Neurotech

# Towards an EU Neurotechnology Strategy

A CFG White Paper

This White Paper draws on two years of research by the Centre for Future Generations' Neurotechnology Programme, synthesising our key ideas and policy recommendations across publications. It intends to provide a call to European policy action on neurotechnology.

Written by Virginia Mahieu, Laura Bernáez Timón, and Pawel Swieboda

Centre for Future Generations - Norrsken House, Rue du Commerce 72, 1040 Brussels, Belgium.

This whitepaper is available at https://cfg.eu/towards-an-eu-neurotechnology-strategy/

# Table of Contents

# Introduction

Neurotechnology is advancing fast, and Europe now faces a field-defining challenge: how to harness its potential and benefits while ensuring its development remains ethical, rights-respecting, and aligned with the public interest. Advances in brain-computer interfaces, neurostimulation, AI-enhanced diagnostics and wearable devices are opening new possibilities for prevention, diagnosis, treatment and rehabilitation. But as neurotechnology expands and mainstreams across both clinical and consumer contexts, it also raises acute ethical, legal and human-rights questions — from safety, transparency and informed consent to mental privacy, autonomy, agency and misuse.

Europe faces a growing burden of neurological and mental health conditions[1], which strengthens the public-interest case for faster progress in brain health and neurotechnology-enabled care. Yet, in Europe neurotechnology still tends to fall between broad, undifferentiated R&I funding streams and a fragmented patchwork of legal and policy frameworks that are often indirect, difficult to navigate, and poorly adapted to the converging nature of the field. Global competitors including the US and China are moving with growing strategic ambition and clearer signals of priority. The result is a double risk: Europe may fail to capture the benefits of a field in which it has major scientific strengths, while also leaving users and innovators exposed to regulatory ambiguity, uneven oversight and avoidable pitfalls. An EU Neurotechnology Strategy is needed to build the conditions for responsible innovation and ensuring Europe can lead this field in a way that addresses unmet medical needs, strengthens industrial competitiveness, and embeds fundamental rights, ethics and public interest into neurotechnology development from the outset.

# Trends and state-of-play in neurotechnology

**Neurotechnology is becoming a strategic asset**

Neurotechnology sits at the intersection of brain health, AI, digital infrastructure, and advanced engineering, giving it significance far beyond any single product category. In healthcare, it offers new possibilities for prevention, diagnosis, treatment and rehabilitation. For consumers, it is opening up new markets in wellness, cognitive performance, entertainment, and human–computer interaction. In industrial terms, it is a foundational field in which early movers can shape standards, capture talent and data, and build durable innovation ecosystems. This strategic dimension is likely to intensify as major

[1] European Brain Council (2026). Press Release – Brain Health: Policy Challenges & Opportunities to Manage Neurological Diseases. https://www.braincouncil.eu/press-release-brain-health-policy-challenges-opportunities-to-manage-neurological-diseases/

technology companies move further into neuro-adjacent interfaces and brain-data ecosystems: CFG's research points to patents, acquisitions and R&I activity by firms such as Apple, Meta, Amazon, Samsung and NVIDIA. This means neurotechnology may increasingly be folded into mainstream digital ecosystems to offer more seamless ways of interacting with external devices, across both healthcare and consumer applications.

**Neurotechnology is moving from clinical niche to pervasive ecosystem**

Neurotechnology is no longer a niche medical field. Over the past decade, it has evolved into a broader ecosystem spanning clinical diagnostics and therapeutics, consumer wearables, brain-data analytics, and human–machine interfaces. Medical neurotechnology continues to advance through neurostimulation, neural implants, and brain–computer interfaces, with growing relevance for conditions such as stroke rehabilitation, epilepsy, Parkinson's disease, chronic pain, depression, and motor restoration. At the same time, wearable neurotechnology has expanded rapidly, moving from research-grade tools and novelty devices into wellness, entertainment, productivity, self-tracking, enterprise and military uses (i.e. neuromarketing, fatigue monitoring, and human-machine teaming) — with some achieving medical device certification. This shift has been driven by miniaturisation, AI-enabled signal processing, and the integration of neurotechnology into everyday form factors such as headbands, headsets, earbuds, glasses, and wristbands.

