

Stability Pathfinder Phase 2 RFI FAQ

FAQ
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General

1. Will the ESO be running future tenders for Stability after phase 2 completes?

Yes, parallel to phase 2 tender, we will be defining our stability needs for the whole of the GB system. Our ambition is to run annual GB wide procurement exercises after phase 2 completion.

2. What plans are already in place in relation to the comment relating to future tenders moving closer to 'real time'? Is this likely to be the last auction for longer term contracts? Does ESO believe the future requirement can then effectively be met by existing assets?

We see the future of stability to be managed through a mixture of long-term contracts (e.g through stability pathfinder) and a close to real time market. Our pathfinders are 'learning by doing' approach, we will further improve and develop future process based on pathfinder learnings. The slide 13 in the RFI relates to our plans for these long-term contracts for GB. There is work ongoing with the aim of creating a short term stability market which will provide commercial opportunity for all stability products to participate. We are in the very initial stages in the thinking of stability market. When we are able to do so we will share more information on this.

3. Is the 132kV connection requirement going to be enduring for the future GB wide procurements or is it purely applicable to the Scottish Phase 2 tender?

Our position at this stage is to keep the 132 kV and above rule as lower voltage solutions are less effective to address our transmission network's stability needs. However, once we have defined our regional needs there could be a case to review this.

4. What is the interaction with this Pathfinder and the Constraints Management Pathfinder (CMP)?

There is no direct interaction between these two pathfinders. Stability pathfinder is looking to raise the overall stability characteristics of the system. CMP is looking to establish the thermal limit at which generators would go unstable and reduce the output rapidly such that its equivalent to pre-fault constraints management. Any questions related to constraints pathfinder can be sent to box.networkdevelopment.roadmap.com with CMP in the email subject.

5. Why have there been so many delays in getting this RFI out? How will NGENSO avoid further delays?

We have experienced some delays in the phase 2 process, compared to our Network Development Roadmap update, due to a few factors. We had a delay to the phase 1 procurement based on providers' feedback on timescales being very tight. We also wanted to make sure we took into consideration and incorporated any learnings from phase 1 ahead of launching phase 2. With the impact of COVID 19 we also needed to consider and review how we could run this tender with most of our teams working remotely. The RFI stage of the process was added in as a direct consequence of us wanting to ensure there were no negative impacts of COVID-19 on any party's ability to tender.

6. Will the EOI feasibility Assessment include an economic assessment? Or will that be delayed until the commercial tender process?

The economic assessment will be part of the commercial tender. The feasibility study is to assess the technical capability of proposed solutions.

Requirement

7. Can you clarify the calculation methodology for short-circuit current, e.g. IEC60909 as generator block, which definition in IEC60909 fits to the RFI "the fault current is defined as the minimum

RMS fault current seen between 5ms after a 3-phase symmetrical fault and the fault clearance (140 ms);"

We have stated a period that we propose to consider in our assessment for all proposed solutions. In light of this comment and other RFI feedback, we are reviewing this and will update to avoid any confusion.

8. Why has the SCL definition been changed from 5ms to 140ms?

Refer to the previous question.

9. Why has your MVA requirements changed so much since last summer?

Since the last publication we have reviewed our requirements. We have taken account of the solutions procured through Stability Pathfinder phase 1, some TO assets that are planned for other network needs drivers but will contribute to our stability needs. We have also reviewed the underlying studies to ensure we are procuring at an appropriate level.

10. Can you provide a technical description of what 'short circuit need' is? What causes it, what is needed to rectify it.

In our analysis of system stability, we considered several technical parameters that were traditionally provided by synchronous generators including short circuit current, synchronising torque, dynamic voltage support and regional inertia. With declining level of these we expect to see several operability challenges on the system including; converter instability, TOV, voltage instability, voltage dips and local frequency swings. Through our analysis we see that sufficient short circuit level enables us to address these operability challenges. We therefore decided to require a solution to contribute to all these operability challenges through meeting our technical specification, but we would value the SCL and inertia contribution in the assessment methodology. We also note that by considering the contribution the remote nodes we are also valuing synchronising torque.

