

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of	)	
	)	
Reassessment of Federal Communications	)	
Commission Radiofrequency Exposure	)	ET Docket No. 13-84
Limits and Policies	)	
	)	
FCC Seeks Comment on RF Exposure	)	
Issues Subject to D.C. Circuit Remand in	)	
<i>Environmental Health Trust v. FCC</i>	)	

COMMENTS OF THE ASSOCIATION FOR COMPETITIVE TECHNOLOGY

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SUMMARY

The Association for Competitive Technology (ACT) represents small technology companies whose apps and connected devices depend on Bluetooth, Wi-Fi, cellular, and satellite links in nearly every sector of the economy. ACT submits these comments to assist the Commission in providing the reasoned explanation the D.C. Circuit requested and to confirm, on the refreshed record, its 2019 conclusion that the weight of the scientific evidence does not warrant changes to its radiofrequency (RF) exposure limits.

ACT supports the Commission's plan to weigh submissions by their quality, under which the findings of the Food and Drug Administration and other expert bodies, including the systematic reviews the World Health Organization commissioned, should carry the most weight. On the other hand, unreplicated studies of biological responses, compilations of studies of uneven rigor, and repetitive testimonials should not be given undue priority. Because portable devices are tested at full power and in the most demanding positions, testing procedures already build in a wide margin, and the Commission should keep them in step with current consensus measurement standards.

On the specific remanded issues, the epidemiological evidence covering children and long-term use shows no increase in risk even as mobile phone use has become nearly universal, and the spread of wireless devices has not brought a proportional increase in exposure. Each new technology should be assessed on the RF exposure it produces in practice, whatever generation label it carries. The good-quality environmental research likewise finds no harm to plants or animals. ACT also urges the Commission to work with the Department of Health and Human Services, whose parallel review covers similar evidence, and to preserve the single national framework that allows small companies to build one product for the national and global markets, in furtherance of American wireless leadership and competitiveness.

I. Introduction and ACT's Interest

The Association for Competitive Technology (ACT) responds to the Public Notice in which the Office of Engineering and Technology seeks to refresh the record on the issues remanded in *Environmental Health Trust v. FCC*.¹ ACT is a not-for-profit trade association representing the global small business technology developer community.² Our members build software applications and connected devices used in nearly every sector of the economy, including healthcare, education, retail, manufacturing, agriculture, and the home, and almost all of these products send or receive data over Bluetooth, Wi-Fi, cellular, or satellite links. Members that make devices take them through the relevant Commission equipment authorization processes, including radiofrequency (RF) radiation exposure evaluation, and they rely on stable rules grounded in science to bring products to market.

The Public Notice asks commenters to describe their qualifications and the basis for their views.³ ACT's views are based on its members' experience designing, testing, and selling wireless products, and its views on the science draw on peer-reviewed studies, the findings of federal agencies and of international scientific bodies, and the consensus standards that govern exposure and compliance testing. ACT is also responding to the parallel request for information (RFI) from the Department of Health and Human Services (HHS) on similar evidence.⁴

¹ *FCC Seeks Comment on RF Exposure Issues Subject to D.C. Circuit Remand in Environmental Health Trust v. FCC*, Public Notice, ET Docket No. 13-84, DA 26-997 (OET rel. Sept. 17, 2026), 91 Fed. Reg. 60128 (Sept. 22, 2026) (*Public Notice*); *Environmental Health Trust v. FCC*, 9 F.4th 893 (D.C. Cir. 2021) (*EHT*).

² ACT, About, <https://actonline.org/about>.

³ *Public Notice* (asking commenters to describe their qualifications and subject-matter expertise).

⁴ U.S. Department of Health and Human Services, *Request for Information on Electromagnetic Fields (EMFs), Radiofrequency (RF) Radiation, and Wireless Radiation Exposure*, 91 Fed. Reg. 59792 (Sept. 21, 2026).

II. The Commission Should Weigh the Record by Quality and Explain Its Conclusions

A. The Commission's Approach to Weighing Submissions Is Sound

The Commission states that it will put the quality of submissions ahead of their quantity, give particular weight to submissions reflecting specialized experience in RF health and safety, and give little scientific weight to meta-analyses that compile studies of widely varying rigor or to unverifiable or repetitive testimonials.⁵ ACT supports that approach, which matches the structured and transparent methods called for by the Information Quality Act and Executive Order 14303 on Restoring Gold Standard Science.⁶ Under methods of this kind, such as the systematic review approach of the National Toxicology Program's (NTP) Office of Health Assessment and Translation, each study counts according to its quality, judged by factors such as the accuracy of its exposure assessment, dosimetry, blinding, replication, dose-response, and consistency with other types of studies, which enable anyone to trace how each conclusion was reached.⁷ The Commission's list of methodological questions puts those factors into practice, and using the list to explain each conclusion would address the court's concern that the Commission had relied on the views of expert agencies without explaining its reasoning.⁸

B. The Highest-Quality Evidence Supports the 2019 Findings

The established science shows that RF energy heats body tissue when its intensity is high enough, but the exposure limits used in the United States and abroad sit well below the point

⁵ *Public Notice* (describing how the Commission will weigh submissions).

