EYE OF EUROPE

FUTURE TOPICS FOR EUROPEAN RESEARCH AREA

Eye of Europe Policy Brief No. 1

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INTRODUCTION

Foresight has gained institutional importance within the EU, with the appointment in 2023 of a dedicated Commissioner and the creation of a joint foresight community involving Member States and experts.

As a Coordination and Support Action funded by the Horizon Europe programme, the project "Eye of Europe" aims to enhance the integration of foresight practices into Research and Innovation (R&I) policymaking across Europe. Ultimately, it aims to bring together a cohesive and influential foresight community that contributes significantly to shaping and guiding policy decisions (Futures4Europe, 2024). To this end, Eye of Europe builds on existing initiatives and experiences to foster knowledge-sharing between foresight practitioners and policy makers, attract domain experts, and engage a broader audience in futures thinking.

Recognising the complexity of current global challenges and the need for a systemic, long-term approach, the project's partners developed a framework for identifying key research and innovation (R&I) topics, which integrated socio-technical perspectives—including human values, organisational structures, and advanced science and technology—encouraging stakeholder engagement through transversal themes. The topic identification process included analysis of EU and national policy documents, stakeholder interviews to bring in diverse and novel views, and collaborative discourse among the consortium's members. This process allowed the consortium to formulate ten inspiring and impactful topics of common interest to R&I actors across the European Research Area (detailed topic selection process available in Deliverable 3.1)

This policy brief provides insights into the thematic areas addressed in the first five Eye of Europe workshops. It also informs about the upcoming workshops and the futures4europe platform, the online home of the European foresight community, where visitors can explore a rich collection of foresight projects, showcase their work, and discover foresight-related upcoming events.

TOPICS FOR EXPLORING THE FUTURE OF ERA

- Long-term Future of Democracy in the EU and beyond
- Future of Sustainable Fashion
- Science and Conflicts
- European Industrial Decarbonisation and Global Context Scenarios
- The Knowledge of our civilisation(s)
- Emotion Ecosystems
- Democracy and Technology
- Ageing and Assisted Living Technologies (AALT)
- Public Policy and Change of Diets
- Future of Knowledge and Emotions

KEY MESSAGES FROM FIRST WORKSHOPS

In Spring 2025, the Eye of Europe project already organised five workshops among diverse stakeholders on the future of democracy, fashion, science and conflicts as well as industrial decarbonisation.

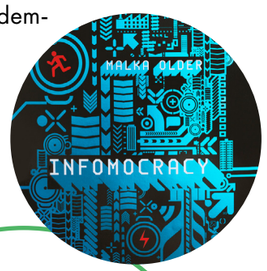
1. LONG-TERM FUTURE OF DEMOCRACY IN THE EU AND BEYOND

The online workshop organised by the Austrian Institute of Technology, examining the spectrum of future challenges facing democratic systems and policy-making, drew international experts into a multimethod approach, including roundtable discussions on governance challenges and a 'literary quartet' examining depictions of democracy within science fiction narratives.

Through a mixture of presentations from different EU-funded democracy projects and organisations, the workshop highlighted different approaches to assessing the future health and longevity of democratic systems and societies. This included quantitative assessment of the global state of liberal democracies and examinations of both a) information disorder and democratic stability, and b) long term stabilising and destabilising factors for liberal democracies (e.g. social trust in government, and quality of public transport). The workshop allowed participants to explore the evolution of past liberal democracies learn, about present research on some cornerstones of democracies today such as institutions, participation and the media, and explore the future by reviewing four selected science fiction novels that deal with future democratic developments.

Despite the deterioration of liberal democracies worldwide as well as in Europe, most of our present democracies are built on solid and resilient institutions against internal and external attacks. Among the factors stabilising liberal democracies are the quality of **trust in public institutions and policies** as well as making participation possible for all citizens. However, when looking at public policies and social benefits, the picture is more ambiguous: while public health expenditure is considered a stabilising factor, high expenditure in pensions might result in distrust. More severe factors destabilising democracy in a country are, for instance, corruption and low quality of public transport.

The **protection of the public sphere** is a cornerstone of democracy. Of similar importance are public service, social media as well as a better regulation of social media companies. Destabilising factors are, among others, disruptive technologies, fragmented public spheres, and distrust in traditional journalism and science. Maintaining media pluralism, thinking long-term and endorsing a culture of diversity are crucial to maintaining democratic values. The discussions also extracted visions of pluralist and diverse societies where humans can change their identity, experiment with new forms of governance in local communities, where central governments are resolved and where people find ways to cope with climate change by supporting each other.



