Regional renewable electricity in 2024

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Key headlines

Renewable generation in the UK increased by **5.1 per cent** from 136.8 TWh in 2023 to 143.7 TWh in 2024. This was a result of increased wind and plant biomass generation. Within this:

- Generation in England was **up 4.4 per cent**
- Generation in Northern Ireland was **down 6.1 per cent**
- Generation in Scotland was **up 11.5 per cent**
- Generation in Wales was **down 8.2 per cent**

Overall capacity increased by **7.3 per cent** from 56.5 GW at the end of 2023 to 60.6 GW at the end of 2024. Within this:

- Capacity in England was **up 5.7 per cent**
- Capacity in Northern Ireland was **up 1.5 per cent**
- Capacity in Scotland was **up 12.9 per cent**
- Capacity in Wales was **up 4.1 per cent**

Background

This article provides information and analysis on the amount of electricity from renewable sources, disaggregated below the UK level. It includes information on capacity, generation, and number of operational sites, as well as derived load factors, for the four UK countries, the nine English regions and, from 2014, UK Local Authorities. It updates the previously published figures in the October 2024 edition of Energy Trends.

These data are consistent with those published in the Digest of United Kingdom Energy Statistics 2025 (DUKES)[1], and use similar categories[2]. The UK totals for 2024 published here are consistent with the figures published in Energy Trends. In addition, data for 2022 and 2023 have been revised to reflect DUKES, except for a small revision to solar capacity in 2022 which will be revised in DUKES next year.

The UK totals published here are consistent with the figures published in Energy Trends. However, there are small differences between the totals published for England, Northern Ireland, Scotland and Wales published here and those published in ET 6.1. Some sites cannot be allocated to local authorities where it would disclose the generation of individual schemes. This leads to some differences for generation between DUKES and these tables for 2022, 2023 and 2024.

Generation from **liquid biofuels** (biodiesel) is not included here. This is because there are a relatively small number of sites that generate from biodiesel and publishing their totals would be disclosive. In total there are:

- 55 sites that generate from biodiesel, with 53 in England
- Their total capacity is 35.5 MW
- In 2024, they generated 144 GWh in total (0.1 per cent of total renewable generation).

[1] https://www.gov.uk/government/statistics/renewable-sources-of-energy-chapter-6-digest-of-united-kingdom-energy-statistics-dukes

[2] On occasion, it has been necessary to combine some renewable sources into categories so that information about individual sites, provided in confidence to DESNZ, is not disclosed.

In addition, there are small differences between the totals published for England, Northern Ireland, Scotland and Wales published here and those published in ET 6.2. This is because some sites cannot be allocated to local authorities where it would disclose the electricity generated by individual schemes.

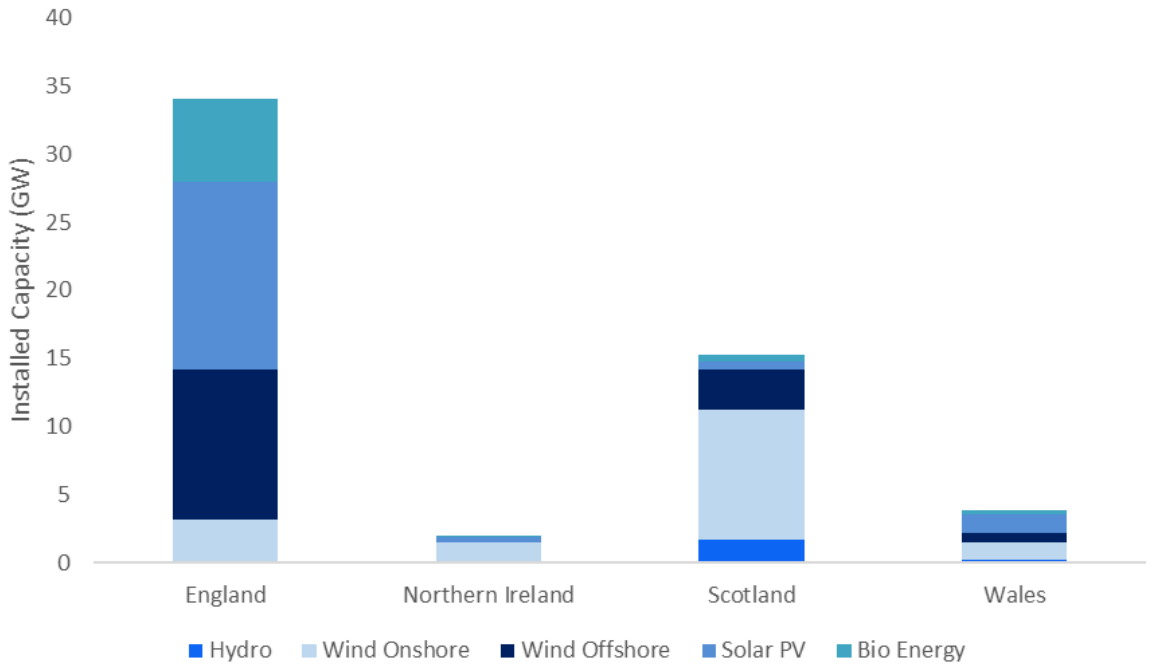
Time-series data are available as Excel spreadsheets at: www.gov.uk/government/statistics/regional-renewable-statistics. The regional tables include data for 2003 – 2024 and the Local Authority (LA) tables include data for 2014 – 2024. The spreadsheets include detailed data and additional charts for generation, capacity, number of sites, generation per GVA, and load factors.

