

DPS FRAMEWORK SCHEDULE 4: LETTER OF APPOINTMENT AND CONTRACT TERMS

Part 1: Letter of Appointment

To whom it may concern,

Letter of Appointment

This letter of Appointment dated Monday 25th January 2021, is issued in accordance with the provisions of the DPS Agreement (RM6018) between CCS and the Supplier.

Capitalised terms and expressions used in this letter have the same meanings as in the Contract Terms unless the context otherwise requires.

Order Number:	CR20128
From:	Department for Business, Energy & Industrial Strategy (BEIS) of 1 Victoria Street, Westminster, London SW1E 5ND ("Customer")
To:	Vivid Economics Limited , 163 Eversholt Street, London, NW1 1BU ("Supplier")

Effective Date:	Monday 25 th January 2021
Expiry Date:	Thursday 31 st March 2022 Please see Break Clause below
Notice Period	Notice Period for cancellation is 30 days

Services required:	Set out in Section 2, Part B (Specification) of the DPS Agreement and refined by: the Customer's Project Specification attached at Annex A and the Supplier's Proposal attached at Annex B;
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Key Individuals:	<div style="background-color: black; width: 100%; height: 15px; margin-bottom: 5px;"></div> <div style="background-color: black; width: 100%; height: 15px; margin-bottom: 5px;"></div> <div style="background-color: black; width: 100%; height: 15px; margin-bottom: 5px;"></div> <div style="background-color: black; width: 100%; height: 15px; margin-bottom: 5px;"></div> <div style="background-color: black; width: 100%; height: 15px;"></div>
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	<p>[REDACTED]</p> <p>[REDACTED]</p>
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Contract Charges (including any applicable discount(s), but excluding VAT):	The Customer shall pay the Supplier the sum of £174,444.00 for delivery of these Services. For the avoidance of doubt, the Contract Charges shall be inclusive of all third-party costs.
Insurance Requirements	<p>Additional public liability insurance to cover all risks in the performance of the Contract, with a minimum limit of £5 million for each individual claim</p> <p>Additional employers' liability insurance with a minimum limit of £5 million indemnity</p> <p>Additional professional indemnity insurance adequate to cover all risks in the performance of the Contract with a minimum limit of indemnity of £2 million for each individual claim.</p>
Liability Requirements	Suppliers limitation of Liability (Clause 18.2 of the Contract Terms);
Customer billing address for invoicing:	All invoices should be sent to should be sent to ap@uksbs.co.uk or Billingham (UKSBS, Queensway House, West Precinct, Billingham, TS23 2NF)

GDPR	Please see Contract Terms Schedule 7 (Processing, Personal Data and Data Subjects).
Special Clause:	<p>There will be a break clause in the contract at the end of Phase 1 for the contracting authority to review the deliverables for BEIS to decide on the continuation of contract. The date at the end of Phase 1 is:</p> <ul style="list-style-type: none"> Wednesday 31st March 2021 <p>If the break clause is initiated, the contract will draw to a close on this date providing that 30 days notices for termination has been served, as per the terms of the contract.</p>

FORMATION OF CONTRACT

BY SIGNING AND RETURNING THIS LETTER OF APPOINTMENT (which may be done by electronic means) the Supplier agrees to enter a Contract with the Customer to provide the Services in accordance with the terms of this letter and the Contract Terms.

The Parties hereby acknowledge and agree that they have read this letter and the Contract Terms.

The Parties hereby acknowledge and agree that this Contract shall be formed when the Customer acknowledges (which may be done by electronic means) the receipt of the signed copy of this letter from the Supplier within two (2) Working Days from such receipt

For and on behalf of the Supplier:

For and on behalf of the Customer:



ANNEX A
Customer Project Specification

1 Introduction and summary of requirements

This invitation to tender (ITT) is for the development of a modelling tool capable of modelling industrial competitiveness and the impacts of key industrial decarbonisation and climate policies. This follows recently concluded research commissioned by BEIS, which sought to establish the conceptual framework for understanding industrial competitiveness and the role of government policies – in particular, UK carbon pricing policy.

The main output of this project will be a model of industrial competitiveness, based on this conceptual framework. The model will provide ex-ante modelling of the competitiveness of industrial sectors. Additional outputs include all supplementary model documents and the transferring of intellectual property and model expertise to BEIS.

We expect the successful contractor will commence work in January 2021 and final outputs will be handed over to BEIS in September 2021. Prospective contractors should note there will be 'checkpoints' before each key stage of the project commences. At these checkpoints, BEIS will review and sign-off all interim outputs before progression. In addition, there will be a 'stage-gate' at the point where the Contractor has provided detail on the model methodology, inputs and assumptions but before they have commenced the development of the model. At this stage-gate, BEIS has the option to enact a break clause if it believes that the final modelling tool will not be of sufficient quality.

2 Background

In June 2019, the UK became the first major economy to legislate a target to bring all UK greenhouse gas emissions to net zero by 2050. This represents a significant increase in ambition compared with the previous target of at least 80% reduction from 1990 levels.

Achieving net zero will require all parts of the UK economy to take action in reducing their emissions, including business and industry which currently account for around 25% of total emissions.¹ As set out in the Clean Growth and Industrial Strategies published in 2017, Government is committed to reducing emissions while also maximising opportunities for economic growth, innovation, and the competitiveness of UK industrial sectors ('Industry'). The competitiveness of UK Industry is also an important consideration as we leave the European Union, and in how we navigate other emerging economic and political trends globally.

