

Section 6 - Renewables

Key results show:

Renewables' share of electricity generation was a record 31.7 per cent in 2018 Q2, up 1.1 percentage points on the share in 2017 Q2, reflecting increased capacity as well as lower overall electricity generation. **(Chart 6.1)**

Renewable electricity generation was 24.3 TWh in 2018 Q2, an increase of 3.0 per cent on the 23.6 TWh in 2017 Q2, but 14 per cent lower than the previous quarter which had been a record for renewable electricity generation (28.2 TWh). **(Chart 6.2)**

Onshore wind generation decreased by 12 per cent (0.8 TWh). Offshore wind rose by 19 per cent (0.8 TWh), to 4.8 TWh but was still 40 per cent lower than the previous quarter when wind average speeds were much higher. The largest increase among the other technologies was for plant biomass (wood) which increased by 12 per cent (0.6 TWh) to 5.5 TWh due increased capacity. **(Chart 6.2)**

Renewable electricity capacity was 42.2 GW at the end of 2018 Q2, a 10 per cent increase (3.9 GW) on a year earlier, and a 1.4 per cent (0.6 GW) increase on the previous quarter, with over half of the annual increase coming from offshore wind. **(Chart 6.3)**

In 2018 Q2, just 37 MW of capacity eligible for the Feed in Tariff scheme was installed, increasing the total to 6.4 GW, across 939,000 installations. **(Chart 6.5)**

Liquid biofuels consumption increased by 14 per cent, from 404 million litres in 2017 Q2 to 460 million litres in 2018 Q2, boosted by a 27 per cent increase in biodiesel consumption. In 2017 Q2, liquid biofuels represented 3.8 per cent of petrol and diesel consumed in road transport, up from 3.4 per cent a year earlier. **(Chart 6.6)**

