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26 February 2017

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Views and suggestions on the Mid-term evaluation of the Connecting Europe Facility (CEF).

The Connecting Europe Facility is driven by [Commission measures](#) on 14 September 2016 for the promotion of wireless Internet connectivity in UE through Wi-Fi and 5G [radiofrequency (RF) electromagnetic fields (EMF)].

The civil organizations forming part of the “[European coordination of organizations for an EMF exposure regulation which truly protects public health](#)” (*) consider the following on this set of measures:

1. – These measures are contrary to Articles 4, 168, 169 y 191 of the Treaty on the Functioning of the EU (TFEU).

2.- Many early scientific and professional warnings on the EMF risks [extremely low frequency fields (ELF) and radiofrequency fields (RF)] within the legal limits are ignored. These measures do not take into account the latest research on the negative effects of EMFs on the human body. The Commission has not waited to know the results of the [Mobi-Kids study](#); the results could come into direct conflict with the project.

- Since 1998, conferences and both medical and scientific declarations worldwide, in line with the ALARA principle (As Low as Reasonably Achievable), call to apply the precautionary principle and more restrictive limits given the growing evidence of the non-thermal effects of exposure to non-ionizing radiation at all frequencies at exposure levels well below the maximum allowable. This implies important risks to the health of the general population and especially the most vulnerable groups. In 2015 two important appeals were emitted: the [Brussels International Scientific Declaration on Electromagnetic Hypersensitivity and Multiple Chemical Sensitivity](#), and the [International EMF Scientist Appeal to the United Nations](#). More than 220 scientists from 41 nations signed this later appeal; all of these scientists have published peer-reviewed papers on the biological or health effects of non-ionizing EMF (ELF and RF).

- The scientific reviews, as the [BioInitiative Report 2007 and subsequent status updates in 2012 and 2014](#) (more than 4,000 studies) and the [Monograph of the International Commission for Electromagnetic Safety](#) (ICEMS) on "Non-Thermal Effects and Mechanisms of Interaction Between Electromagnetic Fields and Living Matter" (2010), find that current levels of public safety are inadequate to protect public health, documenting current scientific evidence on the causal relationship of EMFs.

- Due to a part of these investigations, the WHO's International Agency for Research on Cancer (IARC) classified electromagnetic fields as **possibly carcinogenic to humans (Group 2B)** in 2001 [extremely low frequency fields (ELF)] and in 2011 [radiofrequency fields (RF)]. Director of the IARC Christopher Wild recommended “pragmatic measures to reduce exposure” especially for children. On October 2012, a **judgment of the Italian Supreme Court recognizes the causal link between prolonged use of mobile and cordless phones and the appearance of a brain tumor**. The working group **BioInitiative** presented the results of new studies that endorse the classification as **carcinogens to humans (Group 1)**, both for ELF (2012) and for RF (2014 and 2016).

- The [European Cancer and Environment Research Institute](#) (ECERI) has identified electro hypersensitivity as an environmental disease caused by artificial EMF in its search for the environmental causes of cancer and the genetic and epigenetic mechanisms which promote the occurrence of cancer.

- Numerous [professional associations](#) echoed these calls: environmental medicine associations in different countries ([EUROPAEM](#), [Austria](#), [France](#), [Germany](#), [USA](#), [Ireland](#), [Italy](#), [Macedonia](#), [United Kingdom](#), [Switzerland](#), ...); professional associations of Medical doctors ([Vienna](#), [Austria](#)), pediatricians ([Germany](#), [USA](#),...), biologists ([Galicia](#), Spain), [Doctors for](#)

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safer schools, etc. The Austrian College of Physicians (2012) and the European Academy of Environmental Medicine or EUROPAEM (2016) respectively developed diagnostic and action guides for health problems and diseases related to EMFs.

3.- This set of measures fully disregard the cautionary recommendations of the European Parliament and the Parliamentary Assembly of the Council of Europe (PACE), and European advisory institutions, which do not consider the current limits of exposure to electromagnetic fields as protectors of human health and the environment. They are in contradiction to Directive 2003/4/EC on public access to environmental information.

- The **Resolution 1815 of the Parliamentary Assembly of the Council of Europe (PACE)** on potential hazards of electromagnetic fields and their effects on the environment (2011), the resolutions of the **European Parliament** in 2008 (**P6_TA(2008)0410**) and in 2009 (**P6_TA(2009)0216**), the recommendations of the **European Environment Agency (EEA)** since **2007 (2009, 2011, 2013)**, the points 4.1/4.2/4.3 of the opinion COM (2011) 348 final - 2011/0152 (COD) of the **European Economic and Social Committee (EESC)**, the **Opinion on Electromagnetic hypersensitivity** approved (7 January 2015) by the EESC's Section for **Transport, Energy, Infrastructure and the Information Society (TEN)**, ...
- **Some of the protection measures proposed in these institutional recommendations have already been implemented in some countries (inside and outside the EU):** lower EMF exposure limits; Wi-Fi banned in Nursery Schools and WiFi on "OFF" in elementary schools (France, ...); prohibition of advertising and sale of specific mobile phones for children (France and Belgium); informations to learn about risks and reduce exposure (European Environment Agency, Australia, Austria, Belgium, Finland, France, India, Germany, Greece, United Kingdom, Russia, Switzerland, etc.). Different degrees of recognition of electrosensitivity (EHS): functional disability (Sweden -2000-), diagnosis code in the ICD-10 (Nordic countries -2000-); population to be protected (public agencies of **Canada, USA, Russia, ...**), judicial judgments between 2011-2016 (**Germany, Australia, France (1, 2, 3, 4), United Kingdom, Spain (1, 2)**). The option of withdrawal of "smart meters" installed (**Quebec, Canada, 2015**) ...
- The European Parliament (2009) expressed high concern "about the fact that insurance companies are tending to exclude coverage for the risks associated with EMFs from the scope of liability insurance policies". In **7 January 2015**, the EESC Section TEN requested a normative modification that prevents it. **Will the European Commission take on the risks that are not assumed by insurance companies?**
- **The set of measures took by the Commission not in line with the Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information:** The impact assessment of the WiFi4EU project does not include the additional environmental impact of these artificial EMFs, particularly in schools and hospitals.

