Section 6 – Renewables

Key results show:

Renewables' share of electricity generation was 17.8 per cent in 2014 Q3, an increase of 4.2 percentage points on a year earlier, reflecting increased capacity and generation. This was 1.7 percentage points less than the record share set in 2014 Q1 **(Chart 6.1)**

Renewable electricity generation was 13.4 TWh in 2014 Q3, an increase of 24 per cent on the 10.8 TWh in 2013 Q3, and 2.8 per cent higher than the quarterly generation of 2014 Q2 (13.1 TWh). **(Chart 6.2)**

Bioenergy generation increased by 1.4 TWh (31 per cent) to 6.0 TWh in 2014 Q3, largely due to the conversion of Drax Unit 2 earlier in 2014. **(Chart 6.2)**

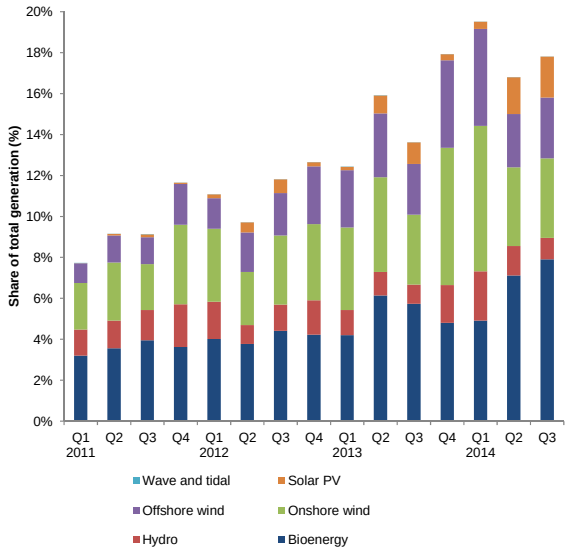
Solar photovoltaic generation increased from 0.8 TWh in 2013 Q3 to 1.5 TWh in 2014 Q3, as a result of increased capacity. **(Chart 6.2)**

Wind generation grew by 10 per cent from 4.7 TWh in 2013 Q3 to 5.2 TWh in 2014 Q3, due to increased capacity, with wind speeds around the same for the quarter as a whole, despite September being the calmest (and driest) month in the last fourteen years. **(Chart 6.2)**

Renewable electricity capacity was 23.1 GW at the end of 2014 Q3, a 19 per cent increase (3.8 GW) on a year earlier, including 0.8 GW installed in 2014 Q3. **(Chart 6.3)**

Solar PV capacity increased by 1.9 GW (74 per cent) between 2013 Q3 and 2014 Q3, while wind capacity increased by 1.5 GW (13 per cent), with offshore and onshore capacity each contributing around half of the increase. **(Chart 6.3)**

Chart 6.1 Renewables' share of electricity generation



Renewables' share of electricity generation increased from 13.6 per cent in 2013 Q3 to 17.8 per cent in 2014 Q3. This was a 1.7 percentage point fall on 2014 Q1's record share of 19.5 per cent. [1]

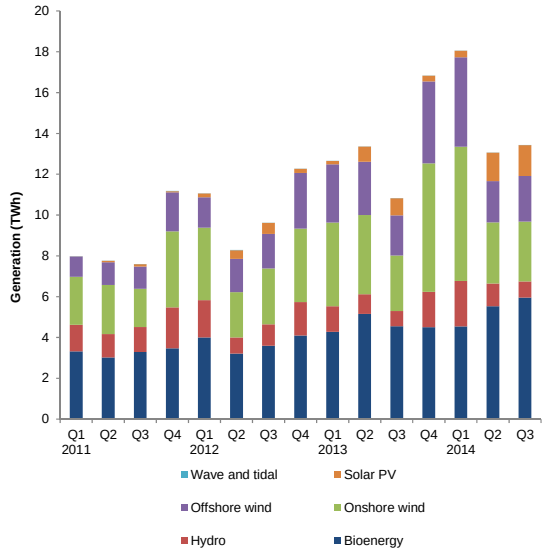
Total generation from renewables in 2014 Q3 increased by 24 per cent compared to 2013 Q3, from 10.8 TWh to 13.4 TWh. Overall electricity generation (75.4 TWh) in 2014 Q3 was down 5.0 per cent on a year earlier (79.5 TWh); this reduction contributed 0.9 percentage points of the 4.2 percentage point increase in renewables' share.