Relevant tables

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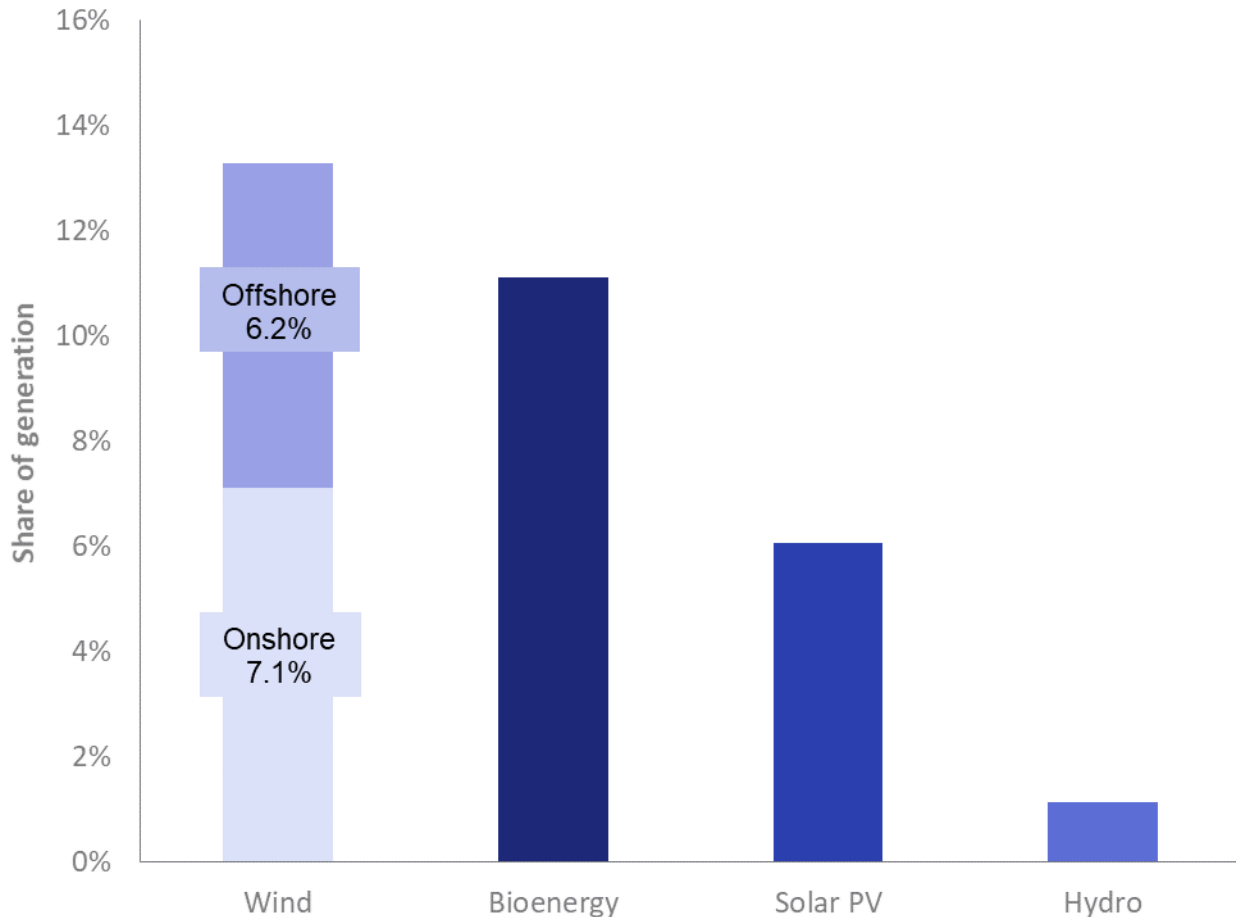
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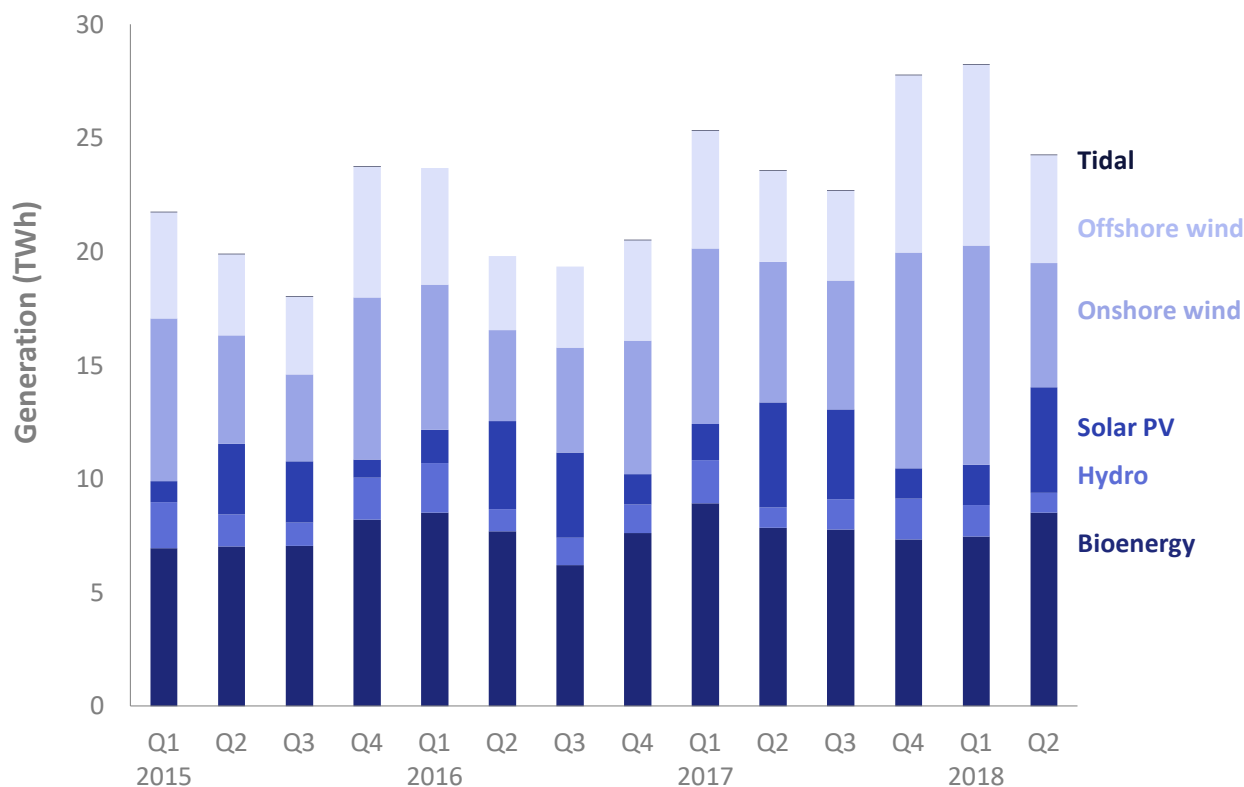
Chart 6.1 Renewables' share of electricity generation (Table 6.1)

Renewables' share of electricity generation increased to a record 31.7 per cent in 2018 Q2 from 30.6 per cent in 2017 Q2 which had previously been a record.

The increased share on a year earlier mostly reflects increased capacity, particularly in wind and solar PV, as well as lower overall generation.

Total electricity generated from renewables in 2018 Q2 was up by 0.7 TWh (3.0 per cent) on 2017 Q2, to 24.3 TWh, but remained 4.0 TWh (14 per cent) lower than previous quarter which was a record of 28.2 TWh. Despite a fall from the previous quarter, the percentage share of electricity generated from renewables increased as overall generation was much lower (by 18 per cent on the first quarter of the year).

