

How 5G will help the environment



Mobile^{UK}

 BUILDING
MOBILE
BRITAIN

Why should we care about 5G?

5G will benefit our economy and society.

It will be better at doing the things that 4G does already, but significantly it will offer faster and more reliable mobile internet.

It will also do things that 4G cannot. It has the potential to change the ways in which we learn, how we communicate and how we do our jobs through the simultaneous and seamless connection of our digital devices.

But because it is often described using technical jargon, many people are unaware of how 5G will enhance their life.

This pamphlet explains the benefits of 5G using examples and language that anyone can understand.

It is one of six pamphlets that look at the impact of 5G. The topics included in these pamphlets are:

- **How 5G will help healthcare**
- **How 5G will increase rural opportunities**
- **How 5G will support the emergency services**
- **How 5G will help councils**
- **How 5G will improve the home and the workplace**
- **How 5G will help the environment**



5G-enabled truck convoys could reduce CO₂ emissions from those vehicles in the convoy by

16%

How will 5G help the environment?

While 4G plays a major role already in protecting and maintaining our environment. 5G digital connectivity is expected to provide added capabilities in two key ways:

- **Reducing emissions.** Data and information from 5G digital connections will calibrate cars, vans and lorries to minimise the CO₂ that they emit. The same type of data and information will manage the usage of appliances and devices in our homes, reducing the power that they consume. In short, 5G will automate a decrease in the emissions we create during our daily lives.
- **Identifying environmental problems early.** 5G technology can measure and monitor the environment much more quickly and easily than humans and existing technology can. 5G will mean that action can be taken sooner to prevent or address environmental harm and damage.

5G networks are being gradually rolled out across the UK. As and when you have access to 5G connectivity will depend on where you live, your network provider and whether you have 5G-enabled devices.

If you have further questions about 5G, some of the most common questions have been answered on the final page

Uses of 5G to help the environment

Supporting our natural world.

5G-enabled technology has been used for the timely identification of toxic algae in the ocean, supporting preventative action to take place. 5G connectivity working in combination with artificial intelligence has helped to uncover illegal logging in Costa Rican rainforests in real time, giving rangers a better chance to catch the culprits. 5G-enabled technology has even encouraged pandas to breed by identifying mating calls and replaying them during narrow fertility windows.¹ In short, 5G is helping us to look after the planet, something that we all benefit from.



A widespread reduction in power consumption.

5G connected devices will allow us to reduce our energy use and emissions, so we have a less negative impact on the environment. Multiple devices will connect to each other, so they know when they're in use and powerup or down accordingly. 5G will allow us to download data in a more efficient way, so we use less energy. Smart energy meters will help us reduce household energy use, and smart transport systems will help us produce fewer emissions when we travel.³



More environmentally friendly transport.

Information on road conditions and traffic flows can be collected by sensors. This information can be seamlessly organised and communicated using 5G, being used to optimise the fuel efficiency of your vehicle and reduce traffic flows and congestion. CO₂ emissions will fall (as will the cost of running your car).² 5G will also eventually be used as the digital connectivity that underpins driverless cars and trucks, managing vehicle convoys on motorways that minimise energy consumption. Trials of these driverless vehicles are already underway.



Limiting environmental damage from food waste.

Some estimates suggest that 30% of food is lost "between farm and fork". 5G-enabled technology can make the food supply chain more efficient. Sensors and data can mean that the use of water, electricity and fertiliser in agriculture can be minimised. Sensors and data can also mean the remote monitoring of refrigerated shipping containers, addressing power losses and equipment failures as they distribute across the globe. Fundamentally, less food waste means less energy has been wasted in producing it - and less impact on the environment.⁴



¹ Columbia University, The coming 5G revolution: How will it affect the environment?

² KPMG, Why 5G can deliver on PM's full fibre internet pledge

³ O2, A greener, connected future

⁴ Ericsson, January 2020, How 5G and the Internet of Things can create a winning business

The statistics



5G will reduce the amount of carbon released into the atmosphere.

O2 has calculated that using 5G across the sectors of transport, utilities and home energy, manufacturing and healthcare, will mean that up to 269 megatonnes of CO₂ can be avoided by 2035.⁵



5G is more energy efficient technology than 4G.

It is estimated that 5G is more efficient than 4G, due to its rapid capabilities.⁶ To give this some context, one kilowatt-hour (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.⁷



5G will make our vehicles cleaner.

5G enabled truck convoys - using sensors to allow trucks to travel close behind one another - could reduce CO₂ emissions from between one to eight percent for the lead vehicle and between seven and 16 percent for the following vehicles.⁸

⁵ O2, A greener, connected future

⁶ Western Digital, 5G vs. 4G - a side by side comparison

⁷ Columbia University, The coming 5G revolution: How will it affect the environment?

⁸ Politico, Connected cars could be big energy savers, or not

Frequently Asked Questions

1. How do I get access to 5G?

Firstly, you need a 5G signal in your area (just as you need a 4G signal to get 4G now). Secondly, you need a device that can receive 5G signal - some 5G-enabled smartphones are available now, with more coming onto the market.

2. Does 5G pose a danger to your health?

5G uses radio waves - as does 4G, 3G etc. - which have been found safe in numerous studies when used within guidelines. Public health organisations around the world support this conclusion.

