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Our reference: ONPID19
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2nd May 2019

Open Networks Project – Consultation on Future Worlds Impact Assessment

Dear Sir / Madam

Thank you for providing us with the opportunity to respond to this consultation and allowing us a short extension to the submission date. This response is submitted on behalf of innogy Renewables UK Ltd and npower Ltd.

In addition to the comments made without our consultation response, we would note that we believe the World A (as detailed and presented within the IA) is not a viable world, given it would in effect require the DSO to become the DER aggregator (in terms of providing services to the ESO), reducing competition and risk future innovation. We are also unsure as to how best to evaluate World C - or whether the analysis relating to Worlds B, D and should / could be rerun to include the assumptions overlaid on the remaining Worlds, given that the analysis presented within Figure 2 of the Executive Summary shows the benefits of World C being incorporated, in contrast to the qualitative assessment undertaken (as shown in the results contained in Appendix A).

Whilst we have significant concerns with World A (from a practical as well as competition law basis) we also note that the continued lack of a modelled world within which the DNO and DSO functions are separated with separate financial incentives, revenues and associated risks is incompatible with assessing the full range of options and this should be rectified before further work is considered.

Please find attached our response to the questions below.

Yours faithfully,

Kate Garth

Kate Garth
Innogy Renewables UK Limited

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.

Innogy Renewables UK Ltd is both a transmission and distribution connected renewables generator.

Npower Ltd is a supplier (with both supply and export customers), aggregator and provider of DER.

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?

- World A: DSO Coordinates – a World where the DSO takes a central role for all distribution connected parties acting as the neutral market facilitator for all DER and provides services on a locational basis to the ESO.
- World B: Coordinated DSO-ESO Procurement and Dispatch – a World where the DSOs and ESO work together to efficiently manage networks through co-ordinated procurement and dispatch of flexibility resources.
- World C: Price-Driven Flexibility – a World where changes developed through Ofgem's reform of electricity network access and forward looking charges have improved access arrangements and forward looking price signals for Customers. This world has been built with flexibility arrangements as described in World B but it is recognised that charging and access developments could be similarly progressed in other Worlds.
- World D: ESO Coordinate(s) – a World where the ESO takes a central role in the procurement and dispatch of flexibility services as the neutral market facilitator for DER, with DSOs informing the ESO of its requirements; and
- World E: Flexibility Co-ordinator(s) – a World where national (or potentially regional) third party(ies) acts as the neutral market facilitator for DER, providing efficient services to the ESO and DSO, as required.

<u>World A (DSO Coordinates)</u>

This world raises most concerns - recognising the potential tension of a local system operator, a DER/Flexibility provider and National Grid-ESO (who ultimately holds the responsibility as System Operator to maintain security of supply). This concern is compounded further when each DNO is considered in isolation as each of their territories and operational capability (including inherent capacity etc) and assumed value of flexibility differs markedly.

Enabling DSOs to become aggregators is an unacceptable scenario due to the risk of the impact across their network region on Balancing Responsible Parties (BRP). DSO activity in world-A could quite easily knock supply and demand out of balance, causing charges and conflicting signals for other actors or even resulting in an inability to deliver for consumers.

In terms of the Baringa interpretation of the worlds and in particular the issue of the role the DSO would play in the Balancing Mechanism. We note the interpretation that the DSO would be required to "*aggregate DER under each GSP to offer flexibility into the Balancing Mechanism and Balancing Service Markets but not be responsible for the energy balance at each GSP*" but believe this would not work and would instead create commercial risk for suppliers and the DER.

In a post TERRE implementation world where there are Virtual Lead Parties who take on imbalance risk (for any TERRE related activities), it would be perverse and inconsistent if the DSO were not also required to take the imbalance risk associated with their actions / inactions.

Although please note for clarity that we consider the idea of the DSO acting as an / the aggregator as wholly unacceptable and as noted earlier should be removed from the list of possible Worlds, as it would:

- Adversely affect competition and potentially create distortion in the market
- Close down activities of existing and future commercial aggregators
- Remove the opportunities for independent choice and revenue stacking across various markets
- Remove control from all DER providers and reduce opportunities for further innovation

We would also note that the continued lack of a modelled world within which the DNO and DSO functions are separated with separate financial incentives, revenues and associated risks is incompatible with assessing the full range of options. This is also inconsistent with the reasoning behind the recent legal separation of National Grid TO and SO

<u>World B (Coordinated DSO-ESO procurement and dispatch)</u>

We agree that World B would require DSOs and the ESO to work together to efficiently manage their networks through coordinated procurement and dispatch and agree that on this basis as the current Status Quo, World B could be the starting point for most future development (as set out in section 5 – although as per our response to question 4, we believe World D stage 1 is also a viable alternative. The timeframes over which the procurement and dispatch decisions would be taken does however need to be clarified in terms of allowing alternative options to be considered which are more longer term versus short term constraint issues.

That said, we disagree with Baringa's assumption that the DSO's needs would be prioritised over the ESO's, with the residual flexibility offered by DER being available to the ESO. This would remove the element of choice from the DER participant and could result in distortions if the value of the flexibility or revenue stacking options is assumed to be higher for the ESO rather than the DSO and is unacceptable. It could also cause issues with cost effective national balancing.

There would likely be significant commercial issues if a DER participant were not allowed to offer its services to the ESO (if it was prepared to pay more for the flexibility) because the DSO needed to prioritise the utilisation of that flexibility for itself.

This may be an area which could be better resolved through the overlay of World C in terms of the charges and costs of using the transmission and distribution system, but we can see a significant risk in World B that DER could be excluded from ESO procurement tenders because the flexibility may not be available in future or because it is perceived as higher risk (by the DER and ESO). This approach would likely result in reduced investment (particularly in lower carbon distributed energy).