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 Q2, electricity generated from onshore wind decreased by 12 per cent, from 6.2 TWh in 2017 Q2 to 5.5 TWh. However, generation from offshore wind was up by 19 per cent (0.8 TWh), to 4.8 TWh but was still 40 per cent lower than the previous quarter when wind average speeds were much higher. Wind speeds in 2018 Q2, at 7.6 knots, were down 0.7 knots on 2017 Q2, and lower than the long term mean - see Energy Trends table 7.2 at:

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

Generation from solar photovoltaics increased 0.9 per cent to 4.6 TWh compared to 2017 Q2 to set a new record for solar generation as a result of increased capacity and average sunlight hours per day being 0.4 hours higher than the long term mean.

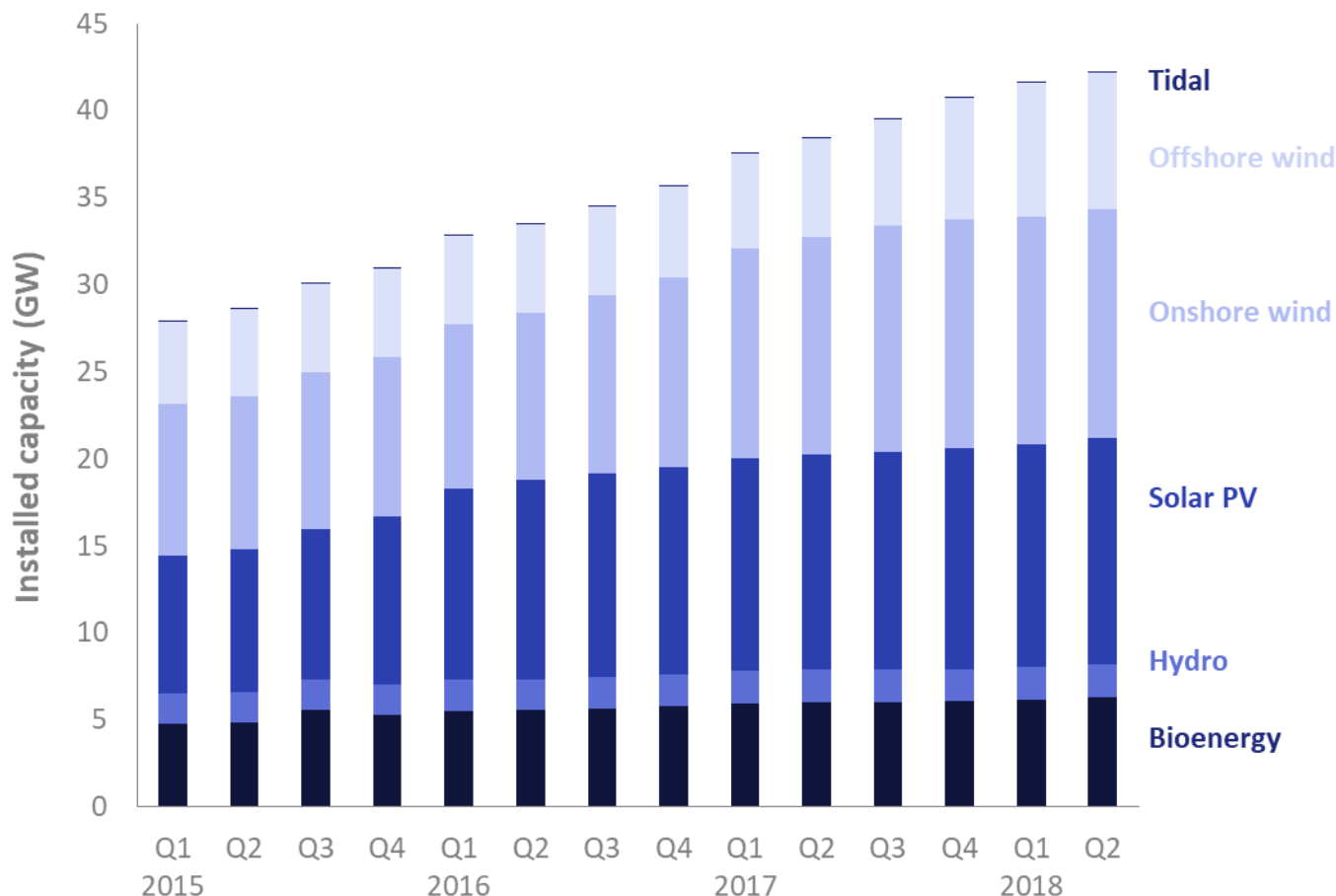
Hydro generation dropped 4.5 per cent but remains at 0.9 TWh when rounded; there was an increase in capacity but average rainfall (in the main hydro catchment areas) fell by 15 per cent during the quarter; Energy Trends table 7.4 at:

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

In 2018 Q2, generation from bioenergy¹, at 8.5 TWh, was up by 8.8 per cent on a year earlier. Within this, the largest increase came from plant biomass (burning wood) which was up by 0.6 TWh (12 per cent) on 2017 Q1. Generation from biodegradable waste was up 12 per cent and animal biomass was up by 15 per cent but this only represents a small fraction of bioenergy. These increases were offset by reduced generation from landfill gas and anaerobic digestion.

