

## Section 6 – UK Renewables 2019 and October to December 2019

### Key results show:

#### Provisional 2019

2019 was a record year for renewable electricity generation which increased by 8.5 per cent compared to 2018, from 110 TWh to 119 TWh, largely due to increased capacity. **(Table 6.1)**

Renewables' share of electricity generation was a record 36.9 per cent and an increase of 3.8 percentage points on the 33.0 per cent share in 2018. This reflects the higher renewable generation and lower overall electricity generation in 2019, compared to 2018. **(Table 6.1 and Chart 6.1)**

In 2019, on the 2009 Renewable Energy Directive basis (normalised to account for variable weather and with the addition of generation from the biogas within the gas supply grid), renewable generation was a record 34.6 per cent of gross electricity consumption, an increase of 2.9 percentage points on 2018's share. **(Table 6.1)**

Renewable electricity capacity was 47.4 GW at the end of 2019, a 6.9 per cent increase (3.0 GW) on a year earlier, around half of this increase was in offshore wind **(Chart 6.3)**

#### Quarter 4 2019

Renewables' share of electricity generation was 37.4 per cent in 2019 Q4, up 0.6 percentage points on the 36.8 per cent share in 2018 Q4, reflecting higher renewable generation and lower overall electricity generation. **(Chart 6.1).**

Renewable electricity generation was a record 32.5 TWh in 2019 Q4, an increase of 0.9 per cent on 32.2 TWh in 2018 Q4. This was driven by record offshore wind generation and bioenergy, a result of increased capacity. **(Chart 6.2).**

Liquid biofuel consumption increased by 44 per cent, from 454 million litres in 2018 Q4 to an estimated 655 million litres in 2019 Q4. Bioethanol consumption increased by 1.7 per cent while biodiesel consumption increased by 76 per cent. **(Chart 6.6)**

### 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 – 2018 and 2019 (provisional)**

	<b>2018</b>	<b>2019p</b>
Renewable generation (TWh)	110.0	119.3
Total electricity generation (TWh)	332.9	323.7
<b>International basis</b>	<b>33.0%</b>	<b>36.9%</b>
Normalised renewable generation (TWh) <sup>1</sup>	110.3	118.8
Gross electricity consumption (TWh)	349.5	343.1
<b>2009 Renewable Energy Directive basis</b>	<b>31.5%</b>	<b>34.6%</b>

<sup>1</sup> Includes generation from the biogas component of gas in the grid

In 2019, renewables provided over a third of electricity generation (36.9 per cent) which is an increase of 3.8 percentage points from 2018. This was primarily due to the completion of new installed capacity through late 2018 and 2019. In addition, total electricity generation from non-renewable sources fell by 6.8 per cent, increasing the relative share for renewable generation.

Total electricity generated from renewables in 2019 increased by 6.9 per cent on 2018, from 110 TWh to 119 TWh. On a Directive basis, generation rose from 110 TWh in 2018 to 119 TWh in 2019.

On the 2009 Renewable Energy Directive (RED) basis, the electricity share was 34.6 per cent, compared with 31.5 per cent in 2018. 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, both wind and hydro were reduced by 2 per cent due to higher load factors in 2019.

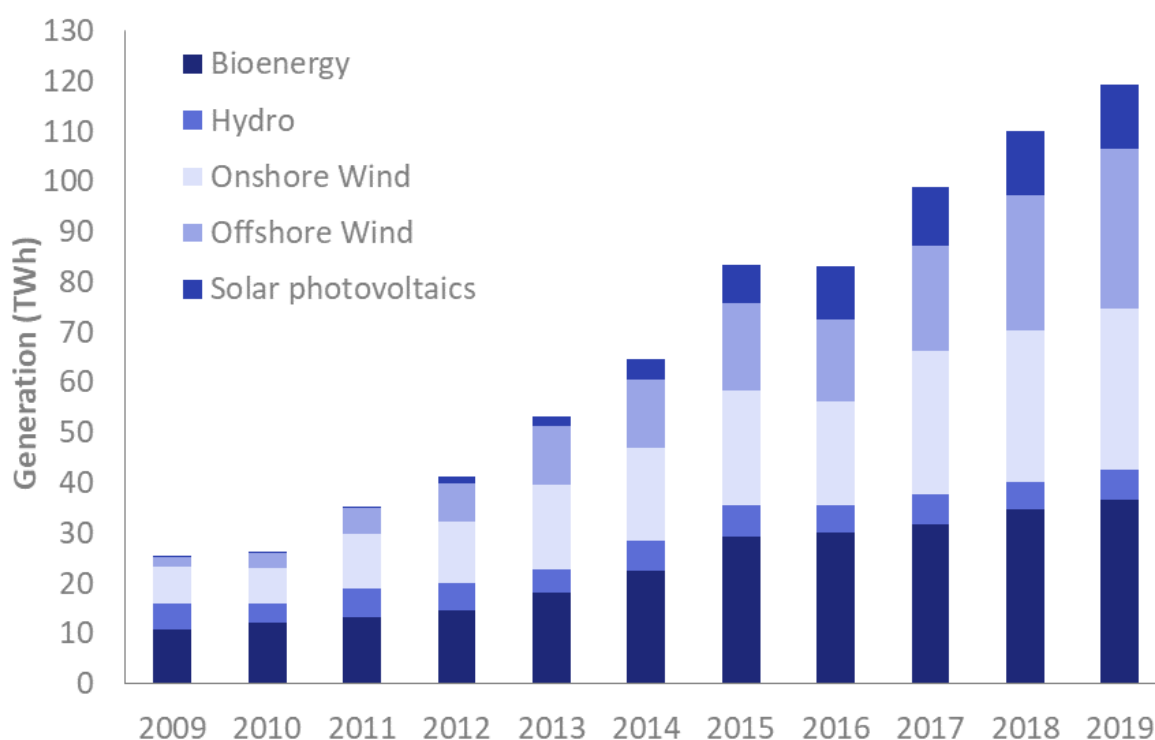
For more information on normalisation, and the various measures of renewable electricity's shares, please see the June 2018 special feature article "Renewable energy in 2017", at:

[www.gov.uk/government/statistics/energy-trends-june-2018-special-feature-article-renewable-energy-in-2017](http://www.gov.uk/government/statistics/energy-trends-june-2018-special-feature-article-renewable-energy-in-2017)

In 2019 Q4 saw an increase in the share of electricity generation compared to 37.4 per cent compared to 36.8 per cent in 2018 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](http://www.gov.uk/government/statistics/electricity-section-5-energy-trends).

Overall quarterly electricity generation was 86.8 TWh in 2019 Q4, down by 0.8 per cent on the same quarter in 2018. A small amount of the increase in renewables share can be attributed to the continued drop in non-renewable electricity generation.

**Chart 6.1 Renewables' share of electricity generation – 2019 Q4** ([Table 6.1](#))

In 2019, record generation was seen in both onshore and offshore wind generation. This was largely due to new capacity coming online. Capacity at Hornsea gradually increased over the year and stood at 1218 MW by the end of 2019, making it the largest offshore wind farm in the world.

2019 also saw record electricity generation from bioenergy at 36.6 TWh, 5.2 per cent greater than the 34.8 TWh generated in 2018. Generation was boosted by Lynemouth power station reopening as a biomass fuelled plant in late 2018.

Hydro generation was up by 8.5 per cent on 2018 which had been a relatively low year. Generation was at a similar level to that of 2017 (6.0 TWh compared to 5.9 TWh).

In 2019 12.7 TWh of electricity was generated from solar, down from 12.9 TWh in 2018, a fall of 1.4 per cent. Average sunlight hours were down on 2018 which had been a record breaking year for solar generation.

Offshore wind overtook onshore wind generation in the previous quarter and has continued to have the greatest share in Q4. Both onshore and offshore wind each generated 9.9 per cent of total energy in 2019, with onshore wind generating 0.3 TWh more than offshore wind for the year.

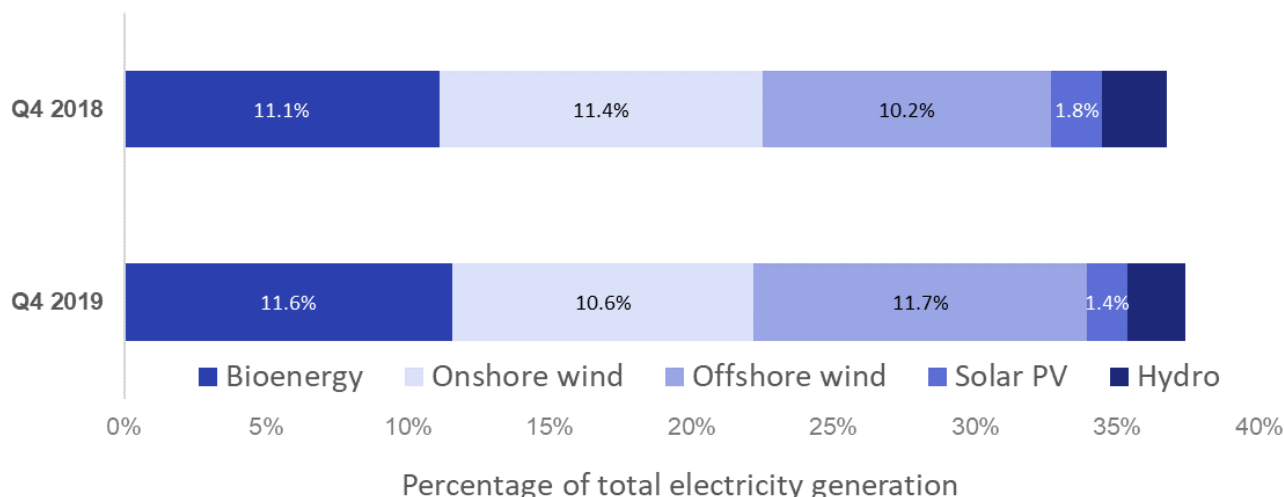
Bioenergy is the next most significant component of renewable generation at 11.3 per cent for 2019. Solar PV accounted for just 1.4 per cent of renewable generation this quarter as average sunlight hours were down on the fourth quarter of 2018. Solar PV generation varies significantly by season and accounted for 3.9 per cent of total 2019 electricity generation.