This is another area which highlights the concerns previously raised about the lack of a separation between the DNO and DSO functions.

World C (Price-Driven Flexibility)

We agree that Price Driven Flexibility should feature as a key variable across all worlds, the dynamics of which should be considered carefully in light of the ongoing Targeted Charging (TCR) and Significant Code Review (SCR) which is expected to reform residual charges, access charges and time of use costs amongst others.

We also suggest that further modelling and changes to the future world assessment should be considered once Ofgem has published its final decisions regarding approach to the both TCR and ENAP with Worlds B, D and E being revisited to account for the changes from TCR & SCR. We strongly encourage Ofgem to be mindful of the desired functions of a smart, flexible world and welcome the existence of the Charging Delivery Body which should be keeping the Open Networks Project firmly within its scope.

World D (ESO Coordinates)

We agree that this World where the ESO takes a central role in the procurement and dispatch of the flexibility services as the neutral market facilitate for DER (with DSOs informing the ESO of its requirements) has many positive aspects, particularly in terms of managing the development of more flexible resources over time.

With regards to the question as to what network level does the ESO coordinate flexibility within World D we agree with the Baringa assumptions that for the stage 1, the ESO would only coordinate flexible DER to the HV level (i.e. down to 11kV inc). Further procurement and dispatch of flexibility to the MV and or LV levels could be an issue in the future under the Community Renewables FES scenario, but given the current lack of clarity and policy certainty regarding the likely routes to decarbonise transport and heating, allowing World B to act as a the starting point may be the least regrets approach.

World E (Flexibility Co-ordinators)

This is the only world that provides truly separate, independent procurement of system services for the ESO and DSOs and we would therefore welcome further focussed analysis to develop this model as we believe only World-E provides assurances of fair operational decisions that would be distinct from network-owner bias and as a result should increase market confidence while reducing tension between all actors (network owners, DER providers etc).

We would also recommend that the further analysis considers a similar legal unbundling structure for DNOs and DSOs (in the same way that the ESO is now a legally independent body from National Grid TO). As per the discussion held with Baringa at the Open Networks event, the fact that the ESO is now legally separate may make some of the discussions more relevant, in terms of being a legally separate and independent entity – and whilst the ESO is highly regulated it is still not a "not for profit" organisation, although it is not clear whether that is the right definition to be used.

World E would help avoid many of the concerns which have been flagged up during the Open Networks project, including issues of conflicts of interest and full independence. However, unless there is full legal and financial unbundling of the DNO and DSO functions in the same way that National Grid Transmission Operator and Owner roles have been separated from the ESO, it is hard to see how the conflicts of interest issue would be resolved. Without this separation we would remain in a world where the DSO is seeking services as part of the same entity that is responsible for the network owner roles / responsibilities.

We would also flag up the issue that the Impact Assessment document (IA) itself highlights in that World E can be interpreted as meaning many different things. We would recommend a clear definition of what is actually being considered, the extent to which the DNO / DSO functions are separated and therefore whether World E is simply a procurement platform or whether it would take on the functions of a fully independent whole system (or regional) system coordinator, as without that clarity different stakeholders will likely be offering views based on different interpretations which could create unintended consequences during the next steps and when the time comes to take final decision.

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 that most of the Future Worlds are technically feasible (with the exception of World A) given the issues highlighted in our response to question 2.

We agree with the assumption that the potential transitional paths would likely start from the basis of World B stage 1 although we believe Stage 1 World D would be equally viable. We agree that the majority of trigger points (diverging from world B or D stage one to other worlds) are related to the level of DER uptake, which according to the FES "*is forecast to ramp up considerably in the late 2020s and early 2030's*". Although the IA does suggest this could happen *"sooner or later depending on the actual update of DER*", We would note that this uptake will also be impacted and influenced by the degree of digitalisation, automation and public engagement with the Ofgem reforms (particularly in terms of TCR and changes within the retail market).

Greater clarity will be required from Government as to the likely pace and potential technologies to be used for decarbonisation of heat and of transport. Until there is further clarity on this and therefore the likely need for and required level of flexibility provision at the lower network voltages coupled with the impacts of the Ofgem charging reviews, we believe it is important that as much optionality is retained as

possible across all Worlds and this should reduce the risk of stranded assets and or costly investments in new systems or resources – much of which could be avoided if Stage 1 World D were considered as the starting point

In terms of the insights relating to further work (shown on page 10), we agree that there are many questions that need to be resolved, particularly re the impact of the outcome of the Ofgem network access and charging arrangements. We would also note that changes to wider policy, legislation and regulation could also significantly impact on the take up and consumer engagement with time of use tariffs.

With regard to the question **"what is the value of flexibility to network operators at LV?**" – we agree that further trials will need to be considered to test the economic viability of running local flexibility markets but not as a basis for considering the transition to World A.

The local flexibility trials should seek to determine any additional need following implementation of the outcomes of the Ofgem charging reforms, which should incorporate wider energy efficiency improvements

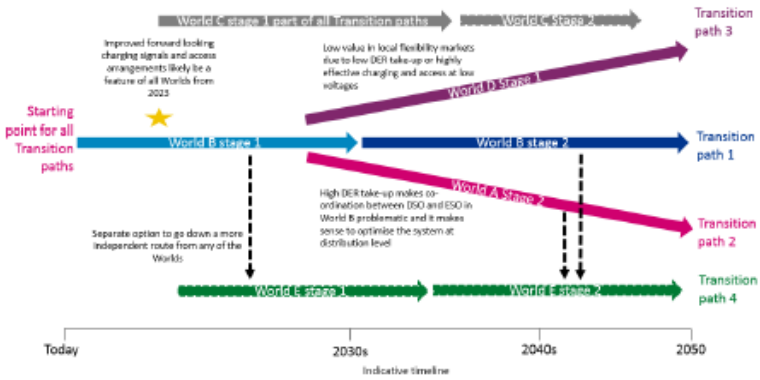
In terms of the question "What **are the potential conflicts of interest and how can they be mitigated**?" – and therefore whether a transition to World E is required is perhaps the wrong question. We firmly believe that there should be no conflicts of interest already – and hence our previous calls for the legal unbundling of the DNO roles and responsibilities from future system operator roles and responsibilities. If the conflicts of interest can be mitigated (which we would hope they would be) then the broader question should be whether in the World E – the rationale for a neutral facilitator operating on a national and or regional level is to create a new entity acting as the whole system operator or whether it is simply a procurement platform for DER to sell its flexibility independently to the DSOs and ESO.

