

Electrosmog impact on environment and climate

Lindsjö, J.

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Abstract

This report focuses on electromagnetic pollution from common wireless communication ("factor W"), rather than lasers and similar. The report covers both atmosphere and biosphere to look at the broad spectrum of potential impact.

Factor W has a potential impact on everything from tiny organisms to climate systems - indirectly and directly - via stimulation of water molecules and electrons (atmosphere) as well as altering molecules or disturbing signals in organisms (trees, insects, humans). Another effect is heating, but due to lack of specific data it is hard to quantify the amount of factor W-heating.

The abundance of scientific evidence is of great importance given the increase of both electromagnetic pollution and impact on nature: Humanity as a whole must embrace this and make proper adaptations.

Terminology (in order of appearance)

Eem = energy and electromagnetism

Electrosmog = electromagnetic pollution

MHz = Megahertz = 1 million electromagnetic waves/oscillations/cycles per second (see 1.2)

Wi-Fi = Wireless Fidelity/Local network (a method of sending digital info on an electromagnetic wave)

RF(H) = Radio frequency (heating)

5G = Fifth generation telecommunication

Factor W = Electrosmog from manmade wireless communication (focus 3 MHz - 6 GHz)

HPA = High Power Antennas

AM / FM (radio) = Amplitude / Frequency Modulation (different broadcasting techniques)

ELF/EHF = Extremely low frequencies 3-30 Hz / Extremely high frequencies 30-300 GHz

EEP-NOx process = Electron precipitation creating nitrogen oxide in the stratosphere below.

Dielectric heating (in this context) = Heating a dipolar material by rotating its molecules

Aerosols = Microscopic airborne matter / atmospheric particles (natural or polluting)

Mediator = Carrier, facilitator, enabler, conveyer, conductor ... helping along

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Introduction

The purpose of this report is to show relationships and lift factors that are rarely considered in this context, and the goal is to improve environmental work. I often focus on cutting edge topics, and from education and various working experience over 15 years, this topic is urgent.

Electromagnetic pollution is generally not considered to be an environmental issue, thereby not considered as a factor in environmental work. Related research has a major focus on impact on human health, but the focus on environment is growing fast. The least considered regarding impact of nature is climate, which is extra interesting these days – and extra challenging since climate is a diffuse and complex macro level system (unlike organisms). To look for correlations between Wi-Fi and climate in this report is not only rare and interesting – it is also very relevant since it may contribute to better understanding and actions, which in turn can lead to accelerated conversion in to sustainable societies.

1) Basic function of our physical world

Important note to start with: Everything in our physical universe is moving/changing, temporarily or permanently, and the human understanding of it is limited. What we call “truth” is a social construction that changes a lot more often than the basic truth of how nature actually works (hundreds of years ago the human consensus was that the Earth was centre of the universe). Human truth is the consensus on a platform of science, and some of it is found below.

The past billions years have develop the comfortable living conditions we enjoy today:

Abundance of energy from the sun and an atmosphere to balance radiation and heat, giving us a moderate climate that supports a thriving biosphere.

The energy from the sun comes in form of (multiple frequency) electromagnetic radiation, which is partly reflected or partly absorbed by the Earth and upper atmosphere. The absorbed part, together with a smaller amount of energy from Earths internal processes, warms the Earth surface and emit heat (infrared waves) through the atmosphere heading for space. The upper atmosphere/ionosphere keep some of the heat and a smaller amount leaks out to space. This atmosphere effect (Gravitational effect + Greenhouse effect), together with the ozone layer and magnetosphere provides a comfortable climate.*

The Gravitational effect explains how we can have +15C at Earths surface and -18C in the upper troposphere, and is an example of the constantly ongoing radiational balance on Earth. Gravity, atmospheric composition and distance to the sun determines temperature (which is why Venus and Mars differs from Earth/Tellus).*

The Greenhouse effect is possible due to surrounding forces such as gravity, but it may change without gravity changing: A chemical change, i.e. increase in greenhouse gases increasing the effect contributing to global warming (the big concern today with most people). [1, 2]

* The magnetic field, gravity and electricity make up the framework that conditions life on Earth, and this framework is only possible through the mighty power of energy and electromagnetism.

Everything is energy and electromagnetism (Eem), supporting and controlling all processes of life, including ELF background resonances (Schumann) and “the global electrical circuit” interlacing all of life. It is an omnipresent, invisible and extremely powerful grid of Eem. [2, 3] We need to consider this when trying to understand nature and deviations (and what actions we humans wish to take to help nature). Many naturally occurring processes aim to balance deviations and many systems are self regulating – powered and controlled by Eem.

1.1) Atmosphere & water

The atmosphere is one of the most diverse, dynamic and complex systems of this planet (and it is home to both climate and weather). Driven by the mighty Eem, while containing most known chemicals and reactions, it interacts with all living beings as well as space.