2. FUTURE OF SUSTAINABLE FASHION

The two Future of Sustainable Fashion workshops in Greece, organised by Helenos Consulting, provided valuable insights into the interplay between sustainability, technology, and societal values within the fashion industry. By combining speculative design with other participatory foresight methods, the workshop showcased the potential of citizen-driven foresight approaches in revealing present and potential needs and challenges but also shaping sustainable development strategies.

There are many places for European R&I stakeholders to engage with the fashion industry in support of the Green transition. This can include addressing **transparency** in supply chains, developing smart textiles and wearables, ensuring that the unique needs of diverse and vulnerable groups are met, and developing new materials and techniques that can address concerns over raw material availability. By approaching the foresight exercise through What-If scenarios and the development of mixed-media artefacts, workshop participants were able to grapple with the incorporation of new technologies and materials into their products and provide critical perspectives on technological vectors. These include considerations of future-oriented results accounting in part for manufacturing and distribution, ecological impacts, social responsibility, education, and artistic and philosophical implications.

Innovation in materials, science, and technology will revolutionise fashion. **AI and sensor-equipped textiles** will enhance functionality and customisation. Prototypes and testing are essential, since they will ensure the safety of emerging technologies. Clothing should become increasingly comfortable while also **reflecting personal values**. Regarding the environmental impact, recycling of textiles and the development of new materials from landfill waste can help reduce pollution. At the same time, natural materials should be prioritised to minimise environmental harm. Finally, **mass production of sustainable textiles** is vital for eco-friendly clothing to become widely available, which can be achieved through investments in new technologies.

The outcomes of the Fashion Futuring methodology align with EU priorities in circular economy, digital innovation, and climate resilience. Clothing, besides being a medium of self-expression, is also considered a tool that provides protection and safety from future challenges. In other words, its main function since ancient times, when people used clothing to survive, seems to still prevail in modern and future contexts. Integrating new technologies into fashion production supports sustainable practices. Policy frameworks and regulations should prioritise ethical production, focusing on green practices, viable working conditions, and transparency within supply chains.

3. FUTURES OF SCIENCE AND CONFLICT VIA SCENARIO DEVELOPMENT

The online workshop was organised by Fraunhofer ISI to create scenario sketches and outline different futures for science and research communities in a world of increasing conflict and geopolitical tensions. The pilot first deployed a participant survey to understand perspectives on the impact of factors that may influence future scientific research approaches, as well as the dynamics of stakeholder relationships on which this work hinges. Using the Tetralemma method for examining potential futures for different factors, the participants outlined 3-4 distinct trajectories for selected influencing factors in two different groups:

- **Group 1** examined emergent futures that account for Artificial Intelligence Systems, Social Trust related to Mis/Dis-information, and international and representation disparities in different scientific fields.
- **Group 2** focused on examining different future trajectories for the topics of Disaster and Emergency Preparedness (particularly related to conflict conditions), international trade and related policy, and the rise of Great Power politics.

Expert discussions on the influencing factors highlighted the impactful role that smaller actors can play in **targeted foreign interference campaigns**, the **crumbling norms of international trade policy** accompanied by **dissolving rules-based alliances** and actors **that wilfully ignore policy rules and regulations**. Similarly, the **policy disagreements and misalignment** arising from **uncoordinated Net-Zero Transformation approaches** in the EU's battle against climate change were discussed as an important example of policy conditions that impact research and innovation stakeholders. However, the development and integration of **Artificial Intelligence (AI) systems in scientific disciplines, decision-making processes, and defense** was a focal point of the factor discussion.

