Invitation to Quote

Department for Energy Security & Net Zero

Invitation to Quote (ITQ) on behalf of The Department for Energy Security and Net Zero (DESNZ)

Subject: Estimating the future prices and scale of engineered GGRs in Voluntary Carbon Markets (VCMs).

Sourcing Reference Number: BE24244

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Section 1 – About UK Shared Business Services

Putting the business into shared services

UK Shared Business Services Ltd (UKSBS) brings a commercial attitude to the public sector; helping our Contracting Authorities improve efficiency, generate savings and modernise.

It is our vision to become the leading service provider for the Contracting Authorities of shared business services in the UK public sector, continuously reducing cost and improving quality of business services for Government and the public sector.

Our broad range of expert services is shared by our Contracting Authorities. This allows Contracting Authorities the freedom to focus resources on core activities; innovating and transforming their own organisations.

Core services include Procurement, Finance, Grants Admissions, Human Resources, Payroll, ISS, and Property Asset Management all underpinned by our Service Delivery and Contact Centre teams.

UKSBS is a people rather than task focused business. It's what makes us different to the traditional transactional shared services centre. What is more, being a not-for-profit organisation owned by DSIT / DESNZ, UKSBS' goals are aligned with the public sector and delivering best value for the UK taxpayer.

Our Customers

UKSBS currently manages £700m expenditure for its Contracting Authorities.
Our Contracting Authorities who have access to our services and Contracts are detailed here.

Privacy Statement

At UK Shared Business Services (UKSBS) we recognise and understand that your privacy is extremely important, and we want you to know exactly what kind of information we collect about you and how we use it.

This privacy notice link below details what you can expect from UKSBS when we collect your personal information.

- We will keep your data safe and private.
- We will not sell your data to anyone.
- We will only share your data with those you give us permission to share with and only for legitimate service delivery reasons.

https://www.uksbs.co.uk/use/pages/privacy.aspx

Privacy Notice

This notice sets out how the Contracting Authority will use your personal data, and your rights. It is made under Articles 13 and/or 14 of the UK General Data Protection Regulation (UK GDPR).

YOUR DATA

The Contracting Authority will process the following personal data:

Names and contact details of employees involved in preparing and submitting the bid;
Names and contact details of employees proposed to be involved in delivery of the contract;
Names, contact details, age, qualifications and experience of employees whose CVs are submitted as part of the bid.

Purpose

The Contracting Authority are processing your personal data for the purposes of the tender exercise, or in the event of legal challenge to such tender exercise.

Legal basis of processing

The legal basis for processing your personal data is processing is necessary for the performance of a task carried out in the public interest or in the exercise of official authority vested in the data controller, such as the exercise of a function of the Crown, a Minister of the Crown, or a government department; the exercise of a function conferred on a person by an enactment; the exercise of a function of either House of Parliament; or the administration of justice.

Recipients

Your personal data will be shared by us with other Government Departments or public authorities where necessary as part of the tender exercise. The Contracting Authority may share your data if required to do so by law, for example by court order or to prevent fraud or other crime.

Retention

All submissions in connection with this tender exercise will be retained for a period of (7) years from the date of contract expiry, unless the contract is entered into as a deed in which case it will be kept for a period of (12) years from the date of contract expiry.

Your Rights

You have the right to request information about how your personal data are processed, and to request a copy of that personal data.

You have the right to request that any inaccuracies in your personal data are rectified without delay.

You have the right to request that any incomplete personal data are completed, including by means of a supplementary statement.

You have the right to request that your personal data are erased if there is no longer a justification for them to be processed.

You have the right in certain circumstances (for example, where accuracy is contested) to request that the processing of your personal data is restricted.

You have the right to object to the processing of your personal data where it is processed for direct marketing purposes.

You have the right to object to the processing of your personal data.

International Transfers

As your personal data is stored on our IT infrastructure and shared with our data processors Microsoft and Amazon Web Services, it may be transferred and stored securely in the UK and European Economic Area. Where your personal data is stored outside the UK and EEA it will be subject to equivalent legal protection through the use of Model Contract Clauses.

Complaints

If you consider that your personal data has been misused or mishandled, you may make a complaint to the Information Commissioner, who is an independent regulator. The Information Commissioner can be contacted at:

Information Commissioner's Office
Wycliffe House
Water Lane
Wilmslow
Cheshire
SK9 5AF
0303 123 1113
casework@ico.org.uk

Any complaint to the Information Commissioner is without prejudice to your right to seek redress through the courts.

Contact Details

The data controller for your personal data is:

The Department for Energy Security & Net Zero (DESNZ)

You can contact the Data Protection Officer at:

DESNZ Data Protection Officer, Department for Energy Security & Net Zero 3-8 Whitehall Place, London, SW1A 2ED. Email: dataprotection@energysecurity.gov.uk

Section 2 – About the Contracting Authority

Department for Energy, Security and Net Zero (DESNZ)

The Department for Energy Security and Net Zero (DESNZ) is focused on the energy portfolio from the former Department for Business, Energy and Industrial Strategy (BEIS). Our focus is securing our long-term energy supply, bringing down bills and halving inflation

Our responsibilities

• delivering security of energy supply
• ensuring properly functioning energy markets
• encouraging greater energy efficiency
• seizing the opportunities of net zero to lead the world in new green industries

Section 3 – Working with the Contracting Authority

In this section you will find details of your Procurement contact point and the timescales relating to this opportunity.

Section 3 – Contact details		
3.1.	Contracting Authority Name and address	Department for Energy Security and Net Zero (DESNZ) 3 – 8 Whitehall Place, London, SW1A 2EG
3.2.	Buyer name	Sharon West
3.3.	Buyer contact details	FMProcurement@uksbs.co.uk
3.4.	Estimated value of the Opportunity	£80,000.00 excluding VAT This contract has the option for a **time only** 3-month extension
3.5.	Process for the submission of clarifications and Bids	**All correspondence shall be submitted within the Messaging Centre of the eSourcing portal. Guidance on how to obtain support on using the eSourcing portal can be found in Section 7.25.** **Please note submission of a Bid to any email address including the Buyer <u>will</u> result in the Bid <u>not</u> being considered, unless formally advised to do so by UKSBS.**

Section 3 - Timescales		
3.6.	Date of Issue of Contract Advert on Contracts Finder	Friday 22nd November 2024
3.7.	Latest date / time ITQ clarification questions shall be received through the eSourcing Portal	Thursday 28th November 2024 @ 11:00hrs
3.8.	Latest date ITQ clarification answers should be sent to all Bidders by the Buyer through the eSourcing Portal	Friday 29th November 2024
3.9.	Latest date and time ITQ Bid shall be submitted through the Jaggaer eSourcing Portal (**the Deadline**)	Friday 6th December 2024 @ 11:00hrs
3.10.	Anticipated notification date of successful and unsuccessful Bids	Friday 20th December 2024
3.11.	Anticipated Contract Award date	Monday 23rd December 2024
3.12.	Anticipated Contract Start date	Monday 6th January 2025
3.13.	Anticipated Contract End date	Thursday 5th June 2025
3.14.	Bid Validity Period	90 Days

Section 4 – Specification

1. Background

Introduction – the role of engineered greenhouse gas removals (GGRs)

The UK will achieve its net zero target by 2050 primarily though taking ambitious decarbonisation measures; however, some sectors, such as aviation and agriculture, will be hard to abate completely by 2050 so will require greenhouse gas removals (GGRs) to compensate for their residual emissions. GGRs is the name given to a group of methods that actively remove greenhouse gases, predominantly CO2, from the atmosphere, also commonly referred to as Carbon Dioxide Removal (CDR). They broadly fall into two categories: nature-based approaches, such as afforestation and soil carbon sequestration, and engineering-based approaches, such as Direct Air Carbon Capture and Storage (DACCS), Bioenergy with Carbon Capture and Storage (BECCS), Wood in Construction, Biochar and Enhanced Weathering (EW). Following the sector classification adopted by the Climate Change Committee (CCC) and in the Net Zero Strategy, DESNZ's focus is on engineered removals and will be the focus of this research project.

The Net Zero Strategy outlined the government's ambition to deliver at least 5MtCO2/year of engineered removals by 2030 to around 23MtCO2 per year by 2035. By 2050, deployment of engineered removals at a large scale, between 75 and 81MtCO2 per year, will be needed to help compensate residual emissions.

The Department for Energy Security and Net Zero (DESNZ) is seeking to commission expert research and modelling to forecast the prices and quantity of engineered Greenhouse Gas Removals (GGRs) traded in Voluntary Carbon Markets (VCMs) in yearly intervals to 2050, by technology type.

Aims of this project

This project will analyse existing research through literature reviews to consider and evaluate factors that will affect the demand and supply, and therefore the prices and quantities, of engineered GGRs in VCMs. It will use this research to inform economic modelling to provide scenario-based, quantitative projections of the prices (£/tCO2) and scale (Mt/y) of engineered GGRs sold in global voluntary markets, presented in yearly intervals from 2025 to 2050. Modelling will then consider how much of the UK supply of engineered GGRs will be exhausted by global demand in the VCM. These forecasts will be used in DESNZ's internal analysis to consider impacts of current and future GGR policy.

