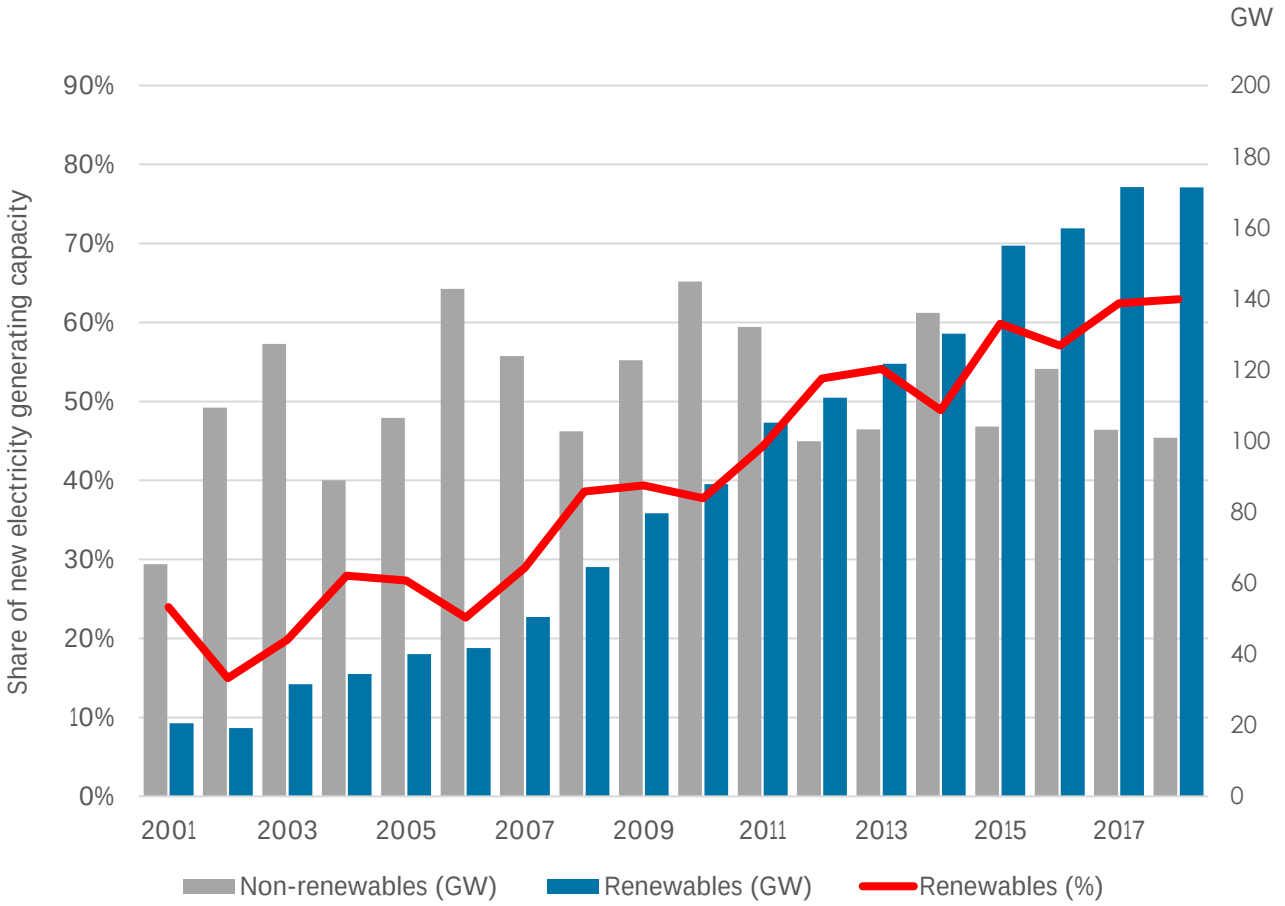
Bioenergy: Three countries accounted for over half of the relatively low level of bioenergy capacity expansion in 2018. China increased capacity by 2 GW and India by 700 MW. Capacity also increased in the UK by 900 MW, with the completion of some conversions of fossil fuel power stations to use solid biofuels.

Solar energy: Asia continued to dominate the global solar capacity expansion with a 64 GW increase (about 70% of the global expansion in 2018). In a repeat of last year, China, India, Japan and Republic of Korea accounted for most of this. Other major increases were in the USA (+8,4 GW), Australia (+3.8 GW) and Germany (+3.6 GW). Other countries with smaller markets and significant expansions in 2018 included: Brazil; Egypt; Pakistan; Mexico, Turkey and the Netherlands.

Geothermal energy: Geothermal power capacity increased by +539 MW in 2018. As before, most of this expansion occurred in Turkey (+219 MW) and Indonesia (+137 MW), followed by the USA, Mexico and New Zealand.

Off-grid electricity: Off-grid capacity in 2018 was 8.8 GW, with an increase of 390 MW during the year (+5%). The time-series for off-grid generating capacity continues to rise each year, as new generating plants are discovered or reported by countries. Just over half of this capacity is located in biomass processing facilities and another one-third is off-grid solar PV generation. Solar mini-grids and household devices each account for about 15% of the off-grid solar capacity and the remaining 70% is used in non-residential applications. Preliminary figures suggest that the expansion of solar mini-grids has slowed in the last two years, but growth trends in the other end-uses remain stable.

Renewable generation capacity and the energy transition



A longer-term perspective on the growth in renewable generation capacity and its contribution to the global energy transition is given in the figure above.

Since 2000, non-renewable generation capacity has expanded by about 115 GW per year (on average), with no discernible trend upwards or downwards. In contrast, renewable generation capacity has expanded by increasing amounts, from less than 20 GW per year in 2001 to about 160 GW per year or more in the last four years.

Consequently, the share of renewables in the growth of electricity generation capacity has increased from about 25% in 2001, passing 50% in 2012 to reach 63% in 2018. The share of renewables in total generation capacity has also increased from 22% to 33% over the same period.

As the figure shows, the expansion of non-renewable generation capacity has continued unabated and shows little sign of slowing down, but these global figures mask some important regional differences.

At a regional level, non-renewable generation capacity has decreased in Europe, North America and Oceania by about 85 GW since 2010, with consistent reductions in capacity every year in Europe and reductions in four of the last eight years in the other two regions.

Over the same period, non-renewable generation capacity has increased by 725 GW in Asia and 100 GW in the Middle East. Together, these amounts are roughly the same as the global expansion in non-renewable capacity over the period. This shows that these two regions have been the main driving forces behind the persistent expansion in the use of fossil fuels for electricity generation.

While the growth of renewables has been impressive, the transition to low-carbon energy production will require that more countries and regions not only switch to expanding renewable capacity but also start to retire or convert more of their existing fossil fuel power plants.