

Energy Networks Association
Open Networks Project

Consultation on Future Worlds Impact Assessment report 2019

3rd May 2019

Dear Open Networks Colleagues,

I am responding to the Open Networks: **Future Worlds Impact Assessment report** consultation on behalf of the **Future Power System Architecture (FPSA) programme**.

The FPSA programme (a collaboration between the Energy Systems Catapult and The Institution of Engineering and Technology and sponsored by Government) was established in 2015, initially to identify the Whole System functions that will be needed to support the energy transformation.

The FPSA programme has closely monitored the progress of the Open Networks Project and has a particular interest in WS3 and 4. We are pleased to be responding to this important consultation and attach our responses to this letter. We hope our comments are helpful. Of course, we would be delighted to follow up on any particular points.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Simon' followed by a stylized surname.

Simon Harrison, FPSA Chairperson

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Response from the Future Power System Architecture (FPSA) Programme

*At several points in the below responses, the importance of 'whole systems' considerations are referred to. Different interpretations of this term are currently used across the energy sector, so for clarity our definition of **Whole System** includes:*

- The physical power system equipment;
- Consumers and the equipment they control;
- The touch points with other energy vectors e.g. gas, heat and transport;
- Associated communications, data and digital platforms;
- Power system regulations and market rules;
- Commercial transactions, business models and contracts.

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.

The Future Power System Architecture (FPSA) management group is an expert group which oversees the FPSA project. FPSA is an ambitious effort involving dozens of industry professionals academics policymakers and stakeholders to assess the challenges to be faced in the electricity system by 2030 and to identify new functionality required.

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?

We generally agree with Baringa's interpretations, but with one important caveat. The Worlds themselves, and also Baringa's interpretation, seem very much built on a traditional industry perspective. On behalf of the FPSA we made the point at the Advisory Group interaction with Baringa in Q4 of 2018 that there was probably other value to be identified and/or released from the end customer perspective as the Worlds do not really consider the wide range of benefits to customers from the digitalization of energy. It could be argued that given the relative nature of the costs and benefits it might not matter, and certainly this is true when just considering traditional industry costs and benefits. But the industry only exists to provide services to customers -and if customers can gain more utility at lower cost from one world over another, this seems to be an important consideration that is lacking in the overall analysis.

Questions that could guide areas that should be explored in more detail might include:

- What are the likely barriers stopping any of these worlds from delivering the desired outcomes intended?
- What are the benefits available to customers from their ability to optimize their own energy use?

- Are there market structures other than the ones highlighted that might provide a more equitable and efficient outcome for all stakeholders, and what might these be
- From a Whole System perspective why is the regulated market only considered as the solution in all worlds? In other words, from a Whole System perspective other options might emerge.

We see the above as key, the comments that follow are second order. Bearing this in mind, aside from the above we do generally agree with the answers to the closed questions that have been posed and the analysis undertaken on this basis. In particular we agree that the increased use of time of use and locational price signalling in World C is compatible with the other 4 Worlds as the need for flexibility procurement isn't resolved by this alone.

In terms of the impacts of the Worlds relative to one another, one potential area of differentiation that could be more explicitly explored is how each World- apart from World C- may enact locational signals to better optimise the location of DG and drive down network costs. Though World C can be enacted alongside the other Worlds, the different SO structures may have further impacts on the strength and clarity of these locational signals.

The way World B offers flexibility first to DSOs seems to unnecessarily reduce differentiation between the Worlds - it misses the co-optimisation one might assume arises from the TSO and DSO's working effectively together, with the associated trade off being the additional relationship complexity.

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.

"The key conclusion is that there is no Future World which excels across all criteria but there are different relative strengths and weaknesses of each". This is sensible and reflects the real uncertainty in the right course of action, and the use of pathways to explore options for making decisions as more information is revealed is useful, though we have some comments about the specific pathways shown (these are in our response to question 4).

The "most important objective" (Table 1) which determines the optimal World will in reality depend on public policy, which in turn should be driven by a wider system approach. Though the impact assessment does a good job of detailing benefits and costs associated with the network, some of the possible SO structures may better complement the technological and commercial evolution of flexibility business models which in turn unlock greater societal benefit. This is alluded to in the report in section 3.2- *"A broader whole systems assessment may be more appropriate at a later stage, once the Future Worlds have been developed in more detail."*, where, as we state in Q2, we would expect broader whole systems to include technical, commercial and societal factors especially beyond the meter as well as across energy vectors. Such a whole systems approach has the potential we believe to materially change which world becomes optimal.

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

It can be argued that the real starting point is closer to world D, as the DSO transition is still in its early stages and DSO procurement of flexibility is not widespread, whilst the ESO has existing experience and expertise in procuring and using flexibility. With this as the starting point instead, there's a natural progression to World B, through the growth of

DSO led procurement, and from there to World A or World E. We would agree that there is time and scope to transition between Worlds and hence optionality at different stages in the future, and that World C can be treated reasonably independently and combined with the other Worlds.

The pathways diagram could also be strengthened by an accompanying high-level description on the regulatory and policy changes that may be necessary to access different paths.

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

Q4 response covers questions 4-6

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

Q4 response covers questions 4-6

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?

