

## **Energy customers could save up to £25 a year off their bill with networks using radio spectrum to deliver smart grids**

- **New analysis commissioned by the Joint Radio Company shows that energy consumers could benefit from nearly £12bn in savings through the use of smart grids to deliver the transition to net zero**
- **Consumers could save as much as £25 on their annual bill if savings are passed on**
- **The most cost-efficient way of implementing smart grids is through the use of a dedicated wireless communications network, using radio spectrum**
- **Cost of using a private radio-based network would be £958million versus £2.42bn partnering with commercial mobile networks**

New research launched today by the Joint Radio Company shows that energy consumers could benefit from up to £25 off their annual energy bills through the implementation of smart grid systems. Energy networks could pass on nearly £12bn in savings if a dedicated radio communications network is used to support the implementation of a more complex, active system.

The new research, undertaken independently by research consultancy Gemserv, analysed several routes to enable the transfer of data across hundreds of thousands of network devices giving the visibility and real-time control necessary to actively manage the UK energy grid. By developing an active network to support complex systems, energy networks would be able to deliver significant savings by maximising the utilisation of existing infrastructure and reducing the need to invest billions in building a much larger 'dumb' network. On a net present value basis, smart grid savings would include:

- £5.6bn as a result of avoiding network reinforcement by having improved visibility and control of the network to increase network asset utilisation
- £5.1bn as a result of reducing the amount of additional electricity generation capacity and associated capital costs
- £1.4bn due to reduced customer outages and associated penalties
- £0.5bn in avoidance of unnecessary inspection and maintenance, with faults more easily detectable as a result of a smart grid
- £0.1bn through a reduction in Black Start costs when energy blackouts take place

Analysing the potential technology routes to enable smart grids, Gemserv reviewed three options; dedicated private radio communications, partnering with existing commercial mobile network, and a hybrid system linking the energy network through public and private fibre optic infrastructure.

Coming out as by far the most cost-effective system, constructing a new private radio communications system would have a net present cost of £958m, subject to Ofcom making available dedicated radio spectrum for use by the UK's energy networks to accelerate decarbonisation. A dedicated wireless network would ensure security and stability of the UK energy system and be designed with the grid's specific operational requirements, e.g. resilience to power outage, guaranteed Quality of Service and reach. Appropriate spectrum

would be sub-1 GHz, ideally in the 400-470MHz range. The actual spectrum need is modest, i.e. 2x3MHz to 2x5MHz to accommodate the traffic requirements associated with the Machine-2-Machine type applications planned.

In contrast, the economic analysis indicates that a commercial mobile network-based solution would have a net present cost of £2.42bn. These higher costs are primarily driven by the relatively short “*rip and replace*” lifecycle of mobile technologies, as well as the need to invest in energy storage to ensure that the system would have adequate resilience to mains power failure.

The most expensive route for implementing smart grids, at £51bn net present cost, would be utilising existing public fibre optic networks, alongside building new, dedicated private networks to connect hundreds of thousands of individual energy network assets across the UK which have not historically been connected to fixed communication networks.

Commenting on the research findings, Dr Peter Couch, CEO of the Joint Radio Company: “The UK energy system is changing as it shifts from a passive energy network to a more complex active system with millions of new devices connected to the system each demanding or supplying energy. For a system to work, and not fail, we must keep an equilibrium of supply versus demand.

“The implementation of an Enhanced Operational Telecommunications control system, utilising radio spectrum will allow the energy networks to have real-time visibility of their network assets and the impact of the range of devices connected to it such as EVs, Heat Pumps and distributed energy resources. With this enhanced connectivity comes greater visibility and control, allowing the network operators to enhance the utilisation of their assets to a higher level of provision, giving greater scope for flexibility solutions and minimising the need for expensive re-enforcement investment.”

Not only does Enhanced Operational Telecommunications support the decarbonisation of the electricity system but it is also an enabler for the decarbonisation of the gas networks, supporting blends of biogas or hydrogen on route to a full hydrogen network.

Couch added: “By using a radio spectrum based solution, energy networks will be able to take a bolder approach to upgrading their operational control systems as they transition to net-zero. Ultimately, it is anticipated that this will allow the UK to decarbonise faster and cheaper. A smarter and more interconnected energy system, supported by radio spectrum, will allow the UK to create a more resilient network that is better able to exploit the investment targeted at renewable energy resources and reduce the risk of outages at a time of increasing demand on the UK energy system.”

Phillip Twiddy, from Gemserv, who conducted the analysis commented: “It’s clear that a smart grid will deliver significant benefits for GB plc. Private radio spectrum is the most economic solution, allowing £12.7bn of benefits to be unlocked for a cost of less than £1bn on a present value basis.”

**ENDS**



## **Editors Notes**

### **About Joint Radio Company**

The Joint Radio Company Ltd. (JRC) is a joint venture company of National Grid plc (the UK electricity transmission & gas transmission and distribution operator) and the Energy Networks Association Ltd, representing UK gas and electricity transmission and distribution companies. We work on behalf of our Membership to secure and manage the radio spectrum they require to facilitate the delivery of mission critical services.

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### **About Gemserv**

[Gemserv](#) is a purpose-driven professional services company, dedicated to enabling sustainable and ethical business practices that tackle today's social and environmental challenges. Working across multiple major sectors of the economy including energy, low-carbon, the public sector, cyber security, digital transformation and health, the Gemserv business provides consultancy and outsourcing capabilities to transform critical services. From safeguarding data and personal information to improving access to information and services, the business helps organisations harness the power of digital transformation through expert industry consultancy.

Gemserv is a registered carbon neutral company in accordance with the CarbonNeutral protocol.