



## **Net Zero Review: Call for Evidence**

### **Executive Summary**

- The Joint Radio Company (JRC) welcomes the opportunity to respond to this call for evidence. Our contribution centres upon the important role that dedicated radio spectrum access will play in efficiently achieving 'Net Zero,' while avoiding market and regulatory failure through appropriate policy interventions.
- A bespoke, radio-based communication network is the most cost-effective option to provide UK energy network distribution and transmission operators with the necessary, resilient real-time command and control capability to manage an increasingly complex and integrated, low carbon energy system. As we transition to Net Zero, energy networks will need to be more flexible to connect more renewable generation, energy storage systems, and millions of low carbon devices – such as electric vehicle chargers, heat pumps and micro-generation – across every tier of the UK energy system.
- As noted by the Carbon Trust, increased flexibility could save UK energy consumers £16.7 billion a year. However, this can only be implemented by granting the industry appropriate radio Spectrum Access.
- JRC commissioned research by Gemserv<sup>1</sup> demonstrated that the initial investment required for a shared operational telecoms network to enable a UK smart grid will more than pay for itself, identifying £12 billion in savings over the period to 2050, helping to make Net Zero cost effective for the UK.
- A smarter and more interconnected energy system, supported by dedicated radio spectrum access, will allow the UK to create a more resilient network, better able to respond to climate related events such as flood and storm related power cuts, reducing the risk of outages at a time of increasing demand.
- To this end, we are keen to ensure that the appropriate 'Direct Public Interventions' are undertaken to facilitate Spectrum Access for the Energy Network Operators to ensure that Smart Grid developments can be enabled to deliver the UK Government's Net Zero ambitions.
- Targeted Ministerial intervention from BEIS, with the support of the Net Zero Review is essential to accelerating the green energy transition, making best use of dedicated radio spectrum to deliver the UK Government's Net Zero policy objectives.
- The independent Net Zero review has an opportunity to spotlight targeted, pro-business, technology-led solutions, including JRC's smart grid proposals, which can help the UK rapidly meet its Net Zero targets while minimising costs to consumers and boosting national resilience.

### **Achieving Net Zero in a cost-efficient manner**

A recent study<sup>2</sup> by researchers at Oxford University has suggested that Net Zero could save the world over **£10 trillion by 2050 or in the UK £210 billion**. The study notes that *"faster deployment increases the probability of rapid progress in key green technologies, so that savings accrue for longer"*, reflecting the

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<sup>1</sup> Economic rationale for enabling Smart Grid functionality of the UK energy system via a Private Radio Frequency based enhanced Operational Communications Solution,' Gemserv, 19 November 2021. <https://www.jrc.co.uk/Plugin/Publications/assets/pdf/ICT-Economic-rationale-for-enabling-Smart.pdf>

<sup>2</sup> R. Way et al., Joule 6, 2057-2082 September 21, 2022 'Empirically grounded technology forecasts and the energy transition', <https://doi.org/10.1016/j.joule.2022.08.009>.



opportunity for offsetting the infrastructure costs rapidly through the deployment of solutions like JRC's smart grid proposals.

UK Economic Development is predicated upon robust and resilient energy supplies. For an increasingly dynamic energy supply system, operational communications will have a crucial role in balancing supply and demand while ensuring stability of the energy networks. This will be necessary to facilitate increased supply from low carbon Distributed Energy Resources (DERs) and the expansion of demand from electric vehicles (EVs)<sup>3</sup>. This functionality will be enabled by the widespread deployment of active, resilient control systems across the UK energy system, with enhanced and resilient data communications key to managing these energy flows. To this end, secure and expanded access to dedicated radio spectrum for Energy Utility Networks is a critical component of their future operating model and to enable the 'Smart Grid' that is central to the UK Government's ambitions for a Net Zero future.