Bioenergy had the largest share of generation (35 per cent), 22 per cent came from onshore wind, 20 per cent from offshore wind, 19 per cent from solar PV and 3.6 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 Q2, the UK's renewable electricity capacity totalled 42.2 GW, an increase of 10 per cent (3.9 GW) on that installed at the end of 2017 Q2, and 1.4 per cent (0.6 GW) higher than the previous quarter.

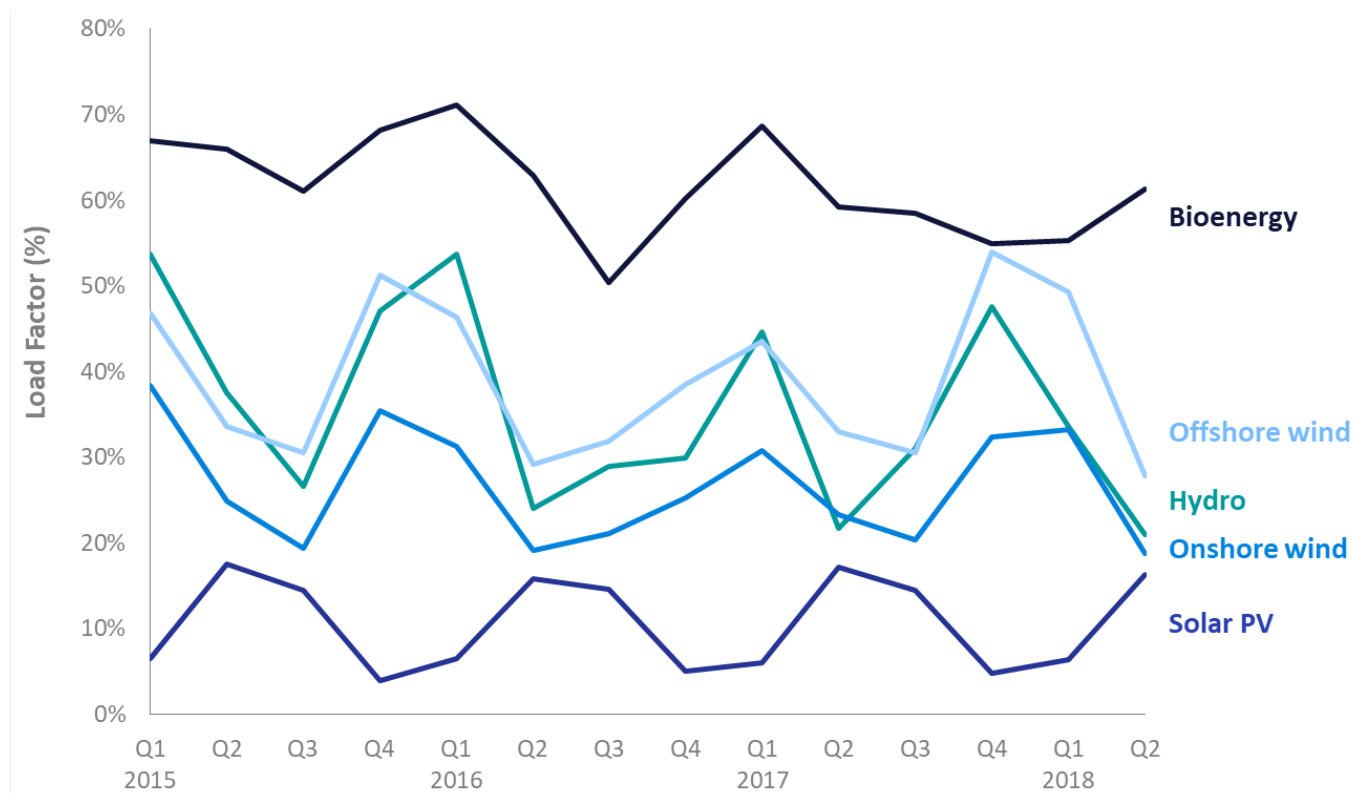
At the end of 2018 Q2, onshore wind and solar PV, both represented around 31 per cent of all renewable capacity, the highest share of renewable technologies. This was followed by offshore wind (19 per cent) and bioenergy.²

Compared with 2017 Q2, the biggest increase was in offshore wind capacity which rose by 2.2 GW (38 per cent). Most of the increase was seen in 2018 Q1 where there was a large expansion to an existing site. Onshore wind capacity increased by around 0.8 GW and solar PV capacity by around 0.6 GW.