This also links into the last question "**how can industry arrangements facilitate a different pace of change across regions?".** This issue is critical and we would welcome further consideration within the Open Networks programme (with views from Ofgem and BEIS) as to the overall value of the different transition paths for those PES areas (and the related DNO / DSO) with higher or lower flexibility requirements – which may be due to physical locations (number, type and density of connection).

We do not agree with the suggestion contained within this IA that *"delivering the DSO capabilities is the best way to understand the technology costs and resourcing requirements",* given that there are still very large issues to be resolved as to what is a DSO function (versus a DNO function) and how might those functions and responsibilities be regulated and incentivised in future.

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

Figure 3 Potential DSO transition paths and triggers



We agree that the 'least regrets' path of World-B, stage-1 is pragmatic for now and allows for ongoing assessment of likely direction of travel by the early-mid 2020s. However we are conscious that many of the trigger points for the transition paths are "driven by the level of DER uptake" both in terms of investment, deployment and commercialisation of flexible assets across GB. However over the last 24-months the market has experienced a series of disruptive events (inc policy change, ill-devised emissions regs and delays in ESO product reform) which have undermined market confidence significantly – potentially resulting in years' worth of lag while funds are invested elsewhere (in to other technologies/territories) where returns are less volatile.

Flexibility assets are also significantly impacted by the ongoing TCR and ENAP Significant Code Reviews, which are unlikely to have any clear direction before 2020.In such circumstances, it would be prudent to also consider World D stage 1 as a potential starting point for the transition, with ESO coordinating and procuring DER flexibility in the EHV and EV levels – triggered by high levels of DER being connected within a short time frame and requiring significant coordination between the ESO and DSO). Given the assumed lower costs for implementation and lack of certainty as to whether there will be a need (at least in the short term) to create flexibility markets at LV we would encourage an assessment of this as an alternative transition path, we note that a transition from World D stage 1 would not preclude a future transition to World B stage 2 (if a high degree of DER connects at LV and / or MV) in the future.

We also note our previous response to question 2 that we believe the assumption that in World B, the DSO would have priority access to DER flexibility to be erroneous and that it would make the transition path 1 (World B stage 1 to World B stage 2) unlikely to be effective given that commercial choice as to whom the DER wishes to provide its flexibility should remain in the DER's hands (otherwise it becomes a variant of World A but without the necessary accountability and clarity on roles and responsibilities).

With regards to transition path 4 – we cannot comment until there is greater clarity on what the World E would actually entail (and the type and number of flexibility coordinators required. We note that Appendix A often refers to 4 regional coordinators but we're unclear as to the justification for that number). We would however be surprised if this transition took place significantly earlier than the other transition paths (as set out in Figure 3).

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

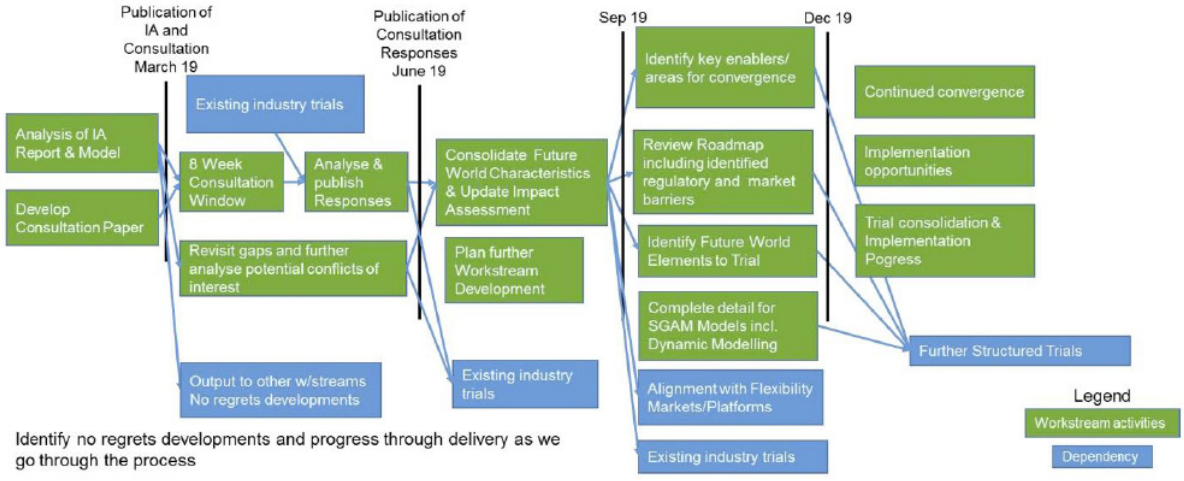
As noted in question 4 – we believe the transition path starting at World D stage 1 would also be viable, given the location of significant volumes of DER (especially generation) at present.

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

Yes, we agree that the 'least regrets' path of World-B, stage-1 is pragmatic for now (although noting our response to question 5) and allows for ongoing assessment of likely direction of travel by the early-mid 2020s.

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?

