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Re: A Smart, Flexible Energy System – A call for evidence

January 12, 2017

Dear Sir/Madam,

Uniper welcomes the Smart, Flexible Energy System call for evidence. Uniper is an experienced international energy company focused on power generation, energy trading, transportation, and storage, as well as a provider of specialist power engineering services. In the UK we own seven power stations comprising over 6GW of flexible installed capacity, as well as Holford underground gas storage site. As such Uniper is the fifth largest generator in GB and is making a major contribution to ensuring security of supply and providing a bridge to the energy market of the future.

Our key points in response to the call for evidence are:

- A stable market framework for procurement of flexibility will be important to provide clear market signals to providers of flexibility in the future.
- The market should be accessible to all forms of flexibility provider that is able to provide the service required on a consistent, technology neutral, basis and without distortions to competition.
- As the amount of smaller scale provider grows we are increasingly relying on them to operate the electricity network. The obligations and duties placed on these parties must be the same as all other market participants.
- There must be equality in transparency of market information across all technologies and between distribution and transmission connected providers.
- Once the new separate legal entity is established, it would be appropriate to consider the merits of an independent System Operator to promote and enhance an effective flexibility market.
- These are significant changes, which will take some time to design and implement. Implementation will need to be coordinated to ensure an effective transition that manages costs and continues to maintain security and quality of supply at the levels that are expected in GB.



Our focus in the call for evidence is on chapters 2, 3 (system value pricing, distribution tariffs, other Government policies), 5 and 6. Our responses to the questions in the chapters that we can contribute to are set out in the following appendix.

We hope that you find our response to be of help and we would be happy to discuss any aspect with you further.

Yours faithfully,
Uniper UK Limited



Appendix Response to Questions

Removing policy and regulatory barriers

Storage

Q1: Have we identified and correctly assessed the main policy and regulatory barriers to the development of storage? Are there any additional barriers faced by industry?

The results of the T-4 2016 CM auction indicate that there are no barriers per se to deployment of batteries and that the pace of change to a more flexible system is increasing. This is largely in part due to other well understood current market distortions that favour smaller distribution connected power sources over larger transmission connected plant.

The areas identified are a list of issues that need to be reviewed to consider any changes that may be required to fully integrate battery storage in to the market.

We would add to the list health, safety and environmental legislation and standards should be reviewed for battery storage. As grid scale storage projects are developed in size and technical complexity the risks associated with these facilities may well be typical of other equivalent types of large industrial plant, for example fire risk. In reviewing the regulatory framework for storage projects we think it would be prudent to extend this to ensure compliance with health, safety and environmental requirements.

Q2: Have we identified and correctly assessed the issues regarding network connections for storage? Have we identified the correct areas where more progress is required?

We are aware of the areas that industry is working on. We would note that a storage project is however no different than any other generation or demand project seeking to connect to a network and as such should not receive special status when seeking a connection.

Clarification and application of appropriate technical parameters through the applicable industry code is also important for storage, so that there is a full understanding of what requirements have to be complied with.

Q3: Have we identified and correctly assessed the issues regarding storage and network charging? Do you agree that flexible connection agreements could help to address issues regarding storage and network charging?

We are aware of the network charging issues that have been identified and agree that it is important that there is clarity on how storage should be charged and ensure that it is treated consistently within the Transmission and Distribution Charging Methodologies.

From a network avoided cost/time of use benefit there may be aspects to explore further with smarter distribution tariffs to recognize where a storage facility provides additional benefits. It may also be possible for other technologies, aside from storage, to provide benefits to a network in avoided capital expenditure or operational expenditure through use at different time periods. Where this can be demonstrated other technologies should also be able to benefit.



This would also extend to any flexible, perhaps less firm, connection arrangements and any associated discount to connection or use of system tariffs. If less firm access rights are created it should be recognized through the connection arrangements that compensation for loss of access or network unavailability would also be lower. How flexible connection arrangements, the value of relative certainty of service provision and revenue entitlement interact in the balancing market, a future flexibility market, as well as the capacity market in terms of ability to contribute to a stress event and associated de-rating factors will also need to be considered.

It is important that all users of a network are exposed to the costs they impose on use of that network. The issue of network cost recovery is not unique to storage and we would suggest is a wider issue, which we note Ofgem considered in its recent open letter. For example, we would highlight that Transmission connected generation is exposed to both generation and demand TNUoS, in the event that it should only import at time of Triad. There may be a case for considering how network costs are recovered from network users.

