Section 6 - Renewables

Key results show:

Provisional 2018
2018 was a record year for renewable electricity generation which increased by 11.8 per cent compared to 2017, from 99.3 TWh to 111.1 TWh, largely due to increased capacity. **(Table 6.1)**

Renewables' share of electricity generation was a record 33.3 per cent and an increase of 3.9 percentage points on the 29.3 per cent share in 2017. This reflects the higher renewable generation and slightly lower overall electricity generation in 2018, compared to 2017. **(Table 6.1 and Chart 6.1)**

In 2018, on the 2009 Renewable Energy Directive basis, renewable generation (normalised accounting for variable weather and including generation from the biogas component of the grid) was a record 31.7 per cent of gross electricity consumption, an increase of 3.6 percentage points on 2017's share. **(Table 6.1)**

Renewable electricity capacity was 44.4 GW at the end of 2018, a 9.7 per cent increase (3.9 GW) on a year earlier, largely due to increased offshore wind and plant biomass capacity. **(Chart 6.3)**

Quarter 4 2018
Renewables' share of electricity generation was 37.1 per cent in 2018 Q4, up 7.0 percentage points on the 30.1 per cent share in 2017 Q4, reflecting higher renewable generation and lower overall electricity generation.

Renewable electricity generation was 32.7 TWh in 2018 Q4, an increase of 18 per cent on 27.8 TWh in 2017 Q4. This was driven by record bioenergy, onshore and offshore wind generation, a result of increased capacity. **(Chart 6.2).**

In 2018 Q4, 58 MW of capacity eligible for the Feed in Tariff scheme was installed, increasing total FiTs capacity to 6.5 GW, across 961,431 installations. **(Chart 6.5)**

Relevant tables

6.1: Renewable electricity capacity and generation
6.2: Liquid biofuels for transport consumption

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Table 6.1 Renewable electricity shares – 2017 and 2018 (provisional)

	2017	2018p
Renewable generation (TWh)	99.3	111.1
Total electricity generation (TWh)	338.6	333.9
International basis	**29.3%**	**33.3%**
Normalised renewable generation (TWh)[1]	98.4	111.2
Gross electricity consumption (TWh)	350.5	350.5
2009 Renewable Energy Directive basis	**28.1%**	**31.7%**

[1] Includes generation from the biogas component of gas in the grid

In 2018, renewables provided a third of electricity generation (33.3 per cent) up from 29.3 per cent in 2017, due to increased capacity. Overall electricity generation fell by 4.4 per cent.

Total electricity generated from renewables in 2018 increased by 11.8 per cent on 2017, from 99.3 TWh to a record 111.1 TWh. On a Directive basis, generation rose from 98.4 TWh in 2017 to 111.2 TWh in 2018.

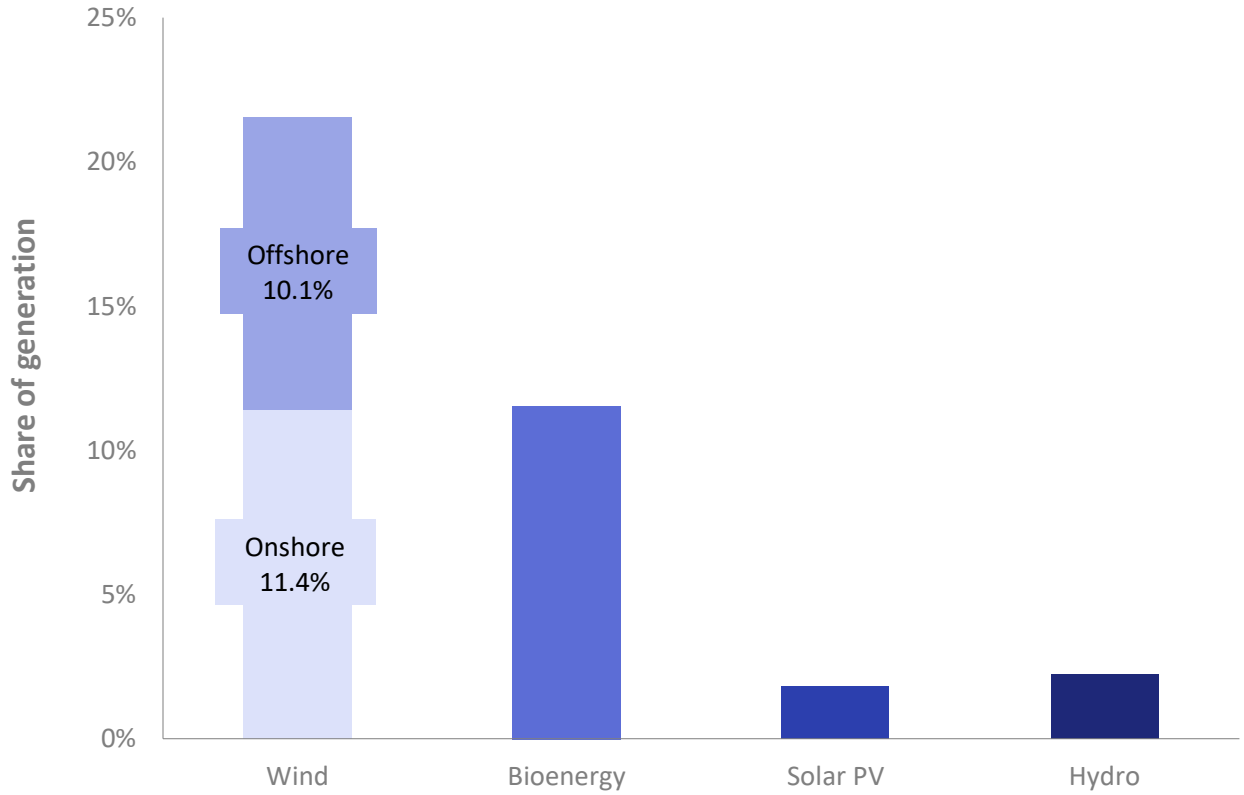
On the 2009 Renewable Energy Directive (RED) basis, the electricity share was 31.7 per cent, compared with 28.1 per cent in 2017. The RED measure uses normalised wind and hydro generation, to account for variable generation due to weather conditions and includes generation from biogas' share of gas in the grid. Under this measure, wind generation was reduced due to higher load factors for 2018, whilst the reverse was true for hydro; normalised generation was increased due to low load factors in 2018.

