EUTC Response to the RSPG Draft Opinion on the Role of Radio Spectrum Policy to help combat climate change

The European Utilities Telecoms Council (EUTC), representing European electricity and gas generation, transmission and distribution companies welcomes RSPG's recognition that Radio Spectrum Policy can play a vital role in helping to combat climate change.

EUTC is pleased to note in Paragraph 16 of the Draft opinion that "The RSPG recommends that Member States better engage in highlighting the potential of current harmonised spectrum to respond to various technology needs in order to support the development of smart meters and smart grids." The EUTC believes that this statement deserves more attention and emphasis at European level. Harmonization of spectrum particularly for usage by utilities, especially of spectrum bands for which harmonized standards are available would be beneficial to meet the requirements of smart grids. This will benefit Europe by accelerating the development and deployment of technologies for smart grids, thereby speeding up the reduction in greenhouse gas emissions, advancing measures to combat the effects of climate change whilst enhancing European industrial competitiveness with new products and services to the overall benefit of all European citizens and consumers.

Energy production and use, including the energy used in transport, account for some 80% of the EU's greenhouse gas emissions. Thus, to tackle climate change effectively, Europe will have to largely 'decarbonise' its energy systems by moving away from fossil fuels. There is now increasing recognition that digitization of grid management, which is dependent on reliable and often dedicated communication infrastructures which in turn is dependent on the availability of dedicated radio spectrum, can assist and accelerate the 'energy transition.'

Measures to strengthen the RSPG recommendation highlighting the potential of current harmonised spectrum to respond to various technology needs in order to support the development of smart meters and smart grids.

1. Encourage closer coordination between DG Energy and DG Connect. Smart meter and smart grid telecommunications fall between the responsibilities of multiple Directorate Generals. Smart Grids are vital to ensure European Nations' Energy Grids meet their 2050 carbon reduction targets. Smart Grids represent the conjunction of telecoms and energy networks working in seamless harmony, but responsibility for initiatives in this area is not prioritized by either DG Energy or DG Connect.
2. Encourage the Commission to identify what initiatives are under way to ensure the energy sector has access to the specialised telecoms provisions it needs (including spectrum access) to ensure European citizens have energy networks capable of delivering secure, affordable and sustainable energy in a low-carbon future.
3. Initiate action to advocate spectrum access in all Member States for private wide-area IMT2020 networks. A significant difference between 4G and 5G is the growth of vertical markets, in areas such as health care, transport, factories and utilities. Steps are being taken to provide these vertical sectors with access to radio spectrum for small low power systems, and larger areas such as campuses, factories and stadia. However, so far there has been no provision for spectrum access for wide-area private 5G networks as required by utilities for smart metering and smart grids.

Detail

How wireless technologies contribute to reduction of the effects of climate change

Background

Historically, a relatively small number of large power stations, mainly fossil-fuelled, fed into a transmission network at extremely high voltages – around 400,000V, gradually being transformed to lower voltages before the power finally emerged from the power sockets in homes, offices and factories at 400V/230V. The transition of the electricity network into cleaner, greener more sustainable power is leading to lots of smaller power sources being connected into the electricity distribution system at intermediate voltages, usually between 100,000V and 10,000V.

Substation connecting a wind farm into an electricity distribution network showing multiple terrestrial UHF and satellite radio links to monitor and control the associated switchgear.

Many of these new power sources are low-carbon and renewable – wind and solar being the most common - but these energy supplies are intermittent and often unpredictable. As we target a zero-carbon economy by 2050, transport and home heating are being converted to electricity, creating large new demands on electricity networks. In addition, as the climate warms, air conditioning loads are rising.