Over half of the increase in renewable generation on a year earlier was due to increased generation from bioenergy, and particularly the conversion of a second Drax unit to biomass in May 2014. However, increased capacity also led to increased generation from solar PV and wind.

Renewables' share of electricity generation in the first three-quarters of 2013 increased to 18.1 per cent, from 13.9 per cent one year earlier.

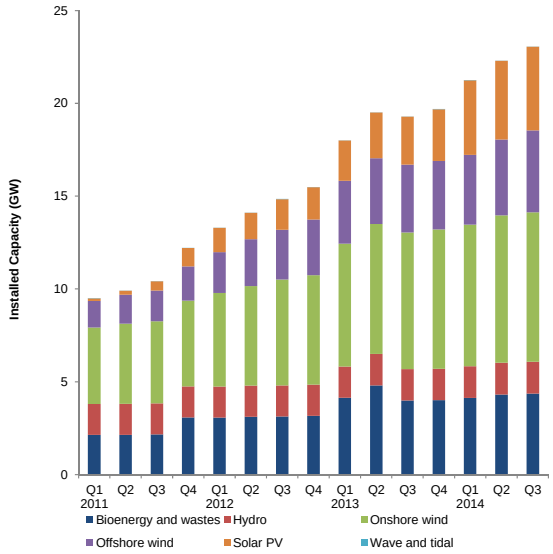
[1] Total electricity generation figures (all generating companies) can be found in table ET 5.1, at: www.gov.uk/government/publications/electricity-section-5-energy-trends

Chart 6.2 Renewable electricity generation



To note that the solar PV (and onshore wind) figures not only include installations confirmed on the Feed in Tariffs (FiTs) scheme, but also a large number of sub 50 kW installations commissioned, and registered on the Microgeneration Certification Scheme, that are awaiting confirmation on FiTs (as well as any capacity supported by the Renewables Obligation (RO) or un-accredited capacity).

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



Electricity generated from onshore wind increased by 7.7 per cent in 2014 Q3, from 2.7 TWh in 2013 Q3 to 2.9 TWh, while generation from offshore wind was up by 14.1 per cent, from 2.0 TWh to 2.2 TWh. The increase in wind generation was due to increased capacity; the average wind speed fell from 7.2 knots in 2013 Q3 to 7.0 knots in 2014 Q3; September 2014 was the calmest month in in the last fourteen years with average wind speeds of just 5.5 knots.[2]

Hydro generation increased from 744 GWh in 2013 Q3 to 787 GWh in 2014 Q3 (5.9 per cent), despite average rainfall falling by 15 per cent. September 2014 was the driest month in the last fourteen years, and saw just 23.7 mm of rainfall, compared to a 10 year average for the month of 120.7 mm.

Generation from bioenergy [3] in 2014 Q3 increased by 31 per cent compared to 2013 Q3, from 4.6 TWh to 6.0 TWh, mostly due to plant biomass which was up by 60 per cent from 2.2 TWh to 3.6 TWh. This can mostly be accounted for by the conversion of Drax (Unit 2) to biomass.

Generation from solar PV in 2014 Q3 increased by 79 per cent, from 0.8 TWh in 2014 Q2 to 1.5 TWh, due to increased capacity.

In 2014 Q3, bioenergy had the largest share of renewable generation, at 44 per cent, with 22 per cent from onshore wind, 17 per cent from offshore wind, 11 per cent from solar PV and 5.9 per cent from hydro.