⁶ 44 U.S.C. § 3516 note (Information Quality Act); Exec. Order No. 14303, *Restoring Gold Standard Science*, 90 Fed. Reg. 22601 (May 29, 2025).

⁷ National Toxicology Program, Office of Health Assessment and Translation, *Handbook for Conducting a Literature-Based Health Assessment Using OHAT Approach for Systematic Review and Evidence Integration* (Mar. 2019).

⁸ *See EHT*, 9 F.4th 893.

where that heating happens. When FDA reviewed the research published between 2008 and 2018, it concluded in 2020 that there was insufficient evidence to support a causal association between RF exposure and tumor formation, noting the lack of (i) a clear dose-response relationship, (ii) consistent findings, and (iii) a plausible biological mechanism.⁹ Later systematic reviews that the World Health Organization (WHO) commissioned reached similar conclusions about cancer and self-reported symptoms. Other expert bodies agree, among them the European Commission's Scientific Committee on Health, Environmental and Emerging Risks (SCHEER).¹⁰ The 2024 WHO-commissioned review of cancer studies, for example, was registered in advance with a published protocol and rated the certainty of its evidence using the GRADE approach,¹¹ which separates it from the simple compilations that the Commission says it will discount. Taken together, the existing body of evidence does not show adverse health effects from exposure at or below current limits. This supports the Commission's 2019 findings that the weight of scientific evidence has not linked cell phones with any health problems and that no changes to the current standards are warranted.¹²

⁹ U.S. Food and Drug Administration, Center for Devices and Radiological Health, *Review of Published Literature between 2008 and 2018 of Relevance to Radiofrequency Radiation and Cancer* (Feb. 2020), <https://www.fda.gov/media/135043/download>.

¹⁰ Scientific Committee on Health, Environmental and Emerging Risks, *Final Opinion on the need of a revision of the annexes in Council Recommendation 1999/519/EC and Directive 2013/35/EU, in view of the latest scientific evidence available with regard to radiofrequency (100kHz - 300GHz)* (Apr. 18, 2023), https://health.ec.europa.eu/system/files/2023-06/scheer_o_044.pdf.

¹¹ Ken Karipidis et al., *The effect of exposure to radiofrequency fields on cancer risk in the general and working population: A systematic review of human observational studies – Part I: Most researched outcomes*, 191 *Environment International* 108983 (2024), <https://doi.org/10.1016/j.envint.2024.108983> (registered as PROSPERO CRD42021236798 and assessing certainty under the GRADE approach).

¹² *Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields, et al.*, ET Docket Nos. 19-226, 13-84, 03-137, Resolution of Notice of

C. Studies of Biological Responses, Symptoms, and Animals Do Not Justify a Change

A biological response, including a proxy such as an oxidative effect, does not by itself establish an adverse health effect, and individual studies reporting low-exposure biological effects have not been reliably replicated. Several studies discussed by the court, as the Public Notice describes them, produced mixed results, examined exposures at the higher ICNIRP limit, or acknowledged that their own findings were inconsistent. None of those features supports a finding of harm at exposures within the Commission's limits. The Commission should evaluate studies of this kind with attention to blinding, dosimetry, independent replication, and dose-response, and it should not treat any single study on its own as proof of harm.

People who report symptoms deserve clinical attention, and the causes of those symptoms deserve study. However, accounts gathered without blinding cannot identify what caused a symptom. In double-blind provocation studies, people who describe themselves as sensitive to electromagnetic fields have repeatedly failed to detect actual exposure at better than chance levels, and the 2024 WHO-commissioned systematic review of 41 experimental studies in humans found (i) that RF exposure had no effect on self-reported symptoms and (ii) that symptoms tracked whether people believed they were exposed rather than whether they actually were.¹³ The Commission therefore should not treat the number of near-identical submissions, which may often be drafted from common templates, as a measure of scientific weight. For

Inquiry, Second Report and Order, Notice of Proposed Rulemaking, and Memorandum Opinion and Order, 34 FCC Rcd 11687 (2019).