For more information on normalisation, and the various measures of renewable electricity's shares, please see the June 2018 special feature article "Renewable energy in 2017", at: www.gov.uk/government/statistics/energy-trends-june-2018-special-feature-article-renewable-energy-in-2017

In 2018 Q4, renewables' share of electricity generation increased by 7.0 percentage points to 37.1 per cent, from the 30.1 per cent share in 2017 Q4. Total electricity generation and electricity demand figures (all generating companies) can be found in tables ET 5.1 and ET 5.2, at: www.gov.uk/government/statistics/electricity-section-5-energy-trends.

Overall quarterly electricity generation was 88.1 TWh in 2018 Q4, down by 4.4 per cent on a year earlier (as mild average temperatures in November and December led to lower demand over the quarter. However, total electricity supply only fell 2.2 per cent, as net imports more than doubled compared to Q4 2017). A small amount of the increase in renewables share can be attributed to this drop in electricity generation.

Chart 6.1 Renewables' share of electricity generation – 2018 Q4 (Table 6.1)



In 2018, generation from onshore wind increased by 4.6 per cent, from 29.1 TWh in 2017 to a record 30.4 TWh. Offshore wind generation also reached a record level, increasing by 28 per cent, from 20.9 TWh to 26.7 TWh. This was due to increased capacity.

Hydro generation decreased by 7.8 per cent compared to 2017, from 5.9 TWh to 5.5 TWh.

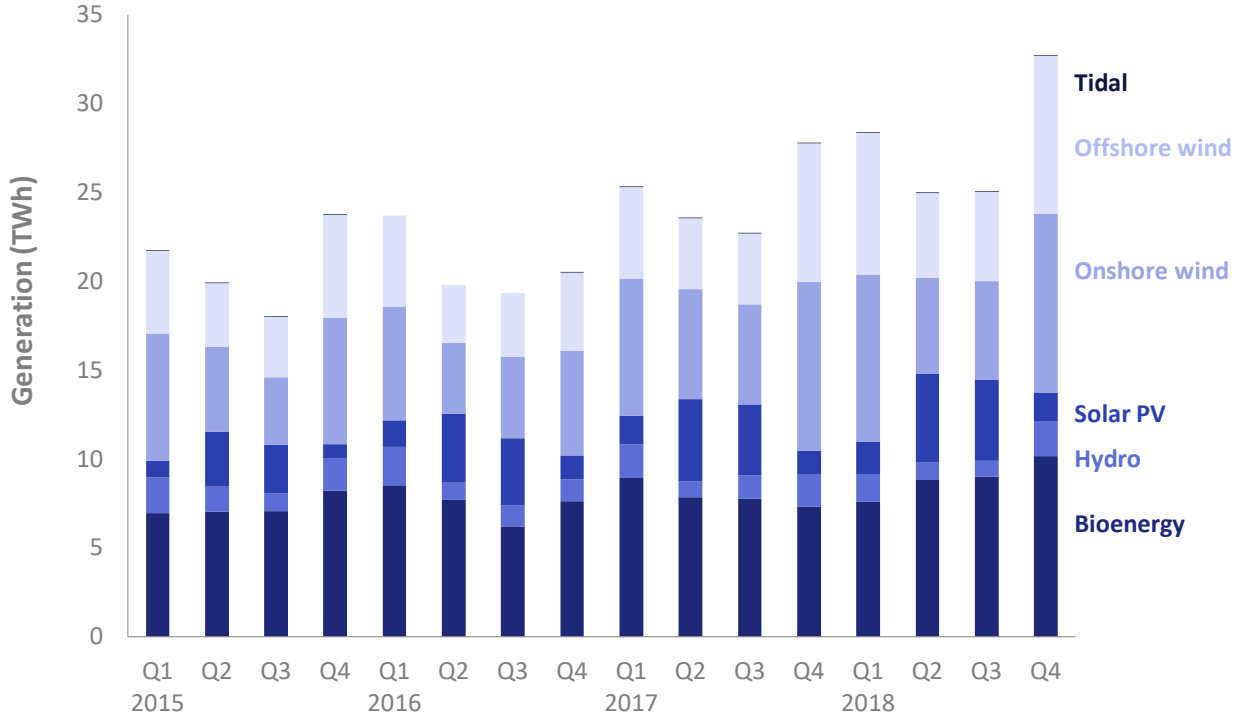
In 2018, generation from bioenergy[1] increased by 12 per cent, from 31.8 TWh in 2017 to a record 35.6 TWh. This was largely due to generation from plant biomass which increased by 21 per cent from 20.1 TWh to 24.3 TWh. Elsewhere, generation from waste increased by 3.2 per cent due to increased capacity whereas generation from anaerobic digestion decreased by 7 per cent, due to a decrease in capacity. Generation from sewage gas by 0.1 per cent with animal biomass generation decreasing by 0.6%.

