Technical Annex:

Methodology, Data & Analytical Approach

Contents

1. Purpose and scope

This technical annex provides a detailed account of the methodology, data sources and analytical approach underpinning the estimates presented in this report.

This document is intended to complement the main report. It does not reproduce all underlying data or intermediate calculations, nor does it provide firm-level detail, but instead focuses on the principles, frameworks and assumptions that shape the results.

Readers should note that this edition of the report incorporates two important technical changes relative to last year's publication, which affect the comparability of results across years and should be taken into account when interpreting any year-on-year differences.

The first important change relates to the UK national accounts data underpinning the analysis. The estimates in this report are based on ONS Blue Book 2025, published in October 2025, which introduced a number of methodological improvements to the national accounts. These revisions resulted in upward changes to measured GVA across several sectors, which in turn have increased the GVA multipliers used in the Input-Output modelling. As a consequence, the estimated GVA contribution of the net zero economy is materially higher in this edition than it would have been under the previous national accounts data. This change is driven entirely by revisions to ONS source data and does not reflect any change to CBI Economics' analytical methodology.

The second important change relates to updates to the net zero taxonomy. The classification of firms within the net zero economy has been refined to reflect developments in the market and to improve the accuracy and coverage of the underlying dataset. Further detail on both changes is provided in the relevant sections of this annex.

For these reasons, figures presented in this report should not be directly compared with those published in previous editions.

2. Analytical Methodology

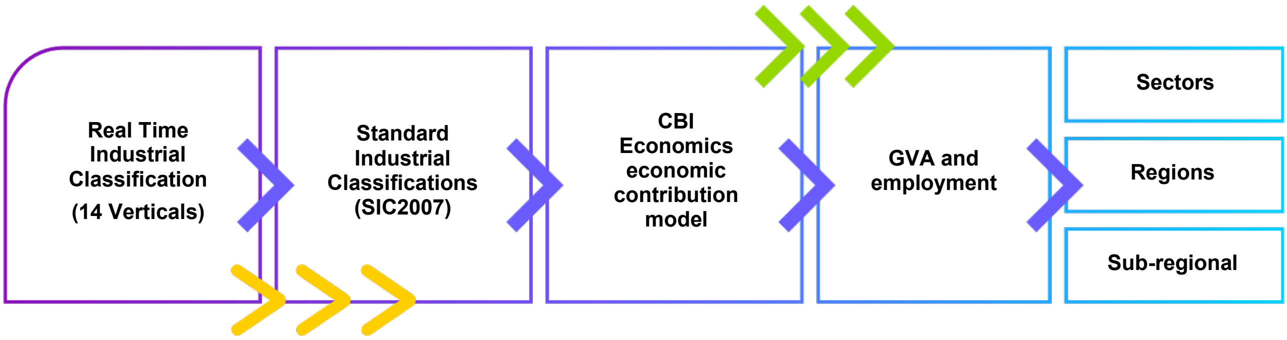
2.1 Overview of approach

The analytical methodology combines firm-level data with national economic statistics to estimate the scale and impact of the UK's net zero economy. Firms identified through the RTIC framework are mapped to sectors and geographies, with their activity aligned to official statistics to estimate their contribution.

To capture the wider economic footprint, the analysis applies input-output modelling to estimate indirect (supply chain) and induced (consumption-driven) effects, using sector-specific multipliers derived from UK input-output tables. Regional and local estimates are produced by integrating firm-level location data with sectoral and economic information, providing a geographically disaggregated view of net zero activity.

This combined approach enables a comprehensive and internally consistent assessment of both the direct contribution of net zero firms and their broader role within the UK economy.