Figure 2: Workstream 3 elements of Open Networks project 2019 Workplan



We are not clear on the final outcome of the consultation earlier in 2019 into the PID for the Open Networks work in 2019 and therefore we are unsure as to what work is planned to be delivered (and when) and therefore how the revised workplan would or could need to be amended. We believe this is a consequence of the short timescales for consultation and reflection, which are necessary to incorporate comments and outputs from other Workstream Products.

Further to our initial comments to question 2, we agree that there are several areas of work that need to be considered, although these may be too big to be considered as discrete or additional areas of work within Workstream 3 and slotted into the workplan (as shown in figure 2 above).

That said, we do not agree that new trials should be set up and managed during 2019 as there will be insufficient time to consider what is required, who and how they should be managed and what aspects are specifically being assessed (independently of over impacts / outputs).

In terms of the specific questions asked (and further to the initial responses provided in question 2) on the issues of trying to understand the current "unknowns", that would influence the trigger points for the different transition paths as set out, we would note the following points

Unknown 1 – Understanding how reformed access arrangements and forward looking charges best support system operation functions.

We agree that it would be useful to trial some of the options for reformed access and forward looking charges (to better understand how World C would / could interact with the different worlds and whether they could deliver overall higher net benefits.

We do not however agree that this should be trials specifically against the coordination mechanisms in World B as (per previous responses) we disagree with the assumption that DSOs would have priority access and that World B is the only starting point (given that we believe World D could also provide a credible starting point.

There is also the issue that if Ofgem does publish its chosen preferred options for the TCR and ENAP then these will need to be treated as part of the baseline for revised modelling, given that that will indeed become the BAU. We would caution against looking at these two Significant Code Reviews independently from one another. The response of all network users to the reforms are inherently dependent upon the outcomes of both together and cannot be considered separately without inviting the likelihood of negative unintended consequences.

Unknown 2 – What is the value of flexibility at low voltage to network operators?

We disagree with the suggestion on page 57 that a key decision to move to worlds A or D is dependent upon the value in local flexibility markets at the lower voltage levels – given that we believe World A would be result in the set up of the DSO as an aggregator, which would be anti-competitive and therefore not a viable future World, although we do agree that gaining a better understanding on the likely need (and value) of flexibility at the lower voltage levels (and when this may transpire) would be helpful. We note (and agree with the suggestion that moving to World D earlier would deliver more cost savings earlier and this underlines our suggestion in question 4 and 5 that another viable transition path would start with World D stage 1 (which could then either evolve to either World B (with amendments) or World E.

We would also note that the question of value is unclear – is this the value (to the network owner / operator) of avoided or delayed reinforcement costs or does it include the perceived value to the consumer of benefitting from selling their flexibility for additional revenue or does it refer to the avoided costs associated with delayed / avoided network reinforcements (net of the cost of setting up the procurement and operational management required)? It will be important to ensure that cost benefit analysis is carried out

regularly to evaluate whether the cost of reinforcement is better value for money for the consumer than constraint costs. To what extent will in future third parties (such as aggregators, data driven suppliers or energy solutions companies manage this on the consumers behalf and seek to provide economies of scale and deliver other, more innovative solutions.

Unknown 3 – What are the potential conflicts of interest and how can they be mitigated?

We note that within the existing 2019 workplan (to be confirmed post consultation decision) includes Product 1 within workstream 1A which is considering this question. That said we don't believe that the outlined product goes far enough in considering what are the potential conflicts of interest and how these can be best mitigated, given that there is still no firm plan to consider the implications for a full legal unbundling and regulation of the separate DNO and SO functions (similar to the full legal separation of the ESO which came into effect on 1 April 2019).

It is critical that all actual and perceived conflicts of interest are identified and mitigated before any further steps towards a final DSO framework are developed, given the risk of investing in areas that are subsequently found to be creating a conflict of interest.

We would also strongly suggest that any investigation of conflicts of interest (especially given the risk of perceived conflicts of interest) is managed by an independent, third party, who would be able to produce a robust and neutral assessment of the impacts on market participants, investor confidence. We would suggest that Ofgem and BEIS may be best placed to procure such an assessment to ensure that all market participants are involved.

We remain concerned that the underlying assessment or rationale for World E (as set out in the Impact Assessment which states:

"Consequently the only reason for moving to World E would be mitigate any perceived conflicts of interest, which surround integrated network and system operation within network operators"

If this were the case, then World E ought to include a separation as standard between the network ownership (and subsequent revenues and regulatory responsibilities) and any System Operator role (whether this is per PES area, on a regional area or on a whole systems National basis).

We would anticipate World E (particularly on the basis of regional SOs) to consider the broader benefits (and costs) associated with providing a whole systems approach [across Transmission and Distribution networks].

Unknown 4 – How can industry arrangements facilitate a different pace of change across regions?

We are concerned with the implicit suggestion within the text on page 58 that certain regions would seek to have different rules and regulations compared to other areas. We agree that (at present), the regulation of the electricity system is based on the uniform application of rules and regulations to ensure that

customers are treated the same and that there can be no discrimination in terms of service, access or support.

Whilst we agree that within some DNO / DSO areas, there may be more acute issues that need to be addressed more urgently than others, it will be critical to ensure that the common arrangements model remains and that from the perspective of potential market participants a clear and unambiguous approach is taken to ensure consistency regarding product standards, contractual terms and conditions (especially in Worlds B, D and E) where there is more potential for multiple revenue stacking opportunities.

With regards to the second half of the question - we agree with many of the areas requiring additional information that will likely be required to build on this assessment, but we would caution (without wishing to repeat points previously made) that changes to the assumptions and basis of aspects of several of the worlds would need to happen first, otherwise the issues and concerns we have raised will simply proceed into the next stage without remedy.