In 2018, 32 per cent of renewables generation was from bioenergy, 27 per cent from onshore wind, 24 per cent from offshore wind, 12 per cent from solar PV, and 5 per cent from hydro.

Total electricity generation figures (all generating companies) can be found in table ET 5.1, at: www.gov.uk/government/statistics/electricity-section-5-energy-trends.

[1] landfill gas, sewage gas, biodegradable municipal solid waste, plant biomass, animal biomass, anaerobic digestion and co-firing (generation only)

Chart 6.2 Renewable electricity generation (Table 6.1)



Total electricity generated from renewables in 2018 Q4 was up by 18 per cent on 2017 Q4, from 27.8 TWh to 32.7 TWh, driven by record generation from wind.

In 2018 Q4, generation from onshore wind increased by 6 per cent to a record 10.1 TWh. Generation from offshore wind increased by 14 per cent, from 7.8 TWh to a record 8.9 TWh. The increase in generation from both onshore and offshore wind was due to increased capacity.

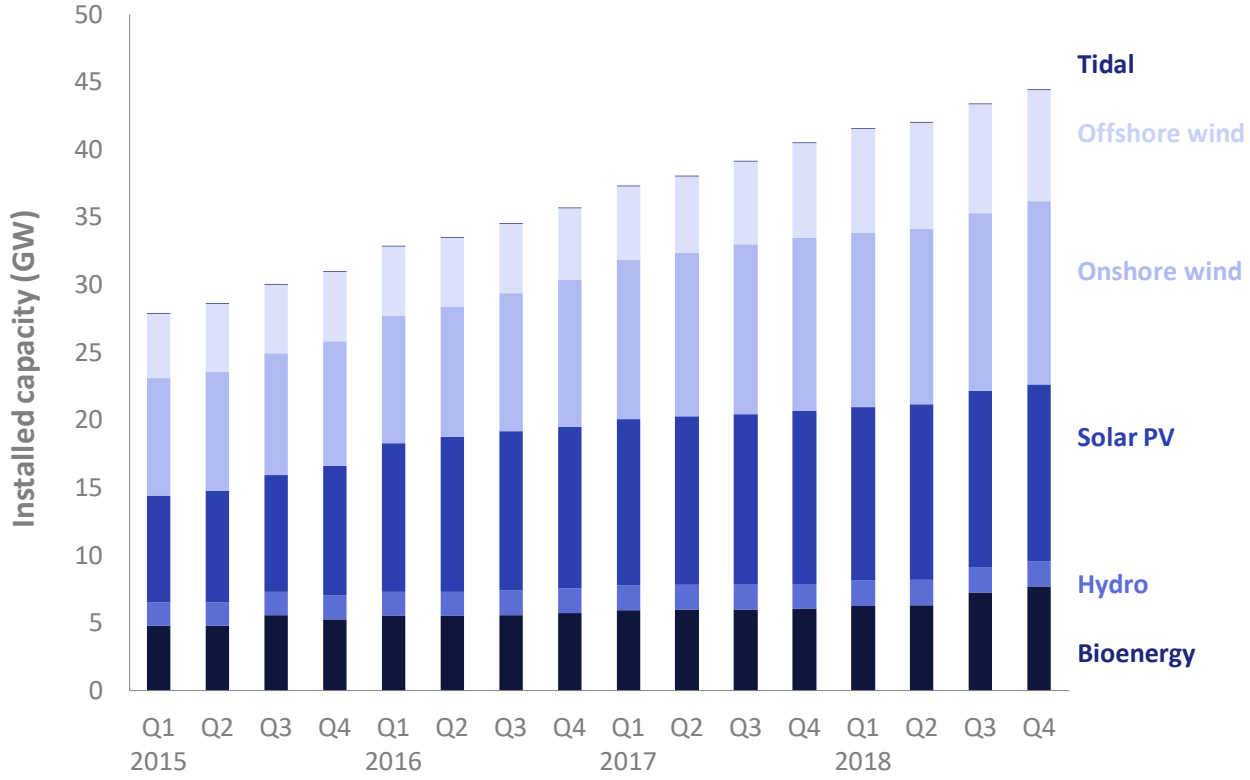
Solar PV generation increased by 19 per cent. Although there was only 2.5 per cent of additional capacity in 2018 Q4 compared to a year earlier, solar generation was helped by higher load factors, a result of 0.4 more sun hours per day than in 2017 Q4.