The budget available for this research will be £80,000.00 Ex VAT and activities will involve:

(i) a literature review including: identification of the factors that will impact the supply and demand of engineered GGRs and analysis of the existing forecasts for engineered GGRs in VCMs

(ii) (ii) scenario-based economic modelling of (a) the global prices (£/Tco2) and scale (Mt/y) of engineered GGRs in VCMs, combining projections of both the supply and demand of engineered GGRs; and (b) projections of the UK supply of engineered GGRs that is met by VCM demand: both forecasts should be presented in yearly intervals from 2025 to 2050, and split by engineered technology type;

(iii) (iii) a final report of key findings from the modelling, a methodology report, and a PowerPoint of key findings for results dissemination. Interim deliverables will also be required.

The project duration will be 6 months, and we anticipate this running from January 2025 – June 2025.

Background Information – GGR Business Model, UK ETS and VCMs

The government response to the GGR Business Model consultation highlighted two potential routes to market for negative emissions: high-integrity voluntary carbon markets (VCMs) and the UK Emissions Trading System (UK ETS).

Voluntary Carbon Markets

Voluntary carbon markets (VCMs) enable carbon credits to be purchased, usually by organisations, as part of their voluntary climate commitments, as opposed to legally binding emissions reduction obligations.

A carbon credit represents a reduction or removal of one tonne of carbon dioxide, or equivalent, from the atmosphere, and can be bought or sold on the VCM. Credits are issued by registries and certified in line with one of several methodologies. They can be bought by purchasers directly or by intermediaries, such as brokers. Project developers and governments can also enter into bilateral offtake agreements and pre-purchase agreements with actors.

Credits can be grouped into avoidance, reduction or removals. Avoidance credits are generated from projects that prevent new emissions from arising that might have otherwise been emitted; reduction credits are projects that seek to reduce the emissions that would have otherwise been emitted i.e. they are measured against baseline emissions of the existing processes; and removals are generated by projects that remove carbon (or other GHGs) from the atmosphere and store it permanently underground. Removals will be the focus of this research project.

Despite rapid growth of the VCM leading to a peak market of $2 billion in 2021, concerns around credit quality of offsets and greenwashing controversies have impacted buyer confidence and led to market stagnation over the last 2 years. However, HMG considers that any support provided through the GGR Business Model for removals will be fully consistent with additionality requirements i.e. to qualify as a genuine carbon removal, there must be confidence that the credits generated from the GGR project would not have occurred in the absence of the incentive created by carbon credit revenues.

Despite the relatively small size of the global GGR sector, there is clear evidence of a rapid growth in voluntary demand for high-durability carbon removal credits. This is demonstrated by high-value, long-term corporate offtake agreements (e.g. Microsoft, JPMorgan Chase, Amazon) and the Frontier initiative, which mobilises over $1 billion for permanent carbon removal through an advance market commitment. In a supply-constrained market, there is credible evidence that the private sector is valuing engineered removals at a significantly higher price per tonne than traditional carbon offsets and some compliance markets.

Efforts to achieve clear standards for GGR projects being financed by the VCM are increasing. For example, in December 2023, the UK committed to developing its own GGR Standard which will build upon best practice in voluntary markets such as the Core Carbon Principles (CCPs) developed by the Integrity Council for the Voluntary Carbon Market (ICVCM); and, in April 2024 the EU announced its Carbon Removal Certification Framework as a voluntary framework for certifying carbon removals.

The price of engineered removals in voluntary markets are typically different to that of nature-based removals and avoidance credits. For example, BECCS, Biochar, DACCS and EW attract average prices within a range of £131-£715, while Afforestation and Forest Management, nature-based activities, attracted an average price of between £12-£16, according to a leading market index. The price of engineered GGRs is likely to be influenced by robust third-party validation and verification; robust quantification of the emission impact; high durability; additionality; and the presence of sustainable development benefits and safeguards.

The VCM is expected to play a significant role in the development of the engineered GGRs sector. Specifically, from a UK perspective, business model support will be conditional on the sale of negative emissions credits into markets, including VCMs. The prices & scale of engineered GGRs in VCMs may have a significant impact on the cost of GGR policies and updated knowledge of these will support the internal analysis of future GGR policies.

Factors affecting the supply and demand of GGR credits in the VCM

There are various factors that could affect the demand and supply of GGR credits in the VCM.

On the demand side, this is likely to include but is not limited to:

- Residual emissions that need to be offset to meet an organisation's net zero target
- Organisations' abilities and appetites to meet these targets (including consideration of pressure from investors of organisations to account for environmental impacts)
- Future emissions reductions ambitions
- Alternative offsets or decarbonisation options available to an organisation and their relative prices
- Actual and perceived differences in the integrity of engineered removals compared to nature-based removals, and/or avoidance credits.
- Impact of GGR costs on downstream products & their consumers
- Changes in international compliance market policies, including their potential collapse/expiry/evolution.

On the supply side, deployment will be largely determined by the pipeline of engineered GGR projects being planned and supported by governments' ambitions and policy development.

However, the supply of engineered GGRs will also vary according to some other factors, including but not limited to:

- Resource constraints (i.e. biomass and land scarcity/restrictions, energy supply)
- Developments in (potential) substitute markets, such as the integrity and/or deployment potential of nature-based offsets improving, which might impact suppliers & governments' decisions.
- Learning curves of engineered GGR technologies and their impact on future costs
- Developers' responses to market signals.

GGR Business Model

To overcome key barriers to deployment in the UK, DESNZ is developing a GGR Business Model to unlock private investment in a portfolio of engineered GGR projects. The policy will provide revenue support for negative emissions, dependent on the price achieved by a

developer when they sell into the VCM. Should GGRs be integrated into the ETS, it may also provide support to these projects too, depending on final policy design.

The subsidy will be a Carbon Contract for Difference (CfDc), whereby a counterparty appointed by the Government will, through a 'Difference Payment', top up a project's 'Reference Price', agreed to be represented by the Achieved Sales Price - the price that the project receives for its credit in either one of these markets, to its 'Strike Price'. The Strike Price will be negotiated between the project and government: it will consider a project's costs as well as an appropriate rate of return. Given this, the price which actors are willing to pay for engineered removals in the voluntary market will have a direct impact on a project's market revenue and hence the difference payment that the counterparty pays to the project to top this up.

Future demand and the prices for engineered GGRs in VCMs is uncertain, largely due to the nascency of the sector and a lack of knowledge about how markets for carbon offsets will develop more widely. DESNZ would like to update its assumptions of the prices of engineered removals and understand the extent different technologies might attract different prices, so it can use these forecasts in internal analysis of GGR policies, such as updating predictions of the of costs of the GGR Business Model.

Up-to-date evidence of forecasts, as well as wider VCM policy developments, may help inform decisions on the design of features in the Business Model in future rounds too.

UK Emissions Trading System (ETS) and GGR integration

The UK ETS went live on January 2021 and replaced the UK's participation in the EU ETS. The UK ETS Authority established the scheme to increase the climate ambition of the UK's carbon pricing policy, while protecting the competitiveness of UK businesses.

The UK ETS works on the 'cap and trade' principle, where a cap is set on the total amount of certain greenhouse gases that can be emitted by sectors covered by the scheme. This limits the total amount of carbon that can be emitted and, as it decreases over time, will make a significant contribution to how we meet our net zero target and other legally binding climate commitments.

Within this cap, participants receive free allowances and/or buy allowances at auction or on the secondary market, which they can trade with other participants as needed.

Each year, stationary installations and aircraft operators covered by the scheme must surrender allowances to cover their reportable emissions. The cap is reduced over time, so that total emissions must fall. The UK ETS applies to energy intensive industries, the power generation sector, and aviation.

In July 2023, the UK Emissions Trading Scheme (ETS) Authority confirmed that it believed the UK ETS was an appropriate long-term market for GGRs. In May 2024 the Authority consulted to seek input on the integration of greenhouse gas removals (GGRs) in the UK ETS.

The inclusion of engineered GGRs in the UK ETS will incentivise investment in and provide a source of demand for GGRs from polluting sectors and futureproof the UK ETS so it continues to play a key role in delivering net zero. The Authority also confirmed that it believes that the UK ETS may offer an appropriate long-term market for high quality nature-based GGRs, subject to further work to consider the range of potential issues raised regarding permanence, costs and wider land management impacts. The scale of the

residual supply of GGRs, after demand in the VCM is exhausted, will have implications for the total supply of allowances in the UK ETS.

Integrating GGRs into the UK ETS will mean that GGR operators that meet market participation requirements will be able to be awarded allowances for removing carbon from the atmosphere and storing it permanently. Understanding the price and quantity of domestic GGRs that could be sold in the VCM will help to determine the impacts of including GGRs in the ETS.

Impact of the study

- This study will impact GGR policy decision-making. More evidence around the price and scale of voluntary demand for engineered GGRs will enable decision makers to better predict exchequer costs of any current or future GGR policy and help support the strategic direction of GGRs.
- This research will also support several key questions on the design of GGR integration into the ETS.
- The cap - The scale of the residual UK supply of GGRs, after demand in the VCM is exhausted, will have implications for the total supply of allowances in the UK ETS. Crucially, this includes understanding the scale of GGRs in the UK ETS and what this might mean for the design of the overall cap on emissions allowances and removals. The Authority regards the proposals for cap policy as the primary lever for ensuring that UK ETS participants continue to decarbonise and do not delay abatement via the purchasing of GGRs. This project will help inform decisions on the long-term design of the ETS to support GGRs.
- Allowance design - Understanding potential price differentials will help the Authority explore whether there is a benefit in differentiating UK Allowances (UKAs) from allowances generated by GGRs.
- Forecasts from this project can be used to directly inform the design of future rounds of the GGR Business Model.
- More up-to-date evidence of engineered-GGR prices will strengthen the government's knowledge about the revenue projects can expect to receive from the market, which in turn may inform decisions on key design features. This will help protect value for money for HMG and also support the development of a market for GGRs.
- This evidence may help inform key decisions on GGR deployment.
- It will support our ability to assess the financial viability and Exchequer costs of projects who apply for GGR business model support in the future. Updated evidence on this could help strengthen the Government's knowledge.