The atmosphere is mainly gases and consists of about 2% water vapour (1-4% in the focus area of this report) and about 0.04% carbon dioxide/CO₂. Water vapour also has a greater warming of the atmosphere, due to unusually high heat carrying capacity, and is the most important

greenhouse gas. [1]

The oceans are the biggest receivers and givers of heat on Earth. They have their own temperature cycles, they regulate the carbon cycle and the overall hydrological cycle is regulating climate. [4, 1]

Climate is weather in a specific region, in average, over time. While weather can change in minutes and locally, climate is measured in decades over bigger areas. But they both are driven by the hydrological cycle (which in turn is related to the ozone layer with its sensitive hydrological interactions). [5]

Everything is energy and electromagnetism (Eem), supporting all of life, which is **extra important in this case since we now must add the factor of "electrosmog"** (electromagnetic pollution) into the equations. Usually we just have the *normal* energy concept in equations – now we must add the *disturbed/modified* part of energy.

1.2) Microwave communication & "factor W"

Wireless communication (by 2018) is mainly 3G/4G and sent by electromagnetic microwaves, something that many people associate with "microwave oven". It is kind of relevant to compare with the oven - partly because it easily shows how efficiently water is heated, partly because the conditions in the environment become more and more like a heating microwave oven.

Microwaves ~ 0,3 – 300 GHz

*Common wireless communication: 2 – 5 GHz **

*Microwave oven and Wi-Fi: 2,45 GHz **

*5G, radar, etc ~ 2 – 300 GHz **

** Modulated/pulsed signals*

Wireless communications mostly take place on frequencies between 3 MHz and 6 GHz (some are favourable for water impact) and with modified signals to improve efficiency. One of the most common frequencies is 2,45 GHz (Wi-Fi) which is also used in microwave ovens, but frequencies below the microwave range also play an important role (see next chapter). Typical Wi-Fi (Wireless Fidelity) transmits a carrying wave in the 2,45 GHz-band, pulsating 10-30 times per second, carrying modulated info (text/picture) → electrosmog. [6, 7]

Overall transmitters have increased - both in number and in position. We have more antennas and routers on ground level (2D), and now the number of satellites (3D) is also increasing. [8] This three-dimensional setting can, under the right conditions, create a box-like area where concentrated exposure increases the risk of destructive impact - including radio frequency heating (RFH). [6]

The above-described situation will hereinafter be referred to as "factor W" (relating to Wi-Fi and the significance of manmade wireless communication).

2) Impact from factor W

So, is impact just a theoretical possibility in this context? No, it has been practically proven. Here are three (of many) examples showing how changing the most important factor (Eem) affects various conditions in planetary systems:

1. **Radio transmission depleting the ozone layer** (paragraph below, including picture 1).
2. Dr Slobodan Tepic has successfully managed to **create a tornado with microwaves**. His intention is good (providing green energy), but history shows that techniques/inventions with good purpose also can be used for evil ... or just have unexpected negative impacts. [9]
3. High Power Antennas such as radars shoot concentrated beams to read atmospheric conditions or to perform experiments. The HAARP radar has performed many experiments where they **deliberately heat electrons in the ionosphere**. [10]

The incredible amounts of energy from the solar radiation is converted and distributed by Eem controlling the processes that determines the very conditions of life on Earth - changing a factor/parameter in the wrong place at the wrong time could have an immense impact. The ionosphere is the main power center since it connects with both the space barrier and upper atmosphere, and contains origins (or interaction points) for many Earth-conditioning processes. Understandable then, that one of the first manmade impacts took place there:

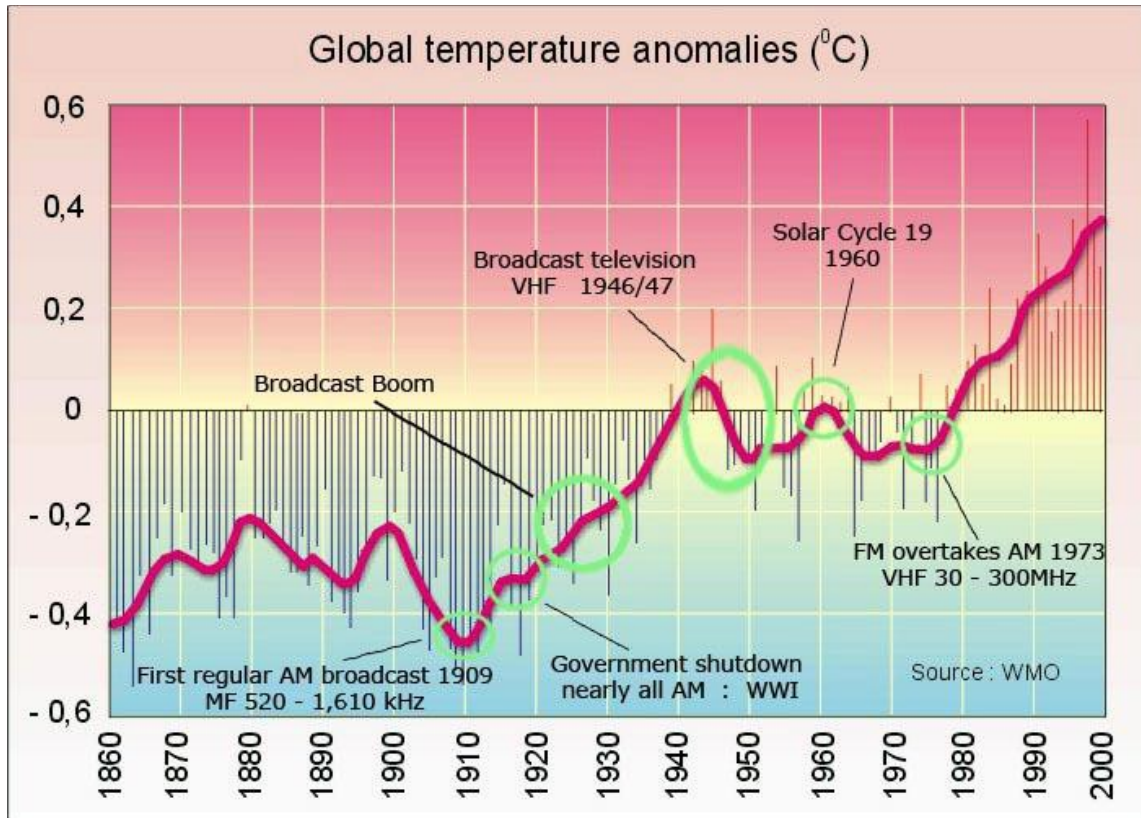
The radio transmission example (1)

When AM radio broadcasts became popular in the 1920's it correlated with a temperature increase (discovered recently). The main reason was that a 1,45 MHz signal irradiated the ionosphere E-layer, releasing electrons into the stratosphere beneath, creating nitrogen oxides that depletes the ozone layer (the EEP-NOx process) thereby increasing sun energy heating the atmosphere. [11] It was recently discovered that also marine VLF transmitters increases the EEP-NOx process. [12] The ionosphere itself can be heated by broadcasting transmitters and may transfer heat to atmospheric layers below.

“At HF frequencies, the broadcasting stations utilise powerful transmitters which can heat the ionosphere and change the temperature and the density. All these wave dissipations in the ionosphere could participate to the global warming”. [11]

Several similar correlations with major broadcasting events has occurred since then*, and the increase of satellites is relevant since they have potential impact on both the EEP-NOx process and the global electrical circuit.

* See related picture on next page.

