

## ENERGY USE OF WIRELESS VS. HARD-WIRED



**HARD-WIRED**



**WIRELESS**

**3G uses 15 times MORE energy,  
4G uses 23 times MORE energy,  
5G will possibly use 69 times MORE  
energy than a hard-wired connection.**

### REFERENCES:

According to Kris De Decker Why We Need a Speed Limit to the Internet, 3G technologies use about 15 times more energy than wired connections, and 4G technologies consume 23 times more energy. There was no data yet on 5G.

Michael Koziol in the IEEE Spectrum article “5G’s Waveform Is a Battery Vampire” (24 Jul 2019) states:

*A 5G base station is generally expected to consume roughly three times as much power as a 4G base station. And more 5G base stations are needed to cover the same area.*

According to a 2015 publication by the Centre for Energy Efficient Telecommunications,

*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 . . . to up to 30 megatonnes of CO2 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 . . .*

IEEE Consumer Electronics Magazine Editor Peter Corcoran says energy is a concern for the Internet of Things (IoT). In a recent article characterizing Corcoran as a “longterm IoT skeptic,” author Steven Max Patterson reports:

*IoT devices are expected to be low-power devices, but the number of IoT devices that Cisco predicts will be 50 billion by 2020, is an order of magnitude larger than the number of smartphones and tablets in use today. If the energy consumed by these devices and the networks and data centers to which they are connected is considered, energy consumption by IoT will impactfully increase the rate of energy consumption growth.*