Therefore, it is important for us to develop a robust evidence base for understanding the competitiveness of Industry; the drivers of competitiveness across different industrial sectors and how current and future decarbonisation and climate policies and trends might impact this. Further, within the context of our domestic and international commitments, it is

¹ <https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-to-2018>

important for us to understand to what extent loss of competitiveness may lead to carbon leakage – defined as the shift of investment and production from a country with more stringent carbon pricing to a country with less stringent carbon pricing.²

In 2019 BEIS commissioned a pioneering research project ('Phase 1'), which sought to define business competitiveness and develop a conceptual framework for understanding the factors that drive this for different industrial sectors.³ As part of this framework, the research identified the potential role climate policies, particularly carbon pricing policy, could have in determining competitiveness for sectors within scope, and developed an approach for high-level analysis using existing, publicly available data and metrics.

Prospective contractors for this project should review the Phase 1 outputs in detail and use this to inform their bids – in particular the conceptual framework developed, which we expect the model to fully incorporate. A high-level summary is provided below.

The framework defines **competitiveness** as the capacity and ability of a firm or sector to gain and maintain a profitable, sustainable market share relative to rivals in domestic and international markets.

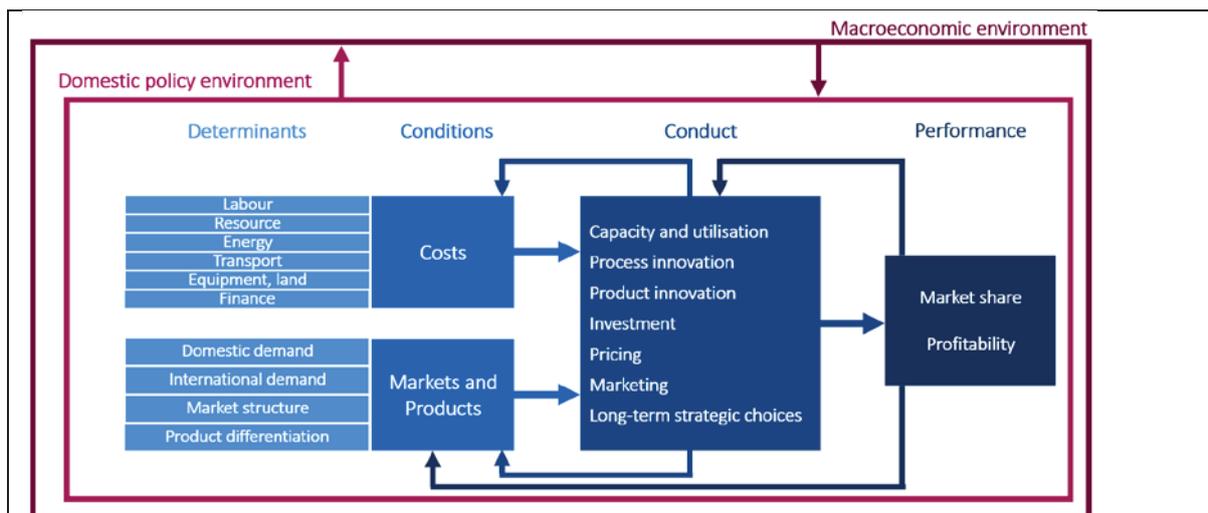
The framework is composed of three main components, which interact in various ways (see below):

- **Conditions:** these form the basis for establishing a sector's competitive edge and inform opportunities and constraints for its conduct. These are categorised into costs, and markets and products.
- **Conduct:** this consists of the actions a firm can take in the market, underpinned by its market strategy and managerial and organisational ability.
- **Performance (i.e. competitiveness):** this is affected by both conditions and conduct and measured by market share and profitability over time.

The framework also takes into consideration the broader macroeconomic and domestic policy environment, which can affect each of the three components above in various ways.

² Note: carbon leakage is only expected to occur when all three of the following conditions are fulfilled: i) carbon pricing across jurisdictions is asymmetric (i.e. a firm's competitors abroad do not face a similarly ambitious carbon price); ii) emissions shift to a region with less ambitious carbon pricing; iii) production shifts to a firm with higher emissions intensity.

³ <https://www.gov.uk/government/publications/business-competitiveness-in-industrial-sectors-and-the-role-of-carbon-pricing-policy-in-the-uk>



Prospective contractors should note the complexity of the framework and the ways these identified components interact with each other. For instance, a firm's conditions influence its conduct choices, which in turn affect performance. However, the relationship between these components is not exclusively one-way, since firms will assess their performance and make conduct choices, that then feedback into their conditions as well as performance directly. Crucially, these interactions will also depend on the timeframe of the analysis.

In terms of the role of carbon pricing and other climate policies in determining competitiveness, the framework identifies two channels of influence:

- **Upside opportunities:** these are longer term in nature, resulting from conduct choices (e.g. investment in lower carbon technologies) that can positively impact performance directly but also positively impact the firm's underlying conditions (e.g. reduce carbon costs).

Downside risks: these materialise first through conditions (e.g. increase in costs faced by businesses), and only affect performance when conduct is constrained (e.g. lack of abatement opportunities limiting process innovation or lack of cost pass-through capacity limiting pricing options). There may be output and investment leakage in the long-term, potentially leading to carbon leakage.

This project ('Phase 2') is intended to build on the foundation established in Phase 1 and develop a model which operationalises this framework for quantitative analysis of competitiveness and carbon leakage risk. The following sections of the specification outline the key requirements we seek to fulfil as part of this work.

As funding has not yet been approved beyond March 2021 for this project, the project is split into two distinct phases. Phase 2.1 will cover deliverables up to 31 March 2021 for which a maximum of £50,000 (excluding VAT) funding has been approved. Phase 2.2 will cover deliverables from 1 April 2021 to the conclusion of the contract. Phase 2.2 can only commence once funding has been approved.