4.- These measures violate International Conventions signed by the European Union: the Universal Declaration of Human Rights (1948), the Convention on the Rights of Persons with Disabilities (2006), the Charter of Fundamental Rights of the EU of 2000 (2000), and the Aarhus Convention of 1998 (binding since 2005) on access to information, public participation in decision-making and access to justice in environmental matters.

- In items 1.4, 3.3 and 8.1 of the **Opinion on Electromagnetic hypersensitivity** (7 January 2015), the EESC's Section TEN showed the **violation of the fundamental rights of EHS people**, which are subject to a false dichotomy between these rights and the right of free communication. Furthermore, set of measures does **not include the EMF environmental impact assessment of the EMF exposure**, with special relevance in sensitive areas such as schools and hospitals, **nor the appropriate participatory channels** in its deployment, guaranteed in the Aarhus Convention.

5.- The objectives of this package of measures that increase the exponential rise of radiofrequencies exposure, go beyond 2025, without even contemplating some plan whatsoever to switch older and maybe obsolete frequencies, such as GSM or UMTS.

- The European Electronic Communications Code provides licenses for a minimum of 25 years, leaving the defense of health and the environment at the mercy of the telecommunications lobbies, which compromises the independence and the democratic quality of the European institutions.

6.- For the above reasons, the Connecting Europe Facility must comply with the precautionary principle of TFEU through technologies and techniques biocompatible and sustainable from the point of view of environmental and human health, starting with the implementation of a

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European network of coaxial / optical fiber cable, in line with the European and pan-European parliamentary resolutions and EU consultative bodies:






- The [PACE Resolution 1815](#) recommends “take all reasonable measures to reduce exposure to electromagnetic fields”, promoting “technologies which are just as efficient but whose effects are less negative on the environment and health” -or that do not have them- (8.1.5) and promoting a wired Internet connection in schools (8.3.2).
- The point 3 of the [European Parliament resolution](#) of 2 April 2009 on health concerns associated with electromagnetic fields (2008/2211(INI)), underlines that in addition to reducing EMF exposure limits, “the Commission, working in coordination with experts from Member States and the industries concerned (electricity companies, telephone operators and manufacturers of electrical appliances including mobile phones), should draw up a guide to available technology options serving to reduce exposure to EMFs”. Furthermore, the point 4.3 of the CESE's Opinion [[COM\(2011\) 348 final – 2011/0152 \(COD\)](#)] recommends reducing the environmental exposure to EMFs, “introducing the best available technologies at economically acceptable costs”.

"There are many examples of the failure to use the precautionary principle in the past, which have resulted in serious and often irreversible damage to health and environments. Appropriate, precautionary and proportionate actions taken now to avoid plausible and potentially serious threats to health from EMF are likely to be seen as prudent and wise from future perspectives. We must remember that precaution is one of the principles of EU environmental policy". Professor Jacqueline McGlade, Executive Director of the European Environment Agency 2003-2013 ([EEA 2007](#)).

Minerva Palomar Martínez, as President of Electro y Químico Sensibles por el Derecho a la Salud (EHS & MCS people for the right to health) (electrosensiblesderechosalud@gmail.com) and PECCEM Coordinator, and on behalf of the **European Coordination of organizations for an EMF exposure regulation, which truly protects public health** (euro.coord.for.emf.regulation@gmail.com).

* The **European Coordination of organizations for an EMF exposure regulation, which truly protects public health**, is driving the [European Manifesto in Support the ECI in favour of the precautionary regulation of the EMF exposure](#). Amongst the [signatories to this European Manifesto](#) there are scientists, researchers and experts, as well as professional bodies and associations and representatives of civil society organizations (from health advocates, consumers, neighbours, environmentalists, ecologists, labour union, parents of students, people with central sensitization syndromes -electro-hypersensitivity, multiple chemical sensitivity, chronic fatigue syndrome, fibromyalgia, etc.-, brain tumour patients, concerned citizens and activists associations working in the field of electromagnetic pollution), coming from 26 countries (Australia, Austria, Belgium, Brazil, Canada, Denmark, Finland, France, Germany, India, Ireland, Italy, Macedonia, Netherlands, Panama, Poland, Portugal, UK, Russia, South Africa, Slovakia, Spain, Sweden, Switzerland and USA)..

The founding organizations of European coordination of organizations for an EMF exposure regulation which truly protects public health * (euro.coord.for.emf.regulation@gmail.com).