**Consumer market expansion blurs boundaries between wellness and medicine**

As documented in our market atlas, consumer-oriented firms now account for around 56–60% of the global neurotechnology landscape and have outnumbered medical firms since 2018. Consumer companies have also proliferated much faster in recent years: since 2010, they have grown more than four-fold compared with the previous 25 years. We further observe two distinct innovation logics: consumer firms tend to move faster, remain leaner, and reach market earlier, while medical firms face longer validation timelines — yet the companies that have so far scaled and reached maturity are mostly medical. Commercial market forecasts likewise point to continued market expansion over the coming decade, with annual growth estimates across different neurotechnology segments generally ranging between 10% and 20%, with the fastest estimates for brain-consumer interfaces in the consumer sector.[2,3,4] At the same time, the distinction between medical and consumer neurotechnology is becoming less clear. As companies increasingly position products around sleep, stress, focus, burnout,

[2] Maurya, S. (2026) Neurotechnology Brain Computer Interface Market. Market Research Future. https://www.marketresearchfuture.com/reports/neurotechnology-brain-computer-interface-market-43082
[3] Imarc group (2024). Neurotechnology Market Report by Product Type (Imaging Modalities, Neurostimulation, Cranial Surface Measurement, Neurological Implants), End User (Hospitals, Clinics, Diagnostic Centres, Ambulatory Surgical Centres), and Region 2025–2033. https://www.imarcgroup.com/neurotechnology-market
[4] Precedence Research (2025). Neurotechnology Market Size, Share, and Trends 2025 to 2034. https://www.precedenceresearch.com/neurotechnology-market

mood, and "brain health", a growing share of the market now operates in a health-adjacent grey zone between wellness and medicine.

**Europe is strong, but competition is intensifying**

Europe already has a strong neurotechnology innovation ecosystem and global market share. CFG's market atlas found that North America remains the largest hub, accounting for roughly 48% of identified neurotechnology companies, while Europe follows at around 38%, giving it a comparatively strong position, but not a guaranteed one. Though data on the Chinese market is lacking, China is treating brain-computer interfaces as a strategic industrial priority: guidelines issued in 2025 set targets for key technological breakthroughs by 2027 and for a globally influential industrial ecosystem by 2030[5] — indeed, China was recently the first country to put a medical brain implant on the market.[6] Within Europe, the landscape is uneven: the UK leads in company concentration, while Spain and Germany are among the strongest EU hubs. Regional specialisation also differs. In Europe, consumer neurotechnology is led more by research-grade tools and software, whereas in North America it is more strongly driven by wellness and fitness applications.

# Risks of neurotechnology

As noted above, the potential of neurotechnology for society is substantial, across healthcare, research, and more. But because these technologies interface with the brain and nervous system, they often generate highly sensitive data from which inferences can be made about cognition, emotions or behaviour. They are also increasingly combined with AI and other personal data, making the stakes particularly high. As laid out in our first report, key ethical concerns include mental privacy, algorithmic bias, transparency, informed consent, and the erosion of autonomy and agency. In clinical settings, additional questions arise around long-term safety, dependency and device abandonment. Outside the clinic, the spread of consumer neurotechnology into wearables, workplaces and digital platforms raises risks of surveillance, coercion, misleading claims and exploitative commercial uses such as personalised neuromarketing and cognitive manipulation. Furthermore, consumer neurotechnology increasingly occupies a regulatory grey zone between wellness and medicine, creating a risk of consumer misperception, delayed diagnosis, inappropriate self-treatment and weakened public trust

[5] Chinese Government (2027). Press release: China aims to achieve breakthroughs in brain-computer interface technology by 2027. https://english.www.gov.cn/news/202508/07/content_WS6894aab8c6d0868f4e8f4b24.html

