

HORIZON SCANNING

EMERGING ISSUES FOR EU POLICYMAKING

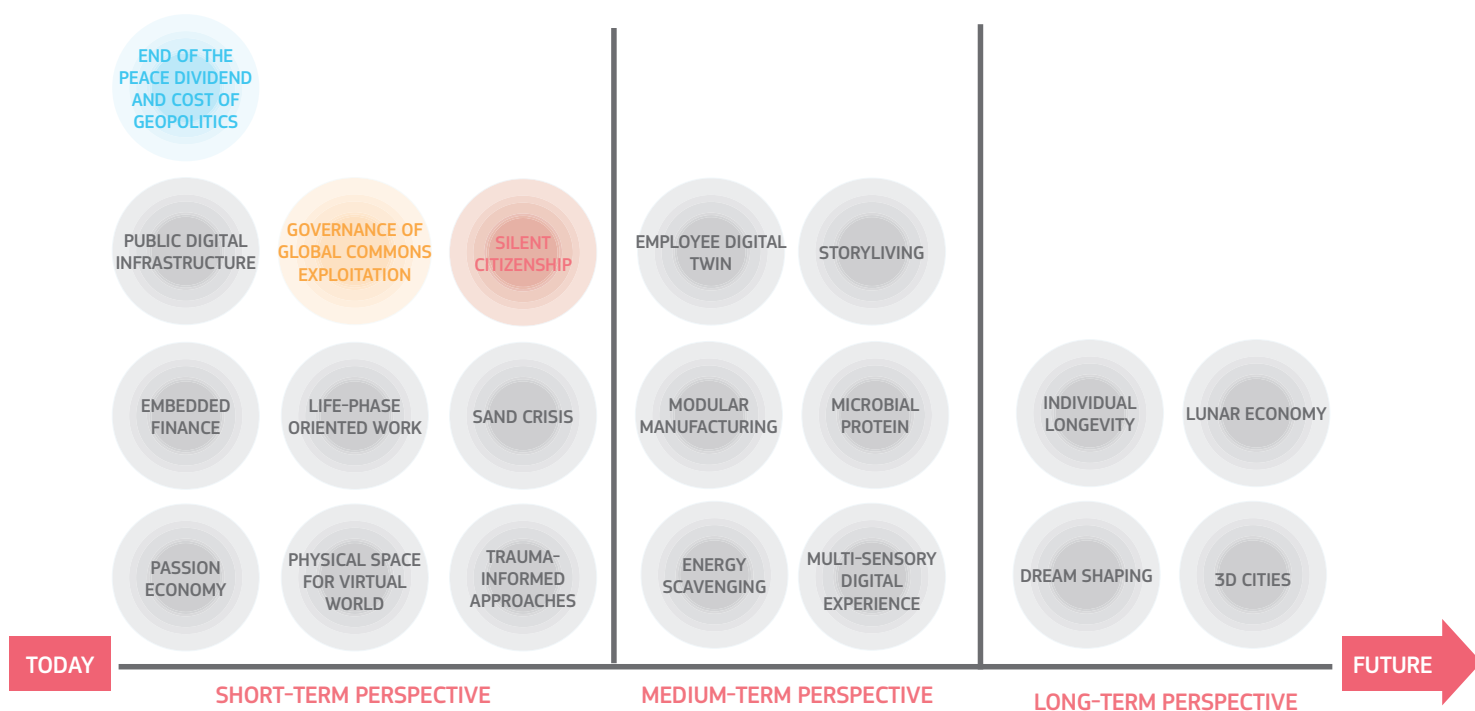
Issue 02

The ESPAS network (European Strategy and Policy Analysis System) launched a horizon scanning process in January 2022. This process, led by the Joint Research Centre and European Parliamentary Research Service, looks at the so-called “signals of change” - emerging trends and issues - that may appear marginal today but may become important for the EU in the future.

