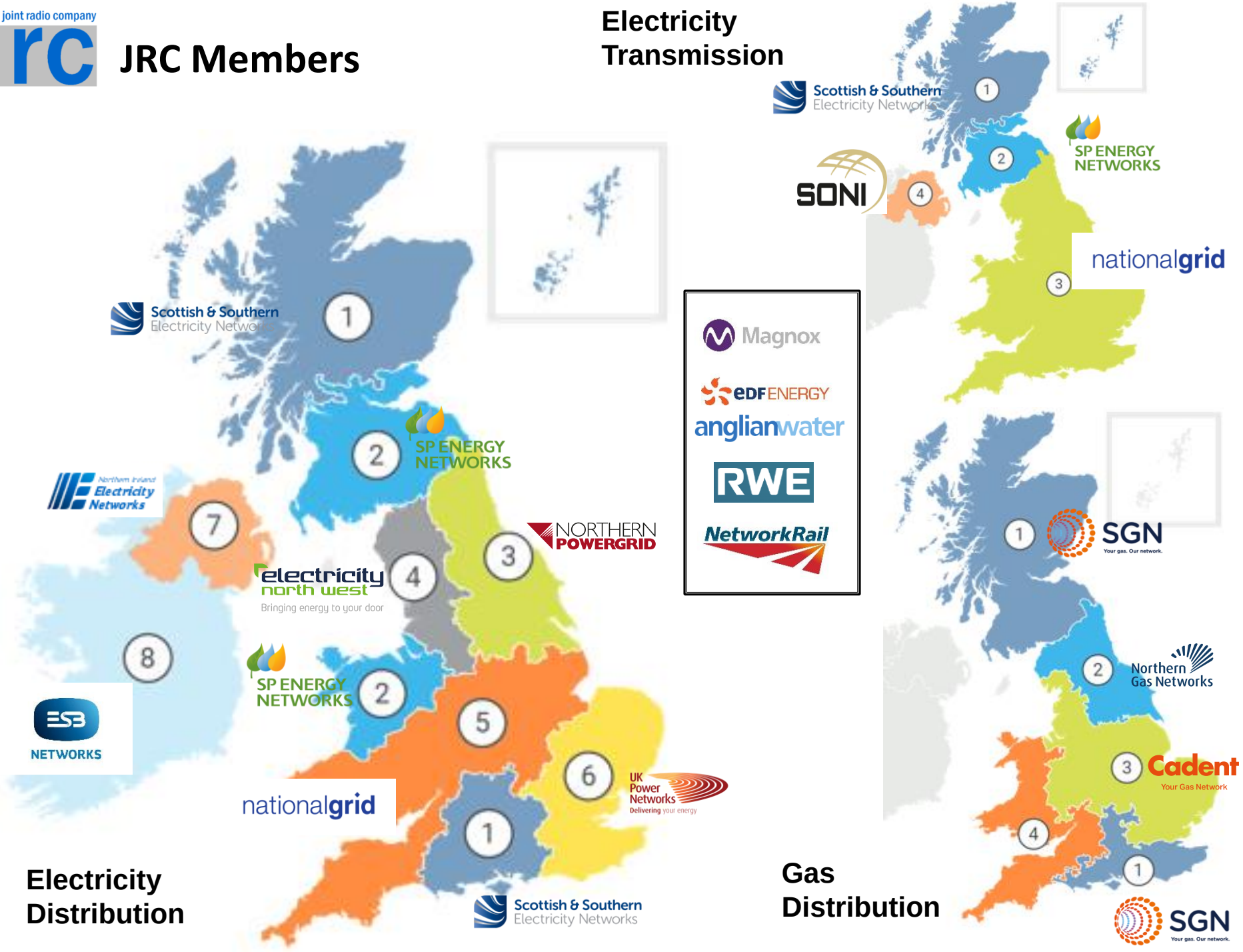
The Energy Transition & Spectrum Access

joint radio company jrc

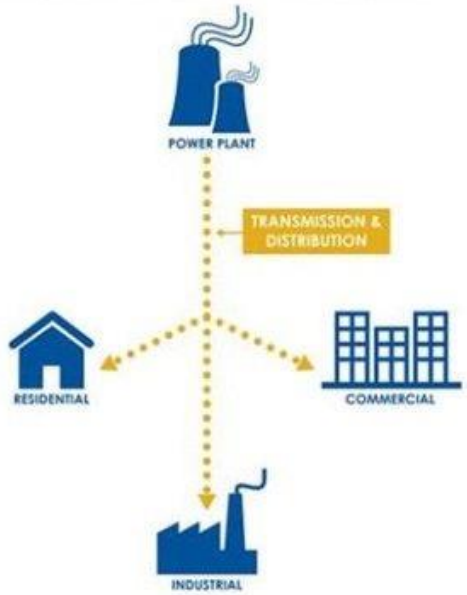
JRC Members



Changing Context

Whole System Perspective