Capacity

- England had the most renewable capacity and generation, roughly two and a half times that of Scotland. This is largely because England has 88 per cent of the UK's bioenergy capacity (including Drax and the Ferrybridge Multifuel Power Station, both in Yorkshire and the Humber, as well as Lynemouth in the North East), 86 per cent of the solar PV capacity, and 70 per cent of the offshore wind capacity.

Chart 1 shows a breakdown of capacity at the end of 2024 by technology and country.

Chart 1: Renewable capacity at the end of 2024 by technology and country



- **Solar PV** capacity in the UK increased by 12.9 per cent, contributing to 50 per cent of the overall growth in the country. An additional 1 GW of capacity has been added, 88 per cent of this new capacity was in England.

- **Offshore wind** capacity grew by 8.1 per cent (1.2 GW). Scotland accounted for nearly all of this additional capacity, primarily from Moray West (882 MW) and Neart Na Gaoithe (224 MW). In addition, the first turbines were installed at Dogger Bank in England.

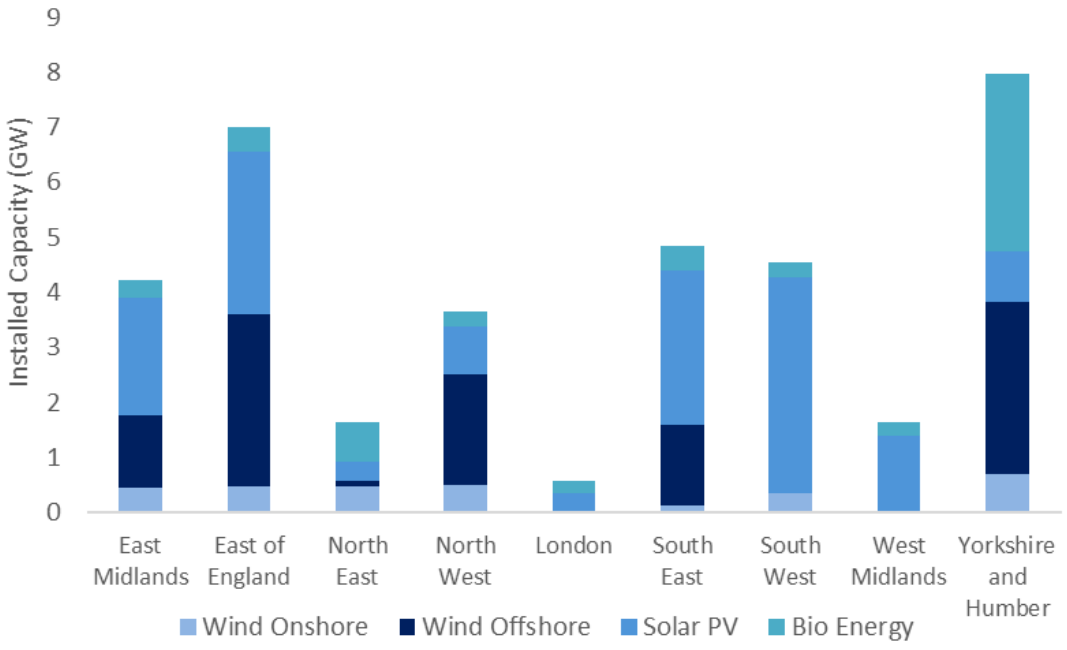
Within England, the breakdown of renewable capacity varies by region as shown in Chart 2. The regions with the highest capacity in England are:

