

24th June

Dear Sir/Madam,

Invitation to Tender for the Monopile Driveability Guidance for Vibratory Pile Driving project for the Carbon Trust's OWA Programme

You are invited to submit a tender for the Monopile Driveability Guidance for Vibratory Pile Driving project which is part of the Offshore Wind Accelerator (OWA) programme. The key objective of this project is to better understand monopile driveability through vibratory pile driving for large monopiles and identify opportunities to reduce excessive conservatism.

Please be aware that dates referred to below may be subject to change where this is necessary in the interests of the project (such changes will be notified in advance).

Should your tender be successful an Award Letter, the Scope of Work, the OWA Conditions of Contract ("**Conditions**"), and any clarifications agreed in writing, will establish the Contract for the Monopile Driveability Guidance for Vibratory Pile Driving project (the "**Contract**") between you and the Carbon Trust. The Conditions accompany this ITT for your prior review. Please note that in the interests of transparency and fairness, these Conditions are non-negotiable, although we will provide clarifications to any queries you may have prior to submitting your tender, answers to which will be distributed to all bidders as set out below. Bids which fail to accept the Conditions in their full un-amended form (other than changes explicitly accepted and agreed by the Carbon Trust on the clarifications page) at the time of submission will be considered to be non-compliant and will be excluded from the procurement process.

Please e-mail clarification questions to elson.martins@carbontrust.com any time before 10th July. Answers to clarification questions will be posted on our website by 17th July. Answers can be found at: <https://www.carbontrust.com/about-us/tenders/>

For information about the OWA programme, please see the Carbon Trust's web site: www.carbontrust.com/offshorewind

Unless informed to the contrary, tenders and communications should be sent by e-mail to the following e-mail address: elson.martins@carbontrust.com

Please submit your tender by 3rd August 2020 at 16.00 UK time.

The timeline of this procurement process is as follows:

Deadline for clarification questions	10th July
Clarification Response Date	17th July
Submission of full tender	3rd August 2020 at 16.00 UK time
Bidder interviews	w/c 31st August
Project kick off meeting	w/c 28th September

If you have any questions about the timing, please let us know.

We look forward to receiving your tender.

Yours sincerely,

Elson Martins
For and on behalf of

THE CARBON TRUST

IMPORTANT INFORMATION FOR BIDDERS

Neither this document, nor any part of it nor any other information supplied in connection with it may, except with the prior written consent of the Carbon Trust, be published, reproduced, copied, distributed or disclosed to any person for any purpose other than consideration by the recipient of whether or not to submit a Tender.

Bidders should note that the Scope of Work described in this Invitation to Tender does not constitute an offer to contract with the Carbon Trust. It only represents a definition of specific requirements and an invitation to submit a tender addressing these requirements. Issuance of this invitation to tender and the subsequent receipt and evaluation of the tenders by the Carbon Trust does not commit the Carbon Trust to enter into a Contract with any bidder.

Bidders should also note that:

- depending on the progress and/or results of the project referred to in this Invitation to Tender and the views of the Carbon Trust and/or the OWA programme as to whether additional analysis or more in depth work in respect of any or all aspects relating to the project are desirable in order to achieve the objectives referred to in the Invitation to Tender, the Carbon Trust may request such additional analysis or work. Any additional analysis or work agreed between the parties shall form part of Scope of Work and the Services to be provided by the selected Contractor under the Contract;
- the Carbon Trust reserves the right not to accept the lowest priced tender or any tender whatsoever;
- the Carbon Trust reserves the right to accept more than one tender;
- unless a bidder makes a formal statement to the contrary, the Carbon Trust reserves the right to accept any part of a bidder's tender without accepting the remainder;
- formal notification that a tender has been successful will be communicated in writing by the Carbon Trust;
- the costs of tendering are the full responsibility of the bidder; and,
- the pricing set by bidders shall be valid for a minimum of 90 days.

The information contained here, in the Scope of Work and in any documents or information it refers to or incorporates (the "**Disclosed Information**") has been prepared to assist interested parties in deciding whether to make a bid. The Disclosed Information is not a recommendation by the Carbon Trust. It does not purport to be all inclusive or include all the information that a bidder may require.