Aims and Objectives of the Project

The aim of this research will be to forecast the prices and scale of engineered GGRs in the global VCM in yearly intervals from 2025 to 2050, split by technology, and show how many of these engineered GGRs are based in the UK. The technologies in scope should include at least the following: Direct Air Carbon Capture and Storage (DACCS), Bioenergy Carbon Capture and Storage (BECCS), Biochar, Enhanced Weathering (EW) and Wood in Construction.

This project should combine existing research through literature reviews to identify key factors that affect the supply and demand of engineered removals. The supplier should use findings from the literature reviews to conduct economic modelling that considers different scenarios of supply and demand of engineered GGRs materialising. Supply scenarios should then be combined with demand scenarios to create various price and scale forecasts for engineered removals.

Current status of evidence on engineered GGR prices in VCMs

There are many uncertainties and evidence gaps on the price and scale of engineered removal credits in VCMs. These include but are not limited to:

- **Evidence gaps within existing data:**
    - **Lack of transparency in data of removal credit sales.**
      The market for engineered greenhouse gas removals is in its nascency, making up only 4% of sales in the VCM[1]. This means that there is only a small sample of transactions to refer to when estimating the average price of a credit. Of these transactions, many are commercially sensitive, so while there have been some high-profile purchases and there are some public indices that track prices, these do not include all purchases in the market.
    - **Current prices do not reflect future prices due to uncertainty.**
      Even where prices are publicly available, there is significant uncertainty as to how the prices of engineered GGRs will evolve over time. Some forecasts seek to extrapolate existing demand to predict future demand; however, future prices will depend on a range of factors that will influence demand and supply, many of which are uncertain.
    - **Existing GGR forecasts do not isolate the price and scale of engineered removals.**
      Many forecasts reflecting the average price of an offset in the VCM do not distinguish between avoidance, reduction and removal offsets. We are **only** interested in the prices of removal offsets: we specifically want the economic modelling to focus on engineered removals.
    - **Even amongst removals forecasts, these are not split according to nature-based and engineered approaches, nor broken down by technology type.**
      Where forecasts do focus on engineered removals, they do not split this between nature-based and engineered approaches. Furthermore, within this latter category, they do not differentiate by engineered technology type. Given prices and scale of demand may differ between different types of removals, we require modelling that: firstly, focusses only on engineered removals, not nature-based approaches; and secondly, isolates forecasts according to engineered technology type, to support policy development.
    - **Existing forecasts lack identifying the assumptions that need to be true for each scenario to materialise.**
      Some forecasts helpfully distinguish between different price and scale scenarios for removals; however, they do not go so far as sharing the assumptions behind each of these scenarios and describing what is needed for each one to materialise. Economic modelling in this project should identify different scenarios for the demand and supply of engineered GGRs and outline the assumptions beneath each of these materialising
    - **Lack of knowledge and data about how compliance market growth may impact the VCM.**

- **Factors affecting the supply and demand of engineered GGR credits and how these factors might interact:**
    - As outlined in the background section, there are many factors that will influence the demand and supply of engineered GGRs. However, this is not an exhaustive list, and each factor's impact on supply & demand will depend on the extent to which it will materialise in the future, which can be uncertain.

[1] https://www.stateofcdr.org/

We would benefit from research that summarises the factors that will impact supply & demand and predicts the impact these factors will have on the scale and prices of engineered removals, depending on different scenarios of these factors materialising.

- **The reasons and extent to which the market could distinguish between different types of offsets:**
  - We would benefit from more evidence of the extent to which one type of GGR technology might be favoured by market participants over another, the reasonings behind any preferences and, if there are preferences, what this means in terms of the scale of demand for each engineered technology. Forecasts on the scale and price differentials of different GGRs technologies will also help the ETS Authority to determine whether there is a benefit in differentiating UKAs from allowances generated by GGRs.
  - Furthermore, evidence on why organisations might be motivated to opt for one engineered GGR credit over another would be valuable in understanding why some credits might attract a premium.

- **How will the price of engineered removals evolve to 2050?**
  - GGRs will play a key role in compensating for residual emissions in hard-to-abate sectors to meet our net zero 2050 target[2] and will continue to offset emissions beyond this point. A consistent policy environment will be essential to help scale deployment between now and then, a period which will cover various political cycles. Decisions on GGR policy now will influence the scale of this industry in the future, so the better understanding we have over how prices for credits might evolve, the more informed we can be when making decisions that will have significant implications beyond this point in time.

- **The quantity of GGR credits sold in the VCM:**
  - Determining the impact of integrating GGRs into the ETS will require evidence on the scale of GGR credits sold in the VCM and the point at which VCM demand for UK credits could be exhausted. This will help inform the scale of the residual GGRs that could enter the ETS.

Research questions:

The following Research Questions (RQs) should be answered through reviewing and analysing evidence, and economic modelling.

As a minimum, addressing RQ1 and RQ2 (including RQ2a and RQ2b):

- **RQ1: What are the factors that will influence the global demand and supply of engineered removal technologies out to 2050, and how will they influence them?**

  This question should be answered as part of an opening literature review. It should consider:

  1) **Factors affecting the demand for engineered removals:**
     This research should consider factors that might make demand lower or higher and highlight any similarities or differences amongst different types of engineered credits (e.g. a DACCS credit vs a BECCS credit).
  2) **Factors affecting the supply of engineered removals:**

[2] https://www.gov.uk/government/publications/net-zero-strategy

This research should consider the assumptions that might make supply lower or higher and highlight any similarities or differences amongst different types of engineered technologies. This research does not concern whether projects will set up in the UK over other countries and vice versa; rather, the focus should be on general factors that will influence supply i.e. analysis of how policy development in all countries could encourage / stifle supply, as opposed to how a single country's policy would influence a project's decision to supply in that country over another.

3) **Evidence of the likely trajectory of these different factors materialising:** This could consider previous evidence from numerical studies that conclude any patterns amongst the different factors, and/or evidence of perceptions of how assumptions might materialise, which may be more qualitative (e.g. interviews & surveys which have already been conducted). For example, there may be numerical studies on the number of corporates who are likely to miss their net zero targets, or qualitative evidence that has collected firms' views on whether they think they're likely to miss their net zero target, both of which provide insight on how the demand for engineered removals might evolve.
4) **How these factors may impact the demand and supply of different engineered removal technologies in different ways:**
   Specifically Direct Air Carbon Capture and Storage (DACCS), Bioenergy with Carbon Capture and Storage (BECCS), Wood in Construction, Biochar and Enhanced Weathering (EW).
5) **Existing research and/or existing modelling on the prices and scale of offsets in the VCM and what this may imply about the future of engineered GGRs in VCMs specifically.**
   This could include analysing:
   a) Existing forecasts on both the prices and scale of offsets in the voluntary market and what these findings imply for engineered removals specifically (if relevant). Many forecasts currently group avoidance and removals projects. Where they only focus on removals, suppliers often group nature-based with engineered; or, where some attempt to isolate engineered removals, they do not necessarily separate them by technology type. The supplier could analyse the methodology and results of forecasts that include a range of credits in the voluntary market, not just engineered removals, and analyse these forecasts to deduce conclusions about what this means for engineered removals specifically.
   b) Evidence of the prices and scale of engineered removals outside of forecasts/modelling. This could include existing studies that contain qualitative evidence or market research about the future of engineered GGRs. Particular attention may be paid to:
      - Any differentiation in the prices of engineered GGR credits by technology, and its extent
      - Differences in the scale of engineered GGRs required
      - The prices and scale of any UK engineered GGRs being sold in the voluntary market.

- **RQ2: This question is split into two sections, a and b.**

This research should project forecasts in yearly intervals from 2025 to 2050, broken down by technology type. It should focus on the global market prices and scale of engineered GGR credits. However, findings should also be applied in a local, UK context, i.e. how much of the UK's GGR supply will be exhausted by the voluntary market? Parts A and B of RQ2 concern each of these matters, respectively.

a) **What are the predicted prices (in £/Tco2e) and quantity (in MtCO2/y) of engineered removals sold in the voluntary carbon markets, split by technology type and presented in yearly intervals from 2025 to 2050 globally?**

This question should consider the individual prices and scale of different types of engineered removals, including Direct Air Carbon Capture and Storage (DACCS), Bioenergy with Carbon Capture and Storage (BECCS), Wood in Construction, Biochar and Enhanced Weathering (EW). For BECCS technologies, forecasts should distinguish between different types i.e. Power BECCS and Hydrogen BECCS. All price and quantity forecasts should be broken down according to these technology types.
The response should consider the factors affecting both the demand and supply of engineered removals from an international perspective, informed by the research collated in response to RQ1.
On the demand side, this should consider market participants' marginal willingness to pay, which may be affected by the following factors, as well as any others identified through the literature review conducted for RQ1:

- **The volume of residual emissions corporations will need to offset to meet their ambitions**, including: net zero targets they have set (both Science Based Targets Initiatives (SBTi) and non-SBTi aligned targets); Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) commitments; and carbon neutrality claims by corporations.
- **Whether an organisation would prefer to purchase an engineered removal over a nature-based removal** and if so, the supply of nature-based removals and when these might be exhausted.
- **Alternative options to offsetting** that might be available to organisations, such as decarbonisation methods and whether these decarbonisation options are cheaper/more dear than engineered removal credits.
- **The cost corporations may face if they surrender or fail to meet their net zero targets** and whether this exceeds the cost of offsetting (i.e. the price of engineered removal credits)
- **Demand for engineered credits in compliance schemes**

On the supply side, modelling should consider the following factors, as well as any others identified through the literature review conducted for RQ1:

- **Government policies** to support both the policy development and deployment of engineered removal technologies, considering any specific targets for engineered removals and, where targets are not specified, assumptions for the deployment of engineered removals which will be needed for countries to meet their net zero targets.
- **The development (or lack of) of standards for all types of credits** that are sold in the voluntary carbon market and the extent to which this impacts the supply of engineered removals in the market.
- **Potential supply constraints**, such as restrictions on biomass, land and energy costs. These factors, together with stringency of standards, will also impact the marginal cost of engineered removals.