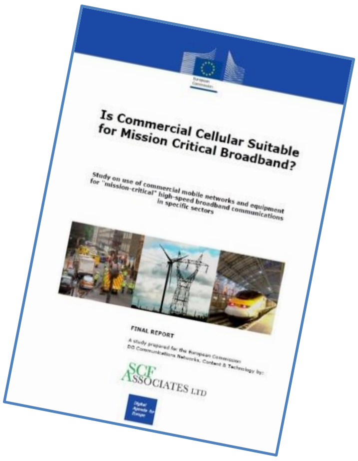
These new sources of generation and demand are creating a two-way flow of electricity within a network designed for a one-way flow, something never envisaged when it was constructed. There are two ways to meet this challenge.

One solution is to build lots more capacity into the network to accommodate power plants which only generate intermittently. This would require a much bigger power network, be very expensive to build, take a long time to achieve, and be highly disruptive.

However, the industry is following a better alternative by progressively converting the existing electricity network into a more intelligent system, often referred to as a '**smart grid'**.

By applying advanced telecommunications to monitor and control the system, utilities can use existing electricity cables and transformers more efficiently and avoid wholesale re-enforcement of the electricity network. Real-time monitoring of assets such as cables and transformers can also permit higher ratings of equipment when operating parameters permit, such as allowing overhead cables to carry more power when they are being cooled by the wind, but reducing their capacity in hot still air to avoid power outages as cables overheat or sag to a dangerous degree.

To match these intermittent power sources, demand management – switching loads on and off to try to match demand to supply - on a second-by-second basis, can be introduced all without disrupting consumers and industry.



Finally, flexibility solutions such as batteries can be placed strategically around the network to absorb excess power when not needed, and top-up supplies at times of high demand.

This enhanced need for monitoring and control increases the number of telecommunications connections on electricity distribution networks from hundreds of points to ultimately millions.

Where copper and fibre cable connectivity exist, this can be exploited, but in many cases, radio is the only means to deliver this sophisticated enhanced control capability quickly and cost-effectively. However, managing electricity networks that usually operate in the region of 99.999% availability requires these radio solutions to be exceptionally reliable, resilient to mains power failure and able to reach locations often unserved by existing telecomms networks.

Gas and water networks are also transitioning towards more intelligent and smarter networks by employing similar technological innovations.

<u>Harmonised technology-neutral access is not a solution</u>

Utility radio solutions are often separate from public telecommunications networks for security and reliability purposes. In 2012, the European Commission, keen to understand the potential for three mission critical sectors – public protection and disaster relief (PPDR), utilities and intelligent transport services (ITS) for road and rail to migrate to commercial broadband networks commissioned a study by Simon Forge Associates (SFA).[1]

Utility telecommunications are most needed when their networks are under stress, such as in extreme weather conditions when utility services have to be restored as quickly as possible for the health and welfare of consumers.

The study concluded that there was a reluctance within the mission critical sectors to employ commercial mobile services exclusively. Their major reservation was whether commercial operators were willing and able to provide long-term reliable and resilient services with the needed coverage and quality. The key conclusion was that commercial LTE networks could support mission critical needs but only if certain conditions are met, but these conditions would fundamentally change the operating environment for the commercial mobile networks.

[1] "Is Commercial Cellular Suitable for Mission Critical Broadband?" Study on use of commercial mobile networks and equipment for "mission-critical" high-speed broadband communications in specific sectors: A study prepared for the European Commission DG Communications Networks, Content & Technology: ISBN: 978-92-79-38679-4.

In summary, the five conditions – **which had to be met in full** – were:

1. The behaviour of commercial MNOs must be constrained to provide the services needed by mission critical users while preventing the use of "lock in" techniques to take unfair advantage of this expansion of the MNOs' market power and social responsibility. Such changes include not just stronger commitments to network resilience, but the acceptance of limits on price increases and contract condition revisions, ownership continuity assurances, and a focus on quality of service for priority mission critical traffic. Equally important for long-term relationships will be the mission critical services' perception of MNO behaviour and performance. For that, measures will be needed that go beyond service level agreements (SLAs) at a commercial contract level: new regulations regarding commercial MNOs services must be enforced by each Member State's national regulatory agency (NRA).