In addition, as we transition to Net Zero and deliver upon the Government's legally binding decarbonisation targets, energy networks will need to operate more flexibly to cost-efficiently connect new renewable energy generation, energy storage systems, and millions of low carbon devices such as electric vehicles, heat pumps and micro-generation. As a result, Energy Network Operators have prioritised dedicated Spectrum Access to enable them to establish the robust, resilient and enhanced Operational Control capability to connect between 100 and 1000 times more network assets than are currently operated today. This is an essential facilitating step towards the widespread adoption of low carbon technologies needed to achieve Net Zero by 2050.

In a 2021 report, the Carbon Trust stated that embedding greater flexibility across the entire energy system will reduce the cost of achieving net zero for consumers while also assuring energy security.<sup>4</sup> The report states that investing in flexibility is a "*no-regrets decision*" as it has the potential to deliver material net savings of up to £16.7bn per annum across all scenarios analysed in 2050.

JRC commissioned research by Gemserv demonstrated that the initial investment required for a shared operational telecoms network to enable a UK smart grid will more than pay for itself, **identifying £12 billion in savings** over the period to 2050, helping to make Net Zero cost effective for the UK.<sup>5</sup>

The research breaks down the £12.7 billion in savings as follows:

- £5.6bn saving by avoiding unnecessary network reinforcements
- £5.1bn by reducing electricity generation capacity and associated capital costs
- £1.4bn due to reduced customer outages
- £0.5bn in reduced unnecessary inspection and maintenance
- £0.1bn through a reduction in Black Start costs

JRC's proposals offer an innovative, pro-business approach to delivering the UK's decarbonisation objectives and tackling the cost-of-living crisis, unlocking substantial efficiency savings through avoided network reinforcements, reduced electricity generation capacity (avoiding the industrialisation of the countryside) and associated capital costs. The cost of delivering a radio spectrum system is estimated to be £958m, versus £2.42bn for a mobile network-based solution or £51bn for a dedicated fibre optic

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<sup>3</sup> Need for Increased Spectrum Allocation and Investment in Operational Telecommunications (OT) to Support Electricity Networks to facilitate the 'Net Zero' transition, Position Statement of the Energy Networks Association Strategic Telecommunications Group, Jan 2019 [Electricity Networks Brochure \(LINKED\) jan \(energynetworks.org\)](#)

<sup>4</sup> Flexibility in Great Britain, Carbon Trust, May 2021. <https://publications.carbontrust.com/flex-gb/analysis/>

<sup>5</sup> 'Economic rationale for enabling Smart Grid functionality of the UK energy system via a Private Radio Frequency based enhanced Operational Communications Solution,' Gemserv, 19 November 2021. <https://www.jrc.co.uk/Plugin/Publications/assets/pdf/ICT-Economic-rationale-for-enabling-Smart.pdf>



system. If passed on, **energy customers would save around £25 a year** off their annual energy bills, helping them to manage the rising cost of living.

### **Improving energy security and resilience**

A smarter and more interconnected energy system will allow the UK to create a more resilient network that is better able to exploit investment in renewable energy resources and reduce the risk of power outages at a time of increasing demands upon the UK energy system. A network supported by dedicated radio-spectrum access will not only help prevent power outages but also support a more rapid restart of the energy system in the event of a power cut.

The UK's current 'Black Start' methodology is based upon a simple, monodirectional energy network. This process is slow because it utilises only a small number of large baseload generators to restart the energy network. A network supported by dedicated radio-spectrum access would be able to leverage the increasingly large number of distributed embedded generators to restart the network more rapidly. Furthermore, by enabling the rapid and cost-effective connection of homegrown, renewable generation technologies, dedicated radio spectrum access will also boost UK energy security, reducing reliance upon international energy imports.

### **International comparisons**

The Republic of Ireland and Germany's decision to allocate dedicated radio spectrum for managing and monitoring their energy networks aimed to protect bandwidth from speculators while unlocking the substantial benefits of accelerated decarbonisation, reduced energy network operating costs and enhanced operational integrity and resilience.

### **About JRC**

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

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

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

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