Generation from bioenergy increased by 39 per cent, from 7.3 TWh in 2017 Q4 to 10.2 TWh in 2017 Q4. Within this, there was a large increase in generation from plant biomass as new capacity came online.

In 2018 Q4, hydro generation increased by 9.3 per cent on a year earlier to 2.0 TWh, the highest Q4 level since 2011.

In 2018 quarter 4, bioenergy had the largest share of generation with 31 per cent (10.2 GWh), marginally ahead of onshore wind (10.1 GWh). Offshore wind accounted for 27 per cent of generation so that total wind and bioenergy provided 89 per cent of renewable generation.

Chart 6.3 Renewable electricity capacity (as at end of quarter) (Table 6.1)



At the end of 2018 Q4, the UK's renewable electricity capacity totalled 44.4 GW, an increase of 9.7 per cent (3.9 GW) on that installed at the end of 2017 Q4, and up 2.3 per cent (1.0 GW) on that installed at the end of the previous quarter. At the end of 2018 Q4, onshore wind had the highest share of capacity at 30.5 per cent (13.5 GW), followed by solar photovoltaics at 29.5 per cent (13.1 GW), offshore wind (18.5 per cent), bioenergy (17.3 per cent) and hydro (4.2 per cent).

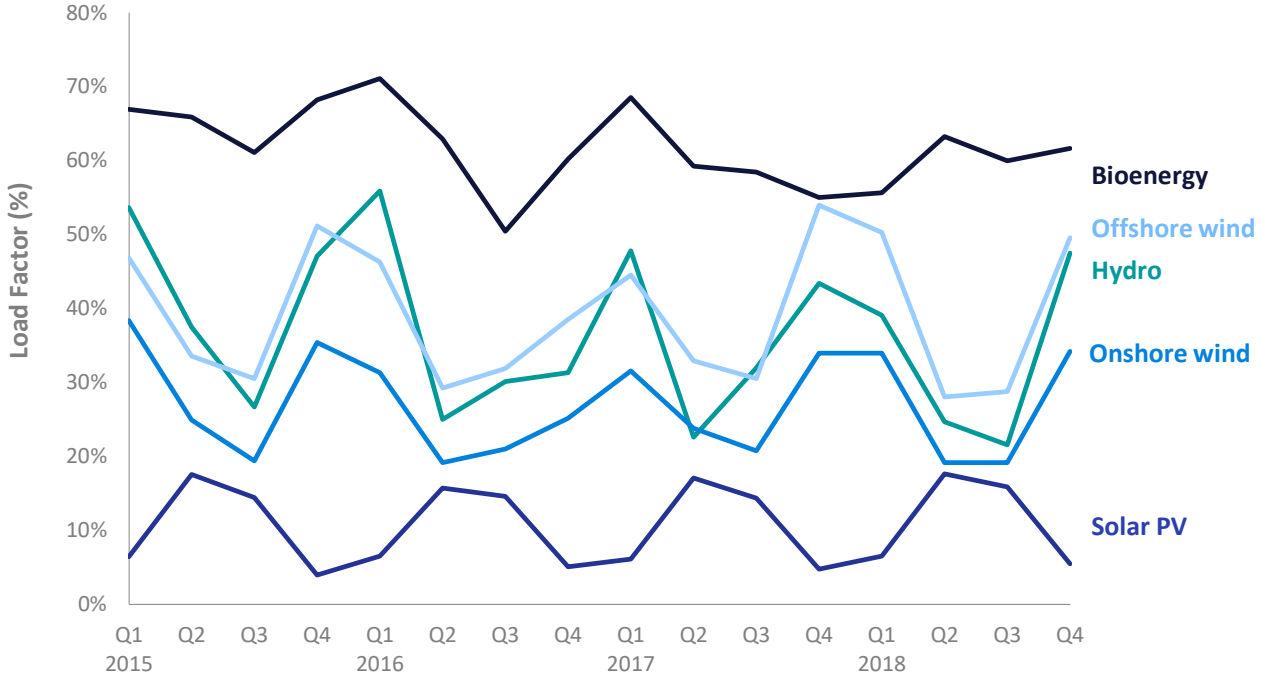
During 2018, onshore wind capacity increased by 0.7 GW, while offshore wind capacity increased by 1.2 GW, with several large sites opening, or continuing to expand during the year. This included the extension at Walney, the world's largest offshore wind farm.