2. Commercial networks have to be "hardened" from RAN to core and modified to provide over 99% availability – with a target of "99.999%". Geographic coverage must also be extended as needed for mission critical purposes and indoor signal penetration improved.

3. All this network hardening and extended coverage, along with the addition of essential mission critical functions and resilience, must be accomplished at reasonable cost. No more should be spent on the selective expansion and hardening of commercial networks for mission critical use than it would cost to build a dedicated national LTE network for that purpose.

4. Hardened LTE networks must be able provide the different types of service required by each of the three sectors. Each sector uses broadband in quite different ways. That is, not just for streaming video, image services and database access, as in PPDR, but for very low-latency telemetry and real-time control for utilities and transport.

5. Commercial mobile networks must overcome ingrained Member State preferences for state-controlled networks for applications that implicate public safety. This is not simply a legal, regulatory or economic question. Some Member States have specific histories of state control as part of their culture, traditions and politics. Thus some Member States may want to continue using dedicated networks in the short and medium term even if they cost more.

Since the publication of the SFA report in 2013, there has been no progress in changing public cellular network license conditions, nor the infrastructure deployed by commercial telecoms operators to provide the priority, guaranteed access, service level agreements and the resilience essential for Smart Grids.

Since the publication of the report, the interests of the commercial broadband operators and the utility sector have diverged as operators have switched their focus to 5G. Although 5G incorporates elements of interest to utilities – network slicing, low latency, high reliability, machine-to-machine, etc, the fundamental problem of ensuring power resilience and priority for critical network operations remains. Indeed, the recognition now is that some vertical sectors will construct their own private 5G networks, making the case for spectrum for the provision of private utility telecommunications networks even more compelling.

Access to radio spectrum

It must therefore be observed that if utilities are to construct their own private radio networks, it will be essential for them to be guaranteed access to a small amount of dedicated radio spectrum for their operations.

The 2 x 3 MHz of spectrum in the 400 MHz region currently being sought by many utilities around Europe is only ½% of the 1200 MHz of spectrum which was identified for broadband radio services in the 2012 EU Radio Spectrum Policy Programme.[2]

EUTC Spectrum Proposal

Within Europe, multiple small allocations within harmonised bands:

LESS INTENSE APPLICATIONS

- **VHF spectrum (50-200 MHz)** for resilient voice comms & distribution automation for rural and remote areas. [2 x 1 MHz]

ANCHOR BAND

- **UHF spectrum (400 MHz bands)** for SCADA, automation, smart grids and smart meters. [2 x 3 MHz]

MORE DENSE APPLICATIONS

- **Lightly regulated or licence-exempt shared spectrum** for smart meters and mesh networks. (870-876 MHz)
- **L-band region (1500 MHz)** for more data intensive smart grid, security and point-to-multipoint applications. [10 MHz]

FOUNDATION BANDS

- **Public microwave bands (1500 MHz – 58 GHz)** for access to utilities' core fibre networks/strategic resilient back-haul.
- **Public satellite bands** to complement terrestrial services for particular applications.

5G

Developments in the 5G ecosystem offer the prospect that if utilities construct their own new private networks using LTE technology, there will be an upgrade pathway to 5G. This aligns with growing interest in private 5G networks in other sectors. If the concept of heterogeneous networks also becomes a reality, the vision is that utilities may be able to take advantage of the benefits of both commercial and private 5G networks integrated into one seamless telecommunications environment.

