

## COMMENTS ON RIIO-ED2 METHODOLOGY CONSULTATION

### RESPONSE FROM THE UNIVERSITY OF MANCHESTER DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

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#### General

This response does not cover the full range of the consultation but covers aspects that impact the relationship between the Electricity Network Companies and the university sector or where there has been previous involvement or where there is a particular interest. As set out in previous responses it is believed that the continuing relationship between Network Companies and universities facilitated through the NIA in particular is critical to targeted research which benefits consumers through reduced costs. It also has the very important indirect benefits of retaining knowledge, expertise, training capability and the capacity to innovate in both the companies and the Universities.

#### Comments on the RIIO-ED2 Methodology consultation overview

#### Net Zero

##### OVQ3

A Net-Zero reopener mechanism is required to allow for the uncertainties that the companies face in providing the infrastructure required to allow for the Energy System Transition to Net-Zero. These uncertainties however are in timing rather than outcome and are largely in the gift of the government to control with the introduction of legislation and incentives. It is vitally important that that ED has a financial framework allows them to be able to invest in an efficient and timely manner to be the seamless enabler of the transition. To this end, a relatively generous baseline allowance with clear and observable business plan objectives intended to allow investment in line with or even ahead of need is required to ensure there is no gap in investment between ED1 and ED2, a critical time for exponential growth in the shift to a Zero Carbon economy. To make sure this investment happens rewards for companies beating targets within the baseline allowance are required as well as reopeners in the likely scenario of the allowance being insufficient to meet the need. In other words it is important that companies have an incentive to make all the investments required and not just to concentrate on making a few but very efficient investments to beat the baseline allowance targets. Uncertainty mechanisms can only be effective if the risk and reward are attractive to investors.

OVQ4: The companies must be able to react appropriately to the centralised drivers, such as government policy, legislation and incentives as well as the regional imperatives required to fulfil local Zero Carbon plans such as that put forward by the Greater Manchester Combined Authority and the hyper-local drivers relieving constraints on the low voltage network allowing the installation of low carbon technologies. This complexity requires a hybrid approach to funding investment.

OVQ5: Fundamentally the large scale take up of low carbon technologies that will require greater investment in the electricity distribution networks will depend on legislation for example the phase

out of fossil fuelled transport and heating and incentives that are centrally controlled. To this extent the greatest uncertainty is generated and controlled by central government. Ofgem as part of government needs to act in a co-ordinated way with other government departments to make sure funding is available to the network companies to enable the legislative changes and allow full advantage of incentives to be taken by consumers. It is therefore required that the level of baseline funding is appropriate to the implementation of government plans, and can be increased if required by changes in those plans.

OVQ6 In addition to, rather than alternatively to, a centralised forecast approach the DNOs should be able to respond to the investment requirements of regional plans which can provide a very high level of detail regarding future electricity demand. Examples would be the conversion of social housing and amenity facilities to electric heating or the provision of charging facilities for fleet vehicles. At the lowest level of detail it is possible for DNOs to identify circuits reaching capacity and provide targeted reinforcement as happens at present but potentially on a larger scale see OVQ7.

OVQ7 Monitoring data from low voltage networks is key in my view to efficiently responding to the challenge posed by the integration of low carbon technologies. As consumers respond to incentives on renewable heat, electric vehicles and local heat and electricity storage, the level, diversity and flexibility of demand will evolve. Understanding where local overloading is occurring through network monitoring should be the basis for allowing decentralised expenditure. For example where it is identified that a particular circuit is, or is likely to become, overloaded then monitoring can be used to confirm and justify reinforcement. A mechanism is required to ensure that this investment can be recovered at a reasonable rate of return. It is certainly true that DSO functions and time-of use charging can alleviate overloads, but it is vital that these are customer choices and not forced by network constraints. A 'touch the network only once' approach is required so that investment is allowed to increase capacity in line with standardised equipment ratings to a level where additional capacity is not likely to be required in the foreseeable future. To this end it would be inappropriate to introduce network utilisation targets or penalties, it would be sufficient to ensure that all network reinforcements were justified within a defined framework.

OVQ8 Broadly yes the LAEP best practice guidance is appropriate, but evolution of the guidance is probably going to be necessary as the energy system transition progresses and integration with LV network data availability plans is necessary.

OVQ9 As set out in answers 4-8 a combined approach is required responding to centralised changes in legislation and incentives, regional plans and localised conditions evidenced by improved network monitoring data. A network utilisation incentive is not appropriate because additional capacity is most efficiently added to the next highest standardised rating and needs to leave room for a 'touch the network only once' approach to upgrading. The final mechanism should however be tested to ensure that it does not incentivise investment in lightly loaded but cheap to uprate parts of the system. A very heavily used system is also one with high losses and low resilience, this should not be incentivised.