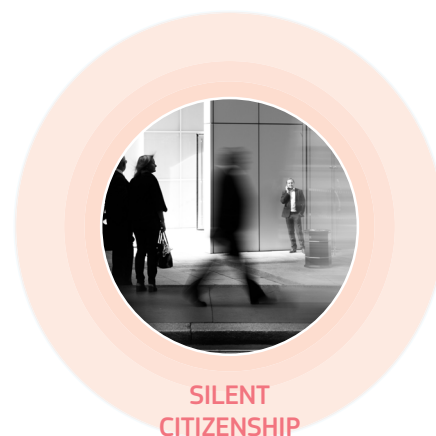
This is the second report from a horizon scanning process which looks at ‘signals of change’ - emerging trends and issues that may appear marginal today but could become important for the EU in the future. The Horizon scanning process was launched in January 2022 and is led by the Joint Research Centre and European Parliamentary Research Service, in collaboration with other EU institutions

These signals of change were identified and developed via a series of workshops with participants from across the EU institutions looking at the recent developments in various domains. These may be considered as new lenses through which we can obtain a different perspective on the challenges and opportunities the EU is facing now and in the coming years.

The twenty signals of change most relevant for EU policymaking are presented in the graph below and detailed in the annex.



Three emerging issues with perceived most policy impact were selected through a survey followed by a prioritisation workshop with policymakers and have been analysed in more depth:



The following pages offer a first exploration of questions, problems or new solutions that can arise from these three selected emerging trends. They are not meant to be exhaustive, merely an indication of issues that may merit further examination.

End of the peace dividend and the cost of geopolitics

In January 2022, the Global Peace Dividend initiative was launched by over 50 Nobel laureates, urging to limit military spending and to reallocate funding to planetary emergencies. However, the war in Ukraine and an increasingly confrontational geopolitical situation is likely to reinforce the increasing trend in defence spending. This highlights the loss of the so called “peace dividend”, and also increases the cost of geopolitics. While there is no evidence of a systematic relationship between countries’ militarisation and economic growth in the past, geopolitical factors in international trade affects supply chains and investment. An analysis of a potential trade war with China suggests that it could cost Germany almost six times as much as Brexit. Less explored are the effects of the end of the peace dividend with the rise of geopolitical tensions on the internationalisation of services, governance of technology, global research ecosystems and the ecological footprint.

How can it change our optics?

Policy choices made under geopolitical tensions are more urgent, with limited options, under increased scrutiny of international actors and with stronger budgetary constraints.

What is this relevant for?

Defence, security, European Semester, economic policies, budgets, trade policies

Futures Wheel: An indication of potential consequences



What if the EU...?

... assessed ex-ante the geopolitical implications of new legislation in the context of different scenarios of global (dis)order to understand and articulate better EU’s engagement in global politics and redefining what better regulation means under these constraints?

Governance of global commons exploitation

The world is going through increasingly non-conventional routes to gain access to energy and mineral resources that would not have warranted attention until recently. In terms of resources, building renewable energy infrastructure creates a strong demand for metals, calling for the exploitation of new frontiers in mining, such as the exploration of the Arctic, deep-sea mining or the mining of asteroids. These expensive practices could come with challenges, such as potentially severe environmental impacts in the case of deep-sea mining, geopolitical competition and the management of the 'global commons'. Institutional and regime designs for benefit sharing is necessary to avoid conflicts and the territorialisation of the global commons. Some countries are using their sovereignty to attract private capital and redefine the questions of exploration and access rights.

How can it change our optics?

To approach something as 'commons' – accessible and cared for by all – means to imagine new ways of governance, institutions, power relations around them, much like European Coal and Steel Community and Euratom were for Europe in the 1950s.

What is this relevant for?

Space policy, policy for the Arctic, raw materials sourcing, industrial policy, environment policies, EU legal system.

Futures Wheel: An indication of potential consequences



What if the EU...?