[6] Garay, J. (2026). China Approves the First Brain Chips for Sale—and Has a Plan to Dominate the Industry. Wired Science. https://www.wired.com/story/china-approves-first-brain-chips-for-sale-plan-to-dominate-industry/

in the sector as a whole. More broadly, neurotechnologies present novel challenges to the protection of human rights, notably the rights to mental privacy[7] and freedom of thought.[8]

## Neurotech governance landscape, in Europe and globally

### Global ethical and normative waves

These challenges are increasingly being recognised internationally. So far, much of the global response has come through soft law in the form of ethical guidance and human rights processes. The OECD's Recommendation on Responsible Innovation in Neurotechnology, adopted in 2019, was the first international standard in this area and frames responsible development around anticipation, stewardship, safety, and societal benefit.[9] More recently, UNESCO has since adopted a Recommendation on the Ethics of Neurotechnology in 2025, which was developed through an expert-led process with several consultation rounds.[10] Neurotechnology is also moving more firmly onto the UN's human rights agenda: in 2025, the Special Rapporteur on the right to privacy called for regulation of neurotechnologies and neurodata,[11] while the Human Rights Council tasked its Advisory Committee with drafting recommended guidelines on how existing human rights law should apply to the design, development, testing, use and deployment of neurotechnologies.[12] Together, these developments suggest a growing international consensus that neurotechnology should be governed not only as an innovation issue, but as a matter of rights, dignity, and democratic oversight.

---

[7] Szoszkiewicz, L., Yuste, R. (2025) Mental privacy: navigating risks, rights and regulation. EMBO Reports 26(14). https://pmc.ncbi.nlm.nih.gov/articles/PMC12287510/

[8] Ligthart, S. (2025). Enslaving Minds: On Freedom of Thought and the Exploitation of Mental Vulnerabilities. Neuroethics 18(48). https://link.springer.com/article/10.1007/s12152-025-09620-6

[9] Organisation for Economic Co-operation and Development (OECD) (2019). Recommendation of the Council on Responsible Innovation in Neurotechnology. https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0457

[10] United Nations Education, Scientific, and Cultural Organisation (UNESCO) (2025). Recommendation on the Ethics of Neurotechnology. https://unesdoc.unesco.org/ark:/48223/pf0000394866

[11] United Nations Human Rights Council (UNHRC) (2025). A/HRC/58/58: Foundations and principles for the regulation of neurotechnologies and the processing of neurodata from the perspective of the right to privacy - Report of the Special Rapporteur on the right to privacy, Ana Brian Nougrères. https://www.ohchr.org/en/documents/thematic-reports/ahrc5858-foundations-and-principles-regulation-neurotechnologies-and

[12] United Nations Human Rights Council (UNHRC) (2025). Guidelines for applying the existing human rights framework to neurotechnology. https://www.ohchr.org/en/hr-bodies/hrc/advisory-committee/human-rights-guidelines-neurotechnology

**Different approaches are manifesting across the world**

Outside Europe, neurotechnology governance is advancing in distinctly different ways. In the Americas, several jurisdictions have moved rapidly on neuro-specific protections: Chile has enshrined neurorights in its constitution[13], while US states such as California[14] and Colorado[15] have explicitly included neural data in privacy law. At the US federal level, the proposed MIND Act of 2025 would direct the Federal Trade Commission to investigate how neural data should be governed, identify regulatory gaps, and report on high-risk uses ranging from AI-driven manipulation to discrimination and national-security threats[16]. By contrast, both the EU and China still rely more heavily on broader, tech-neutral frameworks rather than dedicated neurotechnology law.[17] China's approach is overtly strategic-industrial: the recently announced BCI roadmap to 2030 focuses above all on breakthroughs, scale, and global leadership rather than drawing clear regulatory lines.[18] In that sense, Europe risks being caught between two models — neuro-specific protections in parts of the Americas, and state-backed industrial acceleration in China — unless it develops a clearer strategic and regulatory approach of its own.

