



5G Advice & Guidance

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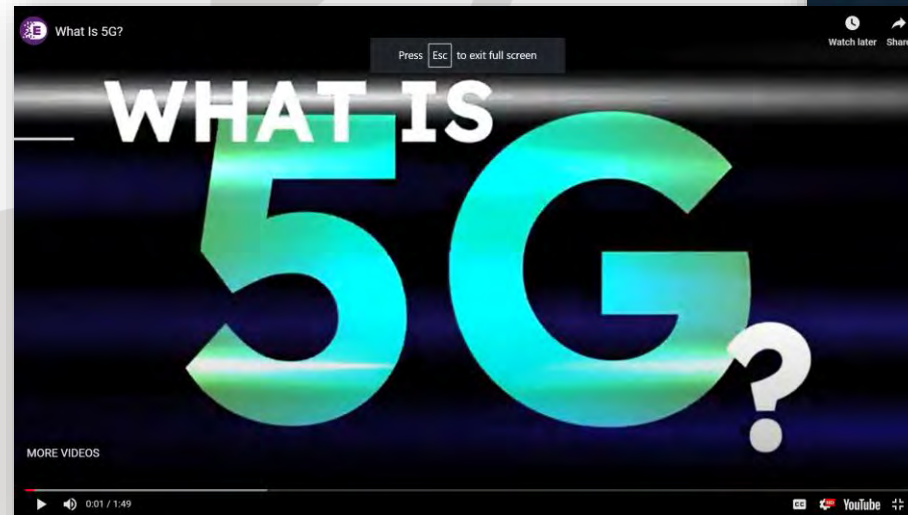
- A beacon for 5G Innovation
- Supporting partners, local stakeholders and decision-makers
- Providing Information - Highlighting benefits - Addressing concerns
- A go to local resource for 5G