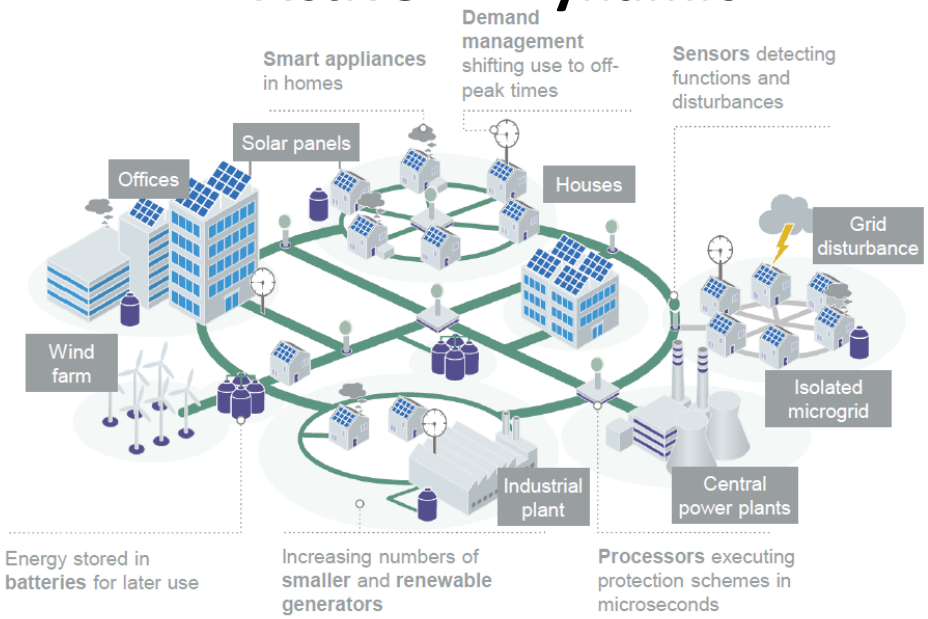
"Passive" – Top Down



Transmission → Distribution

- Large Generation – limited in number

"Active" – Dynamic



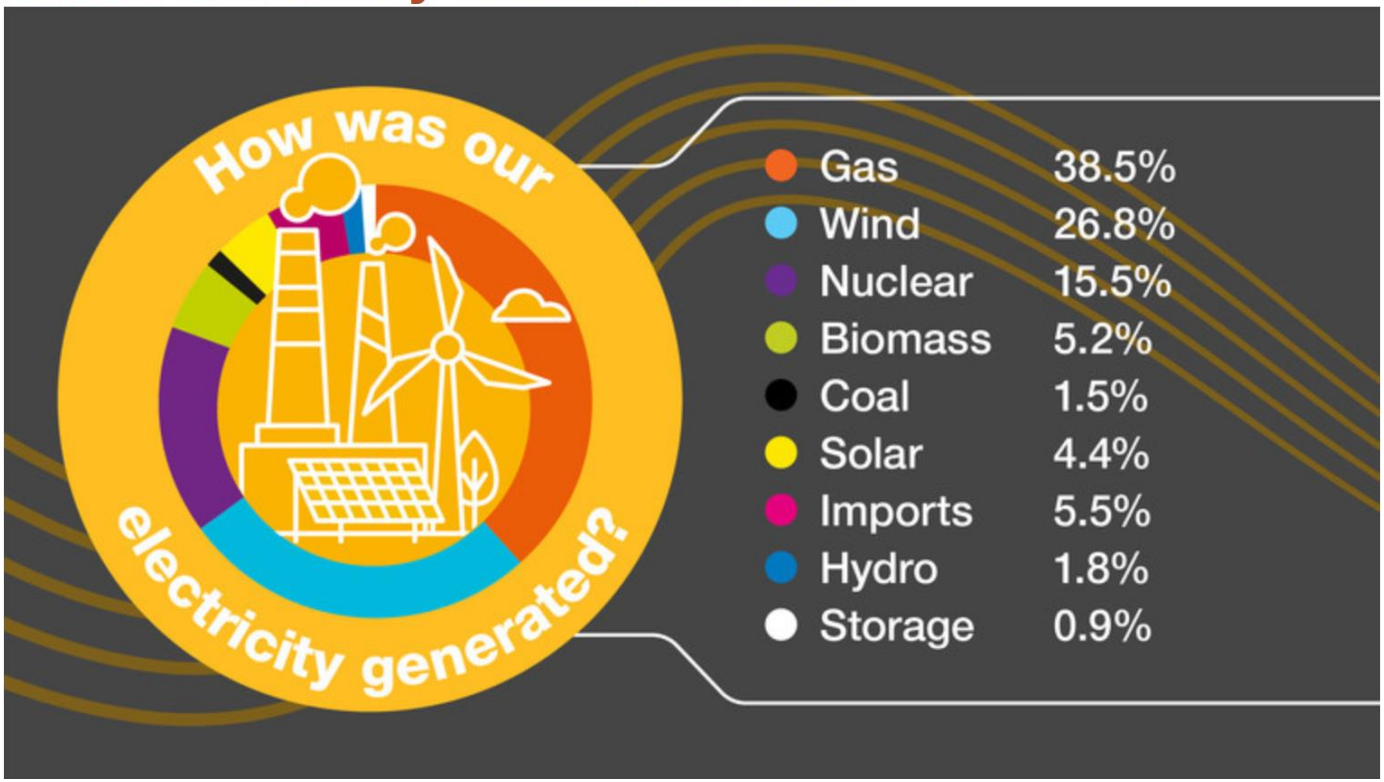
Transmission
DERs
Prosumer
} Smart Grid

- Limited Large generation – Extensive Local Generation + Storage
- Focus on balancing demand and availability through the transition to embedded generation and alternative gases

