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Consultation on Future Worlds impact assessment

Dear Sir/Madam,

We welcome the opportunity to respond to the Open Networks Future Worlds impact assessment consultation.

National Grid Electricity System Operator (NGESO) became a legally separate entity on 1 April 2019. As the ESO we use our unique perspective and independent position to facilitate market based solutions which deliver value for consumers. The ESO strongly believes that in the changing energy landscape such solutions need to take a whole system view to maximise consumer value. To that end we support the work of the ENA Open Networks project and are pleased to be an active participant in its activities.

We are supportive of the overall need for this work and the helpful insights that have been developed through the exploration of the Future Worlds so far. We will be using its outputs, along with its stakeholder feedback, to inform our view of whole electricity system thinking and our business plans for RIIO-2. From an Open Networks perspective, we support the need for this consultation and the importance of stakeholder views to inform both Baringa's work and also the next steps for the Open Networks project in this area. Whilst further work on the Future Worlds may be of merit, the benefit needs to be clearly identified and stakeholder informed.

We have reviewed the Baringa impact assessment report and, in the attached annex, provide responses to the specific questions raised in the associated Open Networks consultation. The key points of our response can be summarised as

- We support the assumption that all transition paths start in stage 1 of World B (joint procurement and dispatch). We believe such an approach will facilitate the timely development of flexibility markets across the whole electricity system, driving consumer value. We note that a World B philosophy is currently widely adopted as the industry standard including the ESO's work in initiatives such as Power Responsive, wider access to the Balancing Mechanism and the Regional Development Programmes.
- We understand the level of uncertainty involved in the future energy system and agree with the need for assumptions to be made in this impact assessment. However, in some areas, we believe that the Baringa assessment may be too heavily reliant on assumptions made and that these have not been sufficiently informed by a broad stakeholder base. This is particularly evident in the qualitative element of the impact assessment.
- We recognise that, due to time limitations, much of the work undertaken is focused on the impacts to network organisations. This includes both the qualitative assessment and quantitative assessment of costs, and consequentially also affects views on the timing of transition and the view of each world's complexities. Care needs to be taken to ensure these insights are used appropriately as alternatively they could be potentially misleading, underplaying the cost of transition and ultimately could slow down the transition to a Future World.
- We support the work looking at unintended consequences and risks of the transition and future arrangements. We believe further work in this area needs to be further informed by stakeholder views.

We are happy to discuss the points we make in our response within the Open Networks project and also with any other stakeholders for whom this may be of interest. Should you require any further information or would like clarity on any of the points outlined in this paper then please contact Andy Wainwright in the first instance at andy.wainwright@nationalgrideso.com

Yours sincerely

Julian Leslie
Head of National Control

Annex 1 - Responses to consultation questions

Q1. Please confirm which stakeholder group you believe that you belong to; this will enable the Open Networks Project to understand the spectrum of respondents to this consultation.

This response is provided on behalf of National Grid Electricity System Operator.

Q2. Please provide your views on Baringa's interpretation of the Future Worlds, detailed in Section 2, for the purpose of this impact assessment and the overall approach, highlighting any key strengths or weaknesses, or areas which should be explored in more detail?

Interpretation of the Future Worlds

We recognise that each of the Future Worlds provides a broad spread of options and that in carrying out the assessment some interpretation needs to be made. We have the following comments on each of the interpretations taken;

World A – We believe that Baringa's interpretation of this world leaves two important questions to be answered;

- The accessibility for service providers to national and international markets. We are currently working with industry to facilitate access arrangements for smaller parties into the Balancing Mechanism (Wider Access to the BM). It is unclear how this approach would work in World A which infers an indirect route that may make aggregation across a GSP group more difficult.
- The level of industry reform required. The Baringa interpretation of World A requires the DSO entity to be the counterparty for the ESO in the provision of flexibility services from distribution connected parties for transmission and national needs. This arrangement would significantly change the Balancing Mechanism and supported codes and processes, and require the DSO to take on significant additional levels of commercial obligation. It is not clear where these changes are captured in the assessment and we would suggest that, if this world is to be further developed, these need to be clearly understood.