Total electricity generated from renewables in 2019 Q4 was 32.5 TWh. This is a new quarterly record, narrowly exceeding the previous record of 32.2 TWh set in 2018 Q4 by 0.9 per cent.

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](http://www.gov.uk/government/statistics/electricity-section-5-energy-trends).

## Renewables

**Chart 6.2 Renewable electricity generation (Table 6.1)**



Renewables' share of electricity generation increased from 36.8 per cent in 2018 Q4 to 37.4 per cent in the final quarter of 2019 leading to an overall share for the year at 36.9 per cent.

In 2019 Q4, both offshore wind and bioenergy<sup>1</sup> each exceeded 10 TWh for the first time. Offshore wind was the largest component of renewable generation at 31.4 per cent (10.2 TWh), increasing by 14.5 per cent compared to Q4 of 2018. In contrast, onshore wind generation decreased by 7.5 per cent to 9.2 TWh and was 28.4 per cent of total renewable generation. Average wind speeds in 2019 Q4 were 0.8 knots below 2018 Q4, causing the drop in onshore wind generation, whilst offshore wind increased due to a large amount of additional capacity being installed.

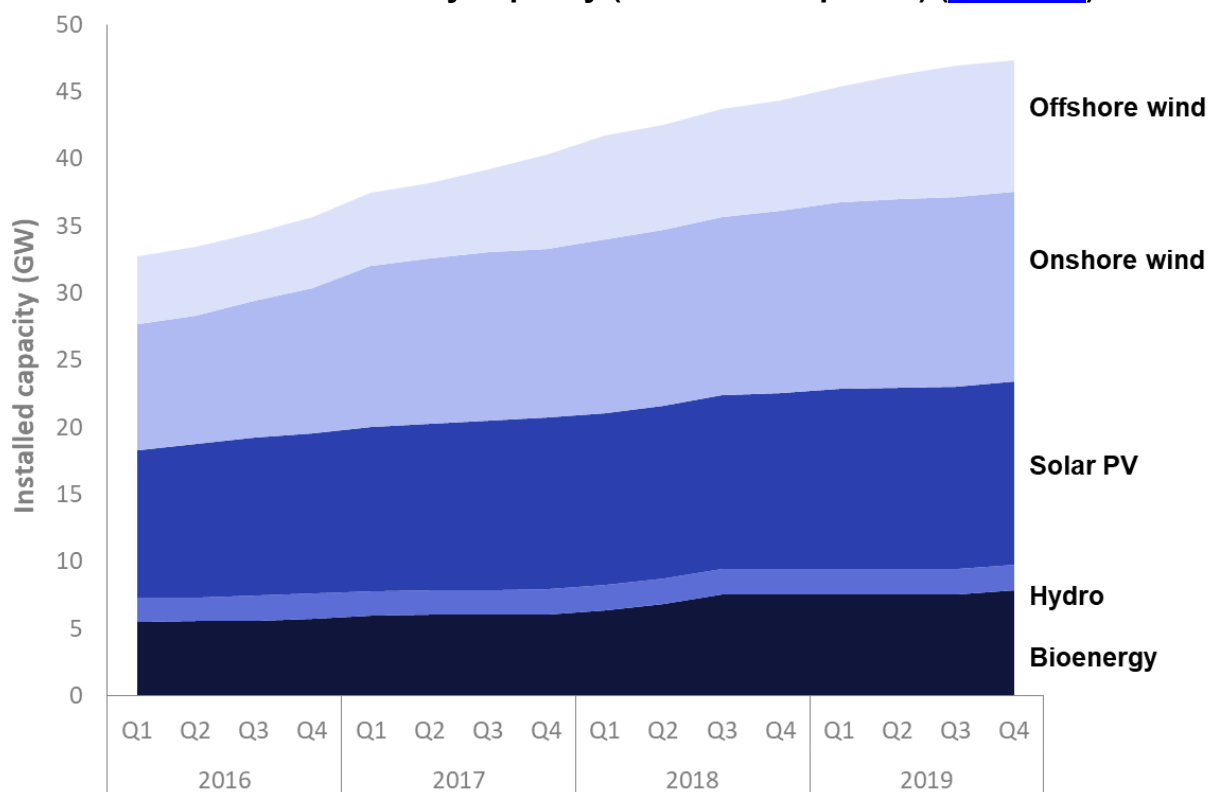
Bioenergy was the second largest component of total renewable generation at 10.0 TWh. This was an increase of 3.3 per cent compared to 2018 Q4.

Generation from solar photovoltaics decreased by 21.4 per cent (0.3 TWh) to 1.2 TWh, compared to 2018 Q4, reflecting a drop in average sunlight hours of a similar scale (25.8 per cent).

Hydro generation fell to 1.8 TWh, decreasing by 11 per cent on the same quarter of 2018; average rainfall (in the main hydro catchment areas) was below the long term mean with November having a particularly low level of rainfall, the driest in our time series (from 2001). Hydro contributed 5.5 per cent of total renewable generation.