Equally with regard to BSUoS it is not clear from paragraph 13 of the call for evidence why standalone storage is particularly disadvantaged when compared to other technologies. We would look to a decision on CUSC Modification Proposal (CMP)250 in the first instance before considering further amendment to the BSUoS methodology. We would also bring to your attention other market distortions between different potential flexibility sources arising from exposure to BSUoS between GB and non-GB generation; where non-GB generation does not currently pay BSUoS it would be appropriate to consider removal of BSUoS from GB generation to ensure an effective market and competition in this area.

Q4: Do you agree with our assessment that network operators could use storage to support their networks? Are there sufficient existing safeguards to enable the development of a competitive market for storage? Are there any circumstances in which network companies should own storage?

We support network companies using new technologies as a way of avoiding costly network reinforcement. We do not support network companies owning and operating storage assets, which would be inconsistent with the unbundling rules. Network companies provide the physical route to market, it is not appropriate that they should also be direct competitors for projects and flexibility service.

Depending on the eventual model, the DSO or SO of the future will need to make more information available to developers to highlight where such requirements or opportunities may exist. If projects do not already exist in a particular area there may be a case for projects having the opportunity to access either a smarter distribution tariff/avoided capital expenditure revenue stream from the network owner or operator as appropriate. Alternatively, where development projects already exist a fully functional flexibility market may provide an appropriate investment signal/revenue stream.

Q5: Do you agree with our assessment of the regulatory approaches available to provide greater clarity for storage?

If the intention is to provide greater clarity and certainty of the role of storage and its place in the policy and regulatory framework, we would favour an option that more explicitly identifies storage as a category in its own right. On this basis either option c



or d would achieve this. If storage is assessed to be a subset of generation then option c may be the best solution.

For planning purposes in our view the installed capacity of the battery should determine what regime applies to it. This would put it in the same position as other technology types.

Q6: Do you agree with any of the proposed definitions of storage? If applicable, how would you amend any of these definitions?

Of the two definitions presented we favour the ESN definition.

Aggregators

Q7: What are the impacts of the perceived barriers for aggregators and other market participants?

Aggregators and other smaller flexible service providers are becoming increasingly important to operation of the electricity system and it is important that they are integrated into the market.

The interaction between aggregators and suppliers in terms of who owns the customers' energy is an area that will need to be considered in more detail in order to integrate aggregators in to the market. Whether an aggregator has to compensate a supplier for its exposure as a result of an aggregator's contracts with a customer and a party procuring its flexibility service and whether a supplier's energy balance position is corrected as a consequence of an aggregator's contracts being called on will need to be addressed. In either case it is important that the solutions should be market based and cost reflective, in that where provision of a service imposes a cost the consumer should see this.

To integrate aggregators in to the market, as well as other smaller sized flexibility service providers, it will be important that these parties have the same obligations as well as rights to access revenue streams in order to give confidence in the effectiveness of future flexibility markets.

We would highlight the importance of transparency of market information, in terms of location/identity, price, volume and utilization from all market participants. There is inequality of information provision across a number of flexibility/system services depending on whether a provider is visible in the BM or not (non-BM). This undermines effective competition as BM providers cannot see the same information from non-BM providers as a BM provider has to submit.

Consequently there is also a difference in cost base as non-BM providers do not currently have to invest in the same level of IT and communications infrastructure as BM participants in order to provide required market information. This will be necessary to verify provision of a service, enable payment for that service and to ensure that the consumer is getting value for money for a service that it will ultimately be paying for.

If there is a lower level of confidence on service delivery by a particular type of flexibility provider, there is a question as to whether the service should also have a lower value in a flexibility market? Demand Side Response and other smaller flexibility providers may be harder to verify accurate service provision under current arrangements and systems.



The limitations of all flexibility providers and respective technology capabilities should be recognised in any flexibility market design.

Q8: What are your views on these different approaches to dealing with the barriers set out above?

In our view change will only be initiated and implemented through a combination of the Regulator and industry working together to identify solutions and implement them in a coordinated manner. Integration of aggregators may be one workstream of a larger project to implement the flexibility markets of the future. This should be subject to a properly managed and visible programme so that the required changes are implemented efficiently and on a timely basis.

Q9: What are your views on the pros and cons of the options outlined in Table 5?

Once solutions are identified it will be necessary to give effect to these through appropriate licensing arrangements, changes to relevant industry codes and supplemental documents. Some of the solutions may be enabled through some of the changes to GB industry codes arising from the implementation of EU network codes and Guidelines.