- Yorkshire and the Humber – 8,044 MW (39 per cent from offshore wind – the largest plants being Hornsea phase 1 and 2 and 41 per cent from bioenergy - mostly from Drax and Ferrybridge).
- East of England – 7,194 MW (43 per cent from offshore wind and 41 per cent from solar PV).
- South East – 5,044 MW (56 per cent from solar PV and 29 per cent from offshore wind).

Table 1 - Largest new schemes (including capacity increases) in 2024:

Offshore wind	Moray West	Scotland	882 MW
	Neart Na Gaoithe	Scotland	224 MW
Onshore wind	Viking Wind Farm	Scotland	443 MW
	Broken Cross	Scotland	43 MW
Solar PV	Breach Solar	East of England	67 MW
	Darlington Road, Skeeby	Yorkshire and Humber	55 MW
	Layer Farm, Crouch Solar Farm, and The Grange (Hawton)	East of England and East Midlands	Each at 49 MW
Biomass	Teesside Renewable Energy Plant	North East	45 MW

Chart 2 – Renewable capacity at the end of 2024 by English region and technology



Generation

- Renewable generation in England was around two and a half times that for Scotland. However, this gap has narrowed from three times higher in 2021 as Scotland's wind generation increased more rapidly than England's over this period. The breakdown of renewable capacity and generation is different in each nation; England has a lot of bioenergy and solar capacity while Scotland has a lot of onshore wind capacity. Bioenergy tends to have higher load factors (see below) than wind, but this is offset by England having more solar PV capacity which has a lower load factor.

Number

- Excluding solar PV, England continues to have the largest number of renewable generating sites (6,093) followed by Scotland (4,738), Northern Ireland (1,356), and Wales (1,208). Wales has more sites than Northern Ireland when solar PV is included.

- Excluding solar PV, regions with the most sites in England are the South West, East of England, and Yorkshire and the Humber which each have over 1,000 installations. When solar PV is taken into consideration, the South East has the highest number of sites followed closely by the South West and the East of England.

Capacity and Generation per GVA

- Economic activity in each country or region is measured in terms of Gross Value Added (GVA)[3]. Scotland shows the largest renewable generation per £ of GVA followed by Yorkshire and the Humber and Wales.

Load Factors

Load factors are the ratio of how much electricity was generated as a proportion of the total generating capacity. UCLFs or "load factor on an unchanged configuration basis" describes the amount of electricity generated from sites that have been operating throughout the whole of the calendar year with the same installed capacity[4].

The UCLFs and load factors on a standard basis can be found in the load factor time-series spreadsheets. A summary by country is given in Table 2:

[3] GVA as published in Regional Gross Value Added (Income Approach), December 2015 at:
https://www.ons.gov.uk/economy/grossdomesticproductgdp/bulletins/regionaleconomicactivitybygrossdomesticproductuk/1998to2022
https://www.ons.gov.uk/economy/grossvalueaddedgva/datasets/nominalandrealregion

[4] The formula for calculating this is:

$$\frac{\text{Elelctricity generated during the year (MWh)}}{\text{Installed capacity of schemes operating throughout the year with unchanged capacity configuration (MW)} * \text{hours in year}}$$

Table 2 - Load factors (UCLFs) by country and technology - 2024:

	Onshore Wind	Offshore Wind	Solar PV	Hydro	Biomass and Waste
England	25.7%	40.2%	9.9%	41.6%	66.8%
Northern Ireland	21.4%	n/a	7.4%	36.8%	58.8%
Scotland	26.4%	35.0%	9.8%	49.6%	68.9%
Wales	25.9%	30.2%	10.0%	23.3%	67.7%
UK average	**25.7%**	**38.7%**	**9.8%**	**44.6%**	**66.8%**

