

***“The digital transition as it is currently implemented participates to global warming more than it helps preventing it. The need for action is therefore urgent.”***

- The Shift Project Report on the Environmental Impact of Information and Communication Technologies, 2019

# Climate Change, 5G & the Internet of Things

**Massive Increases in 5G Equipment = Massive Increases in Energy Use**

## ***Big Tech is Pushing 5G***

5G requires millions of new cellular antennas called “small cells” (basically shorter cell towers) to be built in neighborhoods *directly in front of our homes*. These 5G antennas are to connect with billions of new wirelessly connected “smart” devices referred to as the Internet of Things (IoT). Researchers are warning us that the energy consumption of 5G and the IoT is projected to skyrocket.

## ***5G is NOT Sustainable***

The demand for technology is outstripping the increase in efficiency. The energy consumption will rise sharply due to the ever increasing IoT energy demands *at every stage of the lifecycle* of 5G equipment, from device manufacture to data centers to data transmissions, and networks.

## ***5G is an Energy Hog***

“A lurking threat behind the promise of 5G delivering up to 1,000 times as much data as today’s networks is that 5G could also consume up to 1,000 times as much energy.”

— IEEE Spectrum, 5G’s Waveform Is a Battery Vampire

## ***We must consider the environmental footprint of the digital ecosystem.***

“Behind each byte we have mining and metal processing, oil extraction and petrochemicals, manufacturing and intermediate transports, public works (to bury the cables) and power generation with coal and gas. As a result, the carbon footprint of the global digital system is already 4% of global greenhouse gas emissions, and its energy consumption rises by 9% per year.”

— Jean-Marc Jancovici, President of The Shift Project, member of the French High Climate Council

The digital version of this document is [hyperlinked to online sources for more information](#). View all sources at EHT’s Climate Change webpage [ehtrust.org/climate-change-and-5g](http://ehtrust.org/climate-change-and-5g)

**70.2 million**

“small cell” tower bases to be installed by 2025

**500 billion**

devices are expected to be connected to the Internet by 2030

**8.9 billion**

mobile phone subscriptions worldwide by 2024

**60% increase**

per year in production of wireless peripherals (Wi-Fi/Bluetooth speakers, appliances, wearables)

**700%**

increase in mobile data traffic globally projected between 2017 and 2022

5G was not premarket safety tested.  
Fact sources also at [EHTrust.org](http://EHTrust.org)

 **ENVIRONMENTAL  
HEALTH TRUST**

## **“Smart” is Not Smart.** **The push for all things wireless is the wrong direction.**

### **5G Harms Bees, Trees and Birds**



**Research** finds bees and pollinators absorb between 3% to 370% more of the higher frequencies of 5G, leading the scientists to warn, “This could lead to changes in insect behaviour, physiology, and morphology over time...”



**Research** finds wireless frequencies interfere with birds' navigation systems and circadian rhythms, and can harm their development and reproduction.



**Research** finds trees can be harmed by the standard radiation emissions from antenna equipment. Effects include altered growth, thinner cell walls and adverse biochemical changes.

#### **Damage to the Tree Canopy**

Trees play a vital role in mitigating climate change, sequestering millions of tons of carbon that would otherwise pollute our climate. The installation of 5G equipment often requires heavy pruning and digging. This will obviously damage the canopy and root system of our trees.

**“Wireless devices, antenna networks and data centers are consuming an ever-increasing portion of the global energy supply, based largely on coal...”**

— “Re-Inventing Wires: The Future of Landlines and Networks”

“Our energy calculations show that by 2015, wireless cloud will consume up to 43 TWh, compared to only 9.2 TWh in 2012, **an increase of 460%**. This is an **increase in carbon footprint** from 6 megatonnes of CO<sub>2</sub> in 2012 to up to 30 megatonnes of CO<sub>2</sub> in 2015, the equivalent of adding 4.9 million cars to the roads. Up to 90% of this consumption is attributable to wireless access network technologies, data centres account for only 9%...

...wireless access networks are clearly **the biggest and most inefficient consumer of energy** in the cloud environment.”

— The Centre for Energy Efficient Telecommunications, 2013

### **Solutions for fast, safe and secure internet connections do exist.**

A national **wireline system** can guarantee a superior foundation of Internet access for everyone, unequalled connectivity speed, safety, privacy, security, energy efficiency and long-term sustainability.

#### **Referenced Reports**

Engels, Svenja, et al. “**Anthropogenic electromagnetic noise disrupts magnetic compass orientation in a migratory bird.**” Nature, 2014

Thielens et al., “**Exposure of Insects to Radio-Frequency Electromagnetic Fields from 2 to 120 GHz**” Scientific Reports, 2018

Waldmann-Selsam, C., et al. “**Radiofrequency radiation injures trees around mobile phone base stations.**” Science of the Total Environment, 2016

The Shift Project, “**Lean ICT: Towards Digital Sobriety: Report on the Environmental Impact of Information and Communication Technologies,**” February 2019

Andrae & Edler of Huawei Technologies, “**On Global Electricity Usage of Communication Technology: Trends to 2030,**” Challenges 2015

Vertiv, “**Telco Industry Hopes and Fears from Energy Costs to Edge Computing Transformation,**” 2019

Timothy Schoechele, “**Re-Inventing Wires: The Future of Landlines and Networks,**” National Institute for Science, Law & Public Policy, May 2018

Baliga et al. of the University of Melbourne, “**Energy Consumption in Wired and Wireless Access Networks,**” IEEE Communications, June 2011

Morley et al., Lancaster University, “**Digitalisation, energy and data demand: The impact of Internet traffic on overall and peak electricity consumption,**” Energy Research and Social Science, 2018

The Centre for Energy Efficient Telecommunications at the University of Melbourne, “**The Power of Wireless Cloud,**” 2013

Shehabi et al., “**United States Data Center Energy Usage Report,**” Berkeley Laboratory, 2016