There will be a break clause in the contract at the end of Phase 2.1 for the contracting authority to review the deliverables for BEIS to decide on the continuation of contract. For clarity, the break clause date is Wednesday 31st March 2021.

3 Objectives and Research Questions

The aim of this project is to develop a model which fully incorporates the conceptual framework, which will provide quantitative analysis of UK industry competitiveness and carbon leakage risk over time.

Subsequent sections on methodology (section 4) and outputs (section 5) provide detail on how we expect this model to be designed. This section outlines some of the key analytical questions we expect to answer with the model. Prospective contractors should note however that this list is not necessarily exhaustive, and we expect the model to be designed with flexibility to ensure as far as possible it can be easily adapted to address future needs.

Key analytical questions for each industrial (sub-)sector (at a minimum – see section 4):

- To what extent are they currently competitive and what are the main drivers of their competitiveness? How is this expected to change over time under current policies?
- To what extent are they at risk of carbon leakage under current policies globally? To what extent is this driven by their ability (or lack thereof) to pass on costs to end-consumers?
- At what (effective) carbon prices do loss of competitiveness and carbon leakage become significant risks, if at all?
- What are the direct and indirect impacts of the following on competitiveness and carbon leakage risk, relative to appropriately defined counterfactuals? How do these vary in the short-term versus medium and long-term?
 - Future UK carbon pricing policy⁴, including: the initial standalone UK ETS design, a linked UK ETS with the EU ETS, tightening the UK ETS cap in line with net zero⁵, and future changes to free allocation policy.
 - Other industrial decarbonisation policies, such as funds and revenue support models.
 - Alternative carbon leakage mitigation policies to free allocation, such as border carbon adjustment mechanisms.
 - Industry support / cost-relief policies, such as the EU ETS and CPS indirect cost compensation schemes.
- What are the impacts of changing (and potentially diverging) climate ambition between the UK and international jurisdictions these sectors compete with, including the EU?

⁴ For more detail, see the Government Response and Impact Assessment on the Future of UK Carbon Pricing: <https://www.gov.uk/government/consultations/the-future-of-uk-carbon-pricing>

⁵ See UK's intention to implement a net zero consistent cap, based on advice from the CCC: <https://www.theccc.org.uk/publication/letter-the-future-of-carbon-pricing/>

Phase 2.1 (before March 31st 2021) should demonstrate that the model inputs, calculations and outputs can feasibly answer these questions once further model development and evidence gathering has been completed. The draft technical documentation should demonstrate that the above questions can be answered with the scenarios which the model will be capable of estimating.

4 Methodology

The following section outlines our desired methodology for the model to be developed under this project. It is essential that the model methodology reflects the competitiveness framework developed in Phase 1 (as set out in section 2). This may be delivered through the creation of a new model or adaptation of an existing model – provided it is demonstrated that the specification is consistent with the Phase 1 outputs.

Previous work carried out for the Department of Energy and Climate Change (DECC) by Vivid Economics, used a partial equilibrium modelling approach.⁶ A similar approach may be taken for this project, however we are open to and encourage alternative methodologies. For either methodology, the Contractor will need to demonstrate how it would meet the requirements set out in the document – in particular, the temporal granularity (i.e. analysing both short-term and long-term impacts) and including feedback loops between variables. Prospective contractors must clearly set out their envisaged modelling approach and methodology in their bid, with the aid of a draft model map illustrating the intended inputs, outputs, and interactions of the model.

The model should have the following qualities to answer the research questions set out in section 3:

- **Sector granularity:** at minimum NACE 4 level (or UK SIC equivalent) but where feasible and if sufficient explanatory power possible, PRODCOM level granularity would be desirable. We are also interested in the potential for assessing the competitiveness at firm level and encourage prospective contractors to consider how this could be done, for example by creating an ‘archetypal firm’ which allows the input of specific firm level assumptions into the model. It is essential for the model to be able to achieve this sector granularity for both the UK, and also main regions and/or jurisdictions where firms compete with the UK for market share. For each sector, the Contractor must gather comparable data and assumptions for other jurisdictions and provide justification for the level of granularity proposed.
- **Capability to model carbon pricing policy in detail:** specifically, the carbon price and allocation of free allowances, and the combined impact of these components. Different carbon pricing policy scenarios should be able to be modelled, e.g. a linked versus standalone UK ETS and a Net Zero consistent cap. In addition, it will be important for the model to reflect the direct and indirect effects of carbon pricing on industry, for example through carbon pricing on the power sector and electricity prices.

⁶ For more detail, see: <https://www.gov.uk/government/publications/carbon-leakage-prospects-under-phase-iii-of-the-eu-ets-and-beyond>

Capability to model key features of other climate policies: specifically, the main design features of other key climate and carbon leakage mitigation policies. Most notably, the model should include the effective carbon price that competitors face in other jurisdictions. However, the climate policies and carbon pricing mechanisms in other jurisdictions do not need to be modelled at the same level of detail as the UK.

- **Product heterogeneity:** it should not always be assumed that goods from different jurisdictions are perfectly substitutable as there may be features that differentiate products. Where realistic, product heterogeneity should be factored into the model.
- **Capability to model conduct:** as a minimum requirement, the following conduct variables should be modelled quantitatively – innovation, investment, pricing, and the cost and availability of abatement opportunities. Where available, quantitative modelling of the other variables should be used, however if robust data is not available it should be supplemented with qualitative analysis – this is a key part of the framework developed in Phase 1 and a priority for the model development.
- **Feedback loops:** as a minimum requirement, the modelling tool should capture the dynamic interactions and feedback loops between variables. We are also interested in building model capability to capture how the dynamic interactions between the different elements of the framework, including the feedback loops, change in response to developing policies (e.g. increasing carbon price). Potential contractors will need to demonstrate that the proposed methodology and modelling tool is capable of delivering this requirement.
- **Temporal granularity:** specifically, the ability to model outputs to 2050 including distinguishing between the short, medium and long-term impacts (potential contractors should suggest an approach for this in their bids). The desired (and maximum required) level of temporal granularity is analysis on an annual basis, in particular for the 2020s – beyond which this level of granularity may not be achievable. Prospective contractors should consider whether model outputs need to extend beyond 2050 to avoid perverse results in 2050.