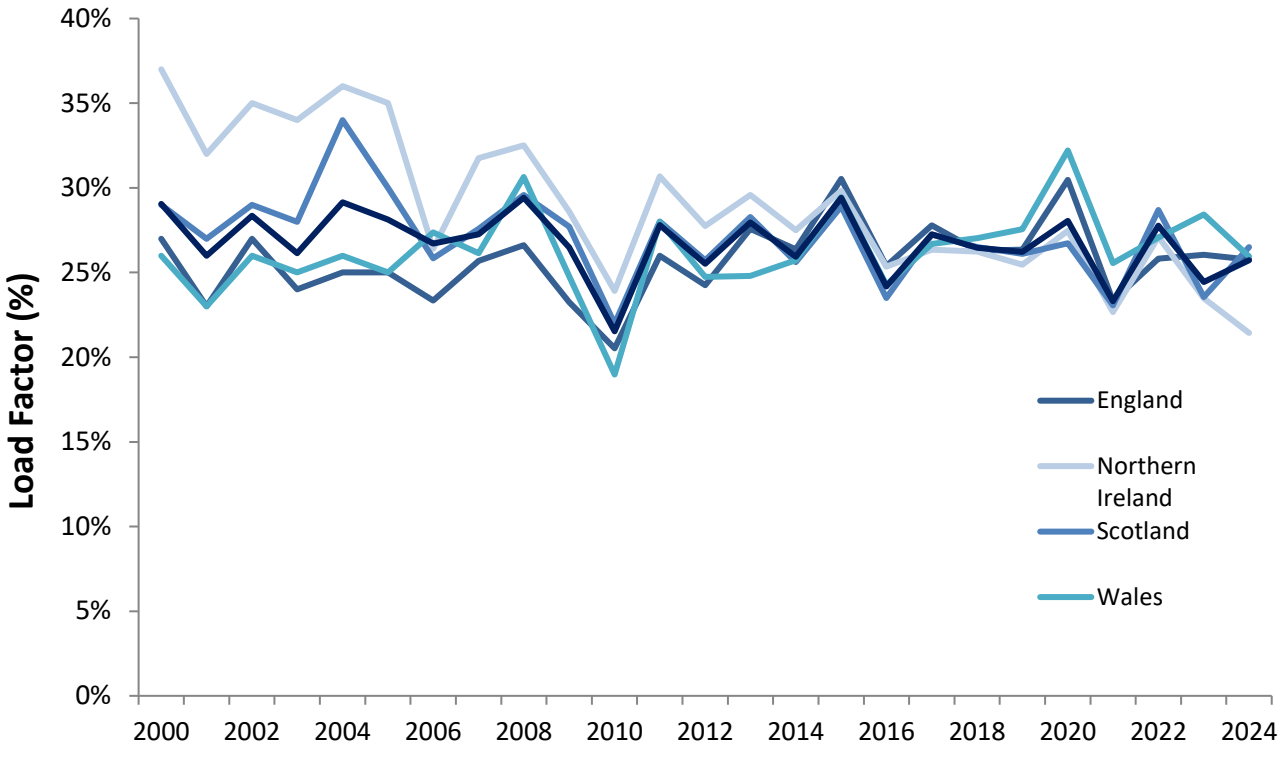
- Scotland has the highest **onshore wind** load factor (26.4 per cent), followed by Wales, England, and Northern Ireland. Load factors can be affected by differences in regional average wind speeds as well as curtailments and planned maintenance.

- England continues to have the highest load factor for **offshore wind** (40.2 per cent), followed by Scotland (35.0 per cent) and Wales (30.2 per cent).

- Wales has the highest average load factor for **solar PV** (10.0 per cent), followed by England, Scotland and Northern Ireland.

Load factors for other technologies are included in the related spreadsheets.

