



Commission for  
**Communications Regulation**

# **Response to Consultation and Decision on the 400 MHz Band Spectrum Award**

## **Submissions to Document 19/23**

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# Content

Section	Page
1 Electricity Supply Board Networks Limited.....	3
2 European Utilities Telecoms Council.....	23
3 Joint Radio Company Limited.....	28

# 1 Electricity Supply Board Networks Limited



Energy for  
generations

Networks Telecoms, ESB Networks

## **ESB Networks' response to ComReg's Response to Consultation and Draft Decision on the Release of the 400 MHz Sub-band (ComReg Document 19/23)**

23/04/2019



## Contents

1. Introduction.....	3
2. Introduction to ESB Networks .....	4
3. Commentary .....	5
4. Summary .....	19

## 1. INTRODUCTION

ESB Networks (ESBN) welcomes the opportunity to respond to the Commission for Communications Regulation (ComReg) Response to Consultation and Draft Decision in relation to the release of the 410 MHz sub-band<sup>1</sup>.

Radio spectrum is a hugely important natural resource, enabling both critical and non-critical services to be deployed and made available for all citizens. It is a key enabler for the provision of wireless services which in turn generates significant economic, technological, social, environmental and safety benefits. In that regard, it is vital that appropriate radio spectrum is made available in a timely manner which brings the maximum benefit for the people of Ireland.

The electricity industry is undergoing unprecedented change, and the methods by which electricity is produced and consumed are fundamentally altering. Secure telecommunications are fundamental to this change and to the safe and efficient operation of the grid. In Ireland we are already transitioning to a low carbon electricity system. Ireland is a world leader in the adoption of renewable energy. Through the successful development of our wind farm industry we now have the third highest wind penetration world-wide. However more work is needed to further increase renewable generation and also to decarbonise our transport and heat systems.

ESBN is committed to supporting Ireland's target of becoming a low carbon system. Securing spectrum is a key to ESBN and Ireland realising this target. ComReg has presented admirable analysis on what Smart Grid is, its requirements and the benefits that can be realised from its deployment. ESBN believe that it would be beneficial to have a long term stable platform on which it can base its Smart Grid investment program.

ESBN is disappointed with two ComReg proposals (one only introduced in ComReg Document 19/23).

Firstly, the proposal of a 15 year licence (which both of ComReg's consultants appear to suggest is too short) is disappointing. In order for ESBN to invest heavily in the usage of spectrum (increasing spectrum efficiency), a reasonable licence timeframe must be available to enable the deployment of a new nationwide network. Smart Grid business model differs from traditional commercial networks as the time to make a return on investment is much longer. In using the spectrum fully as a Smart Grid platform, ESBN would expect to obtain 'network effects'. This effect means that increasing usage and standardisation over time associated with concentration on one approach yields increasing benefits. Additionally, ESBN expects the lifetime of a Smart Grid network and all associated equipment to be at least 20 years. A short licence undermines the incentive to invest and potentially makes the business case for deployment negative. It is in line with ComReg's objectives to apply a more appropriate licence duration of 20 years or more.

Secondly, the reduction in available spectrum in this award from 2 x 5.5 MHz to 2 x 4 MHz (therefore eliminating possibility of 2 x 5 MHz LTE Smart Grid network) is disappointing and ESBN encourages ComReg to make 2 x 5 MHz of spectrum available in this award.

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<sup>1</sup> <https://www.comreg.ie/publication-download/response-to-consultation-and-draft-decision-on-the-release-of-the-400-mhz-sub-band>

ESBN is strongly supportive of ComReg's proposals, particularly with respect to reserving 2 x 3 MHz of spectrum in the 400 MHz band for Smart Grid. ESBN agrees with ComReg that Smart Grid can derive significant benefits in Ireland and that there are no alternative suitable solutions or spectrum bands available. Provision of access to this spectrum in the long term would provide a stable platform for high levels of long term investment in Smart Grid.

## 2. INTRODUCTION TO ESB NETWORKS

ESB Networks Ltd. (ESB Networks and hereafter defined as ESBN), a regulated subsidiary within ESB Group, is the licensed operator of the electricity distribution system in the Republic of Ireland. ESBN is responsible for building, operating, maintaining and developing the electricity network and serving all electricity customers in the Republic of Ireland.

The electricity distribution network includes all distribution stations, overhead electricity lines, poles and underground cables used to bring power to more than 2 million domestic, commercial and industrial customers connected to the electricity network nationwide. ESBN also maintains the high voltage transmission network in Ireland on behalf of the Transmission System Operator (TSO) EirGrid.

Secure telecommunications is vital to the safe and efficient operation of the grid. The electricity network depends heavily on having high quality and high availability communications infrastructure (meeting specifications for back up; redundancy; resilience; low delay and jitter). ESBN deploys and operates extensive fixed and wireless telecommunications infrastructure to provide ESB and EirGrid with necessary real time information for operational purposes (i.e. to control and monitor the distribution and transmission networks). Such critical communication cannot always be provided by public communications networks, as these networks do not satisfy the network requirements. ESBN welcomes that ComReg recognises such networks cannot meet requirements as published in its last 2 documents on the 400 MHz spectrum release.

ESB Networks' telecommunications network requires connectivity in a significant number of locations throughout the country, often in remote areas where propagation of high frequency signals is limited (e.g. within High Voltage substations). A significant proportion of ESB Networks' telecommunications network relies solely on wireless for several reasons, including situations where it is technically difficult to use cables to connect devices to the network, or where it is not economically feasible. Radio spectrum is a fundamental component of ESB Networks' existing safe and resilient narrowband network.

The levels of renewable generation to be connected to the distribution and transmission networks is set to increase significantly by 2030, with approximately 5800 MW of wind based generation and 2400 MW of solar PV generation estimated. Generation of renewable (particularly wind) energy can be unpredictable, with quantum of energy generated and available at any time depending greatly on prevailing atmospheric conditions. Another unpredictable and increasing energy source is solar energy. There has been and continues to be significant investment in solar energy in Ireland, which is also a low-carbon energy source. Solar energy will contribute increasing amounts of energy to the Grid in the future, and this can only be achieved with additional intelligence in the electrical network. Both of these energy sources creates the opportunity for 'prosumers'<sup>2</sup> to participate in the energy market. This

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<sup>2</sup> Large amount of small generating units feeding a smart grid that can both supply power to consumers and take it back from them.

hugely complicates the electrical network, as there will be significant variances and unpredictability in supply and demand of electricity to and from the network. Decentralised intelligence and control is necessary to support such innovation.

ESBN's Information and Communication Technology (ICT) requirements to manage the power system is changing due to new software and hardware based technologies and platforms, combined with the challenge of cost effectively managing the large amount of renewable (and low carbon) technologies being connected to the power system. ESBN uses such new technologies to maximise the efficiency and operation of existing assets in a more controlled and precise manner, freeing up additional capacity from these assets. These technologies provide real time data about the health and performance of ESBN assets. This innovative approach to incorporating different data sources allows ESBN to develop real-time models of the distribution systems which will enable investments in network assets in a more efficient and environmentally friendly manner. Key tools which will be heavily reliant on a secure, stable and reliable Smart Grid infrastructure include;

- Condition based maintenance by incorporating real time sensor data into ESBN's maintenance management and SCADA systems.
- Variable access management tools which allows existing embedded generators release additional capacity from the existing network connections.
- Safely manage the participation of ESBN customers in providing flexibility onto the network without overloading the different components. Flexibility is a customer's ability to modify generator or load in response to a signal. This flexibility can be provided by customers changing their behaviour or using technologies such as smart charging and energy storage. In Ireland, ESBN are already facilitating large commercial customers who are already assisting the operation of the transmission system by providing flexibility from the distribution network. These numbers are expected to increase in the future increasing complexity and the capacity required from ESBN's electrical network.
- Bi-directionally share information with EirGrid and ESBN customers so that the TSO and DSO can work together to maximise the efficient operation of the entire energy system.
- Provide additional monitoring across ESBN assets so that better operational and planning decisions can be made.