11. Will the 90% availability need to be guaranteed? Is it a yearly evaluation?

As part of contract terms in EOI, we will share our thinking on the payment mechanism to ensure this level of availability.

12. Does the availability requirement have a correlation with wind or renewables penetration? If that's so, would it be fair for a wind farm to offer the service just when there is windy as it's when the service is more necessary? See Eirgrid in Ireland for their ancillary services programme (DS3) increases the payments using a scalar based on non-synchronous penetration at the time of enacting the service. Higher level of non-synchronous penetration, higher the revenue for a provider.

There is some correlation between wind output and the level of SCL need. However, there are times where there is a stability requirement, but we expect a low wind output. As we need solutions to contribute in all conditions, therefore we have set a 90% availability condition. Technologies that cannot guarantee this 90% availability may need to add additional equipment (e.g. storage) to deliver the required availability.

13. Can you please explain the fault current after 140 ms means and how it will be evaluated? Will this be a calculation with the transformer impedance and the saturated transient value instead of the sub transient?

We are considering the transient fault current contribution. We have tried to be precise in what we are requesting as different definition of SCL exist. We will further provide information at the feasibility stage for simulations. Refer to Q7.

14. Is there any value for Inertia requirements for each location?

There are no location specific inertia requirements being considered for this tender. However, solutions with inertia will contribute towards our national need for inertia and so will be valued with this in mind.

15. Will there be a definition of simultaneous injection of fault current and inertial response from VSM providers?

Yes, you will be expected to support a simultaneous voltage and frequency event.

16. Do you see the requirements, for any of the eight locations, being met from providers from outside that immediate area?

Yes, it is possible. Solution at any site (outside of the 8 locations) will contribute to the identified locations as per their effectiveness value. Our tender assessment will determine what is the best combination of solutions that meet our needs at the identified locations.

17. Which year between now and 2030 is your network model based on?

Our network models take a view of expected future network upgrades.

Tender eligibility

18. Can it be clarified on voltage connection levels as in Scotland many sites connect at 33kV with SGTs provided by the TOs - will this be considered a 132kV or above connection?

Solution must be 132kV or above, the reason for this requirement is that the effectiveness of solutions drop significantly with additional impedance (from transformers). We therefore set this limit to both set realistic expectation from providers and to simplify the assessment. We are defining 132 kV and above as the voltage of the point of connection or the point of common coupling. If you want to check specific connection, please get in touch with us.

19. Will you be expecting a minimum level of TRL for the solutions?

No, however providers will be expected to demonstrate at the feasibility stage that they can meet some aspects of the technical specification. If you are considered a technology with a low TRL we would encourage you to speak to us before EOI so we can ensure there are no undue barriers to entry.

20. Can you submit multiple technological solutions to the EOI?

Yes, you can submit multiple option into the tender for different technologies and locations. You should make clear if any of your solutions submitted are mutually exclusive with each other - e.g. if you two options of size for the same asset and would only build one.

21. Are services open for 33kV connected battery storage projects too?

See answer to Q18

22. Will wind turbines that normally generate at 0.69kV via a step-up transformer to 33 kV and then a subsequent transformer to 132 kV or 275 kV (or 400 kV) be considered as 'transmission connected'?

See answer to Q18

23. Battery storage sites who has secured TEC through BEGA however 33kV connected and among many other projects on 33kV side of SGT - Are these eligible to participate?

BELLA and BEGA are embedded connections in the distribution networks and not eligible to participate in this tender.

24. Could please elaborate more regarding the need of storage (due to removal of 0MW export condition) for wind/solar facilities willing to participate?

We are not requiring storage, but we have had some feedback that converter-based solutions may need some form of storage to provide some aspects of the specification (particularly inertia). It is up to each provider to consider how their designs meet our technical specification and availability.

25. Why was the 0MW export requirement removed and what additional technologies and capacity is expected to benefit from this move?