Chart 3 – Onshore wind Unchanged Configuration LFs since 2001 by UK country

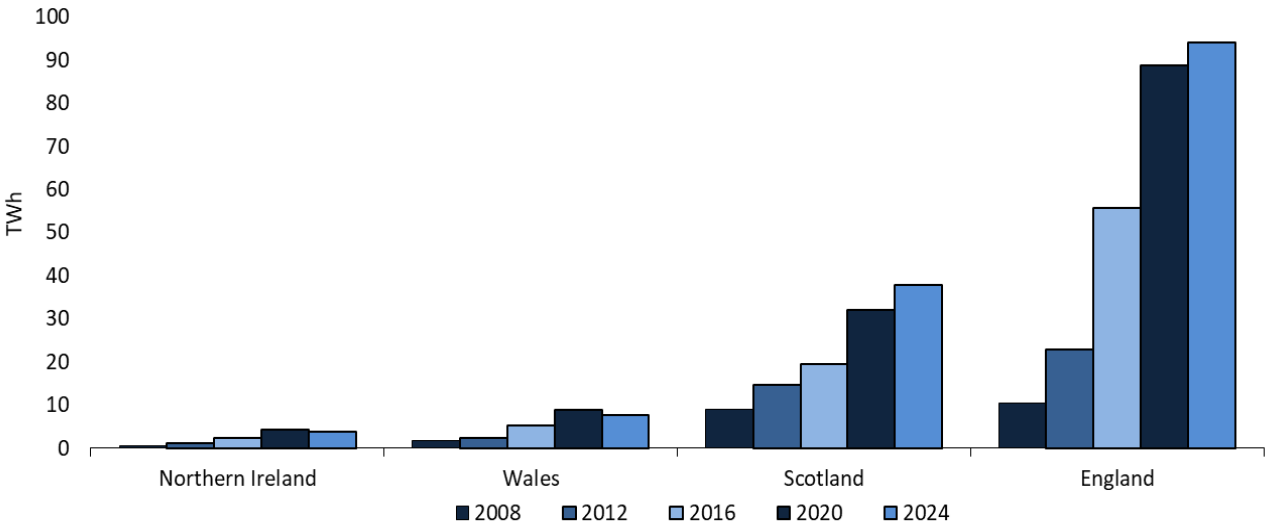


Time series

Capacity and generation have grown at different rates in different regions for each technology, which is partly dependent on the availability of support schemes - Renewables Obligation (RO), Feed in Tariff (FiT) and Contracts for Difference (CfD).

Renewables grew strongly in each country between 2012 and 2020. Renewable generation was at a record level in 2024 in England and Scotland, however the rate of growth has slowed since 2020. Renewable generation in Wales and Northern Ireland were both down on 2023 and both lower than the level in 2020 as shown in graph 4:

Chart 4 – Total renewable generation by country 2004 – 2024



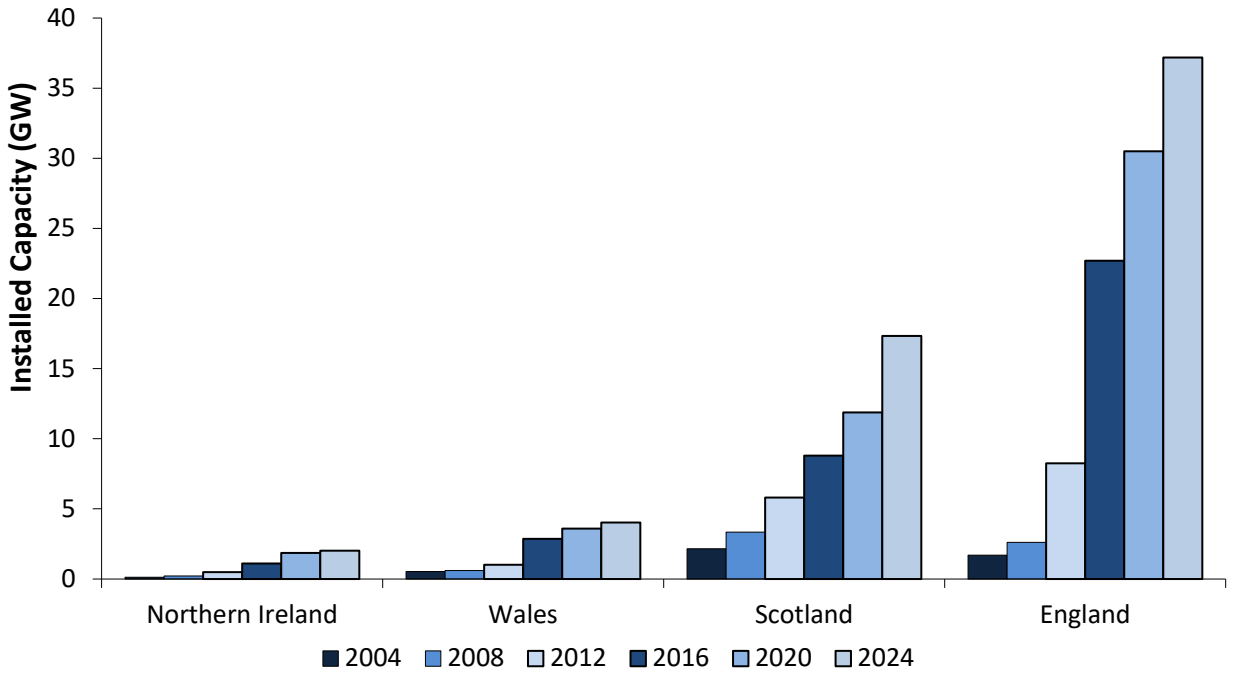
Solar PV: following a period of rapid growth encouraged by the RO and FiT support mechanisms, the initial fast rate of growth has slowed down, which is also reflected in the corresponding generation figures; this is probably due to a combination of effects including the closure of the RO and FiT and the rapid exploitation of prime development sites. Similar patterns are seen for other technologies (onshore wind, landfill gas, sewage gas, and hydro). However, in 2024, strong growth was observed in small-scale and domestic solar installations across each region of the UK.