Figure 2: From defining the net zero economy to quantifying its contributions



Source: CBI Economics (2026)

2.2 Economic Contribution Modelling

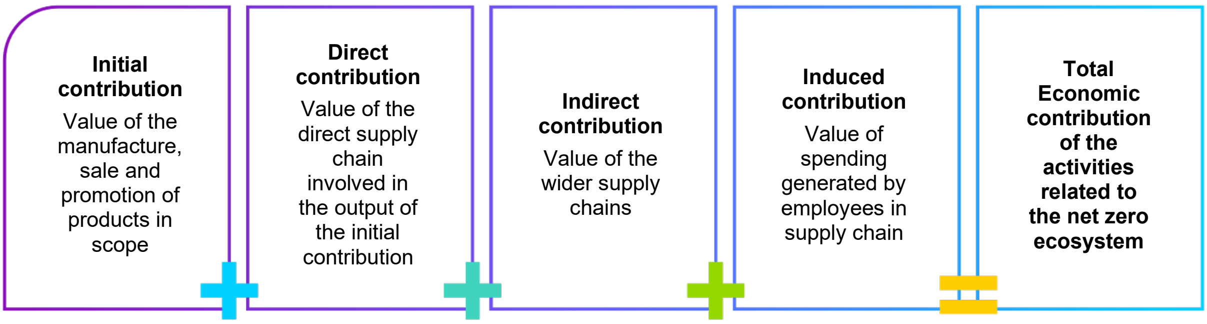
2.2.1 The Input-Output framework

The core basis of this modelling uses the Input-Output (IO) Analytical Tables from the Office for National Statistics (ONS). An input-output table does the following:

- Traces out the relationships between different industries.
- Outlines the sets of inputs required to produce one unit of output.
- Quantify the interactions between the sector and its supply chain and households.

The IO framework allows for Type I and Type II output multipliers to be calculated. Type I multipliers include the direct and indirect effects. Type II multipliers are used in this analysis which include direct, indirect, and induced effects. This captures the wider extent of the economic contribution throughout the economy which is summarised in the figure below.

Figure 3: Total economic contribution methodology



Source: CBI Economics (2026)

This approach allows for a comprehensive assessment of both the core sector and its broader economic footprint.

2.2.2 Regional and local analysis

Having derived estimates for the total economic contribution of the net zero economy in the UK, additional analysis provides a regional and local perspective.

In the absence of sub-national input-output tables, UK-level impacts are apportioned to ITL1 regions, local authority districts, and parliamentary constituencies based on their share of relevant sector activity. At the regional level, this is estimated using GVA and employment shares at a 2-digit SIC level. For subregional geographies, employment shares at a 2-digit SIC level are used to reflect the local distribution of activity across both net zero-related sectors and their supply chains.

These employment-based shares are applied to both employment and GVA estimates at the subregional level. This approach implicitly assumes that productivity levels are broadly consistent within each sector across local areas within a given region, meaning that differences in economic contribution are primarily driven by the spatial distribution of activity rather than variations in output per worker.

This approach draws on official ONS datasets, including regional GVA and employment statistics, to ensure alignment with the wider economic framework. Local-level estimates should be interpreted as modelled approximations rather than precise measurements but provide a useful indication of the geographic distribution of net zero activity.

2.2.3 Changes to the UK national accounts

The national accounts data underpinning this analysis reflects the methodological improvements introduced in ONS Blue Book 2025, published in October 2025. These revisions incorporate updated methods for estimating research and development within gross fixed capital formation, improved treatment of multinational enterprise activity and enhanced deflator methodologies including the adoption of unit value indices for key commodity trade flows. Together, these changes resulted in upward revisions to measured GVA across several sectors, with annual services volume growth for 2023 revised up to 0.9% and the manufacturing contribution to production growth in 2023 revised to 1.19 percentage points. As a result, the macroeconomic benchmarks used in this analysis reflect a somewhat larger and faster-growing economy than would have been indicated by earlier national accounts data.