www.diz.org.uk

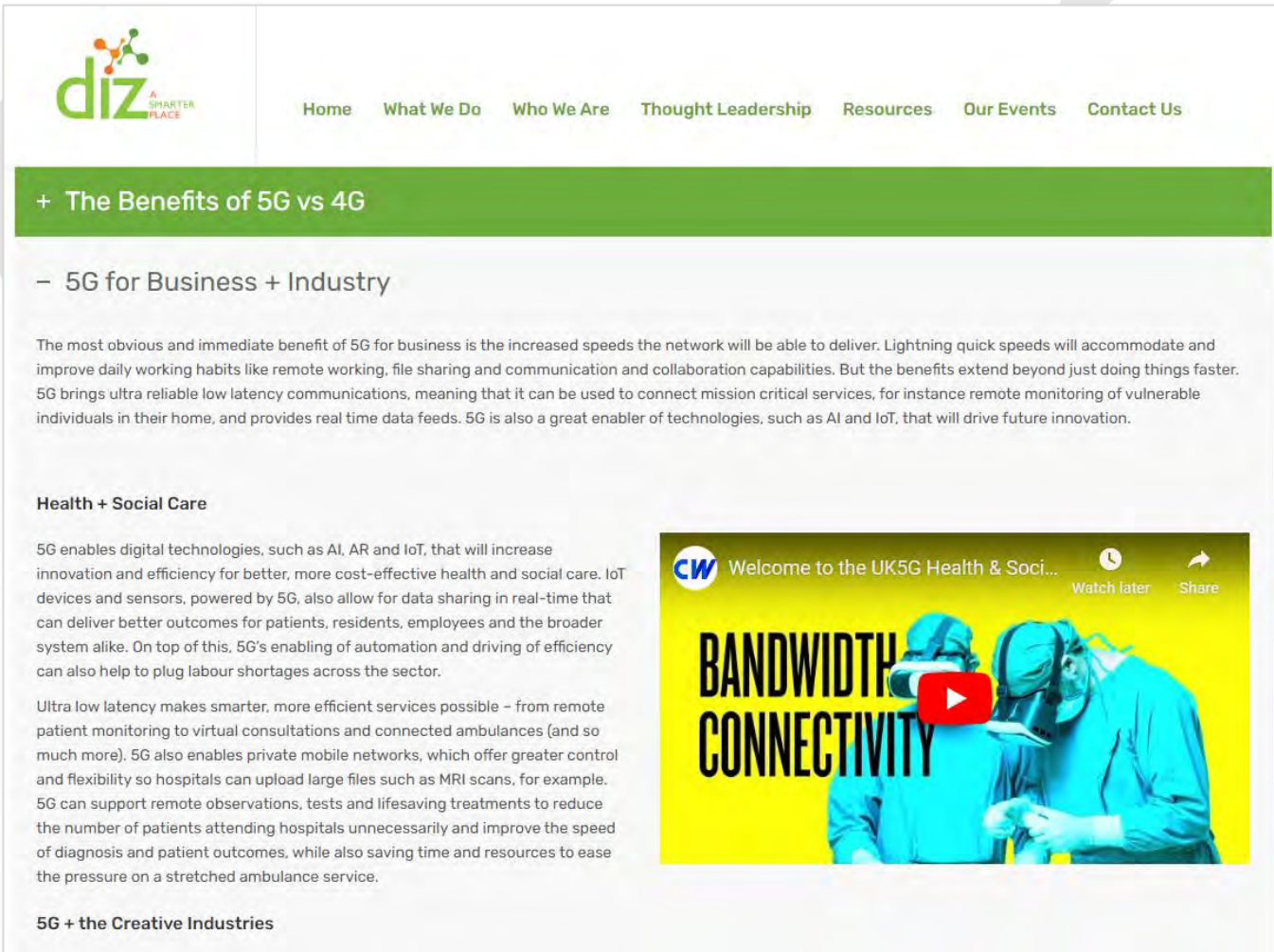


Providing Information – What is 5G?

- Links to external sources of expertise
 - UK5G
 - Mobile UK
 - Essex CC
- Simplifying
- Clarifying
- Supporting decision-making and enquiry responses



Highlighting Benefits



The screenshot shows the DIZ website with a green header and a navigation menu. The main content area is titled '+ The Benefits of 5G vs 4G' and includes a sub-section '- 5G for Business + Industry'. The text describes the benefits of 5G for business, such as increased speeds and low latency. It also features a video player with the title 'BANDWIDTH CONNECTIVITY' and a thumbnail image of two people wearing VR headsets. The video player has a 'Watch later' button and a 'Share' button. The website footer includes the DIZ logo and the tagline 'A SMARTER PLACE'.

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+ The Benefits of 5G vs 4G

- 5G for Business + Industry

The most obvious and immediate benefit of 5G for business is the increased speeds the network will be able to deliver. Lightning quick speeds will accommodate and improve daily working habits like remote working, file sharing and communication and collaboration capabilities. But the benefits extend beyond just doing things faster. 5G brings ultra reliable low latency communications, meaning that it can be used to connect mission critical services, for instance remote monitoring of vulnerable individuals in their home, and provides real time data feeds. 5G is also a great enabler of technologies, such as AI and IoT, that will drive future innovation.

Health + Social Care

5G enables digital technologies, such as AI, AR and IoT, that will increase innovation and efficiency for better, more cost-effective health and social care. IoT devices and sensors, powered by 5G, also allow for data sharing in real-time that can deliver better outcomes for patients, residents, employees and the broader system alike. On top of this, 5G's enabling of automation and driving of efficiency can also help to plug labour shortages across the sector.

Ultra low latency makes smarter, more efficient services possible - from remote patient monitoring to virtual consultations and connected ambulances (and so much more). 5G also enables private mobile networks, which offer greater control and flexibility so hospitals can upload large files such as MRI scans, for example. 5G can support remote observations, tests and lifesaving treatments to reduce the number of patients attending hospitals unnecessarily and improve the speed of diagnosis and patient outcomes, while also saving time and resources to ease the pressure on a stretched ambulance service.

