

## **Electricity generation and supply figures for Scotland, Wales, Northern Ireland and England, 2011 to 2014**

### **Introduction**

This article shows how generation and consumption of electricity varies across the four countries of the United Kingdom. It updates and extends that published in December 2014. The UK figures shown in the tables in this article are taken from the Digest of United Kingdom Energy Statistics (DUKES) 2015, Chapters 5 and 6 and so the definitions used are identical to those in the Digest. Tables 1 and 2 are shown in “landscape” format at the end of the main text and cover the last four years.

### **Generation and trade**

Table 1 shows generation and supply of electricity in each of the UK countries. Because the mix of generating plant is not the same in each country, the overall percentage for each fuel type in individual years will change according to the fuels and stations that are available and the most advantageous to use.

Between 2013 and 2014, England’s share of total generation increased from 76.4 per cent to 77.6 per cent, while Scotland’s share remained around the same at 14.3 per cent. For Wales, there was a decrease in the share from 7.1 per cent to 6.0 per cent, mainly due to a decline in nuclear and coal generation. Northern Ireland’s share of generation remained stable at 2.2 per cent. On average, over the last four years, 76.5 per cent of UK electricity generation has taken place in England, 14.3 per cent in Scotland, 7.0 per cent in Wales and 2.1 per cent in Northern Ireland.

England is a net importer of electricity from Scotland and from continental Europe (via the France and Netherlands interconnectors), but was a net exporter to Wales for the first time in 2014. Net imports from France were a record high 15.0 TWh, while net imports from the Netherlands were 7.9 TWh, also a record high.

In 2014, Scotland exported 23.7 per cent of the electricity generated there to consumers elsewhere in the UK; this has decreased from 28.0 per cent in 2013 due to a reduction in generation in Scotland (down 8.3 per cent) despite steady total consumption. Transfers from Scotland to England fell by 18.9 per cent between 2013 and 2014, following a record high in 2013.

In 2014, Wales was a net importer from England for the first time. This was due to Wales experiencing a 21.8 per cent drop in generation but just a 4.5 per cent reduction in total consumption. Wales started trading with the Republic of Ireland in 2012 and has been a net exporter to them each year, with the equivalent of 11.5 per cent of Wales’ generation exported to the Republic of Ireland in 2014.

Northern Ireland trades electricity with the Republic of Ireland and had been a net exporter for the previous three years; however it became a net importer from the Republic of Ireland for the first time in 2014. Northern Ireland also imports electricity from Scotland via the Moyle interconnector.

### **Generation by fuel**

For each of the four UK countries, Table A1 shows the shares of the generation of electricity by the fuel categories used in Table 5.5 of the Digest of UK Energy Statistics 2015, for 2013 and 2014. The position in 2014 is shown in Chart 1, in terms of GWh. Due to planned and unplanned outages to nuclear stations, the nuclear share decreased slightly in 2014 after remaining steady from 2011 to 2013. In Scotland, the share of nuclear increased during 2011 to 2013 before falling slightly in 2014, while in Wales the share of nuclear generation saw a sharp fall in 2012 before rising slightly in 2013. This was succeeded by another large fall in 2014, down to 9.3 per cent of all generation in Wales, due to planned and unplanned outages.

### Special feature – Sub national electricity figures

Following a resurgence in 2012, coal's share of UK generation rose has been falling, down to 29.8 per cent in 2014. The fall in coal generation in England is due to reduced capacity after the closure or partial closure of multiple coal plants that were opted out of the Large Combustion Plant Directive (LCPD)<sup>1</sup>. This includes the closure of one (of two) 980 MW unit at Ferrybridge C in April 2014 and the closure of Didcot A during 2013. Another factor in the reduction of coal generation in England was the conversion of two units of Drax from coal to biomass, one in 2013 and one in 2014. The decrease in the share of coal generation in Wales (from 44.4 per cent to 35.7 per cent) is due to the closure of Uskmouth in April 2014, as well as a reduction in generation at other plants due to market conditions.

