

Section 6 - Renewables

Key results show:

Renewables' share of electricity generation was 30.1 per cent in 2018 Q1, up 3.1 percentage points on the share in 2017 Q1, reflecting increased capacity. Wind speeds were higher than last year. **(Chart 6.1)**

Renewable electricity capacity was a record 41.9 GW at the end of 2018 Q1, a 11.2 per cent increase (4.2 GW) on a year earlier, nearly half of this was due to new offshore wind capacity. There was also a 3.2 per cent increase (1.3 GW) on the previous quarter. **(Chart 6.3)**

Renewable electricity generation was a record 27.9 TWh in 2018 Q1, an increase of 10.2 per cent on the 25.3 TWh in 2017 Q1. **(Chart 6.2)**

Onshore wind increased by 2.1 TWh (27 per cent) to 9.8 TWh in 2018 Q1, offshore wind increased even more by 53 per cent to 7.9 TWh. Total wind generation increased by 38 per cent to a record 17.7 TWh; this was driven by an increase in capacity and higher wind speeds. Solar generation decreased by 8.3 per cent, from 1.6 TWh in 2017 Q1 to 1.5 TWh in 2018 Q1, despite a small increase in capacity. **(Chart 6.2)**

In 2018 Q1, just 32 MW of capacity eligible for the Feed in Tariff scheme was installed, increasing the total to 6.3 GW, across 930,891 installations. **(Chart 6.5)**

Liquid biofuels consumption provisionally rose by 30 per cent, from 317 million litres in 2017 Q1 to 411 million litres in 2018 Q1. This represented 3.7 per cent of petrol and diesel consumed in road transport. **(Chart 6.6)**

Relevant tables

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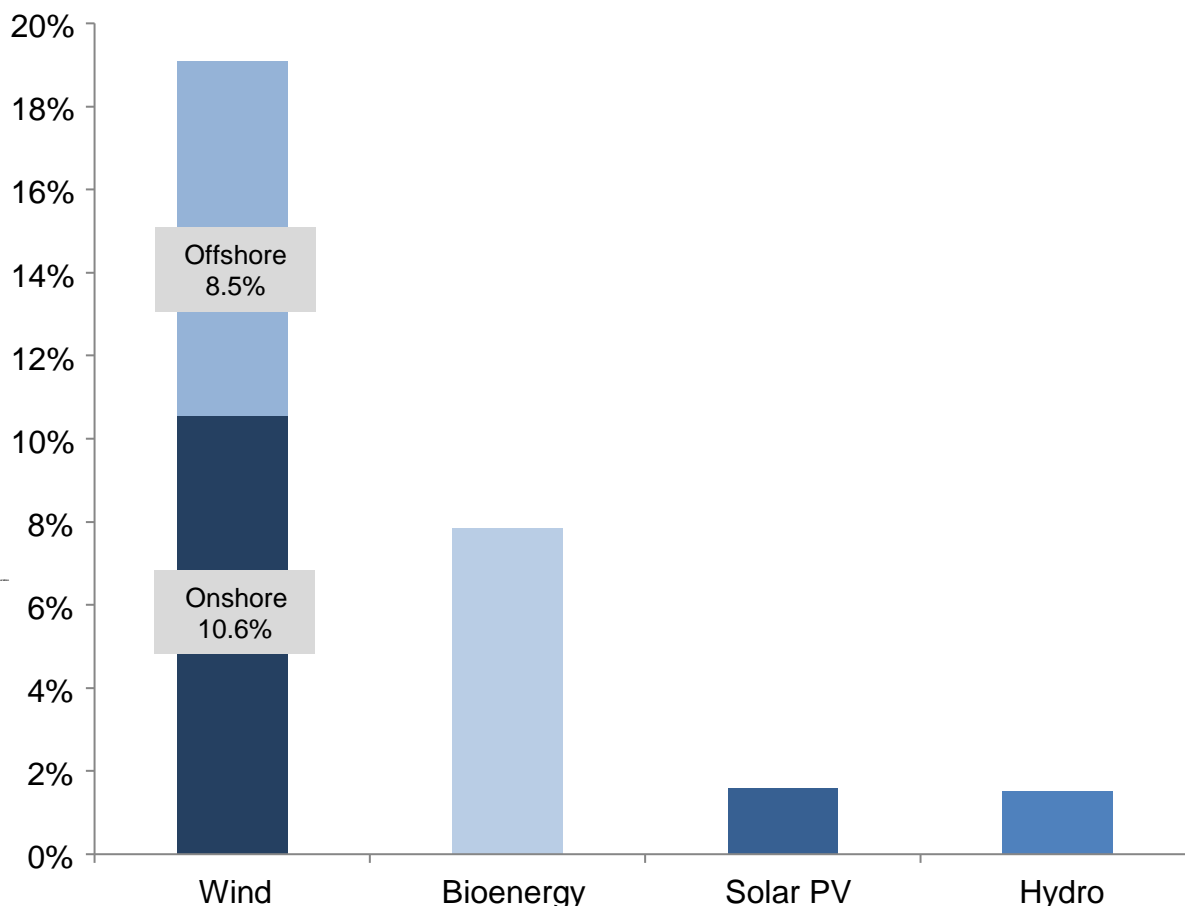
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Chart 6.1 Renewables' share of electricity generation ([Table 6.1](#))