0 MW requirement was removed to widen tender participation. However, we are still looking for additional capability to what current and future BM outlook is expected to provide. By removing 0MW requirement and defining additionality we can consider solutions who are generating a level of MWs in the BM but have changed their running modes or control systems or installed new equipment to meet the additionality criteria.

26. What feedback will participants received from ESO upon submission of the EOI? How strict will the pass or fail decision be?

We will publish pass/fail criteria at the start of the EOI stage. We expect this to be a simple list. EOI participation is needed to progress further in this tender exercise.

Network owners related

27. Are network upgrades with "proceed" status in the NOA assumed to go ahead when you are calculating effectiveness?

Effectiveness is declared as a single number to simplify the assessment and to make the process simple and transparent for providers. Here we have used a mid-decade average view of the network. We accept that in reality the value will change within year as outage are taken and as new transmission assets are built/ changed, however we believe in this a simple and transparent process outweighs the need for complete accuracy.

28. Are there any limitations to the technology solutions that TOs can propose?

TOs can submit any solution to the tender consistent with their licence obligations, in the same manner as other parties.

29. Can TO's compete in the RFI?

TOs and commercial providers will be considered through two parallel processes through this pathfinder. Commercial participants will follow EOI submission whereas TOs will follow System Requirements Form (SRF) submission - Refer to RFI slide # 18. All stakeholders including TOs are invited to feedback to the RFI.

Commercial Assessment/ Cost Benefit Analysis

30. Given batteries and other converter technologies are welcome to participate, we would like clarification on how the short circuit level requirement is going to be technology neutral and not play in detriment of these technologies. At the moment, requirement look mostly suitable to synchronous technologies. This will then result in a very similar outcome to what NGEN had in Phase 1.

We are aware that Virtual Synchronous Machine/Grid Forming converter-based technologies potentially have a current limit that can reduce their SCL contribution. However, they can also potentially provide a greater contribution for remote faults where this current limit is not hit. We have received some feedback on this already and we are planning to account for this within the assessment methodology so that all plants performance is reflected in both how it contributes to local faults and to faults in the wider network. We

want to ensure that there are no barriers for Grid Forming Technologies to participate. Please give us feedback as part of the RFI so we can consider it ahead of the tender.

31. Can you repeat the point about updating the table for grid forming invertors please?

Refer to the previous answer.

32. How will you assess the short circuit contribution from a proposed supplier? Will it be the total contribution at all 8 of the identified nodes considering the effectiveness factors you have published or something else?

Each solution will contribute to needs at all 8 locations. We will use the effectiveness numbers in this calculation. These numbers and our approach could be updated based on the RFI feedback. The draft assessment methodology will be published at the EOI stage which will include how effectiveness numbers will be used.

33. If a project is holding TEC for a connection in the future, are you assuming it will go ahead from a stability requirement perspective and also (if it submits a tender) from an additionality perspective?

We will be using the Future Energy Scenarios to assess what is expected to be available in the BM. Solutions that would be expected to be in the BM and expected to contribute to system stability would not qualify as they would not be considered additional. If a new asset is being built purely for stability pathfinder or an existing asset is being modified to provide additional to what it provides/is expected to provide in the BM, we would consider that to be additional. Anything connected at 0MW will be automatically additional. We are currently in the process of writing some rules to define what is and is not allowed. Refer to Q25.

34. Please can you clarify an earlier remark: Confirm that if you are holding or have accepted a connection offer for your project but the project is not yet built or connected that you will be assessed as providing 'New' contribution to SCL?

Refer to the previous answer.

35. Will there be a chance to comment on the methodology before it is finalised?

Yes, a draft methodology will be published at the EOI stage and we will be asking for comment before it is finalised.

36. You mention that number of years provided in the tender will form part of the economic assessment, but discourage applying for grid connections. How will length of service be weighted? as surely this gives solutions already provided an unfair advantage?

We are reviewing this based on the feedback so far. We understand that some parties may be applying for connections, but it is a risk for those providers to consider as the tender outcome may not be in their favour. For parties without connections, we are proposing to coordinate a connections review with the TOs and provide information to the provider to consider in their commercial tender submission. We are trying to strike a balance between someone paying for a full connections cost ahead of the tender vs a feasibility study cost which would inform their commercial tender submission.

