chemical watch news & insight

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Helsinki Chemicals Forum

Stakeholder views on hot topics in chemicals safety and sustainability

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International think-tank

Welcome to this report on the debates held at the Helsinki Chemicals Forum. The conference was run as a hybrid event, with delegates able to attend in person or join virtually.

This year, 207 delegates from 18 countries participated in the Forum discussions on five main themes:

- Aligning battery and recycling regulations to maximise the reuse of critical materials
- How can the chemicals industry help resolve the economic and triple environmental crises?
- Stimulating substitution by regulatory and non-regulatory instruments
- The role of the Science-Policy Panel in making the Global Framework on Chemicals (GFC) a success
- Challenges to implement the Commission's roadmap to end animal testing

This report, prepared by Enhesa's Chemical Watch News & Insight, aims to provide a balanced and accessible reflection of two days of debate to further understanding. We have not taken sides or judged comments on their accuracy, veracity or fairness.

This is not a formal report because the forum is not an official session and its conclusions do not represent a consensus. Instead, the report offers a reference point for policymakers, companies, academics and others – presenting the voices of those in the room at this important global gathering.

Leigh Stringer

Managing Editor, Europe, Chemical Watch News & Insight by Enhesa

Keynote 1: Competitiveness, resilience and the future of Europe's chemical industry

Kristin Schreiber, Director, Chemicals, Bioeconomy and Retail, DG GROW, European Commission

Europe's industries are operating at a pivotal moment, facing sustained pressure from high energy costs, intensifying global competition and growing geopolitical instability. These challenges have been compounded by renewed disruption to energy markets and global value chains, most recently linked to developments in the Middle East. According to the Commission, these pressures reflect deeper structural shifts rather than temporary shocks, placing competitiveness firmly at the centre of the EU's political agenda.

The chemical industry, described as the "industry of industries", sits at the foundation of Europe's industrial system but is experiencing an acute crisis. Despite being the EU's fourth-largest manufacturing sector, it has lost around 9% of its production capacity since 2022, with more than 20 major sites closing. Structurally higher energy feedstock costs, weak demand and accelerating international competition, combined with increasingly unfair trade practices, have eroded the European business case for investment, even as companies remain committed to the EU's ambitious path towards climate neutrality.

Resilience and fair competition

Schreiber highlighted regulatory complexity and cumulative administrative burdens as additional pressures, particularly for SMEs. These concerns fed into the Commission's adoption of a chemical industry action plan in July 2025, structured around four pillars: resilience and fair competition; energy decarbonisation and circularity; lead markets and innovation; and simplification.

A central instrument under this plan is the Critical Chemicals Alliance, launched in January this year. Bringing together member states, regions and the full value chain, the alliance aims to address capacity closures and unfair competition. Its priorities include identifying critical molecules and production sites, strengthening trade monitoring and defence, and supporting the modernisation of ageing industrial assets such as steam crackers, many of which were built for a very different energy and economic context.

Energy, circularity and lead markets

The transition to net zero, Schreiber stressed, must go hand in hand with competitive energy prices and a resilient manufacturing base. In the short term, this includes managing energy price volatility through joint gas purchasing, long-term contracts and implementation of the Affordable Energy Action Plan. In parallel, Europe must scale up affordable renewable electricity, accelerate grid expansion and develop infrastructure for low-carbon hydrogen and carbon management.

However, Schreiber warned that insufficient demand remains a major barrier to industrial transformation. Markets do not yet consistently reward low carbon and circular products made in Europe. To address this, the Commission is working to foster lead markets for sustainable chemicals, including through demand-side measures under the proposed Industrial Accelerator Act, while continuing to support innovation through Horizon Europe and new EU innovation and substitution hubs.

Simplification and investment

The keynote concluded with an emphasis on simplification, with the Commission committing to cut reporting obligations by 25% without weakening safety or consumer protection. Upcoming legislative packages aim to streamline chemicals legislation, including digital labelling and reduced administrative complexity.

Schreiber concluded that a strong chemical industry is essential for Europe's economic prosperity, underlining that investment must stay in – and come back to – Europe if the bloc is to secure its industrial future.

Keynote 2: Maintaining high protection while restoring confidence in EU chemicals regulation

Paul Speight, Head of Unit, Safe and Sustainable Chemicals, DG Environment, European Commission

Looking ahead to the future of EU chemicals regulation requires first taking stock of where the system stands today. Speight argued that, despite some criticism, the EU's regulatory framework – anchored in REACH and CLP – continues to deliver one of the highest levels of chemical protection globally.

While other jurisdictions are catching up, recent policy initiatives, including the 'one substance, one assessment' package and sector-specific updates to legislation on batteries, detergents, packaging and waste, have further modernised the system.

He noted that the day-to-day management of REACH, coupled with the one-substance approach, is proving to be a relatively cost-effective tool for managing regulatory review. However, the challenges facing the EU chemicals regulatory system today extend beyond legislative design and increasingly reflect broader shifts in Europe's competitive position.

Competitiveness, enforcement and substitution

A central concern is the weakened competitiveness of EU industry, driven by energy costs and trade pressures, which has reduced confidence in the sector's ability to absorb further regulatory demands. At the same time, changes in consumer behaviour – most notably the sharp increase in direct purchases from outside the EU – have created growing enforcement challenges. Products entering the EU via online platforms may not comply with EU chemical rules, undermining both consumer safety and the level playing field for EU producers.

Persistent regulatory bottlenecks were also highlighted. Slow progress on substitution, delays in restrictions and authorisations, and unresolved issues such as PFAS have led to mounting frustration among policymakers. This has, in turn, encouraged the use of non-chemicals legislation to address chemical risks, adding complexity and unpredictability for downstream users. Instead of clear regulatory pathways, companies are often forced into repeated reformulation without long-term clarity.

Science, trust and policy coherence

Speight emphasised that the credibility of the EU system depends on trust in its scientific risk assessment processes. While there is strong political sensitivity around chemical risks, particularly to human health, mistrust between stakeholders has complicated discussions on the future of REACH. Nevertheless, member states have generally resisted lowering protection standards, and consensus remains possible in areas such as reducing animal testing and improving enforcement.

