

Executive Summary

Living organisms depend on a functioning, to the largest possible degree undisturbed bio-electrical system and consequently on naturally occurring electric, magnetic and electro-magnetic fields. Due to technical developments, various fields interfere with and disturb this system. Recently gained insights, experiences and observations leave no doubt that a drastic reduction or a minimisation of anthropogenic electromagnetic fields are necessary and that protective and precautionary measures to safeguard humans, animals and plants need to be taken. Wireless communication networks and technologies are extending further, causing greatest concern, because the impact on the biological regulations of organisms will intensify. Therefore, a change in communication technology is urgently needed and is being outlined in this position paper. As energy rich high frequency fields can penetrate solid bodies (e.g. walls), effective, passive protection of the affected population is hardly possible, contrary to other environmental impacts (e.g. noise) which human beings can sense. The future will call for a controllable concept for protection and precaution in order to counteract legal deficits (in particular those of the 26th Federal Immission Control Ordinance) and guarantee minimum protection of affected citizens. Based on published studies, which contain scientifically supported statements, maximum immission values are being derived for legally binding risk control and precaution. Due to insights gained so far, Friends of the Earth Germany – BUND aims at reaching power densities of anthropogenic fields comparable to those of naturally occurring fields so that these cannot cause disturbances or changes in biological systems. The burden of proof concerning possible changes has to lie with the originator. The implementation of this BUND concept for protection and precaution means moving as far as possible away from common and planned applications and transmission technologies and aiming at sustainable, healthy and risk-free communication technologies and behavioural patterns. The following steps have to be taken:

- the extension of wireless communication applications with high frequency fields and reduce them to low capacity applications or applications for emergency situations, primarily for use outdoors.
- healthy design of wireless communication technologies and their locations, application of the ALARA principle (as low as reasonably achievable) at all levels, reduction of multiple networks, extension of grid-connected technologies, transition to e.g. mobile optical transmission techniques,
- introduction of legislation for the protection and precautionary measures against impacts on health and on other organisms, introduction of the obligation to obtain a permit and right to participation for the general public and the neighbourhood, protection from unwanted radiation in the private sphere,
- open discourse with all stakeholders of wireless communication technology in order to assess scientific insights and experiences, to define further actions, and to prepare political and legal agreements.

In particular, the following concrete demands are being derived:

1. Creation of the regulatory framework. Tighten the rule of onus of proof for initiators: Producers and operators of wireless communication facilities and appliances have to prove that the fields they are causing cannot cause damage to health or the environment. As long as the dangers and risks of anthropogenic fields cannot be sufficiently investigated and excluded with certainty, a general degradation prohibition (with respect to use of frequencies and power densities) needs to be introduced. Also, minimisation and optimisation requirements are necessary in order to limit electro-magnetic fields of equipment and facilities. The right of affected citizens to being informed on field exposures needs to be legally guaranteed by obliging producers, operators and polluters to inform, warn and label their goods and services. The duty of producers and operators of radio technology and facilities to sign liability insurances has to be introduced.

2. Dismantling of electromagnetic fields. Minimisation of power densities by stopping the extension of wireless networks and doing without radio technologies, frequency ranges and signals with health impacts. Moving towards transmission technologies with low biological impacts (e.g. application of optical wave lengths, “light” in the narrow sense). The basic provision with communication services and large data streams are to be grid-bound, parallel networks reduced.

3. Obligation to obtain a permit instead of obligation to disclose. The establishment and the operation of high frequency and low frequency facilities (above 9 kHz) are to be based on an extensive and formal obligation to obtain a permit with public participation. Permits need to be generally restricted and provided with the duty to retrofit if the technical standard is changing.

4. Effective protection standards. To achieve the general prevention of hazards, the first step is to set protection standards of 100 $\mu\text{W}/\text{m}^2$ (0,2 V/m) as enforceable (neighbour protecting) limit values in the Annex to the 26th Ordinance for the Implementation of the Federal Immission Control Law. Its compliance will be achieved with the help of legally prescribed retrofitting measures (including a transition period) at existing installations, if the present exposure is higher.

5. Concretise the entitlement to precautionary measures of the 26. Federal Immission Control Ordinance. The requirements concerning facilities referred to in §§ 2 und 3 of the 26. Federal Immission Control Ordinance are to be extended to environmental damage precaution. As a precautionary measure and for individual protection, precautionary standards for the transition period are to be fixed at 1 $\mu\text{W}/\text{m}^2$ (0,02 V/m) as guideline values in the Annex to the 26. Federal Immission Control Ordinance, to be applied by responsible authorities to buildings or parcels of land meant for human inhabitation when renewing permits/approving facilities.

6. Approval and inspection of equipment. For health protection from unwanted external forces and by applying specific regulations, permitted power densities

are to be guaranteed below the above mentioned precautionary standard at least in rooms frequented by humans.

7. Change of Frequency Allocation Ordinance, inclusion into EIA Law. The allocation of new frequencies (and consequently new applications) may in future only be granted on the basis of a public, transparent process involving civil society, because the naturally occurring electric, magnetic and electromagnetic fields are part of the natural basis of life and environmental conditions protected by the German Constitution. The allocation of frequencies is to be made dependent on a Strategic Environmental Assessment (including the impact on human health), which in effect means the inclusion of frequency allotment into the Law on Environmental Impact Assessment.

8. Binding discourse for risk assessment. In order to reach decisions likely to be accepted by a majority, an unbiased, transparent and binding discourse according to the recommendations of the Risk Commission is to be conducted, which include legitimate, authoritative experts representing the various groups of society (in particular, acknowledged nature conservation organisations). Installation of an independent body for the transparent implementation of risk assessments and for the development of those sustainable solutions outlined in this paper.

9. Transparent and goal oriented research. Securing transparent research independent of industrial interests, disclosing research questions and aims of studies, contractors and contracting bodies as well as complete results. Promoting research into new sustainable wireless communication technologies (infrared transmission technologies, separation of communication outdoors and inside buildings).

10. Spatial planning. Defining sensitive areas in communities, where low immissions can be guaranteed (sanctuaries) with the help of spatial planning (urban land use planning, urban development planning). Introduction of network planning in consultation with affected citizens, authorities and operators.