Data and assumptions:

The model should strive to quantify the key elements of the competitiveness framework identified in Phase 1 of the research using existing, publicly available, and easily replicable data as far as possible. All input data and assumptions will need to be discussed and agreed with BEIS at the project inception and key preliminary milestones, to ensure consistency with other analysis. Once agreed, these should be clearly set out and justified in the technical report alongside the model (see Section 5 on outputs).

However, the model should also be supplemented with data and assumptions from other sources:

- **Stakeholder and market engagement:** it is essential for the data and assumptions used to be validated against the real world to ensure that the conclusions drawn from the model are accurate representations of firms' experience of competitiveness. In particular, this method should be used to accurately capture conduct elements, such as long-term strategic choices, which are not publicly available due to commercial sensitivity.

- **BEIS inputs:** inputs and assumptions should be drawn from internal BEIS evidence where available – for example using outputs from our free allocation and carbon price models, the Net Zero Industrial Pathways (NZIP) model, as well as other key BEIS models such as the Dynamic Dispatch Model (DDM).^{7,8} This will provide further insights gained from BEIS analysis and ensure consistency with other analysis produced internally.

Model outputs:

The main outcomes we are interested in modelling are competitiveness (as defined in Phase 1) and carbon leakage risk. Therefore, we expect the model to provide appropriate output metrics to allow for us to draw conclusions on these to answer the research questions identified in section 3 to the desired level of granularity.

We expect the following types of outputs, but are open to further suggestions from Contractors:

- **Competitiveness metrics:** market share and profit, including a breakdown of revenue income streams and costs.
- **Carbon leakage risk metrics:** emissions intensity and trade intensity, but desirable for further metrics as explored by ICAP.⁹
- **Carbon leakage metrics:** change in output and market share, and corresponding increases or decreases in emissions expected across jurisdictions (relative to the UK) as a result.
- **Summary metrics:** a summary of any other key metrics which will be used when interpreting the results, such as cost-pass through rates.

If lack of data results in some variables being considered qualitatively, the model should provide a systematic and consistent methodology for drawing conclusions using both qualitative and quantitative outputs. This will ensure a holistic assessment of competitiveness and carbon leakage risk (see Section 5).

The outputs of the model should allow the user to use a consistent methodology to draw conclusions between (sub-)sectors and policy scenarios, as well as allow the user to easily validate the model outputs.

Scenarios and sensitivities:

Work has been carried out within BEIS to develop a ‘futures analysis’ framework, which provides a range of scenarios for how the UK industrial landscape may evolve over time, out to 2050. These scenarios have been developed based on consideration of four key axes of uncertainty over the future landscape: the extent of technological innovation, global order and multilateral institutions, international trade and expansion of global supply chains, and climate change action. As far as possible we would like the model to incorporate this

⁷ <https://www.gov.uk/government/collections/carbon-valuation--2>

⁸ <https://www.gov.uk/government/statistics/the-dynamic-dispatch-model-a-fully-integrated-power-market-model>

⁹ For a good overview of possible metrics see: <https://icapcarbonaction.com/en/carbon-leakage-paper>

framework, through the development of key assumption sets that vary under each scenario. Further detail can be provided to the successful contractor at project inception.

We expect the model to be designed with flexibility, and the functionality to investigate multiple sensitivities around the impact of different input assumptions on the main model outputs. Through the development of the assumptions log (see section 5) the contractor should rate the importance and confidence / certainty of each assumption; identify which assumptions may benefit from sensitivity analysis and define an appropriate uncertainty range around these. This will be reviewed during the 'stage-gate' ahead of a decision whether or not to proceed with detailed model development (see section 7). Sensitivity analysis carried out in the development of the model should be clearly documented in the package of model outputs (see section below).

5 Outputs Required

The main output of this research project is a model based on the competitiveness framework developed in Phase 1 and consistent with the methodology set out in the previous section.

The modelling tool should be developed in R to ensure it has sufficient capability to incorporate all elements outlined above. However, BEIS will be open to alternatives if a potential Contractor can sufficiently demonstrate that another programme, such as Excel, is able to complete all required functions, including providing model runs within an appropriate time frame (e.g. under 1 hour), and is in an accessible format.

If a prospective Contractor has an existing competitiveness modelling tool, they will need to provide detail on its current modelling capabilities and how these will be extended to fulfil the requirements outlined above. Additionally, if the existing tool is not in R, the Contractor will need to demonstrate how it is fit-for-purpose or how it can be adapted to R.

The model should have an accessible format, allowing BEIS to easily understand the outputs and draw conclusions using both quantitative and qualitative outputs. One option would be a 'dashboard' which sets out the core quantitative outputs (and relevant assumptions). In addition, the model should have the qualitative outputs and an accompanying structure through which to apply this to the quantitative outputs. Therefore, conclusions will be drawn consistently using all analysis.

The model should clearly display a run log alongside the summary outputs, which outlines the scenario and key input assumptions for each model run.

