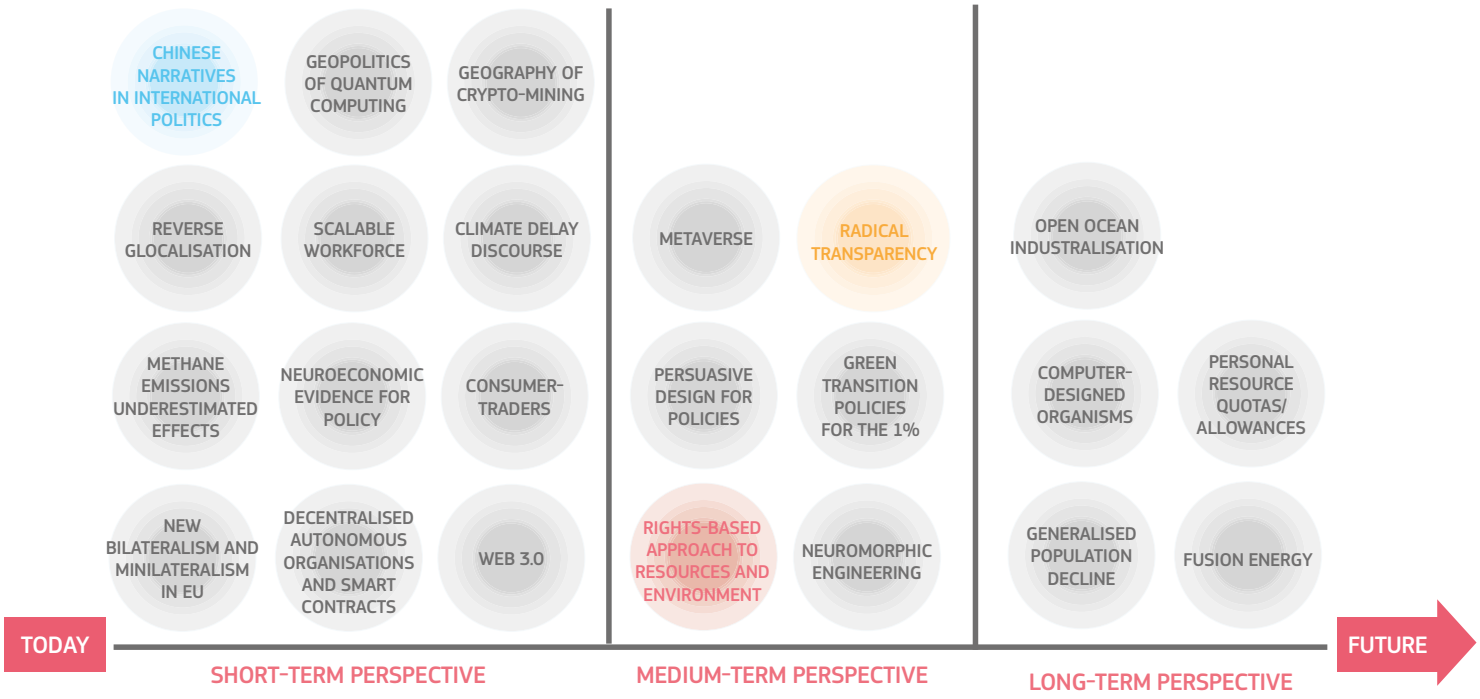
HORIZON SCANNING

EMERGING ISSUES FOR EU POLICYMAKING

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.

These emerging issues were recognized and developed via a series of workshops with participants from ESPAS members including several EU institutions. They **may be considered as new lenses through which we can get a different perspective** on the issues the EU is facing now and in the coming years.

The horizon scanning process identified the 23 signals of changes most relevant for EU policymaking which are presented in the graph below and detailed in the annex.



Three signals of change with most policy impact were selected among the list and have been analysed in more depth. The following pages offer a first exploration of **questions, problems or new solutions that can emerge from these three selected emerging trends**.

CHINESE NARRATIVES IN INTERNATIONAL POLITICS

RADICAL TRANSPARENCY

RIGHTS-BASED APPROACHES TO RESOURCES AND ENVIRONMENT

Chinese narratives in international politics

As part of China's increasing presence on the global stage, it has been introducing its terms and narratives into international agreements, thus mainstreaming diverging narratives into the global legal system. In that light, future interpretations of international law could become more contested, as part of a stategy of using the law as a subtitute for traditional military means.