There was an increase in the share of gas generation between 2013 and 2014 in England (up from 30.3 per cent to 34.3 per cent), Wales (up from 17.3 per cent to 24.1 per cent) and Northern Ireland (45.8 per cent to 49.1 per cent). However, generation from gas fell from 10.3 per cent to 5.4 per cent in Scotland, mainly due to outages at Peterhead.

Renewables' share of generation has been continually increasing, reaching a record high of 19.1 per cent in 2014. The conversions at Drax have led to an increase in England's renewables share of generation, up to 15.6 per cent in 2014. Of Scotland's generation in 2014, 38 per cent was from renewables, up from 32 per cent in 2013, mainly due to the increase in the number of windfarms.

**Table A1: Shares of each country's generation, by fuel type, 2013 and 2014**

	Scotland	Wales	Northern Ireland	England	UK total
<b>2013</b>					
Coal	20.4%	44.4%	34.0%	38.8%	36.4%
Gas	10.3%	17.3%	45.8%	30.3%	26.7%
Nuclear	34.9%	16.7%	-	17.5%	19.7%
Renewables	32.0%	10.3%	19.5%	11.8%	14.8%
Oil and Other	2.4%	11.3%	0.7%	1.6%	2.4%
<b>2014</b>					
Coal	20.3%	35.7%	28.3%	31.1%	29.7%
Gas	5.4%	24.1%	49.1%	34.3%	29.8%
Nuclear	33.3%	9.3%	-	17.3%	18.8%
Renewables	38.0%	16.3%	22.2%	15.6%	19.1%
Oil and Other	2.9%	14.6%	0.3%	1.7%	2.6%

Combined heat and power (CHP) forms the bulk of "Other generators" generation, although some major power producers (MPPs) also operate generating plants that are partially CHP. CHP statistics for 2014 on a sub-national and regional basis were published in the September 2015 issue of Energy Trends<sup>2</sup>.

The share of generation accounted for by generators other than major power producers varies across the UK. In Scotland, in 2014, other generators had a 14 per cent share (up from 12 per cent in 2013), while in England the share was 11 per cent (up from 9 per cent), in Wales 14 per cent (up from 11 per cent) and in Northern Ireland 14 per cent (unchanged from 2013). These larger shares were due to increases in smaller-scale renewables and reductions in larger-scale fossil fuel capacity.

<sup>1</sup> Large Combustion Plant Directive (LCPD): Running hours during winter 2014/15 and capacity for 2015/16, page 71:

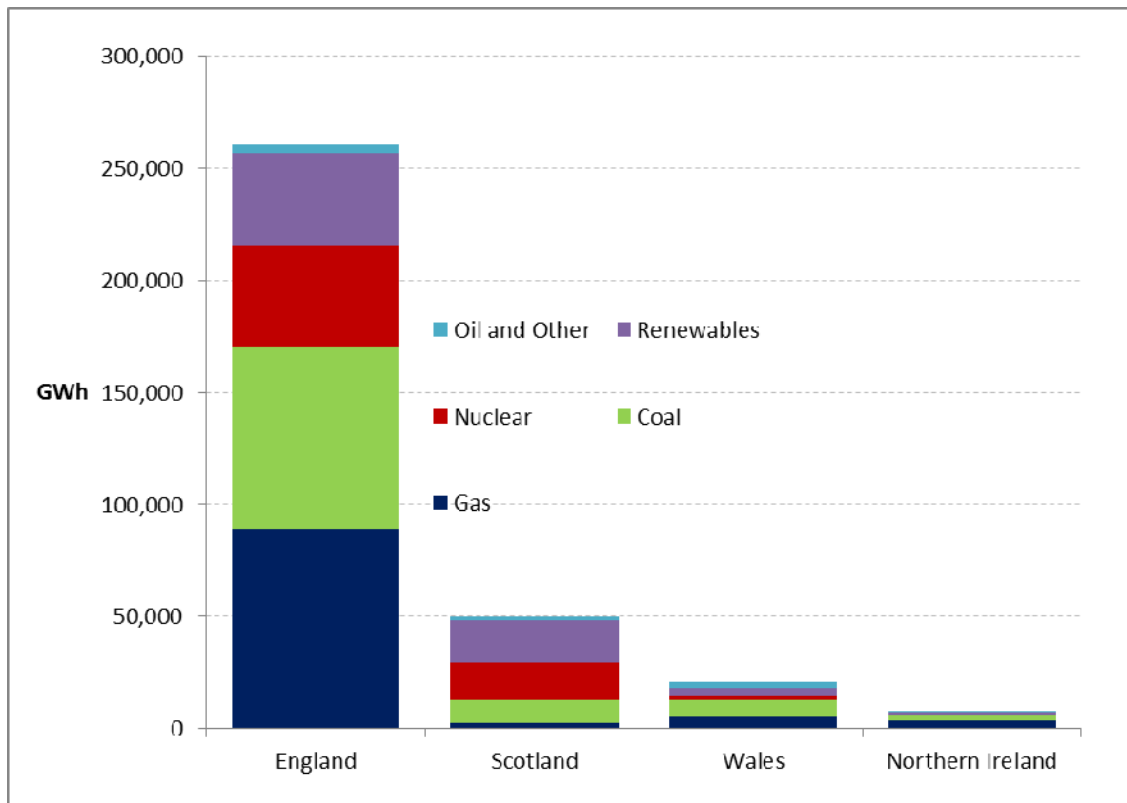
[www.gov.uk/government/statistics/energy-trends-september-2015-special-feature-articles](http://www.gov.uk/government/statistics/energy-trends-september-2015-special-feature-articles)

<sup>2</sup> "Combined Heat and Power in Scotland, Wales, Northern Ireland and the regions of England in 2014" – Energy Trends September 2015, page 61:

[www.gov.uk/government/statistics/energy-trends-september-2015-special-feature-articles](http://www.gov.uk/government/statistics/energy-trends-september-2015-special-feature-articles)

Overall, the UK saw a decline in total generation due to reductions in capacity. The largest reduction in generation share was experienced by coal, with coal fired plants closing throughout 2013 and 2014 due to the LCPD along with conversions of coal units to biomass units at Drax. Adverse market conditions also led to a reduction in the use of coal for generation.

**Chart 1: Generation by country and fuel type in 2014 (all generating companies)**



### Revisions

In the 2015 edition of DUKES, non-biodegradable waste was reclassified from ‘bioenergy’ to ‘other fuels’ for MPPs for 2013 and 2014. As a result, 522 GWh of ‘bioenergy’ was moved to ‘other fuels’ in 2013, but due to other revisions to the data since the 2014 edition of DUKES this has only resulted in a net fall of 119 GWh of bioenergy for 2013. Only England has been affected by this reclassification.

In the article from last year some generation was incorrectly allocated to Wales for 2012 and 2013. As a result, 430.6 MWh has been reallocated from Wales to England for 2012 and 552.9 MWh has been reallocated for 2013.

### Renewables

The share of renewables in electricity generation or sales is measured in two different ways in the UK<sup>3</sup>. First, there is the “headline” overall measure that shows the percentage of electricity generation accounted for by all renewables. Secondly, there is the measure that is based on the Renewables Obligation (RO) (and the analogous Renewables Obligation (Scotland) - ROS) which shows the percentage of electricity sales accounted for by renewables eligible under these

<sup>3</sup> There is also a third method used by the EU – a Renewables Directive basis – see Chapter 6 of the Digest of UK Energy Statistics 2015, table 6.7 and paragraph 6.43.

## Special feature – Sub national electricity figures

obligations. The main differences are the exclusion from the RO of large-scale hydro and non-biodegradable wastes<sup>4</sup>. Table A2 shows the overall measure for 2011, 2012, 2013 and 2014.