OVQ10 Although it is appropriate for innovation that will provide a reasonably certain return within the regulatory period, that is, an investment that can provide a commercial return at a rate consistent with the risk incurred, to be funded as BAU, it is not reasonable to expect companies to invest in innovation that does not fulfil this commercial criteria. To this extent it is important to the consumer interest that alternative mechanisms are provided so that the regulated and disaggregated nature of the privatised networks does not stifle innovation. It is therefore still vital that a well-funded innovation mechanism is in place and the NIA and SIF are welcome features of the methodology. It seems unlikely that companies will simply increase BAU funding of innovation as a result of restricting

the NIA, so NIA funding levels should be maintained at a level commensurate with the big long-term challenges faced by the industry, which are central to society and the economy as a whole.

OVQ11 Broadly yes, the SIF proposals are welcome as a mechanism for funding larger strategic projects to address the major issues in a collaborative way.

OVQ12 Yes, a consistent framework between RIIO-2 and RIIO-ED2 is necessary and should encourage cross-sector co-operation. A review of the guidance document may be appropriate as it is applied to ED2, but any changes should also apply if appropriate to RIIO-2.

OVQ13 Although particularly for DNOs EST and vulnerable consumers are likely to be the major concerns, the definition of these terms should allow for projects that are more broadly in the consumer interest. For examples projects that provide for innovation that enables zero carbon and care for the environment more generally for example through new materials and circular economy thinking on decommissioning. Another important area are projects that aim to prevent harm to vulnerable consumers from low probability high impact events by maintaining and improving network resilience even as components of that network are subject to ageing. Oversight of NIA expenditure, effective reporting and public availability of results are important aspects, post-project review is not productive (it is too late) except as an incentive to complete the required reporting. Proportionate third party review during a project would be more effective, and could perhaps be substituted for internal review when the project is a collaboration between network companies, SMEs and academic institutions.

OVQ14 Encouraging co-operation on innovation between network companies and wide participation in NIA projects should be part of the framework. A suggested method of furthering this aim would be to adjust the level of oversight downwards if there are many participating organisations.

OVQ15 Yes, provided there is a mechanism to require companies to collaborate where they have projects with similar aims particularly where the project consists mainly of a contract with a commercial organisation and the results and data may not be made fully available. The framework should make it unusual for a commercial entity to retain IPR generated in an NIA funded project.

OVQ16 Digitalisation and in particular the use of half hourly or more frequent loading information at an LV feeder level is certain to be a key enabler of the efficient transition to low carbon technologies through the understanding and potentially control of consumer behaviour as it evolves. As set out in OVQ7 this data can also be effectively used to provide justification for local network investment. Provision should therefore be made in the methodology to allow an appropriate return on the provision of such data. A framework needs to be established whereby DNOs are remunerated for the provision of data rather than as a return on investment in monitoring systems, this will allow innovation in the acquisition techniques, but it must be balanced by data quality requirements. For example where network loadings are low then data quality is less important than where the network is periodically overloaded and the data probably needs to come from a dedicated monitoring system. The provision of appropriate data triage and communication systems is vital and a cross sector approach is necessary.

OVQ17 The function of the DNOs in the future of DSO functionality is difficult to predict at present and because of the lack of vertical integration it may ultimately be simply the provision of technical capability in the network and data on that technical capability. The most significant challenge seems to be in enabling the adoption of low carbon technologies seamlessly without transferring costs onto vulnerable consumers unable to access the advantages of technology themselves. For example a consumer investing in PV exporting in the day and an EV importing overnight may be using little actual net energy but will be using the network intensively in effect as a battery, but a consumer with access

to neither of these technologies will pay potentially proportionally more for their use of the network as a result of the investment to allow the former to connect. It would not be reasonable to prohibit whatever use of the network consumers wish, but there must be mechanisms to ensure equitable pricing. This is not directly in the gift of the DNOs even in a DSO role and will need a co-ordinated national approach from Ofgem in setting price controls for consumers. For example adoption of certain LCTs by consumers could be contingent on the installation of half hourly metering and a tariff that penalises use at times when DNO overloads are happening. It seems that the provision of a system capable of providing DSO type services requires integration with suppliers and the adoption of half hourly charging and network monitoring at a very local level as well as co-ordination of ESO national level service provision from distributed resources. It therefore seems more appropriate to look at a mechanism for instituting DNO functions at a national level or at least to be able to co-ordinate DSO functions within the DNOs at a national level.