¹³ Xavier Bosch-Capblanch et al., *The effects of radiofrequency electromagnetic fields exposure on human self-reported symptoms: A systematic review of human experimental studies*, 187 *Environment International* 108612 (2024), <https://doi.org/10.1016/j.envint.2024.108612>; see also G. James Rubin et al., *Idiopathic environmental intolerance attributed to electromagnetic fields (formerly "electromagnetic hypersensitivity"): An updated systematic review of provocation studies*, 31 *Bioelectromagnetics* 1 (2010).

problems involving medical devices, such as electromagnetic interference that disrupts how a device works, the MedWatch and Medical Device Reporting systems already allow clinicians, patients, and manufacturers to engage in reporting.

Comments that cite the 2018 NTP rodent studies should be read in light of their exposure conditions. The rats were exposed over their entire bodies for roughly nine hours each day, at specific absorption rate (SAR) levels as high as 6 watts per kilogram. This is many times greater than the public whole-body limit. FDA's 2020 review took the studies into account and left its conclusions for humans unchanged.¹⁴ Researchers in Japan and the Republic of Korea ran two-year studies built to test the main NTP findings and could not replicate those findings, and Germany's Federal Office for Radiation Protection has pointed to thermal stress from the high exposures as a possible explanation for the NTP results.¹⁵

III. Testing Procedures for Portable Devices Should Be Retained

Each consensus framework identifies the lowest exposure that causes an established adverse effect and then places its limit far beneath that point. The U.S. whole-body SAR limit for the general public is 0.08 watts per kilogram, which is one-fiftieth of the 4 watts per kilogram level linked to adverse heating effects. Compliance testing then places devices at maximum power and in the positions that yield the highest exposure, although phones and other devices

¹⁴ National Toxicology Program, *Toxicology and Carcinogenesis Studies in Hsd:Sprague Dawley SD Rats Exposed to Whole-Body Radio Frequency Radiation at a Frequency (900 MHz) and Modulations (GSM and CDMA) Used by Cell Phones*, NTP TR 595 (Nov. 2018); see FDA, *Review of Published Literature between 2008 and 2018*, *supra* note 9.

¹⁵ Australian Radiation Protection and Nuclear Safety Agency, *Korean and Japanese studies agree that radiofrequency exposure does not cause cancer in rats* (Jan. 2026), <https://www.arpsa.gov.au/korean-and-japanese-studies-agree-radiofrequency-exposure-does-not-cause-cancer-rats>; Federal Office for Radiation Protection (Germany), *Technical Statement of the Federal Office for Radiation Protection on the Results of the NTP Study*, <https://www.bfs.de/EN/bfs/science-research/emf/statements/ntp-study/ntp-statement.html>.

constantly adjust their power and, in everyday use, operate well below maximum permissible levels.¹⁶

The existing dosimetric framework also accounts for characteristics such as frequency, duty cycle, distance from the body, and pulsed signals. Up to 6 GHz, limits are stated as SAR, and above that frequency they are stated as power density, which tracks how the body absorbs energy at different frequencies. Averaging times capture duty cycle and exposure duration, and compliance testing captures distance from the source and closeness to the body. The Commission's procedures require assessment both of simultaneous transmission by several radios in a single device and of the combined exposure where several transmitters share a site. IEEE and ICNIRP also include specific provisions for short and pulsed exposures, and nothing in the evidence indicates that pulsed or modulated signals present different risks from continuous signals at the same time-averaged power.¹⁷ A separate classification system of the kind HHS raised in its RFI, layered on top of these standards, would only repeat what they already do and could confuse the public, regulators, and regulated entities.

The Commission should retain its testing procedures and keep its Knowledge Database guidance current with the consensus measurement standards.¹⁸ IEC/IEEE 62209-1528:2020 sets out how SAR is measured for devices used near the body, IEC/IEEE 63195-1:2022 and

¹⁶ Federal Communications Commission, *Wireless Devices and Health Concerns*, <https://www.fcc.gov/consumers/guides/wireless-devices-and-health-concerns>.

¹⁷ IEEE Std C95.1-2019, *IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz* (2019); International Commission on Non-Ionizing Radiation Protection, *Guidelines for Limiting Exposure to Electromagnetic Fields (100 kHz to 300 GHz)*, 118 Health Physics 483 (2020), <https://www.icnirp.org/en/publications/article/rf-guidelines-2020.html>.

¹⁸ See *Public Notice* (noting that guidance on measurement techniques for portable devices is in the Office of Engineering and Technology Laboratory Division Knowledge Database).