**Table A2: Renewables percentages**

		UK	Scotland	Wales	Northern Ireland	England
Overall renewables percentage	2011	9.4	26.7	8.4	12.6	6.2
	2012	11.3	29.1	9.3	15.9	8.1
	2013	14.8	32.0	10.3	19.5	11.8
	2014	19.1	38.0	16.3	22.2	15.6

With its high proportion of natural flow hydro, as well as wind generation increasing over the last few years due to increased capacity, renewables' share in Scotland under the headline measure increased by 6.0 percentage points to stand at 38.0 per cent in 2014. This increase was mainly due to a rise in hydro generation as a result of higher rainfall, up 15 per cent from 2013. In 2014, Scotland, Wales, Northern Ireland and England all had a record high percentage of electricity generated by renewables. On a RO basis, the percentage measure for the UK (9.8 per cent in 2011, 11.9 per cent in 2012, 16.1 per cent in 2013 and 19.1 per cent in 2014) is not meaningful at sub-national level because electricity generated in one part of the UK can be sold in a different part of the UK.

In Scotland, the renewables target (which is to reach 100 per cent by 2020) is expressed as generation as a proportion of gross electricity consumption (defined as generation plus transfers into Scotland less transfers out of Scotland). In 2011, this percentage was 36.2 per cent, increasing to 39.0 per cent in 2012. In 2013, this rose to 44.4 per cent and has continued to rise to 49.7 per cent in 2014. The next interim target is to reach 50 per cent by 2015.

The amount of electricity from renewable sources transferred from Scotland or Wales to England, or from Scotland to Northern Ireland, is not known. What is known from Table 2 is that the amount of ROS eligible electricity generated in Scotland in 2014 was 4.4 per cent more than in 2013, while the amount of RO eligible electricity generated in Wales in 2014 was 13.3 per cent more than in 2013. In England, the increase was 17.1 per cent. In Northern Ireland RO eligible electricity generated was 9.3 per cent more. In the UK as a whole, RO eligible electricity production increased by 12.9 per cent. Over the four years shown in Table 2, the increases in RO eligible electricity production have been substantial across all countries, namely 65 per cent for Northern Ireland, 43 per cent for Scotland, 31 per cent for Wales and 121 per cent for England.

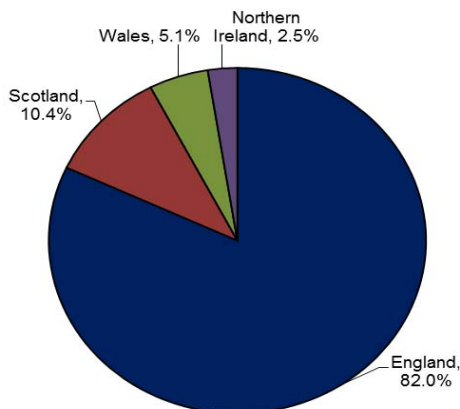
Renewables statistics for 2014 on a sub-national and regional basis were published in the September 2015 issue of Energy Trends<sup>5</sup> (see references at the end of the article).

<sup>4</sup> Specific exclusions from eligibility for the RO are existing hydro plant over 20 MW; all plant using renewable sources built before 1990 (unless re-furbished); and energy from mixed waste combustion unless the waste is first converted to fuel using advanced conversion technology.

<sup>5</sup> "Renewable energy in Scotland, Wales, Northern Ireland and the regions of England in 2014" – Energy Trends September 2015, page 49:

[www.gov.uk/government/statistics/energy-trends-september-2015-special-feature-articles](http://www.gov.uk/government/statistics/energy-trends-september-2015-special-feature-articles)

**Chart 2: Electricity consumption in 2014**



### Consumption and sales

Transmission and distribution losses are not separately available for Scotland, Wales, Northern Ireland and England so estimates have been made using the UK proportions. Consumption figures have then been calculated by deducting net transfers and losses figures from the electricity supplied figures shown in Table 1. These show (Chart 2) that in 2014, 10.4 per cent of electricity consumption in the UK was in Scotland, 5.1 per cent in Wales, 2.5 per cent in Northern Ireland and 82.0 per cent in England. These are all of little variation from the average percentage shares for each country for the period 2011 to 2014, namely 82.1 per cent for England, 10.0 per cent for Scotland, 5.3 per cent for Wales and 2.6 per cent for Northern Ireland.