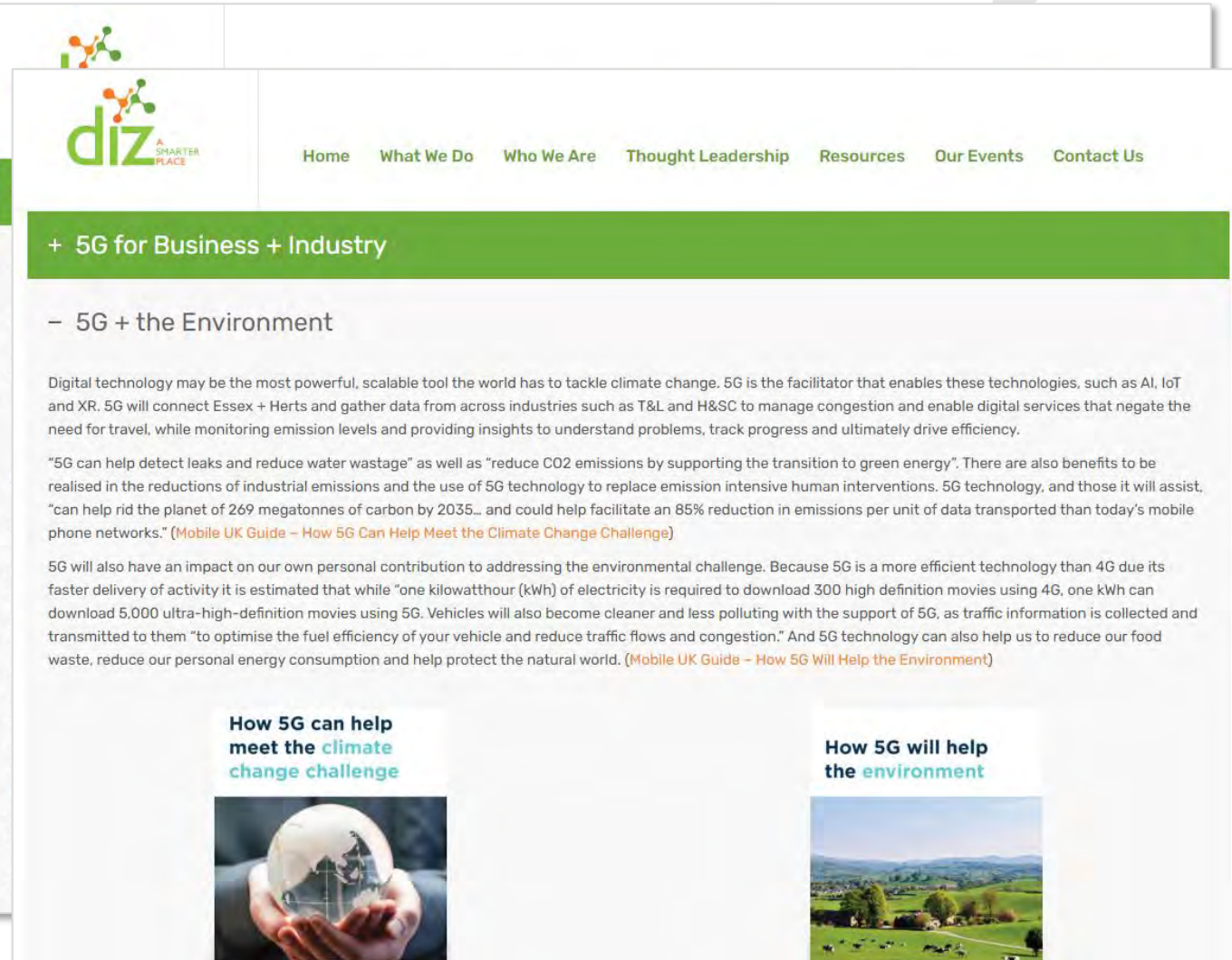
5G + the Creative Industries

CW Welcome to the UK5G Health & Soci... Watch later Share

BANDWIDTH CONNECTIVITY

- Impact on key sectors
 - Health & social care
 - Creative industries
 - Public transport
 - Airport & logistics

Highlighting Benefits



The screenshot shows the DIZ website with the following structure:

- Header:** DIZ logo (A SMARTER PLACE) and navigation links: Home, What We Do, Who We Are, Thought Leadership, Resources, Our Events, Contact Us.
- Main Content Area:**
 - + 5G for Business + Industry** (highlighted in green)
 - 5G + the Environment**
 - Digital technology may be the most powerful, scalable tool the world has to tackle climate change.** 5G is the facilitator that enables these technologies, such as AI, IoT and XR. 5G will connect Essex + Herts and gather data from across industries such as T&L and H&SC to manage congestion and enable digital services that negate the need for travel, while monitoring emission levels and providing insights to understand problems, track progress and ultimately drive efficiency.
 - "5G can help detect leaks and reduce water wastage" as well as "reduce CO2 emissions by supporting the transition to green energy".** There are also benefits to be realised in the reductions of industrial emissions and the use of 5G technology to replace emission intensive human interventions. 5G technology, and those it will assist, "can help rid the planet of 269 megatonnes of carbon by 2035... and could help facilitate an 85% reduction in emissions per unit of data transported than today's mobile phone networks." ([Mobile UK Guide – How 5G Can Help Meet the Climate Change Challenge](#))
 - 5G will also have an impact on our own personal contribution to addressing the environmental challenge.** Because 5G is a more efficient technology than 4G due its faster delivery of activity it is estimated that while "one kilowatthour (kWh) of electricity is required to download 300 high definition movies using 4G, one kWh can download 5,000 ultra-high-definition movies using 5G. Vehicles will also become cleaner and less polluting with the support of 5G, as traffic information is collected and transmitted to them "to optimise the fuel efficiency of your vehicle and reduce traffic flows and congestion." And 5G technology can also help us to reduce our food waste, reduce our personal energy consumption and help protect the natural world. ([Mobile UK Guide – How 5G Will Help the Environment](#))
- Footer:** Two images with captions:
 - How 5G can help meet the climate change challenge** (Image of hands holding a globe)
 - How 5G will help the environment** (Image of a green landscape)

- Impact on key sectors
 - Health & social care
 - Creative industries
 - Public transport
 - Airport & logistics
- Impact on emerging issues
 - Environment and climate change

Highlighting Benefits

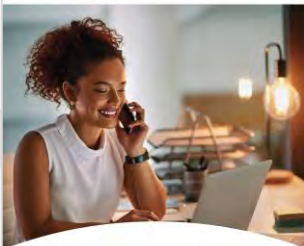
- A suite of reference documents
- Specific advice for local authorities

