

# Combined Heat and Power in the regions

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## Key headlines

London represents the region with the highest number of schemes, 376 out of a total of 2,659 across the UK

Yorkshire and Humberside has the highest generation and capacity in both absolute terms and per unit of economic output

The impact of COVID 19 has been most apparent in London with both heat and electricity generation falling by 3.6 and 3.3 per cent respectively

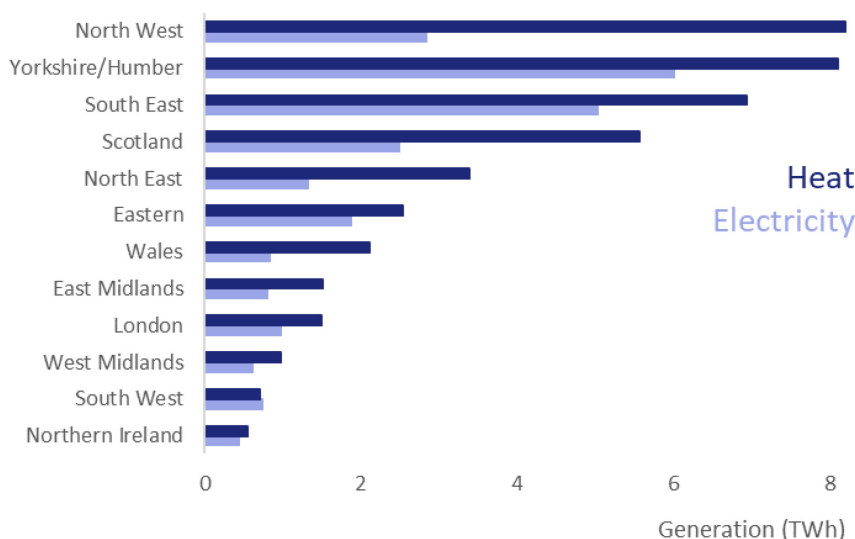
Combined Heat and Power (CHP), sometimes referred to as cogeneration, is the simultaneous generation of electricity and heat resulting in improved efficiencies when compared to meeting electricity and heat demands separately. This article provides additional regional information on CHP using data produced in support of The Digest of UK Energy Statistics (DUKES), Chapter 7;

<https://www.gov.uk/government/statistics/combined-heat-and-power-chapter-7-digest-of-united-kingdom-energy-statistics-dukes>

In 2020, there was an additional 81 schemes ([Table 1](#)), around half of which were in London (18 new schemes), the North West (11 schemes), and the South East (11 schemes). During the year, capacity also increased by 50 MWe (0.8 per cent), 18 MWe of which was in the South East. All regions saw an increase in the number of schemes and only Northern Ireland saw a slight fall in capacity (by 3 MWe, or 1.0 per cent).

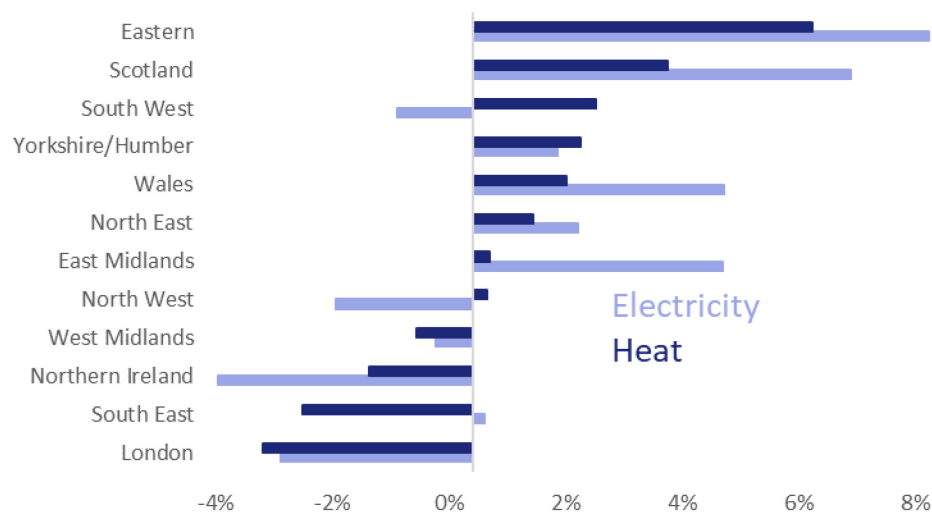
The region with the highest proportion of the UK's electrical capacity is Yorkshire and Humberside with a 33 per cent share, though this region hosts the single largest CHP scheme in the UK. This is followed by the South East with a 15 per cent share, the North West (13 per cent) and Scotland (10 per cent). These regions also represented the highest in terms of outputs, both heat and electricity, with Yorkshire and Humberside accounting for 25 per cent of all qualifying CHP electricity generation and 19 per cent of heat ([Table 2](#)).

**Figure 1. Heat and electricity generation by region in 2020**



UK wide, both electricity and heat outputs increased (by 1.4 per cent and 0.7 per cent respectively) between 2019 and 2020, though there were regional variations.