Number of scenarios:

We expect modelling to consider and outline multiple demand scenarios. The appropriate number of scenarios should be determined by the supplier and informed by the findings from

the literature review. For example, the supplier might find it is optimal to create scenarios reflecting 'low', 'central' and 'high' demand, each of which rely on different demand-side assumptions materialising. The supplier should determine the assumptions that underly each scenario, also led by findings and research from the literature review. These assumptions should be clearly identified in the modelling.

Given this project will consider voluntary carbon markets at the global scale, there is also likely to be significant uncertainty of the supply side of the market. This will be largely influenced by different governments' policies and support, due to the sector's nascency and high barriers to entry. Acknowledging this, we are also interested in capturing variability on the supply side of the market. Like modelling on the demand side, we'd expect the supplier to capture this variability in an appropriate number of scenarios, as informed by the research in the literature review. This does not have to be the same number of scenarios as considered on the demand side of the market: the supplier should model the variability according to what is most appropriate for each side individually, using sound judgement and informed by findings from the literature review.

After identifying different scenarios for demand and supply curves, modelling should combine both sides of the market to create price and scale forecasts for engineered removals. As a minimum, **there should be 3 different scenarios for the price and scale forecasts, 'low', 'central' and 'high'**, although the supplier may wish to provide further forecasts as they see fit.

The supply and demand scenarios that are combined to create each of these forecasts should be identified, as well as their underlying assumptions. For example, if the 'low' price and scale forecast is made up of a 'low' demand scenario combined with a 'high' supply scenario, this combination should be specified as well as the assumptions that need to materialise for the 'low' demand and 'high' supply scenarios to apply.

The price and quantity forecasts should be broken down by technology type and presented in yearly intervals from 2025 to 2050. Crucially, this question seeks to predict the scale of engineered GGRs exhausted in voluntary markets and at what price.

> **b) How much of this quantity traded in the VCM is supplied by UK-based engineered GGR projects?**
>
> Part b of RQ2 will concern how much of this global voluntary demand is met by UK supply of engineered GGRs.
>
> Given the global nature of voluntary carbon markets, some of the demand for engineered GGRs will be met by removal projects in the UK, and purchasers of UK credits may not all be from the UK themselves. Hence, we are interested in the global voluntary demand for UK credits: in particular, the total number of removal credits purchased in the VCM that are generated from UK-based engineered GGR projects. This will develop our understanding of how many additional GGR credits will need to be driven by other markets, such as the UK ETS, to meet Net Zero targets.

We are interested in different ways suppliers might use modelling to answer this question. The supplier may wish to use their assumptions of UK supply, perhaps that which they used in their calculation of global supply and combine this with a share of global demand that represents purchases of UK credits. As in RQ2a, these outputs should be broken down by technology type and presented in yearly intervals from 2025 to 2050. The response to this question should also consider uncertainty: forecasts should reflect variety by modelling scenarios of different states of the world as in RQ2a. Research in response to RQ1 may find that the demand and supply of nature-based credits could impact the demand and supply of

engineered credits. This is because WCC credits and engineered GGR credits may be considered substitutes by some purchasers, or this could become the case in the future, and so suppliers may need to consider this in their modelling.

2. Suggested Methodology

We expect regular communication with the supplier throughout the project and suggest breaking this down into two tiers:

1) Regular, and at a minimum fortnightly, communication with a small number (~2) of DESNZ colleagues (project managers) to provide updates on progress and to escalate any issues that may arise during the week. This should be in the format an online meeting of at least one hour fortnightly, as well as regular communication via email.
2) More formal communication with a Steering Group, led by the GGR & ETS teams within DESNZ, but also involving colleagues who have an interest in the key deliverables of the project, such as other teams within DESNZ or other government departments. This Group will be convened at key stages of the project, such as to peer review interim deliverables, outlined below.

DESNZ will invite the contractor to propose a methodology that aligns with the project's aims and objectives. The proposal should include the following tasks at a minimum:

Task 1: Review existing evidence of engineered greenhouse gas removals (GGRs) in voluntary carbon markets (VCMs), compiling a literature review that articulates the research available in relation to RQ1 outlined above.

The purpose of this task is twofold: firstly, to understand the factors that will impact the supply and demand of engineered GGR technologies out to 2050; and secondly, to use these findings to identify assumptions that will underly the various supply and demand scenarios that the supplier will model to address RQ2a and RQ2b. The literature review should also discuss factors that will impact the supply and demand of specific GGR technologies.

The supplier should outline their approach to conducting the literature review, including proposed data sources, search terms and inclusion/exclusion criteria. This should focus on reviewing existing evidence on the factors that affect and will continue to affect supply and demand of engineered GGRs. Evidence should consider literature and data from sources in both academic and grey fields, such as by industry, and should primarily focus on capturing evidence arising from recent publications and data, given the nascency of the market.
The supplier should focus on engineered removals, including DACCS, BECCS, Wood in Construction, Enhanced Weathering (EW) and Biochar technologies. It should be noted that while DESNZ refers to the technologies outlined above as 'engineered' removals, this is often used interchangeably with the term 'novel' removals. Internationally, 'GGRs' are also often named 'Carbon Dioxide Removal (CDR)' or 'Negative emissions Technologies' (NETS): evidence should examine sources that refer to these specific types of engineered removals, regardless of nomenclature to include all relevant evidence. Voluntary carbon markets can also be referred to as a singular or plural concept i.e. one big market or lots of individual markets. Research should consider evidence from studies that refer to either, with emphasis on the demand for a credit being voluntary as opposed to within a compliance scheme.
Evidence from publications and databases should be analysed. Existing forecasts on the prices and scale of engineered removals may be helpful, as well as evidence from sales to date. Analysis should highlight both the current factors affecting the supply and demand for these technologies in voluntary markets, and any evidence on factors affecting future

demand and supply in the years out to 2050. Leading market indices can also be used to assess the current prices of removals. Analysis should also consider qualitative evidence about the future prices and scale of engineered GGRs in the voluntary carbon market, such as any evidence from existing market research or interviews.

The scope should cover demand and supply on an international scale to support the modelling that will be conducted as part of RQ2a; however, it would also be helpful to include any evidence that highlights the factors affecting demand for UK engineered GGR credits specifically, to support modelling in response to RQ2b. For example, this could include any evidence related to UK credits being sold at a premium or not, and any reasons behind this.

DESNZ is particularly interested in existing evidence on Carbon Capture and Storage (CCS) engineered GGRs, referring to DACCS and BECCS and specific attention should be paid to these technologies. However, given the ability of non-CCS engineered technologies (EW, Biochar & Wood in Construction) to influence the price and scale of all engineered removals, given they may be considered substitutes for each other, and in preparing for future policy development, we are also interested in factors affecting the supply and demand of non-CCS engineered technologies.

Many existing sources of evidence on GGRs group nature-based and engineered removals as one; the supplier should consider this research, but should highlight the elements specifically relevant to our focus on engineered removals. The supplier should also consider using research that groups 'avoidance' and 'removals' credits, but again should identify the elements that are relevant to the latter category. Evidence with a sole focus on either nature-based removals or avoidance credits should only be included if their findings are likely to have implications for the demand and supply of engineered GGRs; otherwise, these studies should be excluded from the literature review, as they are irrelevant for answering RQ1 and RQ2.

The supplier should identify any evidence that distinguishes between factors that might affect the supply and demand of different types of engineered technologies, such as the factors that might cause the supply and demand for DACCS credits to differ than that for BECCS (including different types of BECCS technologies).

Sources should be evaluated, combined appropriately and weighed up to draw conclusions about the factors influencing the supply and demand of engineered GGRs in voluntary carbon markets. The contractor should share their approach to the literature review with project managers from DESNZ.

This literature review should be completed before Task 2 begins, as its findings should inform the methodology required for the rest of the project. Interim findings from the literature review should be shared with the project managers in DESNZ on a fortnightly basis. A synopsis of final conclusions from the literature review should be shared with the Steering Group at least 3 working days before Task 2 commences in a Powerpoint presentation format.

Task 2: Scope, develop and peer review a methodology for economic modelling to address RQ2a and RQ2b, identifying relevant data sources.