Some additional points below:

1) Defining the commercial arrangements for the Future worlds – we agree this will be helpful and this must also take account of the regulatory requirements (and their associated regulatory incentives / penalties) This area should also include a review of the ways in which IT systems, platforms, and monitoring hardware could be rolled out by the ESO, DSOs, TOs, and DNOs across LV, MV, HV and EHV network levels in a coordinated and standardised manner. Additional monitoring is also needed by DNOs, particularly at LV levels, to support smart operations.
2) Mapping the accountabilities and responsibilities in each Future World – as above this needs to include the regulatory authorities and roles that will be managed by different licenced entities, this will be particularly important to ensure mitigation and removal of all conflicts of interest
3) A network engineering model which can forecast investment required under different load and generation growth scenarios across both Transmission and Distribution – we agree and hope that liaison with the FES team will be able to provide further information although we would request that this information be made public rather than remaining managed internally within the ENA
4) Understanding the benefits of economies of scale across different system operation functions – however we believe this may be more relevant to assess the relative merits of economies of scale between World D and E and World D (stage 1 moving into World B stage 2 – with the necessary change in assumptions re DSO primacy).

In terms of the technology costs and how to gain a better understanding of technology costs – whilst we agree this would be helpful to narrow the uncertainty ranges provided we believe it may be more relevant to seek this information once the necessary / additional changes to the Worlds and or assumptions used have been made.

In addition, we believe it would also be helpful for future work to:

- understand the options for better data access to and from network and system operators – if there are any outputs from the Data Project being led by Laura Sandys this may be very helpful to incorporate this into the next stages of the project,.
- Ensure that wider system (whole system) impacts / benefits are considered – we note that this work is being considered within Workstream 4 (assuming the PID continues to include it) but this work will likely need to be expanded to include a much broader range of market participants and may go beyond the current abilities and resources of the project – given the broader impacts on regulatory and legislative changes that may be implemented now and during the mid to late 2020s.

We would also call out that the statement on page 10 of the Impact Assessment, that there is:

"considerable work to do in the coming years to develop new markets, platforms, operating practices, and access and charging arrangements", equally applies to all of the Worlds - , not just to World B.

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

Please see our response to question 7

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?

We agree that the four categories of system operation benefits identified are the main ones.

Q10. Do you agree, disagree on the key benefits assumptions contained within Appendix B (e.g. 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?

We are uncertain as to the accuracy of some of the assumptions included and we have not had the time to fully assess and validate the data provided (both within Appendix B and within the accompanying spreadsheets).

Given the potential importance of determining the relative merits / costs of the different Worlds portrayed we are concerned that few participants will have the knowledge and ability to provide meaning full commentary within the timescales of this consultation and therefore it may be worthwhile seeking further comments from another independent third party organisation to peer review / sense check the benefit assumptions included.

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

Broadly speaking yes, although we would highlight the need to understand more detail about the amount of distribution network investment that will be avoided as a consequence of Ofgem's reform of charging and access arrangements. We would also note the following points where for completeness we would benefit from more information / greater transparency:

(a) the wider variable of assessing the potential benefits of local flexible activity avoiding / deferring investment in network assets and the 'replacement of aged assets' conundrum … i.e. may overstate benefits if a proportion [x]% of all assets are decades old and will be replaced anyway.

(b) replanting [40]yr old network equipment with current tech should introduce not only improved reliability but the secondary benefit of more efficient assets (e.g. lower losses);

(c) the stranded-asset risk shifts from the network owner towards the investor/developer of DER (this risk is likely to change over time as the network is developed and new actors (+/- demand/generation) are connected. The DNO should be obliged to share longer term forecasts of network options/operability.

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? [Pages 22-24, Appendix B]

We have some concerns regarding the very limited data to estimate benefits available through distribution network reinforcement avoidance (given that these are expected to drive the majority of benefits (especially under the Community Renewables FES) where they count for ca. 44% of the total net benefits by 2050.

Given the need to determine if and when there is likely to be a critical mass of flexibility on the lower voltage networks, it is critical to determine given that in the event that there may be little or no additional value achieved outside of the impacts of the charging and access reforms, the case is strengthened to consider World D as the more likely starting point, and as the IA Table 1 acknowledges, World D is the lowest cost to implement and operate.

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 approach of considering the uncertainty/ range of benefits available, although we would note that the indicative benefits shown are directly attributed to the system operation model, It is worth noting that the benefits of avoidance of distribution network reinforcement may be delivered across all five Worlds if Ofgem's review of charging and access is successful and if the Office for Low Emission Vehicles is able to establish comprehensive EV charging standards in a timely manner which would reduce the need for additional distribution network reinforcement associated with EVs.

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.

We would comment that we've previously raised concerns regarding the functions set out as DSO functions, given the issue of separation of network owner and operation functions and system operator functions. Given the uncertainty and concerns raised regarding conflicts of interest and the need to mitigate, it is unclear what the potential range of implementation costs would be faced by all network companies (including DSOs and ESOs) and therefore the likely thickness or thinness of the relative network functions (and therefore the impact of cost).

We also note the very large uncertainty ranges associated with the baseline technology costs (as shown in table C1) which make the outcomes less reliable (and we agree that further work is required to better understand how these could be rendered more accurate.

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

We agree with the approach of utilising a pessimistic, central and optimistic case for many of the assumptions. We agree with the caveat stated in section 3.5 which cautions "*we were keen to avoid firm conclusions being drawn on the back of assumptions which are inherently very uncertain".*

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

Given the high level nature of the impact assessment and the changes that would necessary be required to enable some of the Future Worlds to be considered viable, we believe the current outputs provide a view but will require updates and reviews in future.

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?