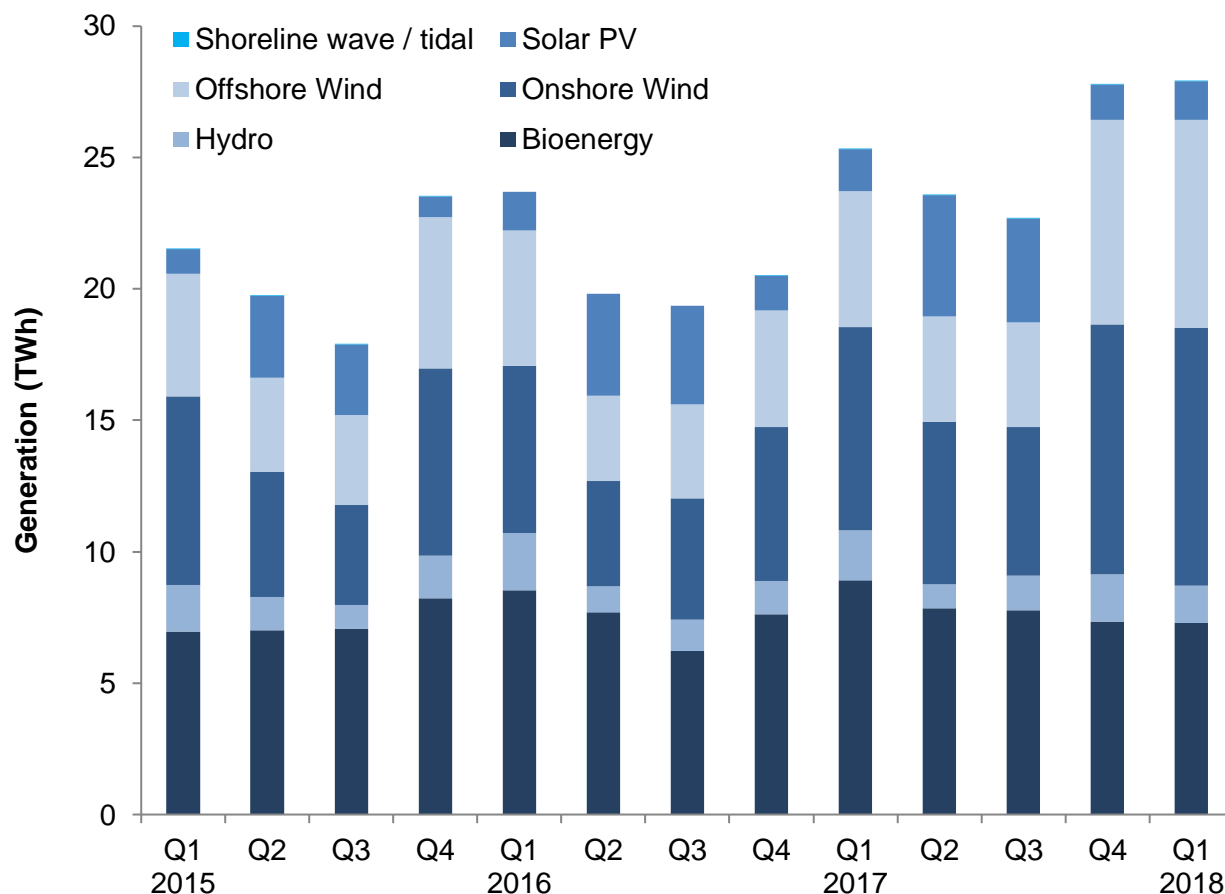
Renewables' share of electricity generation increased from 27.0 per cent in 2017 Q1 to 30.1 per cent in 2018 Q1, but this was down 0.1 percentage points on the previous quarter and 0.8 percentage points lower than 2017 Q2's record 30.8 per cent.

The increase on a year earlier reflects increased capacity, particularly in onshore and offshore wind. Increased average wind speeds and rainfall also contributed to the growth.

Total electricity generated from renewables in 2018 Q1 was up by 10 per cent on 2017 Q1, from 25.3 TWh to a new record of 27.9 TWh.

Overall electricity generation was 92.8 TWh in 2018 Q1, down 1.1 per cent on a year earlier (93.8 TWh). This small decrease in overall generation contributed to the increase in renewables' share of electricity generation.

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

Chart 6.2 Renewable electricity generation (Table 6.1)

In 2018 Q1, electricity generated from onshore wind increased by 27 per cent, from 7.7 TWh in 2017 Q1 to 9.8 TWh. In addition, generation from offshore wind increased by more than a half to 7.9 TWh. This was largely due to a large increase in offshore wind capacity, by 37 per cent. Wind speeds in 2018 Q1, at 9.8 knots, were up 0.6 knots on 2017 Q1 but in line with the long-term average - see Energy Trends table 7.2 at:

www.gov.uk/government/statistics/energy-trends-section-7-weather.

