5G

HELPING TO TACKLE CLIMATE CHANGE

CLIMATE CHANGE

Background

1. Countries around the world have set aggressive targets for cutting greenhouse gas emissions. In 2019, the UK Government adopted one of the toughest climate change targets with a commitment to meet net zero emissions by 2050.

2. To achieve this ambitious but very important target, it means the UK emitting as much as it is removing from the environment and essentially an end to the UK's contribution to global remissions in 2050.

3. However, this is not just about reducing fossil fuel use, recycling, better managing our resources and wastage and electrifying our transport. That alone will be insufficient. It has to go much further than that. It's about changing how we act as individuals, how communities might adapt and embrace new sustainable living and working practices and how public services and industry might adopt technology to support responsible practices, more efficiency and reduce resource use. This in turn requires our cities, towns and villages to evolve and become "smarter", efficient and more self-sustaining. We have to look more closely at advanced modern technologies like 5G to achieve this.

4. Technical advancements in electronic communications will be a key driver and help underpin and support many of these necessary changes. 5G mobile connectivity will be essential to meet these changes. The Department for Digital, Culture, Media & Sport's (DCMS's) July 2018 Future Telecoms Infrastructure Review stated that is the Government's aim for the "majority of the UK" to have 5G mobile coverage by 2027", so we have to move fast and if anything, the seriousness of the current climate concerns will pull this date forward.

So, how will 5G help tackle climate change?

5. Mobile communication networks in themselves rely on power and as data usage increases, the energy to power these networks will inevitably also increase. However, mobile communication networks themselves contribute a very small percentage of CO2 emissions globally and many operators now look to utilise power from renewable resources.

6. More importantly, however, is that these network carbon emissions have to be offset against the enormous contribution mobile communications networks will have to reducing carbon emissions across all aspects of life as we explain further. These benefits will significantly offset the carbon footprint of running the networks.

7. 5G is the next generation of mobile connectivity and will deliver a step change of ultrafast, ultra-low latency, flexible and reliable mobile connectivity, that is able to support wide-ranging new "applications", including machine to machine applications, that will help to drive forward and support our daily activities and help the UK meet zero carbon targets.

8. 5G and associated “Internet of Things” (IoT) capability, with the UK blanketed with ultra-fast mobile connectivity, will bring about a growth of new services and greater dependability. This will help underpin UK’s sustainability and carbon reduction policy by, as examples:

- Reducing energy consumption for the mobile network through more efficient network operations – in simple terms, due to much lower energy required to transmit the same volumes (or more) of data, 5G should outperform 4G by an order of magnitude and 2G/3G networks by many times. It is a much cleaner network technology.

- 5G will allow previous generations of mobile connectivity to be switched off over time, removing the power requirements of older and less efficient networks

- 5G will drive new handsets, which will need to be more power efficient and using more refined ‘Adaptive Power Controls’, so network energy usage is better managed

- 5G will offer significant improvements in capacity and data speeds, which means a level of connectivity that can genuinely support and better manage critical services such as health, power, public services and transport – in turn advancing new technologies that might allow more efficient working practices and reduce carbon footprints for consumers, services and industry. To name a few these might include:

    - Parking space availability applications, with locational notifications to smart phone, so avoiding the need to travel around city centres trying to find a space and helping to improve air conditions

    - Taxing sharing services, where groups of individuals might plan shared taxi rides around a city centre, avoiding unnecessary route duplication

    - Crowdsourced bus services i.e. the sharing of anonymised data with privately run bus operators to suggest new routes which are determined by community demand. This leads to more efficient public transport and helps to reduce private car usage (already available in cities like Singapore)

- Monitoring of remote service vehicles like rubbish vehicles to optimise refuse and waste services