For more information on weather trends that affect energy generation and demand please see consult the tables in Energy Trends section 7: [www.gov.uk/government/statistics/energy-trends-section-7-weather](http://www.gov.uk/government/statistics/energy-trends-section-7-weather)

<sup>1</sup> Bioenergy consists of: plant biomass, animal biomass, biodegradable municipal solid waste, landfill gas, sewage gas, anaerobic digestion and co-firing (generation only)

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

At the end of 2019, the UK's renewable electricity capacity totalled 47.4 GW, an increase of 6.9 per cent (3.0 GW) on that installed at the end of 2018. This is the smallest year on year capacity increase since 2010. Capacity was 0.9 per cent (0.4 GW) above the previous quarter.

At the end of 2019, onshore wind at 14.2 GW represented 29.9 per cent of all renewable capacity, dipping below 30 per cent for the first time since 2016 but remaining the highest share of total renewable capacity. This was followed by solar PV (28.7 per cent), offshore wind (20.7 per cent) and bioenergy (16.7 per cent).<sup>2</sup>

Compared with the end of 2018, the largest change in capacity was for offshore wind which increased by 1.6 GW (21 per cent). Two large offshore wind farms Beatrice (Scotland) and Hornsea (England) extended their total capacity to 588 MW and 1211 MW, respectively. New onshore capacity included Dorenell (177 MW) and Kype Muir (83 MW) in Scotland.

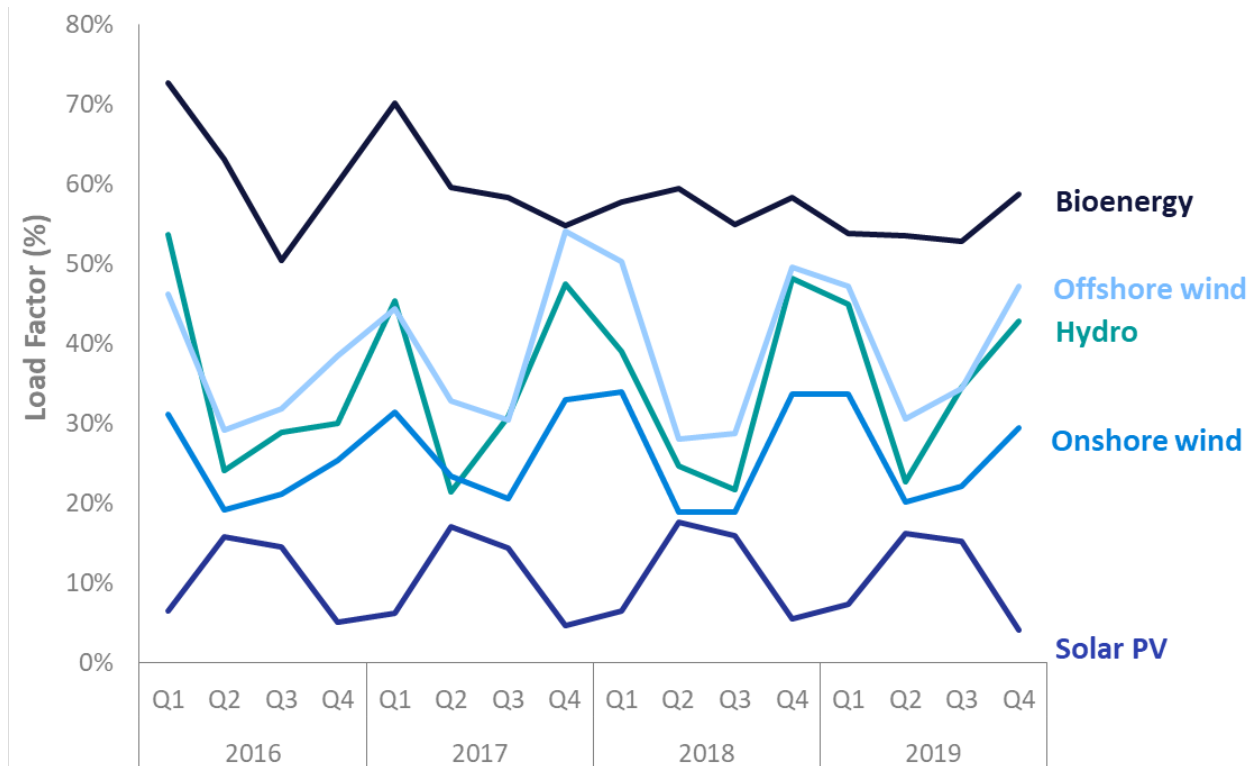
Bioenergy capacity increased by 0.3 GW to 7.9 GW in total which was an increase of 4.6 per cent from the capacity at the end of 2018.

<sup>2</sup> 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 sub 50 kW installations commissioned, and registered on the Microgeneration Certification Scheme (MCS). In addition, the solar PV figures will also include installations awaiting accreditation when FITs closed at the end of March 2019. However, the figures presented here and in ET 6.1 do not currently include unsubsidised solar installations below 1MW capacity that are not registered on the MCS. We are reviewing data sources to improve coverage.

## Renewables

**Chart 6.4 Renewable electricity load factors (Table 6.1)**

Load factors are calculated as electricity generated by a technology as a proportion of maximum potential generation over the period, given the installed capacity.