The development of new ways to collect data from existing assets, and to incorporate this data into ESBN systems with other data sources will unlock hidden potential for our customers. It allows deferment of investment costs, speeds up interactions with customers and enables customers to flexibly use the electrical network to positively contribute to climate change targets.

Safe, efficient and reliable integration of this amount of renewable generation on the electricity system and gathering of data requires sophisticated and robust real time telecommunications infrastructure. To meet these challenges it is imperative that ESBN develops and enables an integrated energy system which requires substantial amount of communications. A key enabler of Smart Grid is radio spectrum.

### 3. COMMENTARY

ESBN has responded with comments on the sections of consultation document which ComReg did not provide any questions on. These comments are outlined below:



## **Developments regarding 400 MHz spectrum**

ESBN welcomes developments within ETSI (TR 103 492) and CEPT (ECC Decisions 16(02) and 19(02)), as outlined by ComReg. ESNB is encouraged by the developments of technical standards for equipment and also sharing criteria for users of spectrum in the 410 MHz and 450 MHz spectrum bands. Such developments, in addition to 3GPP defining band plans, enhances the ecosystems and encourages development of standardised equipment across the European community. These developments will increase competition for equipment, make equipment pricing more attractive and encourage investment in equipment and networks.

ESBN participates on numerous fora (EUTC, 450 Alliance and others) in relation to provision of spectrum for Utilities for the provision of Smart Grid. These groups actively participate in discussions and consultations with ETSI, 3GPP and CEPT and is encouraged by the recognition of the importance of Smart Grid, that there are no alternatives available to deliver on requirements than building dedicated networks and that spectrum bands have been defined with technical parameters identified. Indeed, ESNB has responded to numerous recent CEPT consultations on issues relating to 400 MHz spectrum band.

## **Spectrum for BB-PPDR**

ComReg has introduced a new proposal into the 400 MHz spectrum award at Draft Decision stage which is quite disappointing. ESNB recognises that recent developments outlined in ECC Decision 16(02) has influenced its late introduction to the process. ESNB has many reservations in relation to the proposal to withhold spectrum in the 400 MHz band for BB-PPDR.

By definition, the withholding of spectrum for the potential of BB-PPDR in this band precludes a Network Utility Operator from deploying a 2 x 5 MHz LTE Smart Grid network (or 2 x 3 MHz and 2 x 1.4 MHz network). Foreclosing this option puts a limit on the capabilities of a Smart Grid network and places an upper limit on the amount of devices that connect to such a network. This withholding of spectrum in conjunction with a short (15 year) licence makes the business case for Smart Grid extremely challenging. The most efficient wireless networks allow for the deployment of a large amount of remote devices to connect to each base station. The more devices that can be connected to each base station enhances the business case, ensures efficient use of spectrum and also encourages more investment in deploying a network wide scale as the return on investment is higher.

ESBN notes that ECC Decision 16(02) does not place any requirements on regulators to make spectrum in the 400 MHz band available for BB-PPDR, as noted by ECC's use of the word '*may*' in its proposals. ESNB notes that ECC propose that spectrum in the 700 MHz primarily be made available for BB-PPDR, with the possibility to release additional spectrum in the 410 MHz or 450 MHz ranges if required in addition. ESNB encourages ComReg to confirm its plans with regards to 700 MHz spectrum and encourages ComReg to make some of this spectrum available primarily for BB-PPDR. Spectrum in this range is far more suitable for BB-PPDR than that at 400 MHz given larger availability of devices as this band will also be used for commercial mobile services. Should spectrum in the 700 MHz not be sufficient for BB-PPDR, ESNB urges ComReg to consider the existing 380 – 400 MHz TETRA spectrum to supplement 700 MHz. This allows for deployment in the 700 MHz band to take place, and once up and running the 380 – 400 MHz spectrum can be relinquished from current usage and utilised in whatever manner required by BB-PPDR.

ComReg in its Draft RIA and final RIA has identified that Smart Grid has no alternative options available to meet its requirements other than a dedicated Smart Grid network. Additionally, ComReg recognises there isn't alternative spectrum bands available for deployment of Smart Grid. Whilst coming to this conclusion, ComReg identified that all other potential applications for the 400 MHz spectrum band already have access to spectrum in alternative spectrum bands. ESN believes that the existing provision (380 – 400 MHz for TETRA) and proposed future provision (2 x 5 MHz of spectrum in the 700 MHz spectrum band) is more than sufficient for BB-PPDR requirements.

ESBN believes that TETRA in its current guise will be utilised by blue light agencies for the medium-long term, and believe that procurement of additional TETRA equipment is ongoing by various agencies utilising TETRA. This suggests that TETRA will continue to be available for the medium term at least. Indeed, the example of how long it has taken to transition from TETRA services in the UK demonstrates the amount of time it could take to transition to any alternatives.

ComReg has not provided any clarity on when this spectrum would be released for BB-PPDR or how. ESN would like ComReg to provide more details on this soonest. ESN contends that it is not efficient use of spectrum leaving it fallow for a long time waiting for a potential user (who may prefer to use 700 MHz spectrum or 380 – 400 MHz in any case) when there is apparent demand and a requirement for usage from alternative spectrum users.

ESBN strongly contends that PPDR should be considered in a RIA. ESN believes that this would outline that BB-PPDR has alternative suitable spectrum (380 – 400 MHz and 2 x 5 MHz in 700 MHz band) available and that spectrum should not be withheld from this process for this service.

ComReg's proposal gives no long term potential for Smart Grid to have access to anything other than 3 MHz LTE channels. This is at odds with BB-PPDR, where the requirement for spectrum for this service is getting at least 1 if not 2 additional bands for expansion made available.

ESBN therefore encourages ComReg to;

- Reserve spectrum in the 700 MHz range (if any reservation) for BB-PPDR;
- Make 2 x 7 MHz of spectrum available in the 410 MHz range, with 2 x 5 MHz available for Smart Grid and remaining 2 x 2 MHz for other users (or maintain 2 x 3 MHz for Smart Grid and auction remainder);
- If it proposes to maintain spectrum in 400 MHz range for BB-PPDR, provide clarity on who is permitted to get the licence, when it will be released and under what proposed conditions;
- Should BB-PPDR wish to deploy in this band in 10 years or whenever TETRA expires, there is potential for the deployment of a second mission critical nationwide network to be built in parallel to any Smart Grid. ESN considers this to be potentially wasteful and costly. ESN encourages ComReg to consider the provision of all 2 x 7 MHz of spectrum in this range for Smart Grid, and should BB-PPDR require services in the future, a Smart Grid operator may be obliged to provide fair and reasonable access; and
- Provide clarity on whether BB-PPDR would effectively have access to 3 spectrum bands (380 – 400, 410 MHz and 700 MHz) and if so, what is rationale for same.