These revisions to the UK national accounts have had a consequential impact on the GVA multipliers underpinning this analysis. Because the Input-Output framework derives multipliers from the national accounts supply and use tables, the upward revisions to measured GVA in Blue Book 2025 have resulted in higher GVA multipliers across a number of sectors represented within the net zero economy. As a consequence, the estimated GVA contribution associated with the net zero economy is materially higher in this edition of the report than it would have been under the previous national accounts data. This is not a reflection of a change in CBI Economics' methodology, but rather a direct consequence of revisions to ONS data. Readers should therefore not make direct comparisons between the GVA figures presented in this report and those published in previous editions, as doing so would conflate the effect of ONS data revisions with underlying changes in the scale or composition of the net zero economy.

3. The Net Zero Economy

This section sets out how the net zero economy has been defined, how the underlying dataset has been constructed, and how economic contributions have been estimated. It also explains key methodological choices, particularly where these differ from previous editions of the analysis and outlines the implications for comparability.

3.1 Defining the net zero Economy

3.1.1 Conceptual approach

There is no single, universally accepted definition of the “net zero economy”. Conventional industrial classification systems, such as Standard Industrial Classification (SIC) codes, are not well suited to capturing emerging and rapidly evolving areas of economic activity associated with the transition to net zero. Many relevant activities sit across multiple sectors or are embedded within broader industries, making them difficult to isolate using traditional approaches.

To address this, the analysis adopts a Real-Time Industrial Classification (RTIC) framework developed by The Data City, in collaboration with CBI Economics. This approach identifies firms based on their observed economic activity, rather than their self-reported industrial classification.

RTICs are built through training machine learning models on the web-text of companies that have been identified through extensive research to be prime examples of an industry’s sub-sectors. The language patterns across these sub-sectors, or verticals, form the taxonomy and are the backbone for activity in emerging and fast-moving industries can be captured accurately and dynamically.

In the case of Net Zero, the previous taxonomy was scrutinised under new primary research and new companies were identified and added to the machine learning train set to expand our sector view and best capture its cutting edge.

3.1.2 Role of CBI Economics

While the RTIC framework is developed and maintained by The Data City, CBI Economics has played a central role in shaping how it is applied within this analysis. This includes refining the boundaries and scope of the net zero taxonomy, as well as applying economic and policy judgement to determine appropriate inclusion and exclusion criteria.

CBI Economics has also ensured that the classification is analytically robust and suitable for economic modelling, while interpreting the resulting dataset in a way that is meaningful for policymakers and stakeholders. This collaborative approach ensures that the classification is both technically grounded and fit for purpose as an economic evidence base.

3.1.3 Relationship to existing official measures

A number of official statistical approaches exist to measure aspects of the UK's net zero and environmental economy. The most established of these is the Office for National Statistics (ONS) Low Carbon and Renewable Energy Economy (LCREE) survey, alongside more recent work on defining and measuring "green jobs".

These approaches provide valuable and credible insights, particularly in terms of consistency over time and alignment with national accounts frameworks. However, they are designed with different objectives and methodological constraints, which shape their coverage and interpretation.

The LCREE framework is based on survey data and focuses on a defined set of low carbon and renewable energy activities. This provides a credible and consistent statistical series, particularly for well-established sectors that can be clearly identified and reported through survey instruments. However, by design, its scope is more focused, meaning it may not capture the full breadth of activity associated with the wider net zero transition, particularly where activity is embedded across supply chains, enabling technologies, or emerging business models.

Similarly, recent ONS work on green jobs provides valuable insights into employment linked to environmental objectives. This approach is typically based on occupation-level or industry-level classifications, which offer a structured way to assess labour market trends. However, as many roles and industries encompass a mix of green and non-green activity, these approaches can face challenges in isolating activity specifically associated with the net zero transition.

By contrast, the RTIC-based approach used in this analysis is designed to address these challenges by:

- Identifying firms based on observed economic activity, rather than survey responses or broad industrial categories
- Capturing a wider range of activities, including supply chains, infrastructure and enabling services
- Providing a more dynamic and up-to-date view of the economy, reflecting emerging technologies and business models
- Allowing for greater granularity at firm, sector and geographic levels

As such, this analysis should be understood as complementary to, rather than a replacement for, ONS statistics. While ONS measures provide consistency and comparability within established statistical frameworks, the RTIC-based approach offers a more expansive and activity-driven view of the net zero economy.

