The Association for Decentralised Energy

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Bringing Energy Together

Response: Assessing the efficiency of Great Britain's energy infrastructure 9 April 2015

The Association for Decentralised Energy (ADE) welcomes the opportunity to respond to the consultation on Ofgem's draft report *An assessment of the energy efficiency potential of the gas and electricity infrastructure of Great Britain*. The Association is the leading advocate of an integrated approach to delivering energy locally, designed around the needs of the user, including through combined heat and power (CHP), district heating and demand side energy services. The Association has more than 90 members across the supply chain in these sectors.

Distributed generation

We welcome the recognition in Chapter 4.1 of distributed generation's value in reducing losses by reducing the requirement to transfer energy over large distances. We also welcome the Chapter 4.3 assessment that this increase in distributed generation means the power flows over circuits, and therefore the losses on those circuits, can fall to zero when generation matches demand.

We agree that there is a need for more active management of distribution networks to better manage these flows. This management can be achieved through smart technologies and demand response, as noted, as well as through the better use of existing dispatchable assets on the distribution network, such as CHP.

We welcome the recognition in Chapter 6.2.2 of the important role that distributed generation can play in providing services to improve network management, including reducing losses. However we are unsure why Chapter 6.1.7 recognises the value of distributed renewable generation to support substation auxiliaries, but not other forms of distributed generation such as gas CHP.

The role of CHP in reducing losses on distribution networks

CHP provides a particularly important role in helping to improve distribution network management and loss reduction, as it is fully dispatchable, whether fuelled by gas, biogas or biomass, and is therefore able to respond to market signals. There is approximately 6 GW of CHP capacity, of which more than 3 GW is connected on the distribution network.

In contrast to power stations, which have conversion losses of between 50 to 70 percent, CHP generators are certified to operate at above 80% efficiency. For example, CHP plants located on district heating schemes are able to generate electricity in response to market signals, and capture their generated heat and save it for future demand, integrating the heat and electricity systems to improve overall system efficiency. Similarly, because CHP generators are required to meet a local energy user's heat demand, they are always sited close to that demand.

It is important to further recognise that through their higher generation efficiency of heat and power, in contrast to generating these separately, CHP are able to reduce the relative amount of system fuel demand, reducing demand on the gas networks. CHP are required to reduce at least 10 percent of fuel demand compared to separate generation and can reduce fuel use by up to 30 percent.

The role of CHP in reducing system losses, both in better balancing local demand and in improving overall system efficiency should be more fully recognised within the paper and in the final recommendations. For example, Article 15.7 of Energy Efficiency Directive specifically notes that *"Where appropriate, Member States may require transmission system operators and distribution system operators to encourage high-efficiency cogeneration to be sited close to areas of demand by reducing the connection and use-of-system charges."*

Charging for losses and congestion

We welcome the recognition in Chapter 7.1 that locating generation far from demand increases network losses, and that the growing role of embedded generation can lower transmission losses.

However, we would raise a concern that the draft report does not then consider the opportunities to strengthen these impacts and reduce losses through network incentives. We would specifically note that there is no recognition in the paper on the impact that charging methodologies and how those methodologies impact the geographical location of grid connections.

However, Ofgem recognised in its March 2015 letter that "locational pricing should not be ruled out" and that "locational signals can be provided through a range of channels, including Balancing Services Use of System (BSUoS) charging, losses, transmission charging and the separation of the market into different bidding zones ('market splitting')."

The lack of consideration for losses or congestion in transmission charging reduces the value for a user to site closer to demand, resulting in fewer drivers for more efficient energy use. Similarly in Chapter 4.1, while the report recognises the value of lowering network utilisation, it does not recognise the potential value of congestion charging in helping network utilisation, as reducing the time that the network is near capacity will reduce losses.[1][2]

Demand side management

We welcome the recognition demand side response's value in reducing distribution network losses in Chapter 6.3.2. However, we note that while Chapter 6.2.2 recognises that DNOs are not precluded from entering into contractual relationships with DG operators to provide ancillary services, a similar recognition should be provided for demand side response-led services in 6.3.2.

We are further unsure why Chapter 7.3.3 recognises the "significant potential benefit in terms of reducing network peak" from demand side management, but then argues it is not "within the control of the transmission owners". While control of demand is not within the control of network owners, National Grid is already accessing these resources for other network management aims by putting in place services such services as the Demand Side Balancing Reserve, STOR, and Firm Frequency Response. We would see no reason why such or similar mechanisms could be used to help reduce network peak and network losses.

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[1] Article 15.4 of the Energy Efficiency Directive specifically notes that "Member States shall ensure the removal of those incentives in transmission and distribution tariffs that are detrimental to the overall efficiency (including energy efficiency) of the generation, transmission, distribution and supply of electricity or those that might hamper participation of demand response, in balancing markets and ancillary services procurement. Member States shall ensure that network operators are incentivised to improve efficiency in infrastructure design and operation, and, within the framework of Directive 2009/72/EC, that tariffs allow suppliers to improve consumer participation in system efficiency, including demand response, depending on national circumstances."

[2] Evidence on these benefits can be found in the recent Competition and Markets Authority analysis, as well as an analysis performed by the University of Exeter.