Separate data is collected for sales of electricity from the public supply system in Scotland, England and Wales, and Northern Ireland and published in monthly table ET 5.5 on DECC's Energy Statistics website (see references at the end of the article), but for this article the breakdown between England and Wales has been estimated. Because of definitional and other differences set out in the technical notes to Chapter 5 of DUKES 2015, there is a statistical difference between the calculated consumption and the sales data in Table 1. The overall statistical difference for the UK equals that shown in Table 5.2 of DUKES for the UK as a whole for the public distribution system.

As part of its commitment to improving the quality of its statistics, DECC continues to examine this statistical difference and look further at the component series to see where the differences might be arising and thus where improvements to the data might be made.

Chart 3 shows the relationship between generation and consumption of electricity in each of the countries by means of a flow diagram.

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*Special feature – Sub national electricity figures*

**References:**

Digest of UK Energy Statistics 2015 (DUKES); published for DECC by The Stationery Office. £75.00, but also available on DECC's energy statistics website at:

[www.gov.uk/government/statistics/electricity-chapter-5-digest-of-united-kingdom-energy-statistics-dukes](http://www.gov.uk/government/statistics/electricity-chapter-5-digest-of-united-kingdom-energy-statistics-dukes)

Energy Trends monthly table 5.5:

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

Large Combustion Plant Directive (LCPD): Running hours during winter 2014/15 and capacity for 2015/16, page 71:

[www.gov.uk/government/statistics/energy-trends-september-2015-special-feature-articles](http://www.gov.uk/government/statistics/energy-trends-september-2015-special-feature-articles)