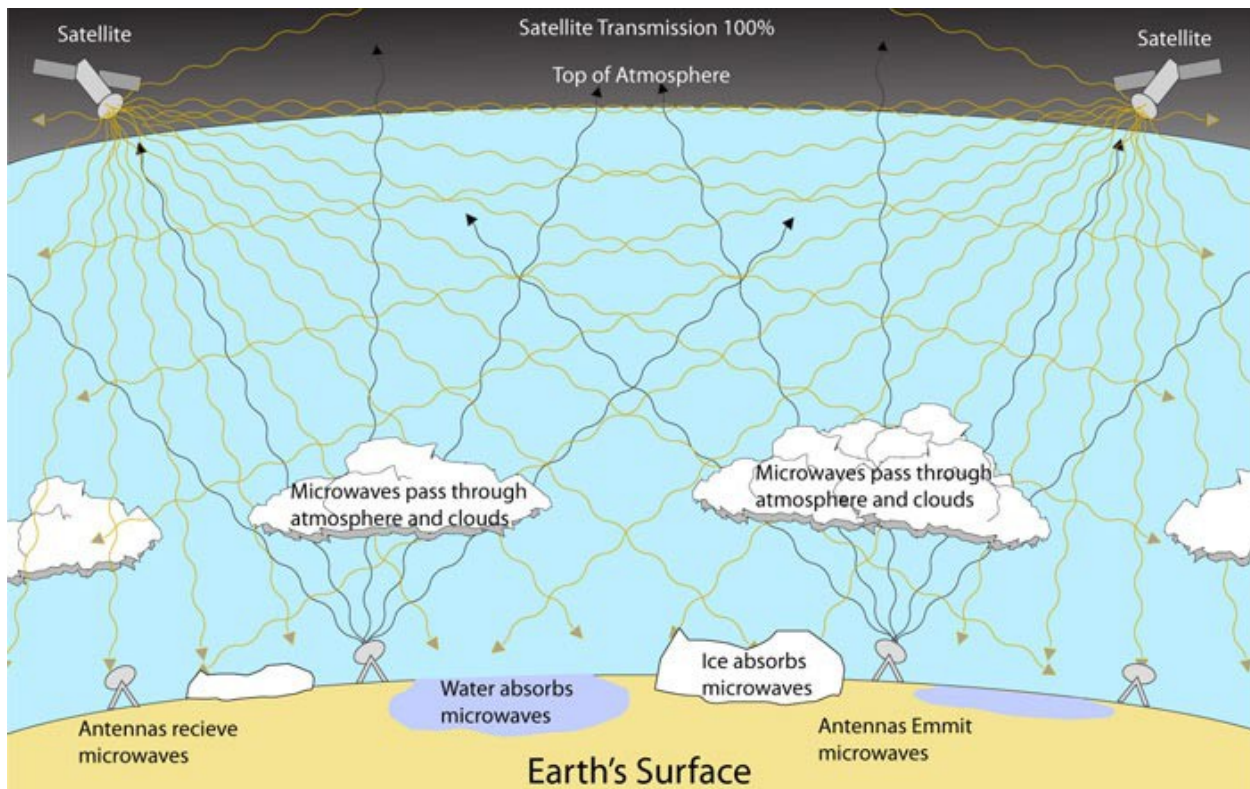


"Once FM came on it increased the electron density between the E & F layers allowing the AM cyclotron energy to flow over the gap. This frequency jump is called a Luxembourg effect and is well understood as a cross modulation of signals that result in a higher frequency, thus resulting in the cyclotron maser beams (~2.45GHz) observed in the F layer of the ionosphere. This once again fuels the EEP-NOx process and allows the global temperature to rise." [11]

If the ionosphere impact from radio antennas dominated the 1900's, the impact of the 2000's has expanded to Earth's surface due to new additions: Many more antennas and signals, and higher intensity, have created an invisible inferno of microwave beams. And together with the cyclotron energy (created in a similar way as the magnetron in microwave ovens) from above, we could potentially get a microwave oven effect in the atmosphere cavity. [6, 13]

Microwaves heat by twisting molecules and creating friction, and water molecules twist easier because they resonate with multiple frequencies and are dipolar → dielectric heating. [14] Rigid water molecules are twisted at lower frequencies than free ones: Ice is heated already in KHz, dense water in MHz and free water in low GHz. [15] Vapour (least dense) may also heat at lower GHz due to increased signal interference at 24 GHz. [16] Wi-Fi signals may increase water impact since they are irregular + sometimes use 5,8 GHz frequency [7, 15] NASA even extracted vapour from surface water with 2,45 GHz in a laboratory, and concluded that higher surrounding temperatures increases impact. [17] But when it comes to optimal *absorbency* by water the frequency is around 10 GHz. [15]

About 99% of Wi-Fi beams and vapour, and a majority of aerosols, are located in the lower troposphere. Therefore it is relevant to focus there - *but*, what if the 2,45 GHz Wi-Fi signals down here interact with the 2,45 GHz maser beams in the ionosphere?



Picture 2: Even though we can't see the millions of Wi-Fi beams moving horizontally, we still get an idea of what it looks like when microwaves bounces around in a microwave oven.

Another thing we don't see in the picture is 20.000 5G-satellites proposed to be sent up and orbit low or medium altitude. [18]

2.1) Effects on environment & climate

Today we have thousands of studies confirming the negative effects of modified microwave radiation, but civil society is slow to adapt. A majority of the studies (and most proven results) relate to humans, but all organisms are affected since we all are energy beings with biochemical bodies. Effects have been measured in insects and animals as well as trees and crops. [19]

The reasons for negative effect are mainly: Disturbing frequencies, constant exposure and pulsed signals = unnatural and polluting versions of the energy needed for good health (energy flowing through the body, magnetic fields in & around, electromagnetic communications and electrical impulses inside - all enabling the fantastic bodies to stay healthy). Radiation in this context is also *coherent*, meaning it could amplify interference/negative effects. [20]

Meanwhile Earth is in a period with weaker magnetic field, and it is relevant to consider what that might mean to the electrosmog situation we have now. [21]

Although **energy** is the main factor, it has been shown that **water** is an important factor due to its diverse properties and polar nature: Water is a good mediator and absorber of microwaves; it has high specific heat capacity; it shields from some radiation while also being a superb electrical conductor. [22, 23]

Water's remarkable abilities seem to include memory as well, which can be explained by quantum mechanics and wave biology: Experiments have shown that a solution radiated 15 minutes earlier affected an organ put in the solution, even though the radiative source was turned off. [22] Other research made subtle changes in molecular structure with esoteric and electromagnetic energy. [24]

Water has been referred to as the *solvent of life* or the *mother and womb* (origin) of life, and is sustaining all life on Earth (and human societies). It is of course very relevant then to consider the potential impact of electrosmog on water in all its phases and through the whole hydrological cycle. There have been some recent deviations in ocean temperature cycles, but no correlation has been made. It is likely more relevant to look at smaller level of impacts. [4]

In general, species with a lot of water around them or in themselves run a greater risk (humans are about 2/3 of water, and our fluid saturated brain is very electro-sensitive).