World B – Whilst we are broadly comfortable with Baringa's approach to this world, we have some reservations over Baringa's proposed prioritisation of system needs. An interpretation which sees only residual flexibility available for transmission and national needs as well as those of international markets, could be seen as more consistent with a World A approach. We strongly believe that, to deliver consumer value, parties should be able to provide flexibility services to whichever market provides the greatest value unless that causes a system risk which cannot be resolved through some other System Operator mechanism.

World C – We agree with Baringa's proposed treatment of this world as a layer whilst clarifying that the interpretation used in the SGAM modelling was solely down to resource rather than intent. We agree that this layer will develop as the work on Access and Forward Looking Charges matures.

World D – We agree that Baringa's proposed layered approach through voltages seems sensible. However, a transitional stage 1 to EHV may have been more appropriate. There is also a question whether World D could stop at this first stage with a different approach (possibly World E?) being taken at lower voltage levels in stage 2.

World E – We recognise that the development of the Flexibility Co-ordinator actor is at an early stage and believe Baringa's interpretation to be reasonable on this basis. However, it is not clear what the role of this party is in transitional stage 1, potentially because it is not required until stage 2? An alternative may have been to take a staged approach similar to that for World D. In either event, we believe this is a potential area of further work. Additionally, our comments on industry reform in World A may also be applicable to this world.

Approach taken

We recognise the challenge in determining an appropriate approach given both the level of uncertainty in each of the worlds and also the timescales for the work. Baringa have carried out three broad assessments;

- a quantitative assessment of benefits. The approach taken seems sensible and we have no comments.
- a qualitative assessment. This also appears appropriate although it does rely on subjective assumptions which we believe may have contributed towards a number of unexpected conclusions to this assessment. Broader stakeholder engagement may offset some of these issues.

- a quantitative assessment of costs. We believe there are two areas where the approach to this assessment could be improved;
    - *Scope of costs considered* - We understand that Baringa have focused solely on the costs to networks, only one component of the costs of each of the Future Worlds. Broader consideration of industry costs would facilitate a broader comparison.
    - *Approach taken to stage 2 timing assessment* – It is important that regulatory barriers do not affect the energy transition and we would suggest that a quicker transition could be effected if timescales were decoupled from electricity price control periods. This is particularly apparent in World E where the driver for regulatory change is not focused on a currently regulated actor. It is also important to consider the transitional impacts on parties other than network organisations. The approach would also benefit from additional clarity on process employed and results presentation (for example it is unclear what range each output in Table 3 represents).

Q3. Do you agree with the conclusions and insights within the Executive summary? If not, please explain your rationale. Please provide reference to more detailed comments against individual sections if this is appropriate.

We agree with the overall conclusion that, at this time, all the potential Future Worlds provide credible pathways. The two-stage approach taken to transition appears sensible, noting that timings need to consider the impact on all stakeholders. To that end we would suggest that the costs of the Future Worlds needs to be considered across all relevant stakeholders.

We support the view that, in the short – medium term, a pragmatic way forwards is to build learnings and DSO thinking around World B. This is supported by stakeholder feedback received throughout the Future Worlds work, and builds on the current ways of working established in the industry including proven initiatives such as Power Responsive. It is also in alignment with European legislation associated with Project Terre and supported by the ESO's work with industry to delivery wider access to the Balancing Mechanism (BM). We would be supportive of policy makers if they chose to provide greater certainty in this area.

In the longer term, we agree that there is greater uncertainty and it is sensible to retain options on the table.

Q4. Do you agree with the options set out as potential transition paths?

Q5. Do you believe there are any other viable transition paths? If so, please explain why.

