

Renewable energy highlights

1 July 2017

HEADLINE FIGURES

5 512 TWh

Amount of electricity generated from renewables in 2015

3.5%

Increase in renewable generation compared to 2014

1 100 TWh

Increase in electricity generation from renewables since 2011

15%

Increase in wind power generation compared to 2014

110

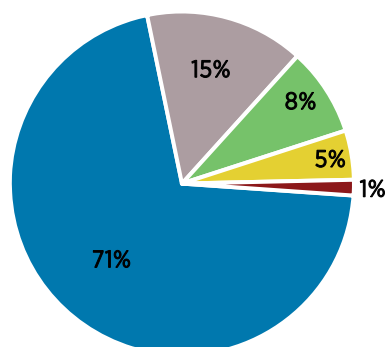
Renewable energy balances now available from IRENA

USD 17 bn

Amount of public investment in renewables in 2016

IRENA's renewable energy statistics can be downloaded from resourceirena.irena.org

Renewable electricity generation by energy source



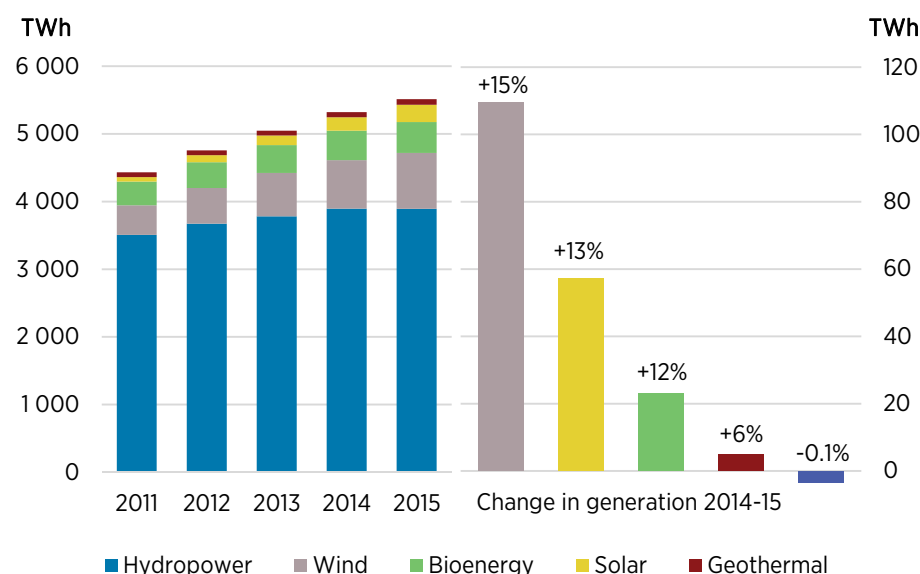
■ Hydro ■ Wind ■ Bioenergy ■ Solar ■ Geothermal

In 2015, the total amount of electricity generated from renewables was 5 512 TWh. Hydro accounted for about 70% of this (3 893 TWh), followed by wind (826 TWh), bioenergy (456 TWh), solar energy (256 TWh), geothermal energy (81 TWh) and marine energy (1 TWh).

Large-scale plants (10 MW+) dominate hydro generation (85%) while solar panels and onshore wind turbines account for most solar and wind generation (95%).

The generation of bioenergy was divided as follows: 301 TWh (70%) from solid biofuels; 84 TWh (20%) from biogas; 65 TWh (10%) from renewable municipal waste; and 5 TWh from liquid biofuels.

Growth in renewable electricity generation



Renewable electricity generation in 2015 was 191 TWh higher than in 2014, an increase of 3.5%. Generation increased relatively slowly compared to previous years, largely due to a slight decline in hydropower generation and more subdued growth in solar generation. However, 2015 was a good year for wind energy generation, which increased by 110 TWh or 15%.

Renewable electricity generation by region

Asia accounted for most of the growth in renewable electricity generation in 2015, with an increase of 156 TWh compared to 2014. Asia's share of global generation also increased to 37%. Europe and North America each accounted for about 20% of global generation, followed by South America (13%) and Eurasia (5%).

In 2015, hydro generation declined in all regions except Asia and Eurasia. The largest decline occurred in Europe (34 TWh), followed by North and South America (with a fall of 20 TWh each). In contrast, hydro generation increased by 58 TWh in Asia and 22 TWh in Eurasia.

Europe continued to account for the largest share of global electricity generation from wind and solar (37% and 39% respectively), although generation in other regions is catching up. For example, wind and solar generation in 2015 was almost 60 TWh higher than in 2014 in Asia, 24 TWh higher in North America and 12 TWh higher in South America.

Generation in 2015 (TWh)	Hydro	Wind	Bioenergy	Solar	Geothermal	Marine	Total
Africa	119	8	3	4	4	<1	137
Asia	1 577	229	122	94	24	<1	2 044
Central America + Caribbean	24	4	4	1	4		37
Eurasia	248	12	1	0	4	<1	265
Europe	562	306	179	110	12	<1	1 168
Middle East	20	0	0	2	0		22
North America	663	226	82	38	25	<1	1 033
Oceania	40	14	4	6	8	<1	72
South America	642	27	61	2	<1	<1	732
World total	3 893	826	456	256	81	1	5 512

Revisions to renewable generating capacity

IRENA's latest statistics include revised figures for renewable generating capacity. The revised capacity figure for 2016 is now 2 008 GW compared to the 2 006 GW reported in March (with a 161 GW increase in 2016, the same as reported previously). The relatively small revision is due to the availability of capacity data for some important countries early in the year and improvements in IRENA's estimation methodologies. The statics for off-grid electricity now show a total capacity of 3 968 MW 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 statistics include balances for 110 countries and areas for 2014 and 2015, 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 for more countries in the Middle East and North Africa are now available, due to a stronger collaboration with energy statisticians working in those countries.

Statistics on investments in renewable energies from selected public financial institutions are also presented for the period 2009-16. These have been collected from 18 major multi-lateral, bilateral and national development institutions with investment in renewable energy of over USD 500 million in at least one year. The data show that public investment in renewable energy was about USD 16 billion in 2015 and USD 17 billion in 2016, slightly lower than the average over previous years (USD 19 billion) but 25-30% lower than in 2014. In 2016, wind energy, solar and geothermal accounted for the majority of this investment (USD 5.3 billion, USD 2.7 billion and USD 2.1 billion respectively), followed by hydroelectricity (USD 1.7 billion), bioenergy (USD 0.7 billion) and marine energy (USD 11 million). The remaining USD 4.2 billion was invested in projects covering more than one technology.