Neither the Carbon Trust nor any of its directors, employees, agents or advisers makes any representation or warranty (express or implied) as to the accuracy, reasonableness or completeness of the **Disclosed Information**. All such persons or entities expressly disclaim any and all liability (other than in respect of fraudulent misrepresentation) based on or relating to the Disclosed Information or any subsequent communication. The bidder should conduct its own due diligence and seek its own professional, legal, financial and other advice as appropriate. The only information which will have any legal effect and/or upon which any person may rely will be such information (if any) as has been specifically and expressly represented and/or warranted in writing to the successful bidder in any written contract that may be entered into with the Carbon Trust.

Tenders and all supporting documentation must be written in English. This ITT, the Contract, its formation, interpretation and performance will be subject to and in accordance with the law of England and Wales.

The Carbon Trust Offshore Wind Accelerator

Invitation to Tender for the “Monopile Driveability Guidance for Vibratory Pile Driving” Project

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1. Introduction to the Offshore Wind Accelerator

- 1.1. The Offshore Wind Accelerator (“**OWA**”) is a collaborative R&D programme between The Carbon Trust, SSE Renewables Developments (UK) Limited, Ørsted Wind Power A/S, RWE Renewables International GmbH, ScottishPower Renewables (UK) Limited, Equinor ASA, Vattenfall Vindkraft A/S, EnBW Energie Baden-Württemberg AG, Shell Global Solutions International B.V. and innogy SE (the latter 9 collectively referred to in this document as “**OWA Partners**”) that aims to reduce the cost of offshore wind as well as provide insights regarding industry standard (and best practice) health and safety requirements.
- 1.2. The focus is on improving the economics of offshore wind farms in European waters through developing innovative technologies that can be deployed in planned and operational European projects.
- 1.3. The Offshore Wind Accelerator currently covers five research areas:
 - Offshore Foundations
 - Yield & Performance
 - Logistics & O&M
 - Electrical Systems
 - Cables
- 1.4. Contractors receive technical direction and data from OWA Partners through the Carbon Trust management team and through their respective Technical Working Group (“**TWG**”) (see Figure 1).
- 1.5. This project will fall under the Foundations research area.
- 1.6. Please note, the term “Contractor”, where used within this document, refers only to successful bidders.

2. Background and Objective of the Work

- 2.1. The OWA Foundations would like to investigate monopile driveability through vibratory pile driving for large monopiles.
- 2.2. More informed guidance to monopile driveability may help reduce excessive conservatism that results from current knowledge, regulations and assumptions about the process, particularly for large monopiles. This is particularly relevant as there is limited application of vibratory pile drivers in offshore wind so far and limited data available to validate driveability methods and assumptions or inform project decisions.
- 2.3. A review of the latest literature and evaluation of data from actual driving works shared by the industry will provide a much clearer understanding of the aspects that need to be addressed or can be improved re: vibratory pile driving for large offshore wind monopiles.
- 2.4. This project aims to better understand monopile driveability through vibratory pile driving for large monopiles and identify opportunities to reduce excessive conservatism. The result will include a guidance report with recommended practices or considerations for various scenarios, based on the latest literature evidence, new

research and the leverage of data from past experiences in this or other relevant industries (e.g. onshore construction, oil and gas).

- 2.5. The project should provide information about possible difficult conditions or limitations with vibratory pile driving and what alternative or mitigation options compliant with low noise requirements to choose.
- 2.6. Suggestions of additional work or alternative approaches to deliver the project objectives and scope are welcome.
- 2.7. The Contractor should seek to source all the data and information required independently from the OWA Foundations TWG. The approach planned should be clearly detailed in the proposal for review.
- 2.8. The Contractor is expected to ensure an impartial approach to the investigation and maintain reasonable flexibility to the delivery of the work.

3. Pre-Conditions

- 3.1. Bidders should take the following pre-condition into account when preparing and submitting their tenders. The Carbon Trust may reject any non-compliant tenders without progressing such tenders through the evaluation phase. If the Carbon Trust, in its absolute discretion, considers that the bidder's response to the following pre-condition is not satisfactory, the bidder's tender will be non-compliant.

