Your response

Question	Your response
Question 1: Have we correctly identified the key changes in the utilities sector that could lead to additional spectrum requirements?	Confidential? – N In order to meet Net Zero and deliver on our communities' ambitions, our sector will require access to multiple different communication technologies interlinked with each other. For SSEN-D to continue to ensure a stable, safe, and reliable electricity grid in a changing world, SSEN-D will have to deal with the increase of digital assets for the purpose of monitoring, protection, and control. More communication devices will need to be deployed and the impact of this means a rapid increase in data points required. For this very reason, we need access to suitable spectrum, or the automation of the distribution system will just not be possible in the1imescalees set out. SSEN-D believe that Ofcom have acknowledged that there are 5 candidates for spectrum bands available for potential usage by the ENO's (Energy Network Operators), as DNO's (Distribution Network Operators) continues their transition to DSO (Distribution System Operators), these bands come with their own complications and will all need some network adjustments to suit the needs of all spectrum users.
Question 2: What alternative communication solutions might play a role in meeting the future operational communication needs of the utilities sector, alongside or instead of additional spectrum for a private network?	Confidential? – N Over the air technology is paramount to meeting Net Zero. Compared to Fibre installation it is less onerous and less expensive to deploy when allocated in the correct area. We also need to point out that If Spectrum is allocated at 450 against 1900, it would be 4 times less expensive to deploy directly due to

	propagation characteristics and the resulting infrastructure cost. Undoubtedly, technology is a factor in deciding what method is used, for instance we may use microwave links and fibre to provide low latency communication for tele-protection, but we are also required to control our rural assets and for storm response where that type of technology is not suitable due to its deployment cost. In short, Spectrum allocation and a pLTE wireless network would form part of the overall communication solution. Options were explored with the GemServ studies which showed that public cellular networks have not been designed to be autonomous to mains power failure and the nature of their infrastructure is not adaptable to this requirement as it will not meet the specification/requirements for Blackstart compliance (Black Out) which all ENO's are held to.
Question 3: Are there any other spectrum bands we should consider for use by utilities?	Confidential? – N Ofcom have captured the relevant bands, in particular the sweet spot of 400-470 MHz with an emphasis on 3GPP designated bands below 1GHz. All ENO's must be careful, the higher the frequency the bigger the infrastructure cost incurred by electricity customers. This is due to propagation characteristics. In our North of Scotland region, the natural topography means that lower frequencies are desired, given the existing challenges associated with deploying infrastructure in remote regions. We also must be careful not to isolate ourselves from equipment manufacturers and their direction of travel, (Currently 450Mhz) large deployments in Europe at 450Mhz has created opportunity to manufacture equipment for vendors, if GB focuses only on higher frequencies, then chip manufacturers and suppliers may not see the benefit in producing equipment for what is a relatively small return.

Question 4: Do you have any comments on the three bandwidths we have considered that might be necessary to support a private network for utilities? Please reference our capacity analysis in annex 7 where relevant.	Confidential? – N SSEN-D believe further analysis is required between ENO's & Ofcom as 450Mhz is the preferred option, but it will bring challenges also as well as looking to utilise the 700Mhz if available.
Question 5: Do you have any comments on our approach to examining each potential candidate spectrum band, including the factors relevant to assessing suitability, and the capacity and coverage analysis provided in annexes 7 and 8?	Confidential? – N SSEN-D believe further analysis is required between ENO's & Ofcom as we require Radio Frequency propagation studies to be carried out at the proposed allocations in order to find out where we need and give coverage and what the likely cost of deployments may be. This will enable us to make decisions around what/if we share with other DNOs.
Question 6: Do you have any comments on our overview of the 400 MHz band in NI? Please consider the specific factors we have discussed in your response.	Confidential? – N This band would align with the spectrum award in the Republic of Ireland, this band does present a co-ordination risk in that agreement would need to be secured with Arqiva / Airwave to the lower 2 MHz alongside an access arrangement to the upper 2 MHz with the PSNI – neither of these outcomes are a given and present considerable risk / uncertainty to the band.
Question 7: Do you have any comments on our overview of the 450 MHz band in GB and NI? Please consider the specific factors we have discussed (including the coexistence analysis in annex 9) in your response.	Confidential? – N In terms of the assessment of the individual bands, the approach adopted by Ofcom is sensible, however, we know that the band is heavily utilised within the UK as we deploy the bands in reverse order. The UK band plan have Uplink and Downlink reversed based on the rest of Europe but will have issues with potential interference depending on the weather in the South/South-East of England which helps aid the harmonised plan for this band. It offers better equipment eco systems as it is adopted in other countries today.