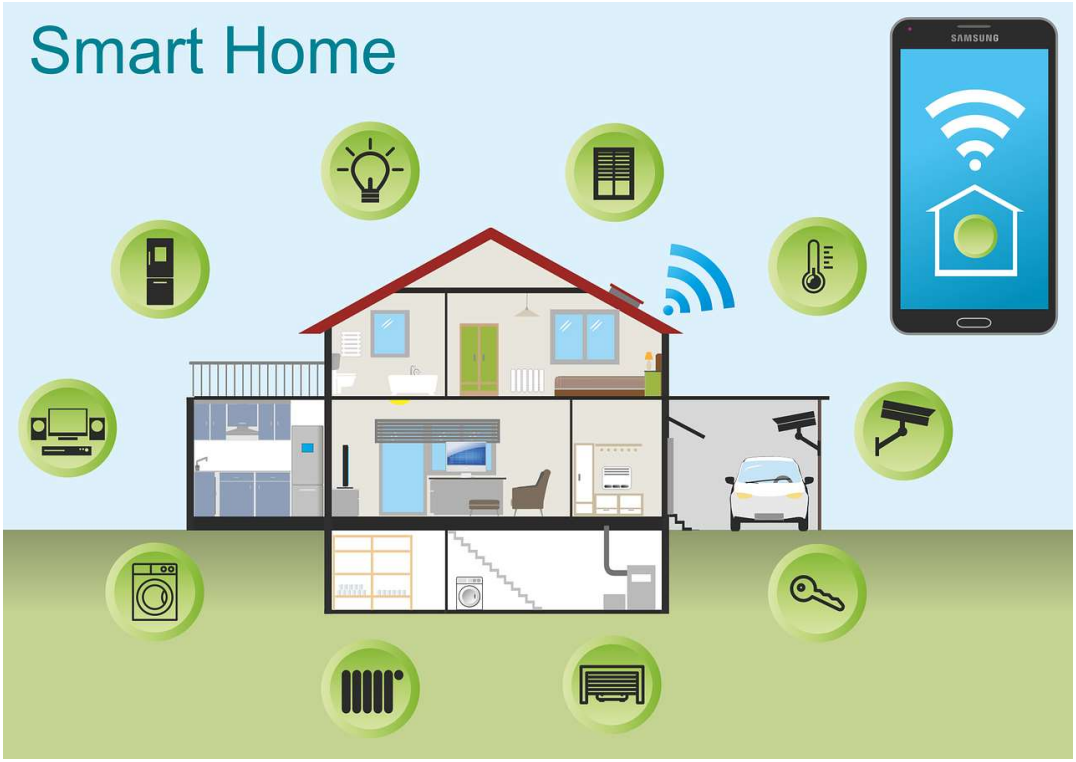
- Maintenance and repair notifications from domestic and industrial machinery like washing machines i.e. a replacement part is ordered well in advance of failure, allowing more efficient replacement

- Implanted communication advices that support “telehealth” applications such as allowing remote monitoring of public health services and patients e.g. pace makers, oxygen tanks, respirators, environmental monitors in patients homes – that allow advanced replacement as part of a more efficient and timely services and reduce unnecessary checks and travel

- “Connected” ambulances with 5G capability which can forward in advance medical conditions of patients, so allowing the triage of medical responses by Emergency Department staff and supporting more efficient health care services and resource planning

- Remote consultations with 5G allow medical appointments to take place remotely via high-quality video calls, more reliably than is currently possible – so meaning that patients do not need to make unnecessary travel