IEC/IEEE 63195-2:2022 do the same for absorbed power density above 6 GHz, and IEC 62232:2025 covers exposure assessment near base stations. Medical device makers apply them together with ISO 14117, which covers the EMC of active implantable cardiac devices, alongside FDA's guidance on EMC and wireless technology in medical devices.¹⁹ All of these were developed through open processes led by experts and are revised as new evidence becomes available.

ACT supports eventually bringing the localized limit, now 1.6 watts per kilogram averaged over 1 gram of tissue under a 1992 consensus standard, into line with the IEEE C95.1-2019 and ICNIRP limit of 2.0 watts per kilogram averaged over 10 grams of tissue, through notice-and-comment rulemaking with input from federal health agencies.

IV. Technological Developments Have Not Increased Exposure in Proportion to the Number of Devices

The court asked the Commission to address the ubiquity of wireless devices and other technological developments since the guidelines were last updated.²⁰ Small technology companies reach their customers through wireless connections, and students and teachers, farmers, manufacturers and logistics companies, small retailers and restaurants, and households all rely on connected devices. That growth has not produced a matching rise in exposure, because newer technologies frequently lower the power each device needs to transmit. Devices use only as much power as they need to keep a connection, networks of closely spaced small cells let both base stations and devices transmit with less power, and devices held against or

¹⁹ U.S. Food and Drug Administration, *Radio Frequency Wireless Technology in Medical Devices, Guidance for Industry and Food and Drug Administration Staff* (Aug. 2013); U.S. Food and Drug Administration, *Electromagnetic Compatibility (EMC) of Medical Devices, Guidance for Industry and Food and Drug Administration Staff* (June 2022).

²⁰ *EHT*, 9 F.4th 893.

worn on the body account for most of the RF exposure people receive. This is why near-field and localized measurement methods like IEC/IEEE 62209-1528 are most important for phones and wearables, while distant infrastructure and satellites contribute far less to RF exposure amounts.

New and evolving technologies should be judged against applicable regulatory limits using established measurement methods, and on the basis of the RF exposure they actually produce rather than technology-generation labels like 5G or 6G. Each technology spans many frequencies, power levels, antenna configurations, beamforming, operating modes, network loading, timing, and use cases, and internet of things (IoT) and smart home devices by themselves rely on protocols that run from Bluetooth to Wi-Fi to cellular. Moreover, every device and transmitter using a particular spectrum technology must meet the exposure limits individually, and sites hosting several transmitters are evaluated for their combined exposure. ICNIRP's 2020 guidelines expressly cover 5G networks, including those using millimeter-wave frequencies, where energy is absorbed in the skin's outer layers and limits are therefore stated as power density. Any frequencies or waveforms that future networks such as 6G introduce will be subject to the same limits, with the Commission and the consensus standards bodies able to assess those technologies through their existing processes as they are developed and deployed.

Wearables, smart home products, smart meters, Wi-Fi equipment, and IoT devices run at low power and frequently transmit only some of the time.²¹ Their exposure is best measured over time based on how each device operates, including its distance from the user, duty cycle, and frequency band, because Wi-Fi equipment and many other devices can operate across several

²¹ See Centers for Disease Control and Prevention, *Facts About Wearable Technology* (describing wearables as using low-powered RF transmitters that expose users to RF levels below applicable exposure limits), <https://www.cdc.gov/radiation-health/data-research/facts-stats/wearable-technology.html>.

bands. Wireless medical devices must comply with the Commission’s exposure rules and undergo FDA review, and those using the bands reserved for medical use are designed to run at low power.

V. The Evidence on Children and Long-Term Exposure Does Not Warrant New Limits

Because the limits are set to protect the entire public, they cover older adults, children, pregnant women, and people with health conditions, and their reduction factors allow for variation among individuals. Standards bodies have taken research on how children absorb RF energy into account. A 2024 WHO-commissioned systematic review of observational studies in humans reported, with moderate certainty, that RF exposure from mobile phone use likely does not raise brain cancer risk for adults or children, including with long-term use. It also found no link between childhood leukemia or pediatric brain tumors and exposure from base stations or broadcast antennas.²² Results from the COSMOS prospective cohort study showed no association between brain tumors and cumulative call time, and the CEFALO study showed no association between brain tumors in children and adolescents and their mobile phone use.²³

In answer to the Public Notice’s question about epidemiologic evidence that considers the saturation of cell phones in the American population,²⁴ brain cancer rates have not risen over the decades in which mobile phone use has become nearly universal, a trend consistent with these

²² Karipidis et al., *supra* note 11.