Question 8: Do you consider that changes in the spectrum environment for the 450 MHz band mean that there is a case for re-examining whether this band should be reconfigured in the UK to align with the harmonised band plan?	Confidential? – N There is a massive gain in reconfiguring the frequency plan as a harmonised band plan for the United Kingdom and European Continent. SSEN-D believe that Ofcom should implement these changes as they will help the spectrum/bands to be proportionately aligned and will create further space for the ENOs (if successful) to utilise. We also believe that the realignment would take more than 5 years and has been considered since 2017 with no movement to date to complete migration of the narrow bands for freeing up spectrum for others with potential that ENOs could have access in less than 5 years
Question 9: Do you have any comments on our overview of the 700 MHz band in GB and NI? Please consider the specific factors we have discussed in your response.	Confidential? – N Ofcom note that this band has been designated for Public Protection and Disaster Relief (PPDR) but also acknowledge that this does not prevent the band being utilized for usage. This is a designated 3GPP band and the developing ecosystem is aligned to the PPDR community. Ofcom therefore conclude that this will make devices expensive, although there is good alignment between the operational needs of the PPDR community and those of Critical National Infrastructure (CNI), so this could be considered a positive. JRC are liaising with third parties to understand the progress being made with the device ecosystem and the potential for this band to address the needs of the CNI community. Ofcom has identified the potential for co-existence issues with adjacent uses, in particular the SDL service, although we are exploring with the vendor community the extent to which SDL may never be deployed due to a lack of consumer devices. In the event that SDL were to be deployed we will seek to understand the usability of this band for CNI purposes.
Question 10: Do you have any comments on our overview of the 800/900 MHz band in NI? Please consider the specific factors we have discussed in your response.	Confidential? – N This is not a 3GPP Band and as such would not be a target for development, there is no correlation with the rest of Europe for this band. There is no, clearly available eco system of hardware vendors for the frequency range under consideration.

Question 11: Do you have any comments on our overview of the 1900 MHz band in GB and NI? Please consider the specific factors we have discussed in your response.	Confidential? – N SSEN-D are aware that the JRC (Joint Radio Company) completed a consultation exploring the future use of unpaired 2100Mhz (1900-1920Mhz). In it, the JRC noted -There is not a clearly available ecosystem of hardware vendors for the frequency range under consideration - this would inhibit (possibly completely) any actual deployments. As a result, SSEN-D find that this band is not suitable, Ofcom need to examine it further to ascertain the Mobile operators needs for future deployments as these operators could be seeking additional spectrum as the cost of deploying any infrastructure in this band would be prohibitive and likely have us looking at cheaper and less suitable alternatives.
Question 12: Which band(s) do you consider we should examine further with a view to developing consultation proposals to enable their use in a private network, if this were needed? Please reference the factors we have considered where appropriate and provide separate answers for GB and NI if relevant.	Confidential? – N The bands which are of interest and relevant to addressing the Energy Network Operators (ENOs) needs are; 400MHz, 450MHz and 700MHz and we encourage Ofcom to focus their future work on these bands. 400MHz: potentially available in NI but subject to co-ordination risk, i.e., commercial agreement with Arqiva / Airwave and shared access with PSNI. Whilst access in GB is complicated by Smart Metering / Airwave use and Home Office applications. 450MHz: there are a range of users in the band, including the utility networks, this band is a focus for energy network operators on the European continent and it is anticipated that the widespread deployment of LTE on the continent will cause disruption to radio systems in the band due to the reversed frequency arrangement ultimately sterilising the band over the long term. There is a potential win-win in the adoption of this band for utility network operations which included a clearance and re-assignment of the band albeit a long-term initiative that would need to be aligned with alternative / additional spectrum access in the short term.

	The 700MHz band is available and ready to be deployed subject to the visibility of the progress with the developing ecosystem and addressing any coexistence issues with adjacent users but raising the frequency means a more costly deployment. RF studies are required to proceed.