Solar PV capacity increased by 0.3 GW during 2018, compared to a 0.9 GW increase during 2017. Around half of the increase in 2018 came from small scale Feed in Tariff[2] sites, with new applications being made before the scheme closes in March 2019.

Bioenergy capacity increased by 27 per cent (1.6 GW), mostly due to a 1.6 GW increase in plant biomass capacity. This was driven by the conversion to biomass of a unit at Drax and the conversion of Lynemouth power station to biomass from coal.

[2] To note that renewable generation and capacity figures include installations accredited on all support schemes (Renewables Obligation, Feed in Tariffs, Contracts for Difference), as well as those not eligible for support or are commissioned but awaiting support accreditation. This should particularly be noted for solar PV (and onshore wind), where figures consist of many installations across several or all of these categories.

Chart 6.4 Renewable electricity load factors (Table 6.1)



In 2018, onshore wind's load factor averaged 26.4 per cent, a 1.7 percentage point decrease on 2017 due to a decrease in average wind speed. Load factors for offshore wind increased by 1.2 percentage points from of 38.9 per cent, to 40.1 per cent.

Hydro's load factor in 2018 decreased by 3.2 percentage points, from 36.5 per cent in 2017 to 33.2 per cent in 2018.

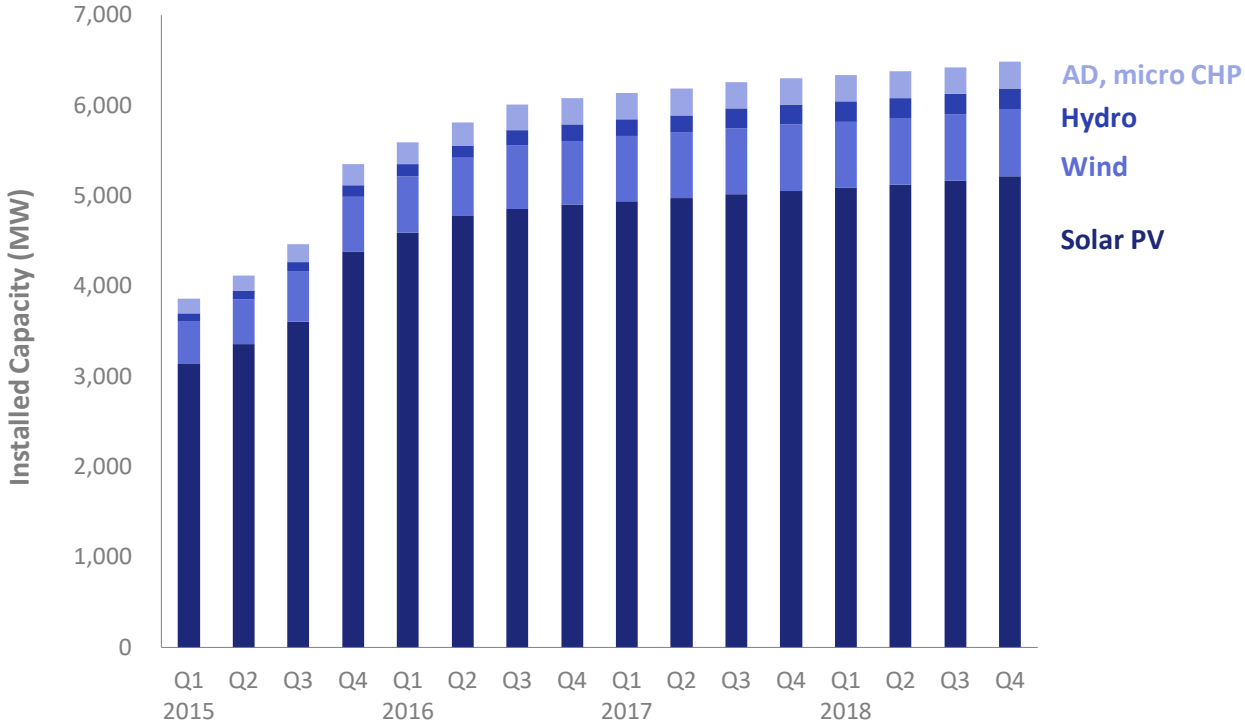
Onshore wind's load factor in 2018 Q4 stood at a three-year high of 34.2 per cent, a 0.2 percentage point increase on a year earlier, average wind speeds were 9.2 knots, 0.2 knots lower than in the same period a year earlier[3] but were still higher than the long term average, as wind speeds in Q4 are typically higher than Q2 or Q3. Offshore wind's load factor decreased by 4.4 percentage points compared to 2017 Q4, from 53.9 per cent, to 49.5 per cent, this may be because new sites had come online in the second half of 2018 which took time to ramp up production.

Hydro's load factor in 2018 Q4 was 47.5 per cent, a 4.1 percentage point increase on a year earlier, due to 6 per cent more rainfall (in the main hydro catchment areas) than 2017 Q4.