Achieving better coordination across chemicals legislation was identified as a priority, particularly for downstream users. While the 'one substance, one assessment' framework offers clear potential benefits, significant work remains to ensure effective data sharing, predictable workflows and transparent communication. Trade-offs between simplification for upstream producers and information needs for downstream users and recyclers will need careful management.

Towards a dynamic regulatory framework

Speight stressed that maintaining high levels of protection alone will not be sufficient to secure Europe's industrial future. Defensive regulatory strategies aimed solely at cost reduction are unlikely to restore competitiveness, given enduring differences in energy and labour costs compared with the US and China. Instead, the EU needs a more dynamic regulatory approach – one that encourages innovation, supports decarbonisation and circularity, and aligns chemicals policy with broader industrial and competitiveness tools.

Only by integrating regulatory reform with wider policy initiatives can the EU create a forward-looking framework that protects health and the environment while enabling its chemical industry to invest and thrive in Europe.

Keynote 3: Delivering chemical safety through science, collaboration and implementation

Sharon McGuinness, Executive Director, ECHA

While wider EU policy debates continue to evolve, Sharon McGuinness emphasised that ECHA's core responsibility remains the delivery and implementation of existing and incoming chemicals legislation. Reflecting on the agency's strategy for 2024–28, she set out ECHA's guiding vision of chemical safety delivered through science, collaboration and knowledge – principles described as increasingly critical as both the regulatory landscape and external pressures change.

At the heart of the agency's mission is trust, she said. ECHA's role is to provide independent, transparent and high-quality scientific opinions and decisions that inform policymakers, rather than to set policy itself. This is achieved through optimal use of the extensive data, expertise and knowledge accumulated over nearly two decades of REACH implementation, as well as close cooperation with the European Commission, member state authorities and other EU agencies.

Growing mandate and implementation challenges

Since its establishment, ECHA's mandate has continually expanded – a development that showcases the continued confidence in the agency's work, McGuinness said. Since 2024 alone, new responsibilities have arrived via legislation on batteries, industrial emissions, packaging and packaging waste, alongside a substantial workload under the 'one substance, one assessment' initiative. Further tasks linked to water legislation, medical devices, toy safety, detergents and end-of-life vehicles are expected to follow.

This widening scope increasingly shifts ECHA's focus downstream – from individual substances and mixtures to chemicals in specific articles such as packaging, toys and batteries. As a result, engagement with member state authorities has broadened significantly, involving a far wider range of competent bodies, ministries and sectors than under traditional REACH and CLP structures.

Science, credibility and stakeholder confidence

Responding to concerns around large-scale restrictions, McGuinness underlined that ECHA does not "plan" regulatory outcomes. Its role is to conduct scientific hazard and risk assessments and provide technical opinions for political decision-makers. Science, she argued, remains the agency's non-negotiable foundation, particularly at a time when scientific evidence can be contested or politicised.

Ensuring that processes are rigorous, consistent and transparent is therefore central to maintaining confidence in regulatory outcomes – even where stakeholders may disagree with the conclusions. Protecting human health and the environment remains the agency's primary legal obligation, regardless of shifts in the competitiveness or simplification agenda.

Future-ready systems and coordination

To meet future demands, ECHA is investing in modernising its systems and internal capabilities. Rather than maintaining legislation-specific IT tools, the agency is moving towards modular, interoperable platforms capable of supporting the full spectrum of EU chemicals legislation. A recent organisational restructuring was presented as a key step in ensuring readiness for upcoming challenges and opportunities.

The 'one substance, one assessment' package was highlighted as particularly transformative, with its focus on shared data, stronger inter-agency cooperation and reduced duplication of scientific work. While political agreement has been reached, McGuinness cautioned that significant implementation work remains to fully realise its benefits.

Balancing policy objectives

McGuinness argued that chemicals safety, competitiveness and simplification need not be mutually exclusive. A science-based, coordinated and future-ready regulatory system can support innovation, decarbonisation and circularity while continuing to deliver high levels of protection. ECHA's task is to ensure that this balance is achieved through credible implementation, robust science and sustained collaboration across Europe's regulatory ecosystem.

Keynote 4: Systems thinking and innovation in addressing the triple planetary crisis

Meredith Williams, Former Director of the California Department of Toxic Substances Control (DTSC)

Williams opened with a reminder of how chemical risks manifest across borders and ecosystems, illustrated by the decline of Swainson's hawks in the Americas. Scientists eventually traced the collapse of the population to the pesticide monocrotophos, banned in the US but still in use in parts of South America at the time. International scientific collaboration led to restrictions and a partial recovery, demonstrating both the global nature of chemical risks and the value of coordinated action.

Williams argued that policy and science often rely on assumptions that make complex problems easier to solve but fail to fully reflect reality. Addressing today's environmental challenges requires moving beyond linear thinking towards systems-based approaches that recognise interconnections, challenge assumptions and account for real-world complexity.

The triple planetary crisis

Williams stressed that the biodiversity, climate and chemical pollution crises are no longer abstract concepts. Evidence points to dramatic declines in insect populations, the loss of billions of birds in North America, accelerating climate impacts such as droughts, heatwaves and wildfires, and growing concern that humanity has exceeded the planetary boundary for chemical pollution. Together, these trends underline the urgency of addressing all three crises simultaneously rather than in isolation.

Against this backdrop, the EU was presented as relatively well positioned, with long-term strategies and roadmaps such as the Chemicals Strategy for Sustainability (CSS), the Circular Economy Action Plan and the Biodiversity Strategy providing clear objectives and metrics for progress. Measures on pesticides, fertilisers and safer feedstocks were cited as examples of how chemicals policy can directly support biodiversity and climate goals, even if current ambitions are unlikely to be sufficient on their own.