In furtherance of this objective, EUTC has become an active participant in the 3GPP process developing standards for 5G to ensure that the criritcal elements required by utilities in 5G are incorporated into the standards. In addition, EUTC is collaborating with other international utility telecoms associations to promote recognition of the need for access to spectrum for utility operations within the International Telecommuication Union (ITU) Radio Sector (ITU-R) Study Group 5 to develop a report on utility spectrum needs. This work is in parallel with a Report ITU-R SM.2351.1 on Smart Grid Utility Management Systems.[3]

Security

Tempering this vision however, it would be remiss if we did not mention the increasingly hostile cyber security environment in which utilities must operate. The European Union Agency for Cybersecurity (ENISA), recently published a study 'ENISA THREAT LANDSCAPE FOR 5G NETWORKS,'[4]. In their report, the authors observe, 'With the advent of the fifth generation (5G) of mobile networks, security threat vectors will expand, in particular with the exposure of new connected industries (Industry 4.0) and critical services (connected vehicular, smart cities etc.). The 3G revolution, introducing internet connectivity into the mobile network infrastructure, is replicated in 5G connected services and vertical

[2] https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32012D0243
[3] https://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-SM.2351-1-2016-PDF-E.pdf
[4] https://www.enisa.europa.eu/publications/enisa-threat-landscape-for-5g-networks

infrastructures. The integration with and exposure to the data network, is even more prevalent across the 5G network.'

The increased exposure to security threat vectors identified in the ENISA report can be addressed more effectively if utilities are able to deploy private networks that are separate and discrete from public networks set-up with appropriate security protocols to reflect the critical nature of the service.

Climate change and the weather

The focus of this response has been to highlight the role that spectrum access can play in assisting utilities to reduce carbon emissions that contribute to climate change, but it is important not to forget the impact that climate change is already having on utility operations, and the role that utilities play in helping citizens survive the damaging effects already being experienced.

The Walham electricity substation inundated in the west of England during the 2013 winter floods in the UK.

Water utilities play a key role in flood prevention and mitigation, while electricity and gas resources must be able to survive increasingly severe storms with more severe rain events, higher winds, droughts, wildfires and excessive summer temperatures.

Critical Electricity switchgear mounted on a plynth above the maximum probable flood level.

In July 2021, abnormally high rainfall caused severe flooding in many European countries, most notably Germany, Belgium, France, Luxembourg, Italy, Switzerland, Austria and Romania with the loss of at least 228 lives.

Whilst utilities are making their contribution to reducing carbon emissions, they are also adapting their infrastructure to mitigate the effect of severe weather where possible. Most notable in relation to flooding, lifting sensitive equipment above the highest predicted water flood level is one example. In these circumstances, where flooding, snow or fallen trees prevents physical access to infrastructure, remote monitoring and control by radio is even more important in enabling systems to continue operating where otherwise they might be inoperable.

Utility telecoms systems serve a vital purpose in aiding the combatting of all these detrimental impacts of climate change, safeguarding citizens lives and property, and helping them rebuild their lives in the sad cases where the environment overwhelms them.

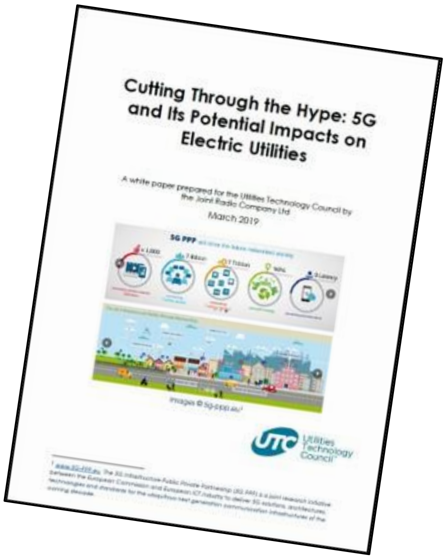
Issues involving radio spectrum policy which help combat climate change, decrease carbon emissions and reduce energy consumption.

As highlighted in the above sections, if utilities do not have access to suitable and sufficient spectrum to address their needs, the pace of migration to a zero-net carbon future will be impeded.