In 2014 Q3, renewable capacity totalled 23.1 GW, an increase of 19.5 per cent (3.8 GW) on that installed a year earlier. Between 2014 Q2 and 2014 Q3, total renewable capacity grew by 0.8 GW.

Solar photovoltaics (PV) capacity was the largest contributor to the increase on a year earlier, increasing by 1.9 GW (74 per cent), with the majority of this coming from large-scale schemes accredited under the RO. Of this increase, 255 MW was installed in 2014 Q3

Wind capacity increased by 1.5 GW between 2013 Q3 and 2014 Q3. Of this, 447 MW was installed in 2014 Q3, with 335 MW of this from the expanding Gwynt-y-mor and West of Duddon Sands offshore wind farms.

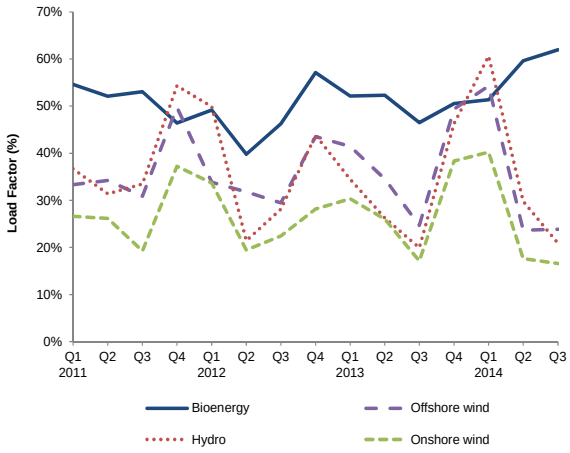
Bioenergy capacity increased by 0.4 GW between 2013 Q3 and 2014 Q3, with the increase from Drax Unit 2 in May 2014 offset slightly by a reduction in capacity at Ironbridge.

At the end of 2014 Q3, onshore wind had the largest share of capacity, at 35 per cent, with 20 per cent from solar PV and 19 per cent from each of bioenergy and offshore wind.

[2] Statistics on weather (temperature, wind speeds, rainfall and sun levels) can be found in tables ET 7.1 – 7.4, at: www.gov.uk/government/publications/energy-trends-section-7-weather

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

Chart 6.4 Renewable electricity load factors



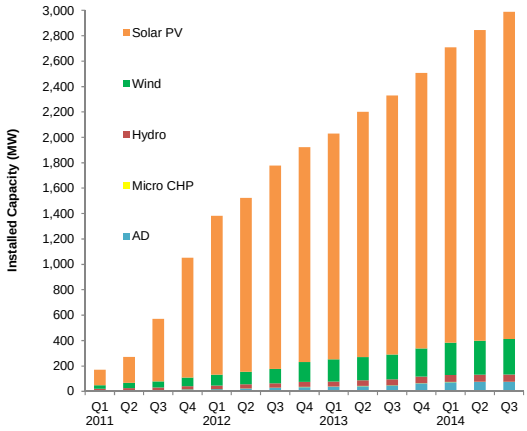
In 2014 Q3, onshore wind's load factor fell by 0.6 percentage points, from 17.1 per cent in 2013 Q3 to 16.6 per cent. Meanwhile, offshore wind's load factor fell by 0.8 percentage points, from 24.7 per cent to 23.9 per cent.[4]

Compared with 2014 Q2, onshore wind's load factor for 2014 Q3 fell by 1.0 percentage point while offshore wind's increased by 0.2. Average wind speeds were just 0.2 knots lower.

Hydro's load factor in 2014 Q3 rose slightly by 0.9 percentage points, from 19.9 per cent in 2013 Q3 to 20.9 per cent. Although rainfall for 2014 Q3 was lower than for the same quarter in 2013, it was higher for the first two quarters in 2014, resulting in higher overall rainfall for 2014 year to date compared to 2013.