Legacy risks and unintended consequences

She also warned that transitions can create new environmental risks if not carefully managed. A case study from California illustrated how historic contamination from lead-acid battery production continues to impose long-term costs on communities, while more recent lithium-ion battery fires have introduced new pollution risks. Moving away from hazardous technologies, Williams cautioned, does not automatically eliminate environmental harm without systemic planning and safeguards.

Innovation, investment and disruption

Responding to the scale of the challenge, Williams argued that incremental change will not be enough. Systemic transformation will require disruptive technologies, significant investment and collaboration across sectors, even where this challenges established market positions. Historical experience suggests that companies investing during downturns often emerge stronger, yet capital continues to flow more readily into digital consumer services than into green and sustainable chemistry.

Advances in toxicology, alternative testing methods and artificial intelligence were highlighted as opportunities to accelerate safer chemical innovation, provided ecological endpoints and long-term impacts are adequately addressed. Williams questioned whether new investment mechanisms could help ensure that future chemical solutions genuinely deliver safe and sustainable chemistry rather than replicating existing problems.

A call for holistic thinking

She concluded with a challenge to participants not to focus solely on regulatory "nuts and bolts", but to periodically step back and consider the bigger picture. If the biodiversity, climate and chemical pollution challenges are truly a crises, Williams argued, they demand integrated, cross-boundary thinking and long-term vision. Conferences such as the HCF, she suggested, provide an opportunity to bring together diverse perspectives and rethink how Europe approaches the transformation of its chemicals system.

PANEL 1
Aligning battery & recycling regulations to maximize the reuse of critical materials

Context

Battery circularity hinges on keeping critical and strategic raw materials in the economy through reuse, high-quality recycling and recovery. Key issues include aligning battery and waste-battery rules with guidance for recyclers, preventing unfair competition in secondary raw materials markets, and raising transparency and traceability expectations across global value chains.

Moderator: Raymond Ng, Director EU, ChemLinked and REACH24H

Panelists:

- Alexander Wielgos, Policy Officer, European Commission (DG ENV), Circular Economy & Secondary Raw Materials Unit
- James Watson, Director General, European Metals
- Ilka von Dalwigk, Director General, Recharge
- Päivi Kinnunen, Research Professor, Industrial chemistry, VTT

Overall focus

The panel examined how Europe can build a competitive, circular battery value chain, balancing industrial competitiveness, environmental protection and strategic autonomy. Speakers broadly agreed that Europe has the technology and expertise required, but progress is constrained by slow implementation, regulatory fragmentation and slow permitting and investment decisions.

Batteries as a cornerstone of Europe's transition

Batteries are essential to achieving Europe's energy transition, enabling renewable energy storage, electrified transport, digitalisation, and defence. Several speakers highlighted that as Europe moves away from fossil fuels, secure access to battery materials becomes increasingly important for the future of electrification and some even referred to the emergence of an "age of metals".

Value-chain approach and critical raw materials

It is essential to develop a complete European battery value chain – from raw material extraction and refining through to manufacturing and recycling. While recycling capacity exists, gaps remain, particularly in downstream refining. Europe is still overly dependent on imported battery materials, undermining resilience and strategic autonomy.

Black mass leakage and material exports

Black mass is the dark, powdery material produced when end-of-life lithium-ion batteries are shredded and mechanically processed. It contains a concentrated mix of valuable metals, including lithium, cobalt, nickel, manganese and copper, making it the critical intermediate product in battery recycling.

A recurring concern was the export of black mass and other recyclable materials outside the EU, where higher prices are offered. Panelists warned that this practice undermines circularity, wastes subsidised European energy and investment, and forces Europe to reimport finished materials. There was broad support for more coherent and effective controls on waste exports.

Regulation – ambition versus delivery

The EU Battery Regulation was widely praised as a pioneering, lifecycle-based regulatory framework and a model for future product regulation.

However, speakers highlighted problems with uneven implementation, fragmented national rules, delays in permitting, and slow rollout of supporting measures such as carbon footprint methodologies. Ensuring coherence between battery, waste, industrial and trade policies was seen as essential.

Permitting, speed and investment gaps

Industry representatives warned that inconsistent and lengthy permitting procedures are delaying viable projects.

Europe's public funding was repeatedly compared unfavourably with the US, with concerns that slow and limited financial support risks Europe losing ground competitively.

Recycling challenges and technology development

Technologically, high recycling efficiencies are achievable, but economic viability remains challenging – especially for newer battery chemistries with lower metal value. Many European facilities stop at mechanical processing and lack refining capacity.

Research speakers highlighted opportunities for integrated recycling technologies and closer links between mining, refining and recycling.

Design, digitalisation and innovation

Several speakers pointed out that many batteries and electric vehicles are not designed for recycling. Digitalisation and AI were identified as major opportunities to improve sorting, safety and efficiency.

Circularity and innovation were framed as areas where Europe could lead globally.

Trade-offs and policy balance

The panel broadly rejected the idea that Europe must choose between environmental protection, competitiveness and speed. Instead, speakers called for pragmatic, science-based regulation that evolves with technological progress while maintaining high environmental standards.

Key takeaways

- Europe has the technology and ambition to build a circular battery ecosystem but struggles with delivery
- Keeping recyclable materials within Europe is essential for competitiveness and strategic autonomy
- Faster permitting, greater investment and stronger policy coherence are critical
- The Battery Regulation provides a strong foundation but must be aligned with industrial, waste and trade policies
- A shared EU-wide vision for the battery value chain is urgently needed

PANEL 2
How can the chemicals industry help resolve the economic and triple environmental crises?

Context

Europe's chemicals industry is facing a convergence of economic pressure and systemic environmental challenges. High energy costs, overcapacity in global markets and lacking investment threaten Europe's industrial base at the same time as the sector is expected to deliver solutions to climate change, pollution and biodiversity loss. This panel explored whether these objectives can be reconciled – and what kind of industrial, regulatory and investment framework is required to deliver a genuine "triple win" for competitiveness, climate and environmental protection.