... was to build on the passion and energy of the early European integration projects to create an innovative institutional system of dealing with global common exploitation?

Silent citizenship

Abstention from voting and engagement in policy processes does not necessarily equal disinterest. Differentiated strategies are required to reach non-voters and those who choose to engage via other means. Increasing attention is being paid to typologies of political absence and silence as political expression: apart from involuntary or disempowered silence, there can also be strategic absence (boycotts or secessions from the political process), or strategic silence (silent protests, vigils, withholding verbal support, or recognition in indifference or anger). This communicative silence, which is a form of agency, can be considered as a basic element of democratic institutions. Democratic politics that could cope with the absence of widespread citizen participation would require a radical improvement of institutional representation, where representatives bear full responsibility for fair outcomes and improving lives of citizens.

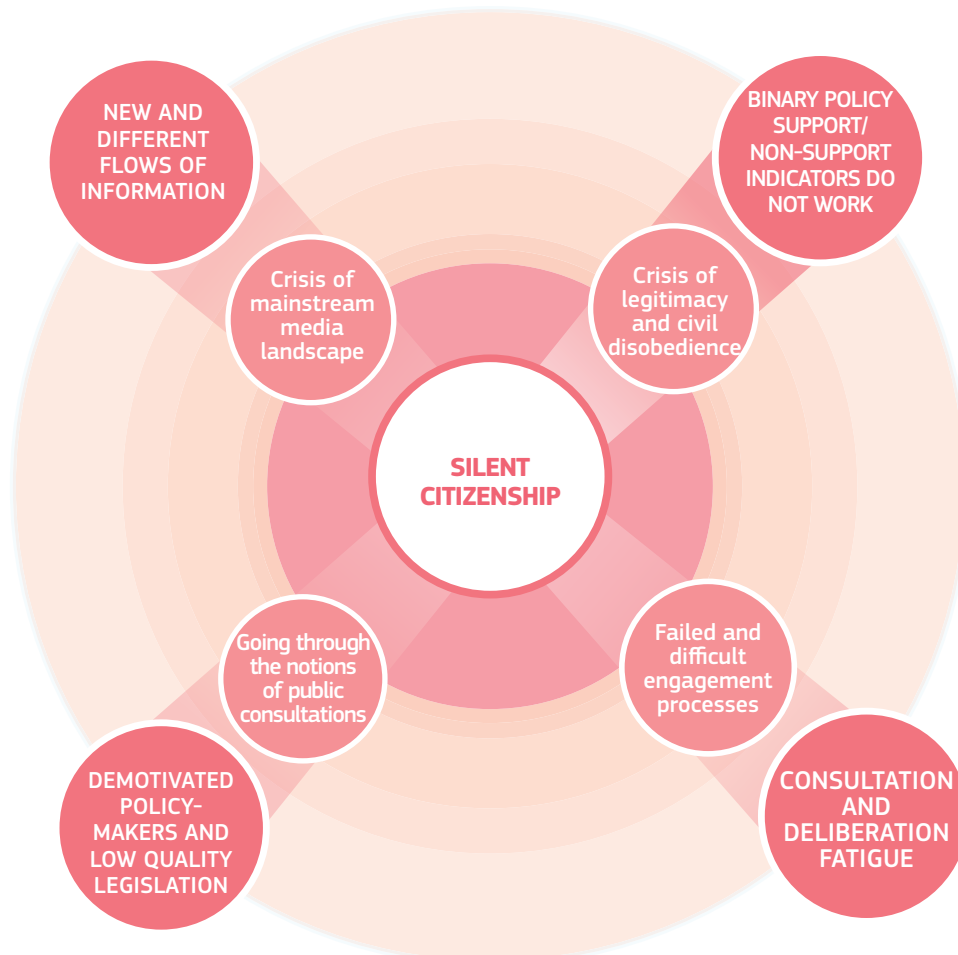
How can it change our optics?