## **Definition of Smart Grid**

The term Smart Grid means different things to different people. ESBN agrees with ComReg's description of Smart Grid as contained in paragraphs 3.43 – 3.45 of ComReg document 19/23. Smart Grid allows for Utilities to access much more granular information on its network which helps significantly in controlling, monitoring and restoration of the electrical network. Smart Grid requires information to be gathered from significantly higher number of points on the network than heretofore. Smart Grid derives numerous significant benefits as outlined elsewhere in this document.

Network Utility Operators without real time control telecommunications have to plan and operate their Utility Networks on a conservative 'worst case basis'. By definition, this leads to excessive costs, inefficiencies and sub-optimal use of assets. By utilising telecommunications which provides real time information on actual system conditions, and allowing real time analysis and associated control, a much more economic and efficient 'Smart' Electrical Network can be enabled.

Smart Grid technology is being deployed worldwide (e.g. Alliander in the Netherlands<sup>3</sup>, various utilities in Canada<sup>4</sup>), whilst there are developments in this area in Brazil, Spain and Portugal. In addition, ComReg has correctly identified (as per paragraph 3.56 of ComReg Draft Decision 19/23 document) that regulators in Germany and Poland have made comparable spectrum (450 MHz) available for deployment of Smart Grid.

Both the Dutch and Canadian Smart Grid deployments have been hugely successful in operating an efficient and low carbon electricity network. These Smart Grid deployments have allowed increased control of the electricity network, but more importantly they have allowed optimisation of electricity generation (e.g. peak load management) and electricity consumption (e.g. balance of supply and demand to improve quality of power).

## **Smart Grid requirements**

ESBN agrees with CEPT and ComReg's definition of requirements for a Smart Grid as contained in paragraph 3.60 of ComReg's Draft Decision, and also with Plum's definition as contained in paragraph 3.59. Smart Grid requires stringent technical performance of the underlying telecommunications network that is being utilised. Smart Grid requires almost instantaneous communications with certain applications, extremely high availability of telecommunications channel, coverage from designated base stations as well as robust cybersecurity. ESBN agrees that there is no alternative solution available to ESBN and no alternative spectrum which could deliver on Smart Grid requirements. In tandem, ESBN contends that BB-PPDR does have alternative spectrum available (380 – 400 MHz and 2 x 5 MHz in 700 MHz should ComReg decide) and therefore does not have the same criteria for spectrum reservation as Smart Grid.

ESBN currently uses public and private wireless solutions to deliver on its telecommunications requirements. ESBN's private narrowband network provides a robust, mission critical service which has proven its resilience in its availability (particularly during the numerous recent storms and extreme weather). This network provides the resilience, coverage and guarantee of service required. However, this solution is capacity limited and is not scalable.

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<sup>3</sup> Explanatory video on Alliander's network available here, <https://www.youtube.com/watch?v=JLLOWDK8YKk>

<sup>4</sup> <http://www.nrcan.gc.ca/energy/electricity-infrastructure/smart-grid/4565>

ESBN utilises third party telecommunications networks to provide cost effective 'best effort' communications in instances where it is appropriate (i.e. low critical services with less stringent requirements) or where ESBN does not have alternatives currently.

It is worth noting that there is precedent in Ireland in this area. TETRA services were procured by Irish Government in 2008 as there was a requirement for mission critical, highly available services to be made available nationwide. It was deemed that a purpose built network was the optimum solution to meet requirements. It appears that the TETRA service will continue to be utilised for some time, proving that third party networks cannot meet requirements of a mission critical, highly available service.

### **Reservation of Spectrum for Smart Grid**

ESBN strongly agrees with ComReg's analysis and RIA which concludes that there is a requirement to reserve spectrum to enable Smart Grid. Although it cannot be a metric of actual interest in spectrum, it is notable that there has been limited interest in ComReg's consultations on this spectrum other than organisations promoting this spectrum be used for Smart Grid. ComReg has correctly identified that other applications which have been discussed in relation to this spectrum band have alternative spectrum (e.g. 450 – 470 MHz, 700 MHz or licence exempt spectrum) or alternative solutions available (e.g. MNOs offerings).

ComReg has correctly identified the potential technology (LTE) which is most suitable for the delivery of Smart Grid services. Given the LTE channel sizes (1.4 MHz, 3 MHz and 5 MHz) which can be facilitated in the band, ComReg is correct in taking the advice from ETSI, EUTC, JRC, Plum, ESBN and CEPT FM54 that 2 x 3 MHz of spectrum is the minimum amount of spectrum required for Smart Grid. The more spectrum available to Smart Grid, the more devices that can be deployed on such a network which greatly benefits the business case and benefits that can be realised.

Research carried out by ESRI recently<sup>5</sup> has outlined how the Irish state and citizens would be liable to a 15 fold increase in carbon tax rates if targets were not achieved, costing each household over €4,000 per annum. This is yet another reason why Smart Grid must become a reality.

ComReg has provided robust analysis (in paragraphs 3.49 – 3.55 of its Draft Decision document) on why Smart Grid meets objectives and targets of ITU, UN, EPRI, SEAI, EC (and its Electricity Directive), DCCAIE (and its NDP and NECP) and Irish Government (National Planning Framework, National Migration Plan). This comprehensive analysis outlines how Smart Grid is a fundamental prerequisite in achieving a wide range of important objectives, both nationally and globally. These benefits that will be realised give justification to ComReg in its reservation of spectrum for Smart Grid.

ESBN agrees that on the balance of things, Option 3 as presented by ComReg best meets its objectives of reserving 2 x 3 MHz for Smart Grid, whilst enabling the market to determine the optimum winner of remaining spectrum. ESBN (as outlined above and below) strongly believe that there should at a minimum be a capability for a Network Utility Operator to be able to acquire 2 x 5 MHz of spectrum (combination of reserved spectrum and from open competition of spectrum). Therefore, ESBN encourages ComReg to facilitate by making at least 2 x 5 MHz

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<sup>5</sup> <https://www.independent.ie/irish-news/households-face-3000-tax-bill-on-fuel-and-energy-to-cover-climate-costs-37550460.html>

in the 410 MHz spectrum range available in this award whilst also providing clarity on BB-PPDR spectrum (when it is needed, when transitioning from TETRA, if 700 MHz being made available for BB-PPDR and when etc.) ComReg should conduct its RIA with inclusion of at minimum 410 – 415 MHz and 420 – 425 MHz as an option (preferably 410 – 417 MHz and 420 – 427 MHz).

### **Access to Smart Grid from other Network Utility Operators**

ESBN notes ComReg's response to ESBN's concerns regarding Network Utility Operator's access to Smart Grid services (as rolled out by a different Network Utility Operator). As ESBN outlined previously, it is not opposed to the principle of fair and equitable access to Smart Grid services from other Network Utility Operators and indeed agrees with this principle. ESBN's concern is with regards to how this works in practice, and sought assurances that any ex-post access obligations were not onerous or detrimental to any Network Utility Operator who rolled out a Smart Grid network. ESBN understands and accepts that ComReg cannot apply ex-ante obligations without detail on users, services etc. ESBN requests that ex-post access obligations are fair and transparent. ESBN would welcome ComReg's proposed method of determining what is fair and reasonable access. ESBN would welcome ComReg's proposed method of determining what is a fair and reasonable pricing model for providing services to another Network Utility Operator. ESBN accepts that specifics regarding cost and what is considered reasonable access cannot be determined at this stage, however ESBN contends that principles regarding how these will be determined are required in advance of the spectrum release.