Moderator: Leigh Stringer, Managing Editor, Europe, Chemical Watch News & Insight

Panelists:

- Kristin Schreiber, Director, Chemicals, Bioeconomy and Retail, DG GROW, European Commission
- Ralf Schulz, Global Head of Industry Transformation Strategy, Sika / representing FEICA
- Joel Tickner, Professor of Public Health, University of Massachusetts Lowell
- Tatiana Santos, Head of Chemicals Policy, European Environmental Bureau (online)

Overall focus

The panel examined whether Europe's chemicals sector can remain globally competitive while fundamentally moving away from fossil-based, hazardous and polluting production models. Speakers agreed that incremental change will not be sufficient but differed on how fast transformation can realistically be delivered, how much regulatory reform is needed, and how to balance investment security with stronger environmental controls.

Crisis and opportunity in Europe's chemicals sector

Speakers broadly agreed that the chemicals industry is under acute pressure, with high energy prices, declining demand and global overcapacity – particularly in China – driving plant closures and investment losses in Europe. Several warned that continued erosion of upstream chemicals capacity risks hollowing out entire downstream value chains.

At the same time, the crisis was framed as a potential catalyst for transformation. Proponents of deeper reform argued that the industry's current structure, built around fossil feedstocks, commoditised molecules and price competition, has become a barrier to sustainability, innovation and resilience.

The 'triple win' challenge: competitiveness, climate and pollution

A central theme was whether Europe can achieve competitiveness, decarbonisation and toxic pollution reduction simultaneously, rather than treating these as trade-offs. The Commission representative argued that the EU's high health and environmental standards are a strategic asset, not a liability.

Others cautioned that unless environmental externalities such as toxicity and pollution are properly internalised, more sustainable chemistries will remain uncompetitive. Environmental representatives emphasised that chemical pollution contributes to multiple breached planetary boundaries and cannot be addressed through climate action alone.

Policy coherence and the role of regulation

Policy alignment emerged as a persistent concern. Speakers

pointed to overlapping frameworks – REACH, the Chemical Industry Action Plan, Circular Economy policies, bioeconomy strategies and trade instruments – that do not always operate coherently across the full value chain.

The Commission representative highlighted efforts to improve coordination through initiatives such as the Critical Chemicals Alliance, innovation and substitution hubs, permitting reforms and lead-market creation via public procurement. However, industry representatives warned that cumulative regulatory complexity is becoming a burden in itself, particularly for SMEs.

REACH: reform or enforcement first?

REACH was widely recognised as the world's most comprehensive chemicals regulation and a driver of innovation and trust. However, views diverged on its future. Industry representatives argued that opening REACH for a full revision would create years of uncertainty at a time when investment confidence is already fragile, urging a focus instead on simplification, secondary legislation and enforcement – especially for imports.

Environmental representatives countered that REACH has failed to prevent systemic chemical pollution, citing PFAS as a major example, and argued that delayed regulatory action is exacerbating long-term harm to human health and ecosystems. They called for urgent updates to reflect modern science and faster use of restrictions to address known risks.

Just weeks after the forum, European Environment Commissioner Jessika Roswall confirmed, after months of speculation, that the Commission is stepping back from its long-awaited revision of REACH.

Instead, the Commission will focus on "simplification and modernisation" measures adopted through comitology, she said, alongside a separate initiative to improve enforcement.

Technology neutrality, innovation and real-world performance

Downstream users stressed the importance of technology-neutral regulation, warning against prescribing technical solutions in legislation. Real-world examples were cited where recycling technologies already outperform regulatory assumptions – for instance, in handling adhesively bonded materials – highlighting the risk of locking in outdated policy debates.

Several speakers emphasised that innovation is occurring faster than regulatory cycles and that policy must enable, rather than constrain, adaptive solutions across product design, materials, processes and end-of-life management.

Incentives, markets and patient capital

There was broad agreement that regulation is key but alone cannot deliver transformation. The industry representative said regulation must "not become an end in itself", adding that it must be efficient, manageable and must serve its purpose.

Investors require regulatory predictability but also viable business cases for sustainable chemistry. Speakers highlighted the gap between pilot-scale innovation and market deployment, where many greener chemistries fail due to lack of demand or price competitiveness.

Proposed solutions included targeted subsidies, demand-side incentives, market-based instruments and mass-balance approaches to enable gradual transitions. Comparisons were drawn with renewable energy, where government de-risking and patient capital played a decisive role.

The role of SMEs was highlighted repeatedly, with several speakers noting that Europe's chemicals innovation ecosystem is dominated by smaller firms that often lack access to long-term capital but are critical to transformative change.

Investment security versus future-proofing

A recurring tension concerned whether protecting existing assets delays unavoidable change. Industry voices warned that losing production capacity in Europe could increase global emissions and weaken strategic autonomy. Environmental representatives argued that continued investment in fossil-based and hazardous chemistries risks stranded assets and worsens long-term economic and environmental outcomes.

Several speakers stressed that only investments aligned with fossil-free, non-toxic and circular production pathways will be future-proof and investable over the long term.

Key takeaways

- Europe's chemicals industry faces simultaneous economic, climate and pollution crises that cannot be solved in isolation
- Maintaining competitiveness while delivering deep transformation requires integrated policy, not incremental fixes
- REACH is broadly recognised as a strong framework, but disagreements persist over the timing and scope of reform
- Innovation and technology are outpacing regulation, reinforcing the case for technology-neutral, outcome-based rules
- Investment will only flow at scale if sustainable chemistry becomes a credible, de-risked business case across the value chain. A clear, time-bound transformation roadmap – supported by incentives, enforcement and market creation – is essential

PANEL 3
Stimulating substitution by regulatory and non-regulatory instruments

Context

Substituting hazardous substances is a cornerstone of Europe's chemicals policy, but progress remains uneven. While straightforward cases can be addressed through authorisation or restriction, many industrial uses involve technical complexity, long development cycles and legal constraints that make substitution far less clear-cut. This panel examined how regulators, industry, downstream users and civil society can move beyond case-by-case stalemate and make substitution work in practice at scale.