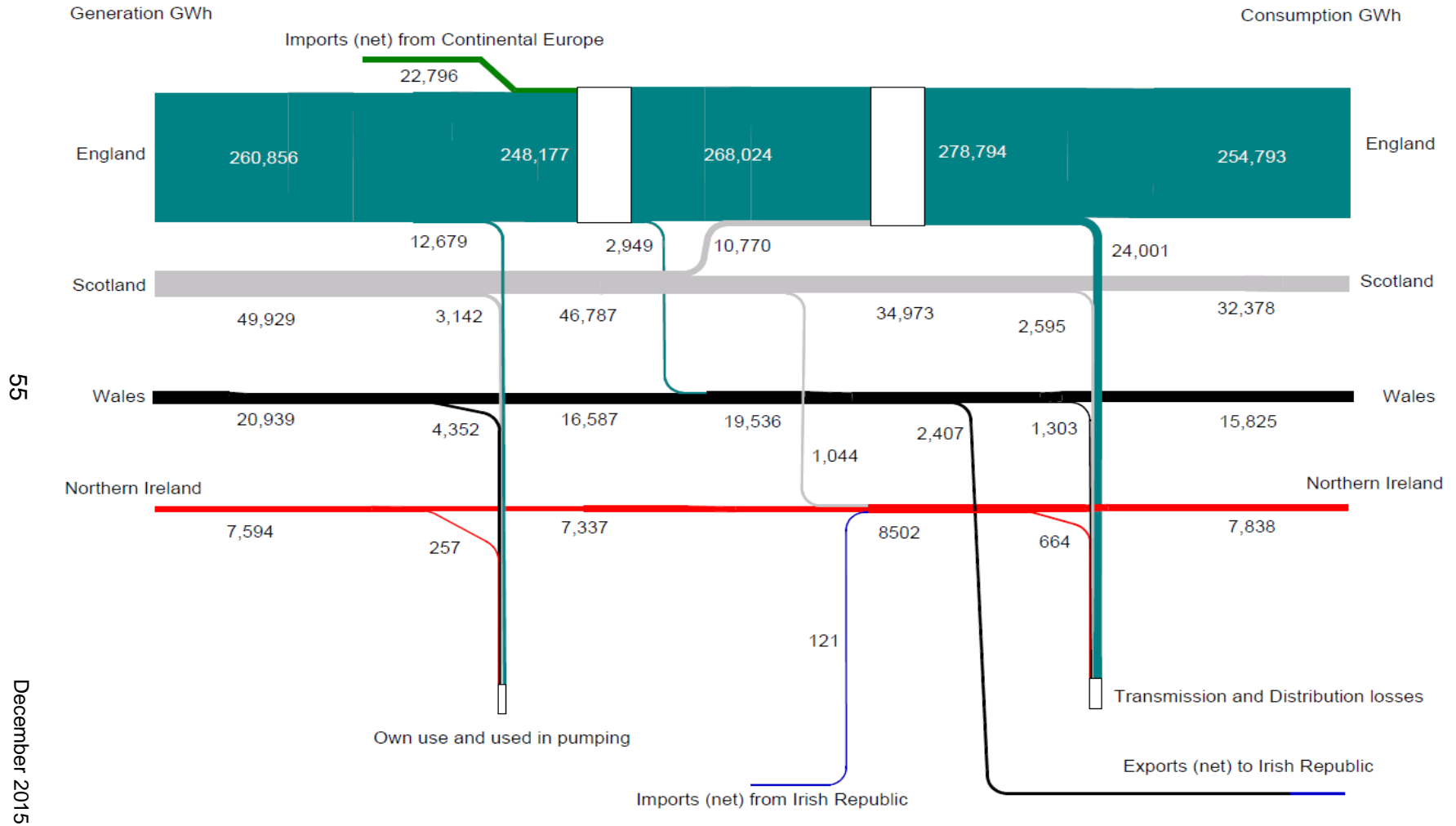
“Combined Heat and Power in Scotland, Wales, Northern Ireland and the regions of England in 2014” – Energy Trends September 2015, page 61:

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“Renewable energy in Scotland, Wales, Northern Ireland and the regions of England in 2014” – Energy Trends September 2015, page 49:

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**Chart 3: Electricity generation and consumption flow chart, 2014**



**Table 1: Generation and supply of electricity in Scotland, Wales, Northern Ireland and England, 2011 to 2014**

		2011					2012					<i>GWh</i>
		UK total	Scotland	Wales	Northern Ireland	England	UK total	Scotland	Wales	Northern Ireland	England	
Generated by	Major power producers	332,461	44,880	25,043	7,319	255,219	328,270	44,823	23,598	6,573	253,275	
	Other generators	34,960	6,290	2,559	618	25,494	35,309	5,697	2,529	822	26,260	
Total generated		367,422	51,170	27,601	7,937	280,714	363,579	50,520	26,127	7,396	279,535	
Own use by Other generators		1,951	351	143	34	1,423	2,108	340	151	49	1,568	
Electricity supplied (net) by Other generators		33,009	5,939	2,416	583	24,071	33,200	5,357	2,378	773	24,692	
Used in pumping at pumped storage and other own use by MPPs		18,322	2,924	4,149	179	11,070	19,837	2,995	4,332	196	12,314	
Electricity supplied (net) by MPPs		314,140	41,956	20,893	7,140	244,149	308,433	41,828	19,267	6,377	240,961	
Electricity transferred to England (net of receipts)		-	11,597	3,652	-	-15,250	-	10,717	2,157	-	-12,874	
Electricity transferred to Northern Ireland (net of receipts)		-	1,769	-	-1,769	-	-	2,162	-	-2,162	-	
Electricity transferred to Europe (net of receipts)		-6,222	-	-	245	-6,467	-11,871	-	104	160	-12,135	
Transfers from other generators to public supply		14,931	2,976	1,005	449	10,501	15,882	2,895	901	618	11,468	
Transmission losses		6,470	632	360	169	5,308	6,757	656	370	175	5,556	
Distribution losses		21,658	1,810	1,091	548	18,210	22,148	1,880	1,104	544	18,620	
Consumption from public supply [A]		307,175	29,126	16,796	8,396	252,857	307,297	29,311	16,433	8,279	253,274	
Consumption by autogenerators		18,068	2,961	1,410	134	13,563	17,303	2,460	1,476	155	13,213	
Total Electricity consumption		325,243	32,087	18,206	8,530	266,419	324,600	31,771	17,909	8,433	266,487	
Electricity sales (public supply) [B]		308,033	29,783	17,241	8,209	252,801	308,408	28,749	17,109	7,942	254,608	
Statistical difference between calculated consumption [A] and sales [B]		-858	-657	-445	+188	+56	-1,111	+562	-677	+337	-1,334	