Table 1 Summary of trade-offs between the Future Worlds

Most important objective	Likely World(s)	Subsequent trade-offs
Decarbonisation of heat and transport (particularly if this accelerates in 2020s)	World A or B	• Potentially more complex to operate (World B) • May require mitigations to be put in place for any perceived conflicts of interests
Ease of market engagement for existing flexibility providers	World D or E	• Potentially less conducive to local (low voltage) energy markets in the short term • It takes time to implement which may impact the speed of decarbonisation in the near term
Lowest cost to implement and operate[5]	World D	• Potentially less conducive to local energy markets in the short term • It takes time to implement which may impact the speed of decarbonisation in the near term
Minimise structural change from today	World B	• Likely to lead to higher longer term costs compared to other Future Worlds • Greater complexity in system operation and dispersion of accountabilities across different actors • Potential frictional issues while co-ordination processes 'bed down'
Transparent, fair, neutral markets	World E	• It takes time to implement which may impact the speed of decarbonisation in the near term • Likely to lose efficiency in decision making as information needs to be exchanged back and forth to the Flexibility Co-ordinators

It isn't immediately obvious why the above 5 criteria have been highlighted (versus the other specific objectives which were discussed (and are contained in Appendix A (pages 60 – 89).

We note in the Exec summary (page 5) it notes that the *"there are trade offs associated with the each Future World which will need to be weighed up against each other. This conclusion was supported through the stakeholder engagement sessions we ran. Different priorities amongst stakeholders drove them to favour different Future Worlds,"* We would be interested in understanding who was involved in those sessions and whether those sessions set the parameters for establishing which of the 30 different criteria were included in Table 1.

Based on the 5 objectives included in Table 1 (page 6) – the Trade Offs appear to have some significant faults:

Decarbonisation of heat and transport (particularly if this accelerates in 2020s)– in terms of the trade off shown for Worlds A & B– it is not a *"may require mitigations to be put into place for any perceived conflicts of interest"* – but clearly these will need to be put into place – which would likely change the out-

come. It would also be more helpful to clarify whether this objective is best met through Worlds A &B if the assumed transitions do not happen in the 2020s, but later.

We would also expect a trade off to include reduced access to ESO flexibility procurement options (based on the current Future Worlds A&B) and likely higher costs if there isn't in fact sufficient demand or value for local flexibility markets.

Ease of engagement for existing flexibility providers – We agree with the suggestion that worlds D & E would likely be the best to deliver this, (although it is surprising World B is not mentioned), given the similarity to current status quo, and therefore existing flexibility providers.

Lowest cost to Operate and Implement – world D – we agree. For both this objective and the ease of engagement objective, we note that the trade-offs cited are "*less conducive to local (low voltage) energy markets in the short term*" and *"it takes time to implement which may impact the speed of decarbonisation in the near term*."

Given that there are 2 specific objectives relating to decarbonisation – '*decarbonisation of heat and transport*' and '*decarbonisation of generation'*, it would be helpful to clarify which of these is meant to avoid confusion, and what is meant *"within the short term*" – is this meant as before 2030? This is also important in terms of achieving World D stage 1 (with ESO coordinating down to EHV & HV levels) given this would be similar in approach to World B.

Minimise structural change from today – World B in terms of the trade-offs – we agree with these and note that there seem to be more trade off associated with this world than others. Not clear if this is because there are more significant trade-offs or that the other objectives identified just don't have so many.

Transparent, fair neutral markets – World E - we are not clear on the trade off shown that this world is *"likely to lose efficiency in decision making as information needs to be exchanged back and forth to the Flexibility Coordinators."* We believe this ambiguity stems from the fact that World E is still poorly defined (and may mean many different things to different people" if the World E (stage 2) manages procurement and operational responsibility – then that trade off would only be temporary until mid-2030s and is therefore more of a consequence than trade off.

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 criteria? If you disagree please explain your reasoning.

We agree with the approach to ranking.

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

Please also note our comment in the cover letter regarding the inclusion of World C – as it is hard to compare the worlds separately, given the expectation of significant changes likely to be delivered through the TCR and SCR processes that are likely to create fundamental and wide-ranging changes to 'Price Driven' flexibility. We have provided comments where necessary (if there is no comment / suggested change this should be taken to mean that we accept the outcome /rationale provided).

There appear to be many issues of considering the Future Worlds as entirely different constructs (i.e. in the case of World D stage 1 where the ESO doesn't coordinate or procure flexibility down to MV and LV level) there is the clear suggestion that this would then not happen, whereas in reality if required and available– it would start / continue to be procured via the DNO / DSO entity.

We also find the frequent justification that Worlds A & B would be better [than world E in particular] because of their existing local knowledge to be a poor justification as it suggests there would be neither a transfer of personnel and or knowledge to the new entity, which appears unrealistic and assumes a status quo for some aspects of the DNO / DSO roles and responsibilities whilst ignoring it under other circumstances.

1. Strategic Case- Enhanced Customer Choice

Affordability – stage 1 - we disagree with the ranking provided for World D – given that Table 1 in the exec summary clearly states World D is the lowest cost to implement and operate. The rankings should be changed to reflect this with World D being a 1, Worlds A&B being 2.

Confidence & trust – stage 2 – World D we believe this should be at least joint ranking (with World C).

Consumer Benefit from Markets - Stage 1 - We firmly disagree with the premise that World A should be ranked as 1 (on the basis that they may be able to perform better through using the DSOs existing relationships through the connections process) as this fundamentally avoids the role of suppliers and existing aggregators (and could in fact make the engagement worse). World C should be ranked higher, given the immediate opportunity for customers to benefit (from avoided costs) if not necessarily deriving revenue from provision of flexibility services.

