Ofcom Consultation: Proposed annual licence fees for 10 GHz, 28 GHz and 32 GHz spectrum

Executive Summary

The Joint Radio Company (JRC) welcome the opportunity to provide input to the Ofcom Consultation: Proposed annual licence fees for 10 GHz, 28 GHz and 32 GHz spectrum on behalf of the UK Distribution Network Operators (DNOs) on who's behalf we hold a licence in the 10GHz band. Our response centres on the important role that the 10GHz spectrum will have in facilitating the 'Net Zero' transition and the extent to which the Energy Network Operators use of the spectrum is focused on resilience and availability of the applications connected as their function is critical to the operational integrity of Critical National Infrastructure (CNI) and as such should be taken into account when setting Annual Licence Fees for the 10GHz band.

Specifically:

- We do not believe that there is evidence of additional demand for spectrum in the 10 GHz band.
- We do not agree that the fixed wireless service should be considered as the highest value alternative use for the 10 GHz band.
- We do not believe it is possible for Ofcom to define a single "highest value" use of the 10 GHz band as consideration is required of the applications supported in the band and their social value contribution as well as economic value.

Separately it is important to note that the imposition of annual licence fees to the 10GHz band will result in additional costs being borne by the Distribution Network Operators, which in turn will lead to additional costs to UK households at a time when households are experiencing an energy price crisis – we encourage Ofcom to take into account the broader economic and social implications in its pricing decisions rather than limiting analysis to a purely economic value perspective.

Broader Context

The transition to net zero is driving many changes in the architecture and implementation of the UK's energy supply system. There are multiple issues to consider with this change including the implications of building and operating a more distributed energy system that has greater complexity when balancing supply and demand and ensuring stability. Coupled with this there are increasing demands being placed on the energy system through developments like electric vehicles. Successfully operating the smart grid that is required to deliver on the policy put in place by Government, requires a significant enhancement in real time communication capability in energy networks, a key part of which will be delivered by wireless networks.

Ofcom has accepted the important role that radio spectrum will play in the 'Net Zero' transition through its ongoing Strategic Review of the Utility Operators' spectrum requirements. This work has been positive and well received but there is also a need to consider the implications for UK energy supply of the displacement in recent years of energy network operators from various frequency bands (key bands like 1.4GHz and more recently 26GHz). Energy network operators have depended on these bands for the efficient and cost-effective delivery of energy to consumers in a safe and reliable manner. To mitigate the effects of loss of access to other bands the Distribution Network Operators (DNOs) secured spectrum in the 10GHz frequency band to afford security of access to spectrum and allow greater flexibility of use to meet the specific operational requirements of evolving energy networks.

While good progress has been made with Ofcom's Strategic Review of Utility Operators Spectrum Requirements, there unfortunately seems to be a clear disconnect between the policy discussion on spectrum for utility operators and day-to-day spectrum management activity such as setting Annual Licence Fees (ALFs). This, unless it is addressed, has the potential to lead to regulatory failure through inconsistent policy interventions.

We encourage Ofcom to reflect on the perspective that UK economic and social prosperity is predicated on robust and resilient energy supplies. As mentioned above, operational communications will have a crucial role in balancing supply and demand and ensuring the stability of an increasingly dynamic energy supply system. This functionality will be enabled by the widespread deployment of active, resilient control systems with enhanced and resilient data communications key to managing energy flows. To this end, secure and expanded access to dedicated radio spectrum

for energy networks at an appropriate cost is a critical component of the UK's future energy supply model and enablement of the 'Smart Grid' that is central to the UK Government's ambitions for a 'Net Zero' future.

JRC have been actively collaborating with Ofcom for in excess of 5 years to ensure that appropriate steps are taken to enable spectrum access for Energy Network Operators. Through this active engagement Ofcom has indicated that they are working to a Pre-ED2[1] timeline to provide guidance to the industry on spectrum access arrangements. Furthermore, the Department for Business, Energy an Industrial Strategy (BEIS) recently commissioned a third-party study[2] to explore the options available to support enhanced operational control requirements of the Energy Networks to inform Government thinking. The recent Storm Arwen final report from E3C and BEIS[3] includes a specific recommendation **R4** which states *'Energy Network Operators should continue to engage with DCMS and Ofcom to secure the utility spectrum so that the energy sector can develop its own resilient data/voice networks in the future.'*

The Department for Digital, Culture, Media and Sport (DCMS) which sets the Policy framework for radio / telecommunications and Spectrum Management is currently preparing updated Spectrum Policy guidance that is anticipated to include measures to facilitate utilities obtaining the spectrum required for the resilient data and voice networks that will be vital for energy networks to deliver a high quality of service.

Considering all these initiatives we encourage Ofcom to revisit its approach to Annual Licence Fees for the 10GHz band and to embrace a broader policy perspective when establishing its approach to setting ALFs for spectrum on which the operational integrity of Energy Networks increasingly depends.

Background

The Joint Radio Company (JRC, www.jrc.co.uk)

Joint Radio Company Ltd is a wholly owned joint venture between the UK electricity and gas industries specifically created to manage the radio spectrum allocations for these industries used to support operational, safety and emergency communications.