3. Does 5G mean more masts and antennae?

Some new infrastructure will be needed to connect more remote communities to the 5G network. But existing masts will be adapted for 5G wherever possible. If new sites are needed, relevant planning rules will apply to them being built.

4. Is 5G bad for wildlife?

No. Despite many false claims, wildlife has not been found to be negatively affected by 5G.

5. Will 5G offer an alternative to broadband?

4G and 5G can both provide mobile home broadband connections. However, while 5G will offer potentially near gigabit capable speeds in the future, currently UK 5G mobile networks don't provide the same capacity or offer speeds as fast as 'full fibre' for home broadband.

Source: Mobile UK - www.mobileuk.org

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How 5G can help meet the **climate change challenge**



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- [How 5G will improve the home and the workplace](#)
- [How 5G will help the environment](#)
- [How 5G will advance the manufacturing industry](#)
- [How 5G will improve the creative industries](#)
- [How 5G can meet the climate change challenge](#)
- [How 5G will change sport](#)



The Paris Climate Change Agreements sets a global target for maintaining a maximum of

**1.5%
degree °C**

global temp increase.

5G-enabled use cases can reduce carbon emissions in the energy industry by almost

**1% by
2030¹**

How 5G can meet the Climate Change Challenge

4G plays a major role already in reducing emissions and in turn climate change and its impact. Here are two ways 5G will enhance our ability to address the climate change challenge:

- **Reducing energy waste and improving existing networks.** Intelligent sensor networks and smart grids enabled by 5G will reduce waste across the energy and water networks we rely on daily.
- **Accelerating the transitions to zero carbon emissions.** 5G will help individuals, businesses, the energy industry and governments to accelerate the transition to zero carbon emissions.

5G networks are being gradually rolled out across the UK. When you will have access to 5G connectivity will depend on where you live, your network provider and whether you have 5G-enabled devices.

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How 5G can prevent climate change

5G can help detect leaks and reduce water wastage.

Water lost through leaks in the UK water network are estimated to equate to three billion litres of wastage daily; that's 1,268 Olympic swimming pools. 5G enabled technology is being used effectively by Vodafone and SES Water to detect and address problems, using specialist devices to spot and alert teams to leaks as they happen. 5G powered technology can penetrate deeper into the ground and offer wider coverage, alerting SES Water immediately so that it can take action to fix leaks, low pressure or any abnormalities affecting water supplies. The project has already cut leakage by 15% and is laying the foundations to more than halve it by 2045. ²



5G can reduce CO2 emissions by supporting the transition to green energy.

Major network providers are committed to reducing their carbon footprint, working to enhance and progress the infrastructure of renewable energy. 5G technology can accelerate the move to renewable energy as its low latency connectivity maintains stable and reliable frequency across the grid. For instance, 5G's advanced real-time technology helps to maintain grid frequency to within 1-2% of 50-60 Hertz mitigating against blackouts and minimising surges and waste. The infrastructure also supports supply and demand peaks and troughs of renewable energy supply, improving its reliability. ³



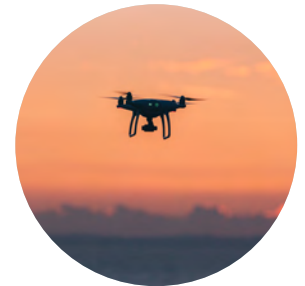
5G reduces emissions across industry.

5G will act as the facilitator to the reduction of emissions across a wide range of industries, including construction, transport, manufacturing and the energy sector. MTU Aero implemented 5G technology in the manufacture process for their jet engine components, and the real time control the technology provided will reduce CO2 emissions from the manufacture and use of the components by 16 million tonnes a year globally. ⁴



5G powered UAVs for gas pipe inspections

5G powered unmanned aerial vehicles (UAVs) or drones, have been effectively used in Shanghai, China to cut the carbon footprint of gas pipe inspections. Reducing the need for manual inspection and land vehicles reduced emissions by 49% and the scheme's success will be replicated widely across the industry due to its effectiveness and low carbon footprint. If 5G powered UAV pipeline inspections are rolled out globally the emission reduction will equate to the energy used by everyone in the world charging a smartphone for 100 days. ⁵



² SES Water turns to Vodafone technology to help reduce water leaks | [Vodafone UK News Centre](#)

³ How 5G can cut 1.7 billion tonnes of CO2 emissions by 2030 | [STL Partners](#)

⁴ Ultra-low latency of 5G improves production of jet engine components | [ericsson.com](#)

⁵ Green 5G: Building a Sustainable World | [huawei.com](#)

The statistics



5G technology and those it will assist can help rid the planet of 269 megatonnes of carbon by 2035. ⁶



The 5G network in 2030 could help facilitate an 85% reduction in emissions per unit of data transported than today's mobile phone networks. ⁷



The reduction in energy and fuel consumption provided by 5G enabled Machine-to-Machine (M2M) and the Internet of Things (IoT) provided a 1.44 billion MWh reduction in energy and global saving of 521 billion litres of fuel in 2018. ⁸



The Paris Climate Change Agreements set a global target for maintaining a maximum 1.5% C global temperature increase.

⁶ O2 says 5G can massively reduce UK carbon emissions | [TechRadar](#)

⁷ How does 5G affect the climate? | [newswise.com](#)

⁸ Mobile Technologies Enabling Huge Carbon Reductions in Response to Climate Emergency | [GSMA Newsroom](#)

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