ESBN raised a number of issues with ComReg's proposed imposition of ex-post access obligations in response to ComReg Document 18/92. ComReg has provided clarity on two of these issues (spectrum valuation and scoping requirements and planned deployment of another Network Utility Operators services). Two of ESBN's concerns remain. These are as follows;

- (a) Difficulties in Roll-out coordination with other parties: It will take some time for a successful winner of Smart Grid spectrum to get services established. The roll out strategy is something that will have been prepared in advance of the auction by Bidders and will affect bidding strategy and price valuation. A bidder's network deployment strategy should not be hindered or impacted by a request for services from another Network Utility Operator, e.g. a Network Utility Operator requesting services in Location A whereas this Location was not intended to be covered by the licensee or is intended to be covered at a much later time. The licensee should not be obliged to roll out services where it had not intended to due to an access request and suffer financial cost of satisfying another Network Utility's service request at the financial cost of the licensee.

- (b) Accommodation of other utility users

In principle ESBN is willing to facilitate fair and reasonable service requests from other Network Utility Operators. In practice ESBN already provide EirGrid with extensive connectivity over ESBN's existing telecommunications network and is required to do so by existing Regulatory agreements. The two other Network Utility Operators (Irish Water and Gas Networks Ireland) may also have access needs that could be less stringent than those of EirGrid or ESBN as their networks do not have the same requirements for continuous real time data and instantaneous control.

ComReg needs to appreciate that there is an opportunity cost associated with provision of network capacity to another Network Utility Operator and this should be grounds for refusing a request, i.e. if Network Utility Operator A requested services off Smart Grid network owner (Network Utility Operator B) today and the network owner had plans to provide services to itself in that area in the near future. This issue is exasperated by the recently introduced proposal to restrict the amount of spectrum being made available in the award. The proposal to limit spectrum released to 2 x 4 MHz (and hence 3 MHz LTE channels) will create difficulties to satisfy requests, whereas the ability to previously deploy 5 MHz channels provided sufficient capacity to deliver on such requests.

Accordingly, ESN suggests that any ex-post competition analysis on access to a Smart Grid network should take into account the lack of information regarding other Network Utility Operator's requirements, and how any requests should not impact negatively on the licensees deployment plans, result in the licensee being financially disadvantaged due to cost of providing services to another Network Utility Operator or cause service access issues for the licensee themselves. ESN understands that ComReg cannot proactively address these issues specifically, but would welcome principles regarding what is fair and reasonable access and what determines a fair pricing model.

### **Auction**

Without prejudice to its preferred position of administrative assignment (as contained in previous responses), ESN agrees that an auction provides an objective, transparent and non-discriminatory means of issuing spectrum. In absence of administrative assignment, ESN agrees with ComReg's proposal to release this spectrum via auction.

### **Sequencing of award processes**

ESN agrees with ComReg's proposal to host two separate auctions for Part A (Smart Grid) spectrum and Part B. This facilitates the base requirements of a Smart Grid operator initially whilst providing flexibility for a Smart Grid operator and any other interested users to compete for remaining spectrum.

### **Format**

ESN agrees that the SCA format as proposed best meets ComReg's objectives whilst providing a simple and fair method of participation. This encourages the most efficient outcome.

ESN agrees that a minimum of 2 x 3 MHz reserved for Smart Grid is a positive proposal. ESN agrees that spectrum reserved for Smart Grid is best located at the bottom of the available spectrum band (i.e. 410 – 413 MHz paired with 420 – 423 MHz). ESN agrees that there is no requirement for spectrum cap with regards to the spectrum being released in this award process.

ESN previously raised the proposal that the SCA provide for opportunity cost pricing to be applied for winning bidder(s) as opposed to paying aggregate final round prices (or exit bid price) for spectrum. ComReg and DotEcon argue that this proposal adds complexity to the award process with minimal impact for winning bidder(s) as any overpayment of fees is likely to not be excessive. ESN argues that any complexity with opportunity cost pricing is burdened on the Auctioneer and not on participants. ESN argues that it does not in any event

add significant complexity. ESN believes that opportunity cost pricing is at the very least possible when the auction finishes in a round when supply equals to or is greater than demand. In this instance, the opportunity cost is simply equal to the maximum exit bid entered by a losing bidder (or aggregate highest fail bid for combination of lots won), or if no exit bid entered the opportunity cost is equal to the pricing of lot(s) in the previous round plus a nominal financial value (i.e. €1). ESN believes that any money paid in excess of what was required for an efficient outcome (regardless of how big or small) is money which would have been invested in rolling out a network. Therefore, ESN encourages ComReg to apply opportunity based pricing for spectrum and suggests ComReg and DotEcon apply the simple methods as proposed.

### **Packaging of available spectrum**

ESN agrees that Part A spectrum should be 2 x 3 MHz and reserved for Smart Grid, and Part B spectrum should be released in 2 x 100 kHz lots.

### **Assignment stage**

ESN agrees with ComReg that there is likely to be no material value difference between spectrum locations in the band, so a software tool which selects specific locations in the band (whilst ensuring contiguity of spectrum assignments) is a good proposal.

### **Spectrum Caps**

ESN agrees that this spectrum award does not merit the imposition of a spectrum cap.

As opposed to other recent awards from ComReg, a Bidder who was successful in winning all the available spectrum would not cause competition issues downstream. The amount of spectrum being released is typically minimum required to roll out a wide band nationwide data network. ComReg has other means it is proposing in this spectrum release to encourage efficient use of spectrum (proposed SUFs and Roll out conditions).

Taking into account the amount of spectrum being made available, the inability for an outcome of this award to cause downstream competition issues and the fact ComReg has other tools included in the award to ensure efficient use of spectrum, ESN reiterates that there is no need for a Spectrum cap in this award.

### **Unsold Lots**

ESN agrees that ComReg should not provide much detail on potential plans for unsold lots in the award in advance of the award as this could encourage strategic demand reduction. ComReg's proposal encourages truthful bidding, which in turn encourages the most efficient outcome.

ComReg should ensure that any unassigned spectrum is contained in the middle of the band (i.e. adjacent to Part A spectrum) so that there is an effective guard band between different users and networks. ComReg suggests in paragraph 4.46 that any unsold lots be located in the upper section of the Part B spectrum to *“greater maximise the future availability of spectrum for BB-PPDR, or to create greater interference protection between a potential BB-PPDR requirement and other users assigned in Part B”*.

ESBN is troubled by ComReg's proposal to locate any unsold lots in lower section of Part B spectrum. Firstly, this proposal creates prominence for a potential BB-PPDR user (ESBN is sceptical about if and when this would become a reality) over successful bidder(s) in this imminent spectrum award for 400 MHz. Smart Grid is a critical service as ComReg correctly identifies. ESBN believe it should be at least given the same prominence as the potential BB-PPDR licensee, and at the very least, unsold lots should be maintained in the middle of Part B spectrum so that Smart Grid and any BB-PPDR licensee are both afforded equitable protection from interference.

## **Fees**

ESBN agrees that it is important to specify appropriate spectrum fees to discourage frivolous bidding, but not so high as to choke demand.

ESBN again agrees that a Minimum Price which includes a Spectrum Access Fee and Spectrum Usage Fee best meets ComReg's objectives. This proposal encourages more efficient use of spectrum as it allows a successful Bidder initially allow more funding for the deployment of a network, whilst also providing the incentive (through SUF) for successful Bidder(s) to hand back spectrum it may not be using.