Q10: Do you agree with our assessment of the risks to system stability if aggregators' systems are not robust and secure? Do you have any views on the tools outlined to mitigate this risk?

We agree that there is the potential for an aggregator with a larger volume of service provision to affect behaviour and stability of the networks, arguably in the same way as other individual larger providers. This underlines the importance of aggregators having robust IT systems, which do not provide 'back door' risks to operation of critical national infrastructure, and that facilitate the provision of equal market information to deliver an effective market and fair competition, and ultimately for the consumer to have confidence that the services it is paying for are being delivered and are value for money.

Providing Price Signals for flexibility

System Value Pricing

Q11: What types of enablers do you think could make accessing flexibility, and seeing a benefit from offering it, easier in the future?

We would look for arrangements that provide market and customer driven solutions with supporting systems to do that. We agree with the need to take account of whole systems costs such that a provider of flexibility is exposed to the full costs of its actions. In order to design this and in turn make it easier to access and offer flexibility, it may be necessary to go back to first principles to identify exactly what is needed and simplify the current broad range of services.

In this regard it will be necessary for the System Operator to review its current range of services and consider whether these can be simplified and standardised, in order to be incorporated in to a future flexibility market platform. Transparent products are needed, with associated terms and conditions that are developed across industry and not on a bilateral trial basis with individual parties, giving first mover advantage, before rolling



these out to the rest of the market. All new products should be offered to the market at the same time, to allow parties to compete for the opportunity on a fair basis.

A single platform that enables providers to offer and trade flexibility services that meet a buyer's requirements may enable parties to offer and access multiple services over different time periods. Whilst there may be a case for certain services to have some element of exclusivity, the ability to sell different services to different buyers in different time frames will be important to a well-functioning flexibility market.

Q12: If you are a potential or existing provider of flexibility could you provide evidence on the extent to which you are currently able to access and combine different revenue streams? Where do you see the most attractive opportunities for combining revenues and what do you see as the main barriers preventing you from doing so?

The more inherent flexibility capability there is in a particular type of technology the greater the range of its ability to offer different services in different time frames. Flexibility capability can currently be monetised through the BM, however individual Dynamic Parameters or capability that can be offered are not rewarded as an explicit product in the same way as existing ancillary services. This can restrict the ability to invest in enhanced capability if there is not sufficient revenue certainty to recover the cost of investing in a particular desired capability.

Q13: If you are a potential or existing provider of flexibility are there benefits of your technology which are not currently remunerated or undervalued?

As has been identified, inertia is currently a free beneficial by product from large scale generation. As seems to be increasingly the case, this capability is valuable to the system operator and therefore it should be rewarded.

A second by product of energy production is reactive power. This does have a long standing payment mechanism under the Connection and Use of System Code (CUSC). The System Operator and Transmission Owners do have a trade-off between procuring reactive power from network users or investing in their own reactive compensation assets under their price control. This trade-off needs to deliver the most economic and efficient outcome for this capability, particularly as the requirement is forecast to increase. The needs case for TO investment in these assets must be robust otherwise it would undermine any potential reactive power market.

In this regard one aspect to consider would be why a TO gets revenue certainty for reactive power assets, through a price control, but a generator does not. If an asset is already remunerated under a price control it should not be able to participate in a future flexibility market. New TO assets by contrast should be subject to the same market arrangements as other non-network providers of a particular service.

It is helpful that the analysis has identified a potentially optimum level of interconnector capacity. We would observe that the indicated interconnector capacity levels are against an assumed level of installed flexible capacity. The optimum amount of interconnector capacity may therefore be different depending on the actual installed flexible capacity mix. The actual value of a service could be eroded by changes in the market that are outside the providers control or associated assumptions that are made.

The EU and individual member states are also considering the implications of changes to flexibility markets considered in the call for evidence, this has two potential implications; the first that interconnectors may not be importing at full capacity at all



times, so therefore would not be available to deliver flexibility services at all times and secondly, that any difference in market arrangements on the two sides of the link may give rise to distortions in a GB flexibility market. Service provision is consistently valued.

Q14: Can you provide evidence to support changes to market and regulatory arrangements that would allow the efficient use of flexibility and what might be the Government's, Ofgem's and System Operator's role in making these changes?