The rationale and presentation of the transitional paths appears sensible and we believe this forms a good basis for further discussion. We see the Baringa paths as one potential option and would recommend this work being further informed by stakeholder views. From our perspective, we have identified a number of areas for further discussion as listed below;

- The transitional paths all assume that each DSO function migrates along a common path. This may not be the case. There was much support for a hybrid approach in responses to the 2018 Future Worlds consultation and this approach seems to have been ignored.
- We would caution against any assumptions that worlds could not migrate into others at this early stage. For example, a World D arrangement could work for higher distribution voltages with World E at lower voltages. There may also be future benefits in tailored regional approaches, particularly in areas with high EV penetrations. This may necessitate a move from World D to World E.
- It is unclear why the second stages of transitional paths 1, 2 and 3 are all deemed to take equivalent periods of time. Intuitively we would expect World D stage 1 to be a shorter period than World A stage 2 to implement, particularly if both are developed from World B stage 1.
- It may not be credible to have a pathway directly from World B stage 1 to World A stage 2. We believe that Baringa's interpretation of World A underplays the level of industry reform required to move to this world and that pragmatically a World A stage 1 period would be required.
- We are not convinced that it would be credible to move directly from either World A stage 2 or World B stage 2 to World E stage 2. This would be due to the relatively nascent role of Flexibility Co-ordinator. Whilst some acceleration of World E stage 1 could potentially be made we believe it would still be required before transitioning to stage 2.

Q6. Do you agree with the assumption that all transition paths start in Stage 1 of World B?

We support the assumption that all transition paths start in Stage 1 of World B and would suggest that this is already in place. We believe that this world has the greatest potential to deliver consumer value through accessible markets for all.

Q7. Do you agree with the areas identified for further work in the 2019 workplan and the further work ideas in the impact assessment or do you feel there are other areas of work that should be prioritised to progress in this area?

Baringa list four areas of potential further work to inform the transition pathways. We provide our thoughts on these below;

- *Understanding how reformed access arrangements and forward-looking charges best support system operation functions?* We agree with the need for this work but believe it could be better considered within Ofgem's work on access and forward looking charges.
- *What is the value of flexibility at low voltages to network operators?* Based on the accompanying narrative we understand this question to mean 'to meet the needs of low voltage networks'. We believe that flexibility provided by parties connected to low voltage networks could be of equal benefit for national or regional transmission or distribution needs. This question may be better served through work to understand how market development could be facilitated through progressive voltage levels recognising that at higher levels there is a much greater pool of resource and therefore potential market liquidity.
- *What are the potential conflicts of interest and how can they be mitigated?* We agree that building on the work of Unintended Consequences and Risks may be an appropriate way to progress this area.
- *How can industry arrangements facilitate a different pace of change across regions?* Stakeholders tell us they want standardised arrangements and approaches. This work may be better framed to consider how we can achieve this whilst recognising different regional needs.

Much of the 2019 workplan for Open Networks workstream 3 rests on both the outputs to this impact assessment and feedback from stakeholders. We believe that it is important that both are fully reviewed to inform the next steps for this work.

Q8. What future work do you believe would enhance the debate and body of evidence around transitioning to the potential Future Worlds?

We agree that further work to inform the assumptions required in this impact assessment would help clarify future arrangements but would question the overall benefit of this. We believe that sharing learnings from actual initiatives and developing the World B approach will ensure a timely progression that delivers consumer value.

Q9. Do you agree or disagree with the four categories of system operation benefits identified? Are there areas that should be excluded from the list and/or other areas that should be included?

Q10. Do you agree, disagree on the key benefits assumptions contained within Appendix B (eg all Worlds, apart from World C, achieve the same benefits by 2050 etc) and used in the impact assessment? If you disagree, please explain your reasoning. Do you have any other comments?

It is helpful that Baringa have laid out the underlying methodologies employed to derive the benefits as this supports stakeholders in critiquing their work. We also appreciate the challenges in developing such a methodology from predominately publicly available material. To that end whilst not all worlds may derive the same benefits by 2050, clearly making this assumption frames the impact assessment and facilitates straightforward comparison between the worlds.

We agree that the overarching assumption that all Worlds, apart from World C, achieve the same benefits by 2050 will drive relative outputs to the impact assessment to a degree, but feel that other underlying assumptions could also significantly influence the assessment's findings. Taking each of Baringa's sections in turn these include;

- Understanding the Unit Value of Avoided Investment
    - *Reduced transmission constraint payments*. We do not believe it is appropriate to compare a locational transmission service with a national service for frequency response. Market liquidity in a national service will always be higher than that from a limited pool of resource in a specific region.