JRC manages blocks of VHF and UHF spectrum for Private Business Radio applications, telemetry & telecontrol services and network operations. JRC created and manages a national cellular plan for co-ordinating frequency assignments for several large radio networks in the UK.

The VHF and UHF frequency allocations managed by JRC support telecommunications networks to keep the electricity and gas industries in touch with their field engineers and remote assets. These networks provide comprehensive geographical coverage to support installation, maintenance, operation and repair of plant in all weather conditions on 24 hour/365 days per year basis.

JRC's Scanning Telemetry Service is used by radio based Supervisory Control And Data Acquisition (SCADA) networks which control and monitor safety critical gas and electricity industry plant and equipment throughout the country. These networks provide resilient and reliable communications at all times to unmanned sites and plant in remote locations to maintain the integrity of the UK's energy generation, transmission and distribution.

JRC also manages microwave fixed link and satellite licences on behalf of the utility sector.

JRC supports the European Utility Telecommunications Council's Radio Spectrum Group and participates in other global utility telecom organisations. JRC participates in European Telecommunications Standards Institute (ETSI) working groups developing new radio standards, and European telecommunications regulatory groups and workshops.

JRC works with the Energy Networks Association's Future Energy Networks Groups assessing ICT implications of Smart Networks, Smart Grids & Smart Meters, is an active member of the Energy Networks Association Strategic Telecoms Group and is an acknowledged knowledge source for cyber-security in respect of radio networks.

[1] RIIO-ED2 is the next regulatory funding period for the GB Distribution Network Operators which begins February 2023.
[2] BEIS: Risk to availability of suitable radio connectivity solutions for energy utilities, 23 June 2022, Plum Consulting.
[3] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1081116/storm-arwen-review-final-report.pdf

The Broader Context:

The 'Net Zero' Transition and the need for enhanced visibility and control of Energy Network Assets

Introduction

UK Energy Networks are undertaking a transition from centralised energy generation to a model where energy generation is distributed via a larger and more diverse range of generation sources resulting in a shift from a passive to an active or "Smart Grid" where energy flows in two directions. This shift to an active and distributed grid demands a greater level of intelligence and interconnectivity (sensors, communications and control) and automation across the entire distribution network, in order to ensure co-ordination, efficiency, responsiveness, safety, security and resilience of supply.

Figure: A vision of the new Smart Grid infrastructure with greater diversity and interconnectivity

Source: European Commission

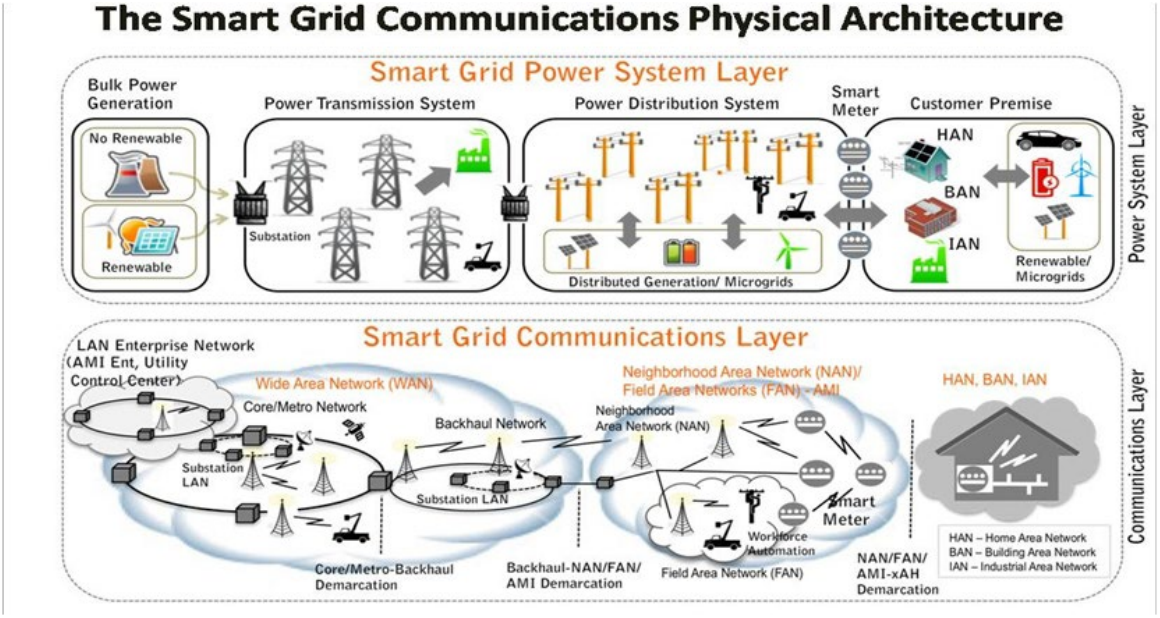
The need for Enhanced Operational Control is a product of the Change in the Supply and Demand Context