At 29.7 per cent, the overall load factor for renewables was at the same level to 2018 and 2017. Load factors were broadly stable for onshore and offshore wind and solar PV. The load factor for plant biomass in 2019 decreased by 8.2 percentage points to 62, this was largely affected by generation at a large plant being relatively low compared to the total capacity. However, the load factors for hydro and other forms of bioenergy increased.

At 31.2 per cent, the average load factor for all renewables was 1.9 percentage points lower than the last quarter of 2018. This included a reduction for all renewable technologies which are dependent on weather conditions (onshore wind, offshore wind, solar PV and hydro).

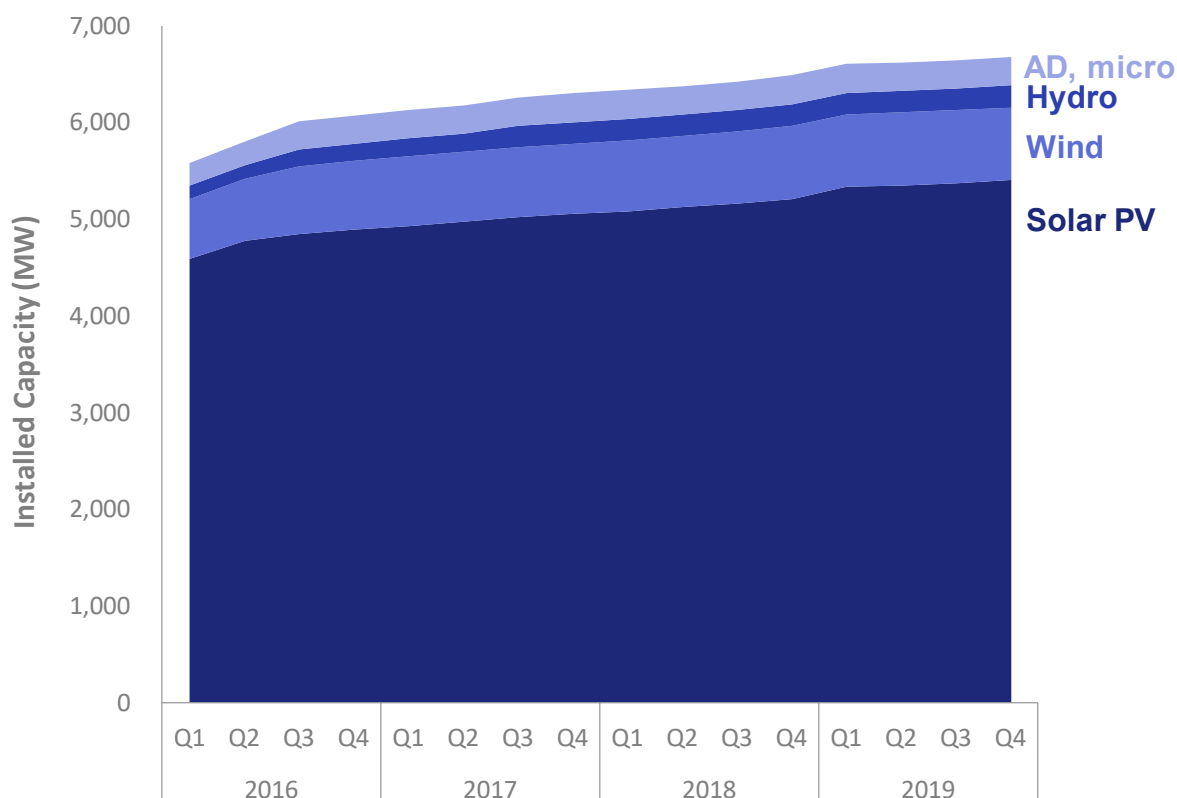
In 2019 Q4, onshore wind's load factor decreased by 4.2 percentage points to 29.5 per cent. Offshore wind's load factor decreased at a lower rate, by 2.4 percentage points to 47.2 per cent in 2018 Q4. Load factors are affected both by wind conditions, which can differ between onshore and offshore sites, as well as the timing that new capacity comes online<sup>3</sup>.

Hydro's load factor in 2019 Q4 decreased by 5.5 percentage points, driven by a decrease in average rainfall in the quarter of around 13 per cent.

Solar PV saw the lowest load factors since 2015 at 4.2 per cent, a decrease of 1.4 percentage points from 2018 Q4. A modest decrease of 0.5 percentage points was seen for 2019 overall.

Bioenergy was the only technology group to see an increased load factor in the current quarter compared to the previous year, rising from 58.3 to 58.8 per cent. The load factor for Plant biomass increased from 69.3 per cent to 69.6 per cent.

<sup>3</sup> 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)**

The Feed in Tariff (FiT) scheme<sup>4</sup> closed to new entrants at the end of March 2019. BEIS continues to monitor small scale generation using the Central FiTs Register as well as records of installations that register with the Micro Generation Certification Scheme (MCS) and the Renewable Energy Planning Database (REPD). The statistics published here do not currently include unsubsidised installations below 1MW capacity that are not registered on the MCS database. We are reviewing data sources to improve coverage.