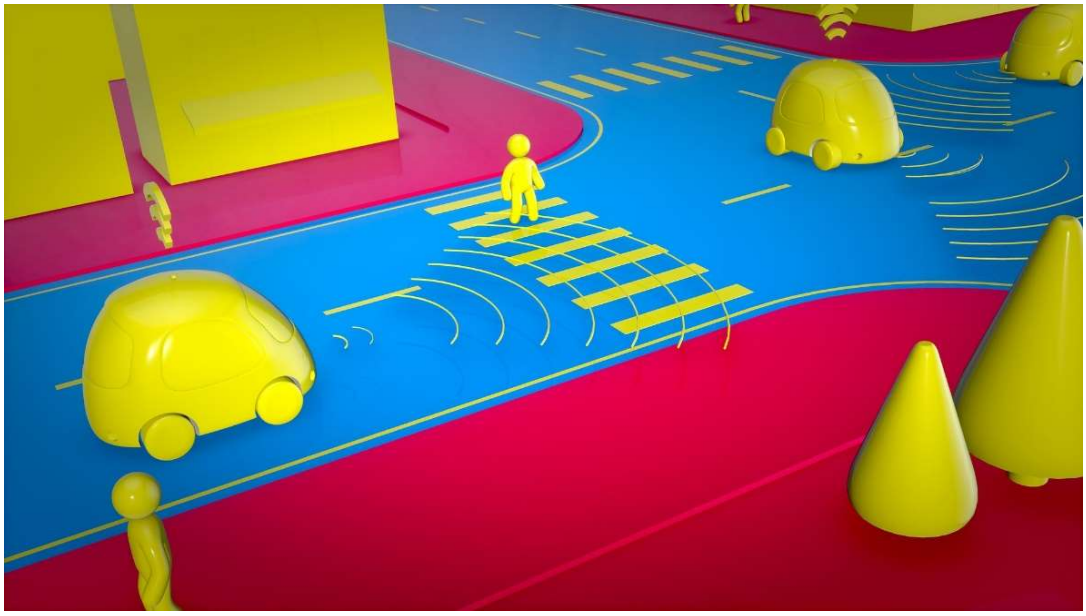
- An ability to support a far larger number of connected devices (including IoT devices) and smart “applications” and supporting new green technologies and businesses including our ability to control our homes – for examples, being able to turn heating on when needed and in advance of arriving home or turn off remotely so to minimise energy waste



- An extension in the battery life of ‘sensors’ that will underpin many 5G and IoT services, thanks to lower power requirements

- Greater reliability and dependability, through massive resilience in the networks, so allowing smart city features like smart motorways that adapt to traffic levels or environmental conditions i.e. regulating car speeds during congestion periods or in times of poor air conditions

- Connected and autonomous vehicles (CAVs) that can use communications technologies to send and receive information to and from other vehicles and/or surrounding road infrastructure. They also use sensors and software to operate without human intervention but can allow driver assistance or report vehicle maintenance and safety. This could be faulty emissions, sending data about a vehicle's performance back to the manufacturer to identify faults more quickly or to a garage.



- Bringing high speed blanket connectivity to areas with little connectivity exists – so supporting different approaches to how and where we live and work (such as supporting more rural enterprises) and influencing travel choices through remote working:

    - For example, a worker who would normally travel 20 miles to and from work each day (40 miles) and could; through 5G, work from home two days a week, would reduce travel emissions by 80 miles a week (which could be around 3700 miles a working year). That would be a reduction of over 80 gallons of petrol (based on @ 45 mpg) and associated carbon emissions

- More efficient production techniques and just in time services through real time monitoring and reduction of waste

- Allowing real time energy consumption information or accurately predict or react to known activity periods that might allow smarter energy management and production

- Switching on machinery when energy generation exceeds demand – a night time economy or service industry

How should the planning system help?

9. To maximise the reduction in greenhouse gas emissions, that can be achieved by smart cities, towns and rural areas, local planning authorities will need to facilitate the timely roll-out of 5G.

10. National policy of all Governments, reflected in the National Planning Policy Framework (NPPF) in England, Scottish Planning Policy (SPP), Planning Policy Wales and the Strategic Planning Policy Statement for Northern Ireland, is to support the provision of advanced mobile connectivity. We expand more on the huge policy support for 5G and associated economic and social benefits in our accompanying document ***'National Policy - Delivering Ultra Fast Broadband Mobile Connectivity'***.

11. Policymakers can also play a role in ensuring that the public sector is an early adopter of 5G. This will spur the proliferation of use cases and generate economies of scope in the use of 5G.

12. In terms of supporting 5G, local planning authorities must also understand the nature of 5G technology and the specific network requirements, which will bring about new apparatus needs, specific sites (coverage and capacity), height requirements and generally larger apparatus. We explain this further within our accompanying supporting document ***'5G Technical Support'.***

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