How 5G will revolutionise the retail industry



Mobile 

How 5G will improve the home and the workplace



Mobile 

Why 5G will help healthcare



Mobile 

How 5G will help councils



Mobile 

How 5G can help meet the climate change challenge



Mobile 

How 5G could increase rural opportunities



Mobile 

How 5G will help the environment



Mobile 

Local Authority Toolkit

5G & Health

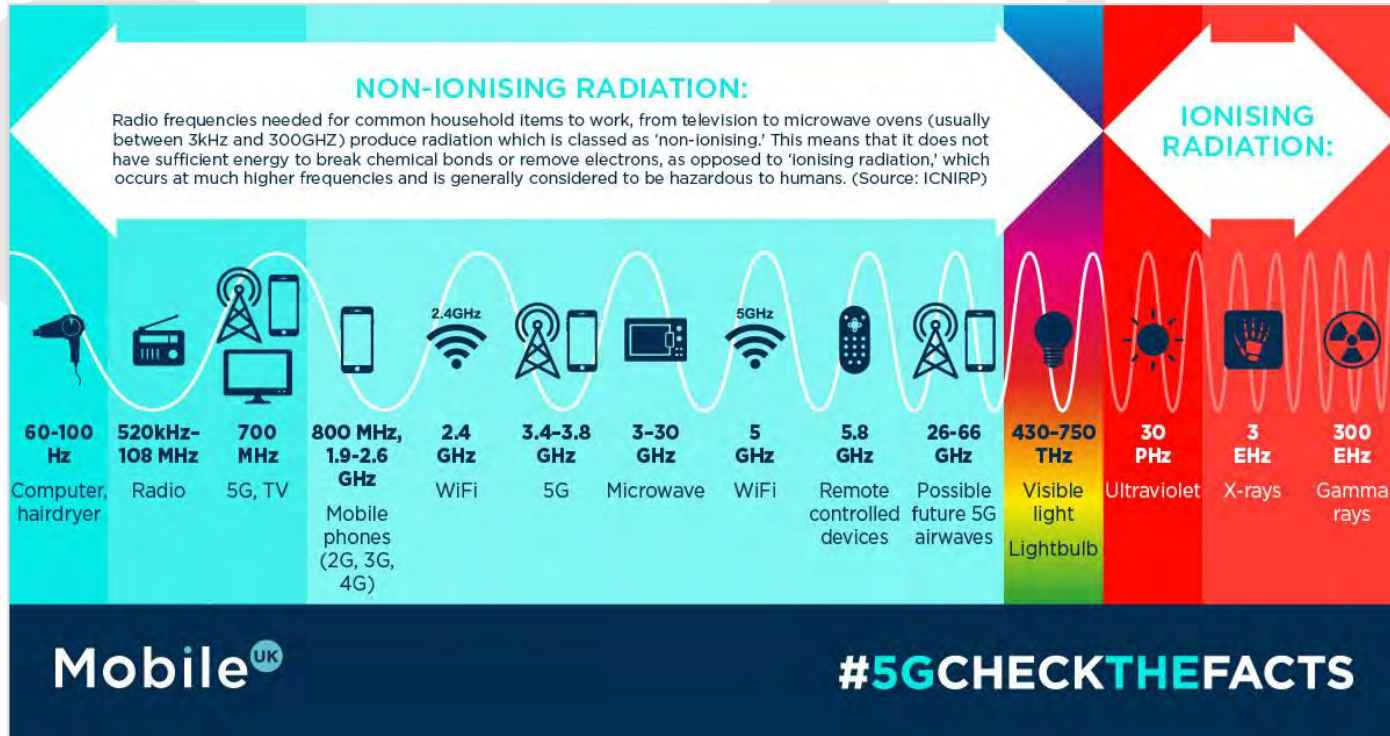


 A SMARTER PLACE

Mobile 

 **diz** A SMARTER PLACE

Addressing Knowledge Gaps



- Key features of 5G technology

Addressing Knowledge Gaps

NON-IONISING

Radio frequencies needed for common household items to produce radiation which is considered to have sufficient energy to break chemical bonds or remove electrons from atoms occurs at much higher frequencies and is generally considered to be ionising.

Frequency	Device
60-100 Hz	Computer, hairdryer
520kHz-108 MHz	Radio
700 MHz	5G, TV
800 MHz, 1.9-2.6 GHz	Mobile phones (2G, 3G, 4G)
2.4 GHz	WiFi
3.4-3.8 GHz	5G

#5G CHECK THE FACTS

Mobile telecoms masts

What is a mobile phone mast and how do they work?

A mobile phone mast is a supportive structure that holds in place mobile radio equipment used to broadcast mobile signals. Mobile phone masts send and receive signals to and from mobile phones and other connected devices to enable calls, texts and access to the Internet. Masts are fitted with radio receivers and transmitters which maximise a network signal within a local area. When the phone signal becomes weaker from one mast and the user moves away, the network automatically transfers the device to the next one to ensure good signal is maintained.

What are the different types of masts?

There are two main types of masts: towers and poles (also referred to as monopoles and look like larger lampposts). There are also smaller structures installed on top of buildings.

Why are some masts taller than others?

The taller the mast, the wider the network coverage. Signals can be sent and received over several kilometres and using taller masts enables a greater number of phones and devices to be covered.

How are masts installed?

Mast locations are picked by telecoms engineers based on technical, logistical and economic requirements. They are spaced to provide seamless network coverage. It can take around 18 months to install a mast, with many phases for site surveying, legal terms, planning permission, construction, etc.

Why do we need 5G?

- On 5G devices, any network delay (known as latency) is decreased so significantly that it is virtually non-existent, delivering perfect conditions for online streaming and video calling.
- 5G provides reliable, low-latency connectivity to sensors, computers, and other devices.
- 5G will facilitate the rollout of the Internet of Things - connected smart devices that will transform many aspects of our lives.
- 5G will allow crucial industries like energy, transport, healthcare and manufacturing to make unprecedented advances, improving their operations and our quality of life.

For more information visit mobileuk.org

Mobile UK

- Key features of 5G technology
- Key features of 5g infrastructure
- Addressing common concerns

Addressing Concerns

- Public safety concerns
- Public health concerns
- Over-development concerns / Imposition of infrastructure
- FOI enquiries

Addressing Concerns

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+ 5G + the Environment

- 5G + Safety

Whilst 5G is different to 4G it is important to understand that, at its core, 5G is fundamentally reliant upon exactly the same principles of radio frequency transmission as 4G and the previous generations of mobile phone communication. These frequencies are illustrated in the following **Mobile UK** graphic where you will see how the radio frequencies associated with 5G, at both its lower and higher levels, sit within the spectrum of radio frequencies that we utilise and live with in our everyday lives. Radio frequencies are found in the home – remote controls, radios, microwaves – and in the natural environment – visible light, ultraviolet.