**European policy action on neurotechnology has been lacking**

In Europe, the 2023 León Declaration on European neurotechnology signalled political recognition at Member State level that neurotechnology should be developed through a human-centric, rights-oriented, and transparent approach,[19] while the European Brain Council's Charter for the Responsible Development of Neurotechnologies added a bottom-up, multi-stakeholder framework, aimed at guiding policy, business practices and investments across the European neurotechnology

[13] Do, B., Badillo, M., Cantz, R., Spivack, J. (2024). Privacy and the Rise of "Neurorights" in Latin America. Future of Privacy Forum. https://fpf.org/blog/privacy-and-the-rise-of-neurorights-in-latin-america/
[14] Moens, J. (2024). California Passes Law Protecting Consumer Brain Data. New York Times. https://www.nytimes.com/2024/09/29/science/california-neurorights-tech-law.html
[15] Goth, B. (2022). Colorado Protects Brain Wave Privacy With First Neurodata Law. Bloomberg Government, 2022. https://news.bgov.com/states-of-play/colorado-protects-brain-wave-privacy-with-first-neurodata-law
[16] U.S. Senate Committee on Commerce, Science, and Transportation (2025). Press release: Sens. Cantwell, Schumer, Markey Introduce Legislation to Shield Americans' Brain Data From Exploitation. https://www.commerce.senate.gov/2025/9/sens-cantwell-schumer-markey-introduce-legislation-to-shield-americans-brain-data-from-exploitation
[17] Wei, B., Cheng, S., Feng, Y. (2025). Neural personal information and its legal protection: evidence from China. Journal of Law and Bioethics 12(1). https://academic.oup.com/jlb/article/12/1/lsaf006/8113730
[18] Chinese Government (2027). Press release: China aims to achieve breakthroughs in brain-computer interface technology by 2027. https://english.www.gov.cn/news/202508/07/content_WS6894aab8c6d0868f4e8f4b24.html
[19] Spanish Presidency of the Council of the European Union (2023). Leon Declaration on European Neurotechnology: A Human-Centric and Rights-Oriented Approach. https://web.archive.org/web/20240422015711/https://spanish-presidency.consilium.europa.eu/media/o4rh53jr/le%C3%B3n-declaration.pdf

ecosystem.[20] When it comes to policy action by the EU Institutions, however, momentum has thus far been thin.

On the industrial front, the EU has made recent commitments to boost the broader life sciences sector through the European Life Sciences Strategy, which aims to position the EU as the world's most attractive place for life sciences by 2030.[21] Key flagship initiatives include the Biotech Act (a regulation intended to strengthen the Union's biotechnology and biomanufacturing sectors), an EU investment plan to facilitate multi-country clinical trials, a matchmaking interface connecting startups, industry and investors, €300 million to stimulate the procurement of life-science innovation, and a Life Science Coordination Group to align policy and funding across sectors. Neurotechnology clearly sits within this broader policy movement, particularly where it relates to brain health, clinical innovation, and advanced bioengineering. However, its specific opportunities and risks are not fully captured by a general life sciences strategy: neurotechnology also raises distinct questions around mental privacy, data governance, human rights, consumer applications, and human–machine interaction.

In regulatory terms, the European Union already has a broad toolkit relevant to neurotechnology, spanning data protection, AI, product safety, consumer protection, cybersecurity, health data, and medical devices. Yet this framework remains fragmented and largely indirect, with almost no neuro-specific rules. Much depends on how existing tech-neutral laws are interpreted and enforced in particular use cases, including unresolved questions around the status of neural data and the boundary between consumer and medical devices. This creates uncertainty for innovators, uneven protection for users, and blind spots for regulators. Europe is therefore relatively strong in overall governance capacity, but still lacks a sufficiently clear, cohesive, and future-ready framework tailored to the converging realities of neurotechnology.

## What we recommend: an EU strategy on neurotechnology

The European Union, with its major scientific strengths and substantial market position, is well-positioned to become an international leader in the responsible development and governance of neurotechnology. However, it still lacks a joined-up strategy capable of aligning innovation, rights protection, and public trust, to shape a field whose technological and geopolitical momentum is accelerating.