Amphibians (like frogs) are at high risk due to their water interaction and sensitive bodies, and several studies are confirming that electrosmog is a factor behind their ongoing extinction. Frogs eat mainly insects who are also declining fast (partly due to factor W), thereby making it even worse for frogs. Also, there is a big increase of deformed frogs, which is a clear warning sign since amphibians in general are good indicators of local environment status. [25]

Birds and flying insects have shown extra impact due to their electromagnetic navigation (needed for migration and finding shelter or food). Another factor of their impact is that they sometimes are in "line of fire". Several studies show impact on bees specifically. [26]

The third example is a group of organisms that can't run & hide: **Vegetation**.

Studies show impact on small crops as well as big trees. Trees in general showed poor growth, smaller leaves and an obvious decline leading to premature death. One study showed heating. Trees are very important since they play many key roles, ranging from mycorrhiza (micro-level) to climate regulation (macro-level). [27]

Aquatic life has less research regarding electrosmog (and it has low relevance to this report) but it is relevant to mention that ... 1) various whales are severely affected by sonar causing organ damage, disrupting navigation and are sometimes found stranded bleeding on beaches. [28] 2) Krill, salmon and eel show disturbed navigation even at weak EMF (unlike sonars who send high power sound waves). [29] 3) Vegetation (seaweed) absorbs ionizing (nuclear) radiation, but this report focuses on non-ionizing and I haven't found such research. [30]

All these impacts combined contributes to what experts call “**the 6th mass extinction**” ... which decreases biodiversity a lot, which affects climate regulation and climate change resilience. [31]

Beside destruction or altered molecules (the primary biological impact from factor W) [22, 32] , there may be thermal increase: Solid objects and liquids accumulating, or even gas/air molecules being twisted or altered by intense beams → kinetic energy → heat ... and all RF-heated objects **emit heat** to cooler air. According to the Laws of thermodynamics this does not add new energy - it only transforms already present energy into heat. But we may locally experience increase due to manmade concentrations and impact on atmospheric cycles. [1]

In addition, *normal* environmental impact is limited: In the event of pollution, deforestation or exploitation of a species, a limited number of species are affected within a limited area.

Electrosmog, however, affects all living things everywhere (as long as it is present).

The big advantage of electrosmog is that it disappears immediately when turned off.

The climate is most potentially affected through atmospheric impact, as mentioned above:

- 1) Electron impact in the ionosphere → depleting the ozone layer + direct heating of the ionosphere.
- 2) Molecule impact in the troposphere – primarily water molecules in all phases (including potential of both direct and indirect warming).
- 3) Rocket launches (for placement & maintenance of satellites) which at all altitudes emit i.e. water vapour and soot (black carbon). Vapour has a much bigger climate effect than carbon dioxide, and the effect from soot is *even* bigger still. The warming effect per year from just 35 big size rockets could equal one billion cars. [33, 34] This will effect environment and ozone layer directly as well. [35]

Direct heating is most noticeable and measurable around *High power antennas/HPA* [3, 6, 10, 34, 35], while the millions of Wi-Fi beams are more diffuse in the atmosphere (which makes it hard to designate heating to them). Therefore laboratory experiments are used. [11, 15, 35] HPA include radars and lasers with concentrated beams who can heat the atmosphere (used temporarily and delimited like EHF scanners, weapons/DEW etc), but this study focuses on antennas with lower intensity. [11] HPA is also used for marine communication (sonars and VLF transmitters) affecting whales as well as EEP-NOx (see above).

The internet now uses 10% of the global electricity, and wireless uses more than wired. [36] That is a lot of energy on a human scale, but small compared to the energy balance of the entire planet. In this context it is more important *how* we produce and use energy in general.

Both climate and **weather** are dynamic and complex (due to their intimate relations with the atmosphere and the influence of Eem) making it very hard to predict how they will respond to human activities (including all the complex actions within *and* between chemicals and energy). But weather has a much faster and more obvious response than the climate, thus weather is a

useful indicator. The bigger and slower climate system has natural cycles of minimum 11 years, and long term changes taking thousands of years, with the sun as the determining factor. And even fast/unusual effects (from impact) take years (sometimes up to 30 years). [1, 37]

It is hard in general to assess human impact and what to do about it, but by adding the factor W to equations we get a better overall picture.

The *combined* human impact is the believed cause of the 6th mass extinction that seems to have started - which means that it would be manmade (anthropogenic) for the first time. The reasons suggested are usually habitat loss, climate change and toxins* - factor W is usually not even mentioned. [38]

One important effect of the extinction is decreased biodiversity (which reduces eco system production and resilience, and potentially increase impact of climate changes).

In addition, if 5G is introduced, all the above mentioned will be multiplied. More about 5G below.

** The chemical impact alone is very very serious today, but combined with factor W we get an even worse scenario. The summary below only considers factor W.*

If we look at the increase of electrosmog/factor W as *increased levels of impact*, the summary could be as follows:

Level 1 (least impact) came from the booming use of the new (AM) radio transmissions, which only affected a specific band in the ionosphere, and on the ground it only affected a few people close to (the small amount of) antennas.