37. How will you value earlier delivery when perhaps the need case is less? i.e. being ready in 2021 but SCL level requirement then much less than 2030

We are reviewing this based on the feedback. We are not looking to change our latest start date of 2024 and end date of 2030.

38. Is the assessment criteria for phase 2 aligned with Net Zero strategy? How different is it from the one adopted in phase 1?

We have a license obligation to ensure safe, reliable and economic operation of the electricity system. Based on this obligation we cannot discriminate based on technology and therefore not able to directly consider CO2 emissions in selecting solutions. The procurement of cost effective stability services will allow us to operate the system with more renewable generation and limit system operation actions to intervene in the market. This aligns with our zero carbon operation 2025 ambition.

39. Is inertia part of the requirement or assessment for phase 2? How will inertia be assessed?

Inertia will be part of the assessment but will contribute to the national inertia need rather than a requirement specifically for this area. We want to recognise the additional value that solutions with inertia bring, but as there will be future tenders specifically for this need, we have not set a minimum requirement for this tender. Further details will be provided at the EOI stage. Refer to Q10 & Q14.

40. Are ESO missing a trick by not giving equal weighting to infeed and inertia in phase 2?

We intend to make the weighting between inertia and SCL reflect the actual value of the two parameters to the ESO based on our regional and national stability needs. We will provide details of this in our draft assessment methodology at the EOI stage. Refer to previous question.

41. From a previous question, so you are not looking for a service to provide the whole of the short circuit contribution required at a single node as the total is the contribution provided from all areas will compound to form the total service you need.

Refer to Q32.

42. Will you be releasing any further information on how dynamic voltage support will be valued?

In the tender assessment, we will only be valuing short circuit current and inertia. The stability solutions are required to meet the technical specification which asks for instantaneous reactive current injection and absorption. The static reactive range which is based on steady state reactive consumption can be declared in the contract. We are considering this in our contract payments but this will not form part of our tender assessment.

43. Will ESO take account of the benefits of multiple small projects which are not subject to common mode failure vs large projects subject to single point of failure/tripping?

We are planning to consider the additional cost associated with a provider not being available in our assessment methodology. We will publish details of this in the draft assessment methodology at the EOI stage.

44. Is electrical consumption of the proposed solution taken into account in the offer evaluation?

We will not consider the volume of electrical consumption of a solution as part of the economic assessment. As part of the EOI, we will provide further details on how the costs of any consumption would be treated.

45. How will you ensure a like for like comparison with the TO bids - for example they do not have to pay TNUOS charges and energy costs are socialised.

For TO solutions we will be looking at the total cost to consumers, which would mean including a calculation of socialised energy costs. We are looking to ensure consistency wherever possible, with the aim of accurately reflecting the cost to the consumer of options proposed by all parties.

46. The tender is looking specifically for short circuit level; however it is acknowledged that the contribution of solutions to national inertia will be valued and more information will be given at the EOI stage. Will contribution to voltage support also be considered?

See Q40 & Q42.

Connections

47. Will you consider planning consents as part of the feasibility of projects ?

We are not planning to consider planning consents as part of the feasibility study of projects. However, should a solution be successful, it will be listed as part of the Post Tender Milestones. The full list of PTMs will be shared in the EOI.

48. Will mod app fees be required to be paid by providers who need to modify their connection (for example if the MSA needs updating)?

If changes are required to the connection agreement to be able to deliver the project, then the regular process to amend the agreement will need to be followed including fees.

49. Will participants be required to have legally-binding land rights when bidding?

This will not be a requirement as part of participating in the tender, but should a solution be successful, it will be listed as part of the Post Tender Milestones. The full list of PTMs will be shared in the EOI

50. Are there any pre-requisite tender requirements around planning consent or necessary land rights?

Refer to the previous question.

51. How will you manage the fact that connection applications are likely to be submitted by developers very soon in aid of securing their connection?

