



International Amateur Radio Union

Region 1

www.iaru-r1.org

Response to

Questionnaire of the Sub-group on Role of RSP to Help Combat Climate Change

The International Amateur Radio Union (IARU) is a Non-Governmental Organisation representing the interests of Radio Amateurs throughout the world

Q1. How can the wireless technologies contribute to the efforts to reduce the climate impact of your sector?

In general wireless technologies can reduce climate impact by reducing the use of copper and fibre and their associated manufacturing.

Whilst full licensed power operation by radio amateurs is still necessary in some circumstances, radio amateurs are increasingly using digital technologies that are enabling them to communicate with lower power consumption and experimenting with low signal communications low power which may influence commercial communications in the future.

Furthermore, amateurs are also innovating with renewable energy powered repeaters and beacons stations.

Q2. Which actions relating to radio spectrum issues and contributing to climate protection are taking place in or being planned for your sector(s)? These may be actions based on your own initiative, on the initiative of a group of stakeholders, or adopted as part of national or European policies.

We are very concerned about the use of spectrum for non-communication purposes, in particular technologies such as higher power wireless power transfer (WPT-EV). Those applications are potentially harmful to spectrum due to unwanted disturbances. This is also a technology which can have a particularly negative impact for the climate due to its relatively poorer efficiency.

The response to 'radio spectrum pollution' for some regulators and many users of the spectrum is to increase transmitting power. This in turn consumes more power from the electrical grid. Hi-tech systems like mobile phone systems will increase power automatically, resulting in more frequent charging of phones, and more power consumption in base stations.

Another example of the same is the upcoming system for wireless charging of electrical vehicles. The current information from developers is that these systems have indicated efficiency in the order of 85 - 90 %. In contrast, chargers using a physical connection have efficiency in the order of 97%. Hence a 10% difference. An electrical

vehicle consumes approximately 0.25 kW/h of energy per kilometre. The average driving distance per annum in EU is 16,000 km. Hence requiring $0.25 \text{ kW/h} * 16,000 = 4,000 \text{ kW/h}$, the difference between traditional charging and wireless charging is 400 kW/h per car per year. Is this a technology for the green future or is it coupling relative inefficiency with unnecessary spectrum pollution?

Q3. How can radio spectrum administration help to reduce the climate impact of your sector?

Several radio amateur associations under the umbrella of the IARU have started efforts to measure and track interference sources, their impacts and potential solutions. Household equipment is employing more and more digital technology, which if not well-engineered can add significantly to the levels of radio spectrum pollution.

There needs to be recognition that pollution from systems such as WPT, VDSL, Solar PV, etc., is both a spectrum matter as well as having energy consumption and climate impact and not purely a technical issue.

We are concerned that the summation of multiple devices will continue to increase the existing noise levels with a potential impact on the trend towards greater use of short range wireless devices in the home environment. The European approach to Standards needs to reflect the reality of the impact of aggregation of noise sources and recognise the need for power efficiency.

Q4. Do you identify any issues involving radio spectrum administration which might prevent combat against climate change, decrease of carbon emissions and reducing energy consumption?

We have identified the following issues:-

- Fixed-line telecomms: The use of unbalanced copper cables with their attendant potential to cause unwanted emissions for data transmission (VDSL, etc.) should be deprecated in favour of fibre transmission to reduce spectrum pollution.
- WPT: It should also be recognised that wireless charging is not a panacea. Its downside in terms of relatively lower efficiency (particularly dynamic WPTEV where many kW are involved)) and the second order effect of spectrum pollution affecting efficient use of the radio spectrum, may outweigh its convenience..
- Satellite Broadband: The use of satellite communications can potentially bring advantages in that while the initial cost may be high, once implemented the on-going carbon footprint is very low compared with a terrestrial network of towers and base stations.

Q5. Do you have any other comments that you would like to address to RSPG on this topic?

We appreciate that RSPG has taken the environmental issues on board. There may be a case for embedding energy efficiency requirements into wireless equipment standards as is the case with domestic appliances.

Spectrum itself is a finite resource and needs to be protected.

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