In addition to the model, the following outputs are required. These must be delivered in an appropriate format for their purpose and should be used to inform and monitor progress against the project milestones (in addition to the specific model outputs set out above). The format should be discussed and agreed with BEIS. For Phase 2.1 the following outputs are required:

- **Model map:** a system diagram that illustrates the logic of the model and intended inputs, calculations, outputs, and (dynamic) interactions. This must be provided to BEIS for approval before substantive model development work commences.¹⁰
- **Draft Technical documentation:** this should include documentation of the scope and specification of the model which details how the model will work. Specifically, the technical report should define the interface, the expected calculations the model will perform, the data inputted and the expected output results. It should describe every eventuality that may need to be handled by the model. All updates should be logged in a version-controlled document.¹¹
- **QA log:** see section 7 for more guidance on the quality assurance required. This guidance should be applied to all outputs listed under Phase 2.1
- **Draft Input data log:** Explanation of all data which will be used in the model, including links to datasets used, how the data will be used in the model, limitations/risks of data, date of required update.
- **Draft Assumptions log:** Explanation of all input data used, including evidence justifying assumption (e.g. literature, previous analysis), expected use of assumptions in the model, limitations/risks of assumption, date of needed review of assumption.¹²

For phase 2.2 the following outputs are required:

- **Final Model map:** a system diagram that illustrates the logic of the model and intended inputs, calculations, outputs, and (dynamic) interactions.
- **Final Technical documentation:** this should include documentation of the scope and specification of the model which details how the model works. Specifically, the technical report should define the interface, the exact calculations the models has to perform, the data inputted and the results. It should describe every eventuality that

¹⁰ See here for some helpful guidance / best practice: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/737272/BEIS_QA_Excel_Modelling_Template.xlsm

¹¹ See here for some helpful guidance / best practice: <https://www.gov.uk/government/publications/beis-model-report-template>

¹² This could be combined with the data log in one document – e.g.: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/737331/BEIS_Model_Assumptions_Log.xlsx

may need to be handled by the model. All updates should be logged in a version-controlled document.¹³

- **User guide:** accompanying the model map and more detailed technical documentation, the contractor should provide a user guide. This should be completed in sufficient detail such that a reasonably skilled analyst from BEIS can fully understand the workings of the model and be able to maintain and/or adapt it for future use. It is recommended that this is produced ahead of the final model and used, alongside the model map, as a design tool to help inform its development.
- **Final QA log:** see section 7 for more guidance on the quality assurance required. This should be applied to all outputs for phases 2.1 and 2.2.
- **Final Data log:** detailed explanation of all data used, including links to datasets used, use of data in model, limitations/risks of data, date of required update.
- **Final Assumptions log:** detailed explanation of all assumptions used, including evidence justifying assumption (e.g. literature, previous analysis), use of assumptions in the model, limitations/risks of assumption, date of needed review of assumption.¹⁴
- **Independent peer review:** the contractor should identify suitable candidates (subject to BEIS approval) to conduct a peer review and engage them at the necessary times to allow them to provide comment on the work; this could include for instance, review of the input data and assumptions into the model and review of the methodology (e.g. how dynamic elements of the model are reflected). All comments and amendments from the peer review process should be documented in a report and shared with BEIS officials. Prospective contractors should outline a plan for organisations or individuals who could conduct a peer review and how they will be engaged throughout the project.

The final output of the research is the transfer of the model and knowledge acquired from the contractor to BEIS. This can be delivered through the model outputs described above and a series of workshops held by the contractor to explain and demonstrate the use of the model. In addition, we have suggested a 'cool off' period in the timetable (see section 8),

¹³ See here for some helpful guidance / best practice: <https://www.gov.uk/government/publications/beis-model-report-template>

¹⁴ This could be combined with the data log in one document – e.g.: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/737331/BEIS_Model_Assumptions_Log.xlsx

where BEIS is able to contact the contractor after the delivery of the final model for further guidance or technical questions. No additional work will be expected during this period.

The project is expected to deliver all outputs by the end of September 2021 (see timetable in section 8). It may be necessary for BEIS to call on the expertise and resource of the contractor beyond this period to update the work or provide insight into new research questions. This will constitute a potential 'Phase 3' which will enable the contractor to provide additional work.

6 Ownership and Publication

As set out in Section 4 (Methodology) above, prospective contractors can either create a new model or build upon an existing model to fulfil the requirements. In both cases, BEIS will take ownership of all input data and assumptions, and the model produced. Therefore, the inputs and model cannot be used by the Contractor for purposes other than our work.

If a new model is produced, BEIS will have ownership of all intellectual property which underpins the model. If an existing model is adapted, BEIS will have ownership of all modelling capability produced for the research project and is willing to explore licensing agreement for the existing intellectual property.

BEIS is committed to openness and transparency. Project outputs should be accessible, non-disclosive and suitable for publication and further use. The exceptions to this are where:

1. The intellectual property rights to an output (or part of an output) are owned by someone other than the contractor. Prospective contractors should state in their tender if this is the case and indicate whether the third party copy righted materials can be redacted.
2. Data is commercial in confidence.
3. A non-anonymised dataset is required for the project.
4. The outputs are internal documents only for BEIS.

Where there are useful insights that are viewed to be disclosive: such as outlier analysis or analysis with small numbers, BEIS would like to see outputs prior to drafting of final versions.

Prospective contractors should be aware that the Government is subject to the Freedom of Information Act 2000 and as such is duty bound to honour requests from the public which may include data from this project. The contractor needs to state if this would be an issue in any aspect of this project and whether there are potential solutions to any such issues.

BEIS expects that the winning contractor will sign a Non-Disclosure Agreement prior to the start of the contract.

The contractor will also need to ensure that all appropriate regulations are adhered to regarding safe storage and transfer of project files and outputs, compliant with BEIS requirements for data processing (particularly processing of restricted data).

