Annex I – Methodology and Sources

The number and capacity of UK data centres

The following data are the foundation of our analysis. Calculations of the current and future economic impact - and future size of - the industry, are developed from these baseline number and capacity estimates.

There are, however, limitations to these baseline numbers:

- **No universal definition.** For instance, the definitions of data centres used by Climate Change Agreements and by the EU Code of Conduct for Data Centres differ and are open to some degree of interpretation. Moreover, the categorisation of data centres, e.g. Colo, Edge etc. is also open to some interpretation.

- **Data gaps.** Directories of data centres collated by private companies have self-reported limitations to their methodologies, with a common issue being the inability to identify enterprise data centres. Moreover, the operational role of some data centres is sensitive - such as those involved in defence operations - and therefore information is unavailable.

Within this context, Table [x] sets out some estimates of data centre numbers and capacity in the UK, with explanation of the origin of the data. Our assessment is that these estimates are the best available, but almost certainly under-report the number of data centres in the UK (because of the aforementioned data gaps). This means that our calculations of economic impact are under-estimates.

One final point to reiterate is the tens of thousands of (and potentially even more) server rooms in the UK that could be counted as part of the data centre family. For example, Carbon3IT has previously estimated that there are 80,000 data centres and server rooms in the UK. These could add to economic impact as well - such as procuring engineering services - but are not counted in our analysis.

Table [x]: Sources of estimates of data centre numbers and data centre capacity

Source	Estimate of data centres (#)	Estimate of capacity (MW)	Notes
techUK	450	Not calculated	This estimate is derived from the number of data centres included in the CCA (see below) but

			doubled to include an estimate of enterprise data centres. The basis for doubling is one source suggesting that enterprise on-premise data centres made up between 40%-60% of data centre capacity between 2017-2022. But there is also recognition among the stakeholders that we spoke to that there is huge uncertainty around the number and capacity of enterprise data centres, with some feeling that this estimate is conservative.
DC Byte	260	1478	Includes commercial and colocation sites, but recognition that bank or public sector facilities before 2018 may not be included.
UK Data Centre Map	372	Unavailable	Most of the data centres within the database are colocation/cloud operators but also covers select hyperscale operators.

Climate Change Agreement scheme	225	6663 Estimated from the number of data centres there are multiplied by megawatts	Note that data centres included in this scheme are of a minimum 200kW.
Mordor Intelligence	Unavailable	2190	

Modelling assumptions - employment, capacity and growth

A series of assumptions were used within the modelling to estimate the economic impact and future growth of the data centre industry. Key assumptions are set out in Table [x], including sources and explanation of how they were used in the quantitative analysis.

Table [x]: Description of key assumptions

Description of assumption	Assumption options
Average employment within a data centre The number of full-time staff employed directly by a data centre when it is operational, including non-technical roles, such as administrative and security workers.	• **20 FTE**. An estimate provided by a member of the Data Centre Council, with the following justification: *"Usually around 3-4 people per shift, and 2 or 3 shifts per day, plus admin etc, so around 20 per site"*. • **88 FTE**. Taken from an economic impact assessment of Equinix operations, which recorded total employee numbers and number of data centres. The mid-point between these estimates was the assumption used within the modelling.
Average data centre capacity in MW The average power demand per recorded data centre in the UK. Capacity is a standard measure of data centre size within the industry, and used for cross-	• **5.7MW.** An average of DC Byte provided data (with the calculation being: total UK market capacity/number of UK data centres).

country comparisons of data centre markets.	• **7.0MW.** An average taken from consultancy CoLo-X blog that states that the UK has 1,000MW of capacity using 143 facilities. A midpoint of the above data was used.
Geographic spread of capacity Where data centre capacity exists in the UK.	• **80% in London.** Taken from data provided by DC Byte. • **70% in London and the South East**. Taken from CCA estimates.
Past UK capacity growth How the UK data centre industry has increased capacity year-on-year. Calculated using Compound Annual Growth Rate (CAGR).	• **10% p.a.** Taken from DC Byte provided data from the period 2020-24. • **11% p.a.** Provided by CBRE as an estimate between 2019-24. Note that this was the only estimate of total UK capacity growth that was identified. There were other estimates for London specifically and for Europe over different time periods.
Future expectations of demand growth How demand for data centre capacity is expected to change year-on-year in the future. Note that this is expectations of demand, not forecast increases in supply capacity.	• **20% p.a.** Taken from a speech by the chairman of the National Grid, looking at 2025-2035. Quoted as saying: *"Demand from commercial data centres will increase six-fold, just in the next ten years"*. • **18.5% p.a.** Taken from JLL Global for the period 2022-27: *"With the growing demands of AI, data center storage capacity is expected to grow from 10.1 zettabytes (ZB) in 2023 to 21.0 ZB in 2027, for a five-year compound annual growth rate of 18.5%"*