Moderator: Otto Linher, Senior Expert of the REACH Unit, DG GROW, European Commission

Panelists:

- René Korenromp, Policy Co-ordinator, Dutch Ministry of Infrastructure and water management
- Ian Cousins, Professor of Environmental Organic Chemistry, Stockholm University
- Theresa Kjell, Head of Chemicals Policy, ChemSec
- Charlene Wall-Warren, Director Environmental Technologies, Apple

Overall focus

The panel explored why substitution succeeds in some areas but stalls in others, focusing on complex industrial uses where alternatives are uncertain, performance-critical or constrained by regulatory frameworks. Speakers broadly agreed that strong regulatory signals remain a critical driver of substitution, but that regulation alone is insufficient. Progress also depends on better information, collaboration and market signals that make substitution viable and predictable.

Simple versus complex substitution cases

Speakers distinguished between relatively clear cases – where alternatives exist and performance requirements are well understood – and more complex situations involving industrial uses, niche applications or legally regulated products such as medicines. In these cases, substitution may depend on specific use conditions and quality requirements, results of testing and building up production capacities, or lengthy authorisation processes that can take years.

Regulators acknowledged that these complexities often lead to prolonged debates over individual use cases, making decision-making slow and resource-intensive, while increasing the risk of regulatory micromanagement.

Limits of regulation alone

There was strong consensus that traditional regulatory tools – such as authorisation and restriction under REACH – remain essential but cannot by themselves deliver substitution across thousands of substances and uses. Regulation can be costly, slow and struggles to keep pace with the volume of chemicals on the market.

Several speakers stressed that relying solely on regulatory action risks creating bottlenecks, particularly where knowledge gaps exist or where industries argue that alternatives are not yet technically or economically viable.

Safe and Sustainable by Design (SSbD) as a decision framework

SSbD emerged as a central concept, reframed not as an abstract sustainability label but as a practical decision-support framework. The key shift described was moving from systems focused

primarily on collecting hazard and risk data towards systems that actively support better choices by comparing alternatives and functions.

Rather than asking whether a substance is "safe enough", speakers argued the more relevant question is: what is the best available option today that provides the necessary performance – considering hazard, and lifecycle impacts? Determining the best available option requires dealing with trade-offs and uncertainties, as well as supply chain coordination/management, to assess the viability of solutions and future scalability.

Innovation and substitution hubs

A strong focus was on the role of innovation and substitution hubs as a complement to regulation. These hubs aim to:

- support companies with practical tools and guidance on substitution;
- facilitate information exchange across sectors and the supply chain;
- bring together regulators, industry, researchers and NGOs to analyse specific substance–use combinations; and
- identify where alternatives exist, where barriers remain and what is needed to move forward.

Speakers stressed that for hubs to be effective, they must be well-resourced, coordinated across member states, and clearly linked to regulatory endpoints rather than operating as voluntary "talking shops".

Lessons from PFAS: what works and where it gets difficult

PFAS was repeatedly cited as a useful but challenging case study. Strong regulatory pressure has driven a rapid phase-out in certain consumer applications, such as cosmetics and textiles, where alternatives have successfully entered the market. This success has helped narrow attention to a smaller set of technically demanding "essential" uses, such as semiconductors, lithium-ion batteries and certain medical applications.

However, these remaining uses illustrate key barriers:

- asymmetry of knowledge between users, regulators and researchers;
- limited transparency on formulations and performance needs;
- difficulty distinguishing genuine technical constraints from economic or contractual inertia; and
- lack of reliable data on alternatives, increasing the risk of regrettable substitution.

Emission control versus substitution

Some panelists criticised a growing reliance on emission control approaches for difficult cases, arguing these risk perpetuating use rather than driving innovation. Because persistent substances such as PFAS accumulate even at low emission levels, emission control was seen by many as a stop-gap rather than a credible long-term strategy.

Grouping substances for restriction, rather than regulating them one by one, was highlighted as an effective way to avoid cycling through structurally similar replacements.

Supply chain transparency and downstream leadership

Downstream users, particularly electronics manufacturers, emphasised their role in driving substitution through clear specifications, full material disclosure programmes and deep supply-chain engagement. Understanding where substances are used and why they are used was identified as a prerequisite for credible substitution.

Speakers highlighted pre-competitive collaboration as essential to overcome supply-chain inertia, share knowledge on alternatives, and align performance expectations so that safer chemistries can scale beyond niche products.