Increases in Solar PV capacity are slower than the rapid expansion seen in 2010 – 2016, partly due to the close of the Renewables Obligation (RO).

Across the year, bioenergy capacity increased by 257 MW, including a new Biodegradable MSW scheme in the latest quarter.

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)

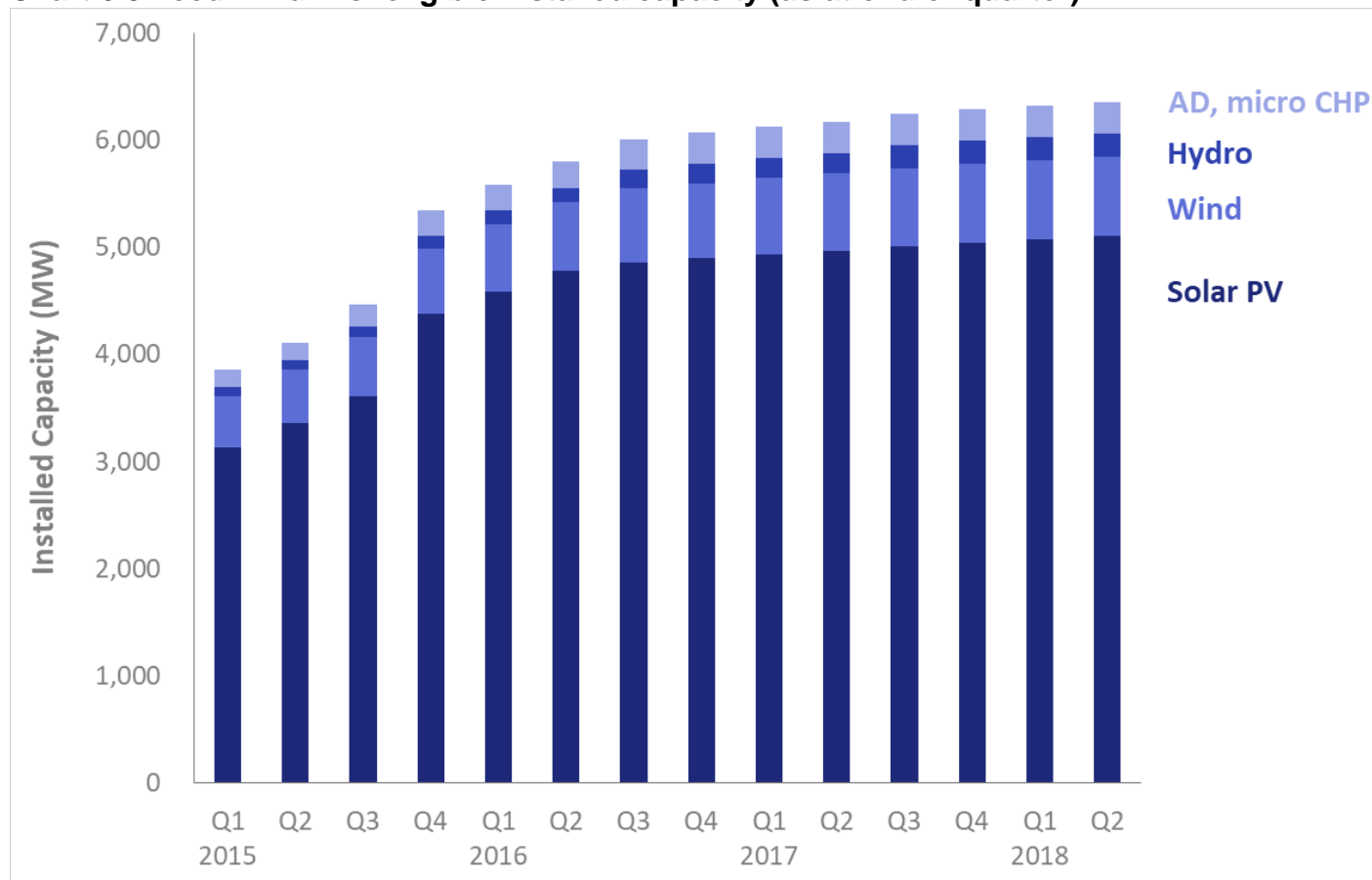
In 2018 Q2, onshore wind's load factor fell by 4.2 percentage points, from 23.2 per cent in 2017 Q2 to 19.0 per cent, due to lower onshore wind speeds. Offshore wind's load factor decreased by 5.1 percentage points, from 32.9 per cent in 2017 Q2 to 28.1 per cent in 2018 Q2.³

Wind factors for onshore and offshore wind were only around half of the level of the previous quarter as winds speeds were on average 2.1 knots lower.

