



STRATEGIC SPECTRUM ROADMAP TOWARDS 5G FOR EUROPE

RSPG Opinion on 5G implementation challenges

(RSPG 3rd opinion on 5G)

Executive Summary

The Joint Radio Company (JRC) welcomes the opportunity to respond to this consultation as a representative of the UK electricity and gas utilities.

The response concentrates on sections 5 to 7 and the key observations are summarised below.

5) Connectivity using mobile operators' solutions, third party providers, and directly by verticals

JRC notes that energy utilities use a variety of telecoms solutions dictated by their widely varying needs. These include access to spectrum by:

- self-licensing of spectrum;
- third party providers; and
- using mobile operator solutions.

The UK's two Smart Meter systems use third party spectrum in the Northern half of the UK and a mobile operator's spectrum solution within the Southern half.

6) Dedicated and shared spectrum for sectoral needs that may not be met by mobile operators.

JRC observes that the majority of electricity utilities in the UK utilise self-licensed spectrum. This allows their electricity grid control systems to include the necessary resilience requirements, e.g. up to five days power backup. (JRC notes that for the mobile operators it would be uneconomic to construct a business case to support the cost of upgrading mobile operator infrastructure to include the necessary power resilience for such a limited user base).

Moreover, JRC emphasises that the requirement for system resilience has necessitated access to exclusive spectrum, e.g. self-managed 12.5 / 25 kHz narrow band channels and Ofcom (UK) managed channels for the fixed links backhaul.

JRC does not believe the market would be well served if vertical sectors could only access spectrum by leasing from operators or through licence-exempt spectrum. This would be a major detrimental step for spectrum access.

7) Pan European services needing technology neutral dedicated EU harmonised spectrum.

JRC notes that the European Utilities Telecoms Council (EUTC) is seeking typically 2 x 3 MHz of dedicated utilities spectrum across Europe within the 400 MHz Band, 2 x 1 MHz in the VHF Band, and 10 MHz in the 1,350 MHz Band. However, EU-wide harmonised spectrum is not an option for some member states, e.g. when existing users have long-term access arrangements in or adjacent to the potentially impacted spectrum.



JRC endorse EU Policy interventions to ensure that the European Energy Utilities have access to appropriate quantities and type of interference free spectrum to enable future Smart Grid and Smart Meter developments.



Background

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. These networks provide comprehensive geographical coverage to support installation, maintenance 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 capability 24 x 365 to unmanned sites and plant in remote locations to maintain the integrity of the UK's energy generation, transmission and distribution.

JRC supports the European Utility Telecommunications Council's (EUTC) 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 also manages microwave fixed link and satellite licences on behalf of the utility sector.

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



JRC's detailed response

The JRC's response is focused on sections 5 to 7 of the consultation and provided below.

5) Connectivity using mobile operators' solutions, third party providers, and directly by verticals

JRC observes that the preferred method of wireless connectivity for the majority of UK utility operators is the self-licensing of spectrum. This includes the licensing of 2 x 1 MHz of dedicated spectrum within the 400 MHz Band, and the licensing of individual fixed links channels. The licensing of dedicated blocks of spectrum is partly to enable the speedy roll-out of new low capacity fixed links, without the delays that would be incurred if they needed to be co-ordinated with unknown other users within shared spectrum, and also partly to ensure that the systems within the neighbouring channels are designed and maintained so as not to cause harmful interference.

JRC notes that the electricity utilities use mobile operator solutions typically as a backup to their primary systems and / or for non-operationally critical applications.

JRC observes that the use of licence exempt spectrum by the electricity and gas utilities is very rare because of the serious risk of harmful interference.

JRC observes that the UK's two Smart Meter systems use third party 25 kHz narrow band spectrum in the Northern half of the UK and a mobile operator's spectrum within the Southern half. Moreover, it is important to acknowledge that the UK's Smart Meter systems are not used to control the Smart Grid so they do not have or need the same resilience requirements as operational Smart Grid systems.

6) Dedicated and shared spectrum for sectoral needs that may not be met by mobile operators.

JRC observes that for the majority of electricity operators within the UK prefer self-licensed / dedicated spectrum. This enables their electricity grid control systems to be designed and operated in-house and thereby be assured that the necessary resilience requirements, e.g. up to five days power backup, are incorporated into the system.

JRC recognises that the cost of upgrading mobile operator solutions to include the necessary power resilience, etc, for electricity grid control systems is uneconomic for such a relatively small user-base.

JRC observes that the requirement for appropriate resilience has necessitated access to exclusive use / dedicated spectrum, e.g. self-managed 12.5 / 25 kHz narrow band channels and Ofcom (UK) managed channels for the fixed links backhaul.