For bioenergy, the load factor in 2014 Q3 was up 15.5 percentage points on a year earlier (when the closure of Tilbury during the quarter reduced the load factor), largely due to the second Drax unit coming online in 2014 Q2 and operating at high availability levels. The load factor was up a further 2.3 percentage points on 2014 Q2.

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



At the end of 2014 Q3, 3.0 GW of capacity was eligible for the GB Feed in Tariff (FiTs) scheme. This was a 5.1 per cent increase on the 2.8 GW eligible at the end of 2014 Q2, and 28.3 per cent higher than that at the end of 2013 Q3. [5]

In terms of number of installations, at the end of 2014 Q3, there were 606,102 eligible for the FiT scheme, a 6.0 per cent increase on the 571,659 at the end of the previous quarter.

Solar photovoltaics (PVs) represent the majority of both installations and installed capacity eligible for FiTs, with, respectively, 98.7 per cent and 86.2 per cent of the total.[6]

Renewable installations eligible for FiTs (all except MicroCHP) represented 13 per cent of all renewable installed capacity.

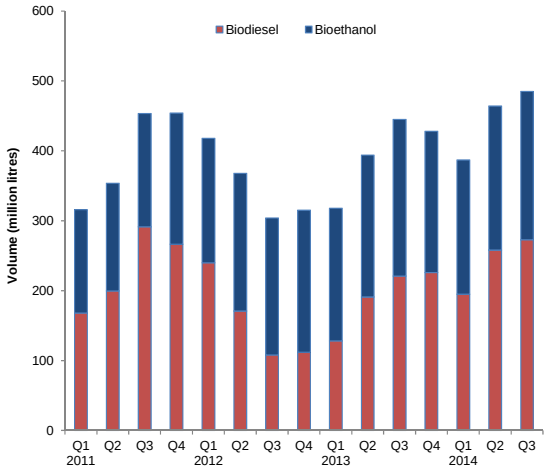
DECC has recently produced load factors, based on actual generation, for installations accredited under the Feed in Tariff. These can be found at: www.gov.uk/government/statistics/quarterly-and-annual-load-factors

[4] 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.

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

[6] To note that Feed in Tariff uptake statistics are based on the *confirmation* date, which can be several months later than the commissioning (installation) date. Hence the amount of capacity installed in a quarter may differ substantially from that confirmed on the FiTs scheme in the same quarter.

Chart 6.6 Liquid biofuels for transport consumption



In 2014 Q3, 485 million litres of liquid biofuels were consumed in transport, a rise of 9 per cent on the total in 2013 Q3 (445 million litres), exceeding the previous record high of 464 million litres in 2014 Q2.

Bioethanol consumption fell by 5.4 per cent, from 224 million litres to 212 million litres. Conversely, biodiesel consumption rose by 24 per cent, from 221 million litres in 2013 Q3 to 273 million litres in 2014 Q3.

Biodiesel contributed 56.3 per cent to the total liquid biofuel mix in 2014 Q3. Apart from the period 2012 Q2 to 2013 Q4, biodiesel has dominated the proportion averaging 60 per cent though varying between 35 per cent and 85 per cent.

Relevant tables

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Table 6.1. Renewable electricity capacity and generation