²³ Maria Feychting et al., *Mobile phone use and brain tumour risk – COSMOS, a prospective cohort study*, 185 *Environment International* 108552 (2024), <https://doi.org/10.1016/j.envint.2024.108552>; Denis Aydin et al., *Mobile phone use and brain tumors in children and adolescents: a multicenter case-control study*, 103 *Journal of the National Cancer Institute* 1264 (2011), <https://doi.org/10.1093/jnci/djr244>.

²⁴ *Public Notice* (listing methodological questions for studies that cast doubt on the Commission’s rules).

findings.²⁵ ACT recommends that the Commission continue to assess exposure for children and other groups within the existing framework while also considering the benefits that connected technologies bring. Children use connected devices to learn at school and at home, and young people with type 1 diabetes depend on continuous glucose monitoring to stay safe overnight and during the school day. Older adults use video calls, smart home and voice-controlled devices, and connected health devices to live independently, and people with disabilities rely on accessibility features in phones, tablets, and wearables throughout their days.

VI. Environmental Effects

Questions of ecology fall outside ACT's expertise in technology and the companies that develop it. However, ACT asks the Commission to hold environmental studies to the same standards of quality, dosimetry, and replication it uses when reviewing research on human health. The Commission has noted the Australian Radiation Protection and Nuclear Safety Agency's (ARPANSA) finding that good-quality studies show no effect from radio waves on plants and animals, and ARPANSA's systematic map of the environmental research found that the studies reporting harm were of poor quality.²⁶ The forthcoming statement of the ICNIRP Project Group on Environmental EMF Protection, which will be based on reliable scientific papers, should also inform the Commission's analysis. The Department of the Interior's 2014 letter, as the Public Notice describes it, reported that no independent third-party field studies on

²⁵ National Cancer Institute, *Cell Phones and Cancer Risk Fact Sheet* (reviewed Apr. 4, 2024), <https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/cell-phones-fact-sheet> (describing stable U.S. brain tumor incidence and the results of the COSMOS and CEFALO studies).

²⁶ Australian Radiation Protection and Nuclear Safety Agency, *Good quality research shows no environmental effects from radio waves* (Aug. 22, 2024), <https://www.arpansa.gov.au/good-quality-research-shows-no-environmental-effects-radio-waves>; see *Public Notice*.

towers and migratory birds had been conducted in North America, and it offers no evidence of harm that would justify revisiting the rules.²⁷

VII. The Commission Should Coordinate With HHS and Preserve a Single National Framework

RF exposure in the United States has long been governed under a single federal framework. Within it, the Commission sets limits for devices and transmitters with input from federal health agencies and consensus standards bodies, while FDA carries out its responsibilities for electronic product radiation under the Radiation Control for Health and Safety Act and its medical device authorities.²⁸ Congress strengthened this national approach by prohibiting state and local governments from regulating where wireless facilities are placed on the basis of RF emissions, so long as the facilities meet the Commission's rules.²⁹ Because HHS is examining many of the same studies through its RFI, the two agencies should work together so that they build one federal record and avoid reaching conflicting conclusions from identical evidence.

A uniform national approach that moves the United States closer to internationally harmonized exposure limits and compliance testing standards would provide consistent information to consumers, patients, and clinicians, and it would let manufacturers, including makers of medical devices that must satisfy FDA and Commission requirements alike, build a single product for sale at home and abroad. That benefit is largest for small companies without the resources to design and test multiple versions of one product, and a fragmented approach to consumer information would similarly burden them. Requiring new labels, disclosures, or

²⁷ *Public Notice* (discussing the 2014 Department of the Interior letter and the ICNIRP Project Group on Environmental EMF Protection).

²⁸ 47 CFR §§ 1.1307, 1.1310, 2.1091, 2.1093; 21 U.S.C. §§ 360hh–360ss.

²⁹ 47 U.S.C. § 332(c)(7)(B)(iv).

warnings that would suggest a health hazard unsupported by evidence would do nothing to improve public understanding. It also might cause some patients to refuse or abandon monitoring their clinicians recommended. Moreover, it could impose compliance costs that weigh most heavily on small device makers and app developers.

VIII. Conclusion

ACT appreciates the opportunity to submit these comments and asks the Commission to use the refreshed record to provide the reasoned explanation the court requested and to reaffirm its exposure limits and testing procedures. ACT also asks the Commission to evaluate any contrary studies against the methodological questions in the Public Notice, keep its testing guidance current, and work with HHS so that federal agencies reach consistent conclusions.

Respectfully submitted,

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October 22, 2026