OVQ24 The intent behind a whole systems approach is welcome as an attempt to reduce the inefficiencies introduced by the arbitrary separation of transmission and distribution at 132kV. This is most keenly felt when connections for demand, generation and reactive support at the 50-100MW/MVAR level are considered. It is not clear that the proposed mechanisms will be effective considering that network companies will be driven to retain or pass on projects according to their financial return. Some higher level oversight of the process may well be required, possibly from an organisation with nationwide DSO/ESO responsibility.

OVQ30 referring also to the answer to OVQ17. It is important that connection charges do not prevent consumers adopting low/zero carbon technologies, changes in Access SCR to reduce up-front costs are therefore welcome. This could help facilitate innovation such as local energy networks, however it is important that increased network costs are not placed on vulnerable consumers as a result. The network pricing model therefore needs to become more sophisticated so as not to penalise for example an SME adopting an electric low carbon solution requiring an enhanced connection just because they happen to be in an area already with high network utilisation, without increasing costs for vulnerable consumers. Extending the integration of network costs into time of use (half hourly) tariffs is a possible mechanism.

OUTQ9 Yes a TTC incentive is required especially in the context of the energy system transition. It is not completely clear whether requests for a significantly enhanced connection for example as the result of the adoption of LCTs at a particular site would be part of the TTC incentive, it would be consistent if they were.

OUTQ16 Yes the GSoPs appear to be working efficiently.

OUTQ19 The importance of addressing the needs of vulnerable consumers is well stated and I believe undeniable. It is particularly important during a time of heavy investment and change that vulnerable consumers are not burdened with costs for improvement that they do not benefit from. It is important however to remember that improving the position of the fuel poor is not only the responsibility of the DNOs and equitable recovery of network costs is fundamentally done through energy suppliers and is in the gift of Ofgem to more directly control these costs.

OUTQ23 The existing approach appears to have driven the DNOs towards acceptable levels of unplanned interruptions and on that basis change is not required, however setting national targets should be a long term aim

OUTQ24 Although rejected as too complex, it would seem possible and desirable to work towards national targets for particular customer types, recognising that different DNOs have different

customer mixes. The improvements in network data and monitoring expected as digitalisation progresses should facilitate this approach.

OUTQ27 Planned interruptions can have a similar level of disruption to customers as unplanned ones so an incentive to reduce or at least control them is required, and the existing system appears functional.

OUTQ27 Moving to nationally uniform targets for particular customer types should be possible and beneficial as technology and data improves. The level of incentive should continue to make the use of temporary supplies attractive as a mitigation measure. Any change must not introduce a perverse incentive to reduce system maintenance.

OUTQ29 Updating VoLL according to the updated ENWL study would seem to be appropriate. At some level of actual customer VoLL it becomes cheaper to provide security in the form of backup batteries so as storage becomes more prevalent in the system there may be a case for a duration dependent VoLL figure.

OUTQ33 – 35 The gathering of data on the prevalence and impact of short duration outages should be encouraged ahead of a possible incentive. Technological advances are likely to diversify the impact of short duration outages (making some impacts worse and some less serious).

OUTQ44 The stated objective of allowing expenditure on maintaining network reliability as being between gold plating and neglect is correct, but hard to achieve. The overall framework has merit for larger more accessible assets where a suitable health index can be determined at a proportionate cost, but for many DNO assets this is simply not feasible. The length of the price control and the business planning time ahead of it are well beyond the technical timescales for the identification of plant in need of replacement on a deterministic basis. An alternative approach is suggested based on the average expected lifetime of particular assets so that DNOs are funded to replace the worst assets in any particular period commensurate with the expected lifetime and show by post-mortem analysis that their lifetime assumptions are correct. The NARM proposed approach although functionally elegant, unfortunately ignores the reality that present technologies and methods lack the capability to identify and predict the condition of plant over such long timescales. The mechanism should allow network investment to reduce the criticality of plant by selective reinforcement as well as by reducing risk with like for like replacement to minimise overall costs.

OUTQ45 Workforce resilience and investment in training and the UK training and knowledge acquisition supply chain is vital for the future of the industry and the country. A specific incentive may be hard to establish but the overall settlement must take into account the costs of investing in the workforce of the future at all levels and directly or indirectly incentivise this behaviour.

OUTQ48 Yes a working group to determine the need for investment in the networks in response to climate change is necessary, preferably established at a UK level. It would additionally be desirable for this group to look at other non-climate change related low probability high impact events.

OUTQ57 Although network companies have strong internal environmental statements and objectives, the implementation is ultimately commercially driven and so cannot be optional. Effective business plan requirements and sufficient baseline funding are necessary but not sufficient.

OUTQ58 Particular incentives on SF6 use/leak reduction and explicitly allowing/requiring loss capitalisation calculations in determining efficient expenditure on new low loss equipment are required.

OUTQ60 Yes reopeners for all legislative changes with a material impact on the networks are required.