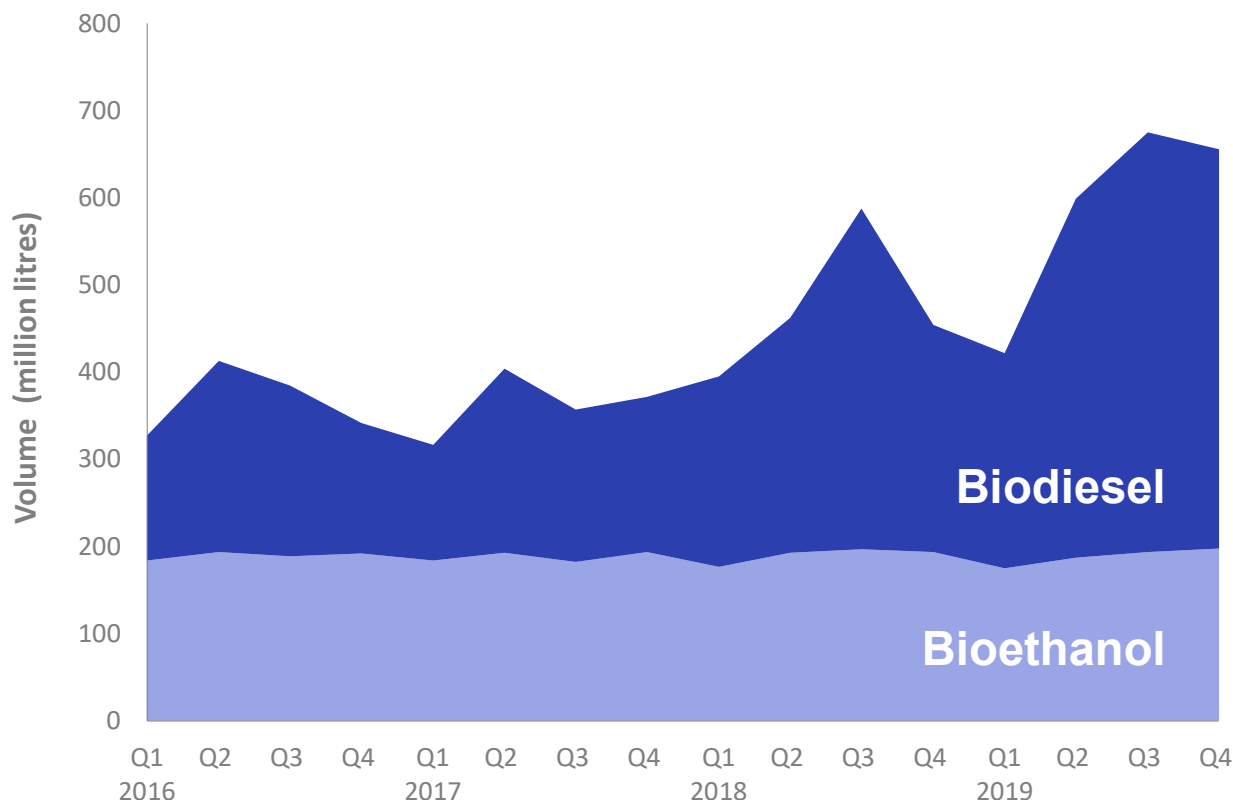
There were over 1.01 million small scale installations (less than 5 MW) installed at the end of 2019, with a total capacity of 6,677 MW. This accounts for 14 per cent of total renewable capacity.

Solar photovoltaics (PVs) represents a significant majority of small scale installations and installed small scale capacity, with respectively 99 per cent and 81 per cent of the total. 931,000 of these installations are sub 4 kW retrofitted solar schemes. These account for nearly 40 per cent of total small scale capacity.

More statistics on small scale renewable electricity generation and Feed in Tariffs can be found at: [www.gov.uk/government/collections/feed-in-tariff-statistics](http://www.gov.uk/government/collections/feed-in-tariff-statistics)

Following the closure of the FIT scheme to new installations, government laid legislation in June 2019 to introduce a new supplier-led smart export guarantee (SEG) in Great Britain from 1 January 2020. Under the SEG, licensed electricity suppliers (with 150,000 domestic customers or more) are required to offer small-scale low-carbon generators a price per kWh for electricity exported to the grid. Further information on the SEG is available at: [www.gov.uk/government/consultations/the-future-for-small-scale-low-carbon-generation](http://www.gov.uk/government/consultations/the-future-for-small-scale-low-carbon-generation)

<sup>4</sup> Data are for schemes accredited under the Microgeneration Certification Scheme (MCS) and ROOFIT, which are prerequisites 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 2019, total biofuels increased by 24 per cent compared to 2018. The final three quarters of 2019 saw the three highest totals for quarterly biofuel consumption. The Renewable Transport Fuel Obligation (RTFO) requires fuel producers to produce a given percentage of their total from renewable bio sources. The obligation increased from 7.25 to 8.5 per cent between 2018 and 2019 and will as part of a gradual increase towards 12.4 per cent by 2032. The annual increase between 2019 and 2018 was driven primarily by biodiesel. Bioethanol saw a modest 1 per cent increase compared to a 40 per cent increase in biodiesel.

The total biofuel consumption in 2019 was greater than 5 per cent of all transport fuel consumption for the first time. This broke the record set in 2018 of 4 per cent.