Level 2: Modified AM into FM (Frequency Modulation), more antennas, more signals, intensified beams. Increase in both ionospheric and biological impact.

Level 3: Cellular techniques enhancing the above mentioned + adds pulsed signals and the demand for mobile functionality + Wi-Fi (early 2000's). Radiation close to body.

Level 4: Generation 4 of mobile tech enhances all above + modifies pulsing + “smart” devices (Internet of things). Adding satellites with 4G techniques.

Level 5: Enhancing all above + laser like transmissions + big satellite impact (3D exposure) + some A.I. Small scale introduction/testing began 2018.

Level 6: Enhancing mainly speed and integration. Speeds in THz range – infrared level(!). Integration of techniques into nature and your home (less bound to gadgets but more implants, A.I. and screens built into windows). This is 6G and 6th mass extinction at full speed. [39]

The table below is a simple overview of major events amplifying electrosmog (level 6 being most severe). The year given is a rough estimate of when the new event became significant.

1	Public use of radio transmission	1920's
2	Development/enhancing level 1	1970's
3	Cellular techniques (mobile phones etc)	1990's
4	Development/enhancing level 3	2011
5	Introduction of 5G (and 6 th mass extinction)	2019?
6	Development/enhancing level 5	?

2.2) 5G (fifth generation of wireless telecommunication)

It is misleading to say "if 5G is introduced" since it has **already started**, but so far it is on a small scale and often referred to as "test" - testing has begun in most European countries. [40] South Korea has installed more than 5800 5G base stations (by 2018-11-30), but it still seems to classify as "test" despite the large amount. However, it has encountered some resistance from the population in Korea - as well as Spain, Denmark and others. The municipalities of Rome and Brussels have said no to 5G. In UK there was even a court ruling (Oct 2018) helping 5G opponents, and a similar one in Italy. [41] But why resist, when EU is spending 4 billion Euros (partly public funding) to launch 5G [42], and telecom companies say it is faster, safer and smarter? [43] Critics and experts dismiss those selling arguments: 5G will be faster *wirelessly* (seldom faster than fiber/cable) when streaming HD-movies and similar, *if* all components along the signal path are 5G-adapted and fully functioning. *Security* issues have not been solved yet. "*Smarter*" really means more A.I. and more gadgets connected (IoT).

Ericsson: "[5G will power] the hottest trends in tech today: IoT (Internet of Things), AI (Artificial Intelligence) and AR (Augmented Reality)". [44]

Another theme among 5G-pushers is "improvement for businesses and the economy" – the impact on health and environment is almost never mentioned, but in a senate hearing 2019-02-07 the telecom industry admitted that 5G is not tested for that kind of safety. [45]

The actual improvement for the average customer will be very small, but the price to pay will be very high: All the impact mentioned in section 2.1 above + a large increase in the number of antennas, satellites and rocket launches + a military radar technology that makes the signals even more disturbing. [46]

In addition, military plan to use extremely high frequencies/EHF 30-300 GHz (millimeter waves) made possible through 5G, thereby increasing frequency *and* number of signals further. [47] Such high frequency/short waves have additional impact on insects due to size. [48] It is the same with trees who are now being cut down in many cities so they won't interfere with 5G signals (reports from 2018 and increasing during 2019). [49]

The interference of atmospheric gases is much higher in the EHF range, which greatly increases the risk of heating these molecules (mainly H₂O, O₂ and CO₂). [46] The use of the 24 GHz band - which has high interference with vapour specifically – was recently approved by the FCC (USA agency). They also approved the launch of 20.000 satellites and other events enabling 5G, and have been widely criticized. [50]

The destructive impact of 3G/4G will be amplified by the planned large-scale introduction of 5G, which is why scientists warn about electrosmog [20] and wish to stop 5G [51]. And SCHEER

(European Scientific Committee on Health, Environmental and Emerging Risks) ranked the impact to wildlife from 5G as “high” in their 2018 report. [52] The overall impact, and methods of introduction, is in violation of several international treaties etc: Aarhus convention; Precautionary principle; Nuremberg code as well as the 1815 resolution (EU) and national regulations. [53]

In spite of all this, the telecom industry (a.o.) is pushing hard to introduce 5G – some of them are even aiming at 6G already. [54]

The introduction of new levels goes faster & faster, and the step up to level 5 will be at least as big as when we moved from 2 to 3. A fast level 5 introduction is possible partly because of a powerful telecom industry and a low awareness about 5G-dangers (in the overall society).

The constant bombardment of natural radiation (sun + earth) dictates the conditions of life on this planet. What happens when we introduce constant bombardment of *modified* radiation?

2.3) Geoengineering

This paragraph is extra important to A) people who *don't want geoengineering at all*, as well as B) people who *want climate engineering* (since electrosmog could counteract that).