Other solutions are available to utilities – commercial networks, wired telecoms (usually fibre) and simply investing in larger utility infrastructure systems – 'putting more copper in the ground'. These options have social and economic consequences in that the pace of recusing carbon emissions will be slower, at greater cost to consumers – often generating 'fuel poverty' in the less wealthy elements of society, and less resilient infrastructures as highlighted in EUTC reports on the socio-economic benefit of spectrum allocated to utilities for operational systems.[5] [6]

Other relevant comments

The Radio Spectrum Policy domain has shifted significantly in recent years with the emergence of 5G as the dominant IMT2020 technology. This has widened the scope of those who must be involved in spectrum policy beyond the confines of the traditional parties – Governments, Regulators, Researchers, Equipment Manufacturers and Network Operators to involve vertical industry sectors such as Healthcare, Industry, Transportation and Utilities. [7]



RSPG is to be congratulated on its open approach to the positive contribution that Radio Spectrum Policy can make in addressing reducing carbon emissions and mitigating the adverse effects of climate change. New industrial sectors must be involved in this dialogue.

Conclusion

The Annex below illustrates where action is already being taken across Europe to facilitate spectrum access for utilities to enhance energy network operation and efficiency.

The utility sector is keen to work with the RSPG to identify areas where European Spectrum Policy can make a significant contribution to reducing carbon emissions as we work towards a net-carbon zero European economy, and to combat the effects of climate change to minimize their impact on European citizens. In addressing these needs, the economic benefits of harmonization must be realized for the benefit of European citizens and consumers who ultimately have to pay the price of this energy transition.

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[5] https://eutc.org/wp-content/uploads/2018/08/Socio-economic-value-of-Spectrum-used-by-utilities-v1.1.pdf

[6] https://www.jrc.co.uk/Plugin/Publications/assets/pdf/ICT-The-Socio-economic-value-of-spectrum.pdf

[7] https://eutc.org/wp-content/uploads/2019/04/Cutting_through_the_Hype_Utilities_5G-2.pdf

ANNEX

Examples of radio spectrum policy helping to reduce the impact of climate change

Illustrative examples from EU Member States

Germany

On 16th November 2020, the German Federal Network Agency BNetzA published its decision to provide the 450 MHz frequency for applications of the critical infrastructures and opened the award procedure.[8]

BNetzA said that the provision of the 450 MHz spectrum for critical infrastructures will help to pave the way for the digitalization of the energy transition. BNetzA noted that this spectrum band is particularly suitable for building a highly available and blackout-resilient nationwide wireless network for sectors such as electricity, gas, water and district heating.

In addition, BNetzA observed that the operators of critical infrastructures do not have any alternative broadband frequencies or exclusive frequency ranges available. The provision of the frequencies can therefore make a significant contribution to the energy transition.

In early 2021, BNetzA announced that a company owned by a consortium of German utility companies had been awarded the spectrum in order to build and operate the 450 MHz network for critical infrastructure operators. The successful applicant will pay a fee of around 113 million euros for the duration of the assignment (20 years). The regulator will allocate the whole available spectrum (2 x 4.74 MHz) in the 450 MHz band to the consortium in order to enable deployment of the newest technologies in the spectrum.

Poland

In Poland, on August 8, 2018, the then Ministry of Energy announced that PGE Systems, part of the Polish electricity distribution sector had received an allocation of spectrum in the 450MHz frequency band to provide services to the entire Energy sector. The conditions for the allocation included:

- Communication for both energy transmission and distribution operators;
- At least 72 hours of guaranteed operation in the event of a blackout to ensure resilience of the communication system;
- Communication for coal/cooper mines, heat production and distribution, oil & gas industry;
- Data transmission for the purposes of automatic control, smart meters (AMI) at consumers, balancing stations (network security); data transmission for operational control, demand side management and software upgrades;
- Internet of Things (IOT) in devices connected to the power grid - ensuring resilience against cyberthreats, including attacks that would result in a network disaster; and
- Broadband data transmission, enabling video transmission, transfer of photos, maps, documentation.