    - *Avoided investment for voltage and reactive power issues*. The statement 'transmission constraint payments only cover thermal constraints' is slightly misleading in this context. National Grid ESO also makes transmission constraint payments for voltage and stability requirements when required. For voltage services, we note you are using figures supplied by the Power Potential project which is at a relatively early stage of development. We would support a range of cost figures for any emerging flexibility service. This may also be applicable to services for distribution needs.
- Profiling the value of time
    - *Transmission.* Parties connected to distribution networks are also able to provide services for transmission constraint management. It is unclear whether these parties have been accounted for in the methodology employed. We also believe that further work is needed to refine the assumptions made on the costing of voltage constraints.
- Reduced Balancing Services costs
    - Based on the explanatory text the main driver for changes in Balancing Services costs appears to be the volume of intermittent generation connected. We believe that further work would be required to test this assumption and the level of future-proofing that has been considered (for example we do not believe that the relationship is always linear). In addition, we have concerns over the general competition efficiencies used.

Q11. Do you agree or disagree on the approach used to assess the overall potential benefits of improved system operation?

In our response to question 10 we provided thoughts on the assumptions used in the benefits assessment. We also have the following comments on the approach used to map the benefits to each Future World;

- We would suggest 'impact of delivery failure' may be a potential metric, possibly instead of 'certainty of response' which all system operators would consider to be of high priority.
- We disagree with the weighting of low for 'maximise participation' in 'Avoided Transmission Investment'. This is because such services are locational and therefore only a finite number of resource can provide the service (similar to the 'Avoided Distribution Investment' case). To that end, there appears to be confusion in the notes to this section, particularly relating the comment 'Maximising participation is not critical for transmission system operation because of the wide range of potential Balancing Services providers across the system.'

Q12. Do you agree with the assessment of the proportion of benefits which each Future World is capable of delivering in Stage 1 and Stage 2?

In our responses to questions 9-11 we provide comments on the approach taken and assumptions made in the assessment of benefits. The materiality of these comments is difficult to quantify however we believe they could be sufficiently significant to influence the results of this assessment. In addition, as the results are presented as decade snapshots, it is not possible to assign them to the benefits delivered in stages 1 and 2.

Q13. Do you agree or disagree on the approach taken to deal with the uncertainty/range of benefits? If you disagree please explain your reasoning.

We agree with the need to consider a range of benefits rather than focus on a central case. However, it is not clear from the material presented in the report how that range has been developed.

Q14. Do you agree or disagree with the areas identified for quantification of the implementation costs that will be faced by DSOs and ESO in Appendix C? If you disagree please explain your reasoning.

Our overall view is that many assumptions have been used in the development of the cost assessment methodology. There is little recognition that each of these assumptions will introduce an error margin and to that end a range of costs would potentially be more appropriate as an output.

The overall scope of costs considered seems reasonable noting the focus on networks costs only. Below we provide commentary on each scope area in turn, focusing, as requested, on any areas of disagreement;

Technology costs

The development of technologies associated with distribution system operation is still at an early stage and it would seem understandable that there is significant variance in costs provided. We are also not convinced by the treatment of many relevant emerging technologies such as active network management and smart meters as BAU.

Additionally, there are a number of assumptions made in this section which could benefit from further justification. These include;

- The uncertainty range chosen in table C1
- The choice of relevant DSO function in table C1
- The scaling factors for each function size in table C2
- The weightings to account for DER uptake
- The choice of when to use economies of scale and by what proportion
- The assumption that maintenance costs would be 10%
- Baseline DSO costs of £120 million at the end of RIIO-ED2

Resource costs

Further rationale would be helpful to understand how the costs in this section have been developed. Further clarity on the use of different scaling factors for resource costs for DSO and ESO (Table C3) would also be of use.

Interface costs

Unlike the previous two sections, based on the information presented in appendix C, there appears to be no account taken for economies of scale relating to the actor with which the functions sits. For example, we would expect to see reduced publication costs in a world with a single SO actor compared to other worlds. The high-level account provided in the main report (section 3.3) suggests that this has been considered so further clarity would be helpful.

Business Transition costs

Each Future World encompasses a range of possible outcomes. The business transition costs will be very dependent on the selection within this range. Further clarity on how the ratios of capex costs to business change costs have been developed in table C7 would be helpful.

