**Expression of Interest**

# **Project Details:**

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| **Project Name** | PS22373 - Consultancy project on operability of the GB electricity system for REMA programme - PIN |
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| **Response required by** | Midday Friday 11th November 2022 |
| **Response required to** | Nicola.turner@uksbs.co.uk  |

# **Description of the Project**

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| **Introduction** The project will be undertaken for BEIS to provide evidence for its REMA (Review of Electricity Market Arrangements) programme. REMA aims to reform electricity market design in Great Britain to facilitate the full decarbonisation of the electricity system by 2035, subject to security of supply, in a way that is most cost effective for consumers. The Government launched a 12 week consultation in July 2022 on REMA’s case for change and a range of reform options[[1]](#footnote-1). At this stage we are keeping most options on the table, from the continued evolution of existing policies to more fundamental change, with the intention of narrowing the field through stakeholder consultation and determining what reform is needed in 2023. Maintaining operability of the electricity system is one of the five broad challenges identified in REMA’s case for change to delivering an affordable, secure, and reliable system, alongside increasing the pace and breadth of investment in low carbon generation capacity, increasing system flexibility, providing efficient locational signals to minimise system cost and managing price volatility. We define operability as the action taken by system operators to ensure the safe and efficient movement of power across the network, which is undertaken through the provision of ancillary services which include:* frequency response;
* reserve;
* stability;
* reactive power (voltage management);
* restoration; and
* thermal constraint management

The contractor will consider the extent to which REMA’s case for change identifies the operability challenges facing the system operator(s) in the context of a zero carbon electricity system by 2035, building on BEIS’s existing evidence base. It will carry out a mapping and appraisal of the policy and regulatory options for meeting these challenges. The core of the project will be advice on addressing the challenges facing operability, focusing on a number of specific policy areas as specified by BEIS.  The contractor will take account of our systems-wide approach to electricity market reform in which we will be considering the linkages between each of the areas of challenge to the electricity system that we have identified. The contractor’s findings will contribute to REMA’s policy development and recommendations for reform of electricity market design with regard to system operability and more widely where appropriate. **Policy context** As most ancillary services are currently provided by fossil fuelled thermal generators, meeting our 2035 commitment for decarbonising the electricity system implies a large proportion of this being rapidly replaced with low carbon generation. While it is theoretically possible at times to provide system operability from low carbon sources, sufficient incentives and signals will be needed for market participants to make this transition and ensure this is possible for all or the majority of the time. We also expect that the need for ancillary services is likely to grow in response to a greater proportion of variable renewables on the system and to changing patterns of demand. The move towards more distribution-level generation and demand (including electric vehicle charging and electric heating) will present different operational challenges.  We have consulted upon five options for reforming operability and will consider others where there is sufficient evidence to support them. Options currently being considered by us are: * continuing with existing policies for reforming operability;
* incremental modifications to existing arrangements. These include requirements for National Grid ESO to procure lower carbon ancillary services and identify the optimum balance between long-term contracts and close to real-time markets for procurement of these services, as well as alignment of Codd, Capacity Market and ancillary service contracts and a matrix approach to ancillary service provision;
* developing local ancillary services markets alongside national markets and giving a greater role to DNOs in maintaining operability;
* modifying the CfD and Capacity Market to incentivise the provision of low carbon ancillary services; and
* co-optimisation of ancillary services procurement with wholesale dispatch.