[8] www.Bundesnetzagentur.de/450MHz

Subsequently, Polska Grupa Energetyczna (PGE), the Polish Electricity Distribution Company announced in October 2020 that LTE450 network rollout and operations will be one of the key elements of its new strategic program until 2030.[9]

The LTE450 communication system being built will ensure the reliability of dispatcher work, but above all, it will support the integration of renewable energy sources as well as distributed energy and energy storage.

Spain

In July 2020, the Spanish administration reserved 10 MHz of spectrum in 3GPP Band 40. The 2370-2380 MHz frequency range is now reserved for networks for the exclusive use of the broadband land mobile service, preferably for the management of public service networks for the distribution of electricity, gas or water (UN50 in Spanish Regulations). The spectrum has previously been used for fixed links.

The spectrum must be shared amongst all utilities, but this is not foreseen as a problem because utility distribution companies operate in separate geographic areas, and distribution companies frequently support their related transmission companies with telecommunications facilities or visa-versa. It is considered that LTE is a particularly suitable technology if the spectrum must be shared amongst several utilities.

Ireland

In the Republic of Ireland, spectrum in the 400 MHz band has recently been awarded to facilitate telecommunications in support of SMART utility networks. The Irish National Development Plan 2018—2027 ‘Project Ireland 2040’[10] declared “The national objective of transitioning by 2050 to a competitive, low-carbon, climate-resilient and environmentally sustainable economy and society must influence public capital investment choices over the next ten years.” (page 74). The report identified that “In addition to the public investment measures … a range of major commercial state sector energy projects will be undertaken over the period of the plan. State owned enterprises are expected to invest in excess of €13 billion in energy related investments, with a particular focus on investment in regulated energy network infrastructure to provide smart reliable electricity networks to support security of electricity supply, SMART metering and enable increased renewable generation.” (page 78).

The allocation of radio spectrum to utilities is a practical commitment by the Irish Government to facilitate the achievement of these policy goals through the application of advanced telecommunications to the energy network.

The Government’s National Development Plan complemented the Commission for Communications Regulation Consultation on the Release of the 410 – 415.5 / 420 – 425.5 MHz Sub-band (ComReg 18/92) published on 24 October 2018.[11]

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9 https://www.wirtualnemedia.pl/artykul/pge-zapowiada-przyspieszenie-prac-nad-budowa-sieci-lacznosci-lte-450
10 https://assets.gov.ie/19240/62af938dce404ed68380e268d7e9a5bb.pdf
11 https://www.comreg.ie/publication/further-consultation-on-the-release-of-the-410-415-5-420-425-5-mhz-sub-band/

The most relevant part of this consultation is reproduced below for convenience as this analysis applies to most European countries.


Further Consultation on the Release of the 410 – 415.5 / 420 – 425.5 MHz Sub-band

Consultation
Reference: ComReg 18/92
Date: 24/10/2018

3.27 Smart Grids are a key component of government efforts to meet demand for increased energy requirements in a cost effective and secure way while reducing the environmental impact of consumption and associated carbon emissions. Different functions of the Smart Grid could provide substantial reductions in energy use and carbon emissions by using new technology and making renewable energy and efficiency programs more affordable and potentially more accessible.

3.28 In particular, greater integration of renewable energy into electricity and gas grids is key to lowering the environmental impacts of generation and meeting climate change targets. For example:

- The ITU has outlined how Smart Grids can help to mitigate climate change by building more controllable and efficient energy systems;
- The United Nations (UN) has outlined that the demands of climate change requires the development of a Smart Grid which is founded upon communications networks that can deliver centralised real time monitoring and control, eventually across the entire power distribution domain.