	2012	2013	per cent change	2012 3rd quarter	2012 4th quarter	2013 1st quarter	2013 2nd quarter	2013 3rd quarter	2013 4th quarter	2014 1st quarter	2014 2nd quarter	2014 3rd quarter p	per cent change [11]
Cumulative Installed Capacity [1]												**MW**	
Onshore Wind	5,899	7,513	*+27.4*	5,696	5,899	6,620	7,011	7,360	7,513	7,624r	7,943	8,054	*+9.4*
Offshore Wind	2,995	3,696	*+23.4*	2,682	2,995	3,381	3,544	3,657	3,696	3,765r	4,085	4,420	*+20.9*
Shoreline wave / tidal	7	7	*+7.5*	7	7	6	6	7	7	7	8	8	*+10.5*
Solar photovoltaics	1,747	2,780	*+59.1*	1,653	1,747	2,170	2,462	2,593	2,780	4,021r	4,249	4,504	*+73.7*
Small scale Hydro	216	222	*+2.8*	212	216	216	219	220	222	237r	238	238	*+7.9*
Large scale Hydro	1,471	1,471	-	1,471	1,471	1,471	1,471	1,471	1,471	1,471	1,471	1,471	-
Landfill gas	1,036	1,042	*+0.5*	1,035	1,036	1,041	1,042	1,042	1,042	1,037r	1,037	1,040	*-0.2*
Sewage sludge digestion	204	198	*-3.1*	204	204	196	197	198	198	203r	205	206	*+3.8*
Energy from waste	521	553	*+6.1*	516	521	546	553	553	553	604r	648	656	*+18.8*
Animal Biomass (non-AD) [2]	111	111	-	111	111	111	111	111	111	111	111	111	-
Anaerobic Digestion	118	150	*+26.5*	97	118	126	132	136	150	158r	163	162	*+18.7*
Plant Biomass [3]	1,166	1,949	*+67.1*	1,161	1,166	2,118	2,767	1,949	1,949	2,016r	2,152	2,189	*+12.3*
Total	15,491	19,690	*+27.1*	14,844	15,491	18,003	19,514	19,296	19,690	21,253r	22,308	23,058	*+19.5*
Co-firing [4]	203	35	*-82.7*	203	203	35	35	35	35	14r	14r	14	*-59.0*
Generation [5]												**GWh**	
Onshore Wind [6]	12,111	16,992	*+40.3*	2,742	3,605	4,100	3,875	2,720	6,297	6,579r	2,994	2,929	*+7.7*
Offshore Wind [6, 7]	7,550	11,441	*+51.5*	1,691	2,728	2,855	2,614	1,963	4,010	4,374r	2,027	2,240	*+14.1*
Shoreline wave / tidal [6]	4	6	*+64.8*	1	1	2	2	1	1	1	0	1	*-34.5*
Solar photovoltaics [6]	1,351	2,036	*+50.7*	544	199	166	743	843	284	325r	1,392	1,505	*+78.6*
Hydro [6]	5,285	4,698	*-11.1*	1,045	1,631	1,256	968	744	1,730	2,227r	1,112	787	*+5.9*
Landfill gas [6]	5,154	5,169	*+0.3*	1,280	1,297	1,297	1,293	1,272	1,306	1,260r	1,260	1,249	*-1.8*
Sewage sludge digestion [6]	719	761	*+5.8*	173	178	180	202	184	196	186r	214	203	*+10.7*
Energy from waste [8]	2,034	1,987	*-2.3*	535	521	499	484	506	499	494r	556	592	*+17.1*
Co-firing with fossil fuels	1,783	309	*-82.7*	410	140	170	49	39	50	35r	37	23	*-42.9*
Animal Biomass (non-AD) [2, 6]	643	628	*-2.3*	144	180	166	167	144	151	160r	162	133	*-7.5*
Anaerobic Digestion	499	707	*+41.6*	133	154	166	168	180	192	203r	210	208	*+15.3*
Plant Biomass [3, 6]	4,083	8,933	*(+)*	918	1,630	1,800	2,792	2,226	2,116	2,208r	3,097	3,552	*+59.6*
Total	41,214	53,667	*+30.2*	9,616	12,265	12,657	13,355	10,823	16,833	18,051r	13,061	13,424	*+24.0*
Non-biodegradable wastes [9]	1,170	1,144	*-2.2*	308	300	287	278	291	287	284	320	341	*+17.1*
Load Factors [10]													
Onshore Wind	26.2%	28.9%		22.4%	28.2%	30.3%	26.0%	17.1%	38.4%	40.2%	17.6%	16.6%	
Offshore Wind	35.6%	39.0%		29.5%	43.5%	41.4%	34.6%	24.7%	49.4%	54.3%	23.6%	23.9%	
Hydro	35.8%	31.7%		28.1%	43.8%	34.5%	26.3%	19.9%	46.3%	60.6%	29.8%	20.9%	
Landfill gas	56.2%	56.8%		56.0%	56.7%	57.8%	56.8%	55.3%	56.8%	56.1%	55.7%	54.5%	
Sewage sludge digestion	40.7%	43.2%		38.4%	39.5%	41.5%	47.1%	42.2%	44.7%	42.8%	47.9%	44.9%	
Energy from waste	45.2%	42.3%		47.0%	45.5%	43.3%	40.3%	41.4%	40.9%	39.6%	40.6%	41.1%	
Animal Biomass (non-AD)	66.2%	64.9%		59.1%	74.0%	69.5%	69.3%	59.1%	61.9%	67.1%	67.2%	54.7%	
Anaerobic Digestion	60.2%	60.2%		65.6%	64.9%	62.9%	59.5%	60.9%	60.8%	61.0%	60.0%	58.1%	
Plant Biomass	40.2%	65.5%		35.9%	63.5%	50.7%	52.3%	42.7%	49.2%	51.6%	68.0%	74.1%	
Total (excluding co-firing and non-biodegradable wastes)	32.4%	34.6%		28.8%	36.2%	34.5%	32.5%	25.2%	39.0%	40.7%	27.4%	26.8%	