Generation from solar photovoltaics decreased by 8.3 per cent (0.1 TWh) to 1.5 TWh compared to 2017 Q1.

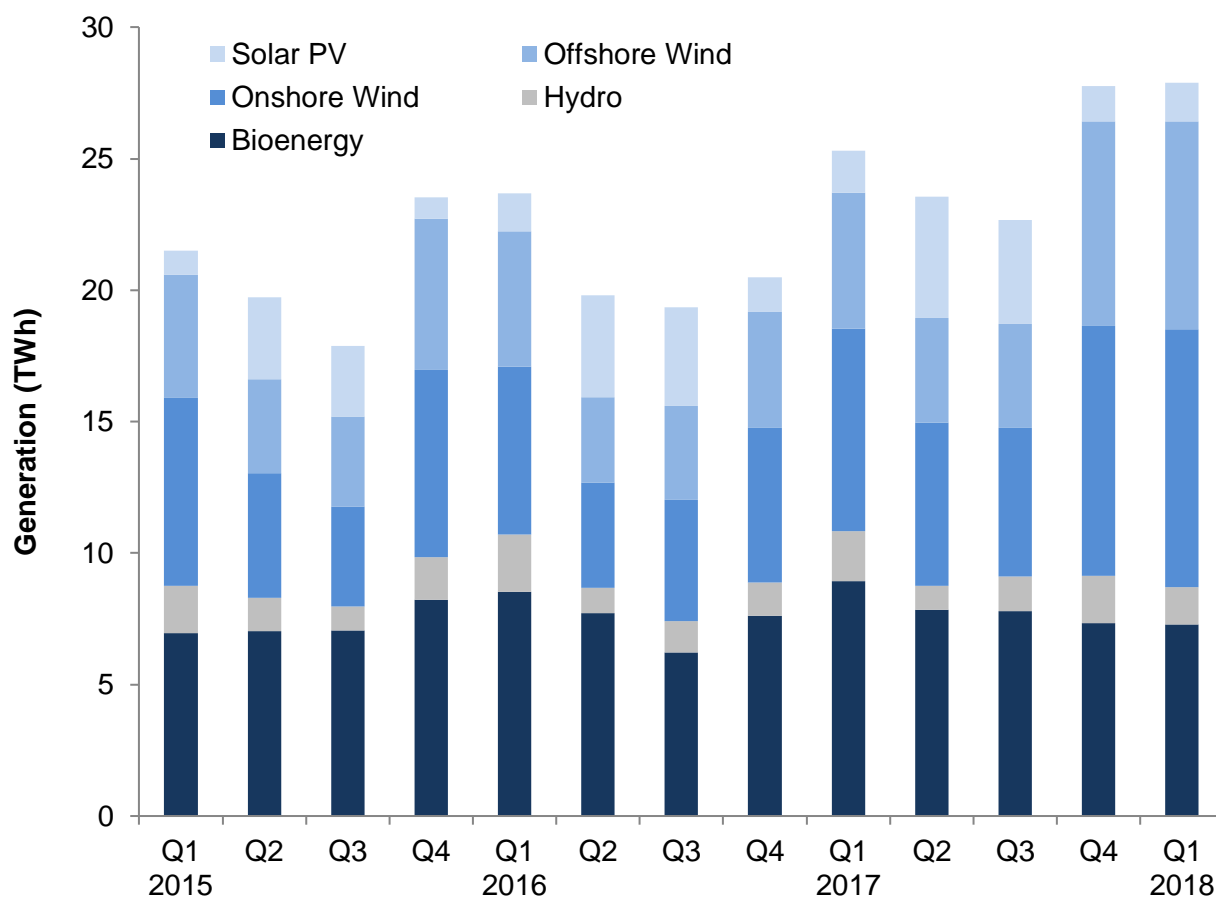
Hydro generation fell by just over a quarter on a year earlier to 1.4 TWh. Hydro generation in 2017 Q1 had been especially high. average rainfall (in the main hydro catchment areas) fell by 6 per cent during the quarter, which included a particularly dry February see Energy Trends table 7.4 at:

www.gov.uk/government/statistics/energy-trends-section-7-weather.

In 2018 Q1, generation from bioenergy¹ decreased by 18 per cent on a year earlier, from 8.9 TWh to 7.3 TWh, with decreases in generation from plant biomass, landfill gas and biodegradable waste partly offset by reduced generation from landfill gas, partly offset by an increase in generation from waste. Generation was affected by an outage at Drax. Furthermore, co-firing with fossil fuels has ceased.

Onshore wind had the largest share of generation (35 per cent) with 28 per cent from offshore wind, 26 per cent from bioenergy, 5.3 per cent from solar PV. And 5.0 per cent from hydro.