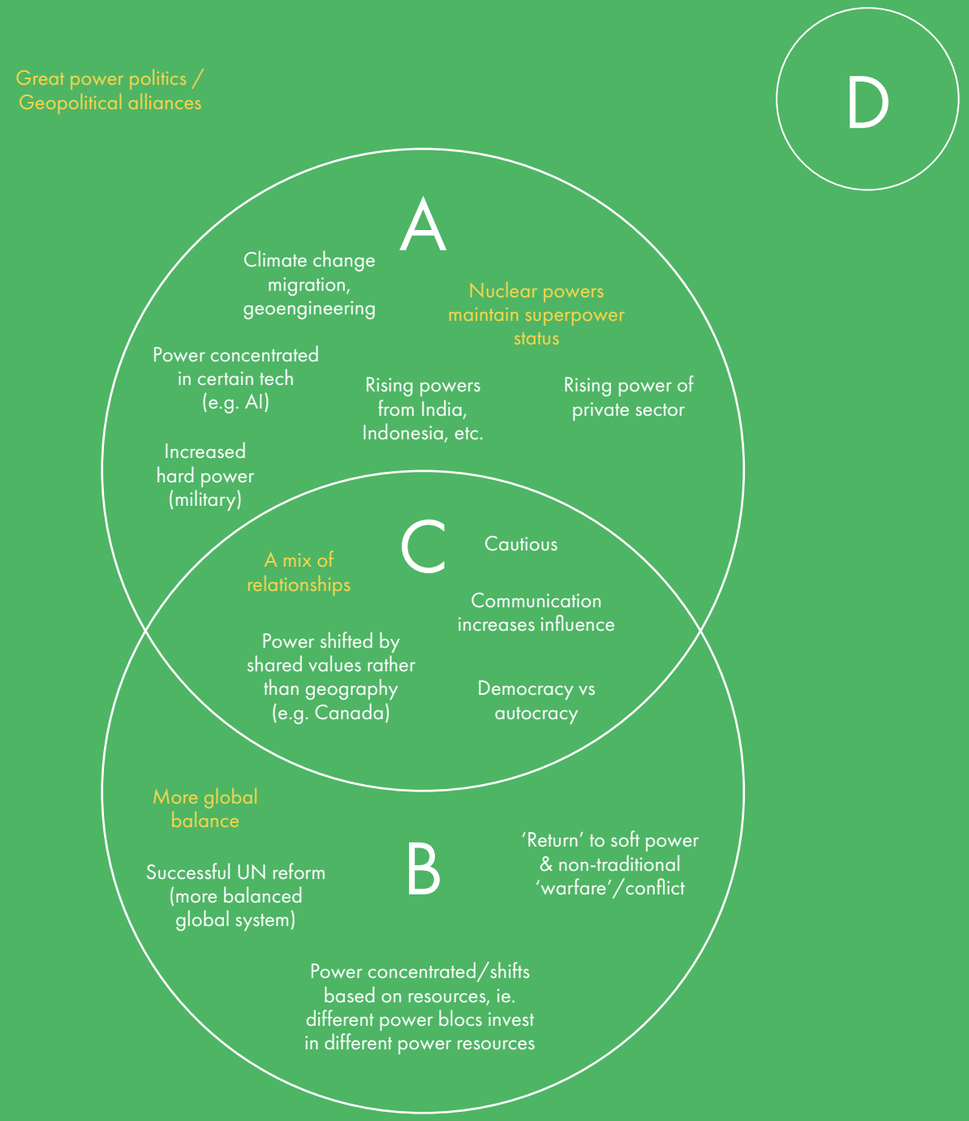
Participants also suggested new factors to be considered in these future scenarios, such as the role of **changing geopolitical alliances and regional influences** more closely in the scenarios – including **accounting for rising powers** (e.g. India and Indonesia) and **globally increasing hard military force**. Given that scientific R&D has both contributed to and gained from digitalisation – **cybersecurity and digital sovereignty** were also considered as key aspects for future scenarios. Lastly, the issue of a **distorted public perception of scientific communities and their advancements**, shaped largely by media narratives, was considered critical to **fostering greater social trust for scientific communities** during times of conflict. Without reflection and consideration of these aspects, experts noted that the **shift towards Great Power Politics**, and the deterioration of social trust combined with disparities between nations, could contribute to more difficult access in funding and support for R&I programmes affecting many study areas.

While the three-hour online workshop was productive and received positive feedback, participants noted that the topic area and its **intersections with Science Diplomacy, Security Studies, and the strategies for Europe's approach to future defense**, and green and digital transitions require more in depth and continuous strategic foresight work approaches. While the initial prospective work for creating useful scenarios was initiated in this workshop, it was clear that more time and resources would be required at both the EU and Member State level to create policy and strategy that is ready for a rapidly changing world with increased areas of conflict.

TETRALEMMA

Outline possible alternative developments for the selected factors

A	B	C	D
Projected/ expected Future	Distinctive Divergence	Hybrid Futures	Paradigmatic Shift



4. EUROPEAN INDUSTRIAL DECARBONISATION AND GLOBAL CONTEXT SCENARIOS

A two-day face-to-face workshop in Spain, organised by Insight Foresight Institute, focused on exploring alternative pathways for industrial decarbonisation in Europe, with an emphasis on identifying key research and innovation (R&I) areas that consider potential shifts in the global industrial landscape. As the European Union intensifies its efforts to achieve net-zero emissions by 2050, several industries face transformative challenges and opportunities. Anchored in the European Union's broader climate and energy targets, the New Clean Industrial Deal for Europe seeks to accelerate decarbonisation across key sectors such as energy, manufacturing, and transportation, while bolstering economic competitiveness and energy security. This comprehensive framework could redefine the EU's industrial landscape, making it more resilient, sustainable, and globally influential and competitive. The workshop contributed to this discussion by taking a long-term view and by focusing on the strategic question: How can the EU navigate amidst global uncertainties to foster a more resilient and effective path toward industrial decarbonisation? With scenario and road mapping work the aim was also to uncover promising avenues for EU R&I to contribute meaningfully to industrial decarbonisation, considering the specific conditions of European industry and the region's emissions reduction targets. Addressing this requires a nuanced understanding of geopolitical dynamics, dependencies, and innovative solutions across various themes and scenarios.