For this task, the supplier should consider their findings from Task 1 and scope out a full methodology for economic modelling to address RQ2a and RQ2b above. They should identify input data sources relevant to the factors that they have identified to affect the supply and demand for engineered GGRs out to 2050: these sources should be robust and suitable to address the purpose of the project, as well as readily available and accessible to the supplier and government.

The methodology should be developed in a methodological note that will be shared with the Steering Group for peer review at least 5 working days before the following task (economic modelling) commences. The note will outline a method to model quantitative projections of the supply and demand of engineered removals in voluntary carbon markets in yearly intervals from 2025 to 2050, broken down by technology type. It should also outline how these forecasts will be combined to create global price and quantity forecasts to answer

RQ2a; and, how these will be applied to a UK context to understand the scale of UK GGRs that will be met by VCM demand to answer RQ2b. The note will also include a list of data sources.

The methodology should combine original modelling, existing data sources and findings from Task 1 to create different supply and demand scenarios for engineered GGRs which rely on specific assumptions materialising. These different scenarios will account for uncertainty and their underlying assumptions should be clearly identified by the supplier.

At a minimum, the methodology should include the following steps:

a. Modelling of multiple demand curve scenarios for engineered removals in VCMs, broken down by technology type and presented in yearly intervals from 2025 to 2050 globally. The appropriate number of scenarios should be determined by the supplier and informed by findings from the literature review. Modelling should consider various factors that will impact demand for engineered credits, as described in RQ1. These demand curves should represent the marginal willingness to pay of corporate buyers.
b. Modelling of at least 2, but possibly more, supply curve scenarios for engineered removals, also broken down by technology in yearly intervals from 2025 to 2050 globally. Modelling should consider the various factors that will impact supply as described in RQ1.
c. Combine the products from steps (a) and (b) above to forecast two outputs below:
    i) The prices of engineered removals (in £/Tco2) in VCMs, broken down by technology type and presented in yearly intervals from 2025 to 2050 globally.
    ii) The quantity of engineered removals (in Mt/y) in VCMs, broken down by technology type and presented in yearly intervals from 2025 to 2050 globally.

There should be **a minimum of three** price and scale forecasts produced per technology type, such as a 'low', 'central' and 'high' scenario, although the supplier may wish to include more depending on their findings from Task 1 and the number of supply and demand scenarios they forecast. These price and scale forecasts should be created by combining different supply and demand scenarios from step (a) and step (b). For example, the supplier may decide that it would be best to combine their 'low' demand curve outputs with 'high' supply curve outputs to create their 'low' price and scale forecast.

d. Apply the global price forecasts to the UK market to examine how many of the VCM credits traded originate from UK-based GGRs. Modelling should provide the scale of UK engineered GGR credits purchased in the voluntary carbon market, broken down by technology and presented in yearly intervals from 2025 to 2050.

Following review of the methodology by the Steering Group, the supplier should update and validate the methodology considering any comments from the Group. The methodological note should be updated to form a final methodology report that will be one of the key deliverables at the end of the project.

Task 3: Application of methodology to produce interim results for RQ2 outlined above.

The supplier should apply the agreed methodology to develop an economic model to produce outputs that specifically answer RQ2a and RQ2b. All outputs should be delivered in an accessible and modifiable format (e.g. Excel), particularly in the case of analytical outputs i.e. the forecasts, and any charts developed by the supplier. Staged milestones will be agreed between DESNZ and the supplier for delivery: as a minimum, this Task should produce interim results for the forecasts in an Excel format, specifically for peer review by the Steering Group (Task 4).

If outputs from this Task suggest that supplementary evidence or clarifications on existing materials are needed, follow-up engagement with DESNZ ahead of the more formal peer

review stage will be necessary. Early versions of the analysis & interim results should be shared with DESNZ project managers to ensure that the project is progressing towards achieving its purpose in a timely fashion.

Task 4: Peer review interim results above with DESNZ.

The supplier is expected to validate the interim findings arising from Task 3 with the Steering Group. This should include sharing the forecasts in response to RQ2a and RQ2b in an excel format and sharing conclusions from these interim results in a PowerPoint presentation format. Peer review should include an ad hoc workshop (convened online or according to any HMG guidelines in place at the time) with materials shared in advance of the meeting at least 5 working days in advance for review. The supplier should allow for ample time to integrate the comments and review the analysis following the workshop.

The supplier should validate all interim outputs with the Steering Group throughout the course of Tasks 1 to 3 (including the workshop mentioned in the paragraph above), to ensure that the outputs and underlying assumptions and methodology have been tested and familiarised across DESNZ.

Task 5: Update modelling to produce final results and quality assure.

Following the peer review of interim results in Task 4, the supplier should further update their methodology and results accordingly to produce a final set of forecasts in an Excel format. These final analytical outputs are key deliverables from Task 5.
All models and modelling must be quality assured and documented, and the supplier should produce a final methodology report.
Contractors should include a Quality Assurance (QA) plan that they will apply to all the research tasks and modelling. This QA plan should be no longer than 2 sides of A4 paper. It should include the delivery of a DESNZ pattern QA Log.
This link contains an externally accessible version of the Department's Modelling QA guidance, and the QA log: The QA log should be filled during the project and submitted at project completion as a deliverable to demonstrate the QA undertaken.
When models are submitted to the Department, during the project or at completion, they should be accompanied by confirmation by a senior (partner or equivalent) of the contracting organisation, that the assurance has taken place in accordance with approaches outlined in the QA plan agreed with the Department. Evidence of testing through development provided in support of the QA Log ratings greatly improves the level of confidence in it.
For all projects, contractors must supply quality assurance evidence for any existing models they wish to submit to the Department. This must be:

- to a standard that is at least the equivalent of the Department's internal standard, available at this link
- accepted as suitable by the Department

Task 6: Write up of results in a report and powerpoint for dissemination of findings.

The supplier should write up their findings from Tasks 2 – 5 in a report, and produce other analytical outputs to articulate key results & conclusions from these forecasts, such as charts. The report should also include the final literature review conducted in Task 1, as well as any information on input data used. Draft versions of the report should be shared with DESNZ on a regular basis, at a minimum fortnightly, for sight and to input comments. Three weeks before project completion, a draft interim report should be shared with the Steering Group for peer review. The supplier should allow the Group five working days to review & input comments. It should then use the final two weeks to update the report in light of these comments and complete the final report.

The supplier should produce a powerpoint presentation summarising their approach and key findings across all tasks for dissemination within DESNZ. This should be presented by the supplier to DESNZ in an online forum for internal colleagues. Appropriate stakeholders may be invited to such events, such as colleagues from other government departments.
Along with the final report and PowerPoint presentation, the final methodology report (i.e. an updated version of the methodological note from Task 2) should also be shared with DESNZ.
We may wish to share findings from this research, including the quantitative forecasts, with other government departments. We may also wish to publish these findings online; however, we acknowledge that this may not be possible, should suppliers need to deploy pre-existing IP. We can discuss about data sharing agreements with suppliers, should the need for this arise.

Proposed timelines, project plan & payment mechanisms:

Bidders must set out the project plan and expected timetable for delivery of the project. Bidders will be assessed on this as part of the assessment criteria. Our provisional timetable is set out below and aims for completion by mid-May 2025.

Bidders are welcome to propose innovative methods and outline a delivery plan which splits the required activities in stages to meet the requirement. Bids should also explore when and how risks will be communicated to DESNZ if they arise during the project, with subsequent action and an updated risk register.

Action	**Timescales and payment mechanisms**	**Potential workstreams**	**Potential outputs**
Appointment of contractor	Early January 2025	Administrative work	Contract appointment letter
Phase 1 – Tasks 1 and 2 above. (Literature review and finalise methodology for Phase 2).	January 2025 (To be paid to the supplier on receipt of outputs from Phase 1)	- Desk research to address RQ1 - Use findings from Task 1 to create a methodology for economic modelling to address RQ2a and RQ2b.	- Powerpoint presentation outlining main findings from the literature review to Steering Group. - Interim methodological note to address RQ2 shared with the Steering Group and updated upon review so the final methodology is agreed with DESNZ before Phase 2.
Phase 2 – Tasks 3 and 4 above. (Economic	February 2025	- Economic modelling	- Interim outputs from economic modelling i.e.

modelling using methodology developed in Phase 1)	(To be paid to the supplier on receipt of outputs from phase 2)	- Workshop with DESNZ to share interim outputs i.e. quantitative projections, for peer review.	forecasts of global the prices and scale of engineered removals; and, forecasts of the scale of UK supply of engineered GGRs sold into VCMs. Both outputs should be presented in yearly intervals from 2025 to 2050 and broken down by engineered technology type. -
Phase 3 – Task 5. (Complete economic modelling in response to DESNZ feedback)	March 2025 (To be paid to the supplier on receipt of outputs from phase 3)	- Any remaining changes to modelling - Data analysis - Quality assurance	- Final analytical outputs from modelling in an Excel format.
Phase 4 (Results dissemination)	April – May 2025 (To be paid to the supplier on receipt of outputs from phase 4).	- Reporting and presentation of findings in an interim report. - Review by DESNZ colleagues and Steering Group. - Supplier to update outputs in light of feedback from DESNZ and produce a final report.	- Interim report of key findings - Final report of overall key findings from the project, including the literature review. - Final methodology report - Presentation of final results and PowerPoint slides to disseminate.

Payment Milestones:

Payments for this project will be broken down into four stages and processed after individual Phases are complete, draft outputs have been submitted to DESNZ, DESNZ have provided comments within 5 working days, and a final version of the outputs has been agreed between DESNZ and the supplier.