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

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

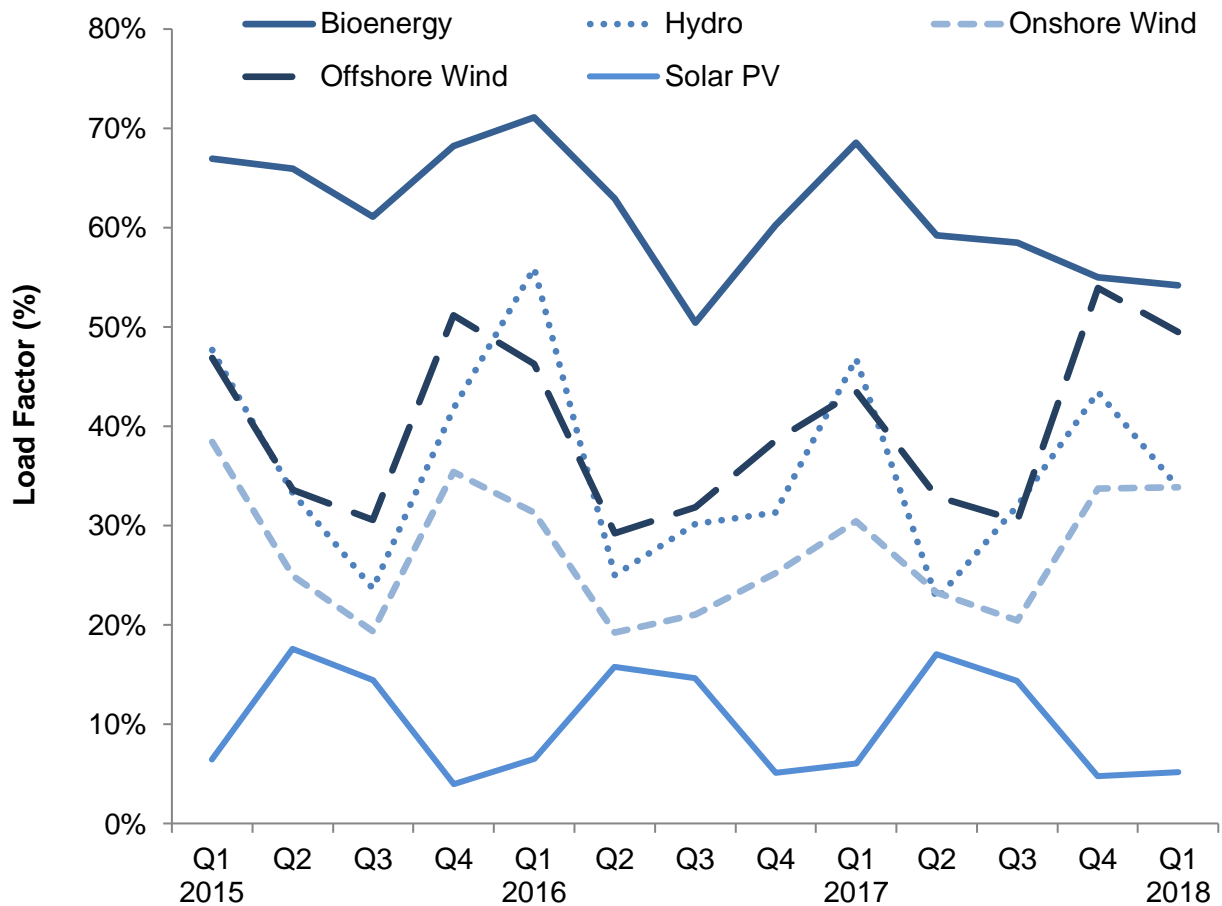
At the end of 2018 Q1, the UK's renewable electricity capacity totalled 41.9 GW, an increase of 11 per cent (4.2 GW) on that installed at the end of 2017 Q1, and 3.2 per cent (1.3 GW) higher than the previous quarter.

At the end of 2018 Q1, onshore wind, at 13.4 GW, represented roughly one-third of all renewable capacity, the highest share of renewable technologies, closely followed by solar PV (31 per cent), offshore wind (18 per cent) and bioenergy (15 per cent).²

Compared with a year ago, onshore wind capacity increased by 1.3 GW (11 per cent), and offshore wind by 2.0 GW (37 per cent). Solar PV increased by 0.6 GW, with 0.3 GW of this deployed in the latest quarter.

During 2018 Q1, onshore wind capacity increased by 560 MW, with the opening of 9 new sites including Brechfa Forest West (57.4 MW) in Wales and Sanquhar Community Windfarm (31 MW) in Scotland, as well as additional capacity in some existing sites. Offshore wind capacity increased by 506 MW.

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.