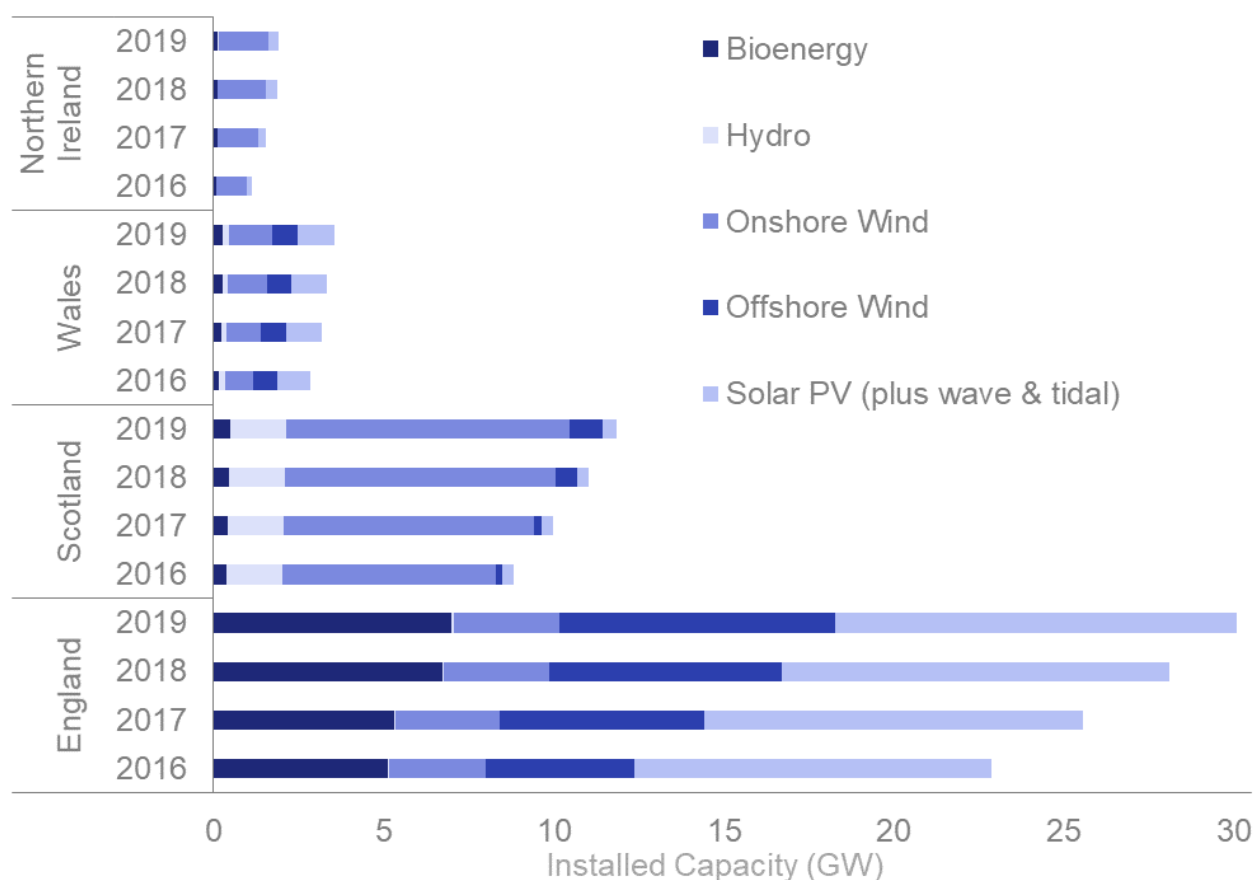
In the final quarter of 2019, an estimated 655 million litres of liquid biofuels were consumed in transport, an increase of 44 per cent on the total of 454 million litres in the final quarter of 2018.

Bioethanol consumption increased by 1.7 per cent from 194 million litres in the final quarter of 2018 to 197 million litres. Biodiesel consumption increased by 76 per cent to 458 million litres in this quarter compared to 260 million litres in same quarter in 2018.

Bioethanol represented 30 per cent of biofuels consumption, with biodiesel accounting for the remaining 70 per cent for the quarter.

In the final quarter of 2019, bioethanol accounted for 4.7 per cent of motor spirit increasing by 0.1 percentage point. Biodiesel represented 6.0 per cent of diesel (DERV) consumption, an increase of 1.6 percentage points on this period last year. Their combined contribution increased by 1.7 percentage points to 5.5 per cent.



**Chart 6.7 Renewable electricity capacity, by UK country**

At the end of 2019, England's renewable electricity capacity was 30.1 GW, an increase of 7.1 per cent (2.0 GW) of capacity at the end of 2018, with offshore wind (up 1.2 GW), Solar (up 0.4 GW) and bioenergy (up 0.3 GW) being the main contributors to this increase.

Scotland's capacity was 11.8 GW, increasing by 7.3 per cent (0.8 GW) on last year, 93 per cent of this increase was due to additional wind capacity, split between onshore and offshore installations.