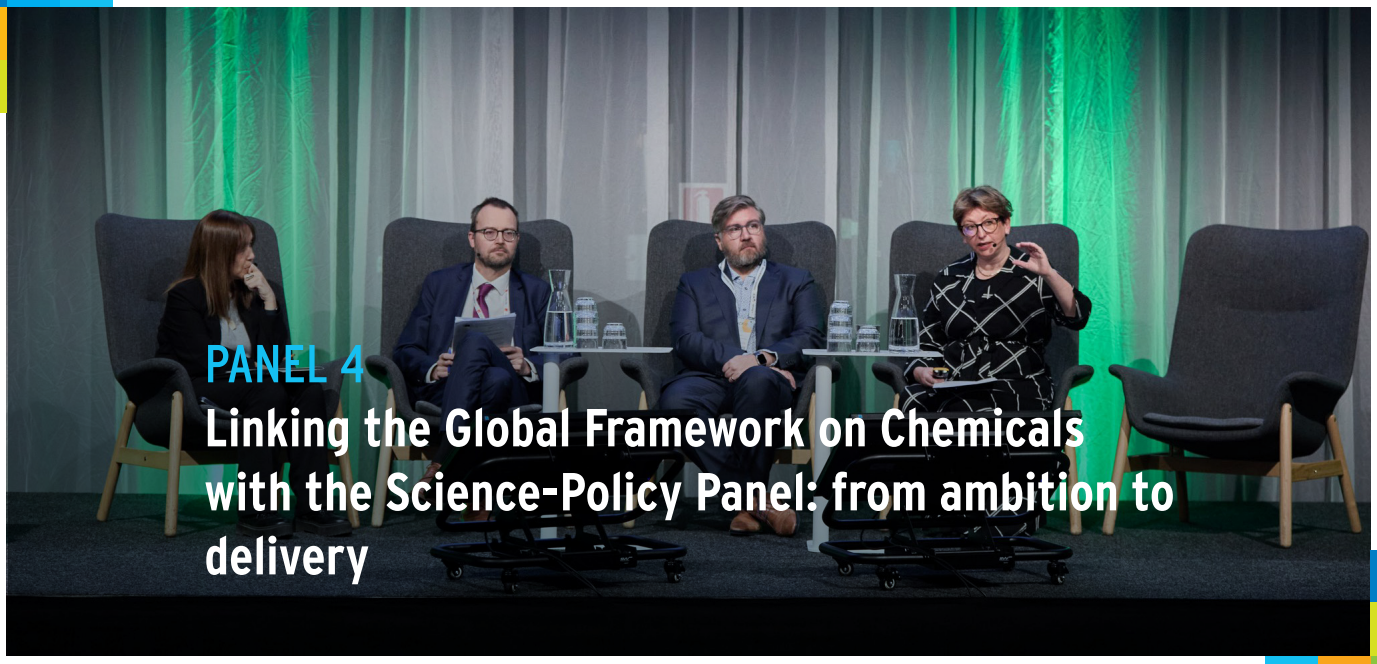
Markets, incentives and predictability

Across perspectives, a key message was that substitution accelerates when companies can see a future market. Regulation creates the "engine" by phasing out hazardous substances, but complementary measures – public procurement, investment support, innovation funding and harmonised criteria – are needed to bring alternatives to scale.

Without firm phase-out signals, speakers warned that investment in safer chemistry remains risky, fragmented and slow.

Key takeaways

- Substitution is straightforward in some cases but intrinsically complex in many industrial applications
- Regulation is indispensable but insufficient on its own to deliver substitution at scale
- Safe and Sustainable by Design can function as a practical decision-support framework, not just a policy slogan
- Innovation and substitution hubs can accelerate progress if clearly tied to regulatory outcomes and properly resourced
- PFAS demonstrates that strong regulatory signals drive innovation, while complex uses require deeper collaboration and transparency
- Markets for safer alternatives only emerge when phase-outs are predictable and credible across the single market



PANEL 4
Linking the Global Framework on Chemicals with the Science-Policy Panel: from ambition to delivery

Context

The global chemicals agenda is entering a new phase, with the Global Framework on Chemicals (GFC) and the Intergovernmental Science-Policy Panel on Chemicals, Waste and Pollution (ISP-CWP) now expected to operate in tandem. This panel examined how the two can reinforce each other in practice, particularly in supporting implementation in developing countries, addressing legacy and emerging issues, and translating scientific knowledge into effective global action.

Moderator: Jacqueline Alvarez, Chief, Chemicals Branch, UNEP

Panelists:

- Lamin Jaiteh, Registrar of Pesticides and Hazardous Chemicals, National Environment Agency, The Gambia (online)
- Paul Speight, Head of Unit, Safe & Sustainable Chemicals, DG Environment, European Commission
- Eric Rushton, Director, Toxicology and Risk Communication, LyondellBasell/ICCA
- Camilla Alexander-White, Senior Policy Advisor, Royal Society of Chemistry

Overall focus

The panel explored how the GFC and ISP-CWP can function as a coherent system rather than parallel processes. Speakers highlighted the need to align scientific assessment, horizon scanning and foresight with on-the-ground implementation, particularly in regions with limited regulatory capacity. The discussion underscored both the promise of the new institutional architecture and the practical challenges that must be addressed for it to deliver tangible benefits.

A shared architecture for planetary crises

Chemicals and pollution form one of three interlinked planetary crises, alongside climate change and biodiversity loss – each now supported by its own global framework and science-policy body. The ISP-CWP was positioned as a missing pillar, intended to strengthen the science–policy interface for chemicals and waste, much as IPCC and IPBES have done in their respective domains.

The central question was how the ISP-CWP can add value without duplicating existing mechanisms under conventions such as Stockholm, Rotterdam and Basel, or national and regional regulatory systems.

Mutual reinforcement: science informing policy, practice informing science

A recurring theme was the two-way relationship between the GFC and the ISP-CWP. Scientific assessments, foresight and horizon scanning produced by the ISP-CWP are expected to inform the prioritisation, refinement and tracking of GFC targets.

At the same time, implementation experience from GFC projects at national and regional level – particularly in developing countries – can help identify knowledge gaps and real-world challenges for the science-policy panel to address.

Speakers argued that success depends on treating these

frameworks as parts of a single system linking evidence, policy and action.

Implementation realities in developing countries

The perspective from The Gambia highlighted both progress and persistent challenges. Past and ongoing projects funded under predecessor programmes and the GFC – including work on asbestos inventories, PCB-containing transformers and pesticide management – have delivered concrete results, such as improved data, strengthened legislation and greater stakeholder awareness.

However, speakers stressed that demand for support far outstrips available funding. In the GFC's early funding rounds, only a small fraction of eligible project proposals could be supported, creating concern that ambition may not be matched by resources.

Capacity gaps and uneven starting points

Several panellists emphasised that weak institutional, technical and legal capacity remains a major barrier in many regions. Challenges include limited access to chemical information, insufficient analytical infrastructure, shortages of trained toxicologists and regulators, and difficulty enforcing existing rules, particularly on imports of hazardous chemicals.

There was strong agreement that capacity building must be needs-driven, long-term and embedded in national systems, rather than relying on short-term project cycles or one-off training initiatives.

Data, transparency and trust

Data availability and credibility emerged as a core cross-cutting issue. Developing countries in particular struggle with identifying chemicals in products, tracking hazardous substances across supply chains and accessing reliable safety data. At the same time, concerns were raised about asymmetries of information, confidentiality of industry data and public trust in regulatory decisions.