Together, these approaches provide complementary perspectives on the net zero economy. ONS statistics offer a consistent and well-established view of defined sectors, while this analysis provides a broader, activity-based perspective on the economic system underpinning the transition.

3.2 Updates to the Net Zero classification (2025)

3.2.1 Overview of changes

The 2025 analysis is based on a significantly refined and expanded RTIC taxonomy. The primary objective of this update was to improve the coverage and precision of the classification, ensuring that it better reflects the evolving structure of the net zero transition. Key improvements include:

A) Taxonomy expansions and additions

B) Tightening of taxonomy boundaries

C) New entrants to the sector

These changes have expanded and refined the representation of the net zero economy, capturing a broader set of economic activities associated with the transition.

A) RTIC taxonomy expansion

The taxonomy expansion reflects a shift towards capturing a broader range of technologies and services now associated with the net zero transition. This includes developments across established verticals such as Green Finance, Renewable Energy Infrastructure and Building Technologies, as well as the introduction of new areas such as Pollution Remediation.

In Green Finance, the scope has broadened to include financial activity that enables investment in net zero infrastructure and technologies, as illustrated by company Climate First Ventures' support for early-stage solutions.

The Renewable Energy Infrastructure vertical has been expanded to capture firms supporting the efficiency and operation of energy systems, including activities such as digital grid optimisation and asset lifecycle engineering, as seen in companies like Cyient.

In Building Technologies, the taxonomy reflects a wider view of the built environment, incorporating design, operation and materials, including retrofit and low carbon construction solutions provided by firms such as A&D Carbon Solutions and Plaswire.

The newly introduced Pollution Remediation vertical captures activities related to environmental monitoring, treatment and restoration, including soil and water systems. This includes companies such as Soilpoint, which focuses on land restoration, and MyWater Solutions, which develops water filtration and reuse technologies.

B) Tightening of the taxonomy boundaries

The Data City has clarified and standardised the criteria used to assess the inclusion of large and diversified companies within the Net Zero RTIC. Inclusion is based on whether a company's primary activities are aligned with net zero objectives and do not materially conflict with them.

In practice, this means that companies whose core activities remain centred on fossil fuel production or processing are not included, even where they have investments in low carbon technologies. For example, companies such as Nissan are only included where distinct subsidiaries are focused on net zero-aligned activities.

By contrast, firms that operate across multiple sectors may be included where their activities support the transition without directly conflicting with net zero objectives. This includes, for example, engineering consultancies contributing to renewable energy infrastructure.

C) Improved website matching and new entrants to the sector

The RTIC framework is designed as an evolving methodology, reflecting the dynamic and fast-moving nature of the net zero economy. As such, the taxonomy and underlying dataset are periodically updated to incorporate new evidence, emerging activities and changes in how companies describe their operations.

The 2025 dataset is based on a revised taxonomy informed by a range of sources, including trade associations and industry bodies, to ensure it continues to reflect the boundaries of the sector. As new firms are incorporated and existing firms evolve or become inactive, the overall size and composition of the dataset will change over time.

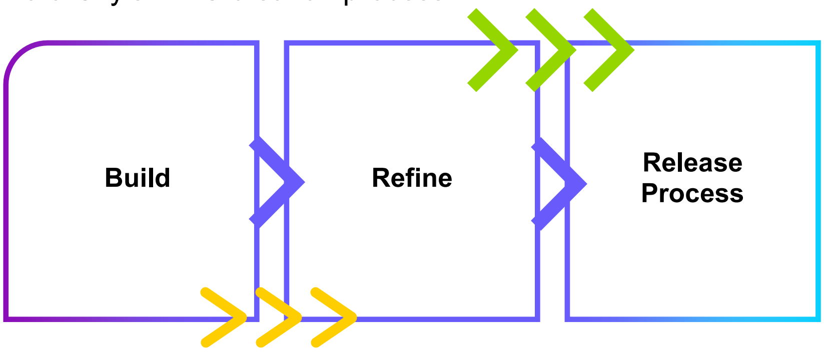
The Data City also applies ongoing enhancements to its classification and website matching processes. Company website data is periodically refreshed, meaning that changes in how firms describe their activities can affect their classification or position within specific verticals. For example, Seaweed Generation, a scale-up focused on marine carbon monitoring technologies, was identified within the Emissions Monitoring and Mitigation vertical as its activities developed.