Hydro's load factor in 2017 Q2 decreased by 1.4 percentage points, from 22.6 per cent in 2017 Q2 to 21.2 per cent, due to lower rainfall, the lowest for Q2 since 2010. Compared with the most recent quarter, hydro's load factor in 2018 Q2 was 13 percentage points lower, with rainfall in the main hydro areas only around half that of Q1 2018.

For bioenergy, the load factor in 2018 Q2, at 62.8 per cent, up by 3.0 percentage points on a year earlier. Generation in Q1 2017 had been affected by an outage at Drax, the largest generator within the bioenergy category, which reduced the load factor in that 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 Q2, 6,355 MW of capacity was installed and eligible for the GB Feed in Tariff (FiT) scheme⁴. This was a 3.0 per cent increase on that installed at the end of 2017 Q2, but just 0.6 per cent (37 MW) up on the previous quarter.

In terms of number of installations, at the end of 2018 Q2, there were over 939,000 installed and eligible for the FiT scheme, a 3.7 per cent increase on the number installed a year earlier.

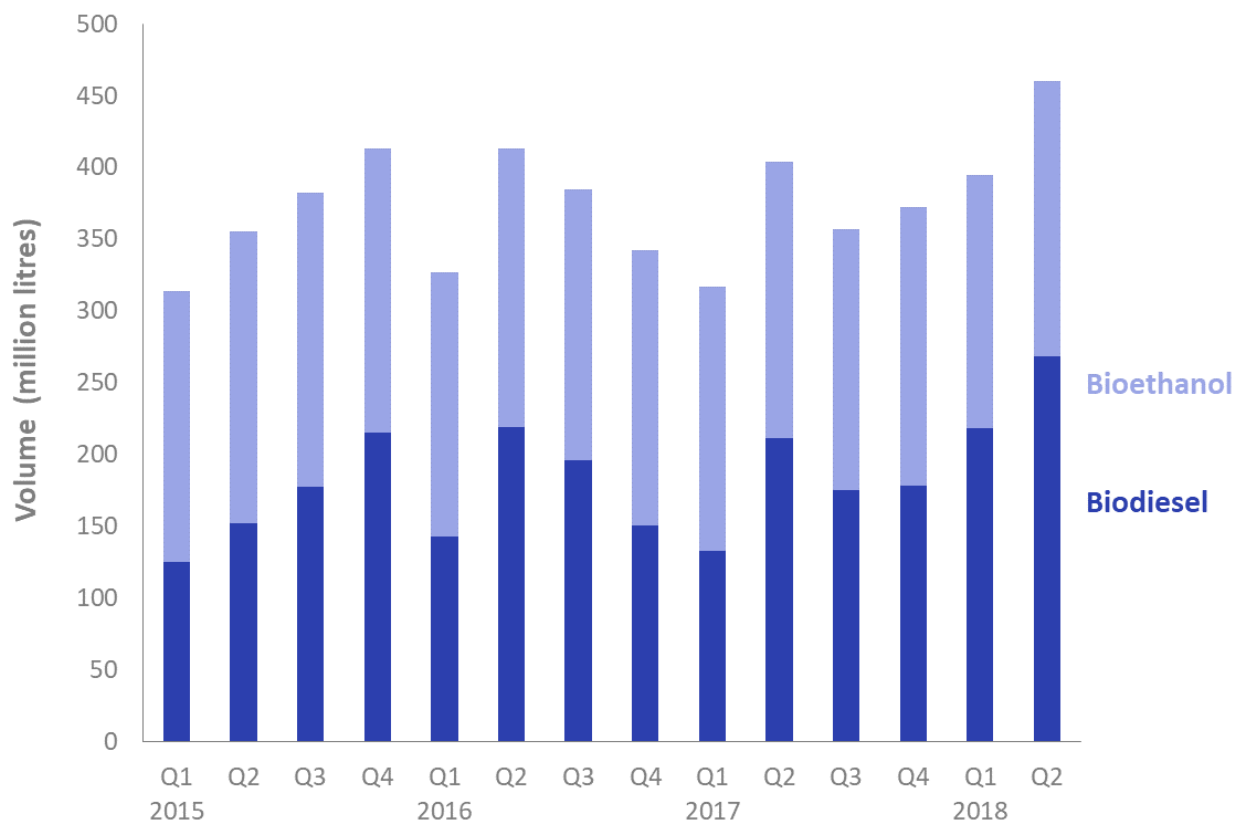
Solar photovoltaics (PVs) represent the majority of both installations and installed capacity on FiTs, with, respectively, 99 per cent and 80 per cent of the total. Nearly half of FiT-eligible PV installations are sub-4 kW retrofitted schemes, 2,501 MW (49 per cent) in 2018 Q2.

Renewable installations eligible for 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 Q2, 460 million litres of liquid biofuels were consumed in transport, an increase of 14 per cent compared to 2017 Q2 (404 million litres).