Description	Information required from Bidders
Conflict of interests	<p>Bidders are required to state that they are free of any commercial interests, partnership arrangements or contracts underway or other matters which may present a conflict or potential conflict of interest in respect of the provision of these services.</p> <p>If a bidder thinks that they may have any conflict or potential conflict of interest, the bidder should describe the details of this conflict and provide details of whether and how it would propose to manage such a conflict in a satisfactory and robust manner.</p> <p>The Carbon Trust reserves the right to require the provision of further information in relation to the bidder's response to this pre-condition.</p>
Conditions of Contract and Scope of Work	<p>The OWA Conditions of Contract and draft Scope of Work for this project are attached. The Contract will be constituted by the Award Letter, the OWA Conditions of Contract and the Scope of Work (including any agreed clarifications to it).</p> <p>Failure to accept these documents in their un-amended form or requesting amendments to them means that a bidder's tender is a non-compliant tender and it would therefore be at the discretion of the Carbon Trust to accept such a tender. Submission of a tender shall constitute unqualified acceptance of the OWA Conditions of Contract.</p> <p>Bidders are required to submit a signed Form of Tender when submitting their tenders. The Form of Tender forms part of</p>

	<p>this Invitation to Tender. The failure by a bidder to submit a signed Form of Tender when submitting its tender shall mean that such tender is a non-compliant tender. Non-compliant tenders may be rejected without further consideration.</p> <p>If any bidder wishes to request an amendment to any term or condition, such amendment must be clearly stated and the exact wording which the bidder is requesting must be set out. No material changes will be considered.</p>
Further Conditions	<p>All documentation and correspondences must be in English with costs given in GBP (£). Staff employment rates must be quoted as hourly rates in GBP (£). All additional expenses must be included under Work Package B: Costs and Expenses.</p> <p>Bidders are requested to input the man hours involved in the project for each work package in table 1, section 6.3. Any additional information (e.g. CVs or References) that Bidders wish to provide must be included in the main bid document (preferably in PDF) as an appendix.</p>

4. Scope of Work

- 4.1. The Contract will be constituted by the Award Letter, the OWA Conditions of Contract and the Scope of Work (including any agreed clarifications to it). This final Scope of Work document will reflect any updates, changes or improvements to the technical scope and Work Packages as suggested by the Contractor in its proposal.
- 4.2. Failure to accept these documents in their un-amended form or requesting amendments to them means that a bidder's tender is a non-compliant tender and it would therefore be at the discretion of the Carbon Trust to accept such a tender. Submission of a tender shall constitute unqualified acceptance of the OWA Conditions of Contract.
- 4.3. If any bidder wishes to request an amendment to any term or condition, such amendment must be clearly stated and the exact wording which the bidder is requesting must be set out. No material changes will be considered.
- 4.4. The following section provides a summary of the key points relating to the technical content of this project and the proposed scope.

Contractor Specification

- 4.5. The Carbon Trust appreciates that due to the breadth of skills and experience required for this project a consortium may be required to successfully meet the objectives of the project. It is envisaged that it will take a small team of mixed seniority ~ 9-12 months to complete. Contractors should use this scope to create a detailed project plan and Gantt chart outlining how they will deliver this project on budget and within the allocated time. This will be agreed by the Technical Working Group & Carbon Trust before work commences. It is expected that simplifying assumptions will be required

to complete this work in the given timeframe; all assumptions will need to be clearly stated and approved by the TWG.

Detailed Scope

4.6. The following Work Packages are the initial ideas on the key activities that the Contractor is expected to undertake during this contract. Contractors are encouraged to offer a different or expanded approach that fulfils the high-level objectives and deliverables. If a different approach is suggested, the Contractor is expected to explain / justify any intended deviation from the advertised work packages.

4.7. It is expected that the Contractor will report on interim deliverables (if applicable) to the Technical Working Group and that the final report will contain documentation of all deliverables.