3.29 A number of seminal international and national studies have estimated the potential carbon reductions arising from the use of Smart Grids:

- the Electrical Power Research Institute (EPRI) has estimated that Smart Grid enabled electrical distribution could reduce electrical energy consumption by 5% to 10% and carbon dioxide emissions by 13% to 25%;
- a smart electrical power grid could decrease annual electric energy use and utility sector carbon emissions by at least 12% by 2030; and
- the Sustainable Energy Authority of Ireland estimates that by 2050, Smart Grids will see an accumulated reduction in energy related CO2 emissions of 250 million tonnes.

3.30 At a European Level, the European Commission has been encouraging the use of Smart Grids in order to encourage more efficient energy generation and consumption. For example, under the Electricity Directive:

- *"Member States should encourage the modernisation of distribution networks, such as through the introduction of **smart grids**, which should be built in such a way that encourages decentralised generation and energy efficiency*.
- "*In order to promote energy efficiency, Member States or, where a Member State has so provided, the regulatory authority shall strongly recommend that electricity undertakings optimise the use of electricity, for example by providing energy management services, developing innovative pricing formulas, or introducing intelligent metering systems or **smart grids**, where appropriate*.

3.31 The European Commission has an existing policy framework for climate and energy from 2020 to 2030 which proposes new targets and measures to make the EU's economy and energy system more competitive, secure and sustainable. It includes targets for reducing greenhouse gas emissions and increasing use of renewable energies noting that "*the EU and Member States will need to develop further their policy frameworks to facilitate the transformation of energy infrastructure with more cross-border interconnections, storage potential and **smart grids** to manage demand to ensure a secure energy supply in a system with higher shares of variable renewable energy*".

Nissan Leaf electric cars at the ESB Turlough Hill substation which serves the largest energy storage facility in the Republic of Ireland.

3.32 In that regard, at a national level the Department of Communications, Climate Action and Environment is currently developing a National Energy and Climate Plan (NECP) as one of the key provisions of the proposed Governance of the Energy Union Regulation. The plan, which is due to be submitted to the European Commission by the end of 2018, will include trajectories for renewable energy, energy efficiency, and national emissions, and measures required to achieve these trajectories. The plan must set out how Ireland is going to achieve targets on reducing carbon emissions and increasing renewable energy up to 2030. The then Minister for Communications, Climate Action and Environment, Denis Naughten TD noted that this will be facilitated by existing work streams such as the National Development Plan (NDP). The NDP includes measures such as Smart Grid to transition to a low-carbon economy.

3.33 Such requirements are also broadly in line with State policy to encourage the provision of Smart Grid and other related technologies. For example:

- The Project Ireland 2040 National Planning Framework promotes a transition to a low carbon energy future which requires decisions around development and deployment of new technologies relating to areas such as wind, **smart grids**, electric vehicles, buildings, ocean energy and bio energy.
- It also commits to a roll-out of the National Smart Grid Plan enabling new connections, grid balancing, energy development and micro grid development.
- The Department of Communications, Climate Action and Environment National Mitigation Plan observes that smart operation of the power system at both transmission and distribution level and energy efficiency will enable maximisation of the existing grid.
- The National Development Plan 2018-2027 foresees the piloting of "climatesmart countryside" projects to establish the feasibility of the home and farm becoming net exporters of electricity through the adaptation of smart metering, **smart grids** and small-scale renewable technologies, for example, solar, heat pumps and wind.
- The Sustainable Energy Authority of Ireland "Smart Grid" Roadmap to 2050 notes that Smart Grid can maximise our use of indigenous low carbon renewable energy resources which is central to ensuring Ireland meets its long-term target of a secure and low carbon future.

The European Utilities Telecom Council (EUTC)

The European Utilities Telecom Council (EUTC) is the leading European Utilities trade association dedicated to informing its members and influencing policies on how telecommunication solutions and associated challenges can support the future smart infrastructures and the related policy objectives through the use of innovative technologies, processes, business insights and professional people.

This is combined with sharing best practices and learning from across the EUTC and the UTC global organization of telecommunication professionals within the field of utilities and other critical infrastructure environments and associated stakeholders.

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