Bioethanol consumption fell slightly (0.5 per cent) from 193 million litres in 2017 Q2 to 192 million litres in 2018 Q2. Biodiesel increased by 27 per cent from 211 million litres in 2017 Q2 to 268 million litres in 2018 Q2.

Biodiesel accounted for 58 per cent of biofuels consumption, with bioethanol accounting for the remaining 42 per cent.

In the second quarter of 2018, bioethanol accounted for 4.5 per cent of motor spirit, and biodiesel 3.4 per cent of diesel (DERV). Their combined contribution was 3.8 per cent, an increase of 0.4 percentage points compared to 2017 Q2.

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Table 6.1. Renewable electricity capacity and generation

	2016	2017	per cent change	2016 2nd quarter	2016 3rd quarter	2016 4th quarter	2017 1st quarter	2017 2nd quarter	2017 3rd quarter	2017 4th quarter	2018 1st quarter	2018 2nd quarter p	per cent change ¹¹
Cumulative Installed Capacity¹													MW
Onshore Wind	10,880	12,847	+18.1	9,600	10,236	10,880	12,103	12,345	12,682r	12,847	13,113	13,170	6.7
Offshore Wind	5,293	6,988	+32.0	5,095	5,095	5,293	5,455	5,653	6,101	6,988	7,669	7,823	38.4
Shoreline wave / tidal	13	18	+36.4	8	8	13	18	18	18	18	18	20	10.9
Solar photovoltaics	11,912	12,776	+7.3	11,467	11,748	11,912	12,263	12,442	12,568	12,776	12,766	13,012	4.6
Small scale Hydro	359	396	+10.4	311	343	359	361	366	406	396	397	397	8.4
Large scale Hydro	1,477	1,479	+0.1	1,477	1,477	1,477	1,479	1,479	1,479	1,479	1,479	1,479	-
Landfill gas	1,062	1,066	+0.4	1,062	1,062	1,062	1,066	1,066	1,066	1,066	1,067	1,067	0.1
Sewage sludge digestion	257	245	-4.6	257	257	257	245	245	245	245	246	246	0.3
Energy from waste	1,028	1,091	+6.1	939	988	1,028	1,077	1,077	1,077	1,091	1,118	1,128	4.7
Animal Biomass (non-AD) ²	129	129	-	129	129	129	129	129	129	129	129	129	-
Anaerobic Digestion	426	460	+7.9	368	385	426	445	448	449	460	409	412	-8.0
Plant Biomass ³	2,852	3,055	+7.1	2,788	2,798	2,852	3,003	3,055	3,055	3,055	3,194	3,296	7.9
Total	35,690	40,551	+13.6	33,502	34,526	35,690	37,645r	38,324r	39,276r	40,551	41,605	42,178	10.1
Co-firing ⁴	13	9	-34.5	13	13	13	9	9	9	9	10	11	22.8
Generation⁵													GWh
Onshore Wind ⁶	20,857	29,088	+39.5	3,996	4,604	5,877	7,723	6,204	5,655	9,506	9,631	5,453	-12.1
Offshore Wind ^{6,7}	16,406	20,916	+27.5	3,253	3,584	4,419	5,166	3,993	3,961	7,795	7,967	4,752	19.0
Shoreline wave / tidal ⁶	0	4	(+)	-	-	0	0	0	1	3	2	2	(+)
Solar photovoltaics ⁶	10,411	11,525	+10.7	3,868	3,747	1,333	1,610	4,606	3,972	1,336	1,787	4,647	0.9
Hydro ⁶	5,617	5,928	+5.5	977	1,201	1,264	1,898	909	1,317	1,803	1,388	868	-4.5
Landfill gas ⁶	4,703	4,284	-8.9	1,171	1,158	1,158	1,093	1,055	1,065	1,071	1,013	973	-7.8
Sewage sludge digestion ⁶	950	967	+1.8	251	229	234	241	247	235	244	239	258	4.3
Energy from waste ⁶	2,740	3,386	+23.6	626	678	710	848	823	871	844	889	922	12.0
Co-firing with fossil fuels	117	54	-54.1	15	5	47	52	0	1	-	-	111	(+)
Animal Biomass (non-AD) ^{2,6}	650	649	-0.2	165	141	173	172	164	141	173	191	189	15.3
Anaerobic Digestion	2,082	2,470	+18.6	500	531	561	601	619	629	621	550	539	-12.9
Plant Biomass ^{3,6}	18,822	20,059	+6.6	4,979	3,479	4,728	5,916	4,933	4,838	4,373	4,573	5,536	12.2
Total	83,354	99,330	+19.2	19,800	19,356	20,503	25,321	23,554	22,687	27,768	28,233	24,251	3.0
Non-biodegradable wastes ⁸	2,742	3,485	+27.1	626	678	710	809	859	911	905	900	901	4.9
Load Factors¹⁰													
Onshore Wind	23.6%	28.0%		19.2%	21.0%	25.2%	31.1%	23.2%	20.5%	33.7%	34.3%	19.0%	
Offshore Wind	36.0%	38.9%		31.9%	39.2%	38.5%	44.5%	32.9%	30.5%	53.9%	50.3%	28.1%	
Solar photovoltaics	11.0%	10.7%		15.8%	14.6%	5.1%	6.2%	17.1%	14.4%	4.8%	6.5%	16.5%	
Hydro	35.4%	36.5%		25.0%	30.2%	31.3%	47.8%	22.6%	32.0%	43.5%	34.3%	21.2%	
Landfill gas	50.4%	46.0%		50.5%	49.4%	49.3%	47.6%	45.3%	45.2%	45.5%	43.9%	41.7%	
Sewage sludge digestion	44.3%	43.9%		44.7%	40.3%	41.3%	44.3%	46.1%	43.3%	45.1%	45.0%	48.0%	
Energy from waste	31.9%	36.5%		30.7%	31.8%	31.9%	37.3%	35.0%	36.6%	35.3%	37.3%	37.6%	
Animal Biomass (non-AD)	61.7%	57.3%		58.5%	49.2%	60.7%	61.4%	58.1%	49.2%	60.6%	68.3%	67.0%	
Anaerobic Digestion	62.2%	63.6%		62.7%	64.0%	62.7%	63.9%	63.5%	63.6%	61.9%	58.6%	60.1%	
Plant Biomass	78.5%	77.5%		81.8%	56.4%	75.8%	93.6%	74.8%	71.7%	64.8%	67.8%	78.1%	
Total (excluding co-firing and non-biodegradable wastes)	28.4%	29.7%		27.3%	25.8%	26.4%	31.9%	28.4%	26.5%	31.5%	31.8%	26.4%	
Renewable share of electricity generation (%)													
Onshore wind	6.1%	8.6%		5.1%	6.1%	6.3%	8.3%	8.1%	7.5%	10.1%	10.3%	7.1%	
Offshore wind	4.8%	6.2%		4.2%	4.7%	4.8%	5.5%	5.2%	5.2%	8.4%	8.6%	6.2%	
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%		5.0%	4.9%	1.4%	1.7%	6.0%	5.3%	1.4%	1.9%	6.1%	
Hydro	1.7%	1.8%		1.2%	1.5%	1.3%	1.9%	1.1%	1.7%	2.1%	1.5%	1.1%	
Bioenergy	8.9%	9.4%		9.9%	8.2%	8.2%	9.5%	10.2%	10.3%	7.9%	8.0%	11.1%	
All renewables	24.6%	29.3%		25.3%	25.4%	22.0%	27.0%	30.6%	30.0%	30.1%	30.3%	31.7%	