Understanding various aspects of silence in the political process shift attention from the most visible deliberations in the 'battle of ideas' to the sensitivity to different ways of political expression.

What is this relevant for?

Communication strategies, citizen engagement, public consultations, democracy.

Futures Wheel: An indication of potential consequences



What if the EU...?

... not only created spaces for deliberation and engagement such as the Conference on the Future of Europe, but also spaces and processes that engage with communicative silence as a form of political communication – such as shared quiet reflection or accepting silence as form of expression?

ANNEX: OTHER PRIORITISED SIGNALS

INDIVIDUAL LONGEVITY

Longevity and anti-ageing research is growing very quickly as the COVID-19 pandemic reinforced consumer interest in health and wellbeing. Ageing tech billionaires are financing research in the area, attracting further venture capital. The focus is on biotech, with recent breakthroughs in the reprogramming of cells for rejuvenation, organ regeneration with stem cell therapies, or reversing the epigenetic clock. The conferences on the topic (such as Copenhagen's Aging Research and Drug Discovery Meeting) are attracting more participants and specific interest groups are forming, such as the US Alliance for Longevity Initiatives or the EU's European Longevity Initiative. At the same time, the UN Human Development Report shows that with COVID-19 in 2020, life expectancy at birth has fallen in 70% of countries.

STORYLIVING

Storytelling and narratives have become a staple of effective communication techniques. Storyliving adds an experiential element to stories, where participants live through the story themselves through interactive, embodied and immersive experiences. With virtual reality technology, the lived stories can be effective in learning (including teaching empathy and emotional intelligence) or healthcare. It is considered an effective tool of journalism, as well as corporate and political communications. In these stories, there is no teller, the audience has some agency but not full control and can access multiple perspectives. However, storyliving does not have to be limited to the virtual world. Disney has announced that it is planning a storyliving residential community, with hospitality, entertainment and design features which are meant to immerse inhabitants in the Disney universe.

PHYSICAL SPACE FOR VIRTUAL WORLD

As the self extends into the virtual world, our physical environments adjust to ensure our online presence. Being in the virtual world requires a lot of physical space. Whether it be on the road- in a car, on a bicycle, or in public transportation, at work- in an office or a collaborative space, or at home. Solutions are being developed to make the transitions between work and home fluid, but also to enlarge the habitable square meters on the planet. Data centres and all the technology behind sustaining the digital world is eating up physical space. How accessible is the virtual world for those who do not have access to this extra space? And how do virtual constraints fit with necessary sustainability requirements?

LIFE-PHASE ORIENTED WORK

The new ways of working marked by digital transformation and remote work, more agile project-based approaches and changing attitudes towards work are leading to new working time models. There is growing interest in the individualisation of working time, job-sharing arrangements (where two or more people share one full-time job), or life-phase oriented working time (changing depending on professional and private life phases). These are increasingly augmented with individualised career advice systems using machine learning to create personalized roadmaps of learning, resources, and work opportunities. Not only are the shape of life-long careers changing, with telework and flexible work, the periods of productivity are changing as well. Adding to the two typical work peaks for knowledge workers – just before and after lunch, a “third peak” has been noticed between 18h and 20h.

MODULAR MANUFACTURING

The reorganization of supply chains and increasing volatility of the business environment have led companies to develop increasingly agile strategies of production and distribution. Modular manufacturing, where production can be divided into modules and easily rearranged, is part of that trend, following the path of the fast-growing modular construction sector. Rather than realising economies of scale through building large production plants with high investment needs and operational costs, a modular approach favours starting at a smaller scale that allows testing and demonstration – and then building hundreds or thousands of modules in distributed systems. Nestle Foods expects to operate modular food processing factories in Africa and Asia, while Nokia has developed a factory-in-a-box concept – a manufacturing space in large cargo containers.