At this stage, we do not require a connection offer as a pre-requisite for entering the tender. We are working with the TOs to streamline any connection queries and tender interactions.

52. Sorry, my question re phrased is developers will apply NOW with a view to secure, if this is done will it freeze out other applications and steal capacity

We understand that developers will apply now for connections, land rights and others. We cannot stop that from happening and we do not want to introduce provisions that have an inappropriate impact on prospective Users rights and obligations. However, we do not require connections as a prerequisite for the tender.

53. It may not be a pre requisite of the tender, but developers will press ahead to secure grid and land rights, how will NG manage this to stop developers locking up land/grid well ahead of the tender

We are not able to stop participants to do this. We are trying to ensure that participants are not disadvantaged in the tender assessment due to not having a connection offer or land rights.

54. What confidence does the ESO have that the Scottish TOs can deliver new connections in a timely manner?

We work with the TOs in Scotland to ensure that connections can be developed and delivered as efficiently as possible. Connections will be delivered in line with the provisions of our respective licences, the CUSC and individual Bilateral Connection Agreements

Connections feasibility study/connections review

55. Will you provide the assumed cost of connection for each connection type and level during EOI stage?

This will form part of the connections review with TOs with one of the approaches mentioned in the RFI slides# 21-22. This will be post EOI.

56. Does ESO intend to fund feasibility studies?

There are two feasibility studies involved in this tender process: 1) Feasibility study to be undertaken by providers to demonstrate meeting key technical specification. 2) Connections review/feasibility which the ESO is likely to coordinate with the TOs to obtain potential connection dates and costs which can be shared with respective providers ahead of the commercial tender submission. The providers are expected to cover costs of the both. For (2) we will publish cost information at the EOI stage.

57. What costs are participants likely to be required to cover as part of the feasibility study, including the connection assessment?

All costs are expected to be covered by the participants. More information on fees related to the coordinated connection review will be provided at the EOI stage. Refer to the previous question.

Tender feasibility study

58. Are you expecting any models of performance to be provided at this stage or results from studies? the level of fault contribution for different residual voltages during a fault as per type b FRT faults may be helpful in the consideration of GFC effectiveness to more remote faults.

We are not expecting any models to be provided during the tender. At the technical feasibility stage, we will be looking for study results to demonstrate compliance against some aspects of the technical specification. We are considering an approach similar to the one you are describing to account for effectiveness due to remote faults. We will publish more details at the EOI stage.

59. What will be the process to determine the technical capability for the solutions to deliver the services required in this tender?

Desktop based feasibility study ahead of commercial tender submission.

60. Is synchronism and rotor angle stability considered in this phase? Will EMT models of non synchronous machines be released for the sake of transparency?

As the feasibility study stage, potential solutions will need to demonstrate performance of their solutions for a series of tests (including tests for voltage angle changes). As ESO we don't own models so we cannot share any user defined models.

61. What feedback is provided during the feasibility study. Is there scope to refine parameters during the study?

We will publish more information at the EOI stage on what can be changed after EOI. At the feasibility study stage, we expect that providers will have some feedback from the ESO before submitting their final feasibility study report.

62. Can ESO provide any further information at this stage on what we will be required to provide and demonstrate during the feasibility study? Will the feasibility scope and requirement be published prior to the EOI commencing? Is NG the sole determinant of whether the feasibility study is passed or not?

Yes, we will publish a feasibility study guidance note which will also include a list of simulations that we want to see. We will also publish a feasibility study template which providers are expected to populate and submit at the end of the feasibility study.

The main purpose of the feasibility study is to understand technical capability of any proposed solution with respect to the technical specification. We will use SCL and inertia values determined at the feasibility study will be used for commercial tender assessment.

The ESO will determine if a particular solution has passed the feasibility study and will be invited for commercial tender.

Contracts terms

63. With the statement of start dates from the conclusion of procurement up to 2024, and I think to an end date in 2030. does that mean that it is not a fixed period of 'x' years you are looking for but a service from the completion date of the project all the way out to 2030

We are reviewing this based on the feedback. We are not looking to change our latest start date of 2024 and end date of 2030.