- Phase 1 (first month of project, to be paid on receipt of outputs): conduct the literature review (Task 1) and create, agree, and finalise with DESNZ the methodology for the economic modelling (Task 2).
- Phase 2 (second month of project, to be paid on receipt of outputs): conduct economic modelling to produce interim results (Task 3) and peer review with DESNZ (Task 4)
- Phase 3 (third month of project, to be paid on receipt of outputs): complete, update and quality assure economic modelling in response to feedback from the peer review, to produce final analytical outputs for dissemination with DESNZ (Task 5).
- Phase 4 (fourth and fifth month of project, to be paid on receipt of outputs): complete final outputs, including a final report, methodology report, and a PowerPoint presentation for dissemination with DESNZ (Task 6).

3. Deliverables

Expected outputs

Bidders should note that DESNZ will exclusively oversee the dissemination of all intermediate and final deliverables from this project. The supplier will be unable to use the outputs from this project for their own purpose. The following outputs are required within the project, irrespective of whether the proposed methodologies are used or whether alternatives, such as more efficient or innovative approaches, are proposed. Alternative reporting approaches or timing may be proposed so long as they meet the needs outlined below and the bidder's reasoning is clearly set out.

The key deliverables of this project (as a minimum viable product) should be delivered using clear, accessible, plain English across the following:

Regular deliverables:

- Regular communication, including via email and fortnightly meetings, with a small number (~2) of DESNZ analysts (project managers) updating on and sharing emerging findings and project progress regarding both (i) the immediate Task(s) of concern and (ii) the project's progress overall.

Interim deliverables:

- Powerpoint slides summarising key findings from the literature review from Task 1, delivered to the Steering Group three working days before development of the methodology (Task 2) begins.
- An interim methodological note outlining a draft methodology. This should be informed by research and findings in the literature review, to model both the demand and supply of engineered GGRs as well as the methodology used to translate these findings into forecasts of both: the global prices and scale of engineered GGRs in yearly intervals from 2025 to 2050, split by technology (addressing RQ2a); and the scale of UK supply of engineered GGRs that is met by VCM demand (addressing RQ2b). This note should be presented to the Steering Group for peer review and updated to reflect a final methodology, agreed with DESNZ, for the economic modelling to be carried out in Task 3.
- Interim analytical outputs from the economic modelling: i.e. scenario-based, quantitative projections for the global prices (£/Tco2e) and scale (Mt/y) of engineered GGRs sold in the VCM, presented in yearly intervals from 2025 to 2050 and split by GGR technology; and, scenario-based, quantitative projections for the scale (Mt/y)

of UK engineered GGRs met by global VCM demand, presented in yearly intervals from 2025 to 2050 and split by GGR technology. These should be presented to the Steering Group during the completion of Task 4 for peer review.

- An interim report setting out the project scope and all the findings on the research questions described in this proposal, including the literature review in response to RQ1 and conclusions from the modelling to answer RQ2a and RQ2b. This should be presented to the Steering Group at least three weeks before final completion of the project. The Group should have at least 5 working days to review and feedback and the supplier should incorporate this feedback into its final overall report on completion of the project (see below).

Final deliverables:

- A final, in-depth methodology report (maximum 20 pages) covering in detail the sources, techniques and modelling used to assess both the demand and supply of engineered GGRs as well as the methodology used to translate these findings into forecasts for both: the global prices and scale of engineered GGRs in yearly intervals from 2025 to 2050, split by technology (addressing RQ2a); and, the scale of UK supply of engineered GGRs that is met by VCM demand (addressing RQ2b). The methodology report should clearly outline the assumptions that each demand and supply scenario rely on, and the combination of demand and supply scenarios that make up each price and scale forecast.
- A final, overall report setting out the project scope and all the findings on the research questions described in this proposal, including the final literature review in response to RQ1 and conclusions from the modelling based on the methodology to answer RQ2a and RQ2b.
- Analytical outputs i.e. scenario-based, quantitative projections for the global prices (£/Tco2e) and scale (Mt/y) of engineered GGRs sold in the VCM, presented in yearly intervals from 2025 to 2050 and split by GGR technology; and, scenario-based, quantitative projections for the scale of UK engineered GGRs met by VCM demand, presented in yearly intervals from 2025 to 2050 and split by GGR technology. This should include a report of the quality assurance processes following the Aqua Book: guidance on producing quality analysis. Policy, technology and modelling assumptions, as well as unknown uncertainties, should be clearly listed. This should represent the main output/minimum viable product.
- PowerPoint slide-deck on key findings for dissemination, with a presentation to DESNZ policy and analyst teams and potentially other stakeholders who DESNZ may deem it appropriate to invite.

Project Management

All bids should include a summary of their project management approach, proposed frequency of project management meetings and how progress will be reported to DESNZ.

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

Where a consortium or sub-contractors are in place, DESNZ expects that they are included in relevant meetings, workshops and review points to ensure their full engagement in the project. All contractors and sub-contractors are responsible for the delivery of outputs to the appropriate time and quality. It is expected that the lead contractor takes an active role in oversight of all workstreams and bears the overall responsibility for the delivery of the evaluation activities and outputs.

Bids should assume that DESNZ takes an active role in review and quality assurance of research materials, analysis and outputs, beyond peer review. It should be expected that research materials and outputs go through iterations following comments from DESNZ.

We envisage the need for close interaction between the DESNZ Project Manager(s) and contractor throughout the process, to ensure that emerging issues are dealt with promptly and that DESNZ fully understands the assumptions and approach taken. Bidders should assume that engagement with DESNZ will include fortnightly project management video calls, fortnightly progress updates and/or reports, online Steering group meetings (frequency to be confirmed), and if necessary, Covid-safe face to face meetings as required to design and deliver the chosen methods. Throughout the research, DESNZ will be required to review and sign off all final reports, analytical approaches (including key assumptions) and outputs.

Price and payments

Payments for this project will be broken down into four stages and processed after individual Phases are complete and outputs delivered.

The estimated budget for this project is £80,000 excluding VAT. Cost will be a criterion against which bids will be assessed. An estimated payment schedule is proposed above in the methodology section and corresponds to the completion of each phase.

Contractors should provide a full and detailed breakdown of costs. This should include staff (and day rates) allocated to specific tasks.

In submitting full tenders, suppliers confirm in writing that the price offered will be held for a minimum of 90 calendar days from the date of submission. Any payment conditions applicable to the prime contractor must also be replicated with sub-contractors.

DESNZ aims to pay all correctly submitted invoices as soon as possible, within 30 days from the date of receipt, in line with standard terms and conditions of contract.

Terms and Conditions

Bidders are to note that any requested modifications to the Contracting Authority Terms and Conditions on the grounds of statutory and legal matters only, shall be raised as a formal clarification during the permitted clarification period.

Section 5 – Evaluation of Bids

The evaluation model below shall be used for this ITQ, which will be determined to two decimal places.

Where a question is 'for information only' it will not be scored.

The evaluation team may comprise staff from UKSBS and the Contracting Authority and any specific external stakeholders the Contracting Authority deems required.

To maintain a high degree of rigour in the evaluation of your bid, a process of commercial moderation will be undertaken to ensure consistency by all evaluators.

Do not exceed the page limits specified within each of the Non-Commercial criteria, any additional content provided beyond the specified page limit will not be considered or scored during the evaluation process. Where bidders include a cover page and/or annex, this will be taken into consideration within the page limit and therefore this is discouraged.

Where a Non-Commercial criterion requires an additional attachment such as an organogram or risk register bidders are to note the eSourcing Portal only permits 1 document upload per question therefore bidders must attach their response as a Zip folder.

Pass / Fail criteria		
Evaluation Envelope	**Q No.**	**Question subject**
Qualification	SEL1.2	Employment breaches/ Equality
Qualification	SEL1.3	Compliance to Section 54 of the Modern Slavery Act
Qualification	SEL2.12	UK GDPR
Qualification	FOI1.1	Freedom of Information
Qualification	AW1.1	Form of Bid
Qualification	AW1.3	Certificate of Bona Fide Bid
Qualification	AW3.1	Validation check
Qualification	AW3.2	Conflict of Interest Declaration
Qualification	AW3.2.1	Conflict of Interest Declaration Supporting Information
Qualification	AW4.1	Compliance to the Contract Terms
Qualification	AW4.2	Changes to the Contract Terms
Qualification	AW4.3	PPN 01/22 - Contracts with suppliers from Russia or Belarus
Qualification	AW6.1	Compliance to the Specification
Qualification	AW6.2	Variable Bids
Commercial	AW5.3	Firm and Fixed Price
-	-	Invitation to Quote response received on time within the eSourcing Portal
	In the event of a Bidder failing to meet the requirements of a Mandatory pass / fail criteria, the Contracting Authority reserves the right to disqualify the Bidder and not consider evaluation of any of the Award stage scoring methodology or Mandatory pass / fail criteria.	

Scoring criteria

Evaluation Justification Statement

In consideration of this particular requirement the Contracting Authority has decided to evaluate Potential Providers by adopting the weightings / scoring mechanism detailed within this ITQ. The Contracting Authority considers these weightings to be in line with existing best practice for a requirement of this type.