LUNAR ECONOMY

Beyond the Low Earth Orbit, the Moon is the main target for space activities. A lunar economy encompasses all general economic activity associated with the production, use, and exchange of lunar resources on the Moon's surface, in lunar orbit and on Earth and it has been estimated that it will be worth 170 billion USD by 2040. Alongside space resources utilisation and transportation markets (resource prospecting mining, processing, cargo transportation), this potential also includes in-space manufacturing and data markets. Economic opportunities feature highly in both US's NASA Artemis' and China's CNSA missions to develop base camps on the Moon. In July this year, the European Space Agency created the European Centre for Space Economy and Commerce.

PASSION ECONOMY

The great resignation, as well as the job losses due to COVID-19 fed the broader trend to search for fulfilment in the working life. Adam Davidson's 2020 book, *The Passion Economy*, suggests that through platforms and access to small niche markets people can monetize their knowledge and skills in hobbies and passion projects as a main source of livelihood and an alternative to the gig economy. The unbundling of work from job has resulted in more related trends. Taking on a 'side-gig' or a 'side-hustle' in addition to a full time job is increasingly popular, as people experiment with other forms of gainful activities. This may require limiting engagement in one's full-time job, dubbed as 'quiet quitting' or not going above and beyond at work and just meeting the job description.

EMBEDDED FINANCE

As online commerce and digital payment methods become the norm, many production and service companies and platform ecosystems are including financial services as part of their offering – accounts or wallets, payments, lending – to serve their customers (both businesses and consumers). The process has been made relatively easy with banking as a service (BaaS) provided by fintech companies and can include 'buy now pay later' models of lending money or providing, embedded insurance, . It is projected to grow fivefold over the next five years, from 200 million USD to 1.3 billion. This new model is exemplified by Starbucks which could be considered to be a neobank with its mobile app, where over 24 million members load over 10 billion USD annually, and of that, over 1 billion USD is stored card value not spent.

MULTI-SENSORY DIGITAL EXPERIENCE

The visual, audio and haptic input/output elements are considered the most important elements for immersive digital experiences, such as augmented or virtual reality. There is however, increasing research into digitising other senses. Thermal and vibrotactile stimuli can simulate wetness and liquid sensation, or even wind sensation (when accompanied with visual and sound effects). Digital taste can be achieved through electrostimulation and digital scent technologies allow users to smell in digital environments. These approaches will also shape the field of information experience design, or the process of shaping how people engage with information.

DREAM-SHAPING

While influencing and inducing dreams has long attracted interest, a series of new technologies and approaches is being developed that could make it possible. In the stage of sleep called hypnagogia – as the brain is transitioning electrically and chemically to enter unconsciousness – it is most suggestible to external prompts. Targeted Dream Incubation uses sensory stimulation to induce specific prompts at the sleep onset with the use of a glove-like device. Another approach is to use pre-sleep stimuli, such as virtual reality tasks, to influence dream content, while transcranial alternating current stimulation is being used to induce lucid dreams. While it can be used in therapies to interrupt nightmares and address anxiety disorders, brands have started to experiment with inducing advertising prompts into the dreams of their consumers.

MICROBIAL PROTEIN

Amid the growing demand for food and sustainability concerns with traditional agricultural practices, there is growing interest in alternative proteins. Single cell proteins (SCP), or proteins derived from yeast, fungi, bacteria and algae, are one such alternative. Biomass fermentation uses the fast growth and high protein content of algae and fungi to efficiently produce large quantities of protein. Precision fermentation uses microorganisms as cell factories to produce specific proteins, enzymes, vitamins or fats – like casein and whey, honey and other animal-free bio-identical products. Solein is a protein ingredient developed by Solar Foods and produced by microbes from carbon dioxide – with a demo facility planned in 2023.