We believe whole system (including beyond the meter and cross vector) implications should be prioritised to inform optimal decision making for the whole energy system. For example, developing a richer understanding of how electrified transport and heat could be best integrated is an important aspect of this discussion- a future work piece may find the distributed nature of EV demand means there is currently uncaptured benefit from moving more towards World A, for example.

We agree the future work pieces outlined in the report would all be valuable additions to the general debate. Particularly topical and useful would be understanding the impact of Ofgem's charging and access work on system operation.

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

See response to Q7.

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?

An assessment of total energy benefits due to changing customer behaviour should be included in the cost benefit assessment. Customers may be expected to seek to optimise their energy use once they have greater control and engagement with the whole energy system.

We believe that there will be differences in the costs of the different worlds. For example, because the peak demand on parts of the distribution network is not synchronised with the national peak, time limited resources such as Demand Side Reduction or V2G may not be available for both peaks. This is likely to drive different solutions depending on whether the DSO or ESO takes the lead on balancing or an attempt is made to take a whole system view.

The term 'system operation benefits' is broader than the benefits discussed here- for instance there are complexity, clarity of accountability, risk, optionality and timescale (the ability to deploy sooner) benefits- here we are just talking about monetary benefits that are realised directly through changes to system operation. Clarification in language and emphasis might help better focus the debate, given the subjective discussions around qualitative benefits in this report are potentially more certain and as important as the figures derived for the monetary benefits.

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?

In the very long term, the pathways do still end up at different points with different relationships, information flows, running costs, and different priorities that could still drive different outcomes and different allocation of benefits. For example, the wider optimisation achieved by world B could be expected to deliver lower costs than worlds A or D. However, due to the lack of certainty of the future state in 2050, assumed benefit levels at that time should be heavily discounted anyway, so the focus of the Impact Assessment around earlier years, and optionality, seems sensible.

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

"We did not seek to quantify the wider benefits to the energy system as this would have added considerable complexity and required further assumptions to be made on the Future Worlds. We did not feel this would be appropriate for an initial Impact Assessment and would make it more difficult for stakeholders to engage with the approach and challenge the results. *A broader whole systems assessment may be more appropriate at a later stage, once the Future Worlds have been developed in more detail.*"

We agree with the italicised statement above and would emphasise the importance of understanding the wider benefits and costs of the DSO transition on customers, on different energy vectors, industries, and new players.

"the absolute numbers we have produced should not be directly compared with other more detailed studies on the benefits of DSO"

It is important the reader understands the above point, therefore perhaps there is spurious precision in the quantified benefits. Some of the underpinning assumptions for generating the benefit and it's phasing through time are necessarily high level and thus the actual figures are of the right order, but the credible range is the more useful result than a single figure.

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?

It seems a reasonable approach. However, a more accessible and potentially useful presentation would be a ranking of the Worlds against the four monetised benefit pools with a summarising explanation of the drivers of relative performance.

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.

There is, as is to be expected from a high-level assessment, a large degree of uncertainty and range around the plausible monetised benefits. The approach to derive these ranges is sensible.

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.

Agree, a sensible and detailed breakdown of the costs that will be incurred in implementation with appropriately large uncertainties/ranges.

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

It seems a reasonable approach.

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

It seems a reasonable approach.

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?

The selected 'most important objectives' could be expanded- 'minimised system costs' and 'maximised renewables usage' are two important goals that could be factored in (particularly in light of the CCC's recently published "Net Zero" report). Of those presented:

Decarbonisation of heat and transport: Agree

Ease of market engagement for existing flexibility providers: we do not think implementation of D would take relatively longer to implement, as discussed in Q4 response.

Lowest cost to implement and operate: Again, we do not think implementation of D would take relatively longer to implement. We would also highlight that there is large uncertainty around the cost.

Minimise structural change from today: We would argue World D is also a likely World for this objective, which would have different trade-offs- poorer information and use of flexibility at LV in the near term.

Transparent, fair, neutral markets: We do not necessarily agree that there is informational inefficiency with Flexibility Co-ordinators- could be a single body, as opposed to data being funnelled via multiple DSOs for example.

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 as a good framework for discussing and understanding pros and cons of the different worlds. We would caution against focussing too much on 'ranking' per se: ranking can lead to an unhelpful focus on a single approach whereas multiple approaches might be more effective, especially as relative attractiveness may change as a whole systems approach is adopted

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

We have not been able to undertake any analysis of this.

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 agree it is a worthwhile and valuable exercise. The text states it is mostly World 'agnostic', however especially in terms of complexity and accountability risks there would seem to be some differentiation. Cross vector risks should be considered more deeply- if EVs are a source of flexibility, that introduces a further layer of availability and access risks, which require communication with more stakeholders to be fully understood. Additionally, some of the Scale of Impact rankings on Figure 20 could be further amended or justified- for example "poor engagement of consumers" seems likely to have a very substantial impact from the standpoint of losing access to large amounts of flexibility that increase costs for all. Consideration could also be given to whether the issue is "poor engagement of consumers" rather than "failure to offer consumers a compelling proposition". More detail on these ratings would therefore be welcome.