Average definition of geoengineering =
“*deliberate large scale modification of planet Earth and its systems*”

In recent years geoengineering is more often suggested as a solution to climate change (by various methods of CO₂ removal or Radiation management). But the results climate engineers want, could be weighed out by the climate impact of intense electrosmog or simply cancelled by the power of (modified) Eem.

It's very interesting that our combined science over time show that we already modify our planet on many scales. However, this isn't considered “deliberate”... but neither was the global toxicification from PCB:s (one of many examples of big scale destructive impacts).

We must realise that ...

- 1) geoengineering is a fundamental intervention (impact on Earth).
- 2) our focus on matter (in assessments and actions) is also dominant in proposed geoengineering methods. Thereby missing the most important factor (Eem) ... again.
- 3) because of the importance of Eem, ***we are already engineering*** in the most profound way. We are already at level 4 in impact, but despite of the destruction already happening some people are racing towards level 5 (5G).

However, people are becoming aware of 5G and geoengineering and their risks (and they are both regulated in international treaties – to some extent). [55]

3) The responsibility of human societies

We have a responsibility to prevent negative impacts, but if they do occur, we also have a responsibility to counteract them. The human society is a very complex and dynamic system, creating a lot of challenges when trying to achieve our responsibilities.

Here are some relevant groups in our societal system:

3.1) The science community

The scientific challenges are quite big regarding the focus of this study. The effect of electrosmog on *health* is well documented, a little less on environment & animals, and the least on climate specifically. This means that a significant part of this research area should include cross disciplines and holistic approach to get relevant results. The “Broadcast theory” [11] is a good example of that since it alone covers several fields of research from plasma physics, antenna engineering, gravity maps and much more.

Challenges in showing *environmental* impact from electrosmog usually are: it's a relatively new phenomenon; EMR is invisible; lack of tracking long-term impacts and standard protocols to study these → lack of data and no control group. [56]

We couldn't ask for more challenges, trying to combine all the most complex systems and their many variables: Energy, electromagnetism, atmospheric chemistry (and cocktail effects) and the atmosphere as a system (including climate and weather).

But there is another challenge, facing all scientists who reveal new and groundbreaking research: To reach out to the society, get acceptance, and finally societal adaptation.

Overall, scientists is most likely the only societal group achieving their responsibilities this far. But more research in this area specifically is desired, since it may deepen our understanding and possibly show even greater impacts than are known today.

3.2) Climate officials and environmental organisations

With regard to electromagnetic pollution, problem focus has so far been dominated by the health aspect, which meant little or no attention to the *environmental* aspects (our surrounding environment and nature as a whole - including all ecosystems and climate).

This may explain the absence of *factor W* in **climate models**. Another explanation is that factor W did not exist when the early models were created (which partly function as a template for newer models). It is almost impossible to predict climate, which IPCC:s internal revision hints:

“[climate models] all generate simulations which are to a substantial degree realistic, at the same time they display a number of systematic errors in common.” [57]

But info from a 2018 climate model workshop show that “EEP-NOx process” is a hot topic. [58] Hopefully it will soon be introduced in actual IPCC models.

The situation with **environmental organisations** is similar, since electrosmog is not seen as an environmental issue (or seen at all). These organisations today focus much more on climate than 20 years ago, but seem to just follow advices based on the above mentioned models (rather than critically evaluate or doing novel research themselves).

Implementation of factor W into environmental work could go fast since most of the existing structures and resources can be used. Some municipalities and politicians have already made improvements: Better limits on exposure [59]; stopping Wi-Fi in schools [60]; halting 5G. [41]

3.3) Individuals/citizens

Individuals have a responsibility too, but slightly different. There is a bigger challenge for individuals to find time & energy to handle this advanced info (therefore usually rely on whatever “experts” say). The big *advantage* of individuals is that we can make changes rapidly and of personal choice – for now (if 5G is fully introduced it will be much harder). So some now use the power of the people to try and stop 5G, while also raising public awareness (see “2.2) 5G”).

4) Discussion & conclusion

As the introduction of this report states, these topics and perspectives are unusual, creating extra challenges. One challenge is the direct **impact of air from Wi-Fi signals**: Concentrations of humans, microwaves and water/vapour are found in the same areas. This doesn't mean that microwave heating in those areas is certain, but the probability is higher. HPA *can* heat the atmosphere partially, due to higher power and frequencies than Wi-Fi beams, *but* Wi-Fi beams (unlike HPA) are sent in millions, non stop, horizontally through the air. It is very likely to have impact – but I haven't found any research specifying just that.