NON-IONISING RADIATION:

Radio frequencies needed for common household items to work, from television to microwave ovens (usually between 3kHz and 300GHz) produce radiation which is classed as 'non-ionising.' This means that it does not have sufficient energy to break chemical bonds or remove electrons, as opposed to 'ionising radiation,' which occurs at much higher frequencies and is generally considered to be hazardous to humans. (Source: ICNIRP)

Frequency Range	Technology / Source
60-100 Hz	Computer, hairdryer
520kHz-108 MHz	Radio
700 MHz	5G, TV
800 MHz, 1.9-2.6 GHz	Mobile phones (2G, 3G, 4G)
2.4 GHz	WiFi
3.4-3.8 GHz	5G
3-30 GHz	Microwave
5 GHz	WiFi
5.8 GHz	Remote controlled devices
26-66 GHz	Possible future 5G airwaves
430-750 THz	Visible light, Lightbulb
30 PHz	Ultraviolet
3 EHz	X-rays
300 EHz	Gamma rays

- Industry body facts and figures

Addressing Concerns

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+ 5G + the

– 5G + Saf

Whilst 5G is different to 4G and the previous generations, the radio frequencies associated with 5G are different to those used by 4G and the previous generations. The radio frequencies used, even at the highest frequency that 5G will operate at, remain within what is referred to as non-ionising radiation. This radiation does not have sufficient energy to break chemical bonds or remove electrons, as opposed to 'ionising radiation', which occurs at much higher frequencies and is generally considered to be hazardous to humans. (Mobile UK Planning).

A number of key research publications and articles have reinforced this view. [Public Health England https://www.gov.uk/government/publications/mobile-phone-base-stations-radio-waves-and-health/mobile-phone-base-stations-radio-waves-and-health](https://www.gov.uk/government/publications/mobile-phone-base-stations-radio-waves-and-health/mobile-phone-base-stations-radio-waves-and-health) points out that "Independent expert groups in the UK and at international level have examined the accumulated body of research evidence. Their conclusions support the view that health effects are unlikely to occur if exposures are below international guideline levels."

[Which Magazine https://www.which.co.uk/news/2020/06/is-5g-safe-everything-you-need-to-know-on-the-5g-powered-future/](https://www.which.co.uk/news/2020/06/is-5g-safe-everything-you-need-to-know-on-the-5g-powered-future/) reinforced the view that "The wavelength 5G operates at is non-ionising radiation. That means it doesn't produce enough energy to damage the cells in your body, which can cause cancer" and, on concerns about the proliferation of masts 5G will require, that "although there will be more masts, they are low-powered and act more like signal repeaters, relaying the signal from one mast to the next."

[UK5G, the national innovation network dedicated to the promotion of research, collaboration and the industrial application of 5G in the UK, reinforces the message of 5G's safety stating that "The resounding opinion of health agencies worldwide, including the World Health Organisation and the UK Health Security Agency \(UKHSA\), formally Public Health England, is that there is no cause for concern over the rollout of 5G infrastructure. Just like our TVs, remote controls, home Wi-Fi and so on, the strength of a 5G signal is extremely weak. Therefore, so long as the international guidelines on public exposure are followed, there are no risks to public health"](https://www.uk5g.org/)

[Cancer Research UK https://www.cancerresearchuk.org/about-cancer/causes-of-cancer/cancer-myths/do-mobile-phones-cause-cancer](https://www.cancerresearchuk.org/about-cancer/causes-of-cancer/cancer-myths/do-mobile-phones-cause-cancer) acknowledge that 4G and 5G mobile signals "use higher frequency waves than older mobile networks, but they still don't have enough energy to damage DNA to cause cancer."