**Table 1 continued: Generation and supply of electricity in Scotland, Wales, Northern Ireland and England, 2011 to 2014**

		2013					2014					GWh
		UK total	Scotland	Wales	Northern Ireland	England	UK total	Scotland	Wales	Northern Ireland	England	
Generated by	Major power producers	324,725	46,778	23,024	6,706	248,217	300,823	42,876	17,997	6,520	233,430	
	Other generators	34,443	6,185	2,843	1,072	24,342	38,104	7,052	2,942	1,075	27,426	
Total generated		359,168	52,963	25,867	7,778	272,560	338,927	49,929	20,939	7,594	260,856	
Own use by	Other generators	2,222	399	183	69	1,570	2,563	474	198	72	1,845	
Electricity supplied (net) by	Other generators	32,221	5,786	2,660	1,003	22,772	35,541	6,578	2,744	1,002	25,582	
Used in pumping at pumped storage and other own use by	MPPs	19,598	3,090	4,538	199	11,770	17,842	2,668	4,155	184	10,835	
Electricity supplied (net) by	MPPs	305,127	43,688	18,485	6,507	236,447	282,981	40,209	13,842	6,335	222,595	
Electricity transferred to England (net of receipts)		-	13,275	1,143	-	-14,418	-	10,770	-2,949	-	-7,821	
Electricity transferred to Northern Ireland (net of receipts)		-	1,541	-	-1,541	-	-	1,044	-	-1,044	-	
Electricity transferred to Europe (net of receipts)		-14,429	-	2,161	45	-16,636	-20,510	-	2,407	-121	-22,796	
Transfers from other generators to public supply		13,998	3,424	1,178	877	8,520	14,916	4,059	1,423	989	8,445	
Transmission losses		6,351	626	322	163	5,241	6,489	669	328	156	5,336	
Distribution losses		21,374	1,810	952	501	18,111	22,073	1,925	975	508	18,665	
Consumption from public supply [A]		305,851	29,864	15,087	8,216	252,685	289,862	29,862	14,505	7,826	237,668	
Consumption by autogenerators		18,201	2,359	1,481	125	14,237	20,608	2,516	1,320	13	17,125	
Total Electricity consumption		324,052	32,222	16,567	8,341	266,922	310,470	32,378	15,825	7,839	254,793	
Electricity sales (public supply) [B]		306,640	28,879	17,342	7,714	252,706	291,100	27,421	16,791	7,436	239,453	
Statistical difference		-789	+985	-2,255	+502	-21	-1,239	+2,442	-2,286	+390	-1,785	
<b>between calculated consumption [A] and sales [B]</b>												

*Figures in this table do not sum exactly to the UK totals shown because of rounding*



**Table 2 continued: Generation of electricity by fuel in Scotland, Wales, Northern Ireland and England, 2011 to 2014 GWh**