Industry speakers highlighted initiatives to improve transparency, such as global databases on plastic additives and efforts to make safety and sustainability data more accessible through recognised frameworks (OECD, GLP, mutual acceptance of data). Scientists and regulators stressed the need for clearer rules on data sharing, conflict-of-interest management and independent verification.

The role of the ISP-CWP: credibility over speed

From a scientific perspective, the ISP-CWP was described as a government-led but science-informed process, where legitimacy depends on transparent procedures, balanced participation and trust between scientists and policymakers.

Speakers warned that politicisation of science could undermine credibility, particularly if observer roles, conflict-of-interest rules and work programme priorities are not clearly defined.

There was broad consensus that the panel's early outputs should focus on well-scoped pilot topics, allowing the new structure to demonstrate value before tackling highly polarised issues.

Priorities and 'issues of concern'

The discussion highlighted the complexity of setting priorities. "Issues of concern" under the GFC include both legacy problems – such as lead paint, asbestos and PCBs – and those considered more emerging challenges, including PFAS, endocrine disruptors, pharmaceuticals, nanomaterials and e-waste.

Developing-country representatives stressed the urgency of addressing chemicals banned in developed countries but still produced and exported elsewhere, particularly pesticides. Others cautioned that the ISP-CWP should avoid becoming a venue for reopening entrenched political disputes and instead focus on areas where science can genuinely unblock decision-making.

Defining success for the ISP-CWP

Panelists were asked what success would look like in five years' time. Common expectations included:

- a well-respected, trusted panel producing policy-relevant assessments;
- efficient processes capable of delivering timely outputs;
- tangible influence on national and international decision-making; and
- improved coherence across the global chemicals governance ecosystem.

Several speakers stressed that success would ultimately be judged not by reports alone, but by whether governments, industry and regulators actively use the panel's outputs.

Key takeaways

- The GFC and ISP-CWP are intended to operate as a mutually reinforcing system linking science, policy and implementation
- Developing countries face acute capacity and funding constraints that threaten delivery of global ambitions
- Data availability, transparency and trust are core challenges across regions and stakeholder groups
- The ISP-CWP's credibility will depend on clear governance, balanced participation and disciplined prioritisation
- Early, well-chosen pilot topics are critical to demonstrating value and building confidence in the panel
- Success will be measured by real-world uptake of scientific outputs, not by assessments alone

PANEL 5
Implementing the roadmap to phase out animal testing in chemical safety assessments

Context

The EU has entered a decisive phase in its transition towards non-animal approaches for chemical safety assessment. The Commission's roadmap to phase out animal testing marks the first EU-wide effort to modernise safety assessment frameworks across multiple pieces of legislation. This panel examined how that transition can be delivered in practice, addressing regulatory readiness, scientific confidence, international alignment and the scale of change required in risk assessment methodologies.

Moderator: Patience Browne, Principal Administrator, Environmental Directorate, OECD

Panelists:

- Georg Streck, Policy Officer, REACH Unit, DG GROW, European Commission
- Ofelia Bercaru, Director for Regulatory Cooperation, Biocides and Water, ECHA
- Katia Lacasse, Cefic Senior Advisor Product Stewardship and Industry Co-Chair of the European Partnership on Alternative Approaches to Animal Testing (EPAA)
- Julia Pochat, Political Adviser, Chemicals Strategy, Eurogroup for Animals

Overall focus

Although the EU roadmap was not published at the time of the forum and specific details were not available, the panel explored what is needed to translate the roadmap from political commitment into operational change. Speakers agreed that replacing animal testing is not a question of method substitution alone, but of a broader paradigm shift in how chemical risk is assessed and decisions are made. The discussion highlighted the need for a robust scientific review of methods, coordinated governance, regulatory clarity, stakeholder trust and sustained investment.

A historic shift in chemical safety assessment

Speakers described the pending publication of the roadmap as a milestone: the first EU-wide framework bringing together regulators, agencies, industry, NGOs and the scientific community around a shared objective. Unlike previous sector-specific or voluntary initiatives, the roadmap covers around 15 pieces of legislation and provides a common direction for future reform.

However, it was emphasised that the roadmap is non-binding in nature, creating both flexibility and risk. Progress will depend on sustained coordination, shared priorities and continuous engagement across institutions as well as greater involvement of member states.

From replacement to transformation

There was broad consensus that phasing out animal testing cannot be achieved by simply swapping animal studies for single alternative methods. Non-animal approaches often generate different types of information, requiring new ways of interpreting data and redefining decision criteria. For complex endpoints, non-animal approaches will need to be used in combination. Building

confidence in integrated approaches and ensuring standards for human and environmental protection are maintained will require broad engagement among all stakeholders.

Several speakers argued that the end goal is not merely reducing the use of animal testing, but a fundamentally different, potentially more human-relevant risk assessment system – supported by next-generation risk assessment (NGRA), mechanistic data, exposure-based approaches and integrated evidence streams.

Regulatory readiness and constraints

A recurring theme was the challenge of aligning innovation with prescriptive regulatory frameworks – particularly REACH. While many non-animal methods are already scientifically promising, their uptake is constrained by existing legal requirements that specify traditional data types.

Speakers highlighted the need to address this at multiple levels: regulators, legislators and stakeholders must progressively adapt frameworks, while maintaining protection goals and legal certainty during the transition.

Building trust, confidence and capacity

Confidence in non-animal methods emerged as a central issue. Validation remains critical, but speakers cautioned against viewing validation as the only gateway to progress. Equally important is agreeing on regulatory needs: what information decision-makers actually require to assess safety.

Partnerships such as the EPAA were presented as essential platforms for confidence-building, drawing on cross-sector experience, including pharmaceuticals, chemicals and environmental safety. Training, shared case studies and joint interpretation of results were seen as vital to enable regulators and industry to learn together.