	Associazione per le Malattie da Intossicazione Cronica e/o Ambientale AMICA (Association for Environmental and Chronic Toxic Injury) – Italy	
	http://www.infoamica.it/	amica@infoamica.it
	Associazione Italiana Elettrosensibiliti (Italian "Electrosensitivity" association) – Italy	
	http://www.elettrosensibili.it/	presidente@elettrosensibili.it
	Beperk de Straling (Limit Radiation) - Belgium	
	http://www.beperkdestraling.org/	Beperk.de.straling@gmail.com
	Coordination Nationale des Collectifs contre les antennes relais (National Coordination of Collectives against the masts) - France	
	http://coordinationnationalestopantennes.blogspot.com.es/	stopantennesmalefrics@hotmail.fr
	Diagnose: Funk (Diagnose: wirelees) - Germany	
	https://www.diagnose-funk.org/	kontakt@diagnose-funk.de

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	EQSDS. Electro y Químico sensibles por el Derecho a la Salud (EHS & MCS people for the right to health) – Spain	
	http://electrosensiblesderechosalud.org/	electrosensiblesderechosalud@gmail.com
	Electrosensitivity in Ireland – Ireland	
	https://iervn.com/contact-us-2/	https://iervn.com/contact-us-2/
	EM-Radiation Research Trust – United Kingdom	
	http://www.radiationresearch.org/	eileen@radiationresearch.org
	Fundacja Instytut Badań Elektromagnetycznych im. Jamesa Clerka Maxwella (Foundation Research Institute of Electromagnetic Jamesa Clerka Maxwella) – Poland	
	http://www.ibe.org.pl/	ibe@ibe.org.pl
	Movimento para a Prevenção da Poluição Electromagnética (Movement for the Prevention of Electromagnetic Pollution) – Portugal	
	https://www.facebook.com/moppe2016/	paulojvval@gmail.com
	PECCEM. Plataforma Estatal Contra la Contaminación Electromagnética (State Platform of Organizations Against Electromagnetic Pollution) – Spain **	
	http://www.peccem.org/	coordinacion@peccem.org
	Association Nationale Robin des Toits (National Association Robin Roofs) - France	
	http://www.robindestoits.org/	contact@robindestoits.org
	SOS EHS-EASC (Electrohypersensitivity - Environmental Diseases of Central Sensitization) – Spain	
	http://s0s.snappages.com/	sos.ehs.easc@gmail.com
	Stichting Elektrohypersensitiviteit (Electrohypersensitivity Foundation) – Netherlands	
	https://www.stichtingehs.nl/	https://www.stichtingehs.nl/stuur-een-mail
	Stralskyddsstiftelsen (Swedish Radiation Protection Foundation) – Sweden	
	http://www.stralskyddsstiftelsen.se/	info@stralskyddsstiftelsen.se
	Verein Für Elektrosensible Und Mobilfunkgeschädigte E.V. (Association for the <i>electrosensitive</i> and mobile injured) – Germany	
	http://www.elektrosensibel-muenchen.de/	kontakt@elektrosensibel-muenchen.de

** The **Spanish State Platform Against Electromagnetic Pollution (PECCEM)** is made up of Confederations, federations and associations involving diverse sectors of civil society: neighborhoods (such as CEAV, FRAVM, CAVA, ...), environmentalists and ecologists (such as more than 300 groups that make up the Confederation of Ecologists in Action or organizations of strong local implementation as the APDR), consumers (such as FACUA Castile and Leon), parents of students, people with central sensitization syndromes (such as EQSDS and SOS EHS-EASC), and for the protection of public health from electromagnetic pollution (such as the AVAATE pioneer association)

ANNEX I

ENVIRONMENTAL EFFECTS OF EMF EXPOSURES

“Numerous recent scientific publications have shown that EMF affects living organisms at levels well below most international and national guidelines. Effects include increased cancer risk, cellular stress, increase in harmful free radicals, genetic damages, structural and functional changes of the reproductive system, learning and memory deficits, neurological disorders, and negative impacts on general well-being in humans. Damage goes well beyond the human race, as there is growing evidence of harmful effects to both plant and animal life.” International Electromagnetic Field Scientist Appeal to United Nations and World Health Organization (May, 2015).

ADVERSE HEALTH CONDITIONS LINKED WITH EMR

An increasing number of studies indicate adverse health effects as a result of environmental exposure to electromagnetic pollution. There is substantial evidence indicating that even low intensity EMF exposures can cause ill health. Conditions linked with environmental EMF exposures include:

Cancer (Coureau et al. 2014, Moon et al. 2014, Hardell & Carlberg 2013); **Alzheimer's disease** (Davanipour & Sobel 2009, Huss et al. 2009); **Childhood & adult leukaemia** (Dolk et al. 1997, Hocking 1996); **Autism** (Herbert & Sage 2012, Kane 2004); **Immune system effects** (Boscolo et al. 2001, Novoselova et al. 1999); **Miscarriage** (Li et al. 2002); **Infertility** (Avenida o et al. 2010, Otitoloju et al. 2010, Aitken & De Lullis 2007); **DNA damage** (De Lullis et al. 2009, REFLEX 2004); **Oxidative stress** (Kumar et al. 2012, Agarwal et al. 2009, Ilhan et al. 2004).

We suggest the cost to the European economy of electromagnetic pollution runs into many billions of euros in terms of reduced health, wellbeing and productivity, and would be greatly exacerbated by the proposed wireless rollout.

CANCER: Radio frequency exposure at levels that can be experienced environmentally can cause DNA damage, which can be a precursor of cancer (De Lullis et al. 2009, Adlkofer 2004). Cancer rates for females living adjacent base stations 4.15 times greater than those at lower exposures ($p < 0.0001$) (Wolf & Wolf 2004).

