Waiting for dedicated spectrum for utilities' private networks could delay net zero ambitions

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Telecoms solutions must evolve to meet the needs of smart utility systems

Many utilities worldwide have started working towards their goal of reaching net zero carbon emissions by transitioning to smart utility systems. However, this transition is complex. The telecoms solutions for some utility networks need to evolve to be able to communicate with millions of devices instead of just a few thousand devices. The range of applications within a smart system has also increased, and these applications have varying requirements. For example, some parts of the utility network only need to be monitored periodically, whereas other parts require near-instantaneous control. Introducing this range of requirements across the whole footprint of a utility network, as well as 'deeper' into the network itself (that is, closer to the customer premises), increases the complexity of the telecoms solutions required. The challenge to design suitable telecoms solutions is further exacerbated by uncertainties about which applications are needed because many are still undergoing trials and have yet to be proven at scale.

Analysys Mason is currently working with an energy utility to develop an evolution strategy to ensure that their telecoms solutions are capable of meeting the needs of eleven smart energy applications, some of which have yet to be proven in trials on the power network. The use of a dedicated private network (for example, using devices and infrastructure aligned to the 3GPP LTE specifications and deploying as a private LTE network) is viewed as the optimum solution, particularly in the context of having full control of the network and its level of resilience. However, access to spectrum to deploy a private LTE network at scale is a key barrier. Indeed, it may be many years before dedicated spectrum that is suitable for nationwide deployment becomes available, if at all. Alternative approaches for the case when nationally dedicated spectrum is not available, perhaps using a hybrid network approach with a combination of on-site and mobile public network assets, should therefore not be ruled out.

Certainly, the strategy needs to allow for the evolution of the telecoms solution so that it can adapt to an alternative option, if necessary. In this example, Analysys Mason is developing a cost model to help the energy utility understand the total cost of ownership (TCO) of different private and public network options.

Investment risk, governance and cost of delivery are important considerations

Utilities that wish to follow the private network approach using dedicated spectrum must consider how the market in any given jurisdiction will approach investments in private networks. The delivery of a private network comes with risks and obligations and, depending on the structure of the market (for example, the amount of sector competition and the geographic overlap/contiguity), governance may be a critical success factor. In the UK, for example, the geographic boundaries of utilities in each sector (electricity, gas and water) do not overlap. Dedicated spectrum for use by utilities in the UK is under consideration, but it is not clear how a

private network might be delivered, who will invest to build it and how it will be managed. Furthermore, the TCO for a 15–20 commitment, for example, does not seem to have been established. These factors will play an important part in any decision to allocate dedicated spectrum, particularly when, as in the UK, the spectrum that the utilities are interested in is already in use by other parties. In other countries where dedicated spectrum has been successfully allocated to utilities (such as Poland, Germany and Ireland), the spectrum was not already in use or was relatively easy to free up.

Therefore, for countries such as the UK, robust analysis about the TCO of building private networks and the benefits that this provides, along with clarity about the delivery approach and commitment to invest, is essential to enable the successful award of spectrum that is dedicated for use by utilities.

Timely action is critical to achieving the status of 'net zero'

Mobile network operators' (MNOs') public networks are a key alternative to private networks with dedicated spectrum. MNOs argue that they can offer utilities solutions that have a long-term roadmap and use the spectrum more efficiently than private networks would. However, utilities are sceptical that acceptable levels of resilience would be provided. The opposing views of MNOs and utilities create tension, and regulators and policy makers have the challenging task of finding the right balance between the two positions. The enormity of the net zero goal means that it is vital that deliverable plans are put into action as soon as possible.

The challenges outlined in this article are important for utilities, national and regional governments, telecoms regulators, utilities regulators, fixed and mobile telecoms operators and investors. Analysys Mason has undertaken numerous telecoms options appraisals and has used our deep market insights and modelling experience to offer independent and pragmatic recommendations to resolve complex issues. For further details about how Analysys Mason can support you with the utilities industry challenges and private network opportunities outlined in this article, please contact Ian Adkins, Principal.