**Figure 2. Percentage change between 2019 and 2020 for heat and electricity outputs**



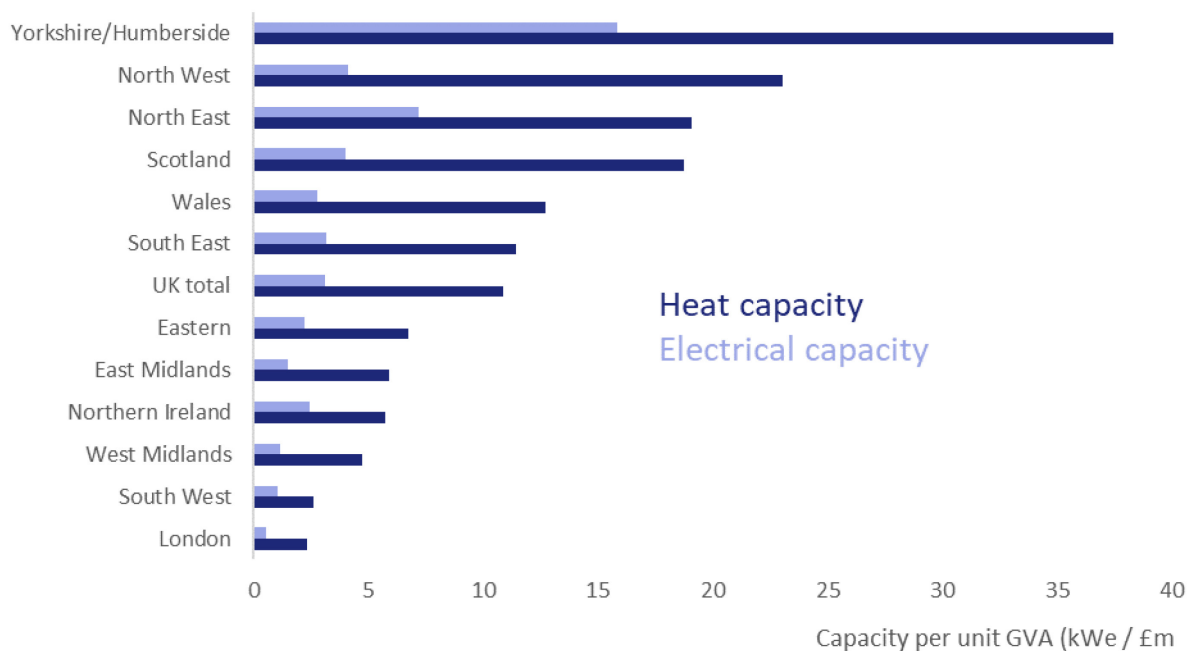
The Eastern region saw increases in both heat and electricity output due to one large site in the industrial sector. Activity levels in certain sectors have been more affected by COVID-19 than others, notably those schemes serving hotels, sporting facilities and district and community heating schemes have seen large falls in output between 2019 and 2020. This trend is most apparent within London where heat output has fallen by 3.6 per cent and electricity by 3.3 per cent. This is also reflected in the low load factor ([Table 3](#)) for London at just 50.3 per cent. This compares with 63.4 per cent for Yorkshire and Humberside which has a high proportion of industrial sites including large refineries, a sector ideally suited to CHP.

[Table 5](#) shows the distribution of capacity across the different sectors and regions with London accounting for almost half of all capacity in the electricity, gas, steam and air conditioning supply sector which includes district and community heating schemes. The chemicals sector which, along with oil refineries, is suitable for CHP, is concentrated in the North East, the North West and Yorkshire and Humberside; taken together these regions account for 83 per cent of CHP capacity in those sectors.

The large share of capacity employed in vehicle manufacture in the West Midlands is in line with the importance of this region to the automotive sector. More than a third of all capacity in the food and drink sector is in the Eastern region reflecting the large heat demands associated with sugar manufacture. The concentration of large horticultural sites (i.e. greenhouses) in South East England helps to explain the deployment of 45 per cent of all agricultural capacity in this region. The distribution of capacity serving public administration, mostly hospitals and education, tends to align with population density.

To determine CHP's contribution relative to how much a sector contributes to the regional economy as a whole, capacity per unit of GVA is compared in [Table 4](#) and Figure 3 below. Yorkshire and Humberside represents the highest proportion reflecting not only the concentration of favourable CHP sectors in that region (particularly oil refining on the Humber Estuary) but also its high share of the regional economy. Conversely, although CHP capacity in the vehicle sector is concentrated in the West Midlands (63 per cent), vehicle manufacturing represents a comparatively lower share of the regional economy.

**Figure 3. Relative importance of CHP in the regional economies in 2020**



[Tables 6 and 7](#) show the regional split of installed qualifying electrical capacity by prime mover (Table 6) and by size range (Table 7). At this level of disaggregation, some regions show only the totals to prevent disclosure due to the small number of sites.

Gas turbines, whether on their own or as part of Combined Cycle Gas Turbines (CCGT), continue to dominate the CHP market. In 2020, just 139 schemes of the CCGT and Open Cycle Gas Turbine (OCGT) technologies accounted for 61 per cent of total qualifying CHP capacity. Almost half of gas turbine capacity is to be found in Yorkshire and Humberside.

Reciprocating Engines represent over 90 per cent of all schemes, around 40 per cent of which are located in London, the South East and the North West, specifically in high population density areas with high heat demand from leisure centres, hotels and retail outlets, suited to the capacity range and heat grade offered by reciprocating engines.



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