[20] European Brain Council (2025). European Charter for the Responsible Development of Neurotechnologies. https://www.braincouncil.eu/european-charter-for-the-responsible-development-of-neurotechnologies/
[21] European Union (2025). Press release: Making Europe a global leader in life sciences. https://commission.europa.eu/news-and-media/news/making-europe-global-leader-life-sciences-2025-07-02_en

Setting a clear neurotechnology strategy now would allow Europe not only to safeguard its market position and competitiveness, but also to steer the development of neurotechnology in line with its values and long-term societal priorities – mitigating crucial ethical concerns around its development.

An EU Neurotech Strategy would have the following objectives:

1. Fostering a transparent, trustworthy and competitive European neurotechnology ecosystem that strengthen public and investor confidence by embedding ethical governance
2. Direct public investment and innovation incentives towards unmet medical needs and neurotechnologies delivering demonstrable societal benefit
3. Enable a shift towards prevention, early detection and monitoring of brain disorders by ensuring that neurotechnology development serves brain health across the life course, including in underserved populations and geographies
4. Create clear, proportionate and future-ready governance frameworks (particularly for converging and borderline applications) that address gaps and grey areas current EU law leaves unresolved
5. Strengthen Europe's strategic leadership in neurotechnology by building the interdisciplinary talent, standards and coordination infrastructure the field requires
6. Protect individual, communities and vulnerable populations from abuse, manipulation and misuse of neurotechnology and safeguard their rights to mental privacy, cognitive liberty and informed consent

To achieve these objectives, Europe needs more than isolated regulatory fixes or ad hoc support measures; it needs to align innovation, public oversight, and societal trust. The three pillars below set out how the EU can build a stronger neurotechnology ecosystem, create clearer and more cohesive governance, and ensure that development of the field remains publicly accountable and socially legitimate. They build on CFG's work to date, as well as wider European efforts including the European Brain Council's Charter for the Responsible Development of Neurotechnologies[22], which provides a crucial foundation for EU-level coordination and action. They are not necessarily comprehensive nor prescriptive – they are intended to spur deliberation and debate.

[22] European Brain Council (2025). European Charter for the Responsible Development of Neurotechnologies. https://www.braincouncil.eu/european-charter-for-the-responsible-development-of-neurotechnologies/

## Pillar 1: Optimising the funding ecosystem for responsible neurotechnology development

If Europe wants to lead in neurotechnology, it must build an ecosystem capable of carrying discoveries from the laboratory to validation, adoption, and successful scaling. Neurotechnology thrives at the intersection of neuroscience, engineering, data science, artificial intelligence, clinical medicine, behavioural science, and materials science — it depends on close coordination across disciplines and stages of development. Europe has significant scientific strength, but lacks strategic alignment across funding, translation, and uptake.

**Investing in foundational neuroscience research with ethics embedded by design**

Neurotechnology depends on a deep mechanistic understanding of brain circuits, neural dynamics, cognition, and behaviour. The first priority is therefore strategic investment in foundational neuroscience research, particularly in areas such as high-resolution spatio-temporal mapping and connectomics. At the same time, public financial support should be directed towards technologies that address unmet medical needs and deliver the greatest social value, including in prevention, diagnosis, treatment, rehabilitation, and severe disability. Responsible innovation should not be treated as an afterthought: ethical oversight, equity, and patient-centred design need to be built into the funding ecosystem from the outset.

**Establish a Neurotechnology Funding Board**

Neurotechnology's long development cycles — from discovery to prototype, validation, and clinical deployment — do not fit comfortably within generic funding models, which often leave the field stranded in the high-risk phases between early research and market take-up. Rather than creating a single standalone fund, a dedicated Neurotechnology Funding Board could help close this "valley of death" by coordinating multiphase funding, shaping both horizontal and domain-specific calls, and ensuring that neurotechnology is better served across programmes such as Horizon Europe and relevant public-private partnerships. In parallel, it could support pooled reimbursement and procurement approaches among willing Member States, helping innovative solutions scale while improving access across Europe.