After 5 years, the risk of malignant tumours in individuals exposed to raised radio frequency exposures from base stations was 3 times higher than those with lower exposures (Eger et al. 2004). In 2009 cancer cost the EU €126 billion (Luengo-Fernandez et al. 2013).

CHILDHOOD LEUKAEMIA: Association noted between increased incidences of this and mortality at exposures of $8 \mu\text{W}/\text{cm}^2$ (Hocking et al. 1996).

It is important to note that radio waves are already classified as 'Group 2B Possible Carcinogens' (WHO/IARC 2011) based on increased rates of the fatal brain tumour, glioma, linked with increased radiofrequency radiation exposure. Some experts are calling for an upgrade to Group 2A 'Probably carcinogenic to humans', or even to Group 1 'Carcinogenic to humans' (Hardell & Carlberg 2015, 2013). The partial report from the US National Toxicology Program (NTP 2016, 2016a) is already creating pressure for a classification upgrade. The full report, to be published next year, will further corroborate this concerning finding with evidence of DNA damage.

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SLEEP QUALITY: The annual cost of chronic sleep deprivation in the UK alone has been estimated at £1.6 billion (Bupa 2010). Many studies indicate that individuals sleep better in environments with very low EMF levels compared to those with even slightly raised EMF levels. As examples: Improved sleep has been noted in low-field environments with exposures of 0.05-0.22 V/m (0.0006-0.0128 $\mu\text{W}/\text{cm}^2$) compared to 0.25-1.29 V/m (0.0165- 0.4400 $\mu\text{W}/\text{cm}^2$) (Oberfeld et al. 2004) and for 0.7 V/m exposures compared to 1.17 V/m exposures (Eger & Jahn 2010).

Additionally, a dose-response relationship has been shown between sleep-related fatigue and injuries (Swaen et al. 2003); and almost 20% of all serious car crash injuries are associated with driver sleepiness (Connor et al. 2002).

DEPRESSION: Suicide is the leading cause of death in England and Wales for men between 20-49 years old, and one of the main causes of death among 5-19 year olds (ONS Digital 2015). Depression is a gigantic public health burden that exceeds other common sources of morbidity and mortality. [In England in 2000, the annual cost of depression was estimated to be £9 billion (Thomas & Morris 2003)]. Individuals with depression are at heightened risk of: Alzheimer's disease; Cancer; Diabetes (type 2); Epilepsy; Obesity; and Stroke (BC's Physicians 2009).

Oberfeld et al. (2004) noted depressive tendency with 900/1800 MHz exposures of 0.25- 1.29 V/m (0.0165-0.4400 $\mu\text{W}/\text{cm}^2$) compared to 0.05-0.22 V/m (0.0006-0.0128 $\mu\text{W}/\text{cm}^2$) ($p = 0.0016$). Others have made similar findings (Eger & Jahn 2010, Bortkiewicz et al. 2004, Santini et al. 2002). [Many wireless smart meters create RF EMF exposure levels above those associated with increased depressive tendency].

EFFECTS OF EMR ON BIOIVERSITY

Unfortunately, Nature too can be adversely affected by electromagnetic pollution. As examples:

Ants: Ants perform many vital services including: pollination, predation and seed removal and dispersion. Exposures of 0.0795 $\mu\text{W}/\text{cm}^2$ significantly inhibited memories and association between food sites and visual and olfactory cues. The overall state in exposed colonies appeared similar to bee colony collapse disorder (CCD) (Cammaerts et al. 2012). [Effects of on pollinators, such as bees, have also been reported (Rahmani et al. 2011)].

Birds: "... *migratory birds are unable to use their magnetic compass in the presence of urban electromagnetic noise,*" Engels et al. (2014). The RF levels assessed [0.001 μT , approximately equal to 0.3 V/m or 0.0236 $\mu\text{W}/\text{cm}^2$] are similar to the levels found in the 2 kHz to 5 MHz frequency range in urban environments as a result of electromagnetic pollution.

Mice: Mice and rats can act as pollinators and form an important part in Nature's food chain (Pattimore & Wilcove 2012). Exposure to 80-900 MHz radiation at 1.053 $\mu\text{W}/\text{cm}^2$ could cause irreversible infertility in mice after 3 generations, and levels of 0.168 $\mu\text{W}/\text{cm}^2$ caused total infertility after 5 generations (Magras & Zenos 1997). As mentioned earlier, research has additionally shown that EMFs can reduce human fertility (Avenda o et al. 2012, Falzone et al. 2011, Santini et al. 2002).

Low EMF initiatives that promote the use of the most biologically friendly types of technology, and create more biologically friendly exposures than standard wireless systems, are urgently required to help protect the environment and create more viable and sustainable Internet provision.

HIGH CAPACITY NETWORKS - MILLIMETRE WAVE WI-FI

Millimetre waves and biological effects

It has been known for well over a hundred years that millimetre waves can be biologically active (Bose 1906). Though beneficial effects can result from short-term millimetre wave treatments (MMWT) (Table 1), side effects can also arise. The effects of long-term chronic exposures have yet to be assessed.