3.2.2 Quality assurance and classification approach

The Data City applies a structured, multi-stage quality assurance process to develop and maintain the RTIC taxonomy. This process is designed to ensure that classifications remain consistent and reflective of the evolving boundaries of the sector.

The process comprises three main stages: build, refine and release.

Figure 1: The Data City's RTIC creation process



Source: The Data City (2026)

In the build stage, updates to the taxonomy are informed by a range of evidence, including industry research, company information and input from relevant trade associations. This ensures that changes are grounded in observed economic activity and that core sector definitions remain real-time.

The refine stage involves iterative testing of the classification outputs. This includes assessing the relevance of firms identified within each vertical, reviewing high-impact companies, and applying a combination of filters and keyword analysis to identify potential outliers. These are then removed through updating the machine learning model and the irrelevant language patterns it is trained to recognise.

In the release stage, the overall composition and scale of each vertical is sense-checked against external benchmarks and industry knowledge. A sample of firms is also reviewed to verify classification accuracy and if issues are identified, the process returns to the refine stage and the machine learning model is again updated to ensure that outliers are removed.

Judgements on outliers and edge cases are updated and documented in the taxonomy throughout these three stages so that it can best reflect how the dataset has been created and managed.

3.2.3 Implications for comparability

The changes to the taxonomy have important implications for how the results should be interpreted. As the underlying population of firms has evolved – both in scope and composition – headline metrics such as GVA, employment and firm counts are not directly comparable with those presented in previous editions of this analysis.

The 2025 analysis therefore establishes an updated baseline that reflects a more expansive and refined view of the net zero economy. This approach is intended to enhance the relevance of the analysis, while recognising that methodological developments over time can affect comparability with earlier estimates.

3.3. Data sources and construction

3.3.1 Core data inputs

The analysis is based on a combination of proprietary and official data sources. The core dataset is derived from The Data City's RTIC classifications, which provide firm-level information on companies identified as part of the net zero economy.
This is supplemented by:

- Business registry data, including Companies House
- Office for National Statistics (ONS) national accounts
- Sector-specific datasets, including energy infrastructure and investment data
- Additional sources used to validate and contextualise the analysis

These datasets are integrated to construct a consistent and comprehensive picture of net zero-related economic activity across the UK.

3.3.2 Firm selection and treatment

The analysis focuses on firms that demonstrate measurable economic activity, specifically those with reported employment and/or turnover. Companies that are inactive or do not report meaningful economic indicators are excluded, ensuring that the results reflect the active economic footprint of the sector.

Where possible, firm-level data is interpreted in the context of corporate group structures. However, limitations in how data is reported – particularly for large, multinational firms – mean that this cannot always be fully resolved.

3.3.3 Data constraints

There are several structural limitations associated with firm-level data reported through Companies House. Turnover is often recorded at a global or consolidated level, rather than reflecting UK-specific activity, while many firms operate across multiple markets and sectors. In addition, reporting lags and incomplete disclosures are common.

As a result, firm-level turnover is not used as a direct measure of UK economic contribution or growth. Instead, the analysis draws on a combination of firm-level indicators and macroeconomic data to produce consistent estimates.