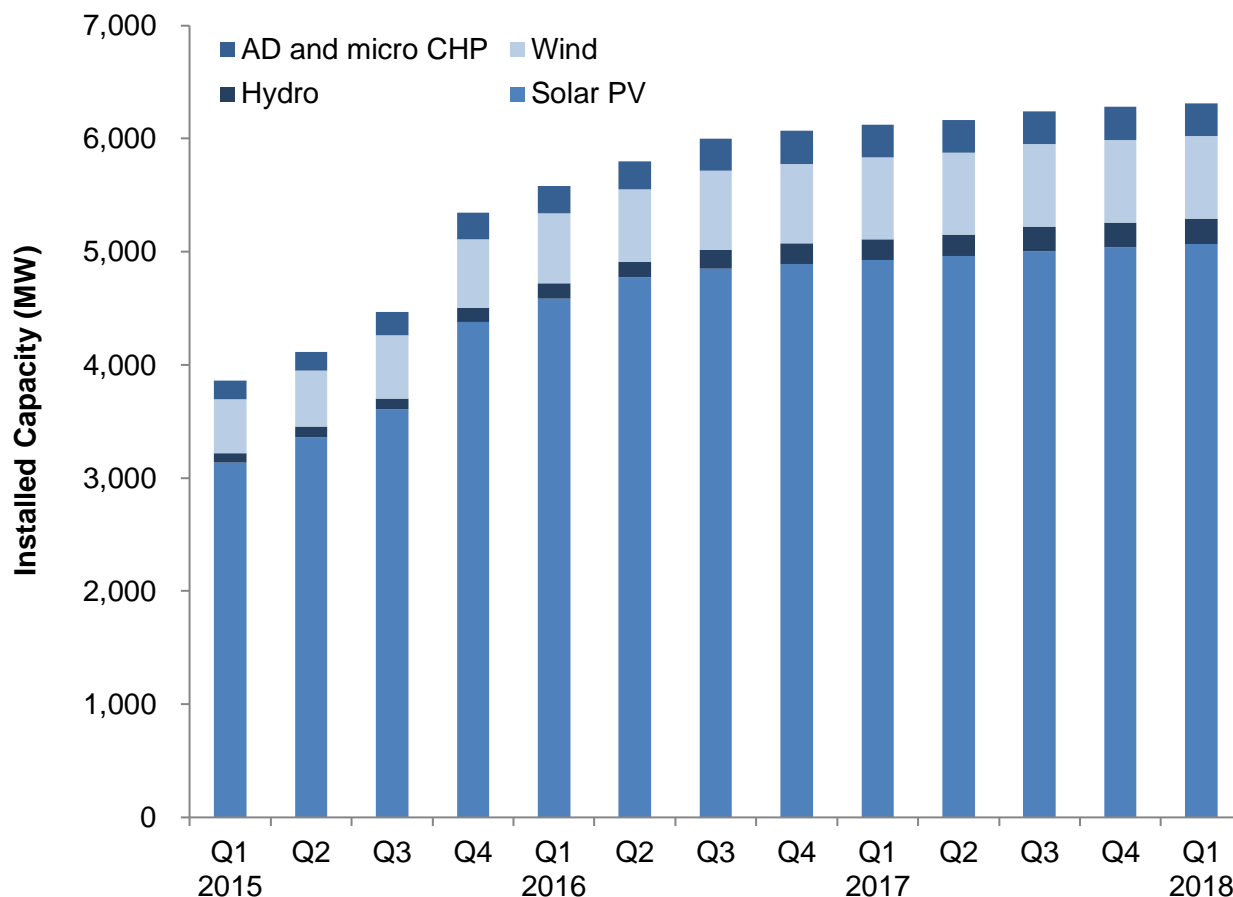
Chart 6.4 Renewable electricity load factors (Table 6.1)

In 2018 Q1, onshore wind's load factor rose by 2.8 percentage points, from 31.1 per cent in 2017 Q1 to 33.9 per cent, helped by higher wind speeds. Offshore wind's load factor increased by 5.0 percentage points, from 44.5 per cent in 2017 Q1³, however, this load factor was lower than the most recent quarter - 2017 Q4, where it was 53.9 per cent. The load factor for onshore wind remained stable with the previous quarter.

Hydro's load factor in 2018 Q1 fell by 13 percentage points, from 46.8 per cent in 2017 Q1 to 33.9 per cent, despite an increase in average rainfall. Load factors had been high in 2017 despite it being a drier year than 2016. Compared with the most recent quarter, 2014 Q4, hydro's load factor in 2018 Q1 was down by 9.6 percentage points, from 30.1 as average rainfall fell by 13 per cent.

For bioenergy, the load factor in 2018 Q1 was 54 per cent, down 14 percentage points on the record 68.5 per cent in 2017 Q1, but down just 0.8 percentage points on 2017 Q4.

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 Q1, 6.3 GW of capacity was installed and eligible for the GB Feed in Tariff (FiT) scheme⁴, a 3.1 per cent increase on that at the end of 2017 Q1.

In terms of number of installations, at the end of 2018 Q1, there were 930,891 eligible for the FiT scheme, a 0.8 per cent increase on the 923,052 confirmed at the end of the previous quarter, and 3.8 per cent higher than the 896,634 schemes confirmed at the end of 2017 Q1.