Changing Context

Whole System Perspective – Increased Diversity of Generation

2022's Electricity Generation Mix

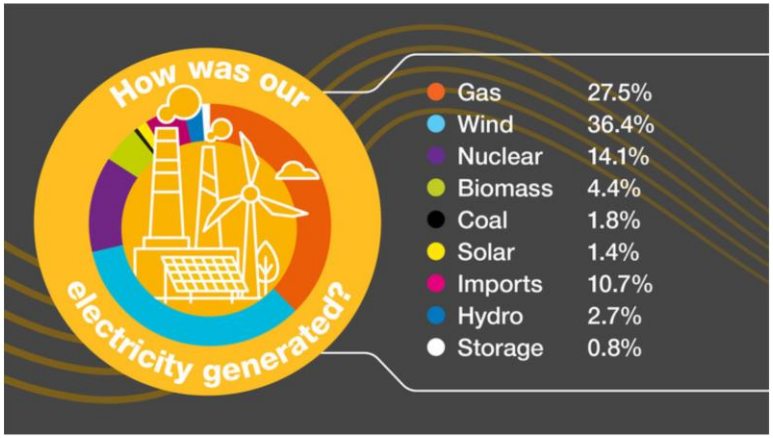


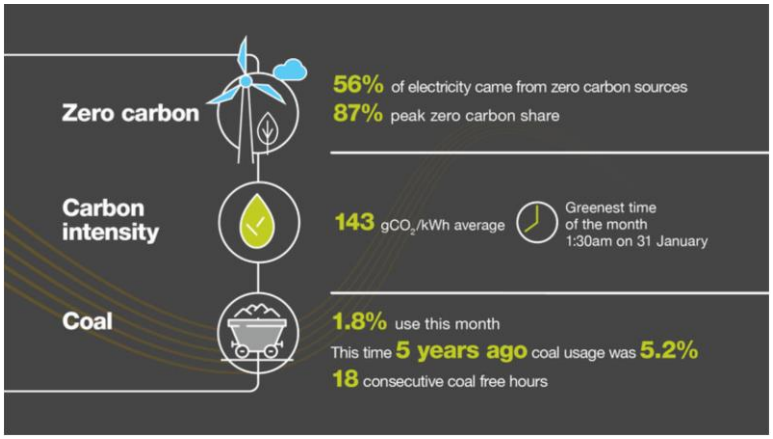
Notable Developments

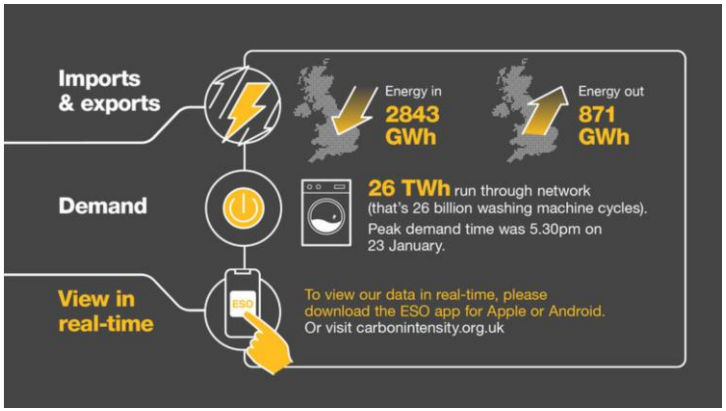
- The first time wind generation provided over 20GW of electricity
- The lowest carbon intensity month since records began (February 2022 - 126 gCO2/kWh average)
- Greenest day on record (52 gCO2/kWh on 28 December)
- Second greenest year on record, second only to 2020

Changing Context

Whole System Perspective – Increased Diversity of Generation (January 2023)







- Low Solar
- >50% electricity for zero carbon sources
- 1.8% from coal down from 5.2% 5 years ago
- Imported 3 x more energy than exported

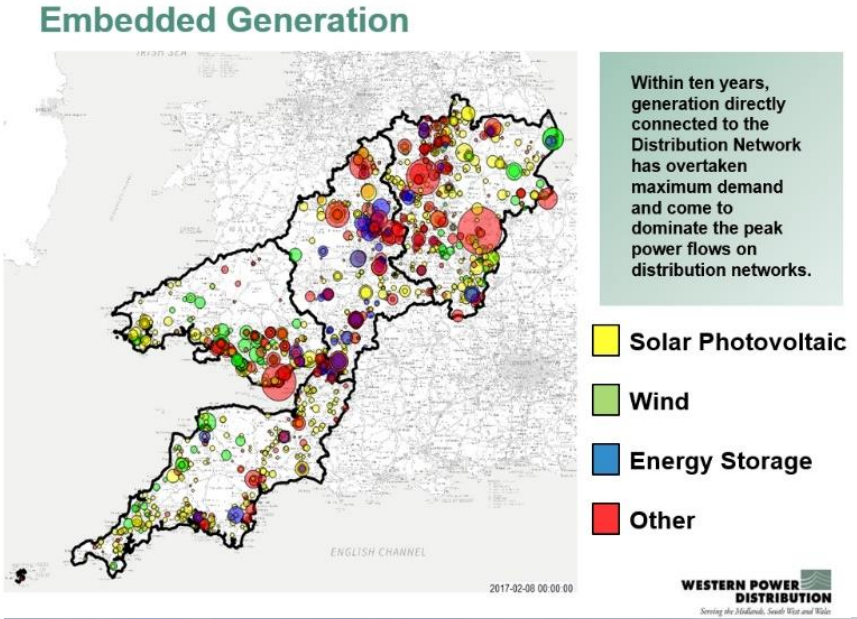
Increased Unpredictability and Complexity

Increased Diversity of Supply & Demand

The need for enhanced communications capability

- Distributed Generation
- Enhanced Demand, EVs
- Enhanced asset visibility and control
- Wireless enables rapid and cost effective deployment
- New technology offers enhanced bandwidths
- Enabling a diversity of data streams from hundreds of thousands of geographically dispersed points

"Managing a network with 10% renewables is very different to 90%"