Firms identified through the RTIC framework are mapped to Standard Industrial Classification (SIC) codes, allowing their activity to be aligned with official statistics. This enables the use of established datasets, including the ONS Business Population Estimates (BPE), Business Register and Employment Survey (BRES), and national accounts data, to derive estimates of employment and Gross Value Added (GVA) that are consistent with the wider UK economic framework.

As stated above, the national accounts data underpinning this analysis reflects the methodological improvements introduced in ONS Blue Book 2025, published in October 2025. These revisions incorporate updated methods for estimating research and development within gross fixed capital formation, improved treatment of multinational enterprise activity and enhanced deflator methodologies including the adoption of unit value indices for key commodity trade flows. Together, these changes resulted in upward revisions to measured GVA across several sectors, with annual services volume growth for 2023 revised up to 0.9% and the manufacturing contribution to production growth in 2023 revised to 1.19 percentage points. As a result, the macroeconomic benchmarks used in this analysis reflect a somewhat larger and faster-growing economy than would have been indicated by earlier national accounts data.

3.4 Interpretation and comparability

3.4.1 Comparability with previous analysis

The 2025 results are not directly comparable with those presented in previous editions of this analysis, reflecting updates to the underlying methodology. These include refinements to the taxonomy and classification approach, expanded coverage of net zero-related activity, and enhancements to firm identification. Taken together, these developments provide a more comprehensive and up-to-date view of the net zero economy.

3.4.2 Interpreting the findings

The results presented in this report should be understood as an estimate of the current scale and structure of the net zero economy, alongside an assessment of its economic contribution and its role within the wider UK economy. They also provide an indication of the sector's ongoing development and momentum.

However, they should not be interpreted as a precise like-for-like comparison with previous estimates, and so not as a single definitive measure of growth.

4. Renewable Energy Investment Pipeline

This section outlines the approach used to develop the investment tracker. The tracker is based on project-level data from the Renewable Energy Planning Database (REPD) and estimates capital investment across the UK renewable energy development pipeline. The REPD tracks the progress of renewable electricity projects above 150 kW capacity through the planning system and provides a comprehensive snapshot of projects at different stages of development. The database is compiled primarily from publicly available sources and information provided by project developers.

4.1 Data preparation and filtering

We begin by cleaning the REPD dataset to ensure that only relevant projects are included in the analysis. Projects are removed if their current status indicates they are no longer active in the development pipeline. This includes projects that have been withdrawn, refused, abandoned, decommissioned, or are already operational.

In addition, projects are excluded where no installed capacity (MW) value is available. This is equivalent to 9% of the dataset. Installed capacity is required to estimate capital expenditure (CapEx), which is expressed on a £/MW basis.

In addition, a time-based cut-off is applied to ensure the dataset reflects a realistic and up-to-date development pipeline. Projects that have not been updated since 31 December 2018 are removed from the active dataset. Renewable energy projects in the UK typically move through planning, consent and construction within a number of years, and each stage normally generates a recorded update. Planning permissions are also time-limited, meaning schemes that do not progress within a set period generally lapse. Where no update has been recorded for more than eight years, it is unlikely that the project remains live. Keeping such records would risk overstating pipeline capacity and future investment. The 2018 threshold therefore provides a pragmatic and conservative basis for maintaining an accurate representation of the current pipeline.

4.2 Pipeline definition

Projects are categorised into pipeline stages using their most recently updated development status. Only the development statuses listed below are retained; all other statuses are excluded from the dataset.

Pipeline stage	Development statuses included
Early	Application Submitted; Appeal Lodged; Revised
Active	Awaiting Construction; No Application Required
Under construction	Under Construction

This approach ensures that the pipeline reflects projects that are actively progressing towards construction and excludes those that are no longer viable.

4.3 Capital expenditure assumptions

CapEx estimates are assigned to each technology on a £/MW basis in **2024 prices**. Where available, cost estimates are sourced from electricity generation cost reports using **medium construction and infrastructure cost assumptions** for projects commissioning in **2030.**

The table below summarises the CapEx values applied to each technology alongside the number of projects identified in the REPD. Where appropriate CapEx for technologies have been separated depending on whether they are CHP enabled.