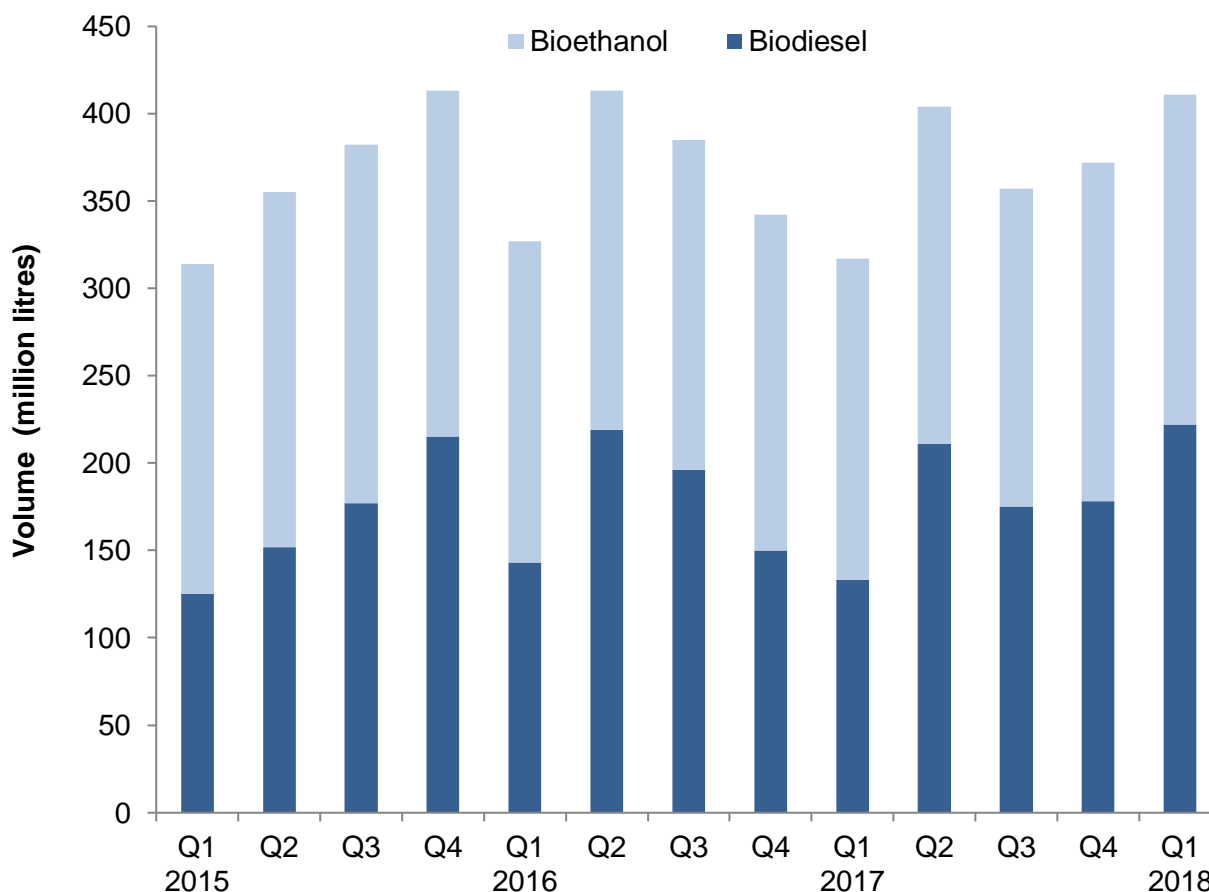
Solar photovoltaics (PVs) represent the majority of both installations and installed capacity confirmed on FiTs, with, respectively, 99 per cent and 80 per cent of the total. The majority of PV installations are sub-4 kW retrofitted schemes, which increased by 30,000 installations (66 MW) from 2017 Q1 to bring the total to 865,147 (2,485 MW) at the end of 2018 Q1.

Renewable installations confirmed on FiTs (all except MicroCHP) 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 Q1⁵, 411 million litres of liquid biofuels were consumed in transport, an increase of 30 per cent on the total of 317 million litres in 2017 Q1.

Bioethanol consumption increased by 2.5 per cent, from 184 million litres in 2017 Q1 to 189 million litres in 2018 Q1. Biodiesel consumption increased by 67 per cent, from 133 million litres in 2017 Q1 to 222 million litres in Q1 2018 Q1.

Bioethanol represented 46 per cent of biofuels consumption, with biodiesel taking the other 54 per cent.

In the first quarter of 2018, bioethanol accounted for 4.7 per cent of motor spirit, and biodiesel 3.0 per cent of diesel (DERV). Their combined contribution was 3.6 per cent, showing increases for bioethanol and biodiesel and an increase for their combined contribution on a year earlier.

⁵ Data for the latest quarter are provisional, due to unavailability of the last months' data at the time of compilation.

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Table 6.1. Renewable electricity capacity and generation