**Launch a Neurotechnology Medicine Platform**

Third, Europe should launch a Neurotechnology Medicine Platform to support collaboration before firms compete directly on the market, through a shared infrastructure where research groups, start-ups, industry, clinicians, and public actors can work together on core components, interoperable systems, and early feasibility testing. A platform of this kind would reduce duplication, share risk, and accelerate progress by creating validated building blocks for future therapies. It should also serve as a

space for regulatory learning, multistakeholder engagement, and the integration of patient and citizen perspectives, helping ensure that innovation is not only faster, but also safer, more relevant, and more socially grounded.

**Create a Hub of Hubs**

Finally, the EU should connect emerging centres of excellence through a Hub of Hubs model that links innovators to real-world testing, validation, and scale-up finance. Europe already has strong neurotechnology clusters, but they remain too dispersed. A Hub of Hubs would act as the ecosystem's coordination layer, connecting disciplines, aligning standards and data models, and creating a clearer pipeline from early discovery to prototyping, validation, and deployment. This model would mirror successful approaches used in fields such as oncology, AI, quantum technologies, and advanced materials, while being tailored to the specific challenges and opportunities of the brain space.

## Pillar 2: A clear and cohesive regulatory framework

As noted above, Europe already regulates many parts of neurotechnology indirectly, but through a fragmented framework that remains difficult to navigate and uneven in its application. This matters not only for patient and consumer protection, but also for competitiveness: fragmentation and ambiguity create blind spots for regulators, uneven protection for users, and insecure and costly compliance pathways for innovators. An EU Neurotech Strategy should therefore improve the existing framework to make it clearer, more coordinated, and more future-ready, enshrining respect for human rights at its core. This should begin by translating the current patchwork of relevant laws into a more legible framework for companies, regulators, and users. This should be supported by an inter-DG task force within the Commission to stress-test existing legislation against emerging neurotechnology use cases and identify where clarification, guidance, or targeted reform is needed.

**Establish clear safeguards for brain data**

A first priority within this broader effort is safeguarding brain data, and thus mental privacy. Neural data is exceptionally sensitive: beyond revealing health status or identity, it can allow inferences about attention, emotions, intentions, preferences, and potentially thoughts. Yet under the GDPR its legal status remains unclear. In some cases it may qualify as health or biometric data, but in many non-medical contexts it may not benefit from the heightened protection granted to special-category data. The result is a protection gap precisely as consumer neurotechnology becomes more accessible and capable. A targeted amendment to Articles 4 and 9 GDPR would help close that gap, reduce legal uncertainty, and better align the GDPR with the AI Act. Whether this is done by clarifying biometric data, extending protection to mental-state inferences, or explicitly recognising brain data as a special

category, the principle should be clear: data that can intrude into the intimate mental sphere deserves enhanced protection under EU law.[23]

**Clarify the regulatory grey zone between medical and consumer devices**

A second priority is resolving the regulatory grey zone between consumer wellness tools and medical devices. As CFG has documented, many consumer wellness devices use similar technologies and process similar forms of physiological, psychological, or neurophysiological data as medical devices, while avoiding medical claims and therefore falling outside the Medical Devices Regulation. Applying the MDR wholesale to this space would be disproportionate, but leaving the sector in regulatory limbo is equally unsustainable. Europe should therefore create a new, proportionate framework for wellness devices, which should include five core elements:

1. An EU-level oversight mandate for the wellness devices market, to avoid fragmentation and coordinate market surveillance.
2. Mandatory labelling and transparency standards covering efficacy, safety, data governance, and ethical design; the EBC's Seal of Responsible Neurotechnologies - a voluntary, independently verified ethical label operationalising the Charter's principles - could serve as a reference standard for such labelling.[24]
3. Support for compliance through practical guidance, model documentation, and regulatory sandboxes.
4. Clearer and stricter rules on marketing and health-adjacent claims.
5. Infrastructure for interoperability with healthcare systems, for instance via the European Health Data Space.

Taken together, these measures would not only improve consumer protection, but also give responsible companies a more credible and predictable route to market, as well as provide a novel source of data for research and clinical purposes. In a field evolving as quickly as neurotechnology, regulatory coherence is one of the conditions for trustworthy industry growth.