ESBN has outlined above that it believes Opportunity cost based pricing achieves ComReg's objective in spectrum awards, whilst also ensuring that a successful Bidder does not overpay for the spectrum won. ESBN encourages ComReg to consider opportunity cost based pricing (potentially using method(s) proposed by ESBN above) for the proposed SCA.

ESBN agrees with ComReg's proposal to split the SAF and SUF in a ratio of 40:60. This split achieves the objectives of deterring frivolous bidding (by applying reasonable SAF), not choking demand (by requiring all fees upfront) and efficient use of spectrum (60% SUF is large enough to encourage any winning Bidders to hand back spectrum). Another benefit of a larger SUF is that it allows a winning Bidder more funds to develop the network, which meets ComReg's objectives regarding spectrum efficiency and investment in innovation.

ESBN previously set out its position that ComReg should apply a more suitable discount rate for any Smart Grid network operator. ComReg proposed a discount rate of 8.63%, whereas CRU has determined that a Weighted Average Cost of Capital of 4.95% is suitable for investments in Network Infrastructure. ESBN notes that ComReg and DotEcon accept that ideally operator specific discount rates would be used. ESBN accepts that ComReg needs to set an appropriate discount rate which covers all potential users of the spectrum being awarded, and it is not possible to know suitable discount rate for each potential user in advance. ESBN therefore suggests that should a Network Utility Operator be successful in acquiring spectrum in this award and there are no other successful bidder(s) in the award, the most appropriate discount rate to use would be that as determine by the CRU (4.95%). If this scenario occurred, the correct application of discount rate would result in more funds being made available for network deployment (therefore enhancing spectrum efficiency) whilst at the same time achieving the most efficient spectrum release outcome for ComReg. ESBN believes application of operator specific discount rate in the scenario where the only successful bidder was a Network Utility Operator is more in line with ComReg's objectives.

ESBN's proposals are without prejudice to ESBN's position that the licence duration should be longer (i.e. 20 years or more). Should ComReg justifiably increase the licence duration, the proposed spectrum fees should be modified and spread over the increased licence period.



ESBN agrees with the principle of applying CPI to SUFs. ESBN currently pay spectrum fees with CPI applied.

### **National Licences**

ESBN agrees that national licences should be issued by ComReg in this spectrum award process. ESBN refers to its previous responses supporting this position rather than reproduce its reasoning.

National licences enhance the business case for a successful Bidder and creates investment opportunities and incentives. Equally, spectrum issued nationally reduces coordination issues between licensees of the same spectrum in different areas. Sub-national licensing of spectrum creates inefficiencies with regarding spectrum usage as there will be areas in the country where spectrum will not be utilised due to interference, minimising coordination and network deployment. As identified by ComReg, Smart Grid is a service which would be deployed nationally, therefore it is imperative that spectrum is issued on a national basis.

### **Channel Bandwidth**

ESBN agrees that ComReg's proposal to release a single 2 x 3 MHz channel for Smart Grid and lots in part B in 2 x 100 kHz as the optimum solution which best meets its objectives. This allows for 2 x 3 MHz for Smart Grid with a flexible outcome facilitated by auction of Part B spectrum.

### **Licence Duration**

ESBN encourages ComReg to consider a licence duration of at least 20 years. It is important to note that any deployment of Smart Grid requires a reasonable period to realise the benefits of deployment to justify investment. As ComReg correctly identified, Smart Grid can provide significant benefits. The business case for Smart Grid, and indeed other uses in this band, may be undermined should licences be issued for only 15 years. ESBN notes that **all** respondents to ComReg consultation 18/92 argued that ComReg should increase the duration of any licence to at least 20 years (ranging to 30 years). ComReg has not provided sufficient rationale for why it does not accept that licences at the very least be increased to 20 years.

ESBN can understand why ComReg, from a regulatory perspective, may find it challenging to issue indefinite licences. ESBN can understand DotEcon's arguments why the telecommunications network supporting Smart Grid does not need to necessarily be tied to the lifecycle of the assets they are monitoring. ESBN's major concern is with respect to a Network Utility Operator having access to a licence of reasonable duration (minimum 20 years) to justify investment in a dedicated nationwide network. A licence of shorter duration will either result in the business case for Smart Grid not being positive, or the roll out will only be deployed at key strategic locations (whilst meeting roll out obligation) as these would be deployed first and therefore likely to give a return on investments. A longer licence would incentivise investment, increase the size of the network, increase the benefits of Smart Grid and makes better use of the spectrum. All of this is in line with ComReg's obligations and objectives.

ComReg (in paragraph 3.8 of Draft Decision) states "*that Smart Grids are likely to be required to meet various national and international policy goals and are likely to be viable services in the time period up to 2040 (that is, a 15 - 20 year licence duration).*"

ComReg on one hand accepts that the roll out obligation should be increased to 7 years to allow minimum coverage condition to be met. The time taken to roll out an entire network and realise benefits of investment is tied to the length of the licence. ComReg accepts that it will take some time to fully roll out a dedicated network. ComReg should therefore acknowledge that in tandem with this, the benefits need to be realised over a longer period to justify investment. Another related matter is that ComReg is proposing to limit the amount of spectrum in the award. This would result in there being a limit of the number of devices that could be connected in such a network, so this in turn creates a challenge for investment. Convolving the short proposed licence duration with the limit of 3 MHz LTE carriers and no flexibility with mode of operation creates an extremely challenging environment for investment. ESN believes that ComReg needs to at least increase the licence duration to encourage investment, and should facilitate possibility of 5 MHz carriers to increase spectrum efficiency and incentivise investment.

ComReg seems to justify its position regarding a 15 year licence as it reduces “*the potential for licensees to resist changes in the coordination of such bands for strategic reasons*”. Any Network Utility Operator is simply seeking a reasonable period to realise the benefits of investment. A longer licence facilitates this. ESN can assure ComReg that this is the rationale for a longer licence, not to strategically resist changes.

Plum’s updated report suggests that ComReg should consider increasing licence duration to 20 years. Plum consulting previously proposed a minimum term of 15 years, whilst recognising that the service and networks that would use Smart Grid have a lifetime of 15 years or longer. Plum previously recognised that networks will not be replaced as long as they continue to meet operational and economical requirements, noting scanning telemetry was introduced in the UK over 20 years ago and still operating. Investments made by Network Utility Operators in deploying a network that meets operational requirements is relatively expensive, with this cost not offset by commercial revenue. Accordingly, the payback term is longer than that of commercial networks. ESN’s research in this area has concluded that equipment deployed as part of a Smart Grid network is likely to be deployed over a period of 20 years as there is no need for refreshing of equipment as takes place in commercial networks. The fundamental telecommunications requirements from applications connected to a Smart Grid is not expected to change in the long term. Deploying Smart Grid equipment at remote sites is costly, as is the cost of change should spectrum not be successfully relicensed for Smart Grid. The equipment is expected to last 20 years or more. Taking all this into account, it makes perfect sense to issue a licence for a minimum of 20 years to encourage investment and deployment of Smart Grid.

In DotEcon’s most recent report, whilst it refutes the rationale for issuing indefinite licences, it suggests there may be valid reasons for a longer licence duration.

Should an organisation get access to this 400 MHz spectrum band, it is likely to have plans to utilise it as effectively as possible and deploy a network as intensively as required to meet its needs. In order to do so, that organisation will need to have the ability to invest in its network. In order to invest in a vast network, a user needs to factor in the life time of the asset. As opposed to MNOs, a wide-band user of this spectrum will not have a significant revenue stream available to it to rapidly deploy a network and rapidly realise the fiscal benefits of roll out. In order to make investment in technology, a wide-band user of this spectrum would need assurances that this spectrum will be available to the user for a long time. The benefits of Smart Grid need to be realised over a longer period to justify such investment.