Work Packages

WORK PACKAGE	Description of work
<p>WP1. Literature review</p>	<p>The Contractor will perform a comprehensive review and critique of the literature evidence, with particular focus on:</p> <ul style="list-style-type: none"> - <u>Driveability modelling</u> – the typical methods and assumptions used in offshore wind for a number of different scenarios (e.g. site conditions, geometries of the pile, vibratory pile driving technology) - <u>Driveability considerations</u> – particularly critical ones such as pile insertion and extraction, pile stress and fatigue damage, soil disturbance and resistance, noise levels, pile refusal, etc. In-situ behaviour after installation should also be considered but it is not the main focus of the project - <u>Driving process</u> – requirements, restrictions and typical and/or recommended practices for driving works (e.g. upending, positioning, driving, measurement) and relevant preparation works at site - <u>Driveability examples</u> – case studies, field research work and lessons learned from offshore wind or other relevant industries - <u>Driveability data</u> – from actual driving works relevant to this project, if available and in addition to the data brought into the project by the Contractor <p>The aim will be to summarise the most up-to-date knowledge, assumptions and practices for vibratory driving of large monopiles, identify current unknowns and potential areas to address or improve.</p>
<p>WP1 deliverables:</p> <ul style="list-style-type: none"> - D01: Detailed report 	
<p>WP2. Data review and comparison</p>	<p>The Contractor will review data from past experiences in the industry, with particular focus on actual performance vs predicted performance via the typical methods. Factors to assess (if data permits) include but are not limited to:</p>

	<ul style="list-style-type: none"> - Contact force - Driving energy and velocity - Vibration rate/frequency - Pile stress and fatigue damage - Soil conditions - Soil disturbance and resistance - Noise levels <p>The Contractor is expected to:</p> <ul style="list-style-type: none"> - Have relevant actual performance data before the project start – <u>this needs to be confirmed in the proposal</u>. This data may be complemented by relevant data found in WP1 - Model monopile driveability with all or a selection of methods to be agreed with the F-TWG to perform this performance review. <p>The aim is to evaluate the methods in terms of level of accuracy of predictions, potential excessive conservatism and suitability to different scenarios. The work must build on WP1 and clearly describe and justify the level of confidence around the knowns and unknowns re: monopile driveability, and the priority areas to focus for further investigation and clarification.</p>
<p>WP2 deliverables:</p> <ul style="list-style-type: none"> - D02: Detailed report 	
<p>WP3. Further investigation of findings and unknowns</p>	<p>The Contractor will explore some of the focus areas for further investigation and clarification identified in WP2. These will be agreed with the F-TWG near or at the end of WP2. These investigations could aim any of the following:</p> <ul style="list-style-type: none"> - Establishing a method to validate and update driveability models - Propose and validate a new driveability model - Clarify the degree of transferability of driveability assumptions and results to different scenarios - Overcoming any critical limitations identified leading to pile refusal and/or considering potential mitigation actions <p>Contractors are welcomed to put forward other possibilities in addition to these.</p> <p>The aim is to build up on the insights from WPs 1-2 and address as part of this project all or some of the priority areas of focus for further understanding of monopile driveability.</p>

WP3 deliverables: - D03: Detailed report	
WP4. Conclusions and guidance report	<p>The Contractor will summarise the main conclusions and final recommendations for further research work. In addition, the Contractor will develop a dedicated Guidance Report re: monopile driveability through vibratory pile driving.</p> <p>This is not meant to be public – it will act as an effective framework and decision support tool for designers, engineers and offshore professionals. It will take into account different scenarios and include recommended practices, notes and answers to typical queries about:</p> <ul style="list-style-type: none"> - Driveability modelling - Driveability considerations – particularly critical ones such as pile stress and fatigue damage, soil disturbance and resistance, noise levels, pile refusal, etc. In-situ behaviour after installation should also be considered but it is not the main focus of the project - Driving process - Possible alternatives or mitigation actions to difficult conditions or limitations
WP4 deliverables: - D04: Guidance Report	
WPA. Project Management	<p>The contractor should stipulate how they will manage the project efficiently and effectively. This should include specific costs for project management time, to include update calls with the Carbon Trust Project Manager and/or Technical Working Group as required.</p> <p>This should also include production of a one page executive summary for the whole project, for internal dissemination. This should include a short summary of areas for future research. Carbon Trust will provide the template for this. The budget should also accommodate production of a final presentation and time dedicated to presenting this in the form of a short webinar to invitees from the developers of the OWA.</p> <p>Finally, if appropriate, resource should also be allocated to provide inputs into the 'OWA Cost Model'. The contractor is not expected to produce a cost model of its own, but rather provide guidance on the effect of the research on inputs to the 'OWA Cost Model'.</p>