Greater Environmental Sustainability

Facilitates decarbonisation of heat and transport – we disagree with the assessment of World E on the basis of the justification provided "*in the early stages of development Flexibility Coordinators may struggle from a lack of understanding over how the d networks have historically operated. While network loading information can be easily transferred to the Flexibility coordinators, knowledge of how particular network assets or customers have behaved is more difficult to pass onto a new separate organisation. However this information could be crucial in understanding where flexible DER can provide the most benefits. This leads to Worlds A &B performing relatively better than World E due to the ability to use historic knowledge of the networks to help to create additional headroom through flexibility and create capacity*

for EVs and HPs". This seems to suggest that there would be no personnel transfer from the DNO / DSO function to the flex coordinator and also understates the need for additional resource (if Worlds A& B) were possible. Suggesting that the implicit and tacit knowledge gained and held with the existing bodies as a reason to downrate an alternative world seems irrational and feeds into the concerns of conflicts of interest and a lack of independence.

(A point that appears to be acknowledged ono page 69, where the justification for World E is given as *"..since regional Flexibility Coordinators are fully independent have no legacy approach to system operation which may favour certain solutions over others"*

2 – Economic Case

Cost of implementation versus benefits and **Expected Benefits**

We disagree with the assessment as this runs counter to the information included in Table 1, which shows World D is the lowest cost to implement and operate – we therefore disagree that worlds A&B perform the best in Stage 1.

Whole system optimisation

Brings more flexibility into the system - We disagree with the equal 1 ranking provided to Worlds A&B. World A would likely reduce the level of flexibility given it would remove the current role of aggregators operating with DER and may discourage existing DER providers to offer flexibility. We would suggest World B scored the 1 with the World E with World A scoring a 4– within the Stage 1 period.

Manages Conflicts - It is unclear why World E would perform worse than all the other Worlds. Given the main "selling point" of World E is its independence, suggesting that it would cause more conflict as a result seems odd and performs worse than World B (where conflicts between the DSOs and ESO has already been highlighted, seems very inconsistent.

The justification given is that in stage 1 DSOs and the ESO would have to *"implement the decisions without understanding or agreeing with the detailed assumptions that sit behind it"* This would seem to suggest that DSOs/ ESO would not be involved in the process to set up and implement the creation of the Flexibility Coordinators and that they would have the opportunity to question the decisions taken, which would seem to be more a function for the regulatory and potentially legislative authorities.

We would instead (for stage 1) suggest rankings of World C & E – 1, Worlds A & D 3 and World B 5.

Avoids duplication - It is unclear why in both Stages 1 and 2 – World E performs worse that Worlds A & B – given that duplication of multiple DSOs would be required. We would suggest that World E scores a 3 and Worlds A & B score 5.

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3. Commercial Case

Appropriate Regulation - We believe that World C should score 1 – given that it would essentially be a World designed on the basis of the ultimate aims of the ongoing Ofgem access and charging reforms, for which there would clearly be regulatory change required and implemented.

Given that there would also need to be some regulatory change to World B (notwithstanding our comments in question 2) given that such a world would be incompatible with free and competitive markets [given that the assumption is that the DSO has priority, irrespective of the commercial value opportunities available].

Ranking for stage 1 should be World C 1, Worlds B&E 2, and Worlds A & D 4

4. Financial Case

Funding available to support market participation - We are unsure about the ranking ascribed to World E in Stage 2 - as the IA states that a new market actor would be set up and it is not clear how this would be funded. Our initial assumption would be that any funding provided or intended for DSOs and ESOs to manage and incentive the system operation capability would instead be allocated to the regional coordinator role / s. Funding issues would likely be prevalent in Worlds A and D also –given the change in roles, responsibilities and incentives and it would seem more consistent to consider World E in the same ranking.

5. Management Case

Difficulty to implement for system operators - We believe in stage 2 the level of operational difficulty to implement Worlds A and D would be similar given the new requirements, new systems and resources that would be required (particularly the changes to the balancing and settlement system).

Service availability - This criteria causes more concern due to the lack of consideration of conflicts of interest – and as per our response to question 2 we do not believe World A would be legitimate or viable given the conflicts of interest that would ensue – we note the scores that have been ascribed to World A under this criterion are based on those conflicts of interest and should be reconsidered and reranked accordingly.

Resilience and recovery -For Stage 2 – we disagree with the ranking that suggests Worlds A & B perform relatively better than D and E – all worlds should be ranked equally.

Clear, dischargeable accountability - we disagree with the rankings and justification provided for both stages, as the justification suggests that in World A, DER can still provide services directly to the ESO – this is not how the Baringa assumptions about the worlds are set out on page 16, which states that *"A world where the DSO takes a central role for all d connected parties acting as the neutral market facilitate for all DER and provides services on a locational basis to the ESO".*

We believe World B should be ranked as 1 with Worlds A, D and E jointly ranked 4. In Stage 2 all worlds should be ranked equally on the basis that the regulatory roles and responsibilities would be clear, the requirements to safely operator the networks (as ongoing DNO functions) would be retained and there would be no discernible difference in identifying which entity was responsible for delivery (or failure to deliver) the system operation to the required standard.