7 Quality Assurance

All work completed for this research must be subject to quality assurance consistent with the Aqua Book guidance.¹⁵ The model developed under this project should also adhere to BEIS's modelling guidance, which is summarised below.¹⁶ All models and modelling must be quality assured and documented.

The project milestones and quality assurance plan will be agreed by BEIS and the contractor at projection inception. This will include specific 'checkpoints' before each key stage of the project commences. At these checkpoints, BEIS will review and sign-off all interim outputs before the next stage of work starts. This is to ensure that both the Contractor and BEIS are clear on the model details and BEIS is able to verify that the proposed model will meet the requirements to a high quality. The checkpoints will be at the following stages:

- **Checkpoint 1:** sign-off of project scope and delivery plan, based on the inception workshops between BEIS and the contractor.
- **Checkpoint 2:** sign-off of draft model after initial testing, before it is sent for peer review.
- **Checkpoint 3:** sign-off of final model and accompanying outputs, after final 'knowledge transfer' workshops and project close.

In addition, there will be a '**stage-gate**' between the finalisation of the proposed model methodology and starting the development of the model. At this stage-gate, BEIS will be able to assess whether the proposed model will meet our requirements sufficiently and whether the quantitative outputs will be within an acceptable uncertainty range. To support this the Contractor will be required to produce a reasonably detailed data and assumptions log, and any supplementary analysis of uncertainty and uncertainty ranges around key variables for BEIS review. BEIS will have the option to enact a break clause if it does not wish to pursue the development of the model further.

All final outputs will need to have senior sign-off by BEIS before the project can be closed. Within the contractor organisation, sign-off for the quality assurance must be done by someone of sufficient seniority who will take responsibility for the work done. BEIS reserves

¹⁵ See: <https://www.gov.uk/government/publications/the-aqua-book-guidance-on-producing-quality-analysis-for-government>

¹⁶ BEIS full QA guidance: <https://www.gov.uk/government/collections/quality-assurance-tools-and-guidance-in-decc>

the right to refuse to sign off outputs which do not meet the required standard specified in this Specification of Requirements.

The contractor should provide BEIS with a quality assurance plan that they will apply to all of the research tasks and required outputs. This QA plan should be no longer than 2 sides of A4 and include provision of a sufficiently detailed QA log at project completion to demonstrate the QA undertaken.

To demonstrate relevant experience in producing high quality reporting, the contractor must:

- Ensure that quality assurance is done by individuals who were not directly involved in producing the specific component of the research, analysis or model development being reviewed.
- Specify who will be responsible for quality assurance before it comes to BEIS.

Further, model documentation and any supplementary technical reports must be produced to a high standard that meet the following criteria:

General:

- Answer the research questions clearly, in plain English
- Clearly structured so that information presented in each section of each report is clear
- Connections between sections are clear
- Executive summaries of no more than two sides that set out the findings clearly and their relevance to BEIS policies
- All sections have clear introductions and conclusions (including findings being written concisely upfront)
- Methodology clearly explained so others could repeat the work in future
- Citations are made and referenced appropriately throughout all reports

Use of good quality English:

- Thoroughly proofread and peer reviewed for writing quality
- No jargon is used, and all terms are defined and referenced clearly
- All acronyms are written out in full the first time that they are mentioned in each section of each report
- No grammar and phrasing errors
- No typos / typographical errors present
- Concise and non-wordy sentences and paragraphs

- Concise reports that are not too long and do not have vast annexes

Visualisations:

- All visualisations are labelled
- All axes are labelled, including with appropriate units
- Clear and appropriate use of visualisations (large enough size, data can be read clearly without reference to the raw data and there are not too many visualisations presented at once)
- All visualisations are clearly explained and discussed
- A range of different types of visualisations are used to provide more interesting and innovative ways of presenting the results

Data quality:

- Limitations in the research need approach to be clearly stated and justified
- Further research should be stated to build upon the limitations that cannot be addressed in the research
- Where the findings are stronger and more robust and where they are not needs to be stated clearly
- Appropriate and consistent use of units
- All numerical units should include the range of uncertainty / error margin

8 Timetable

The table below sets out the intended delivery timetable for the project:

	Milestone	Deadline
Phase 2.1		
1	Contract award to the successful contractor	08 th January 2021
2	Inception meeting(s) to clarify requirement and delivery plan	22 nd January 2021
3	Contractor delivers detailed project scope and project delivery plan	29 th January 2021
4	Fortnightly 'check-ins' between BEIS and the contractor commence	29 th January 2021
5	Contractor presentation to steering group for feedback on scope and delivery plan	5 th February 2021
Checkpoint 1: BEIS sign-off of project scope and detailed project delivery plan		12th February 2021

6	Contractor delivers draft technical outputs, including detailed model map, input data and assumptions log, risks, and uncertainty ranges	12 th March 2021
7	Contractor presentation to steering group for review and challenge on draft technical outputs	19 th March 2021
Stage-gate: BEIS decision to proceed with proposed model and delivery plan or otherwise enact break clause and close project		31st March 2021
Phase 2.2		
8	Contractor proceeds with detailed model development and delivers draft model and accompanying outputs	25 th June 2021
9	Workshop with reduced steering group to run through draft model and accompanying outputs to facilitate BEIS testing	2 nd July 2021
10	BEIS finishes testing and delivers feedback on draft outputs	9 th July 2021
Checkpoint 2: BEIS sign-off of interim outputs and plan for peer review		16th July 2021
11	Independent peer review of project outputs	13 th August 2021
12	Final model and accompanying documentation submitted to BEIS, workshop(s) to present and transfer knowledge of model	27 th August 2021
Checkpoint 3: BEIS approval of final project outputs		17th September 2021
13	Project de-brief and close	17 th September 2021
14	Suggested 'cool off period'	31 st March 2022

Potential contractors must include in their proposal detail on how they will ensure delivery of the project in line with this timetable, accounting for time required for BEIS review and clearance of outputs.