Technology	CapEx (£/MW) (2024 real)	Count of projects	Source
Solar Photovoltaics - roof*	-	2547	Source
Solar Photovoltaics - ground mounted*	-	1620	Source
Battery*	-	1486	Source
Wind onshore*	-	800	Source
Biomass (dedicated)	£3,866,218	77	Source
Wind offshore	£4,027,688	44	Source
EfW (without CHP)	£11,130,805	43	Source
Small Hydro	£4,080,000	39	Source
Anaerobic Digestion (without CHP)	£5,640,000	34	Source
EfW (with CHP)	£17,126,400	30	Source
Hydrogen	£894,937	30	Source
Anaerobic Digestion (with CHP)	£6,360,000	24	Source
Advanced Conversion Technologies (without CHP)	£7,480,838	17	Source
Advanced Conversion Technologies (with CHP)	£9,274,286	14	Source
Pumped Storage Hydroelectricity	£8,214,000	14	Source
Tidal Stream	4,200,000	12	Source
Solar Photovoltaics - ground and roof	£667,567	9	Source
Solar Photovoltaics- floating	£834,459	3	Source
Large Hydro	£4,440,000	2	Source
Fuel Cell (Hydrogen)	£2,700,000	1	Source

*Economies of scale applied

4.4 Economies of scale for high-volume technologies

Solar photovoltaic (rooftop and ground-mounted), battery storage, and onshore wind technologies account for a significantly higher number of projects than other technologies in the REPD. For these technologies, a single fixed CapEx value would not adequately capture cost variation by project size. Therefore, economies of scale are explicitly incorporated.

4.4.1 Solar photovoltaics – ground mounted

For ground-mounted solar PV, cost estimates are primarily sourced from a recent Arup report, which provides low, medium, and high CapEx estimates across a range of project sizes[1]. These estimates are supplemented with central CapEx values for 1–5 MW projects from the 2016 electricity generation cost report, assuming commissioning in 2025.[2]

4.4.2 Solar photovoltaics – rooftop

For rooftop solar PV, CapEx values for 1–5 MW projects are taken directly from the 2016 electricity generation cost report with a commissioning year of 2025. A CapEx ratio between rooftop and ground-mounted PV is calculated for this size range and applied to the Arup ground-mounted PV estimates to derive size-dependent rooftop PV CapEx values.

4.4.3 Onshore wind

Onshore wind CapEx estimates are derived from another Arup report using the same methodology as applied to solar PV, with cost estimates varying by project capacity to reflect economies of scale.[3]

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[1] **Renewable Energy Generation Cost and Technical Assumptions – Onshore Wind and Solar PV: Cost of Electricity Report Update 2024**
[2] **BEIS Electricity Generation Costs (November 2016)**
[3] **Renewable Energy Generation Cost and Technical Assumptions – Onshore Wind and Solar PV: Cost of Electricity Report Update 2024**

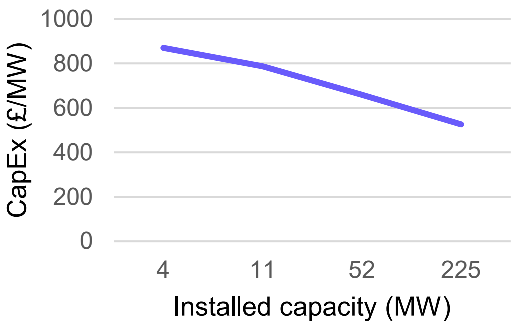
4.4.4 Battery storage

All battery projects are assumed to use lithium-ion technology, as this is the dominant battery technology currently deployed. CapEx estimates are sourced from a report prepared for BEIS on storage cost and technical assumptions. [4] These estimates are consistent with more recent long-duration electricity storage reports, noting that those studies primarily express costs by storage duration rather than installed capacity.[5]