Table 1: Biological effects reported from mm wave exposures

Power Density [$\mu\text{W}/\text{cm}^2$]	Frequency range	Exposure type	Effects noted	Author
0.000,000,000,1 to 0.0001	30-60 GHz	5-15 minutes exposure	Stimulated growth of pine seed microflora.	Ratushnyak et al. (2008)
0.000,000,01	54-76 GHz	5 minutes per day for 5 days on mice previously exposed to ionizing radiation	Normalizing effect on growth of damaged cells.	Bundyuk et al. (1994)
0.07	53.37-78.33 GHz	1-hour exposure every 2 days. 5 treatments given to human breast cancer cells in culture.	Cell number approximately 60% less in irradiated group of cells than in sham-exposed control.	Beneduci et al. (2005)
0.1	41.303 GHz	10-minute irradiation.	Maximum effect on <i>E. coli</i> cells' genome conformational state.	Alipov et al. (1993)
≥ 0.3	60 GHz	1-minute exposure [3 current cycles - 5 second exposures every 20 seconds].	Changes in firing rate of neurons.	Siegel & Pikov (2010)
1 – 3	54-78 GHz	4-6 treatment sessions, each of 10-20 minutes duration.	Complete relief of headaches in 122 out of 177 patients with pre-stroke forms of cerebrovascular pathology ¹	Kuz'menko (1998)
10	42.2GHz	Mice received 30-minute whole body exposure daily for 15 days.	Tumor growth inhibited by 33.5% compared to controls.	Kalantaryan et al. (2016)

Side effects from short-term MMWT exposure

¹ 65% of patients receiving this treatment remained in remission for around 1 year, versus 20% in control group receiving standard medication

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Mild side effects have been reported as a result of short-term mm wave exposures.

Paresthesias

In a number of patients minor short-term paresthesias [a sensation of burning, numbness, prickling or tingling that most often occurs in the body's extremities] has been reported as a result of exposure, as have feelings of fatigue and sleepiness (Usichenko et al. 2006, Radzievsky et al. 1999).

It is suggested by the author that such side effects may be likely to arise in members of the general population as a result of chronic long-term environmental exposures.

Altered neuronal activity

Tests have indicated that neuronal activity in the brain can be affected by very low intensity short-term exposures to mm waves (Siegel & Pikov 2010).

Cancer

In research by Bellossi et al. (2000), DBA/2 mice were irradiated with 60 GHz waves for 30 minutes a day, for 5 consecutive days a week at 500 $\mu\text{W}/\text{cm}^2$. While mice with lymphocytic leukemia cells showed increased survival (for 2 series out of 4), mice with Lewis tumor cells exhibited accelerated tumor growth. The exposure level was half that permitted by both ICNIRP (1998) and the FCC (1996) in basic restrictions for members of the general public.

Radio waves are already classified as 'Group 2B Possible Carcinogens' (WHO/IARC 2011), with some experts now calling for them to be upgraded to Group 2A 'Probably carcinogenic to humans', or even to Group 1 'Carcinogenic to humans' (Hardell & Carlberg 2015, 2013). The recent NTP (2016) findings could be particularly instrumental in causing such an upgrade.

EUROPE IS OBLIGED TO RESPECT BASIC HUMAN RIGHTS WHEN SEEKING TO PROMOTE INTERNET CONNECTIVITY

European Convention on Human Rights: Convention for the Protection of Human Rights and Fundamental Freedoms

It is estimated that between 3% to 5% of Europeans (around 22.3 million to 37.1 million individuals) may presently be affected by EHS. [This number is growing](#) (Jamieson 2014, Mallery-Blythe 2014a).

The proposed widespread proliferation of wireless Internet throughout Europe that the European Commission is proposing would cause profound harm to many individuals and the environment.

ARTICLE 1: Obligation to respect Human Rights

“The High Contracting Parties shall secure to everyone within their jurisdiction the rights and freedoms defined in Section I of this Convention.”

It should be additionally noted that in Article 1 of the Charter of Fundamental Rights of the European Union (The European Parliament, the Council and the Commission 2010) it is declared that *“Human dignity is inviolable. It must be respected and protected.”*

Similar is stated in the Universal Declaration of Human Rights *“The Declaration is based on the “inherent dignity” of all people and affirms the equal rights of all men and women, in addition to their right to freedom. The Declaration gives human rights precedence over the power of the state.*

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While states are permitted to regulate rights, they are prohibited from violating them,” UNAC (2012, 2012a).

SECTION I: RIGHTS AND FREEDOMS

ARTICLE 2: Right to life

1. “Everyone’s right to life shall be protected by law. No one shall be deprived of his life intentionally save in the execution of a sentence of a court following his conviction of a crime for which this penalty is provided by law.”

Expectant and New Mothers: It is recognised in The International Covenant on Economic, Social and Cultural Rights (OHCHR 1976) that *“Special protection should be accorded to mothers during a reasonable period before and after childbirth.”*

Exposures of mothers to be and new mothers to EMFs *“has raised public health concerns because of the possible effects (cancer, neurological effects, developmental disability effects, etc.) from the long-term exposure to low-intensity, environmental level fields in daily life,”* (Bellieni & Pinto 2012).

Protection of Embryos/Foetuses: All EU States agree that the human embryo/foetus belongs to the human race (Hoffman & Rowe 2010). The potential of that being obliges it to be protected in the name of human dignity, even when it is not legally ruled as a person with right to life (Mowbray 2012). It can still have interests capable of protection under law (Deazley & Smith 2013).