	• **15.0% p.a.** Taken from Goldman Sachs market assessment, 2023-2030: *"Our views on key questions on the coming data centre/AI power surge. How significant will the power demand growth from AI/data centres be? We forecast a 15% CAGR in data centre power demand from 2023-2030, driving data centres to make up 8% of total US power demand by 2030 from about 3% currently"* • **9.5% p.a.** Taken from McKinsey US analysis: "In the US alone, data centres are projected to consume 35 gigawatts (GW) by 2030. That's more than double the industry's 17 GW capacity in 2022 in under a decade, according to McKinsey." The 15% growth figure was used within the modelling, as this was the figure that directly referenced demand growth rather than linking growth to supply that might happen.
Baseline UK capacity growth What capacity growth in the UK is expected to look like, i.e. how overall supply is expected to increase over time.	• **10.5% p.a.** Taken from Mordor Intelligence for the period 2024-29: *"The United Kingdom Data Center Market size is estimated at 2.19 thousand MW in 2024, and is expected to reach 3.61 thousand MW by 2029 growing at a CAGR of 10.49%."* • **6.6% p.a**. Taken from Tariff Consultancy, UK, 2022-2026.

Economic impact studies and assumptions

Previous studies on the economic impact of data centres were reviewed to input into our analysis. The majority of these studies looked at the local and national impact made by a

specific data centre (sometimes to support a planning application in a particular area). One study - conducted by PWC - looked at the industry-wide impact of data centres in the US.

The studies all followed the same broad approach to economic impact analysis. They used input-output models to look at the direct expenditure associated with the construction and operation of a data centre, before applying economic multipliers to estimate the wider economic impact (the so-called indirect and induced impacts of supply chains and household expenditure).

Multipliers are calculated in different local, national and industry contexts, inevitably varying. A selection of the results of economic impact studies are included in Table [X], and demonstrate that there are different calculations made of data centre impact (with some quite broad ranges of estimates).

Table [x]: Summary of multipliers from previous economic impact studies

Study	Data Centre	Jobs Type II Multiplier	GVA Type II Multiplier
Google Europe Study, 2022	St. Ghislain, BE	1.65	1.78
Google Europe Study, 2022	Fredericia, DK	1.48	1.65
Google Europe Study, 2022	Hamina, FI	1.51	1.59
Google Europe Study, 2022	Dublin, IE	1.54	1.59
Google Europe Study, 2022	Groningen, NL	1.72	1.87
Oxford Economics	Havering, Local	1.45	1.25
Oxford Economics	Havering, UK	3.28	2.61
PWC data centre coalition	US Data Centre Industry	7.40	3.57
Equinix	All Equinix Data Centre	Unavailable	1.93
Google Europe Study, 2022	Middenmeer, NL	5.10	Unavailable
PWC data centre coalition	Arizona Data Centres	4.52	3.13
PWC data centre coalition	Ohio Data Centres	4.37	3.25
PWC data centre coalition	Virginia Data Centres	3.96	2.32
Google / Deloitte Study	Louden County	22.40	

Calculations

Our analysis used the aforementioned assumptions and studies to estimate GVA and jobs directly generated, and further supported, by the UK data centre industry. The headline calculations were:

- Estimates of GVA and jobs per MW of data centre capacity, applied to the UK population of data centres.
- Application of Type II economic multipliers to these figures to estimate indirect and induced economic activity supported by the industry.

Limitations

The modelling is based upon input-output economic impact methodology. This has well-established limitations to it, but there are wider limitations to the modelling - set out below - that could serve as an indicator of the type of information that is needed to understand the industry better:

- **Speed to market.** Anecdotally, data centres take on average between 12-24 months to build. But there is no evidence base that sets out how long different sizes of data centre take to build (and there is likely to be variation by local market conditions as well).
- **Changing market dynamics.** The modelling does not take account of how the balance between Colo and Enterprise capacity will change in the future (again, anecdotally a shift away from enterprise towards Colo was mentioned, but there is no quantification of the difference).
- **A skewed evidence base.** Many of the existing studies that we have drawn from focus on the very large end of the data centre market. While any economic impact analysis assumes constant returns to scale (a well-established limitation of the economic impact more generally), and smaller data centres are likely to have a different economic impact to larger ones.