	2016	2017 p	per cent change	2016 1st quarter	2016 2nd quarter	2016 3rd quarter	2016 4th quarter	2017 1st quarter	2017 2nd quarter	2017 3rd quarter	2017 4th quarter	2018 1st quarter p	per cent change ¹¹
Cumulative Installed Capacity ¹													MW
Onshore Wind	10,880	12,847	+18.1	9,445	9,600	10,236	10,880	12,103r	12,345r	12,682r	12,847	13,407	10.8
Offshore Wind	5,293	6,988	+32.0	5,095	5,095	5,095	5,293	5,455	5,653	6,101	6,988	7,494	37.4
Shoreline wave / tidal	13	18	+36.4	8	8	8	13	18r	18r	18r	18	18	-
Solar photovoltaics	11,912	12,776	+7.3	10,994	11,467	11,748	11,912	12,263r	12,442r	12,568r	12,776	12,910	5.3
Small scale Hydro	359	396	+10.4	307	311	343	359	361r	366r	406r	396	406	12.2
Large scale Hydro	1,477	1,479	+0.1	1,477	1,477	1,477	1,477	1,479	1,479	1,479	1,479	1,479	-
Landfill gas	1,062	1,066	+0.4	1,062	1,062	1,062	1,062	1,066r	1,066r	1,066r	1,066	1,066	-
Sewage sludge digestion	257	245	-4.6	257	257	257	257	245r	245r	245r	245	245	-
Energy from waste	1,028	1,091	+6.1	929	939	988	1,028	1,077	1,077	1,077	1,091	1,118	3.8
Animal Biomass (non-AD) ²	129	129	-	129	129	129	129	129	129	129	129	129	-
Anaerobic Digestion	426	460	+7.9	362	368	385	426	445r	448r	449r	460	422	-5.1
Plant Biomass ³	2,852	3,055	+7.1	2,788	2,788	2,798	2,852	3,003r	3,055r	3,055r	3,055	3,161	5.3
Total	35,690	40,551	+13.6	32,852	33,502	34,526	35,690	37,645r	38,324r	39,276r	40,551	41,855	11.2
Co-firing ⁴	13	9	-34.5	13	13	13	13	9	9	9	9	10	11.4
Generation ⁵													GWh
Onshore Wind ⁶	20,857	29,088	+39.5	6,380	3,996	4,604	5,877	7,723r	6,204r	5,655r	9,506	9,814	27.1
Offshore Wind ^{6, 7}	16,406	20,916	+27.5	5,150	3,253	3,584	4,419	5,166r	3,993r	3,961r	7,795	7,913	53.2
Shoreline wave / tidal ⁶	0	4	(+)	-	-	-	0	0	0r	2r	1	2	(+)
Solar photovoltaics ⁶	10,411	11,525	+10.7	1,462	3,868	3,747	1,333	1,610r	4,606r	3,972r	1,336	1,476	-8.3
Hydro ⁶	5,617	5,928	+5.5	2,175	977	1,201	1,264	1,898r	909r	1,317r	1,406	1,406	-25.9
Landfill gas ⁶	4,703	4,284	-8.9	1,218	1,171	1,158	1,156	1,093r	1,055r	1,065r	1,071	1,000	-8.5
Sewage sludge digestion ⁶	950	967	+1.8	236	251	229	234	241r	247r	235r	244	224	-7.0
Energy from waste ⁶	2,740	3,386	+23.6	726	626	678	710	848r	823r	871r	844	899	6.1
Co-firing with fossil fuels	117	54	-54.1	51	15	5	47	52	0	1	-	-	-100.0
Animal Biomass (non-AD) ^{2, 6}	650	649	-0.2	171	165	141	173	172	164r	141r	173	191	11.3
Anaerobic Digestion	2,082	2,470	+18.6	489	500	531	561	601r	619r	629r	621	452	-24.9
Plant Biomass ^{3, 6}	18,822	20,059	+6.6	5,636	4,979	3,479	4,728	5,916r	4,933r	4,838r	4,373	4,527	-23.5
Total	83,354	99,330	+19.2	23,695	19,800	19,356	20,503	25,321r	23,554r	22,687r	27,768	27,904	10.2
Non-biodegradable wastes ⁸	2,742	3,485	+27.1	728	626	678	710	809r	859r	911r	905	906	12.0
Load Factors ¹⁰													
Onshore Wind	23.6%	28.0%		31.3%	19.2%	21.0%	25.2%	31.1%r	23.2%r	20.5%r	33.7%	33.9%	
Offshore Wind	36.0%	38.9%		46.3%	29.2%	31.9%	38.5%	44.5%r	32.9%r	30.5%r	49.5%	49.5%	
Solar photovoltaics	11.0%	10.7%		6.5%	15.8%	14.6%	5.1%	6.2%r	17.1%r	14.4%r	4.8%	5.2%	
Hydro	35.4%	36.5%		55.9%	25.0%	30.2%	31.3%	47.8%r	22.6%r	32.0%r	43.5%	33.9%	
Landfill gas	50.4%	46.0%		52.5%	50.5%	49.4%	49.3%	47.8%r	45.3%r	45.2%r	45.5%	42.5%	
Sewage sludge digestion	44.3%	43.9%		44.3%	44.7%	40.3%	41.3%	44.3%r	46.1%r	43.3%r	45.1%	41.3%	
Energy from waste	31.9%	36.5%		35.8%	30.7%	31.8%	31.9%	37.3%r	35.0%r	36.6%r	35.3%	36.9%	
Animal Biomass (non-AD)	61.7%	57.3%		65.4%	58.5%	49.2%	60.7%	61.4%	58.1%r	49.2%r	60.6%	66.9%	
Anaerobic Digestion	62.2%	63.6%		64.2%	62.7%	64.0%	62.7%	63.9%r	63.5%r	63.6%r	61.9%	46.4%	
Plant Biomass	78.5%	77.5%		95.7%	81.8%	56.4%	75.8%	93.6%r	74.6%r	71.7%r	64.8%	66.0%	
Total (excluding co-firing and non-biodegradable wastes)	28.4%	29.7%		33.9%	27.3%	25.8%	26.4%	31.9%r	28.4%r	26.5%r	31.5%	30.7%	
Renewable share of electricity generation (%)													
Onshore wind	6.1%	8.6%		6.9%	5.1%	6.1%	6.3%	8.2%	8.0%	7.5%	10.3%	10.6%	
Offshore wind	4.8%	6.2%		5.6%	4.2%	4.7%	4.8%	5.5%	5.2%	5.2%	8.5%	8.5%	
Shoreline wave / tidal	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Solar photovoltaics	3.1%	3.4%		1.6%	6.0%	4.9%	1.4%	1.7%	6.0%	5.3%	1.4%	1.6%	
Hydro	1.7%	1.8%		2.4%	1.3%	1.6%	1.4%	2.0%	1.2%	1.2%	2.0%	1.5%	
Bioenergy	8.9%	9.4%		9.2%	9.9%	8.2%	8.2%	9.5%	10.2%	10.3%	7.9%	7.9%	
All renewables	24.6%	29.3%		25.7%	25.4%	25.5%	22.0%	27.0%	30.6%	30.0%	30.1%	30.1%	