Offshore wind continues to grow. In total, offshore wind capacity grew by 8.1 per cent, most of this growth came from Moray West in Scotland.

Landfill gas: the rate of exploitation of prime sites reached saturation more than a decade ago but there is no similar plateauing of generation data which instead decreases with time. This is because biogas production rates reduce with time as less organic waste is sent to landfill.

Chart 5 shows how capacity has grown over time in each country:

Chart 5 – Total renewable capacity by country 2004 – 2024



Tables 3 to 5 rank the top five Local Authorities[5] (LAs), by number of installations, installed capacity, and generation for key technologies.

- **Number of sites:** data are summarised in Table 3. Cornwall remains the top-ranked (31,493), reflecting the large number of solar PV schemes installed in the South West. The Orkney Islands has the most onshore wind sites. Highland has the most hydro sites. Somerset has the most plant biomass sites.

- **Capacity**: data are summarised in Table 4. North Yorkshire is the top ranked local authority, primarily from Bioenergy. This is followed closely by Highland, which has more hydro and onshore wind capacity than any other LA.

- **Generation**: data are summarised in Table 5. North Yorkshire is the top ranked local authority, primarily from plant biomass, including Drax, the largest biomass plant in the UK. Highland has the second most generation, due to the large amount of hydro and onshore wind generation there. Highland has more than twice as much renewable generation as Lancaster, the next LA in the list.

- Cornwall continues to have the most **solar PV** in terms of number, capacity and generation. Wiltshire is second and Somerset third in terms of capacity and generation. North Yorkshire has the third highest number of sites and Aberdeenshire the fifth. However, they have significantly lower capacities and generation due to the high proportion of small-scale domestic solar in these local authorities.

[5] Where disclosure of confidential generation data was likely at the site level, the data have been removed, and added to the unallocated row at the bottom of the Local Authority listings.

- Highland's overall capacity and generation is driven by the construction of large-scale, **onshore wind** farms. Whilst the Orkneys has the highest number of wind sites (almost three times that of Highland) it has much smaller capacity and generation, suggesting these tend to be smaller projects meeting local needs.

- 'Armagh, Banbridge and Craigavon' have the highest number of Anaerobic digestion facilities, followed by Shropshire and 'Derry and Strabane'. However, East Riding, Shropshire and East Cambridgeshire have the largest capacities.

Table 3: Local Authority: Number of sites generating electricity from renewable sources, 2024									
Onshore Wind		Solar PV		Hydro		Bioenergy		Total	
Orkney Islands	803	Cornwall	31,024	Highland	309	Somerset	59	Cornwall	31,493
Aberdeenshire	590	Somerset	24,603	Argyll and Bute	126	Shropshire	52	Somerset	24,753
Cornwall	433	North Yorkshire	22,983	Gwynedd	120	North Yorkshire	49	North Yorkshire	23,297
Dumfries and Galloway	318	Wiltshire	19,794	Perth and Kinross	90	Armagh, Banbridge and Craigavon	49	Wiltshire	19,826
Highland	275	Aberdeenshire	17,381	Dumfries and Galloway	84	Dumfries and Galloway	39	Aberdeenshire	18,005
UK Total	**9,782**		**1,696,872**		**1,578**		**1,976**		**1,710,278**