JRC observes that the spectrum requirements for dedicated electricity utility systems is minimal when compared with the spectrum that is allocated to the mobile operators.

JRC supports the allocation of dedicated spectrum to the electricity utilities.

JRC acknowledges that the 5G equipment options that will be used for mobile operator systems may also be used for resilient Smart Grid control systems subject to access to dedicated spectrum for this Industry Vertical.

7) Pan European services needing technology neutral dedicated EU harmonised spectrum.

JRC notes that the control of electricity Smart Grids is a Pan European requirement. To this end, the following three documents include the long-term technology neutral spectrum requirements of the electricity utilities within the EU:

- EUTC Spectrum Position Paper (Spectrum needs for Utilities);
- ETSI TR 103 401 (Smart Grid Systems and Other Radio Systems suitable for Utility Operations, and their long-term spectrum requirements); and
- ETSI TR 103 492 (Critical Infrastructure Utility Operations requirements for Smart Grid systems, other radio systems, and future radio spectrum access arrangements below 1,5 GHz).

Moreover, the European Utilities Telecoms Council (EUTC) has identified the following technology neutral spectrum access arrangements for the utilities across Europe:

- 2 x 3 MHz within the 400 MHz Band;
- 2 x 1 MHz within the VHF Band, and
- 10 MHz within the 1,350 MHz Band.

Furthermore, ETSI TR 103 492 acknowledges that the utilities within 12 member states already have access to spectrum within the 400 MHz band, See Figure 1 below. In addition, the UK utilities have access to 2 x 1 MHz of spectrum in the 400 MHz band

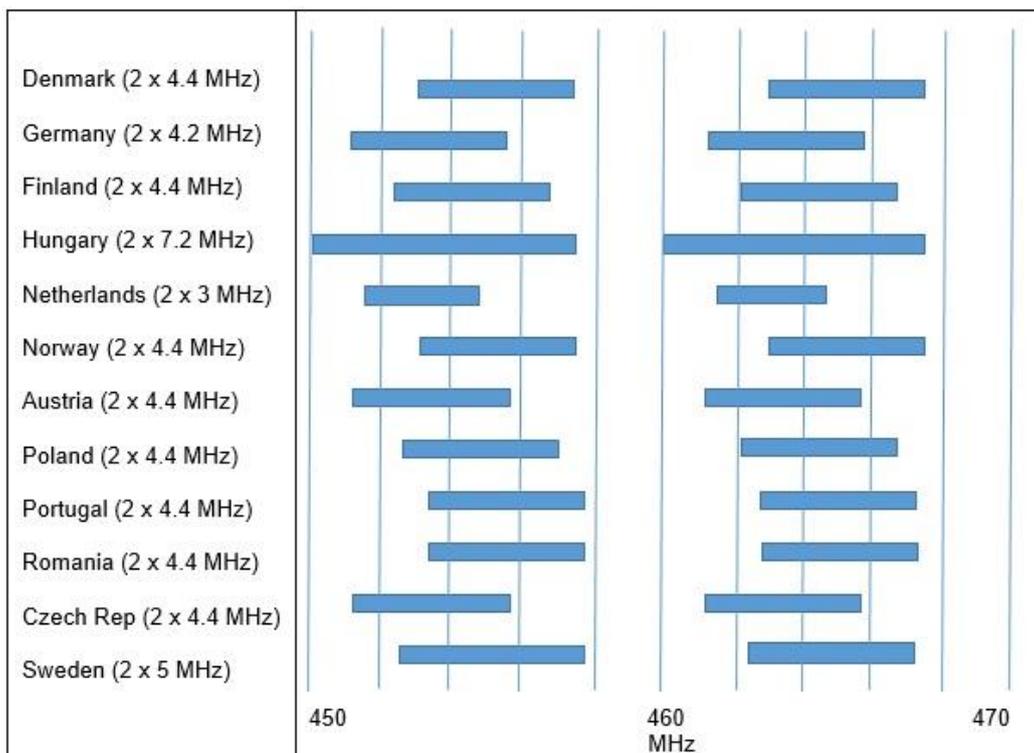


Figure 1: Example allocations of spectrum in 450 to 470 MHz for broadband services within Europe.



However, JRC notes that the EU-wide harmonisation of spectrum within the 400 MHz Band may not be an option for all member states as a consequence of some existing users having long-term access arrangements in, or adjacent to, the potentially impacted 400 MHz Band spectrum.

JRC advises that ITU SM.2351 is in the process of being updated to include the 12.5 / 25kHz narrow band options that will continue to be used for Smart Grid and Smart Meter control systems within some member states.

JRC endorse EU Policy interventions to ensure that the European Energy Utilities have access to appropriate quantities and type of interference free spectrum to enable future Smart Grid and Smart Meter developments.

ENDS