

5G THE ENVIRONMENTAL IMPACT

Organisms - Continuous exposure to non-ionising microwave radiation, has a detrimental impact on all living organisms, animals, birds, insects, plants, trees, soil based micro-organisms, as well as humans. Birds may abandon their nests, suffer plumage deterioration, locomotion problems, reduced survivorship or death. The declining bee population suffers colony collapse, and disrupted navigational skills. Bees are a crucial part of the earth's ecosystem and vital for agriculture, providing pollination for our plant-based food.

Ecosystems - Microbes central to all life on Earth, are also susceptible to damage from microwave radiation. Microbes are diverse in form and function. In soils, one teaspoon of topsoil contains around 1 billion individual microscopic cells and around 10,000 different species. These organisms have many tasks, and are central to crop fertility, purifying the environment from pollutants, regulating carbon storage stocks and production/consumption of many significant green house gases, such as methane and nitrous oxides.

Energy Consumption - The expansion of the use of digital technology and the 5G wireless network, is the most significant contributor to increased energy consumption. During 2013-15 the expansion of the wireless cloud was equivalent to an additional 4.9 million cars on the road. Current mobile phone usage at 3%, consumes energy at a higher rate than aviation. This is projected to rise to 20% over a decade, but with 5G, energy consumption is predicted to escalate to upwards of 170% by 2026. By 2030 information technology will consume one fifth of all global electricity.

Carbon emissions – The use of digital technologies increases as the global population rises and new devices enter the market. 5G will create an increased demand for such devices, therefore raising the current carbon footprint. During production, digital technologies are at their least environmentally sound, generating around 68% of total carbon emissions, equating to 30kg of carbon dioxide. The total impact that digital devices have on carbon emissions throughout their life span, from manufacture to the energy required to power them and ultimately the end waste created, is hard to estimate.

Earth's Natural Electromagnetism - The alteration of the Earth's electromagnetic environment may be an even greater threat to life than the radiation from ground-based antennas. 5G satellites located in the Earth's magnetosphere, will exert a significant influence over the electrical properties of the atmosphere or the global electrical circuit in which we naturally inhabit. The biological rhythms of living species are controlled by the Earth's natural electromagnetic environment. The

well-being of all living organisms depends on the stability of this environment, and the electrical properties of the Earth's atmosphere.

Space debris - enveloping our planet in low Earth orbit, lies within 1.250 miles of the Earth's surface. The debris ranges from microscopic particles to obsolete spacecraft, chunks of satellites, rocket bodies, momentum flywheels, nuclear reactor cores to residual fragments from a collision or debris breaking up. Space debris moves about 10 x faster than a bullet. Some will fall out of orbit and burn in the Earth's atmosphere, but a giant rocket fragment crashing into a satellite at 21,6000 mph would present untold problems on Earth. As the launching of 5G satellites continues, without an appropriate end of life plan, this situation can only worsen.

Atmosphere - Implementation of a 5G global wireless network includes the launching of rockets to deploy 5G satellites. The satellites will have a short lifespan, which would indicate an increase in deployments for the foreseeable future. Black carbon particulates emitted through these launches, could potentially cause significant changes in the global atmospheric circulation and distributions of ozone and temperatures. Solid state rocket exhaust contains metallic debris, chlorine and alumina which destroys the ozone. Google's Project Loon is launching helium balloons. The balloons will only have a 10-month lifespan. The amount of helium being used or its' impact is yet unknown.

SpaceX intends to launch 42,000 satellites, each having a planned lifespan of 5 years. 42,000 divided by 5, this equates to 8,400 satellites wearing out annually, being 'deorbited', then left to burn up in the atmosphere. They cannot just disappear. They become orbiting computer banks and solar panels, then start breaking down into toxic dust and smoke as they re-enter the atmosphere.

Oxygen and water - Higher radio frequency signals especially in the mm-wave range, are effected by atmospheric attenuation. This attenuation in the atmosphere is caused mainly by signal absorption by gasses such as O₂ and H₂O. The effect of signal absorption under 10 GHz is fairly low and predictable, however above this, the attenuation increases significantly, especially at certain frequencies. This is dependent on the absorbing characteristics of gasses, with 60GHz being absorbed by the atmosphere with almost 98%. attenuation by O₂.

Noise – The global wireless use of radio-frequency threatens vital climate applications, long term weather and natural disaster predictions, along with the study of water vapour in relation to climate change. Transmissions 24/7 from mobile-phone networks degrade the quality of the Earth Observations from space. Certain 5G radio-frequency signals, are close to those used by satellites to gather crucial weather and climate data. A noise buffer, may be required between the 5G transmissions and the water-vapour signal to minimise interference. Electromagnetic noise interference disrupts the navigation process of birds, bees and other insects.

Light pollution – 'Brightness' from SpaceX Starlite satellite constellations will be visible with the naked eye, and will destroy the natural aspect of the night sky. It will also have a disastrous effect on astronomy. The ability to search for potentially hazardous asteroids and comets, the most dangerous objects in the entire Universe

to our species survival, will be threatened. The specific identification and measurement of transient and variable events, such as supernovae, flares, and variable stars, may also be lost.

Birds – During migration birds are guided by the stars. When there are going to be more satellites visible in the sky than stars, we cannot foresee how this is going to affect them.

Data - harvested by 5G infrastructure is likely to result in an increase in data traffic of up to a thousand times. The data will require massive computers to allow it to be stored and maintained. These computers will be housed in large data storage centres.

Economic incentives mean that telecommunication companies will pursue their strategies for increased marketing and production of technology in spite of any known environmental impact. . By way of the experimental nature of 5G, we cannot foresee the full impact that the new 5G technology is going to have on the environment.

Waste - The many component parts used in technology associated with 5G network creates waste and scours important resources, with detrimental consequences for the environment. Precious metals and minerals used in the production of smart-phones or the small cells needed for 5G, are not a renewable resource. These metals often cannot be recycled and so the technologies cannot be recycled, thus creating tons of waste which ends up in landfills or other disposal systems

Water Pollution - The manufacture of electronics consumes thousands of different kinds of toxic chemicals and gases and produces enormous quantities of toxic waste. The pollution of the groundwater wherever computers, cell phones and other electronics are manufactured, is an increasing problem worldwide.

Devastation – The Democratic Republic of Congo rich in minerals, is mined for columbite-tantalite or coltan for use in the manufacture of electronic devices. The mining has a devastating impact on the incredible biodiversity of the region, which is the habitat of the Grauer's Gorillas. The forests are decimated by the mines and wildlife is killed or traded. Grauer's Gorillas are one of the 25 most-endangered primates in the world. Scientists fear they may very soon be extinct.

Exploitation and Extinction– The Congo is being destroyed at an alarming rate, not only ecologically but socially and culturally. Millions of children are working in the coltan mines as virtual slaves in order to produce the world's disposable electronics.

It is not only the Grauer's gorillas that are placed at high risk of extinction, indigenous tribes living in the forests of the Congo, are also at grave risk. The Pygmies of the Ituri Forest, are the largest known group of hunter-gatherers left in the world. The extreme exploitation of the forest and of the Pygmies to satisfy consumer demand for coltan and other rare metals and minerals, endangers their very existence.

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