Bioenergy's load factor increased to 61.6 per cent in 2017 Q4, up from 55.0 per cent in 2017 Q4 and 1.6 percentage points higher than the previous quarter.

[3] Load Factors are calculated using an average of capacity at the start and end of the quarter. Therefore, they can be influenced by the time in the quarter when any new capacity came online.

Chart 6.5 Feed in Tariffs: eligible installed capacity (as at end of quarter)



At the end of 2018 Q4, 6.5 GW of capacity was installed and eligible for the GB Feed in Tariff (FiT) scheme[4]. This was an increase of 0.9 per cent (58 MW) on that installed at the end of 2018 Q3, and 2.9 per cent (180 MW) higher than the amount installed at the end of 2017 Q4. 89 per cent of FiT capacity installed across the year was solar PV.

In terms of number of installations, at the end of 2018 Q4, there were 961,448 installed and eligible for the FiT scheme, a 1.3 per cent increase on the 949,181 installed at the end of the previous quarter, and a 4.2 per cent increase on the 923,101 installations a year earlier.

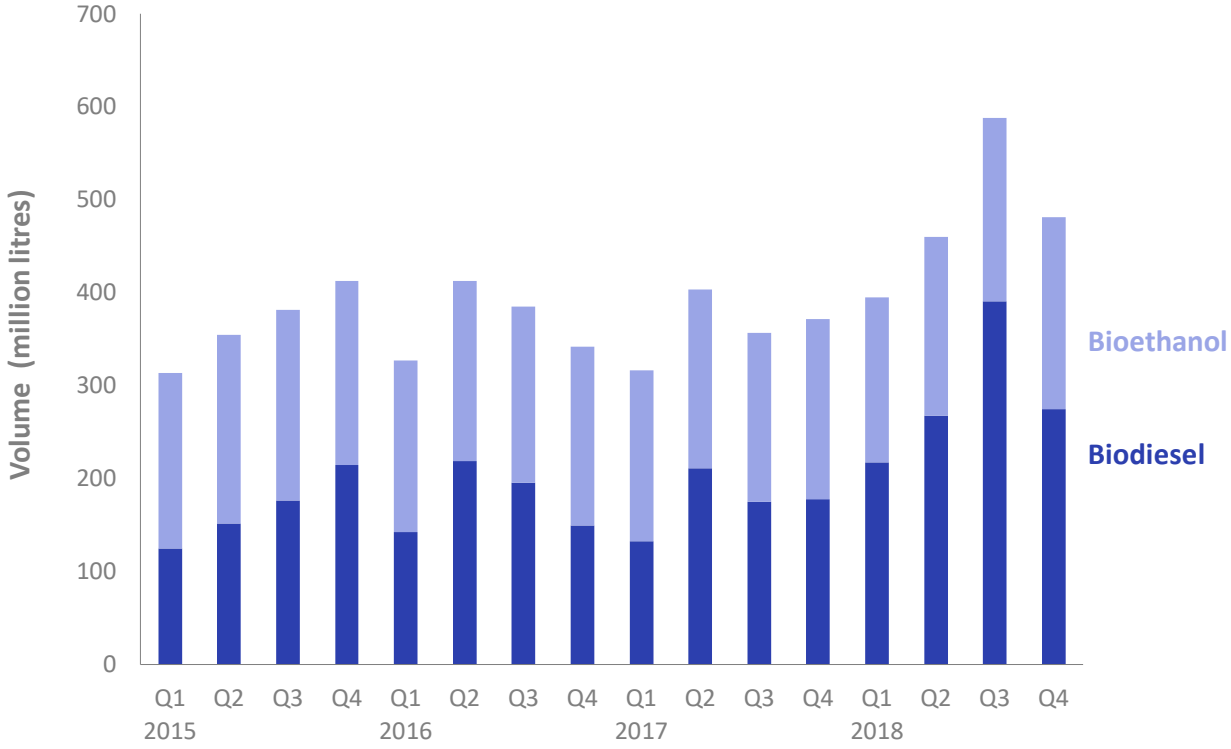
Solar photovoltaics (PV) represent the majority of both installations and installed capacity confirmed on FiTs, making up, respectively, 99 per cent and 80 per cent of the total.

Renewable installations eligible for FiTs (all except Micro CHP) represented 15 per cent of all renewable installed capacity.

Statistics on Feed in Tariffs can be found at:
www.gov.uk/government/collections/feed-in-tariff-statistics

[4] Data are for schemes accredited under the Microgeneration Certification Scheme (MCS) and ROOFIT, which are pre-requisites for registering for the FiT scheme; not all of these installations will eventually be confirmed onto the FIT scheme.

Chart 6.6 Liquid biofuels for transport consumption (Table 6.2)



In 2018, 1,925 million litres of liquid biofuels were consumed in transport, an increase of 33 per cent on 2017's 1,450 million litres. Bioethanol consumption increased, by 2.6 per cent, from 753 million litres to 773 million litres. Biodiesel consumption increased by 65 per cent, from 697 million litres in 2017 to 1,152 million litres in 2018, a new record high.