If ComReg issued a national licence for 15 years this would create investment issues for a National Utility Operator deploying a network. Other than MNOs, other users of spectrum do not have access to such amounts of capital to invest in deploying a network. Therefore the full roll out of a network can take many years to allow for cost benefits to be accrued which enables additional investment. For example, at year 10 of a 15 year licence, the incentive to invest is reduced if there is only 5 years remaining. Therefore a 15 year licence is unsuitable for this spectrum band. A longer licence of at least 20 years or more enables and incentivises more investment in a network. A 20 year licence is consistent with ComReg's objectives regarding spectrum efficiency and investment in innovation.

It is worth noting that it may take ESN numerous years to deploy a Smart Grid network. For example, the deployment of devices nationally requires a continuous process of installation and maintenance which is likely to be aligned with regular work being conducted by ESN staff who will install such devices. The more extensive the deployment of Smart Grid, the greater ESN's dependence is on the technology. This results in a situation where it is less possible for ESN to replace units in the face of a change/cessation in licence, there would simply be too much work and cost to change out Smart Grid devices. This in turn means that the shorter the licence period, the less investment that can be committed due to the uncertainty and short term available to realise the benefits of deployment. A good reference of issues migrating from a mission critical network can be seen in the UK where migration from Airwave's TETRA network is hugely complicated and significantly delayed. Any Smart Grid operator would have to factor in the same possibility of migration from dedicated network to a public network in its business plan in advance of spectrum award and network deployment. Such a change results in significant costs and time to achieve migration. Having this potential issue at the end of a 15 year licence creates yet another challenge regarding investment. ESN references the TETRA network in Ireland. It appears that this licence is extended and likely to continue to be used for the medium term future as it is necessary for mission critical services to have access to spectrum and realise benefits of investment over a longer period.

ESN previously outlined in its response to ComReg document 18/92 that investment cycles dictated by CRU (Price Review) will influence investment cycles. ComReg in paragraph 5.113 of the Draft Decision notes that a 15 year licence allows for 3 price reviews to take place for Smart Grid providers. In theory this is correct, but in practice is not valid. There will be a Price Review period from 2021 – 2025 and 2026 – 2030 which a Network Utility Operator could make submissions and get funding to invest in such a Smart Grid network. The third Price Review period during a proposed 15 year licence would run from 2031 – 2035. It is highly unlikely that the CRU would look favourably on submissions for funds to invest in deploying telecommunications services where the return on investment could only be realised over the following 4 years (presuming a licence would cease at the end of 2034). Indeed, ComReg indicate that it would make announcements on next release of such spectrum 2 – 3 years in advance of expiry. This means that in 2031 it would not be known by a Network Utility Operator if it can invest in deployment given pending licence expiry in 2034. Therefore, in practice a Network Utility Operator only has two Price Review periods to get funds and deploy services. It is worth noting that funds cannot be carried over from one Price Review period to the next. Therefore a 15 year licence creates investment issues for any Network Utility Operator and could indeed undermine any investment.

Accordingly, to maximise the use of the spectrum the licence period should be sufficiently long as to allow investment certainty (e.g. 20+ years). With certainty over the spectrum availability a Network Utility Operator could make long term strategic decisions on how Smart Grid devices would be developed. Without a long licence period, usage of the spectrum may still

be made but would be limited to those investments which could make a return within the short licence period, with little investment in the period coming up to any expiration of licence.

### **Mode of Operation TDD/FDD**

ComReg in Section 5.4 of the Draft Decision reiterates its proposal for the release of spectrum in FDD mode only. This is based on Plum's recommendation that FDD appears to most likely equipment available in this band, and relies heavily on ECC Decision 19(02). This proposal is also based on the potential for interference between FDD and TDD systems in adjacent spectrum lots. ComReg and Plum suggest that asymmetry is the main reason for the request for flexibility.

ESBN wants to clarify that it requests flexibility to ensure the optimum use of spectrum by any successful bidder(s), and this is in line with ComReg's obligation to ensure efficient use of spectrum. The reality is that FDD and TDD equipment exists in this band, and rationale for allowing flexibility is that this would permit a successful licensee to have the benefit of a larger range of equipment and vendors, therefore facilitating the procurement of equipment from a more open and larger market on a cost efficient basis.

ESBN believe that ECC Decision 19(02) does not preclude the use of TDD equipment. This Decision states that "1.4 MHz, 3 MHz and 5 MHz LTE FDD channelling arrangements **could be implemented in the paired frequency arrangements in 410.0-415.0 MHz / 420.0-425.0 MHz, 411.0-416.0 MHz / 421.0-426.0 MHz and 412.0-417.0 MHz / 422.0-427.0 MHz.**" [emphasis added]. The Decision presents the proposed spectrum bands in "paired frequency arrangements", this paired arrangement could be used for FDD or TDD. ComReg has the option of allowing flexibility within the spirit of ECC Decision 19(02).

### **Interference mitigation**

ESBN welcomes ComReg's revised wideband block edge mask. ESBN in its previous response outlined why ComReg needed to adopt emission levels which were more appropriate and practical. ESBN commends and agrees with ComReg on its proposal (in line with ECC Decision 19(02)) to use modified wideband block edge mask as outlined in Annex 2 of its Draft Decision.

### **Protection of Radio Astronomy**

ESBN notes ComReg's proposal regarding Radio Astronomy as outlined in paragraph 5.51 of Draft Decision. ComReg states that "any potential licensee of the 400 MHz band will be required to coordinate with any potential user of Radio Astronomy in order to protect the Radio Astronomy service from harmful levels of interference." Radio Astronomy and any licensee of 400 MHz spectrum from this award are both primary users of spectrum in this band. ESBN is concerned that ComReg appears to put the onus on any new licensee to coordinate with any potential user of Radio Astronomy (without understanding of when or where this could be deployed) to protect it from interference, yet ComReg doesn't propose that any potential Radio Astronomy user attempts to protect a new 400 MHz licensee from interference. ESBN accepts that there should be coordination between the Radio Astronomy and any new service to mutually avoid interfering with the others network.

ESBN has a concern about such coordination in practice. If a Network Utility Operator successfully deployed a network and a number of years later Radio Astronomy service wished to be deployed (potentially on experimental and/or short term basis), this could result in the Network Utility Operator's service potentially having to be modified or indeed turned off in a

given area under ComReg's proposals. ESBN would like clarity from ComReg about how a Network Utility Operator could prevent against costs occurred due to modification to its own network due to the introduction of Radio Astronomy. Would ComReg provide funds/rebates of licence fees in this scenario? It would appear justified as a Network Utility Operator risks costs and effort to coordinate/modify network without anyway of understanding when and where coordination or taking pre-emptory steps to avoid costs.

### **EIRP Limit**

ComReg has reiterated its proposal from previous consultation (which ESBN previously agreed with) that 50W EIRP is a suitable limit. ESBN still believes this limit is appropriate for reasons previously presented.

ESBN welcomes the increase of UE maximum mean in block power from 23 dBm to 31 dBm. ESBN previously articulated why such an increase was important as this will enable the design and build of an optimised network.