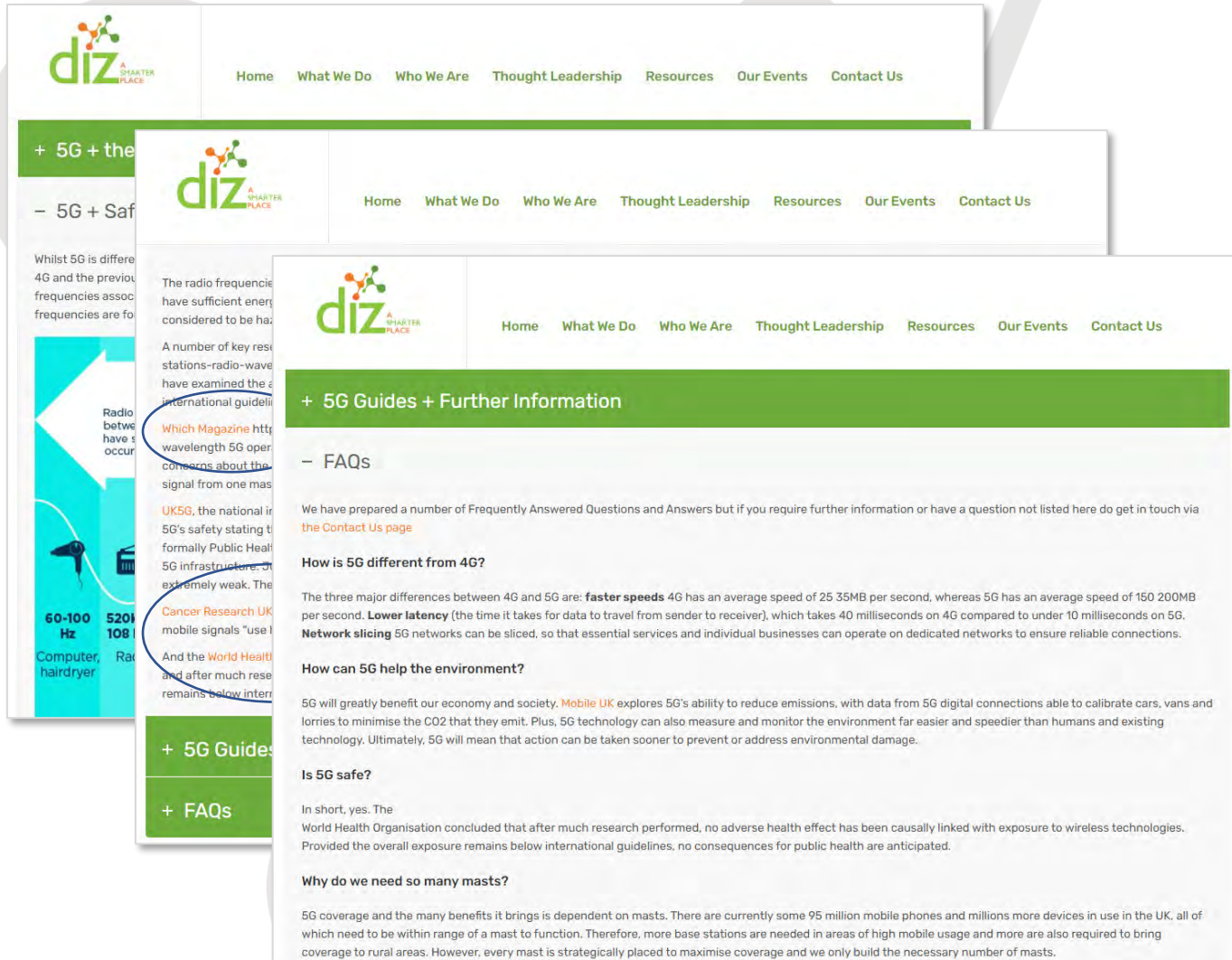
And the [World Health Organisation https://www.who.int/news-room/questions-and-answers/item/radiation-5g-mobile-networks-and-health](https://www.who.int/news-room/questions-and-answers/item/radiation-5g-mobile-networks-and-health) concluded that "To date, and after much research performed, no adverse health effect has been causally linked with exposure to wireless technologies. ... Provided that the overall exposure remains below international guidelines, no consequences for public health are anticipated."

+ 5G Guides + Further Information

+ FAQs

- Industry body facts and figures
- Respected health commentators and researchers
 - WHO, PHE, Cancer Research, Which?