Evaluation Envelope	Q No.	Question subject	Maximum Marks	
			Overall	Breakdown
Commercial	AW5.1	Price	20.00%	20.00%
Technical	PROJ1.1	Approach	80.00%	40.00%
Technical	PROJ1.2	Staff to Deliver		10.00%
Technical	PROJ1.3	Understanding the Project Environment		20.00%
Technical	PROJ1.4	Project Plan, Timescales and Risk Management		10.00%

Evaluation of criteria

Non-Commercial Elements

Each question will be judged on a score from 0 to 100, which shall be subjected to a multiplier to reflect the percentage of the evaluation criteria allocated to that question.

Where an evaluation criterion is worth 20% then the 0-100 score achieved will be multiplied by 20**%**.
Example if a Bidder scores 60 from the available 100 points this will equate to 12% by using the following calculation:
Score = {weighting percentage} x {bidder's score} = 20% x 60 = 12

The same logic will be applied to groups of questions which equate to a single evaluation criterion.

The 0-100 score shall be based on (unless otherwise stated within the question):

0	The Question is not answered, or the response is completely unacceptable.
10	Extremely poor response – they have completely missed the point of the question.
20	Very poor response and not wholly acceptable. Requires major revision to the response to make it acceptable. Only partially answers the requirement, with major deficiencies and little relevant detail proposed.
40	Poor response only partially satisfying the question requirements with deficiencies apparent. Some useful evidence provided but response falls well short of expectations. Low probability of being a capable supplier.
60	Response is acceptable but remains basic and could have been expanded upon. Response is sufficient but does not inspire.

80	Good response which describes their capabilities in detail which provides high levels of assurance consistent with a quality provider. The response includes a full description of techniques and measurements currently employed.
100	Response is exceptional and clearly demonstrates they are capable of meeting the requirement. No significant weaknesses noted. The response is compelling in its description of techniques and measurements currently employed, providing full assurance consistent with a quality provider.

All questions will be scored based on the above mechanism. As there will be multiple evaluators their individual scores and commentary will be recorded, then a consensus meeting will be convened by the evaluators to determine your score. Note this will include a chairperson or lead and all evaluators are of equal status.

Example
Evaluator 1 scored your bid as 60
Evaluator 2 scored your bid as 60
Evaluator 3 scored your bid as 40

The convened meeting came to a consensus that the final recorded score to given to your submission against this question should be 60, with the justification and reasons for this score recorded.

Once the consensus process has been finalised, all justifications recorded and all non-priced scores are agreed, this will then be subject to an independent commercial moderation review.

Commercial Elements will be evaluated on the following criteria.

Price will be evaluated using proportionate pricing (lowest bid / bid * mark). A bidder's score will be based on the lowest total score received divided by their total cost and then multiplied by the marks available.

For example, if the total basket price for three bid responses is received and Bidder A has quoted £50,000 as their total price, Bidder B has quoted £80,000 and Bidder C has quoted £100,000 then the calculation will be as follows:

(Maximum marks available in this example being 12.5)

Bidder A Score = 50000/50000 x 12.5 = 12.5

Bidder B Score = 50000/80000 x 12.5 = 7.81

Bidder C Score = 50000/100000 x 12.5 = 6.25

This evaluation criteria will therefore not be subject to any averaging, as this is a mathematical scoring criterion, but will still be subject to a commercial review.

The lowest score possible is 0.

The scores achieved for the Non-Commercial and Commercial Criteria will be combined to give a bidders total score and ranking.

Award criteria in the event of a tied place for an award decision

If as a result of the application of the aforementioned scored criteria applicable to Commercial and Non Commercial has been undertaken and suitable due diligence has occurred to ratify this position, this then results in a tied place re more than one supplier has attained a score that is equal to another bidder under this procurement procedures due process, then the Contracting Authority shall make an award decision on the basis of the bidder who provided a bid that attained the highest score under Non Commercial criteria

For example:
Bidder A scores 12.50 for Commercial and 45.00 for Non-Commercial
Bidder B scores 15.10 for Commercial and 42.40 for Non-Commercial

The result is a tied place at score of 57.50

The Contracting Authority stated in its procurement documents that the bidder who scored the highest on under Non-Commercial criteria in a tied place, shall be awarded the contract therefore Bidder A wins the award.

This evaluation criteria will therefore not be subject to any averaging.

Evaluation process

The evaluation process will feature some, if not all, the following phases.

Stage	Summary of activity
Receipt and Opening	• ITQ logged upon opening in alignment with UKSBS's procurement procedures. • Any ITQ Bid received after the closing date will be rejected unless circumstances attributed to UKSBS, the Contracting Authority or the eSourcing Portal beyond the bidder control are responsible for late submission.
Compliance check	• Check all Mandatory requirements are acceptable to the Contracting Authority. • Unacceptable Bids maybe subject to clarification by the Contracting Authority or rejection of the Bid.
Scoring of the Bid	• Evaluation team will independently score the Bid and provide a commentary of their scoring justification against the criteria.
Clarifications	• The Evaluation team may require written clarification to Bids
Re - scoring of the Bid and Clarifications	• Following Clarification responses, the Evaluation team reserve the right to independently re-score the Bid and Clarifications and provide a commentary of their re-scoring justification against the Evaluation criteria.
Moderation meeting (if required to reach an award decision)	• To review the outcomes of the Commercial review • To agree final scoring for each Bid, relative rankings of the Bids • To confirm contents of the feedback letters to provide details of scoring and relative and proportionate feedback on the Bidders response
Due diligence of the Bid	• the Contracting Authority may request the following requirements at any stage of the Procurement: o Submission of insurance documents from the Bidder o Request for evidence of documents / accreditations referenced in the / Invitation to Quote response / Bid and / or Clarifications from the Bidder o Taking up of Bidder references from the Bidders Customers. o Financial Credit check for the Bidder
Validation of unsuccessful Bidders	• To confirm contents of the letters to provide details of scoring and meaningful feedback on the unsuccessful Bidders Bid in comparison with the successful Bidders Bid.

Section 6 – Evaluation Response Questionnaire

Bidders should note that the evaluation response questionnaire is located within the **eSourcing Portal.**

Guidance on how to register and use the eSourcing portal is available at

https://beisgroup.ukp.app.jaggaer.com/

PLEASE NOTE THE QUESTIONS ARE NOT NUMBERED SEQUENTIALLY

Section 7 – General Information

What makes a good bid – some simple do's ☺

DO:

7.1 Do comply with Procurement document instructions. Failure to do so may lead to disqualification.

7.2 Do provide the Bid on time, and in the required format. Remember that the date / time given for a response is the last date that it can be accepted; we are legally bound to disqualify late submissions. Responses received after the date indicated in the Section 3 of the ITQ shall not be considered by the Contracting Authority, unless the Bidder can justify that the reason for the delay is solely attributable to the Contracting Authority

7.3 Do ensure you have read all the training materials to utilise the eSourcing portal prior to responding to this Bid. If you send your Bid by email or post it will be rejected.

7.4 Do use Microsoft Word, PowerPoint Excel 97-03 or compatible formats, or PDF unless agreed in writing by the Buyer. If you use another file format without our written permission, we may reject your Bid.

7.5 Do ensure you utilise the eSourcing messaging system to raise any clarifications to our ITQ. You should note that we will release the answer to the question to all Bidders and where we suspect the question contains confidential information, we may modify the content of the question to protect the anonymity of the Bidder or their proposed solution

7.6 Do answer the question, it is not enough simply to cross-reference to a 'policy', web page or another part of your Bid, the evaluation team have limited time to assess bids and if they can't find the answer, they can't score it.

7.7 Do consider who the Contracting Authority is and what they want – a generic answer does not necessarily meet every Contracting Authority's needs.

7.8 Do reference your documents correctly, specifically where supporting documentation is requested e.g. referencing the question/s they apply to.

7.9 Do provide clear, concise and ideally generic contact details; telephone numbers, e-mails.

7.10 Do complete all questions in the evaluation response questionnaire or we may reject your Bid.

7.11 Do ensure that the Response and any documents accompanying it are in the English Language, the Contracting Authority reserve the right to disqualify any full or part responses that are not in English.

7.12 Do check and recheck your Bid before dispatch.

What makes a good bid – some simple do not's ☹

DO NOT

7.13 Do not cut and paste from a previous document and forget to change the previous details such as the previous buyer's name.

7.14 Do not attach 'glossy' brochures that have not been requested, they will not be read unless we have asked for them. Only send what has been requested and only send supplementary information if we have offered the opportunity so to do.

7.15 Do not share the Procurement documents, they are confidential and should not be shared with anyone without the Buyers written permission.

7.16 Do not seek to influence the procurement process by requesting meetings or contacting UKSBS or the Contracting Authority to discuss your Bid. If your Bid requires clarification the Buyer will contact you. All information secured outside of formal Buyer communications shall have no Legal standing or worth and should not be relied upon.

7.17 Do not contact any UKSBS staff or the Contracting Authority staff without the Buyers written permission or we may reject your Bid.

7.18 Do not collude to fix or adjust the price or withdraw your Bid with another Party as we will reject your Bid.

7.19 Do not offer UKSBS or the Contracting Authority staff any inducement or we will reject your Bid.

7.20 Do not seek changes to the Bid after responses have been submitted and the deadline for Bids to be submitted has passed.

7.21 Do not cross reference answers to external websites or other parts of your Bid, the cross references and website links will not be considered.