Potential contractors should note BEIS's preference for an agile approach to model development. This will likely require draft outputs to be shared with and reviewed by BEIS at appropriately frequent intervals before near final draft outputs are formally provided (milestone 8 above).

Given the challenging timetable (see section 9 of the Specification of Requirements) the contractor should also consider what no / least regrets work can be carried out before formal approval of the project delivery plan (checkpoint 1).

9 Challenges

We acknowledge that the requirement set out in sections 3, 4, and 5 of this document will be challenging to deliver. Prospective contractors should be aware of the following key challenges in particular, and explicitly outline in their bids how they will be addressed in the project.

Challenge	Description
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<p>Metrics / quantifying variables</p>	<p>The challenge of this is to fully incorporate all elements of the framework into the model using quantitative metrics. In particular, the ‘conduct’ section of the framework will be challenging to incorporate given the variables are not commonly quantified, e.g. marketing and long-term strategic choices. Therefore, prospective contractors must demonstrate how they propose to address these challenges in their proposal.</p>
<p>Limitations / gaps in publicly available data</p>	<p>Prospective contractors should be aware of the limitations of publicly available data. Detailed data will be required to analyse carbon price impacts at firm or sector level – for instance, firms’ market share, profit margins, price elasticity of demand for their goods/services, cost and availability of abatement opportunities, trade with other countries. However, the extent of publicly available data may be limited in these areas, for example due to commercial sensitivity.</p> <p>Therefore, the contractor may have to consider approaches to address these limitations, such as supplementing publicly available data with other sources, or providing qualitative assessment alongside any quantitative work. To aid the successful contractor, BEIS will share any relevant input assumptions and datasets where possible at the beginning of the project to support delivery of the work.</p>
<p>Validation and verification of model</p>	<p>The challenge of developing a model is validating and verifying that it robustly models the real world, and that conclusions drawn from the model accurately represents firm-level experiences of competitiveness.</p> <p>Therefore, it is essential that prospective contractors clearly demonstrate how they will address this issue, for example through stakeholder/market engagement, detailed technical documentation, testing versus existing literature, peer review.</p>
<p>Timetable</p>	<p>The timetable for delivering the project is ambitious, driven by the constraints of policy milestones within BEIS, into which the envisaged outputs of this project are intended to feed. Therefore, it is important that prospective contractors demonstrate their ability to deliver the project requirements within the timetable set out, while ensuring the quality of outputs are not compromised.</p>

<p>Uncertainty</p>	<p>Due to the complexity of the modelling, there will be uncertainty surrounding the quantitative outputs of the model. An important element of the model will be how it ensures the uncertainty ranges are within an appropriate range, such that conclusions can still be drawn from quantitative outputs.</p> <p>When evaluating the technical report and model methodology during the stage-gate, an important consideration for BEIS will be how the Contractor proposes to identify, measure and present uncertainty. For example, the model should clearly identify all known and unknown uncertainty risks, the drivers (e.g. input assumptions or data), and provide uncertainty ranges / assessment for the model as a whole and for each model run.¹⁷</p>
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10 Ethics

All applicants will need to identify and propose arrangements for initial scrutiny and on-going monitoring of ethical issues. The appropriate handling of ethical issues is part of the tender assessment exercise and proposals will be evaluated on this as part of the ‘addressing challenges and risks’ criterion.

We expect the contractor to adhere to the following GSR Principles:

1. Sound application and conduct of social research methods and appropriate dissemination and utilisation of findings
2. Participation based on valid consent
3. Enabling participation
4. Avoidance of personal harm
5. Non-disclosure of identity and personal information

11 Working Arrangements

The successful contractor will be expected to identify one named point of contact through whom all enquiries can be filtered. A BEIS project manager will be assigned to the project and will be the central point of contact.

The contractor should assume that engagement with BEIS will include fortnightly project management phone calls and progress update reports, steering group meetings (frequency to be confirmed), and face to face meetings as required. The project will start with an inception meeting with key BEIS colleagues in attendance within two weeks of contract

¹⁷ See uncertainty toolkit for analysts in Government: <https://analystsuncertaintytoolkit.github.io/Uncertainty-Web/index.html>

award, with a subsequent meeting to agree project milestones, approach, outputs, and QA procedure. Specific terms of engagement will be agreed at inception.

Throughout the project, we expect the successful contractor to be available to ad hoc queries from the BEIS project managers relating to any aspects of the work.

BEIS also expects that the contractor will establish suitable internal working arrangements and channels of communication. As the project will likely involve multiple work strands feeding into various project activities, it is important that people assigned to different tasks regularly communicate, feedback, and understand what else is happening. It will be the responsibility of the contractor's project manager to ensure that this occurs.

BEIS will be required to review and sign off all final data collection instruments, analytical approaches (including key assumptions) and outputs.

12 Skills and experience

BEIS requires the contractor to demonstrate sufficient experience and capabilities to undertake the project. Proposals should include a summary of each proposed team member's experience and capabilities.

The contractor should propose named members of the project team and include the tasks and responsibilities of each team member. This should be clearly linked to the work programme, indicating the grade / seniority of staff and number of days allocated to specific tasks.

The contractor should identify the individual(s) responsible for managing the project and providing quality assurance of project outputs.

13 Consortium Bids

In the case of a consortium tender, only one submission covering all of the partners is required but consortia are advised to make clear the proposed role that each partner will play in performing the contract as per the requirements of the technical specification. We expect the contractor to indicate who in the consortium will be the lead contact for this project, and the organisation and governance associated with the consortia.