[23] This recommendation was formulated by the European Expert Group on Human Rights and Emerging Technologies, in a letter addressed to the European Commission in the context of the Digital Omnibus. CFG co-signed this letter, which is available here.
[24] European Brain Council (2026). Press release: EBC Introduces the Seal of Responsible Neurotechnologies. https://www.braincouncil.eu/ebc-seal-of-responsible-neurotechnologies/

## Pillar 3: Building public trust and inclusive stakeholder engagement throughout the neurotech life cycle

Neurotechnologies touch on some of the most sensitive and intimate aspects of being human: cognition, behaviour, health, privacy, and autonomy, among others. Their development must therefore be shaped through meaningful and sustained engagement with the people and communities they affect. Europe should complement investment and regulation with structures that embed patients, users, developers, researchers, civil society, and citizens across the neurotechnology life cycle, from research and design to standards, regulation, deployment, and post-market oversight. As CFG's earlier work argues, this kind of inclusion is central to anticipatory governance: it helps identify risks, ethical concerns, and societal impacts earlier, and supports technologies and policies that are more socially robust and more readily accepted.

**Systematically include patients and users in neurotechnology development**

The EU should promote the systematic inclusion of patient and user perspectives in neurotechnology research, clinical trial design, device development, standards-setting, and regulatory processes. Particular attention should be paid to voices that remain underrepresented in current governance debates, especially people with lived experience and technology developers themselves. Early and equitable engagement can help ensure that neurotechnology is shaped not only by abstract principle, but by real-world needs, practical constraints, and the values of those most directly affected.

**Create enduring dialogue mechanisms for policy learning and oversight**

In parallel, the EU should support durable multi-stakeholder platforms for dialogue at European level, alongside more focused thematic networks in key domains of neurotechnology. These structures should help translate social concerns into better policy, better design, and more legitimate oversight. In a field as fast-moving and contested as neurotechnology, more dialogic formats — such as citizen deliberation, foresight exercises, shared decision-making, and co-creation spaces — are likely to be more productive than one-way consultation alone. Europe already has participatory tools that could be adapted to this purpose, from citizen panels and stakeholder consultations to more targeted forms of strategic foresight and co-creation. The challenge is to use them deliberately and consistently in ways tailored to the specific ethical and conceptual complexities of neurotechnology.[25]

**Seeking consistent feedback for market surveillance and policy monitoring**

This participatory approach should also continue after policy is adopted. Public and stakeholder engagement can help monitor implementation, stress-test governance frameworks, and guide reform

[25] Our 2024 report, "Towards inclusive EU governance of neurotechnologies" provides resources towards this..

as neurotechnologies and their uses evolve. Just as importantly, participatory processes must be made visible and accountable: stakeholder input should not disappear into a black box, but be reflected in public reporting that shows how consultation has shaped policy choices. In a field marked by ambiguity, hype, and rapidly shifting boundaries, such transparency is essential for maintaining trust in both governance and the market.

**Developing a shared lexicon and understanding**

Finally, Europe should invest in the human infrastructure needed to govern and develop neurotechnology responsibly. This includes targeted education efforts and opportunities for exchange between policymakers, regulators, and practitioners, as well as initiatives to attract and connect interdisciplinary talent. It also includes support for a more responsible public conversation about neurotechnology itself. CFG's work stresses that framing and language matter: concepts such as "mind-reading", "brain chips", "enhancement", or even "invasive" and "non-invasive" can shape expectations, fears, and policy outcomes in powerful ways. Europe should therefore combine public education with efforts to improve conceptual clarity, including the participatory development of a more common neurotechnology lexicon. A European Neurotechnology Academy, alongside a neurotechnology-focused strand within broader scientific talent programmes, could help ensure that Europe remains capable not only of advancing this field, but of scrutinising, communicating, and steering it on its own terms.

# Conclusion

Europe has a window to shape neurotechnology before market momentum, geopolitical competition, and regulatory fragmentation harden into path dependency. An EU Neurotech Strategy would help ensure that Europe does not have to choose between strong innovation and robust safeguards, but can build the conditions for both together: scientific leadership, trustworthy governance, and public confidence in a field that will increasingly shape health, industry, and society.