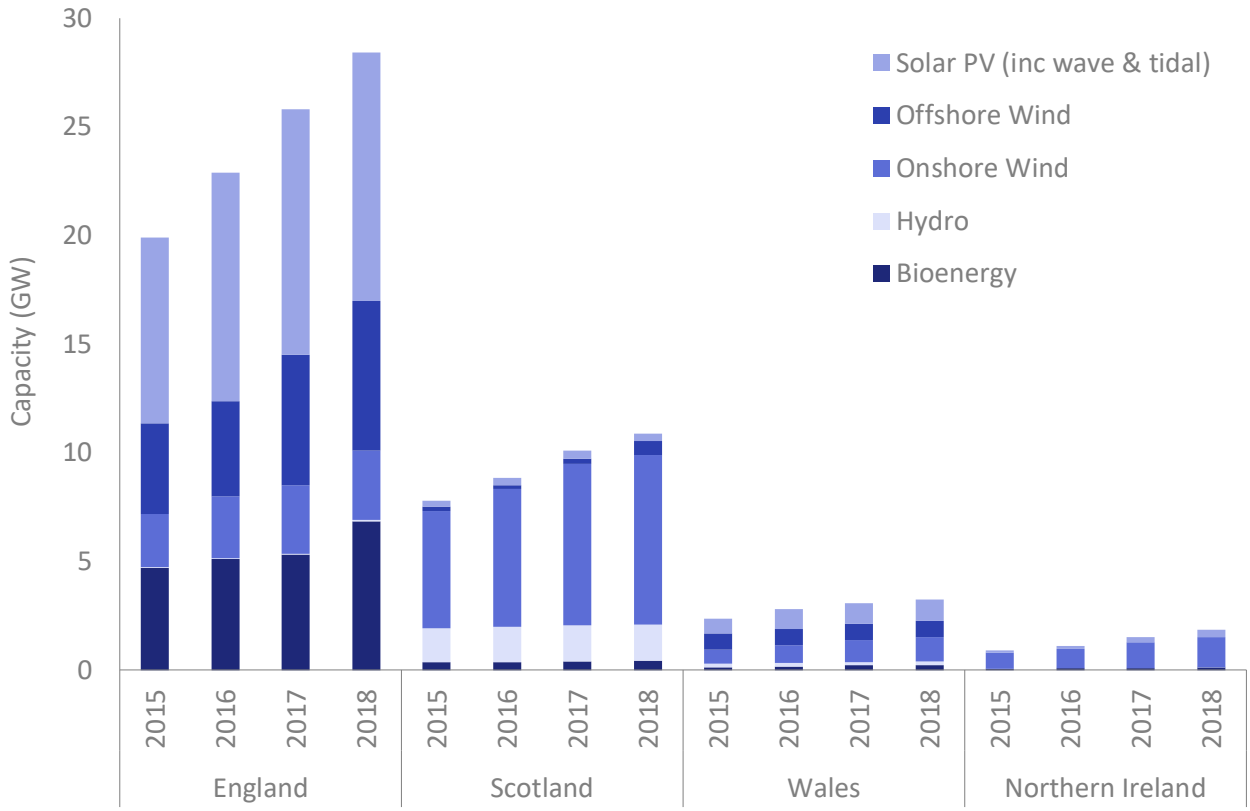
In 2018, in volume terms, bioethanol contributed to 40 per cent of biofuel consumption, compared with 60 per cent from biodiesel.

In 2018, in volume terms, bioethanol accounted for 4.6 per cent of motor spirit, and biodiesel 3.8 per cent of total diesel; the combined contribution to total road fuels was 4.1 per cent, up from 3.1 per cent in 2017.

In 2018 Q4, 482 million litres of liquid biofuels were consumed in transport, an increase of 29 per cent on the 372 million litres in 2017 Q4. Biodiesel consumption increased by 54 per cent, from 178 million litres, to 275 million litres. Bioethanol consumption in 2018 Q4 increased by 6.7 per cent, from 194 million litres, to 207 million litres in 2018 Q4.

In 2018 Q4, the largest share of consumption was from biodiesel (57 per cent), with the remaining 43 per cent from bioethanol. Biodiesel share increased 9 percentage points on a year earlier.

Chart 6.7 Renewable electricity capacity, by UK country



At the end of 2018, England's renewable electricity capacity was 28.4 GW, an increase of 10 per cent (2.5 GW) on that at the end of 2017, with plant biomass (1.6 GW), offshore wind (0.9 GW) and solar (0.2 GW) being the main contributors to the increase.

Scotland's capacity was 10.9 GW, an increase of 8 per cent (0.8 GW) on a year earlier, 88 per cent of this increase was due to additional wind capacity.