The extent of the changes to the market and regulatory framework required to implement flexibility markets are significant. Government should set out the aims of the reforms, including any legislation that may be required to set out the framework for flexibility markets. Ofgem will be important to effect changes to the licensing and regulatory frameworks and to supplemental documents. The System Operator will need to review its current suite of system services and consider how these can be translated in to more market based products. Industry will have an important role in helping to shape proposals in to workable solutions that create investable arrangements, and support implementation, which could also involve market participants' systems in order to interface with any new flexibility platform.

Q22: Do you anticipate that underlying network cost drivers are likely to substantively change as the use of the distribution network changes? If so and what way should DUoS charges change as a result?

We agree that DUoS charges should be reviewed to ensure that costs and/or benefits that network users incur on the network are reflected in the charges they are exposed to.

Other Government Policies

Q25: Can you provide evidence to show how existing Government policies can help or hinder the transition to a smart energy future?

To enable an effective and competitive market for flexibility it is important that market participants are treated on a consistent basis, that they are subject to the same equivalent rights and obligations, including penalties for non-delivery.

Clarity on treatment of interconnectors going forward is one important area that needs to be resolved. Interconnectors are competing to provide the same services but are exempt from use of system and balancing charges. In order to provide the service they are making the same use of the network as other service providers. If they are network they would be paid through a price control for the services. They are no longer acting as transportation alone and are being rewarded for capability that is either located elsewhere or inherent in HVDC technology. In the transition they will increasingly be competing with other assets connected to the grid.

Consistent and robust application of emissions legislation is necessary if we are to enable a cleaner energy future. Government energy policy needs to be joined up in this regard. We noted that carbon price assumptions used are approximately half the level used in the impact assessment modelling in the coal phase out consultation. When performing analysis to underpin energy policy, Government needs to use a consistent set of assumptions to avoid unexpected outcomes.



Q26: What changes to the CM application/verification processes could reduce barriers to flexibility in the near term, and what longer term evolutions within/alongside the CM might be needed to enable newer forms of flexibility (such as storage and DSR) to contribute in light of future smart system developments?

As has been evidenced, storage and DSR is already capable of successfully competing in the capacity market. We note that a number of Rule change proposals have been raised with Ofgem around DSR and the integration of storage in to the capacity market. These industry led proposals consider areas of priority to the functioning of the capacity market. We think it would be right for these proposals to be considered first and any approved decisions implemented ahead of any further near term Rules changes. The Secretary of State's review of the capacity market in 2019 may provide an opportunity to consider longer term changes that may compliment an evolving flexibility market, as there will be more certainty at that point in time over the medium term developments to the electricity system.

One aspect of the CM that needs to be reviewed is the level of de-rating that applies to battery storage. The storage de-rating factor is currently based on historic performance of pumped storage. The capability of battery storage will inevitably be different. A separate de-rating value should be assessed for battery storage.

A System for the Consumer – Consumer Protection and Cyber Security

Q42: What risks would you highlight in the context of securing the energy system?

We have no direct evidence to cite on this but, as with our comments on aggregator systems, it is essential that market participants have robust IT systems, which do not provide 'back door' risks to operation of critical national infrastructure. The recent publicity around the involvement of foreign national state backed IT hacking highlights the need for the UK intelligence services to continue to support the energy industry by continuing to monitoring developments and providing advice.

The roles of different parties in system and network operation

Q43: Do you agree with the emerging system requirements we have identified (set out in Figure 1)? Are any missing?

This provides a good summary overview of the issues.

Q45: With regard to the need for immediate action: a) Do you agree with the proposed roles of DSOs and the need for increased coordination between, DSOs, the SO and TOs in delivering efficient network planning and local/system-wide use of resources?

We agree that there does need to be greater coordination between emerging DSOs, the SO and TOs both in terms of network planning and operation, given the challenges that the SO in particular has already faced as a result of changes to the patterns of use of the transmission system.

Q46: With regard to further future changes to arrangements: a) Do you consider that further changes to roles and arrangements are likely to be necessary?

We note the announcement of 12th January regarding the creation of a separate legal entity within National Grid comprising the System Operator. To facilitate, encourage and give confidence in the flexibility markets of the future, once the new separate legal



entity is established, it would be appropriate to consider the merits of an independent System Operator, in the context of the emerging role of the DSO, and a timetable for implementation that parallels any future flexibility market arrangements. A time horizon that is compatible with commencement of the next RIIO-T2 Transmission Price Control period may be an appropriate consideration.

Innovation

Q48: Do you think these are the right areas for innovation funding support?

We agree with the potential areas identified. Funding to support development of a flexibility trading/optimization platform may be helpful to initiate or bring forward an industry wide solution.