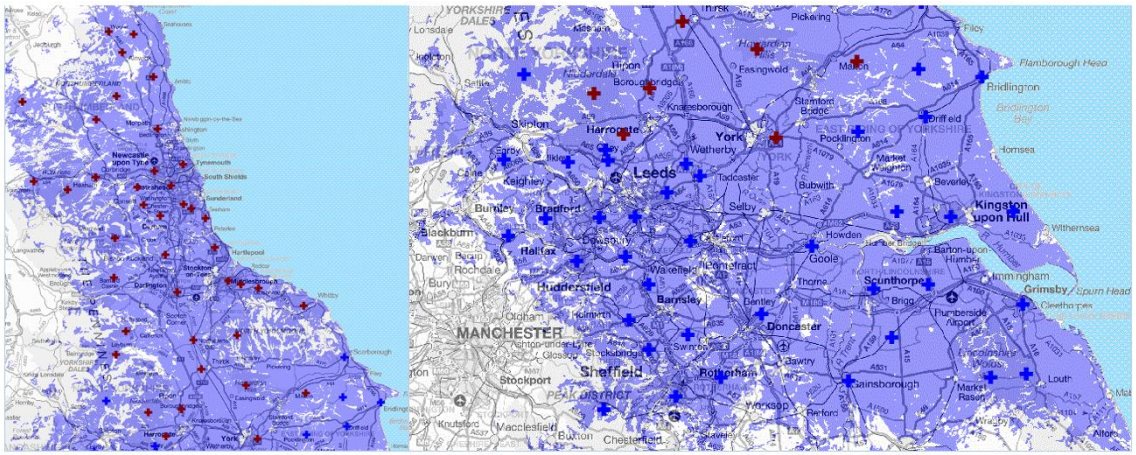
Provision of Services – Future Challenges & Opportunity

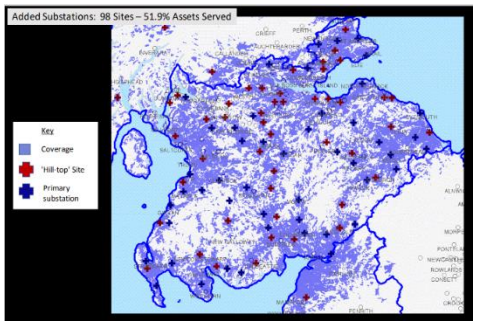
Almost all of the new monitoring and control requirements associated with a smart grid are required where historically there has been no asset visibility

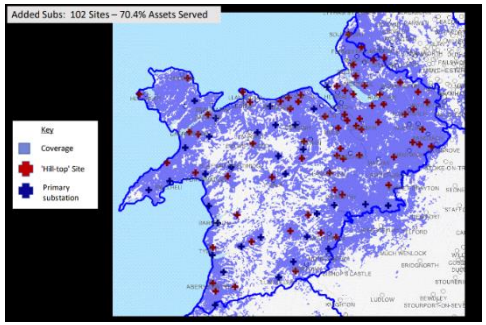
- Increase in electric vehicle adoption and Distributed Generation
- Local Storage Solutions;
- Heat Pumps / Hybrid Heat
- Peer to peer trading of electricity through smart phone apps
- The need for more efficiency (enhanced utilisation) coupled with control & visibility of devices at the edge of the network
- Remote workforce management in emergency situations

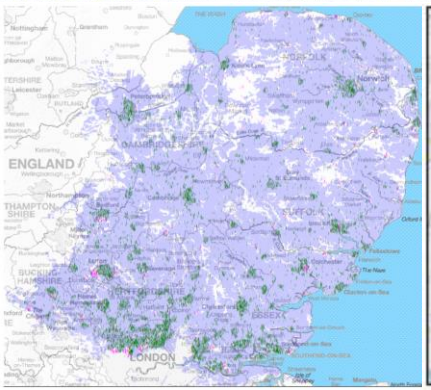
Private LTE Network Capability - Subject to Spectrum Access

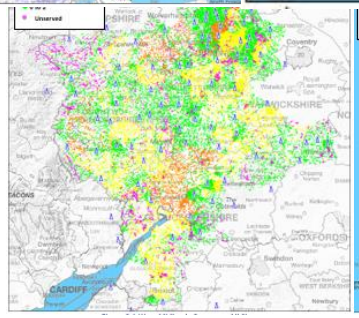
Mobilising embedded assets to respond to network demand / supply in real-time