7.22 Do not exceed page limits, the additional pages will not be considered.

7.23 Do not make your Bid conditional on acceptance of your own Terms of Contract, as your Bid will be rejected.

7.24 Do not unless explicitly requested by the Contracting Authority either in the procurement documents or via a formal clarification from the Contracting Authority send your response by any way other than via the eSourcing portal. Responses received by any other method than requested will not be considered for the opportunity.

Some additional guidance notes

7.25 All enquiries with respect to access to the eSourcing portal and problems with functionality within the portal must be submitted to eSourcing Helpdesk

Phone 08000 698 632
Email customersupport@jaggaer.com

Please note; the eSourcing Portal is a free self-registration portal. Bidders can complete the online registration at the following link:
https://beisgroup.ukp.app.jaggaer.com/

7.26 Bidders will be specifically advised where attachments are permissible to support a question response within the eSourcing portal. Where they are not permissible any attachments submitted will not be considered as part of the evaluation process.

7.27 Question numbering is not sequential and all questions which require submission are included in the Section 6 Evaluation Response Questionnaire.

7.28 Any Contract offered may not guarantee any volume of work or any exclusivity of supply.

7.29 We do not guarantee to award any Contract as a result of this procurement

7.30 All documents issued or received in relation to this procurement shall be the property of the Contracting Authority / UKSBS.

7.31 We can amend any part of the procurement documents at any time prior to the latest date / time Bids shall be submitted through the eSourcing Portal.

7.32 If you are a Consortium you must provide details of the Consortiums structure.

7.33 Bidders will be expected to comply with the Freedom of Information Act 2000, or your Bid will be rejected.

7.34 Bidders should note the Government's transparency agenda requires your Bid and any Contract entered into to be published on a designated, publicly searchable web site. By submitting a response to this ITQ Bidders are agreeing that their Bid and Contract may be made public

7.35 Your bid will be valid for 90 days or your Bid will be rejected.

7.36 Bidders may only amend the contract terms during the clarification period only, only if you can demonstrate there is a legal or statutory reason why you cannot accept them. If you request changes to the Contract terms without such grounds and the Contracting Authority fail to accept your legal or statutory reason is reasonably justified, we may reject your Bid.

7.37 We will let you know the outcome of your Bid evaluation and where requested will provide a written debrief of the relative strengths and weaknesses of your Bid.

7.38 If you fail mandatory pass / fail criteria we will reject your Bid.

7.39 Bidders are required to use IE8, IE9, Chrome or Firefox in order to access the functionality of the eSourcing Portal.

7.40 Bidders should note that if they are successful with their proposal the Contracting Authority reserves the right to ask additional compliancy checks prior to the award of any Contract. In the event of a Bidder failing to meet one of the compliancy checks the Contracting Authority may decline to proceed with the award of the Contract to the successful Bidder.

7.41 All timescales are set using a 24-hour clock and are based on British Summer Time or Greenwich Mean Time, depending on which applies at the point when Date and Time Bids shall be submitted through the eSourcing Portal.

7.42 All Central Government Departments and their Executive Agencies and Non-Departmental Public Bodies are subject to control and reporting within Government. In particular, they report to the Cabinet Office and HM Treasury for all expenditure. Further, the Cabinet Office has a cross-Government role delivering overall Government policy on public procurement - including ensuring value for money and related aspects of good procurement practice.

For these purposes, the Contracting Authority may disclose within Government any of the Bidders documentation/information (including any that the Bidder considers to be confidential and/or commercially sensitive such as specific bid information) submitted by the Bidder to the Contracting Authority during this Procurement. The information will not be disclosed outside Government. Bidders taking part in this ITQ consent to these terms as part of the competition process.

7.43 The Government revised its Government Security Classifications (GSC) classification scheme on the 2nd April 2014 to replace the previous Government Protective Marking System (GPMS). A key aspect of this is the reduction in the number of security classifications used. All Bidders are encouraged to make themselves aware of the changes and identify any potential impacts in their Bid, as the protective marking and applicable protection of any material passed to, or generated by, you during the procurement process or pursuant to any Contract awarded to you as a result of this tender process will be subject to the new GSC. The link below to the Gov.uk website provides information on the new GSC:

https://www.gov.uk/government/publications/government-security-classifications

The Contracting Authority reserves the right to amend any security related term or condition of the draft contract accompanying this ITQ to reflect any changes introduced by the GSC. In particular where this ITQ is accompanied by any instructions on safeguarding classified information (e.g. a Security Aspects Letter) as a result of any changes stemming from the new GSC, whether in respect of the applicable protective marking scheme, specific protective markings given, the aspects to which any protective marking applies or otherwise. This may relate to the instructions on safeguarding classified information (e.g. a Security Aspects Letter) as they apply to the procurement as they apply to the procurement process and/or any contracts awarded to you as a result of the procurement process.

USEFUL INFORMATION LINKS

- Contracts Finder
- Equalities Act introduction
- Bribery Act introduction
- Freedom of information Act

8.0 Freedom of information

8.1 In accordance with the obligations and duties placed upon public authorities by the Freedom of Information Act 2000 (the 'FoIA') and the Environmental Information Regulations 2004 (the 'EIR') (each as amended from time to time), UKSBS or the Contracting Authority may be required to disclose information submitted by the Bidder to the to the Contracting Authority.

8.2 In respect of any information submitted by a Bidder that it considers to be commercially sensitive the Bidder should complete the Freedom of Information declaration question defined in the Question FOI1.2.

8.3 Where a Bidder identifies information as commercially sensitive, the Contracting Authority will endeavour to maintain confidentiality. Bidders should note, however, that, even where information is identified as commercially sensitive, the Contracting Authority may be required to disclose such information in accordance with the FoIA or the Environmental Information Regulations. In particular, the Contracting Authority is required to form an independent judgment concerning whether the information is exempt from disclosure under the FoIA or the EIR and whether the public interest favours disclosure or not. Accordingly, the Contracting Authority cannot guarantee that any information marked 'confidential' or "commercially sensitive" will not be disclosed.

8.4 Where a Bidder receives a request for information under the FoIA or the EIR during the procurement, this should be immediately passed on to UKSBS or the Contracting Authority and the Bidder should not attempt to answer the request without first consulting with the Contracting Authority.

8.5 Bidders are reminded that the Government's transparency agenda requires that sourcing documents, including ITQ templates such as this, are published on a designated, publicly searchable web site, and, that the same applies to other sourcing documents issued by UKSBS or the Contracting Authority, and any contract entered into by the Contracting Authority with its preferred supplier once the procurement is complete. By submitting a response to this ITQ Bidders are agreeing that their participation and contents of their Response may be made public.

9.0. Timescales

9.1 Section 3 of the ITQ sets out the proposed procurement timetable. The Contracting Authority reserves the right to extend the dates and will advise potential Bidders of any change to the dates.

10.0. The Contracting Authority's Contact Details

10.1 Unless stated otherwise in these Instructions or in writing from UKSBS or the Contracting Authority, all communications from Bidders (including their sub-contractors, consortium members, consultants, and advisers) during the period of this

procurement must be directed through the eSourcing tool to the designated UKSBS contact.

10.2 Bidders should be mindful that the designated Contact or other persons associated with this opportunity, should not under any circumstances be sent a copy of their Response outside of the eSourcing portal, unless the portal cannot receive your response due to an outage, should this happen then Contracting Authority will suitably formally instruct all bidders as to how to submit your Response. Failure to follow this requirement will result in disqualification of the Response.

Appendix A – Glossary of Terms

TERM	MEANING
"UKSBS"	means UK Shared Business Services Ltd herein after referred to as UKSBS.
"Bid", "Response", "Submitted Bid ", or "ITQ Response"	means the Bidders formal offer in response to this Invitation to Quote
"Bidder(s)"	means the organisations being invited to respond to this Invitation to Quote
"Central Purchasing Body"	means a duly constituted public sector organisation which procures supplies / services / works for and on behalf of Contracting Authorities
"Conditions of Bid"	means the terms and conditions set out in this ITQ relating to the submission of a Bid
"Contract"	means the agreement to be entered by the Contracting Authority and the Supplier following any award under the procurement
"Contracting Bodies"	means the Contracting Authority and any other contracting authorities described in the Contracts Finder Contract Notice
"Contracting Authority"	A public body regulated under the Public Procurement Regulations on whose behalf the procurement is being run
"Customer"	means the legal entity (or entities) for which any Contract agreed will be made accessable to.
"Due Diligence Information"	means the background and supporting documents and information provided by the Contracting Authority for the purpose of better informing the Bidders responses to this ITQ
"EIR"	mean the Environmental Information Regulations 2004 together with any guidance and / or codes of practice issued by the Information Commissioner or relevant Government department in relation to such regulations
"FoIA"	means the Freedom of Information Act 2000 and any subordinate legislation made under such Act from time to time together with any guidance and/or codes of practice issued by the Information Commissioner or relevant Government department in relation to such legislation
"Invitation to Quote" or "ITQ"	means this Invitation to Quote documentation and all related documents published by the Contracting Authority and made available to Bidders and includes the Due Diligence Information. **NOTE:** This document is often referred to as an Invitation to Tender within other organisations
"Mandatory"	Means a pass / fail criteria which must be met in order for a Bid to be considered, unless otherwise specified.
"Named Procurement person "	means the single point of contact for the Contracting Authority based in UKSBS that will be dealing with the procurement
"Order"	means an order for served by any Contracting Body on the Supplier
"Supplier(s)"	means the organisation(s) awarded the Contract
"Supplies / Services / Works"	means any supplies/services and supplies or works set out at within Section 4 Specification