WPA deliverables:

- **D05: Monthly flash reports**
- **D06: Project executive summary**
- **D07: Delivery of webinar**
- **D08: Inputs to OWA Cost Model**

WPB. Expenses

The contractor should detail the capped amount of expenses it expects to incur throughout the project. Expenses will be paid as incurred and any unused balance will not be paid.

5. Intellectual Property and Knowledge

- 5.1. All rights in and relating to pre-existing intellectual property and knowhow contributed by the Contractor, third parties or OWA Partners shall remain the exclusive property of the contributing party.
- 5.2. In the event that bidders plan to use or rely on pre-existing intellectual property knowhow for the project, the Carbon Trust's expectation is that a premium will not be charged for leveraging this IP or knowhow.
- 5.3. Results of this project will be owned by the Carbon Trust for the benefit of the OWA Partners and OWA programme.
- 5.4. Full details of the intellectual property requirements and conditions can be found in the attached draft Contractor's Conditions.

6. Bid Pricing

- 6.1. To provide bidders with greater clarity on the nature, level and type of work involved in the various Work Packages (WPs), the expected total budget is between £90k and £100k. The Contract Price submitted with the tender must be derived from the cost breakdown table requested in Table 1, and must include the costs for optional work packages as well as all expenses. Suggestions (within budget) are welcomed. If the Contract Price exceeds the budget (including where the bid includes alternative suggestions), to avoid receiving a lower score for this criterion, please provide a clear and justified reason why the Contract Price exceeds the expected budget.
- 6.2. For the avoidance of doubt, 'suggestions' referred to in preceding paragraph means 'additional areas of work or alternative or substitute activities to those described in Annex A, that would further support the objective of the work' (see description of criterion 1).
- 6.3. The Contractor is required to fill in the following staff rate and project cost breakdown table as part of their tender. The project is expected to take approximately 9-12 months.

Table 1: Staff rates and project cost breakdown

Staff member	Time spent per work package (WP) in hours						Total time in hours	Staff rate (£)	Staff cost to project (£)
	WP 1	WP2	WP3	WP4	WP5	WPA: Project mgmt			
Project Sponsor	hr	hr	hr	hr	hr	hr	hr	£	£
Lead Consultant	hr	hr	hr	hr	hr	hr	hr	£	£
Analyst	hr	hr	hr	hr	hr	hr	hr	£	£
Etc.	hr	hr	hr	hr	hr	hr	hr	£	£
Total Time In hours	hr	hr	hr	hr	hr	hr		WPB: Expenses	£
Total cost of each WP	£	£	£	£	£	£		Total Cost	£

As detailed in section 4, the work packages are as follows:

- WP1: Literature review
- WP2: Data review and comparison
- WP3: Further investigation of findings and unknowns
- WP4: Conclusions and Guidance Report
- WPA: Project management
- WPB: Expenses

- 6.4. All rates quoted in Table 1 must be in GBP (£) and represent the **Hourly Rate** for employment of staff members.
- 6.5. Bidders should be aware that the Carbon Trust and TWG usually require 2-3 weeks for the review and feedback procedure after delivery of each WP with at least one round of review comments to be accommodated. This should be taken into account when the table is completed.

7. Tender Evaluation Criteria

Bidders should take the following evaluation criteria into account when preparing and submitting their tenders. Tender documents should be no more than 20 pages excluding CVs.