**Overall project aims**The project aims to inform BEIS’s consideration of the extent that existing policies can be relied upon to ensure that the provision of operability services for the GB electricity system is consistent with our objective for a decarbonised electricity system by 2035, subject to security of supply, which is reliable and cost effective. It will consider how the challenges posed to future operability can be most effectively addressed by examining potential areas of reform as identified by BEIS and informed by the contractor’s assessment of operability issues. A key outcome will be to determine how system operators can make the transition from fossil fuel-based ancillary services to those provided reliably by low carbon energy sources, cost effectively.  **Specific questions****1. To what extent does REMA’s case for change identify the operability challenges facing the system operator(s) in the context of a zero-carbon electricity system by 2035?** Building on analysis previously undertaken by BEIS (which would be made available to the contractor), as well as other available existing research, the contractor will identify areas where the picture is unclear, including: the ability of low carbon ancillary services to meet operability needs during long periods of low wind/sun in advance of firm low carbon generation of sufficient scale being deployed, such as CCUS and new nuclear; the extent to which the need for inertia will rise and how far it can be met from non-thermal sources; and other potential challenges identified by the contractor. This will include indicating periods when challenges are likely to be most acute within this time range. The contractor will consider how the challenges facing operability will evolve over time with the deployment of technologies. Issues will be identified that are specific to an individual ancillary service as well as common to all or a sub-set. As BEIS already has an evidence base on the challenge posed by operability, we do not anticipate this question as representing the main focus of this project. **2. What policies, regulation and markets are in place (or are in the process of being developed) for addressing the challenges facing operability (as identified in question 1)?** A mapping exercise will be undertaken of policies and regulation which are aimed, partially or exclusively, at ensuring that operability meets the Government’s objectives for carbon reduction, system reliability and cost-effective operation. The scope would include, but is not limited to, policy and regulation by BEIS, National Grid ESO (including policies set out in its Markets Roadmap[[2]](#footnote-2) and 5-point plan for constraints management[[3]](#footnote-3)), DNOs and Ofgem. Initiatives by National Grid ESO and DNOs will be taken into account, including improved coordination between the two bodies, the identification of small-scale generation at a local level and digitalisation. The role of relevant markets would also be considered.**3. How far are the policies, regulation and markets (as identified in question 2) likely to enable zero carbon operability of the system by 2035 that is reliable and cost effective?** Strengths and weaknesses of existing policies will be identified as well as gaps. The contractor will also consider the extent that some carbon emitting generation (such as from natural gas) may need to be retained to ensure ancillary services are available when needed, and how this type of generation could be provided. **4. What is the scope for addressing thermal constraint management through an ancillary service, as an alternative or as a supplement to the wider structural reforms being considered in the wholesale markets chapter of the REMA consultation which could in theory help mitigate thermal constraints?** Both the demand and supply side will be considered, as well as the need to meet our objectives for decarbonisation, reliability and cost effectiveness. The contractor will consider what steps the National Grid ESO could take beyond its existing 5 point plan for managing constraints more effectively. While network investment is outside REMA’s scope, the contractor should note that the Government is of the view that major investment is needed in new network infrastructure to accommodate increased low-carbon generation and demand and should work on the basis that this will happen[[4]](#footnote-4). Network investment is not however a substitute for effective market approaches to reducing thermal constraints - we need both. **5. Under what conditions might a long-term contract be appropriate for the provision of ancillary services rather than closer to real-time markets?** Close to real-time markets have the advantage of giving greater scope for the participation of variable renewable generation and demand-side response by enabling improved predictability. However, this needs to be balanced against the greater investor certainty offered by longer-term contracts. The contractor will consider the way in which National Grid ESO and DNO/DSOs contract with assets and then operate them in real time. It will also consider how a requirement for National Grid ESO to determine the optimum balance between long-term contracts and close to real-time markets could be formulated.**6**. **What is the role of ancillary services in creating the investment and operational signals for low carbon technologies to meet system needs during extended periods of low wind/sun?** The contractor will consider how the need for any such system service is likely to evolve over time (as we deploy more renewables), how this maps against possibly deployment of the technologies that can help address the challenge, and whether an ancillary service in this space could help either (a) stimulate greater investment needed to meet the scale of the challenge (or are other REMA options sufficient / better?), and (b) ensure these technologies are deployed/ operated in a manner which means they are able to meet the challenge of extended low renewable output (e.g. sufficient charging of storage, access to fuel stores for H2).**7**. **What is the scope for reforms to support schemes like the CfD and CM to meet our objectives for operability?** The majority of options we consider in the mass low carbon power chapter of the REMA consultation for reforming the CfD could have the effect of incentivising investment in and provision of flexibility and ancillary services by exposing generators to wholesale market signals. This could encourage investment in deploying technologies which enable variable renewables to provide low carbon ancillary services, for example, inertia and voltage control through installation of suitable converters and invertors. The contractor will consider the extent to which these options would offer opportunities as well as any threats for operability. It would also consider other ways in which the CfD could be modified (i.e. in addition to the options outlined in the REMA consultation for increasing market exposure) including the use of multipliers which could be incorporated in CfDs for encouraging investment in operability. We are investigating in a separate research project the scope for modification of auction design in the Capacity Market to support our objectives for capacity adequacy, decarbonisation, flexibility and operability, but would like the contractor to consider other opportunities for reform of the Capacity Market (i.e. beyond reforming auction design) in order to help meet our operability needs.**8**. **What is the case for local ancillary services markets for the provision of services such as frequency response, reserve, and inertia etc. to both local and national systems?** The contractor will consider the benefits, risks and practicalities of local ancillary services markets, existing and future capabilities, and the potential for better co-ordination between the local and national level, taking into account any international examples.**9**. **How would co-optimisation of ancillary services with energy dispatch work under: a) a central dispatch model with a single national wholesale price, and (b) a Locational Marginal Price model, also with central dispatch?****Methodology**Bidders are asked to propose their approach to delivering this policy development project and will be assessed accordingly. We require, however, that within one month of the letting of the contract, the contractor provides its assessment of operability challenges with an evidenced based opinion of the extent to which existing policies, regulation and markets are likely to meet them (questions 1 to 3 in section 2 above), identifying strengths, weaknesses and gaps. At the same time that this assessment is presented, the contractor would propose how the focus and scope for the further stages of the project, as set out in questions 4 to 9 in section 2 above, would be influenced by its findings; BEIS would consider this and confirm the approach to be taken for the remainder of the project.The contractor will liaise with National Grid ESO to obtain evidence to inform their work; BEIS will agree an approach with the contractor for managing this relationship. The contractor would also liaise with distributed-level entities as appropriate.The project should provide a comprehensive overview and synthesis of existing evidence, where available, to address the specific questions posed. As well as this, bidders are expected to apply market expertise and economic and electricity markets theory in their provision of advice.**Outputs**Bidders should note that BEIS will own the intellectual property rights of any and all intermediate products, including final deliverables, and in particular including presentation slide packs, reports and data. The following outputs are required within the project, irrespective of whether the proposed methodologies are used or whether alternatives 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.Outputs from the project are expected to include:*Evidence sources*This should detail the evidence sources used in the review. Evidence sources should be provided to BEIS where possible.*Assessment of operability challenges and proposal for how the rest of the project is undertaken* The contractor would provide its assessment of the operability challenges facing the system operator(s) in the context of a zero-carbon electricity system by 2035 (within one month of the letting of the contract). This assessment would include a mapping of policies, regulation and markets that are in place (or are in the process of being developed) for addressing the challenges facing operability. Along with this this assessment, the contractor would propose how the focus and scope for the further stages of the project, as set out in questions 4 to 9 in section 2 above, would be influenced by its findings. BEIS would consider the contractor’s findings and confirm the areas of focus for the rest of the project.*Interim report*This should summarise key early findings to inform policy thinking. This report will not be published.*Final report*This should detail findings. This report must be written to a sufficiently high standard for publication and formatted according to BEIS publication guidance. Our experience shows that this may require 2-3 drafts and this should be taken into account when considering timelines and costs. The report will not be considered final until the BEIS project manager has signed it off. The report should include an executive summary (3 pages) which succinctly summarises the key findings from the review.*Final presentation to BEIS*The team should provide a presentation of the review’s findings for colleagues at BEIS**.****Timetable**Contractors must demonstrate that they can meet the following provisional timetable for the delivery of the project:

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| **Date** | **Details** |
| Early Jan 2023 | * Inception meeting
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| Late January 2023 | * Assessment of operability challenges
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| Early March 2023 | * Delivery of interim report
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| Mid March 2023 | * Delivery of draft final report
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| End March 2023End March 2023 | * Delivery of final report
* Presentation of findings to BEIS
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*This form is an expression of interest only; the full details of the project and the desired outcomes will be provided in the Further Competition.*

# **Procurement Plan / Dates and Budget**

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| **Project budget** – The budget available for these services is £100,000.00 excluding VAT**Indicative advertising timescales for a further competition** – It is intended that this procurement will go live the week commencing 14th November 2022. We are proposing a 3 week bid period for suppliers to provide responses.**Indicative Contract start date** – 3rd January 2022**Contract end date** – 31st March 2023 |

# **Validation Questions**

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| To ensure that this procurement maximises appropriate bidder responses we have the following questions that we would like to pose to interested suppliers:1. **Procurement Timescales** – Based on the timescales for the procurement and services, please can you advise if your organisation would have capacity to provide a bid response and undertake the services within the timescales detailed
2. **Project Budget and Scope** – Based on the budget provided, please can you advise if you feel this is appropriate based on the scope of services required.
3. **Bid Response Questions** – Questions 1 to 6 (under the heading ‘specific questions’ above) are our priority questions. Please can you advise if:
	1. You feel that you would be able to provide a bid proposal which provides advice on all 9 questions within the budget and time allowed for?

or* 1. If you do not feel that you would be able to provide advice on all 9 questions proposed, would the first 6 questions with the option to provide your choice of any of the additional remaining 3 (at your discretion), within the budget and time allowed, be a more feasible option?
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# **Response from Supplier:**

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| *Based on the project detail provided, is it your intention to respond to the Further Competition documentation once issued?* Yes / No*Response to validation Questions*1. **Procurement Timescales** –
2. **Project Budget and Scope** –
3. **Bid Response Questions** –

*Any further comments* |

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| Name: |  |
| Email: |  |
| Organisation: |  |

1. Review of Electricity Market Arrangements: www.gov.uk/government/consultations/review-of-electricity-market-arrangements [↑](#footnote-ref-1)
2. ESO Markets Roadmap (March 2022): www.nationalgrideso.com/research-publications/markets-roadmap [↑](#footnote-ref-2)
3. www.nationalgrideso.com/news/our-5-point-plan-manage-constraints-system [↑](#footnote-ref-3)
4. The Government’s position on network investment is set out in the Electricity Networks Strategic Framework: www.gov.uk/government/publications/electricity-networks-strategic-framework [↑](#footnote-ref-4)