Addressing Concerns



The image displays three overlapping screenshots of the 'diz' website, which is branded as 'A SMARTER PLACE'. The top screenshot shows the homepage with a navigation menu: Home, What We Do, Who We Are, Thought Leadership, Resources, Our Events, and Contact Us. The middle screenshot shows a page titled '+ 5G + the' with a sub-header '- 5G + Saf'. It contains text about radio frequencies and a sidebar with a diagram showing radio waves between a mast and a device, with frequency ranges 60-100 Hz and 5200-108 Hz. The bottom screenshot shows a page titled '+ 5G Guides + Further Information' with a sub-header '- FAQs'. It contains sections for 'How is 5G different from 4G?', 'How can 5G help the environment?', 'Is 5G safe?', and 'Why do we need so many masts?'. A blue circle highlights the 'Cancer Research UK' link in the sidebar of the middle screenshot.

Whilst 5G is different from 4G and the previous generations, the radio frequencies associated with 5G are considered to be safe. A number of key research organisations - radio-wave experts - have examined the evidence and international guidelines. Which Magazine http://www.which.co.uk/news/2018/05/5g-safety-what-you-need-to-know/ concerns about the signal from one mast. UK5G, the national infrastructure for 5G's safety stating that 5G's safety is formally Public Health. 5G infrastructure is extremely weak. The Cancer Research UK mobile signals "use the same radio frequencies as 4G and after much research remains below international guidelines". And the World Health Organisation (WHO) has stated that after much research performed, no adverse health effect has been causally linked with exposure to wireless technologies. Provided the overall exposure remains below international guidelines, no consequences for public health are anticipated.

Why do we need so many masts?

5G coverage and the many benefits it brings is dependent on masts. There are currently some 95 million mobile phones and millions more devices in use in the UK, all of which need to be within range of a mast to function. Therefore, more base stations are needed in areas of high mobile usage and more are also required to bring coverage to rural areas. However, every mast is strategically placed to maximise coverage and we only build the necessary number of masts.

- Industry body facts and figures
- Respected health commentators and researchers
 - WHO, PHE, Cancer Research, Which?
- Specific FAQs



Addressing Concerns



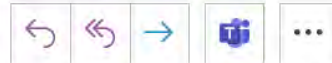
- Responding to FOI Enquiries
- Key messaging and comms resources and flowcharts

Horizon-Scanning

DIZ Board Digital Links Newsletter - 2nd December



Michael Warr
To Michael Warr



Fri 02/12



Hello All,

Please see below this week's links of interest.

Week ending Friday 2nd December 2022 (N.B. Previous weeks' links are retained below)

DIZ Smart Place Seminar

(DIZ) Online Smart Place Seminar: 'What Can 5G Do For Us?' - December 9th 10:00-11:30 This is the last week to secure a ticket for our latest Smart Place Seminar which, with speakers from CGI, DCMS, DIZ and Bable Smart Cities will explore just what 5G, and the technologies, applications and services it can enable, could mean for a place like the DIZ. Book your free place here:
<https://www.eventbrite.co.uk/e/what-can-5g-do-for-us-tickets-445068892037>

Connectivity

(DMCS / BDUK) The Gigabit Broadband Voucher Scheme: Thanks to the Gigabit Broadband Voucher Scheme homes and businesses across the UK are benefitting from fast, reliable broadband and you can watch this latest case study video to find out more. Also, visit the Digital Essex website to [learn more about how Essex County Council will top-up the scheme up to £15,000 per business and £8,500 per residence](#)

(Advanced Television) Report: Economic benefits of 5G in emerging markets: An Ericsson-commissioned study by management consulting firm Analysys Mason highlights the potential economic, consumer and environmental benefits of 5G connectivity in 15 national emerging markets.

(Advanced Television) Forecast: 5G subs at 5bn by 2028: Global 5G subscriptions remain on track to top one billion by the end of this year, and five billion by the end of 2028, despite current and developing economic challenges in many parts of the world

(DCMS) Broadband beamed from space to isolated areas under plans to boost countryside internet connections: Some of the UK's most remote homes and businesses will be connected to better

- Weekly weblinks newsletter
- Covering articles, reports, research and events on emerging digital issues including 5G
- Sign up for free





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www.diz.org.uk

LinkedIn: <https://www.linkedin.com/showcase/dizmatters/>

Twitter: @DIZMatters <https://twitter.com/DizMatters>