64. Does this mean up to a 9 year contract is available?

The end date is end of March 2030. We are reviewing how we define the start date based on the feedback.

65. Will there be a similar 'double-clawback' as for Phase 1 for availability payment?

We are looking into the payment mechanism that we would apply in phase 2 where availability is less than 90%. There is not the same seasonality to service requirement as there was in phase 1 which we are considering. Further details will be shared in the EOI.

66. Will there be a similar 'double-clawback' as for Phase 1 of service fees for generators who would choose to generate when in merit? And how would this apply to generators that would typically only generate during periods of high inertia (i.e. when wind output is low and when this service is not required)?

See previous question. The availability requirement will apply to all providers and as mentioned in the webinar, certain technologies may need to make modifications to ensure the required level of availability.

67. How will you monitor performance? Will there need to be some kind of fault recording device?

We are considering how to monitor performance. We will publish more information later.

68. How will ESO avoid risk of winners having lowest prices but not delivering. Will ESO consider bid bonds?

We are considering mechanisms for assurance for service delivery, as either prior to the assessment process or as part of the Post Tender Milestones (PTM).

69. What securities are required for participation?

As above, we are considering possible mechanisms to ensure successful providers are able to deliver any contracts they may be awarded.

70. What will be stackability of this service? In particular for BM and energy markets for battery storage.

With the changes to technology types that can participate in this service, we are reviewing the list of services that can be stacked with Phase 2 contracts. We will share our thinking on these services in the EOI.

71. Will the SO keep to the 10 year contract length rather than moving to short term contracts as has happened with ancillary services?

The contract length for future contracts will be based on system requirements. At this stage, we cannot commit to the number of years future contracts will be awarded for.

72. Will the SO consider extending the length of the contract from 2030 for those who connect in 2024?

The end date is end of March 2030.

73. What is the reason for contract ending in 2030 and not being set time frames from contract commencement? Will NG still require this service post 2030?

The end date of 2030 has been set based on our current analysis of system requirements. From our response to Q1 and Q2, our ambition is to run future procurement events for Stability though the years we would look to contract for will be defined by our studies of system requirements.

74. What due diligence do NG expect to carry out post contract award?

Similar to phase 1, we will require all providers who are successful in the economic assessment to complete a comprehensive list of Post Tender Milestones to ensure services will be delivered as stated in the tender.

75. What penalties are proposed for under delivery and non-deliver?

From our response above to “**double-clawback**”, we are designing a payment mechanism to incentivise providers to deliver the high level of availability required for this service. In addition, we are considering a mechanism where an asset may have reduced technical capability than what was stated in the tender and how that should be penalised.

76. What is the reasoning for allowing contract commencement up to 2024?

To encourage wider participation in this service and to open it up to a range of technologies, we recognise that some solutions may require a lead time prior to delivery.

Codes related

77. Does NGESO believe there could be implications to level playing field for new converter technologies to participate in phase 2 given that GC0137 Grid Forming Working Group has been de-prioritise? I'd have expected both procurement process and working group, to progress in parallel to ensure converters with grid forming can participate competitively.

The Stability Pathfinder has been working closely with the GC137 group to ensure that our product aligns with their work. Specifically, the technical specification has been aligned with the GC137 specification. There are specific reasons for the delay of the GC137 work group but we do not feel that we need to delay the Stability Pathfinder. If there are any specific barrier for converter technologies in the pathfinder RFI, we would like to know about them in the RFI feedback.

78. Will you be waiting for the grid code modification GC0137 on the VSM service definition to be concluded before considering VSMS for this tender?

See the previous question.

79. Are sites going to need to become fully ECC and ECP compliant if they modify the grid connection? (ref 1.2.2 of tech spec)

Providers will be subject to grid code clauses which are in their Bilateral Connection Agreements (ECCs or CCs as relevant). In addition to this, the providers will be subject to demonstrating compliance against the stability commercial service agreement which could mean additional compliance to their Bilateral Connection Agreements as some aspects of the stability pathfinder technical specification refer to ECCs.