		2013					2014				
		UK total	Scotland	Northern			UK total	Scotland	Northern		
				Wales	Ireland	England			Wales	Ireland	England
Major power producers:	Coal	130,204	10,802	11,478	2,606	105,319	100,158	10,152	7,478	2,159	80,369
	Oil	745	161	-	20	563	530	181	-	23	326
	Gas	82,891	3,497	3,432	3,457	72,505	88,871	880	4,187	3,679	80,126
	Nuclear	70,607	18,498	4,326	-	47,783	63,748	16,633	1,953	-	45,161
	Thermal renewables	9,285	360	129	-	8,796	12,707	375	74	-	12,258
	Other thermal	522	-	-	-	522	528	-	-	-	528
	Hydro natural flow	3,609	3,412	175	-	22	4,635	4,391	213	-	30
	Hydro pumped storage	2,904	620	2,283	-	1	2,883	494	2,389	-	-
	Non thermal renewables	23,958	9,428	1200	622	12,708	26,763	9,770	1702	660	14,632
	<b>Total</b>		<b>324,725</b>	<b>46,778</b>	<b>23,024</b>	<b>6,706</b>	<b>248,217</b>	<b>300,823</b>	<b>42,876</b>	<b>17,997</b>	<b>6,520</b>
Other Generators:	Coal	564	19	-	39	506	549	-	-	-	549
	Oil	1,346	434	49	38	825	1,351	633	43	-	675
	Gas	13,137	1,943	1,043	102	10,048	12,057	1,836	858	62	9,300
	Thermal renewables	8,873	999	490	134	7,250	9,995	1,353	493	144	8,004
	Other thermal	1,490	33	594	-	862	1,646	135	621	-	890
	Hydro natural flow	1,093	951	52	21	69	1,250	1,045	62	28	115
	Non thermal renewables	6,459	1,798	615	737	3,308	9,304	2,028	864	840	5,963
	Wastes	1,481	8	-	-	1,473	1,951	22	-	-	1,929
<b>Total</b>		<b>34,443</b>	<b>6,185</b>	<b>2,843</b>	<b>1,072</b>	<b>24,342</b>	<b>38,104</b>	<b>7,052</b>	<b>2,942</b>	<b>1,075</b>	<b>27,426</b>
Total generation by fuel		359,168	52,963	25,867	7,778	272,560	338,927	49,929	20,939	7,594	260,856
<i>within which:</i>											
	Renewables Hydro	4,702	4,363	227	21	91	5,885	5,436	276	28	145
	Wind, wave, solar	30,417	11,227	1,815	1,360	16,016	36,068	11,798	2,566	1,500	20,595
	Other	18,159	1,359	619	134	16,046	22,702	1,728	568	166	20,262
	<b>Total</b>	<b>53,277</b>	<b>16,949</b>	<b>2,661</b>	<b>1515</b>	<b>32,152</b>	<b>64,654</b>	<b>18,962</b>	<b>3,409</b>	<b>1,694</b>	<b>41,002</b>
Renewables eligible under the renewables obligation		44,948	13,979	2,107	1,414	27,449	52,745	15,094	2,628	1,563	33,460
Percentage shares of generation:	Coal	36.4%	20.4%	44.4%	34.0%	38.8%	29.7%	20.3%	35.7%	28.3%	31.1%
	Oil	0.6%	1.1%	0.2%	0.7%	0.5%	0.6%	1.6%	0.2%	0.3%	0.4%
	Gas	26.7%	10.3%	17.3%	45.8%	30.3%	29.8%	5.4%	24.1%	49.1%	34.3%
	Nuclear	19.7%	34.9%	16.7%	-	17.5%	18.8%	33.3%	9.3%	-	17.3%
	Hydro natural flow	1.3%	8.2%	0.9%	0.3%	-	1.7%	10.9%	1.3%	0.4%	0.1%
	Other renewables	13.5%	23.8%	9.4%	19.2%	11.8%	17.3%	27.1%	15.0%	21.9%	15.5%
	Other	1.8%	1.2%	11.1%	-	1.0%	2.1%	1.3%	14.4%	-	1.3%
	<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Figures in this table do not sum exactly to the UK totals shown because of rounding