

## Written evidence submitted by Vodafone (IND0033)

### 5G Unlocking Growth: Clean Energy

Harnessing the power of 5G in wind power generation alone could generate enough additional clean energy to heat 2.4 million UK homes.

#### Overview

The transition to clean energy is crucial for achieving environmental sustainability and reducing carbon emissions. 5G and digital technologies hold significant potential to drive this transformation across the energy sector. The enhanced connectivity and low latency of 5G enable the deployment of smart grids, which can monitor and manage energy consumption more efficiently. By integrating IoT devices and sensors, energy providers can gain real-time insights into energy usage patterns, identify inefficiencies, and optimise the distribution of renewable energy sources such as wind and solar power. For instance, harnessing the power of 5G in wind power generation alone could generate enough additional clean energy to heat 2.4 million UK homes, which is enough to heat every home in Scotland. This digitalisation not only enhances the operational efficiency of the energy sector but also reduces overall emissions by ensuring that energy is used more effectively.

Additionally, 5G-enabled solutions can support the development of smart buildings and cities, where energy consumption is closely monitored and controlled. This has a direct impact on consumers consumption of energy. For example, smart meters and IoT sensors can provide data on energy usage that allows for better management of heating, lighting, and other systems in residential, commercial, and industrial buildings. This can lead to substantial energy savings and a reduction in carbon footprint. The integration of these technologies can also facilitate the adoption of electric vehicles by providing the necessary infrastructure for efficient charging and energy management. Moreover, smart technology could help the public sector estate reduce its carbon emissions by up to 15%, enabling a fiscal saving to the taxpayer of between £264 million and £380 million annually.

To fully realise the benefits of 5G and digitalisation in the energy sector, Government should champion the widespread adoption of these technologies by developing a comprehensive strategy for utilising digital technologies to support environmental goals. This strategy should include subsidies for digitalisation across the energy sector, making it financially viable for energy providers to invest in new technologies. By subsidising these efforts, the Government can ensure that the transition to a digital energy sector is inclusive and far-reaching. This includes ensuring that the Government addresses the North-South smart meter divide. Moving to a single cellular network across the UK could resolve the regional divide and enhance overall connectivity. Vodafone already works with Smart DCC to deliver connectivity for meters in the South of the UK. To streamline the process and avoid future inefficiencies, revisiting the policy of optional installation could drive broader and more consistent adoption. Both of these solutions will be supported through nationwide rollout of connectivity. While we are actively collaborating with industry to overcome these obstacles, Government support in achieving full smart meter coverage would be invaluable.

Additionally, Government should consider funding of pilot projects to test and showcase the benefits of digitalisation in real-world scenarios. This would not only provide valuable data and learning but also build confidence and momentum in the transition to a digitalised energy sector, necessary to make the UK a leader in this space. This aligns with the wider goals Government set out in the industrial strategy.

### **Case study: Centrica**

Centrica needed to enhance the efficiency and reliability of its energy services, particularly in managing distributed energy resources (DERs) like solar panels, wind turbines, and battery storage systems.

Vodafone provided a 5G-ready Mobile Private Network (MPN) at Centrica's plant in North Yorkshire. This secure, dedicated network delivers high-speed, low-latency connectivity, transforming the plant into a fully connected digital ecosystem. Key components of the solution included:

- **IoT Sensors:** Deployed across various DERs to collect data on energy production and consumption.
- **Edge Computing:** Used to process data locally, reducing latency and enabling faster decision-making.
- **AI and Machine Learning:** Implemented to predict energy demand and optimize the use of renewable energy sources.

#### **Results:**

- **Increased Efficiency:** Real-time data and advanced analytics improved the management of energy resources, reducing waste and enhancing the reliability of energy supply.
- **Enhanced Safety:** The network supports gas exposure alerts and remote maintenance, improving worker safety and reducing business risk.
- **Scalability:** The 5G-ready MPN provided the scalability needed to manage a growing number of DERs as Centrica expanded its clean energy initiatives

### **Recommendations**

- **Industrial Strategy:** 5G is critical to unlocking growth across the whole economy. The Government should ensure that digital infrastructure and technology, particularly 5G, are key pillars in the industrial strategy as well as the individual sectoral growth plans.
- **Energy Digitalisation Strategy:** Develop a comprehensive strategy to support environmental goals by utilising digital technologies. This includes providing subsidies for digitalisation across the energy sector, making it financially viable for energy providers to invest in new technologies and invest in pilot projects to test and demonstrate the advantages of digitalisation in real-world scenarios.
- **Support the development of smart buildings and cities:** The Government should also create a fund to create smart energy management systems across the public sector estate. This will have significant fiscal and environmental benefits. The average local authority could save up to £350,000 per year on their energy bills and reduce as much as 17% of their electricity usage by installing digital energy-saving technologies

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