Aquatic impact: Frequency, quantity and intervals are less significant in oceans than on land. But it is relevant to look deeper into marine transmitting activity, since most aquatic research so far is focused on chemical interference or species exploitation. Water interacts with factor W in many ways – here are three examples of (potential) impact:

- 1) The “power” (wattage) factor, since it is generally higher than the average Wi-Fi signal.
- 2) Land-antennas (usually have all the above factors) could stimulate nearby water (incl lakes) and coastal vegetation. *Seaweed (such as Nori) has absorbed a lot of nuclear/ionizing radiation since the Fukushima catastrophe. Can seaweed absorb non-ionizing radiation as well?*
- 3) Disturbance in the overall Eem grid (oceans included). Studies show that even weak EMF have disoriented marine life, and that sources can be land based (and marine of course).

Direct destructive impact of **objects** is most noticeable in smaller animals – birds i.e. Besides confirmed studies there are indications that 5G testing killed birds instantly ([26]), but not yet confirmed. Compare this to insects: If hundreds of birds die suddenly in your neighborhood, you will notice. If the same happened to millions of insects - would you notice?

The many billions of animals that potentially can be RF **heated**, and billions of devices emitting waste heat, are not among the significant factors in research. The heat balancing mechanisms

of Earth should take care of it, but what if heat increase is big and fast – is the thermal outlet to space that flexible?

What happens when we introduce constant bombardment of *modified* radiation? Can factor W alter the balancing mechanisms or change the radiation equilibrium point (+15C Earth surface)? What if it disturbs the Schumann resonances or the global electrical circuit interlacing all of life? *The social, mental and spiritual impacts are also relevant but not covered in this report.*

These questions need to be answered and considerations made for adaptation of existing societal systems as well as decisions about the future. But some propose 5G and deliberate geoeengineering (→ biggest impact on Earth and hubris of mankind) without such consideration. Is it due to the lack of holistic view and understanding of all related subjects causes and effects at a macro level... or simply corruption?

The FCC approval of 20.000 **satellites** and of other events enabling 5G, raises the question: By what right is a criticized USA agency making decisions effecting the whole world? Especially when the overall potential negative impact is in violation of several international treaties.

When looking at narratives on 6th mass extinction, organisations are usually more according to research while media is more alarmist and climate-focused. How does this affect the public? The power of the media, and the people, changes narratives and affect decision makers.

4.1) Conclusion

Considering both direct and indirect potentials, common wireless communication of today have a significant impact on nature (atmosphere as well as biosphere).

Even if half the research included in this report would be insignificant, the remaining half is enough to show how serious this is.

In general, it is of outmost importance to raise awareness and understandings of the great influence of factor W - throughout society. Since it affects everything (literally), considerations and *quick* adaptations by the society as a whole are absolutely necessary.

4.2) A positive ending

Positivity and feelings of meaning and hope are always important – especially in overwhelming situations like this. So, to bring a little balance to all the negative aspects presented in this report, I will end with these important positive aspects:

1. People are already waking up and acting. Welcome to join in.
2. Scientists, doctors and various experts (and even some decision makers) have joined.
3. Unlike persistent toxic chemicals, electrosmog disappears immediately when turned off. So it's never too late to stop it, but the sooner the better.

Finally, my deep gratitude to all researchers contributing to the scientific material of these topics. All their time and energy invested - sometimes while facing resistance due to breaking new grounds. My work (and this report) would not have been possible without Your work ... moving human societies closer to ecological sustainability.

Thank You Alfonso Balmori and Arthur Firstenberg for feedback during writing.

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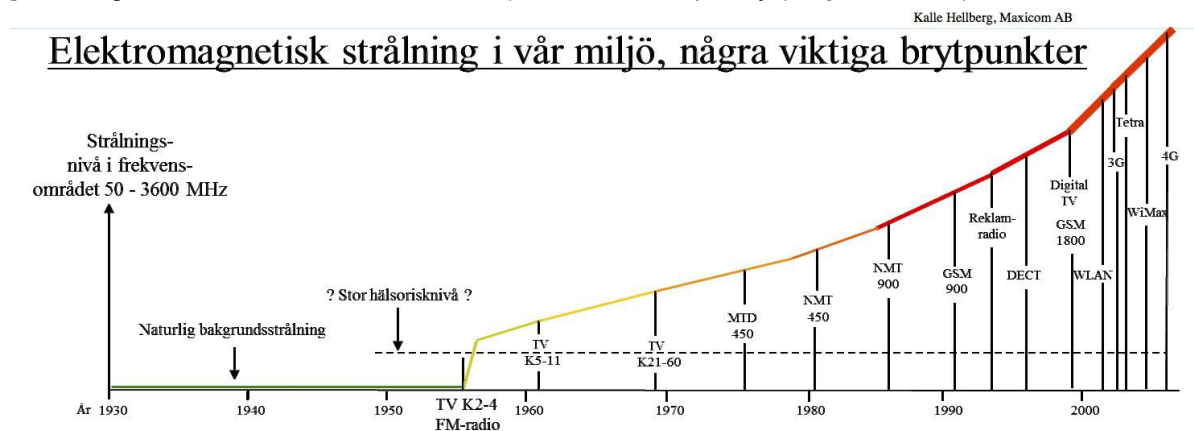
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