With regards to energy systems, **emerging heat pump technologies** offer promising pathways for industrial decarbonisation in Europe, particularly for medium- to high-temperature process heat. Emerging innovations such as supercritical CO_2 systems, solid-state thermoelectric and magnetocaloric heat pumps, and refrigerants with low global warming potential (GWP) aim to boost efficiency and reliability. Coupling emerging technologies with **thermal storage, smart controls, and waste heat recovery** can enhance flexibility and performance. Hybrid systems combining renewable sources or excess heat with heat pumps are also gaining traction, supporting a shift to low-carbon industrial heating solutions.

To advance with **circular raw materials management** for industrial decarbonisation, among various opportunities **solvolysis** (a chemical reaction in which a solvent and solute result in the formation of new compounds) was identified as a potentially promising future R&I area. As industries seek to reduce reliance on virgin raw materials and lower embedded carbon in products, solvolysis presents a pathway to circular manufacturing, especially in sectors such as aerospace, automotive, and construction where composite materials are widely used but difficult to recycle through conventional means. Future research and innovation **in solvolysis technologies** offer significant potential for industrial decarbonisation in Europe, particularly by **enabling the recovery and reuse of high-value materials from complex waste streams**. Advanced solvolysis processes using tailored solvents, such as bio-based alcohols or supercritical fluids, can efficiently break down composites while preserving the integrity of embedded fibres or fillers. Innovations in catalyst design, solvent recovery systems, and process intensification techniques could drastically improve energy efficiency and scalability.

Furthermore, future European research and innovation could increasingly **converge carbon dioxide removal technologies with industrial symbiosis, artificial intelligence and biotechnology** to forge self-optimising, negative emission production hubs. High resolution AI models can continuously map industrial clusters' heat, material and CO_2 streams, then orchestrate closed-loop exchanges. Machine learning driven digital twins could refine microbial metabolisms to maximise carbon uptake and product yield while minimising energy demand and unlocking scalable pathways to climate-positive industrial ecosystems across Europe.

FURTHER TOPICS AND UPCOMING WORKSHOPS

In 2025 and 2026, we will organise workshops on the following topics. Programme and registration details will be available on the futures4europe.eu platform:

1. **The Knowledge of our Civilisation(s) in 2040:** In this two-day Berlin based workshop participants with diverse domain expertise will explore the future of knowledge in human civilisation in the face of multiple drivers of change.
2. **Emotion Ecosystems**: This Bucharest based two-day workshop will investigate the impact of technologies like affective computing and brain-machine interface on individuals and collectives with different stakeholder groups.
3. **Democracy and Technology**: In this workshop citizens in Prague will jointly reflect on democratic approaches to risks connected with new technologies and their impacts on various societal groups.
4. **Aging and Assisted Living Technologies**: This workshop in Berlin with international research and policy actors is dedicated to future ways of integrating smart and digital technologies into assisted living and care for older adults.
5. **Public Policy and Change of Diets**: In this workshop in Paris a diverse group of citizens will reflect on policy inroads into future pathways towards healthy and sustainable diets.

NEW FORESIGHT APPROACHES AND COMMUNITIES

The pilot workshops aim to engage a broad range of participants in foresight exercises tailored to specific contexts and encompassing a variety of policy levels, stakeholder types, and R&I foresight methods. Around 350 stakeholders are expected to participate in face-to-face workshops, with an additional 50-60 joining online sessions. Furthermore, 300-500 respondents will contribute to an online Delphi consultation and a handbook will emphasise and provide guidance on the lessons learned in a common format across all activities.

We engage with experts, citizens, entrepreneurs, scientists, policymakers, journalists and many other stakeholder groups. We apply both established and novel Foresight approaches to dive deep into topics of common interest across the European Research Area. The workshops take place in cities such as Madrid, Prague, Berlin, Bucharest, Paris and Thessaloniki, as well as online. These workshops have a twofold purpose.

First, they serve the project's aspirations expressed by Eye of Europe coordinator, Radu Gheorghiu, namely, to nurture the "vibrant community of individuals engaging in a conversation about our collective future" and to fuel the "continuous loop of dialogue, learning and inspiration".

Second, they aim to mobilise collective anticipatory intelligence. We hope to shed light on the evolution of research and innovation and its contribution to a wide range of important future questions.

To stay tuned to the workshops and their outcomes, follow the Futures4Europe Event page. You can also sign up, create your profile and become part of the European foresight community.

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