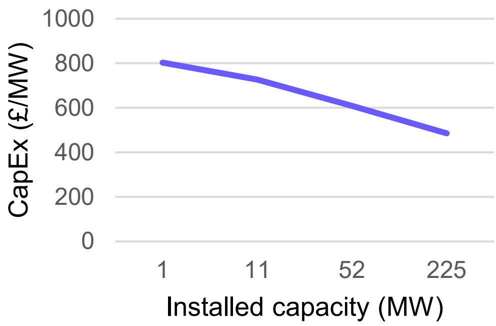
4.4.5 Linear interpolation

For each technology incorporating economies of scale, CapEx values are linearly interpolated between defined capacity points. Linear interpolation was chosen so that each project is assigned a specific CapEx value based on its installed capacity, which captures economies of scale effects. Projects with capacities below or above the defined capacity ranges are assigned the minimum or maximum CapEx values respectively. The cost curve for each technology are as follows:

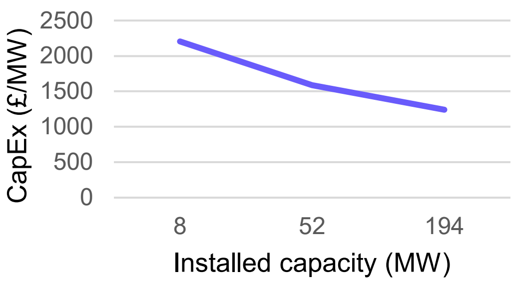
Solar Photovoltaics – ground mounted



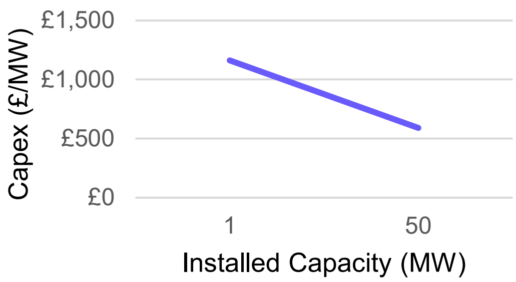
Solar Photovoltaics - roof



Onshore wind



Battery



4 Storage cost and technical assumptions for BEIS
5 Benefits of long-duration electricity storage

4.5 Estimating investment cost

For each project, the installed capacity (MW) is multiplied by the assigned capital expenditure (CapEx) value (£/MW) to estimate the total investment cost. Estimated investment costs are then aggregated by pipeline stage to derive total investment values across the development pipeline.

4.6 Analytical Assumptions

- The analysis assumes that the Renewable Energy Planning Database (REPD) is up to date, free from duplicate entries, and that all reported installed capacity values (MW) are accurate. Projects without an installed capacity value were excluded from the analysis, which may result in some pipeline activity not being captured.
- Economies of scale for solar photovoltaic and onshore wind technologies are derived from cost reports produced for DESNZ to inform allocation rounds. These reports are based on surveys of project developers and present low, medium, and high CapEx estimates, where the low and high values represent the 5th and 95th percentiles of responses and the medium value represents either the mean or median, depending on sample size. To construct cost curves, it is assumed that lower-capacity projects correspond to higher CapEx values and higher-capacity projects correspond to lower CapEx values. As a result, CapEx estimates reflect general capacity-based trends rather than project-specific costs.
- All battery storage projects are assumed to use lithium-ion technology, reflecting it as the most common application in large-scale battery deployment. This may not capture cost differences associated with alternative or emerging battery technologies.
- Hot dry rock geothermal and liquid air energy storage technologies are included in the dataset; however, standardised CapEx estimates are not applied. Instead, project-level investment costs are sourced directly from publicly available news articles.
- We assume constant costs across different stages of the pipeline. In other words, projects currently under construction are assigned 2030 construction and infrastructure costs, and projects at earlier pipeline stages are assigned the same costs. Similarly, where costs are not presented in 2024 prices, we convert using the Bank of England's Inflation calculator.

CBI Economics

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