### **Roll out obligations**

ESBN welcomes ComReg's proposal to increase the time to meet roll out obligations from 3 years to 7 years. ESBN in its previous response outlined why it would be challenging to meet the proposed target within 3 years for a number of reasons (e.g. funding periods, procurement, acquiring sites (if necessary) and time to deploy safely). ESBN commends ComReg on the proposal to allow a Network Utility Operator 7 years to reach the roll out obligation.

ESBN appreciates the clarity provided by ComReg regarding applicable conditions if a Network Utility Operator was successful in winning spectrum in Part A and Part B. ESBN agrees that conditions associated with Part A are appropriate for all spectrum licensed in such an event.

### **Memorandum of Understanding (MoU)**

ESBN agrees that it is appropriate to revisit MoU between UK and Ireland, and indeed all respondents to ComReg consultation 18/92 on this issue agree. The existing MoU is not fit for purpose given existing proposals. ESBN previously requested that ComReg begin discussions with Ofcom imminently, and that ComReg consults on the proposed MoU with industry. ESBN is disappointed that it appears (from paragraph 5.127 of Draft Decision) that such discussions have not begun, and also that ComReg appear to dismiss the idea of consulting on the proposed MoU. The MoU is critical for any potential licensee and therefore clarity on details of the MoU is required soonest. Additionally, ESBN believes that potential users of this spectrum have a very good understanding of what a practical deployment would look like and therefore could provide ComReg with useful input for MoU discussions. ESBN therefore encourages ComReg to consult on a draft MoU (perhaps along with its Draft Information Memorandum).

### **Draft Decision Instrument**

ESBN welcomes the presentation of the Draft Decision Instrument in Section 6 of the Draft Decision document. ESBN has feedback on same below. ESBN encourages ComReg to consult on the Draft Regulations along with the Information Memorandum.

ESBN has noted the following in Draft Decision Instrument;

- Page 101 of Draft Decision, the definition for “Award Spectrum” has some confusing/erroneous explanatory text in opening sentence;
- On page 102 – 103, ComReg lists a range of documents it has considered. ComReg has not listed all documents (for example the documents containing all responses to 17/105, 18/92, 19/23 and associated documents), and indeed ComReg should have considered all materials (states non-confidential responses only).

## **4. SUMMARY**

Radio spectrum is a vital natural resource which must be managed efficiently to facilitate economic, social, technological and environmental advances within Ireland. ESB Networks welcomes the opportunity to respond to this consultation

Securing spectrum is a key to ESB Networks developing and operating a reliable smart network necessary to meet Ireland’s decarbonisation targets. Smart Grid produces significant benefits for every electricity user in Ireland, specifically economically and environmentally. A fundamental requirement of Smart Grid is the availability of dedicated radio spectrum.

ESBN is broadly supportive of ComReg’s proposals and congratulates ComReg on presenting well researched reasoning and arguments regarding the benefits of Smart Grid, and for making dedicated spectrum available for this use case. ESBN encourages ComReg to consider ESBN’s statements regarding requirement for a longer licence duration (20 years or more), the inclusion of more spectrum in this award (to facilitate 5 MHz LTE carriers) and flexibility regarding mode of operation of spectrum for Smart Grid.

**ENDS**

## 2 European Utilities Telecom Council



## **EUTC Response to the Irish Commission for Communications Regulation Document No. 19/23 on the Release of the 410 – 415.5 / 420 – 425.5 MHz Sub-band**

### EUTC

The European Utilities Telecom Council (EUTC) is a non-profit organization delivering education, collaboration, best practices and thought leadership in telecommunication technology to utilities, other critical infrastructure providers and regulators, ensuring efficient, secure, sustainable and affordable smart infrastructure solutions.

The membership is comprised of major gas and electricity transmission and distribution companies from across Europe plus vendor partners representing telecommunications suppliers focused on utility telecoms provision.

ESB Networks is one of EUTC's members and will therefore respond directly to the questions posed by the Irish Commission for Communications Regulation (ComReg).

### Background

EUTC welcomes ComReg's proposal to release 2 x 4 MHz of spectrum in the 410-430 MHz band to provide smart grid services within Ireland.

Since our comments on previous ComReg consultations on use of the 400 MHz band, the most notable international development has been the publication of the International Panel on Climate Change (IPCC) Special Report on Global Warming. Published on 8 October 2018. The report stated that limiting global warming to 1.5°C would require rapid, far reaching and unprecedented changes in all aspects of society. The IPCC said that "With clear benefits to people and natural ecosystems, limiting global warming to 1.5°C compared to 2°C could go hand in hand with ensuring a more sustainable and equitable society"<sup>1</sup>. Smarter electricity grids will play an indispensable part in attaining that goal, within which advanced telecommunications will be an essential ingredient.

We also note that ETSI System Reference Document SRDoc TR 103 492 (Critical Infrastructure Utility Operations Requirements) has also now been approved for publication.

Against this continuing background of international progress towards more intelligent networks and lower carbon societies, ComReg's consultations on release of spectrum in the 400 MHz sub-bands are progressive and far-sighted.



Western Power  
Distribution's 400 MHz  
LTE trial base station  
at an electricity substation  
near Bristol in UK

<sup>1</sup> [https://www.ipcc.ch/pdf/session48/pr\\_181008\\_P48\\_spm\\_en.pdf](https://www.ipcc.ch/pdf/session48/pr_181008_P48_spm_en.pdf)



### Specific comments

Our comments are restricted to those areas of greatest importance and relevance to utilities generally, rather than the specifics of the Irish environment which are best left to more local responders.

#### Section 2.2: Developments within the European Conference of Postal and Telecommunication Administrations

- It is unfortunate that the recent adoption of ECC Decision (19)02 has altered ComReg's approach to this spectrum release at a relatively late stage in the process. The way in which the previous consultation document was structured offered the opportunities for utilities to potentially acquire 2 x 5 MHz of spectrum to build an LTE network if that was the most economically efficient solution.
- Utilities in Ireland have to focus on the 410-430 MHz band for LTE technology as it is unlikely that 450-470 MHz will be available in Ireland in the foreseeable future.
- Utilities do not wish to detract from the valuable and essential services provided by the Public Safety community (PPDR), and would not wish to impede their access to radio spectrum which is equally important as that for utilities. However, whereas virtually all European utilities are focused on spectrum in the 410-470 MHz band, PPDR already has access to 2 x 5 MHz in the 380-400 MHz range, with ambitions to gain access to spectrum in the 700 MHz bands in some form. With the specialist and diverse nature of both the PPDR and utility markets, it would be more likely to be successful if utilities were allowed to focus on 410-430 MHz in Ireland with public safety access to the 380-400 MHz spectrum for wide-area use allied to 700 MHz for more urban areas.



#### Section 5.4: Mode of Operation

- Utilities are ultimately concerned with delivering benefits and reliable services to energy consumers while respecting government energy, safety, social and environmental policies. The communications technology employed to deliver these objectives and benefits is largely irrelevant. EUTC believes that it is therefore best to be as open as possible to alternative technologies. In this context, if it is possible to remain open to both Frequency Division Duplex (FDD) and Time Division Duplex (TDD) alternatives, that may facilitate delivery of maximum benefit to energy consumers though the most effective technology choice.
- Specifically, although FDD technology is more common for large networks at this type of frequency range, it should be pointed out that TDD enables the balance between down-load and upload capacity to be optimized for utility operations. For utilities, the upload path is dominant, enabling TDD to deliver more efficient spectrum utilization than FDD.
- If it is possible to conform to the recommended CEPT Band Edge Masks (BEM), that will permit the most cost-effective solution, avoiding the unnecessary cost of more stringent adjacent channel performance whilst also respecting and enhancing European Standards on a world-wide basis.