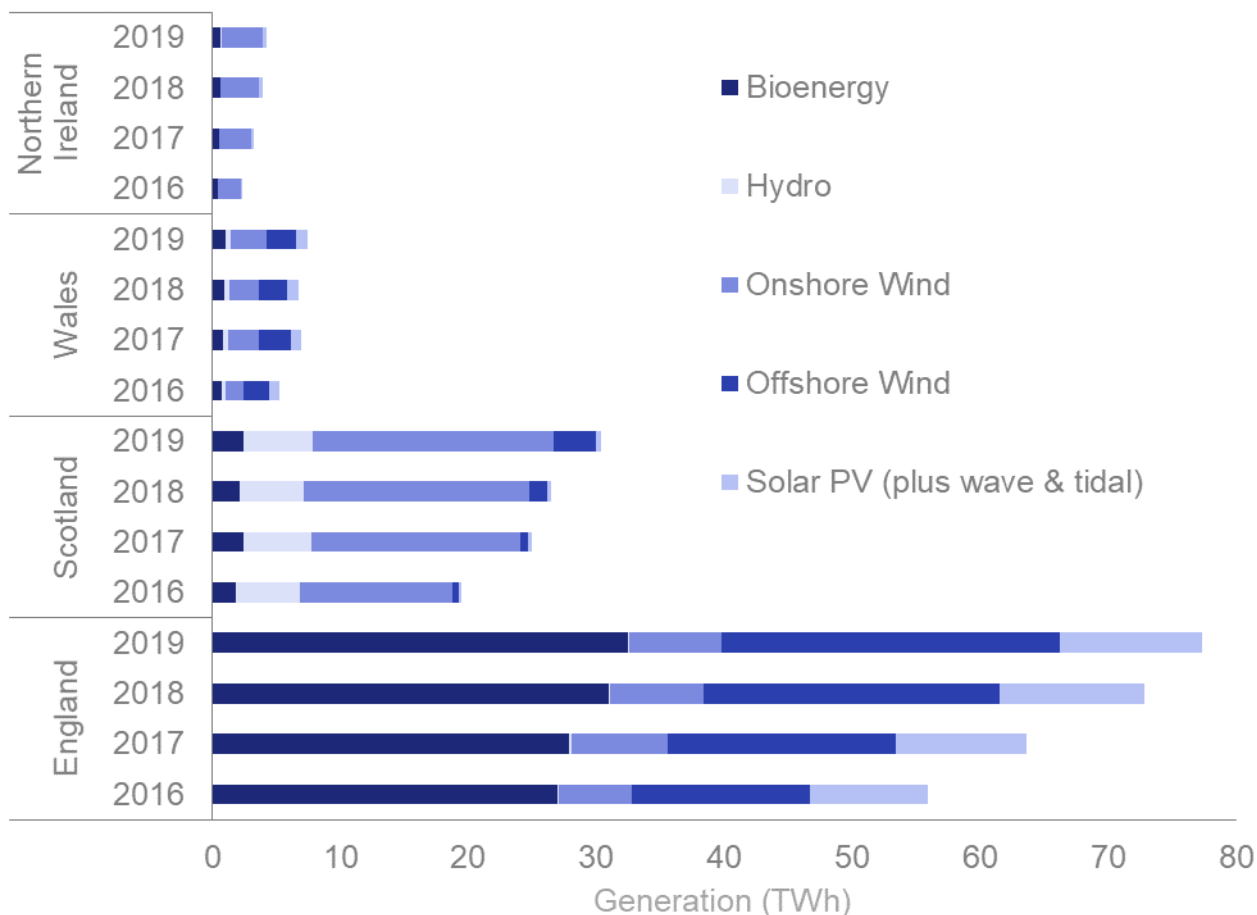
Wales's capacity was 3.6 GW, an increase of 6.2 per cent (0.2 GW) on the capacity at the end of 2018. Over two thirds of this increase was in onshore wind.

Northern Ireland's capacity increased to 1.91 GW from 1.86 GW, an increase of 2.7 per cent (0.05 GW) on the previous year, nearly all of this increase was attributable to onshore wind farms.

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 7.5 per cent and Northern Ireland's stood at 4.0 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](http://www.gov.uk/government/statistics/energy-trends-section-6-renewables)

**Chart 6.8 Renewable electricity generation, by UK country**



In 2019, renewable electricity generation in England was 77.0 TWh, an increase of 5.8 per cent (4.2 TWh) on 2018. Of this extra generation, 3.1 TWh came from offshore wind, due to increased capacity.

Generation in Scotland was 30.5 TWh, an increase of 15 per cent (4.1 TWh) on 2018; 2.0 TWh of this additional generation was from offshore wind and a further 1.4 TWh was from onshore wind.

Generation in Wales was 7.6 TWh, an increase of 12 per cent (0.8 TWh) on 2018. Most of this change (74 per cent) was due to increases to onshore wind.

Generation in Northern Ireland was 4.2 TWh, an increase of 5.6 per cent (0.2 TWh) on 2018, most of this increase was from wind, the remainder was from bioenergy.

In 2019, England accounted for nearly two thirds (65 per cent) of UK renewable electricity generation; Scotland's share was 26 per cent, Wales's was 6.4 per cent and Northern Ireland's 3.5 per cent.