Q15. Do you agree or disagree with the approach used to assess the costs of each world? If you disagree, please explain your reasoning.

In our response to Q14 we describe areas where further clarity would be helpful to understand to the derivation of the factors used to determine implementation costs. These factors, and the assumptions used to derive them, provide the majority of our comments on the cost assessment work in this impact assessment. The overall methodology appears reasonable, noting the focus on networks costs only.

Q16. Do you agree or disagree with the approach to dealing with the uncertainty/range of costs? If you disagree please explain your reasoning.

Baringa's report recognises the level of uncertainty in the cost assessment and the use of assumptions in developing the methodology. Recognising this it would be helpful if the results presented graphically in Fig.12 and 13 showed more than just a central case assumption.

More guidance and information could also be provided to the reader of the sensitivities developed. These do not appear to be clear either from Appendix C or anywhere else in the report.

Q17. Do you agree with the trade-offs of each of the Future Worlds identified against each of the high-level criteria in Table 1 of the Executive summary?

Whilst the high-level trade-offs in Table 1 of the Executive Summary appear reasonable it is important to understand the underlying assumptions drawn to inform these. This comment also informs to our thoughts in responses to the next two questions.

Q18. Do you agree or disagree with the Appendix A approach of ranking of worlds to help identify the strengths and weaknesses of each World against each criterion? If you disagree please explain your reasoning.

Q19. Do you agree or disagree with the rankings and whether they are suitably justified? If not, please comment on which ones and why?

Whilst we understand the approach taken to rank the worlds, such an approach could lend itself to subjective outputs and needs to be informed by stakeholder engagement. At this stage, some of the results of the ranking of the worlds appear counter intuitive and this may benefit from broader stakeholder input. Below we list some examples drawn from the conclusions in section 4.4;

- **Great environmental sustainability**. There is an underlying assumption that the ESO in World D would not consider flexibility resource in World D stage 1. This is at odds with our current work with smaller providers to open up flexibility markets for transmission system needs as demonstrated through Power Responsive and Wider Access to the BM. We see that in the World D stage 1 case, whilst not being the SO for lv networks, the ESO would still look to create consumer value from active parties connected to these networks. Indeed, it would be difficult to manage loads on HV networks without this valued resource.
- **Whole System Optimisation**. The conclusion drawn is that Worlds A, D and E all have a single market facilitator with information across the whole electricity system. This conclusion does not appear to consider markets for transmission system needs which would be facilitated under current arrangements in all cases.
- **Industry structure and organisation**. The conclusions drawn seem to relate to 'system operator structure and organisation' rather than 'industry structure and organisation' to. If this broader view was taken, then it could be the case that Worlds B and E would be more efficient for stakeholders as they would keep the complexity within System Operator / Flexibility Co-ordinator entities helping facilitate markets and competition.
- **Managing conflict**. We would intuitively expect World B to be better at co-ordinating efficient DER use than the report suggests and particularly have concerns over the concluded deterioration of this co-ordination over time.

Q20. Do you agree or disagree with the list of potential unintended consequences identified in Section 4.5, and their prioritisation and potential mitigation as charted in Figure 20? If you disagree please explain your reasoning. Should the Open Network project progress further work on unintended consequences?

We believe the section 4.5 provides a useful starting point for development of important topics for the DSO transition. We would suggest the following next steps;

- **Broader stakeholder feedback.** We strongly believe that this work should be subjected to further stakeholder feedback, and welcome this consultation to provide one route to achieving this. This could inform not just the themes for potential unintended consequences and risks but also the prioritisation chart shown in Fig.20.
- **Reviewing the prioritisation chart**. We would welcome the opportunity to further develop the chart shown in Fig. 20 and believe it would be helpful to get feedback from a wide stakeholder base.
- **Progression of further work**. We believe there is overall value in further progression, but that the nature of the progression will be specific to the theme. Some may lend themselves towards Open Networks public positions, such as the 2018 Principle of Neutral Market Facilitation. Others may be factors to account for in the development of flexibility markets.
- **Continued monitoring and sharing of learning**. We believe that many of these risks may become more evident as we transition to DSO and it is important that learnings are shared and risk mitigations refined as a result.