

# Suggestions for Reducing Power Consumption in Wi-Fi Networks

Please consider these approaches for reducing the power consumption of Wi-Fi routers and access points without impacting network performance or requiring changes in human behavior.

## 1) Reduce the frequency of the beaconing signal

This is the primary approach used by an eco-WiFi system developed in Europe.[1] It is a modification of an existing router's firmware to support changing the default beacon signal from 10 Hz down to 1 Hz (or anything in between). This simple change reduces power consumption by approximately 90% without slowing the speed of data transmission. It would be ideal if this configuration was allowed and officially supported by the access point vendor and became an industry standard approach for saving power.

## 2) Enter sleep mode when not in use

This approach puts the wireless access point (and the constant beaconing signal) to sleep after a defined interval. This is the approach used by computers and smartphones to blank the screen after a period of non-use. There was a patent granted for this design in 2003.[2] This approach will require some patent research for the vendor, but it may be trivial to work around the patent, or buy or license the patent with very few years left until it expires. Schools are encouraged to request this of their vendors.

## 3) Hardwire as many devices as possible.

Use Ethernet cables for as many devices as possible. Devices that have Ethernet ports and are easy to directly connect to the network should be hardwired and not consume the bandwidth of the wireless network (smart boards, projectors, etc.). Wired connections consume less power and are more secure. This is especially recommended for devices that stream video. An assessment of your current network traffic may help to reveal devices or sites that are consuming large amounts of network bandwidth.

## 4) 5Ghz Band

Consider turning off the 5Ghz band. Higher frequencies consume more power. Although this band can be used for higher speed networking, it does not go through walls as well, and may not be as power efficient as a well planned and managed 2.4Ghz network.[3]

An ideal approach would combine all of these solutions to dramatically reduce power consumption immediately, without having to wait for low power Wi-Fi HaLow (802.11ah), which is expected to roll out in 2018.

## References

- 1) [Eco Wi-Fi](http://bit.ly/ecoWiFi) <http://bit.ly/ecoWiFi>
- 2) [SwissCom Patent: Reduction of Electrosmog in Wireless Local Networks](http://bit.ly/patWiFi) <http://bit.ly/patWiFi>
- 3) [Cisco details RF planning for enterprise wireless networks](http://bit.ly/mgntWiFi) <http://bit.ly/mgntWiFi>