1. Cumulative capacity at the end of the quarter/year

2. Includes the use of poultry litter and meat and bone.

3. Includes the use of straw and energy crops. Also includes high-range co-firing (>85% biomass).

4. This is the amount of fossil fuelled capacity used for co-firing of renewables based on the proportion of generation accounted for by the renewable source over the course of the year.

5. Generation figures for the latest quarter are highly provisional, particularly for the thermal renewable technologies (such as landfill gas) in the lower half of the table.

6. Actual generation figures are given where available, but otherwise are estimated using a typical load factor or the design

load factor, where known. Generation from FIT schemes is estimated this way.

7. For 2009, shoreline wave and tidal are included in offshore wind.

8. Biodegradable part only, which accounts for 50% from 2015.

9. Non-biodegradable (50%, from 2015) part of Energy from Waste, plus a small quantity of generation from waste tyres, hospital waste and general industrial waste.

10. Load factors are calculated based on installed capacity at the beginning and the end of the quarter/year. These can be influenced by the time in the period when new capacity

came online.

Load factors on an unchanged configuration basis, which consider just those sites operational throughout the year, are available annually in table DUKES 6.5, at:

<https://www.gov.uk/government/statistics/renewable-sources-of-energy-chapter-6-digest-of-united-kingdom-energy-statistics-dukex>

11. Percentage change between the most recent quarter and the same quarter a year earlier, (+) represents a positive percentage change greater than 100%.

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Table 6.2. Liquid biofuels for transport consumption

	2016	2017 p	per cent change	2016 1st quarter	2016 2nd quarter	2016 3rd Quarter	2016 4th Quarter	2017 1st Quarter	2017 2nd Quarter	2017 3rd Quarter	2017 4th Quarter	2018 1st Quarter p	per cent change ¹
Volume (million litres)													
Bioethanol	759	753	-0.8	184	194	189	192	184	193	182r	194	189	2.5%
Biodiesel	708	697	-1.6	143	219	196	150	133	211	175r	178	222	67.0%
Total biofuels for transport	1,467	1,450	-1.2	327	413	385	342	317	404	357r	372	411	29.6%
Energy (thousand toe)													
Bioethanol	428	424	-0.8	104	109	107	108	104	109	103r	109	106	2.5%
Biodiesel	582	573	-1.6	117	180	161	123	109	173	144r	146	183	67.0%
Total biofuels for transport	1,010	997	-1.2	221	289	268	231	213	282	246r	256	289	35.6%
Shares of road fuels													
Bioethanol as per cent of Motor Spirit	4.4%	4.5%		4.5%	4.4%	4.4%	4.5%	4.6%	4.5%	4.3%	4.6%	4.7%	3.7%
Biodiesel as per cent of DERV	2.4%	2.3%		2.0%	2.9%	2.6%	1.9%	1.9%	2.7%	2.3%	2.3%	3.0%	61.8%
Total biofuels as per cent of road fuels	3.1%	3.1%		2.9%	3.4%	3.2%	2.8%	2.8%	3.4%	3.0%	3.1%	3.6%	27.4%

1. Percentage change between the most recent quarter and the same quarter a year earlier.

Source: HM Revenue and Customs Hydrocarbon Oils Bulletin, available at:

www.uktradeinfo.com/Statistics/Pages/TaxAndDutybulletins.aspx

Shares of road fuels - % change on quarter in previous year

Bioethanol as per cent of Motor Spirit	-0.1%	-0.2%	-0.3%	-0.1%	0.1%	0.1%	-0.1%	0.1%	0.2%
Biodiesel as per cent of DERV	0.2%	0.8%	0.2%	-0.9%	-0.1%	-0.1%	-0.3%	0.3%	1.1%
Total biofuels as per cent of road fuels	0.0%	0.4%	0.0%	-0.7%	-0.1%	-0.1%	-0.2%	0.2%	0.8%