Historically, energy networks have largely been passive composed of only a small number of active control components at the High Voltage layer (i.e. above 33,000 volts). The operational telecommunications systems used in these systems have typically been narrowband, employing a mixture of wired and wireless connectivity solutions. In the case of wireless connectivity, a relatively limited amount of radio spectrum has been utilised to date to support these legacy needs. The centralised or 'top down' approach of energy supply required no visibility for control purposes of what was happening at the edges of the network (Low Voltage - LV) and relatively limited visibility at Medium Voltage (MV). However, as the UK's energy networks have become more dynamic both from a supply and demand perspective – incorporating distributed generation and storage alongside the adoption of high energy-consumption but low carbon emitting technologies like electric vehicles and heat pumps – there is an increased need for active control. For electricity this will require control components within the medium and low voltage layers – effectively turning the monitoring and control (and connectivity) hierarchy upside down. I.e. rather than requiring connectivity at low data rate to a small number of very large, centralised, critical assets, the future scenario will require higher bandwidth connections to a much larger number (100 x) of distributed assets each of which will play a critical part in the future network (individually & collectively) with the number of wireless connections expected to grow significantly leveraging

their cost effectiveness and flexibility. Within the Gas networks additional capability is required as hydrogen and other green gases are added to the mix of the energy system.

This significant increase in the number of connected assets will result in a dramatic increase in data flows necessary to operate the energy system in real time, requiring a corresponding expansion in the need for connectivity including use of radio spectrum-based solutions. It is estimated that the typical data requirement could be in the range 0.1 to 1 Mb/s per device.

Figure: IEEE graphic of the Smart Grid Power Layer overlaid on the telecoms layer



Source: IEEE

Enabling a Dynamic Energy Supply Solution through enhanced Operational Telecommunications Capability

Wireless based communication systems have always been a critical component of the operational Command and Control systems of the Energy Networks. The need for enhanced operational communications solutions has been under review for the past 5 years or more and work has been taking place with Ofcom through its Strategic Review of Utility Operators Spectrum Requirements project which has been contributed to by Joint Radio Company[4] and ENA-STG[5]. Ofcom's study is exploring the spectrum access needs of the utility operators and considering what regulatory interventions may be required to enable efficient energy networks that meet the government's future policy objectives. It is also important to note that Government departments, DCMS and BEIS, are actively engaged in responding to the developing needs of the Energy Network Operators through the 'Net Zero' transition. One common theme that regularly needs to be addressed when exploring the needs of the Energy Network Operators with policy makers is the limitations[6] of publicly available communications services to address the critical operational needs of the sector, i.e. resilience to mains power failure, reach, guaranteed QoS and availability, etc. To this end JRC commissioned research by Gemserv[7] to establish the potential benefits and costs of an enhanced operational control solution via three different approaches: fibre, public cellular and private wireless. The Gemserv analysis clearly

[4] Joint Radio Company a joint venture between National Grid and the Energy Networks Association
[5] ENA-STG, Energy Networks Association Strategic Telecommunications Group
[6] 'Operational Control of Mission Critical Networks and the Service Limitations of Public Mobile Networks (JRC White Paper)' https://www.jrc.co.uk/Plugin/Publications/assets/pdf/ICT-Operational-Control-of-Mission.pdf
[7] 'Economic rationale for enabling Smart Grid functionality of the UK energy system via a Private Radio Frequencybased enhanced Operational Communications Solution,' Gemserv, 19 November 2021. https://www.jrc.co.uk/Plugin/Publications/assets/pdf/ICT-Economic-rationale-for-enabling-Smart.pdf

demonstrates the private wireless solution to be the most cost effective and capable option at a cost one twelfth of the benefit that would be realised – an annual net saving of £25 on every household's energy bills. JRC and the ENA-STG are committed to working closely with Policy Makers to ensure that the appropriate Policy Interventions are enabled, e.g. dedicated spectrum access to facilitate the 'Net Zero' transition.

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JRC's Detailed Response to Questions

Question 1. Do you agree with our initial conclusion that fixed wireless services are the highest value alternative use for each of the 10, 28 and 32 MHz bands? If not, please provide evidence to support your answer.

JRC Response

Confidential? Yes.

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Question 2. Do you agree with our initial conclusion that there is likely to be excess demand for each of the 10, 28 and 32 GHz bands in future, if cost-based fees were applied and that therefore an AIP fee is appropriate? If not, please provide evidence to support your answer.

JRC Response

Confidential? Yes.

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Question 3. Do you agree with our proposed market value for the national 10, 28 and 32 GHz spectrum? If not, please provide evidence to support your view.

JRC Response

Confidential? Yes.

✂

Question 4. Do you agree with our proposed calculation of the regional 28 GHz ALFs set out in detail in Annex A6, including our proposed calculation of fees for specific locations in part of a region? If not, please provide evidence to support your view.

JRC Response

Confidential? No.

No Comment.

Question 5. Do you agree with our initial conclusion that fees set based on our estimate of market value will best meet our statutory duties?

JRC Response

Confidential? Yes.

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Question 6. Are there any other comments that you wish to make in respect of the proposals that we make in this consultation?

JRC Response

Confidential? Yes.

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