

# Renewable energy highlights

8 July 2018

## HEADLINE FIGURES

### 5 886 TWh

Amount of electricity generated from renewables in 2016

### 6.7%

Increase in renewable generation compared to 2015

### 1 160 TWh

Increase in electricity generation from renewables since 2012

### 31%

Increase in solar power generation compared to 2015

### 16%

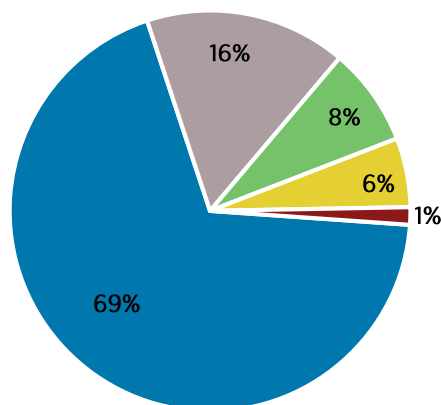
Increase in wind power generation compared to 2015

### USD 19 bn

Amount of public investment in renewables in 2016

IRENA's renewable energy statistics can be downloaded from [resourceirena.irena.org](http://resourceirena.irena.org)

## Renewable electricity generation by energy source

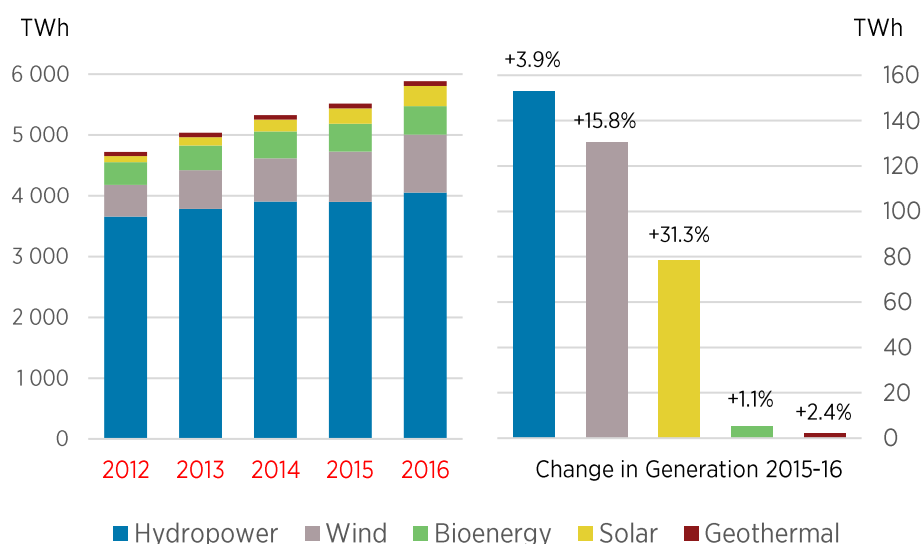


■ Hydro ■ Wind ■ Bioenergy ■ Solar ■ Geothermal

In 2016, the total amount of electricity generated from renewables was 5 886 TWh. Hydro accounted for about 70% of this (4 049 TWh), followed by wind (958 TWh), bioenergy (467 TWh), solar energy (329 TWh), geothermal energy (83 TWh) and marine energy (1 TWh).

The generation of bioenergy was divided as follows: 321 TWh (70%) from solid biofuels; 88 TWh (20%) from biogas; 51 TWh (10%) from renewable municipal waste; and 7 TWh from liquid biofuels.

## Growth in renewable electricity generation



Renewable electricity generation in 2016 was 369 TWh higher than in 2015, an increase of 6.7%. Generation increased significantly compared to last year due to a recovery in hydropower generation and continued rapid growth in solar and wind generation.

Solar generation increased by over 30%, as recent rapid capacity expansions have started to generate electricity. Wind also continued to perform solidly with an increase in generation of 16%. These two sources of energy together have contributed to about 55% of growth in renewable generation since 2012.

## Renewable electricity generation by region

Asia accounted for most of the growth in renewable electricity generation in 2016, with an increase of 182 TWh compared to 2015. Asia's share of global generation also increased to 38%. Europe and North America each accounted for about 20% of global generation, followed by South America (13%) and Eurasia (5%).

In 2016, hydro generation recovered in all regions except Africa where there was another slight fall. Asia overtook Europe to become the largest generator of electricity from wind and solar, due to a huge increase in solar energy production in 2016 (+53 TWh, compared to 2015). Asia is now by far the largest generator of electricity from solar power and is also rapidly approaching Europe in terms of wind energy. South America's share of global renewable electricity production is also gradually increasing.

Generation in 2016 (TWh)	Hydro	Wind	Bioenergy	Solar	Geothermal	Marine	Total
Africa	118	10	3	5	5	<1	141
Asia	1 640	295	123	141	24	<1	2 223
Central America + Caribbean	25	4	5	2	4		40
Eurasia	265	16	2	1	5	<1	288
Europe	578	306	182	113	12	<1	1 191
Middle East	23	1	<1	3	0		27
North America	688	271	83	54	25	<1	1 120
Oceania	43	15	4	6	8	<1	76
South America	671	41	64	3	0	<1	780
<b>World total</b>	<b>4 049</b>	<b>958</b>	<b>467</b>	<b>329</b>	<b>83</b>	<b>1</b>	<b>5 886</b>

## Revisions to renewable generating capacity

IRENA's latest statistics include some minor revisions to the 2017 renewable generating capacity reported in March 2018, but the global total remains the same at 2 179 GW. The statistics for off-grid electricity capacity now show a total capacity of 7 045 MW (a slight increase compared to previously) and these figures may continue to be revised upwards as IRENA collects more information about off-grid renewable electricity generation.

## Renewable energy balances and public investment data

Renewable energy balances present a complete picture of renewable energy production and consumption. In addition to the generation of electricity from renewables, they include the direct use of solar and geothermal heat and biofuels for heating and transport. IRENA's published statistics have expanded to include balances for 120 countries and areas for 2015 and 2016, showing the final consumption of renewables by energy source, type of energy use (electricity, heat, direct use) and end-use sector (industry, transport, residential, commercial and public services, other). Energy balances are also available for another 20 countries that are not shown in the statistics publication (due to space limitations).

Statistics on investments in renewable energy from selected public financial institutions are also presented for the period 2009-16. In contrast to previous years, these have been compiled from the OECD-DAC database, plus additional investments reported by 20 major multi-lateral, bilateral and national development institutions that invest in renewable energy. A major improvement in the data has been the addition of some information about Chinese public investments in renewables in developing countries, which has significantly increased the figures overall.

The expanded dataset shows that public investment in renewable energy was about USD 19 billion in 2016. This is slightly lower than the USD 26 billion recorded in 2015 and generally below the long-term average. However, it also, in part, reflects the rapid fall in technology costs recorded in recent years.