The contractor must provide details in their proposal on how they will manage any sub-contractors and what percentage of the tendered activity (in terms of monetary value) will be sub-contracted.

If a consortium is not proposing to form a corporate entity, full details of alternative proposed arrangements should be provided in the Annex. However, please note BEIS reserves the right to require a successful consortium to form a single legal entity in accordance with Regulation 28 of the Public Contracts Regulations 2006.

BEIS recognises that arrangements in relation to consortia may (within limits) be subject to future change. Potential Providers should therefore respond in the light of the arrangements as currently envisaged. Potential Providers are reminded that any future proposed change

in relation to consortia must be notified to BEIS so that it can make a further assessment by applying the selection criteria to the new information provided.

14 Budget

The maximum budget for this project is £175,000 excluding VAT.

Cost will be a criterion against which bids which will be assessed, however we expect that bids that use existing models will come in at a lower value than bids that require developing new models.

Prospective contractors should provide a full and detailed breakdown of costs, including options where appropriate. This should include staff (and day rate) allocated to specific tasks.

Payments will be linked to delivery of key milestones and should be weighted across the project to reflect the amount of resource required to deliver each milestone. A suggested payment programme is:

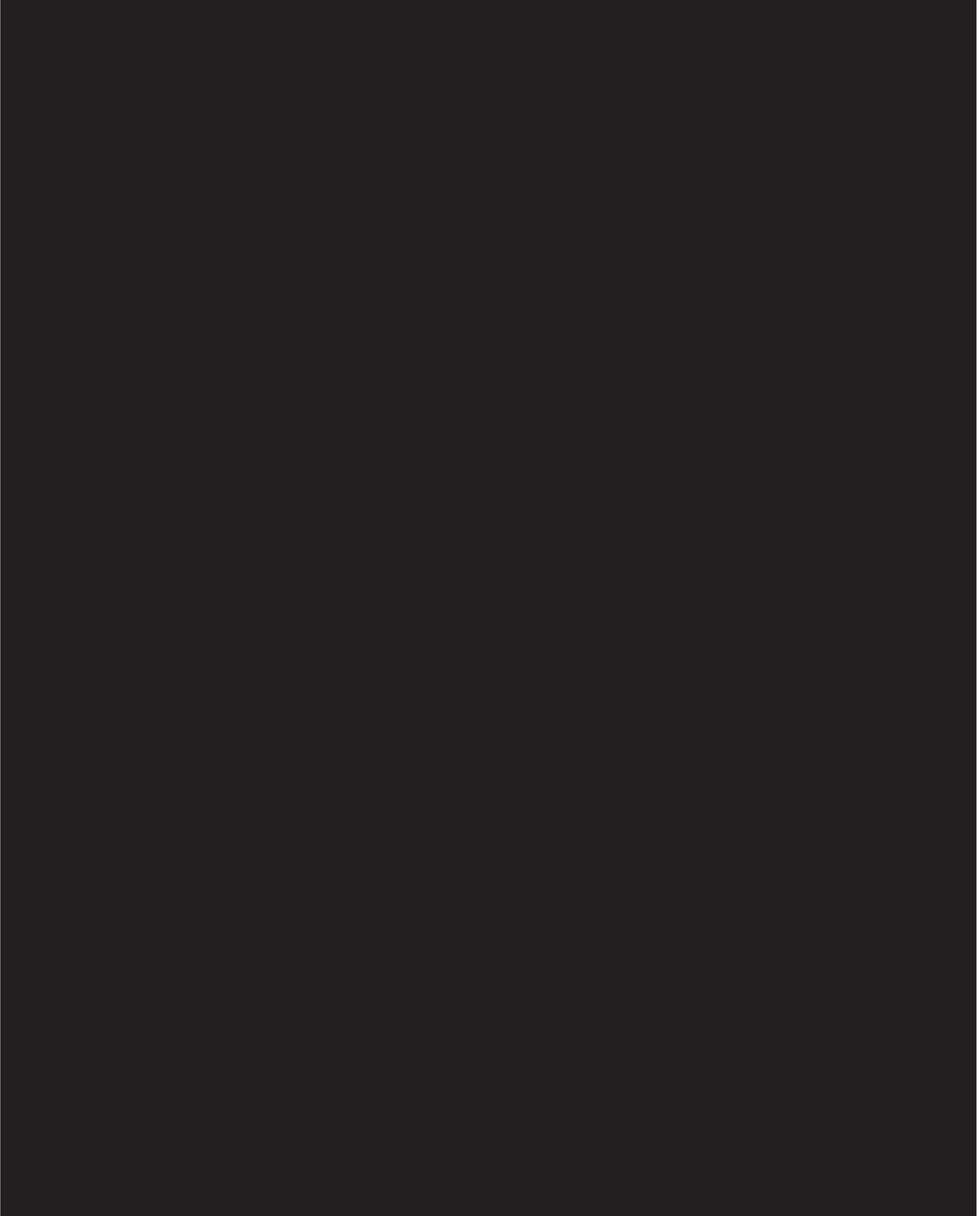
- Payment 1 – £50,000 at 'stage-gate', regardless of whether model development is pursued further.
- Payment 2 – £62,500 at Checkpoint 2, after sign-off of draft model.
- Payment 3 – £62,500 at final sign-off and close of project.

In submitting full tenders, prospective contractors confirm in writing that the price offered will be held for a minimum of 60 calendar days from the date of submission. Any payment conditions applicable to the prime contractor must also be replicated with sub-contractors.

ANNEX B

Supplier Proposal

PROJ1.1 Approach/methodology



Part 2: Contract Terms



Contract Terms v6.0