Table 4: Local Authority: Installed capacity of sites generating electricity from renewable sources, 2024								MW	
Onshore Wind		Solar PV		Hydro		Bioenergy		Total [2]	
Highland	2,044	Cornwall	650	Highland	819	North Yorkshire	2,722	North Yorkshire	3,043
South Lanarkshire	1,506	Wiltshire	600	Argyll and Bute	300	Northumberland	456	Highland	2,945
Dumfries and Galloway	929	Somerset	535	Perth and Kinross	278	Wakefield	192	North East Lincolnshire	2,894
South Ayrshire	691	Dorset	381	Dumfries and Galloway	157	Bedford	131	Moray	2,087
Scottish Borders	688	South Cambridgeshire	296	Stirling	86	Halton	127	East Suffolk	1,759
UK Total	**16,166**		**18,280**		**1,899**		**8,328**		**60,631**

Table 5: Local Authority: Generation of electricity from renewable sources, 2024								GWh	
Onshore Wind		Solar PV		Hydro		Bioenergy		Total [b]	
Highland	4,583	Cornwall	536	Highland	3,024	North Yorkshire	10,472	North Yorkshire	10,838
South Lanarkshire	3,413	Wiltshire	482	Perth and Kinross	804	Breckland	530	Highland	7,826
Dumfries and Galloway	2,192	Somerset	429	Argyll and Bute	568	Fife	495	South Lanarkshire	3,569
Scottish Borders	1,518	Dorset	302	Dumfries and Galloway	359	North Lincolnshire	470	Lancaster	3,527
South Ayrshire	1,480	South Cambridgeshire	257	Stirling	306	Sheffield	434	East Suffolk	3,260
UK Total	**34,744**		**14,364**		**5,796**		**40,108**		**143,708**

a Top five ranked Local Authorities (LAs). Where more than five schemes are listed, this indicates that more than one LA has the same ranking.

b Totals include offshore wind sites allocated to nearest Local Authority.

Annex A – Capacity Growth

Table 6 summarises capacity growth and the major new sites in each region:

Table 6: Regional capacity growth

Region	Technology	Growth (MW)	Major New Sites
East Midlands	Solar PV	184.9	The Grange, Crifton Lodge, White Cross Lane, Sudbury, Alfreton, Inkersall Road, Pretoria Road
East of England	Solar PV	316.9	Breach, Crouch, Layer Farm, Periwinkle Hall, Maldon Wycke, Pentlow Hill, Bracon Ash, Wicken
London	Solar PV	2.7	Biggin Hill Airport & 8 other small sites
North East	Solar PV	9.3	Unipres Building & 11 other small sites
	Biomass	49	Teesside Renewable Energy Plant
North West	Solar PV	22.1	Chamber House, Little Hulton, Amazon, Altham Business Park, Burneside Mill
	Onshore Wind	0.9	Rassau Industrial Estate
South East	Solar PV	128.1	Whirlbush Farm, Three Maids Hill, Hamer Warren, Ray Valley, Gander Down, Kingshill, Diamond Light, Syzygy Renewables Limited
	MSW	25	Greatmoor EfW
South West	Solar PV	72.7	Stokeford Farm, Beavor Grange, Aller Court Farm, Dorset Green, Markham Brook, Pattemores, Lag Farm
	Onshore Wind	0.9	Lower Tregeen
West Midlands	Solar PV	88.1	Larport, Bishampton, Lower Strensham, Bourne Road, Ricoh UK Products
Yorkshire and the Humber	Solar PV	88.6	Darlington Road Skeeby, Broken Scar, Castle Hill, Winterton, Elmsall Way Warehouse
	Biomass	0.9	R G Walter & Sons, Golden Acre Site
Northern Ireland	Solar PV	0.2	Hillmount
	Onshore Wind	1	Murley & 12 other small sites
Scotland	Solar PV	32	FE Irvine, Dunfermline EDI4, Aviva Headquarters, Eden Campus
	Offshore Wind	1,106	Moray West, Neart Na Gaoithe
	Onshore Wind	623.3	Viking, Broken Cross, Pines Burn, Sneddon Law, Strathallan, Kirk Hill, Rigmuir, Irvine Wind, Easter Drumclair Wood, Carlincraig
	MSW	34.5	Earls Gate EfW, Millerhill EfW
	Small Hydro	2.6	Allt na Moine, Ceitlein
Wales	Solar PV	46.4	Hopkins, Milford Energy Ltd, Royal Mint, Bluestone Resort
	Onshore Wind	1.8	Nantygwyddo, Kenfig Industrial Estate
	Anaerobic Digestion	0.5	Ystum Colwyn Farms Ltd

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