The role of member states

Several speakers stressed that member states are pivotal to implementation. As the roadmap is not legally binding, national buy-in will determine whether progress accelerates or fragments. Member states not only contribute regulatory expertise but also policy direction, funding priorities and enforcement experience.

Effective mechanisms are needed to gather regulatory needs from member states, communicate them to method developers and ensure feedback loops that support regulatory uptake.

International alignment and the OECD dimension

International harmonisation was repeatedly identified as a make-or-break factor. Speakers warned that if non-animal approaches are accepted in some jurisdictions but not others, mutual acceptance of data breaks down – undermining both animal-reduction goals and regulatory efficiency.

The OECD's role to support harmonised test guidelines, data formats, guidance and assessment approaches was highlighted as critical. Alignment across jurisdictions was seen as essential to avoid duplication, reduce animal testing globally, increase the number of chemicals assessed and maintain a level playing field.

Data, digital infrastructure and safe spaces

Data sharing and digital infrastructure were recognised as enablers of the transition. The 'one substance, one assessment' approach, common data platforms and structured data formats were cited as tools to support cross-legislation use of data.

The concept of "safe spaces" – confidential environments where companies can share data with regulators early and receive feedback – was highlighted as a way to de-risk innovation and support regulatory learning without compromising competitiveness.

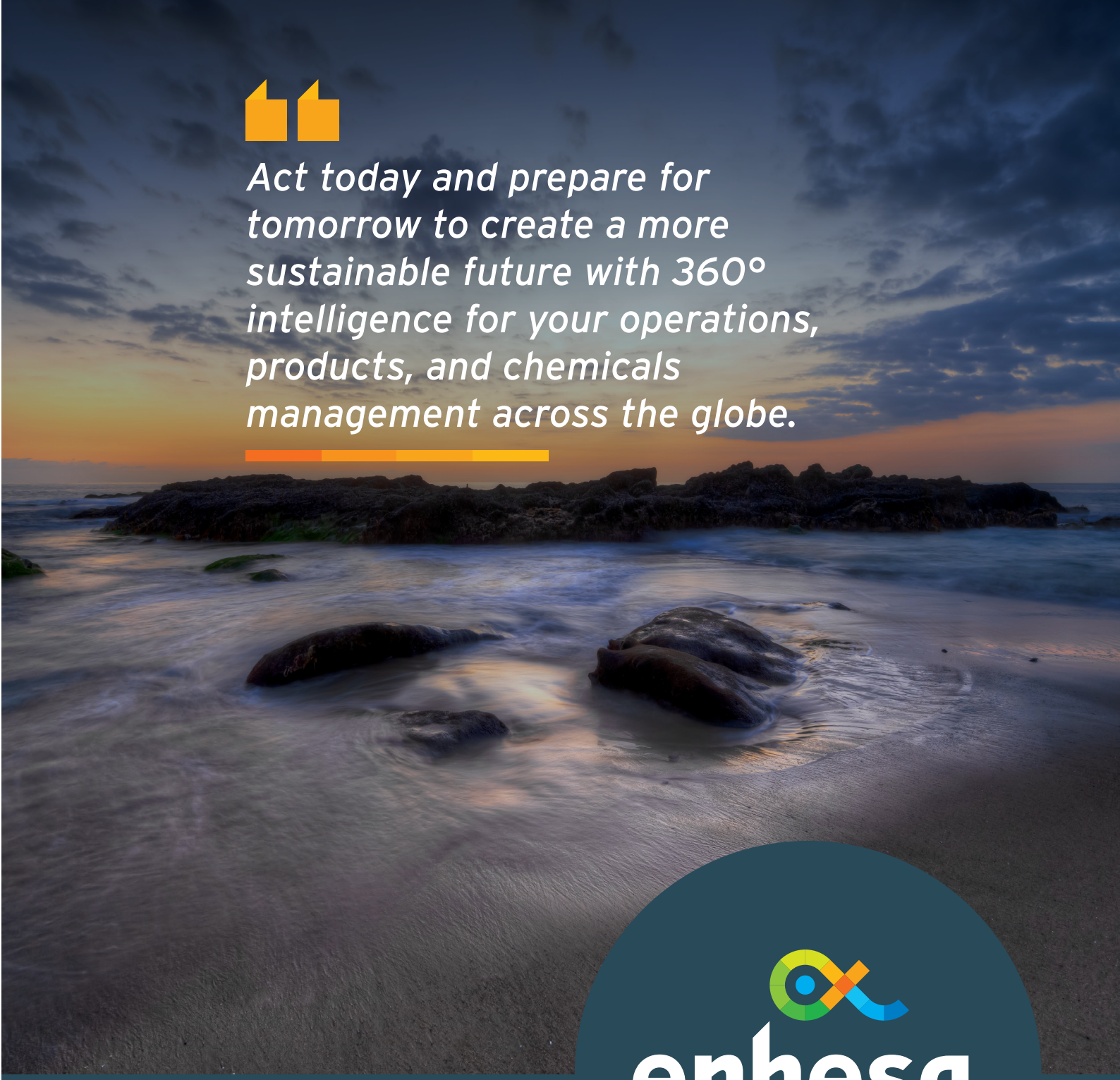
Governance, prioritisation and expectation management

Speakers underlined the importance of strong governance to define priorities, monitor progress and ensure accountability. With limited funding and capacity, not all methods or endpoints can be advanced at once. Strategic prioritisation – based on regulatory needs, impact and feasibility – was seen as essential.

Expectation management was also emphasised: the transition will be incremental, with uneven progress across endpoints and regulatory areas. Success depends on maintaining momentum while accepting uncertainty as part of the change process.

Key takeaways

- The roadmap represents a historic step towards transforming chemical safety assessment across the EU
- Phasing out animal testing requires a paradigm shift in risk assessment, not just alternative methods
- Regulatory frameworks must evolve to accommodate new types of data while preserving protection goals
- Trust, validation and shared understanding of regulatory needs are central to uptake
- Member state engagement and international alignment, particularly through the OECD, are critical
- Data infrastructure, safe spaces and case studies can accelerate learning and confidence building



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