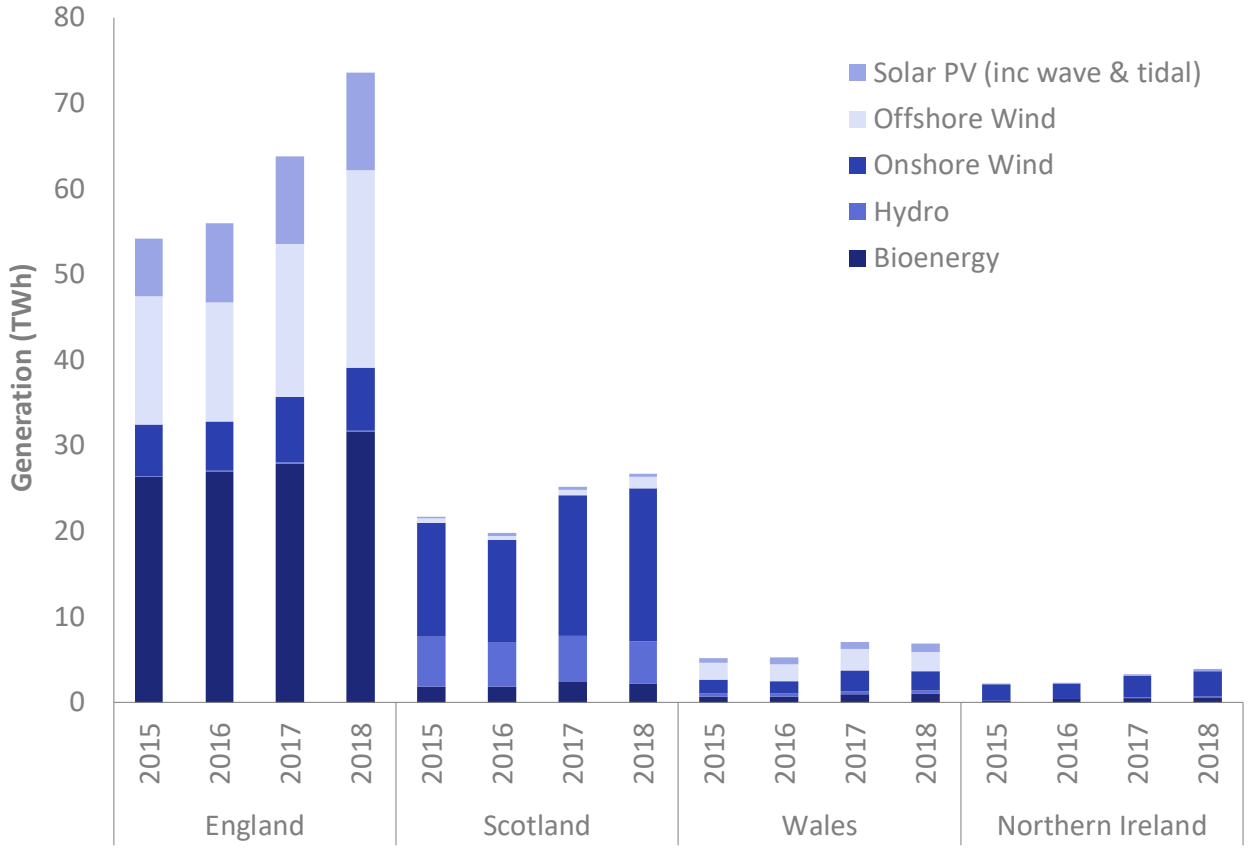
Wales's capacity was 3.2 GW, an increase of 5 per cent (0.15 GW) on that at the end of 2017, with 70 per cent of this increase due to additional onshore wind capacity.

Northern Ireland's capacity was 1.9 GW, an increase of 22 per cent (0.3 GW) on a year earlier, with 64 per cent of this increase attributable to new wind farms, and 30 per cent due to new solar capacity (both small and large solar).

At the end of 2018, England accounted for 64 per cent of UK renewable electricity capacity; Scotland's share was 25 per cent, Wales's was 7.3 per cent and Northern Ireland's stood at 4.2 per cent.

Quarterly renewable electricity statistics by UK country can be found in table ET 6.1, at:
www.gov.uk/government/statistics/energy-trends-section-6-renewables

Chart 6.8 Renewable electricity generation, by UK country



In 2018, renewable electricity generation in England was 73.5 TWh, an increase of 15 per cent (9.9 TWh) on 2017. Of this extra generation, 4.9 TWh came from onshore and offshore wind, due to increased capacity.

Generation in Scotland was 26.7 TWh, an increase of 6 per cent (1.5 TWh) on 2017; 2.1 TWh of this additional generation was from wind.

Generation in Wales was 6.9 TWh, a decrease of 3 per cent (0.2 TWh) on 2017. This was the result of a 0.4 TWh fall in wind generation.

Generation in Northern Ireland was 4.0 TWh, an increase of 21 per cent (0.7 TWh) on 2017, 0.4 TWh (63 per cent) of this increase was from wind.

In 2018, England accounted for nearly two thirds (66 per cent) of UK renewable electricity generation; Scotland's share was 24 per cent, Wales's was 6.2 per cent and Northern Ireland's 3.6 per cent.