Protection for Children: The need for special protection being accorded to children is recognised in human rights legislation. As examples, it is mentioned in The UN Convention on the Rights of the Child (United Nations 1989) and the Declaration of the Rights of the Child (UN1990) that *“the child, by reason of his physical and mental immaturity, needs special safeguards and care, including appropriate legal protection, before as well as after birth.”* Refer also to Mallery-Blythe (2014) for a detailed discussion on risks to children of EMF exposure [<https://www.youtube.com/watch?v=sNFdZVeXw7M>]

As noted by Hoffman & Rowe (2010), when authorities are aware (or should be aware) of real risk to life they are under obligation to take appropriate mitigative action to protect those at risk.

The present proposals by the European Commission (2016) completely ignore warnings and best practice advice related to electromagnetic fields given by the Parliamentary Assembly of the Council of Europe (PACE) documenting 'The potential dangers of electromagnetic fields and their effect on the environment' (Parliamentary Assembly 2011), the European Parliament (2008) and the European Environmental Agency (EEA 2007).

ARTICLE 3: Prohibition of torture

“No one shall be subjected to torture or to inhuman or degrading treatment or punishment.”

The term 'Degrading treatment' can be defined as *“... such as to arouse ... feelings of fear, anguish and inferiority, capable of humiliating and debasing... and possibly breaking... physical or moral resistance,”* (Conseil de l’Europe / Council of Europe 1978).

The above appears very similar to descriptions provided by some electromagnetically hypersensitive (EHS) individuals (EMFSN 2016), describing how their condition makes them feel when exposed to EMFs.

Article 3 embodies a fundamental human right. *“... the right to freedom from bodily harm is second only to the right to life, and is equally based on the right which all people have a level of basic respect*

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and dignity as human beings,” (Hoffman & Rowe 2010). The physical symptoms experienced by some of those with EHS, and some non-EHS individuals adversely affected by EMFs, are a form of torture.

ARTICLE 5: Right to liberty and security

1. *“Everyone has the right to liberty and security of person. ... “*

Right to Liberty: The liberty of EHS to go where they wish is compromised by electromagnetic pollution. The rights of such individuals may be violated if emissions prevent them from being able to go where they wish (even within their own homes and gardens) unhindered by exposures to electromagnetic field regimes perceived as detrimental to their wellbeing.

“EHS has been described by patients as a 'loner's disease'. Due to the prevalence of ubiquitous EMR in the contemporary urban environment, EHS causes patients to experience extreme social isolation. The serious symptoms confine them to their home. Venturing out to shopping malls, libraries, theatres, hospitals, and doctors' offices is often precarious because of the prevalence of wireless routers, cell phones, antennas, and other sources of EMR. Furthermore many ... are often no longer able to spend time in the homes of family members due to EMR issues. As a result, huge stresses are placed on marriages and families ...” (Genuis & Lipp 2012).

Please note that many of the areas mentioned in the above quote are areas that the current European Commission (2016) proposal recklessly seeks to install wireless Internet into. It appears highly likely that individuals who consider that they are deprived of their liberty to go where they wish, when they wish, may eventually seek legal recourse.

Prohibiting individuals from enjoying proper liberty within society is dangerous, demeaning, degrading and a gross breach of human rights.

Right to Security: 'Security of person' can be legally defined as *“The legal and uninterrupted enjoyment by a man of his life, his body, his health and his reputation.”*

Claims may be brought by some that their enjoyment of life, body, health and reputation may be seriously affected as a result of the increased electromagnetic radiation exposure they would receive.

Claims might additionally be brought that some individuals may have their reputations damaged as a result of how they are forced to behave as a result of exposures, or potential exposures. Claims could also be brought that they find that having to behave in this way is degrading and damaging to their security of person.

Security of health impacts both wellbeing and productivity. The health of a growing number of individuals is being adversely affected by electromagnetic pollution.

ARTICLE 8: Right to respect for private and family life

1. *“Everyone has the right to respect for his private and family life, his home and his correspondence.”*

“Respect for home and home life means more than just providing some form of dwelling or shelter: it extends to maintaining the situation to which a person has become accustomed, and the very permanence of which gives comfort,” Hoffman & Rowe (2010).

The quality of home life and enjoyment of inhabiting a dwelling may be *“spoilt by various forms of interference, such as noise, light, smells, fumes or other forms of pollution [including the present*

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author suggests electromagnetic pollution], and anyone who has experienced this might well refer to it as an invasion of their privacy,” Hoffman & Rowe (2010).

In *Guerra and others v. Italy* (Conseil de l'Europe/Council of Europe 1998), it was ruled that environmental pollution can cause a violation of human rights. In that instance, the European Court found the state guilty of failing to take „positive steps“ to provide vital information and that the quality of life of individuals, and that of their home and private lives had suffered as a result of their human rights being breached on this issue.

In the case of *López Ostra v Spain* (Conseil de l'Europe/Council of Europe 1994), the European Court declared: *“environmental pollution may affect individuals“ well-being and prevent them from enjoying their homes in such a way as to affect their private and family life adversely, without ... seriously endangering their health.”*

The right for people to be able to enjoy their property in the manner to which they have become accustomed can become severely compromised by electromagnetic pollution. It is already indicated that EMF emissions can prevent some individuals using parts of their homes and gardens, and can even cause them to move home in order to avoid/reduce adverse health effects (EMFSN 2016, Gregory 2011, Havas 2011). There is a need for low EMF environments to be retained whenever possible.

ARTICLE 12: Right to marry

“Men and women of marriageable age have the right to marry and to found a family [emphasis by current author], according to the national laws governing the exercise of this right.” [Refer back to section covering the effects of electromagnetic radiation on fertility].