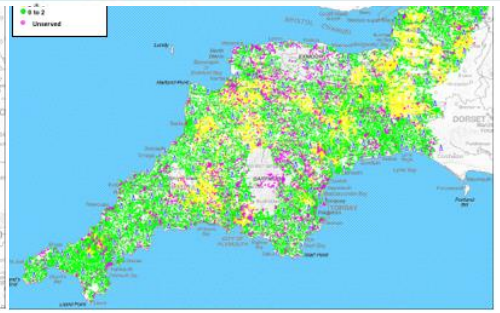


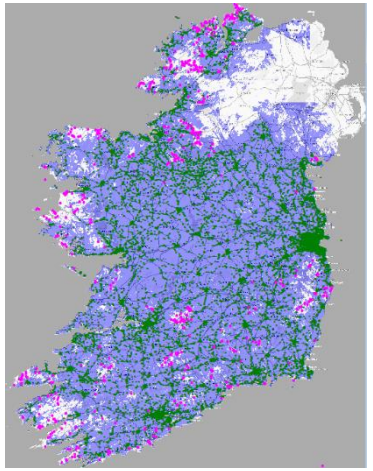












Policy Developments

Facilitating the Net Zero Transition

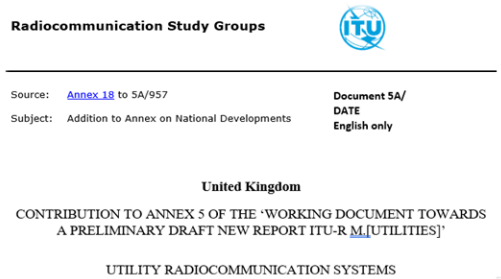
Policy paper

Spectrum statement

Published 11 April 2023

Ofcom – Spectrum for Utilities

- Spectrum Options under consideration
- Statement anticipated Q1 2023/24;
- ITU input document submitted
- 2.1 GHz Spectrum Consultation
- PSNI Consultation Update



Radiocommunication Study Groups

Source: Annex 18 to 5A/957

Subject: Addition to Annex on National Developments

Document 5A/
DATE
English only

United Kingdom

CONTRIBUTION TO ANNEX 5 OF THE 'WORKING DOCUMENT TOWARDS A PRELIMINARY DRAFT NEW REPORT ITU-R M.[UTILITIES]'

UTILITY RADIOCOMMUNICATION SYSTEMS

Assessing the energy sector's communications requirements

Spectrum also plays an important role in enabling the digital connectivity needed for future low carbon energy networks. Reaching Net Zero requires fundamental changes to the way we generate, transport and consume energy. We are moving towards a smarter, more flexible and more integrated energy system which will require significantly enhanced connectivity and digitalization throughout the network to support the coordination, automation and control of energy network assets. This increased connectivity requirement will likely require a variety of telecommunications technologies including fibre, satellites, and public and private mobile networks. Certain communications functions may require enhanced power resilience and reliability. If meeting these or other requirements is best served by private wireless networks, the identification of suitable and sufficient spectrum may be necessary.

We are working closely with the Department for Energy Security and Net Zero, Ofcom and Ofgem to assess the energy (and wider utility) sector's communications requirements and ensure that timely decisions are taken on any resulting spectrum needs.

Department for Science, Innovation & Technology

E3C Storm Arwen Report

R4	Energy Network Operators should continue to engage with DCMS and Ofcom to secure the utility spectrum so that the energy sector can develop its own resilient data / voice networks in the future	STTG	31 Dec. 2023

UK WIRELESS INFRASTRUCTURE STRATEGY

The digitalisation of energy networks is critical to reaching net zero by 2050 and supporting a smart, flexible energy system. Alongside the Department for Energy Security and Net Zero, and as part of the Energy Digitalisation Strategy, we will continue to encourage collaboration between telecoms and utilities providers to support the digitalisation of the energy sector.

Summary

Dedicated Spectrum Access for Utility Enhanced Operational Telecommunications

- Secure
- Reliable
- Resilient to power failure
- Have full geographical coverage
- Scalable
- Accessible to multiple utilities
- Cost effective*

**** "The cost of deploying a Private Radio Frequency network is significantly less than that of a commercial mobile network alternative, whilst the cost of a private fibre network (or public / private hybrid) is uneconomic."***

Independently Reported by Gemserve, Nov. 2021

Economic rationale for enabling Smart Grid functionality of the UK energy system via a Private Radio Frequency-based enhanced Operational Communications Solution

Enabling 'Net-Zero' Transition from Fossil Fuels to Renewables