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	<i>per cent change</i>	2016	2016	2016	2017	2017	2017	2017	2018	2018	<i>per cent change</i> ¹
				2nd quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter p	
Volume (million litres)													Million litres
Bioethanol	759	753	-0.8	194	189	192	184	193	182	194	177	192	-0.5%
Biodiesel	708	697	-1.6	219	196	150	133	211	175	178	218	268	27.0%
Total biofuels for transport	1,467	1,450	-1.2	413	385	342	317	404	357	372	395	460	13.9%
Energy (thousand toe)													Thousand tonnes of oil equivalent
Bioethanol	428	424	-0.8	109	107	108	104	109	103	109	100	108	-0.5%
Biodiesel	582	573	-1.6	180	161	123	109	173	144	146	179	220	27.0%
Total biofuels for transport	1,010	997	-1.2	289	268	231	213	282	246	256	279	328	16.4%
Shares of road fuels													
Bioethanol as per cent of Motor Spirit	4.4%	4.5%		4.4%	4.4%	4.5%	4.6%	4.5%	4.3%	4.6%	4.6%	4.5%	
Biodiesel as per cent of DERV	2.4%	2.3%		2.9%	2.6%	1.9%	1.9%	2.7%	2.3%	2.3%	3.0%	3.4%	
Total biofuels as per cent of road fuels	3.1%	3.1%		3.4%	3.2%	2.8%	2.8%	3.4%	3.0%	3.1%	3.6%	3.8%	

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

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

Bioethanol as per cent of Motor Spirit	-0.2%	-0.3%	-0.1%	0.1%	0.1%	-0.1%	0.1%	0.0%	0.0%
Biodiesel as per cent of DERV	0.8%	0.2%	-0.9%	-0.1%	-0.1%	-0.3%	0.3%	1.2%	0.7%
Total biofuels as per cent of road fuels	0.4%	0.0%	-0.7%	-0.1%	-0.1%	-0.2%	0.2%	0.7%	0.4%