Criterion 1: Approach to Work (Weighting: 35%)

Bidders are required to provide the evidence of the approach to work within the main body of the tender (not in a separate document).

<i>Description</i>	<i>Information required from bidders</i>
Proposed Approach	<p>Bidders are required to provide a detailed description on how they plan to develop each work package described in Section 4.</p> <p>The description should include an initial overview on the approach followed by a description on how each Work Package and task will be delivered.</p> <p>Also, bidders need to justify how their proposed approach meets the project objectives.</p>
Suggestions	<p>Suggestions of additional areas of work to those described in Section 4 of the ITT that the bidder proposes looking at as part of this study in order to achieve the required objectives, maintain an industry focus and provide valuable insights into the potential for reducing costs and risks for Round 3 offshore wind projects.</p> <p>Bidders are required to differentiate which are their additional areas of work from the proposed approach. Besides, bidders should specify if the proposed additions affect to the total price and quote them separately.</p>
Project management	<p>Bidders are required to describe how they will manage the project utilising appropriate resources and describe how they will work with the various stakeholders, such as the OWA TWG, to get information and manage potentially conflicting relationships. It is not expected that the Contractor will have to run any workshops with stakeholders.</p>

Criterion 2: Experience (Weighting: 35%)

Bidders are required to provide the experience evidence as an appendix, at the end of the bid document (not in a separate document)

<i>Description (Projects of a similar nature)</i>	<i>Information required from Bidders</i>
Expertise and experience with vibratory pile driving, geotechnical engineering and driveability modelling, particularly in offshore wind.	<p>Bidders should elaborate on experience of the criteria described. Explain how these past experiences are relevant for this tender.</p> <p>In addition, the bidder should provide at least two examples (with reference to specific roles, responsibilities and activities the bidder undertook) of previous work which illustrates the bidder's skills, capabilities, and experience in all of these areas (bidders may wish to make reference to submitted examples of previous work for other clients)</p> <p>Bidders are advised that experience is considered a key important criterion and partnerships with other companies to support certain areas of experience are welcomed.</p> <p>All experience / case studies should be attached as an appendix to the proposal, but a summary of each case should be listed in the proposal main text.</p>

Criterion 3: Staff Skills (Weighting: 20%)

Bidders are required to provide the staff skills evidence as an appendix, at the end of the bid document (not in a separate document)

<i>Description</i>	<i>Information required from bidders</i>
CVs/Resumes	Detailed CVs/Resumes for any staff who will be involved with this Contract together with proposed project structure, intended position of staff in the project, and main responsibilities. CVs should include professional memberships of proposed staff working on this project.
Applicable skills	Bidders should elaborate on the most relevant skills of the selected staff that will be applicable in the project.
Prior experience form involved staff	Please include examples of similar work performed by the proposed staff members, explaining how is relevant to the work described in Section 4.

Expert engagement	A close working relationship with key stakeholders such as banks' engineers, LiDAR OEMs, offshore wind farm developers, wind turbine OEMs, as well as the OWA Technical Working Group are seen relevant to the success of this project. Please supply ideas of how these groups can be engaged and leveraged.
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Criteria 4: Price (Weighting: 10%)

In the event that tenderers plan to use or rely on pre-existing intellectual property or knowhow for the project (e.g. existing O&M modelling tools), the Carbon Trust's expectation is that a premium will not be charged for leveraging this intellectual property or knowhow.

Description	Information required from bidders
Day rates and man-h for all staff grades	Bidders are required to provide day rates for all staff grades and to input the man-h involved in each work package described in Section 4.
Fixed price for the project	<p>Project cost breakdown by work package, time and rate of person completing the work as specified in Section 6.3.</p> <p>Bidders are required to specify expected expenses apart from the estimated budget for each work package.</p> <p>Carbon Trust will reimburse reasonable expenses at cost and receipts may be requested. Pre-approval will be required for travel costs over £150 per return journey and combined hotels & subsistence cost exceeding £200 per day.</p> <p>Bidders will be required to confirm or comment on their ability to carry out the activities detailed in the Scope of Work within the initial term of the Contract and provide an outline plan of work</p>