- The issue of ‘guard bands’ or ‘restrictive blocks’ could be addressed in the licence conditions by requiring the winners of the various lots of spectrum to co-ordinate amongst themselves.

#### Section 5.6: Roll-out obligations

- Roll-out conditions are appropriate to commercial mobile networks where consumers in less populated areas are disadvantaged if network operators are not incentivized to provide services outside major conurbations. In contrast, utilities are incentivized to build intelligence into their networks where the energy needs are greatest, for example, where customers are suffering from above average power interruptions, where connections of new renewable energy resources are constrained by power network capacity, where energy networks cannot supply new additional loads, etc. Conversely, prioritizing the construction of operational telecoms network coverage in areas not currently subject to energy network constraints leads to sub-optimal allocation of capital spending.



Telemetry outstation antenna in Western Power Distribution’s 400 MHz LTE trial in Bristol, UK

#### Section 5.7: Licence duration

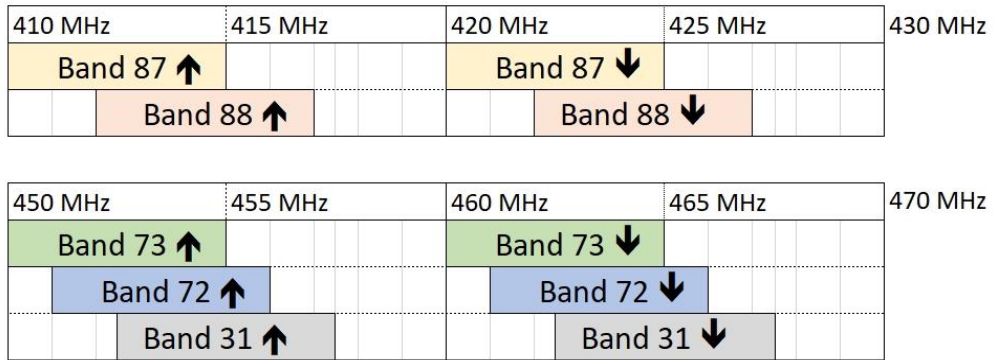
- Utility infrastructure, unlike telecoms networks which are designed to attract domestic consumers, is designed and constructed for longevity as opposed to feature-rich networks to woo customers from competing suppliers. Against this background, a longer licence period than 15 years would be most advantageous to enable energy consumers to derive maximum benefit from the longevity of operational telecoms investment.
- EUTC believes that a licence period of 15 years will be to the detriment of energy consumers. By the time the spectrum licence is issued, the telecoms network built and assets installed in the utility networks, it may not be possible to recover the total expenditure within the remaining period of the spectrum licence, potentially resulting in assets being scrapped before the end of their working lives to the detriment of customers. There is also the subsidiary environmental issue in that products may be withdrawn and scrapped before the end of their economic life, resulting in unnecessary waste of materials with a consequential increase in carbon footprint.
- Although EUTC understands that ESN is keen to take advantage of the opportunity contained within this consultation to create an LTE utility smart grid telecoms network in 410-430 MHz spectrum, ESN is also aware that this is likely to be one of the first LTE networks in 3GPP band 87 (see attached diagram). As a relatively new



Unlike consumer products, utility assets are often designed with a service life of up to 50 years.



band for LTE, ESN will be an ‘early adopter’ and unlikely to benefit from the economies of scale and price reductions in equipment which will inevitably follow later. Since Ireland is a relatively small market in global terms, this will compound the challenge of securing competitive equipment suppliers in the early days. This creates a further compounding reason necessitating a longer time period over which to recover the investment than would be the case for a mature 3GPP band with multiple vendors already competing to supply equipment.



Section 5.8: Memorandum of Understanding

- International co-ordination will be a priority as ESN has to provide service to the very edges of the Republic of Ireland’s border. However, utility networks share energy resources on a cross-border European-wide basis with regulation on a European basis. EUTC and its members are therefore at ComReg’s disposal to assist in international co-ordination of use of radio spectrum by utilities wherever EUTC can be of help. Specifically, EUTC encourages spectrum harmonization and co-ordination on a European basis to facilitate lowest cost solutions and enhance Europe’s industrial strengths, and wishes to support the Irish Administration in their endeavours in this direction wherever possible. In our view, this ComReg consultation is a positive step in this direction.

Adrian Grilli  
 Secretary, Spectrum Working Group  
 European Utility Telecom Council  
 April 2019  
 Brussels

# 3 Joint Radio Company Limited

## Response to Consultation and Draft Decision on the Release of the 400 MHz Sub-band

### Response

The Joint Radio Company (JRC) welcomes the opportunity to respond to this consultation. JRC supports the actions of the Commission for Communications Regulation (ComReg) to progress the release of the of 400 MHz spectrum under consideration for ‘Smart Grid’ developments in Ireland. The principle focus of this response is the change proposed to the spectrum available to the award process, in particular the reduction of the lot B award from 2 x 2.5 MHz to 2 x 1 MHz with 2 x 1.5 MHz being reserved for potential Broadband - Public Protection and Disaster Relief (BB-PPDR) purposes in the future. From a procedural perspective it seems strange to intervene at this very late stage in the regulatory process with a proposal that is potentially detrimental to the key objectives of this award, i.e. facilitate spectrum to support ‘Smart Grid.’ Furthermore, the reservation of spectrum in this frequency range for BB-PPDR purposes whilst now contemplated within the revised decision ECC 16/02 it is at odds with the emphasis that is being placed across Europe on the 700 MHz band.

### Detrimental Impact of Proposed Changes to the Lot B Award

The reduction of the Lot B award to 2 x 1 MHz of spectrum forecloses the opportunity for this spectrum to be deployed alongside Lot A spectrum utilising the minimum LTE standard channel configuration of 2 x 1.4 MHz and in so doing would prevent the Smart Grid network from potentially utilising 2 x 5 MHz channels in the radio design. This reduces flexibility in terms of the network capability and how it might be optimised and has implications for the ultimate configuration of the network, including the number of sites and quantity of equipment that will need to be deployed with the resulting negative impact on system cost and complexity.

### Potential Implications of the Changes to the Lot B Award on Licence Obligations

Considering the proposed changes to the Lot B award there are potential detrimental implications to the terms of the spectrum award, in particular;

- Roll-out term obligation – whilst we welcome the increase to 7 years for the roll-out obligation to be satisfied, the reduction in flexibility resulting from the proposed changes to the Lot B award may cause added complexity and hence delay and we encourage ComReg to revisit this target.
- Minimum Licence Term – we continue to encourage ComReg to increase the minimum licence term to at least 20 Years and ideally 25 Years. With Smart Grid capability and applications in their infancy and the acknowledgment that Utilities will be required to profoundly change their operating model to implement and harness their benefits it is imperative that the sector has long term certainty over spectrum access to realise the benefits of the Investments and Industry changes necessary. Noting this need for long term security of access to spectrum it is unfortunate that the Lot B award has been changed in such a manner to render it unsuitable to offer flexibility to the Smart Grid developments targeted to the Lot A award.

Overall, we continue to support the actions of ComReg to facilitate spectrum access for Smart Grid development in Ireland, subject to some minor adjustments to the terms of the award and the licences as noted above.



## 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 coordinating 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.