EMPLOYEE DIGITAL TWIN

Efforts are being made to introduce more 'virtual humans' into the workplace. Virtual clones that mimic real-life people and things using text, voice, video, imagery and interaction are quickly being transitioned to business use. The company Hour One is one of a burgeoning number catering to the enterprise 'digital twin' market. Users can create videos from text in just a few minutes from any device, conveying messages through an avatar that talks with a matching voice and graphics. Users can even create literal digital twins after a short filming session that captures their likeness. These avatars can be deployed in a variety of roles. The company plans to embed this capability into any software product and enable its use in real-time via an application programming interface (API).



ENERGY SCAVENGING

Driven by the need to reduce dependency on fossil fuels, people across many sectors have embarked on a drive to deal with energy much more efficiently. Whether through the development of small heat engines with no moving parts, or thermophotovoltaics, or lightweight hydrogen tanks for aircraft, or engineered crystals to reduce computer power consumption, the objective is the same: use less energy for our activities. Energy harvesting, or scavenging is a way of generating energy from ambient environment, which can be used by sensors, wearables etc. This includes solar, thermal, flow-based (wind or hydro), but also mechanical (vibration) or human-based. The scale of gains is still insufficient to bring about a radical change in the short-term, but this has potential for the long-term.



THE SAND CRISIS

In April, United Nations Environment Programme (UNEP) released a report warning that current extraction of sand exceeds the replenishment rates, leading to shortages, socio-economic conflicts and environmental degradation. With a yearly use of 50 billion tons, it is the second most used resource after water. The UNEP report calls for the recognition of sand as a strategic resource and to create strategies for regenerative and circular approaches, establish ownership and access rights, source responsibly and restore ecosystems. Modelling exercises show a 45% increase in global building sand use from 2020 to 2060, with a threefold increase in low- and lower-middle income regions.



3D CITIES

The Oversky project proposes a series of semi-floating structures that could fill the unused aerial space above cities. Based on the technology that allows zeppelins to float, these modular structures would combine into clusters of rooms in the sky, connected to adjacent buildings, or other fixed structures to enable access. These structures can create shaded microclimates that reflect sunlight and radiation, bouncing back into the sky what would otherwise get absorbed into the dense surface of the built environment, cooling the shaded space below. This could be combined with high-altitude, high-resolution imagery collected by autonomous devices attached to small weather balloons, to help autonomous driving and the next generation of navigation systems. Organizing urban air mobility infrastructure would also be an interesting potential application.



TRAUMA-INFORMED APPROACHES

Trauma-informed approaches recognise that trauma and lingering traumatic stress have an impact on mental wellness, cognition or decision-making. The approach focuses on six principles: safety; trustworthiness and transparency; collaboration and mutuality; empowerment, voice and choice; peer support; intersectionality (understanding context). Initially developed in the healthcare, social services and education environments, the trauma-informed approach provides a meaningful framework across a wide range of policies. In one example case, taking food insecurity as a form of trauma, the principles were used to strengthen the resilience of a city's food system. Trauma-informed design and computing try to bring these principles to the world of designing physical spaces and digital technologies that can create and exacerbate traumatic experiences. It is also increasingly considered in journalism and organisational development, but applicable to all fields where working with people is crucial.



PUBLIC DIGITAL INFRASTRUCTURE

The concept of public digital infrastructure linked to public digital goods, sees the role of governments as much more than enablers and enforcers – but as co-designers and moderators of public digital spaces. India has been particularly active with digital interventions, setting up platforms and building digital ecosystems aiming for digital disintermediation. In Europe, the Next Generation Internet initiative, in its report, 'Towards Public Digital Infrastructure' encourages the EU to “redistribute power over the internet by building a more vibrant, diverse and resilient ecosystem of trustworthy open solutions, on top of a shared set of rules and open protocols and standards.” This includes the move from a platform to protocol-based economy of smaller collaborative ecosystems, collective decision-making on rules and protocols, and opening up data and identity. The growing govtech ecosystem in Europe can support this role.