As scientific research indicates environmental exposures to EMFs can reduce human fertility and increase risk of miscarriage (Bellieni & Pinto 2012), there is a risk that those promoting the proliferation of wireless devices may be found negligent if the resultant increase in electromagnetic pollution compromises the ability of individuals to found families.

ARTICLE 14: Prohibition of discrimination

“The enjoyment of the rights and freedoms set forth in this Convention shall be secured without discrimination on any ground ...”

Individuals with EHS are discriminated against with regards to jobs, place of residence and public access to most areas of life. They are not just restricted from access to desirable things, such as leisure and entertainment, but also essentials such as groceries, health care and even petrol.

The present proposal by the European Commission (2016) to *“... offer free local wireless connectivity in the centres of local public life ...”* appears inadvertently discriminatory. All the areas that it suggests should have Internet access should also provide low EMF zones / White Zones as standard.

Claims might be brought that those who ignore the special needs of individuals who are, or believe they are, vulnerable to EMF radiation may be guilty of discrimination and wilful blindness. Claims might also be brought that those who deliberately ignore and dismiss relevant scientific evidence of potential risks, whether through wilful blindness or recklessness, may be guilty of inciting others to unwittingly discriminate against such individuals (Jamieson 2014a).

The use of the Precautionary Principle, as advocated by Professor Jacqueline McGlade, when Executive Director of the European Environment Agency, helps address this serious issue (EEA 2007).

ARTICLE 17: Prohibition of abuse of rights

“Nothing in this Convention may be interpreted as implying for any State, group or person any right to engage in any activity or perform any act aimed at the destruction of any of the rights and freedoms set forth herein or at their limitation to a greater extent than is provided for in the Convention.”

The rights and freedoms of EHS, and others adversely affected by EMFs, must be actively protected when seeking to enhance Internet connectivity within communities. Doing so will help protect, health, wellbeing and the economic prosperity of Europe.

Protocol

to the Convention for the Protection of Human Rights and Fundamental Freedoms

ARTICLE 1: Protection of property

“Every natural or legal person is entitled to the peaceful enjoyment of his possessions. No one shall be deprived of his possessions except in the public interest and subject to the conditions provided for by law and by the general principles of international law,” HRA (1998).

Many EHS individuals are forced to move home as a result of adverse health effects from electromagnetic pollution experienced in their property. The term „property“ can be legally defined as including real estate, land, growing plants and animals.

Evidence indicates that, in addition to potentially harming humans, EMFs at levels considerably below those permitted in ICNIRP guidelines, which can be created by wireless systems, appear capable of causing damage to plants and animals.

ARTICLE 2: Right to education

As the right to education of children who are EHS can be potentially compromised by electromagnetic pollution in schools, it is suggested that wired, instead of wireless, connections be used as a matter of best practice to enable connectivity.

Protocol No. 4

to the Convention for the Protection of Human Rights and Fundamental Freedoms securing certain rights and freedoms other than those already included in the Convention and in the First Protocol thereto

ARTICLE 2: Freedom of movement

1. *“Everyone lawfully within the territory of a State shall, within that territory, have the right to liberty of movement and freedom to choose his residence.”...*

This freedom is already being compromised for those who are EHS as a result of electromagnetic pollution.

The Commission's strategic aim to have “... sites at which public services are provided, such as public administrations, libraries and hospitals to be equipped with Gigabit internet connections ... [and connect] these and other centres of community life, including outdoor spaces accessible to the general public ...” would breach Article 2 if standard wireless technologies were used.

The provision of hard-wired alternatives helps address this challenge. LiFi may also provide a suitable solution if it is properly developed.

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There is a need for low EMF / White Zones in such areas as discussed above to help protect such individuals and allow them freedom of movement and access to general services and amenities. The same holds true for the workplace.

Increased saturation of the environment with electromagnetic pollution would further restrict the freedom of movement of EHS individuals. Refer also to earlier comments related to “Article 14: Prohibition of discrimination”.

Protocol No. 12

to the Convention for the Protection of Human Rights and Fundamental Freedoms

ARTICLE 1: General prohibition of discrimination

1. ***“The enjoyment of any right set forth by law shall be secured without discrimination on any ground”***
2. ***“No one shall be discriminated against by any public authority on any ground such as those mentioned in paragraph 1.”***

Social inclusion is one of the major goals of sustainable development. It is also one of the main declared objectives of the European Union (Atkinson 2009).

The best way to ensure Human Rights are adhered to and that those with EHS are not discriminated against is to adopt more protective EMF guidelines, specify safer technologies for Internet connection, and encourage the creation of Low EMF / White Zones in rural and urban areas by encouraging, for example, the use of hard-wired cabling.

RISK AND QUESTIONABLE RETURNS FOR INVESTORS

The 'Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulations (EU) No 1316/2013 and (EU) No 283/2014 as regards the promotion of Internet connectivity in local communities' document states that: ***“... many public authorities and private respondents supported the deployment of Wi-Fi networks in public premises, while seeking an appropriate regulatory environment for issues like access provider liability and exposure to electromagnetic fields (EMF).”*** (European Commission 2016).