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 enhanced 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. All solar photovoltaic generation is estimated this way.
7. For 2009, shoreline wave and tidal are included in offshore wind.
8. Biodegradable part only.
9. Non-biodegradable part of municipal solid waste plus waste tyres, hosptal 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/publications/renewable-sources-of-energy-chapter-6-digest-of-united-kingdom-energy-statistics-dukes
11. Percentage change between the most recent quarter and the same quarter a year earlier.

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Table 6.2. Liquid biofuels for transport consumption

	2012	2013	per cent change	2012 3rd quarter	2012 4th quarter	2013 1st quarter	2013 2nd quarter	2013 3rd quarter	2013 4th quarter	2014 1st quarter	2014 2nd quarter	2014 3rd Quarter p	per cent change [1]
Volume													**Million litres**
Bioethanol	775	819	*+5.7*	196	203	190	203	224	202	192	206	212	*-5.4*
Biodiesel	634	766	*+20.8*	109	113	128	191	221	226	195	258	273	*23.5*
Total biofuels for transport	1,409	1,585	*+12.5*	305	316	318	394	445	428	387	464	485	*9.0*
Energy													**Thousand tonnes of oil equivalent**
Bioethanol	437	462	*+5.7*	111	115	107	114	126	114	108	116	120	*-5.4*
Biodiesel	521	629	*+20.8*	89	92	105	157	182	186	160	212	224	*+23.5*
Total biofuels for transport	958	1,091	*+13.9*	200	207	212	271	308	300	268	328	344	*+11.7*
Shares of road fuels													
Bioethanol as per cent of Motor Spirit	4.1%	4.5%		4.2%	4.3%	4.4%	4.3%	4.9%	4.5%	4.5%	4.5%	4.8%	
Biodiesel as per cent of DERV	2.4%	2.8%		1.6%	1.6%	2.1%	2.8%	3.2%	3.2%	3.0%	3.7%	3.9%	
Total biofuels as per cent of road fuels	3.1%	3.5%		2.7%	2.7%	3.0%	3.4%	3.9%	3.7%	3.6%	4.0%	4.2%	

1. Percentage change between the most recent quarter and the same quarter a year earlier.
Source: HM Revenue and Customs Hydrocarbon Oils Bulletin, available a
www.uktradeinfo.com/Statistics/Pages/TaxAndDutybulletins.aspx