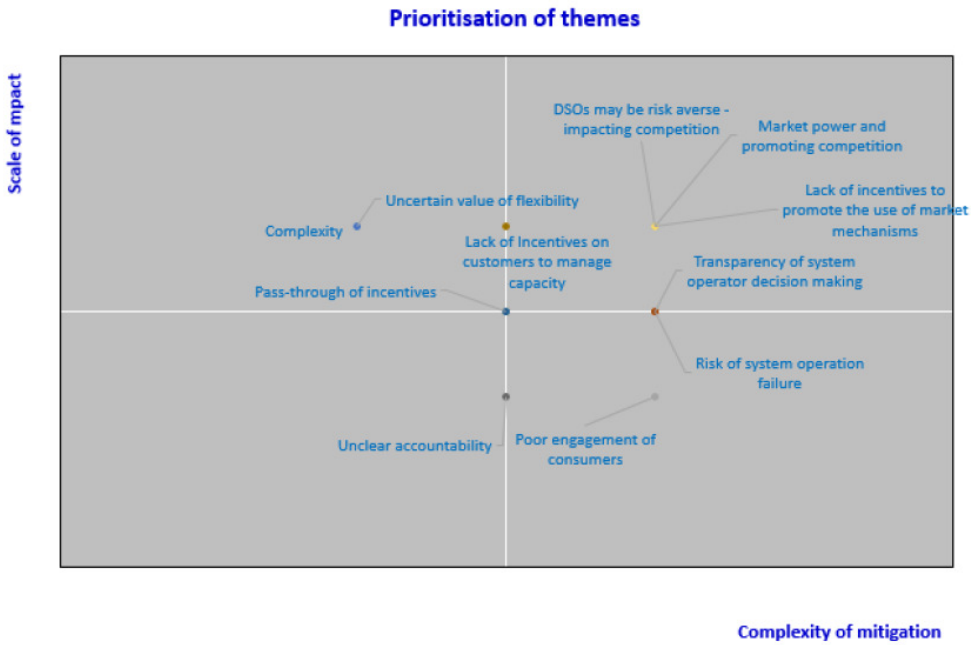
Q20. Do you agree or disagree with the list of potential unintended consequences identified in Section 4.5, and their prioritisation and potential mitigation as charted in Figure 20? If you disagree please explain your reasoning. Should the Open Network project progress further work on unintended consequences?

Six key themes for unintended consequences and risks identified:

1. *System operator conflicts;*
2. *Gaming and market power;*
3. *Operational integrity;*
4. *Distributional impact on consumers;*
5. *Network resilience and security; and*
6. *Risk of regret.*

It is unclear what potential mitigation is proposed, as this is not shown in Figure 20 (below) – this simply outlines the prioritisation of themes (on the basis of scale of impact and complexity of mitigation).

Figure 20 Prioritisation of unintended consequences/risks themes



There are a lot of uncertainty and co-dependent issues highlighted in Figure 20 – i.e. uncertain value of flexibility [particularly at the LV level] and poor engagement of consumers.

We have significant concerns which were expressed in the response submitted to the Smart Systems Flexibility Plan regarding the conflicts of interest between the DNO / DSO functions and also the wider use of network assets in flexibility markets (and their potential to distort competitive, commercial markets):

"We believe this lack of a clear, mandated requirement to remove any potential [and actual] conflict of interest risks undermining the broader intention for DNOs and potentially in future, DSOs from acting as neutral market facilitators. Ofgem and BEIS must clearly signal the intent and requirement that there are no opportunities for any part a regulated business (or its direct subsidiaries) to provide services procured through market based tenders (or equivalent) to itself or another regulated business, given the risk for distortion and undermining competitive markets.

We believe it clear that DNO participation in ancillary service markets is contrary to the ongoing work of Ofgem and the EU in market design and unbundling regarding regulated network operators participating in commercial activities and we reiterate here our concerns regarding the CLASS innovation project's participation and commercial success within recent FFR tenders. While DNO assets may have the technical capability to provide ancillary services to the ESO, we require Ofgem to provide clarification that that capacity should only ever be accessed as a last resort as a formal 'DNO Demand Control 'event when all other Response and Reserve (provided by the market) has been exhausted – see example of DNO Demand Control enactment (under Grid Code OC6.5.3) on 11 February 2012.

The issue of DNO / DSO responsibilities and the lack of clarity on funding, incentives and responsibilities remains a significant issue and risk. Whilst we recognise the wide range of work and effort currently being undertaken by ENA with regards to its Open Networks project, we remain concerned at the progress and direction being taken, particularly with regards to the opportunities to consider stakeholder input from consultation before the next stages are undertaken.

We note in particular the consultation in September 2018 into the proposed 5 worlds and the lack of a modelled scenario for a separation between the DNO and DSO functions (similar to the separation on the TO and ESO functions), as well as the constrained timelines that meant stakeholder feedback was unlikely to be reflected in the later Impact Assessment . We believe that to be a significant oversight and noted this (alongside other concerns) in our response to the consultation"

If the Open Networks is to consider further work on mitigation on unintended consequences, it is vital that there is broader stakeholder engagement to help consider the issues and potential ways to assess, and mitigate any measures to avoid / remove unintended consequences.

Unintended consequences occurring due to conflicting actions across network areas must be fully explored ahead of the implementation of any of the future Worlds to ensure that the ESO retains the ability to deliver security of supply.

We would also encourage OFGEM to avoid any further delay and rule formally on the position of Distribution Network Owners providing Ancillary Services to National Grid, which we would consider to be an anti-competitive Red Line. While we accept that some recent Ofgem funded developments (supported by LCNF/LCNi/NIC initiatives) have provided novel, replicable network optimisation solutions it is important to distinguish between (a) active network management solutions dynamically 'self-healing' circuits (to form HV rings) and re-route power around local failures e.g. the Capacity to Customers project and (b) other more 'commercial' initiatives such as Electricity North West's CLASS project which intends to provide MWs of response in to ESO Ancillary Services contracts and therefore undermine competitive markets.

The functionality developed under projects such as CLASS is welcomed but should only ever be used as a last-resort in the event of an OC6 Demand Control instruction. Any use of DNO-owned assets in markets introduces the risk that development of DER for Ancillary Services will slow/cease as the DNO provider's return in investment model differs massively from any other asset owner. Permitting their use will ultimately mean that Ofgem and the ESO have "too many eggs in one basket" in the event of a major OC6 event i.e. in the event of a major disruption where would the response / reserve come from if the capacity provided by the markets are unable to compete with subsidised DNO assets?