The EC (2016) 'Full synopsis report of the public consultation on the evaluation and review of the regulatory framework for electronic communications' briefly touched on this issue as well noting that ***“... many public authorities and private respondents supported the deployment of commercial/municipal Wi-Fi networks in public premises, while seeking appropriate regulatory safeguards for a.o. liability or exposure to EMF.”***

Many individuals do not wish blanket wireless coverage

Ofcom's Communications Market Report 2016 indicates that approximately a third of adult UK Internet users (around 15 million individuals) have undertaken a „digital detox“ ***“in a bid to strike a healthier balance between technology and life beyond the screen.”*** It also suggests approximately 1 in 10 adults (11%) may undertake such a 'digital detox' every week. Of all those taking such measures, 25% spent ≤1 day without the Internet; 20% avoided it for ≤1 week; and 5% went web-free for ≤1 a month. It is likely that similar figures will be found elsewhere in Europe.

The report mentions that 30% of respondents had undertaken a holiday „digital detox“. 16% had deliberately gone on vacation to a place without Internet access; 13% deliberately went on holiday

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minus their mobile phone; and 9% who had chosen an area where there was neither mobile phone nor Internet access (Ofcom 2016).

Such findings add yet further weight to the already substantial benefits of creating low EMF zones / White Zones within buildings and external environments.

The creation of such spaces will also help address the needs of the growing percentage of the population who are becoming electromagnetically hypersensitive (Jamieson 2016a) and reduce the risks of potential claims from those exposed to electromagnetic pollution.

Many insurers are excluding risks associated with electromagnetic radiation

As examples:

“... insurers over the past 10 years increasingly have been excluding coverage under both general liability and umbrella policies. Others are neither excluding nor making affirmative statements about the risk” (White Geisel 2007).

“Risk is so fundamental ... that there are some risks that we simply will not insure against. These include ... electromagnetic fields and electromagnetic radiation ...” (AVIVA 2012).

“We will not pay anything under this policy, ... in respect of ... Electromagnetic fields any liability of whatsoever nature directly or indirectly caused by, in connection with or contributed to by or arising from electromagnetic fields (EMF) ...” (Zurich Insurance Group 2014).

THE TELECOMMUNICATIONS INDUSTRY IS ALSO AWARE OF RISKS

As examples:

“The influence of electrosmog on the human body is a known problem. ... The risk of damage to health through electrosmog has also become better understood as a result of more recent and improved studies. When for example, human blood cells are irradiated with electromagnetic fields, clear damage to hereditary material has been demonstrated and there have been indications of an increased cancer risk. ...” Swisscom AG - major Swiss telecommunications provider (Swisscom AG 2003).

“Unfavorable litigation or governmental investigation results could require us to pay significant amounts or lead to onerous operating procedures,” (AT&T 2014).

“... any perceived risk of adverse health effects of wireless communication devices could materially adversely affect the Company...” (BlackBerry Limited 2014).

LEGAL RULINGS RELATED TO EMF EXPOSURE

2011: The Labour Court in Madrid declared that hypersensitivity, caused in part by microwave exposure, can cause permanent disability. Its ruling set a precedent for future conditions related to EHS. [The verdict awarded the college professor, who has been permanently incapacitated, a permanent disability pension at 100% of his base salary rate (WEEP News 2011)].

2012: The Italian Supreme Court affirmed a casual link between a businessman’s heavy mobile phone use & his brain tumour (Alleyne 2012, Microwave News 2012).

2013: The Australian government ordered to pay claims for damaging the health of an employee with EMF sensitivity (Administrative Appeals Tribunal of Australia 2013, GSMA 2013).

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2013: An Israeli cell phone company compensates a customer who contracted cancer (Leibovich 2013, Raz & ZivIsraeli 2013).

2014: The Federal Administrative Court (Bundesverwaltungsgericht) finally recognized as an occupational disease, the EHS of a German soldier who was hired as a radar mechanic in the German army, because of their exposure to radio frequencies on the workplace (Bundesverwaltungsgericht Beschluss 2014)

2014: The French Departmental Home for Disabled Persons (MDPH) in Essonne has provided financial assistance to a person electro (a first in France) to arrange his home and personal protection (Mag de l'Esonne 2014)

2015: A judgment of the Toulouse inability Dispute Tribunal recognize disability due to "hyper sensitivity to electromagnetic waves Syndrome" (first time in France), emphasizing that "the description of the clinical signs is irrefutable" (Legalis.net 2015)

2016: The judgment Nº 588/2016 of the High Court of Madrid has recognized for the first time a situation of total permanent disability for the exercise of the profession of a telecommunications engineer as result of "electrosensitivity syndrome (EHS)". For the first time in Spain, this EHS condition is considered as the main cause of disability involved. (Lefebvre – El Derecho S.A. 2016)

CONCLUSION

It is proposed that great caution is warranted with regard to the proposed widespread rollout of wireless technologies within Europe to meet perceived Internet connectivity requirements and that more environmentally friendly, biologically tested, alternatives are required.

"There are many examples of the failure to use the precautionary principle ..., which have resulted in serious and often irreversible damage to health and environments. Appropriate, ... actions taken now to avoid plausible and potentially serious threats to health from EMF are likely to be seen as prudent and wise ...," Professor Jacqueline McGlade, Executive Director of the European Environment Agency (2003-2013) (EEA 2007).

It is already known that electromagnetic fields can be biologically active. Proper assessment of the potential health and environmental consequences of their widespread use is urgently required. An unchecked proliferation of wireless technologies could create catastrophic results, and is highly unwise particularly given that safer alternatives are already available to provide such services. A far more sophisticated approach than that presently proposed in the European Commission's current proposal is required to create real lasting benefit for Europe in the 'Bioelectromagnetic Age'.

Widespread proliferation of wireless technologies as proposed by the European Commission (2016) could lead to unprecedented public health and environmental disasters. A major rethink is necessary.

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