"Non-Western terminology" may become more present in international politics – e.g. the "ecological civilization" adopted by the Chinese Communist Party as an alternative framing of a shift to more bio-holistic worldviews.

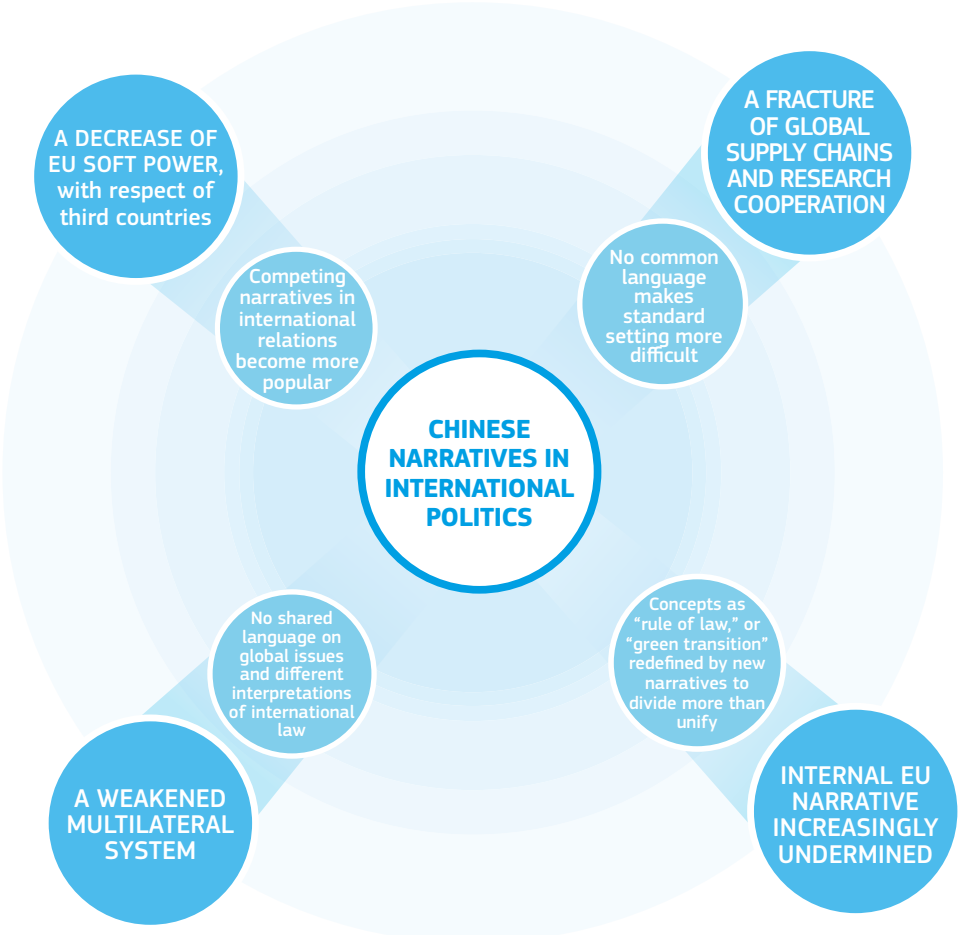
How can it change our optics?

As Western concepts and terminologies are increasingly contested and their meaning distorted, the EU will need to assess its actions by also taking into consideration the perspective of external narratives and be ready to engage with them and to refine, assert and explain its own narrative.

What is this relevant for?

Diminishing role of EU in international negotiations, donor competition, securing top jobs in international organizations, emerging countries greater role in summit diplomacy.

Futures Wheel: An indication of potential consequences



What if the EU...?

... were to develop multiple narratives in parallel? In the face of competing and/or adversarial concepts and terminologies, the EU could move from grand, unifying narratives to much more diverse, complementary stories about values that could more easily engage and address different contexts. For example the European Green Deal – "trying to do what is right for nature," and "exploring alternatives to economic growth" while "avoiding exacerbating the current injustices."

Radical transparency

The decreasing levels of trust and social capital in societies, together with the availability of a large amount of information, have increased calls for "radical transparency". This concept refers to being explicit about values, open processes, information for examination (publishing contracts, sharing salary information, etc.), offering "raw content" and big data, often provided through new technologies (livestreaming the revolution, body cameras, etc.). Currently, radical transparency is a result of strong external pressures on organisations, but it could become the new normal.

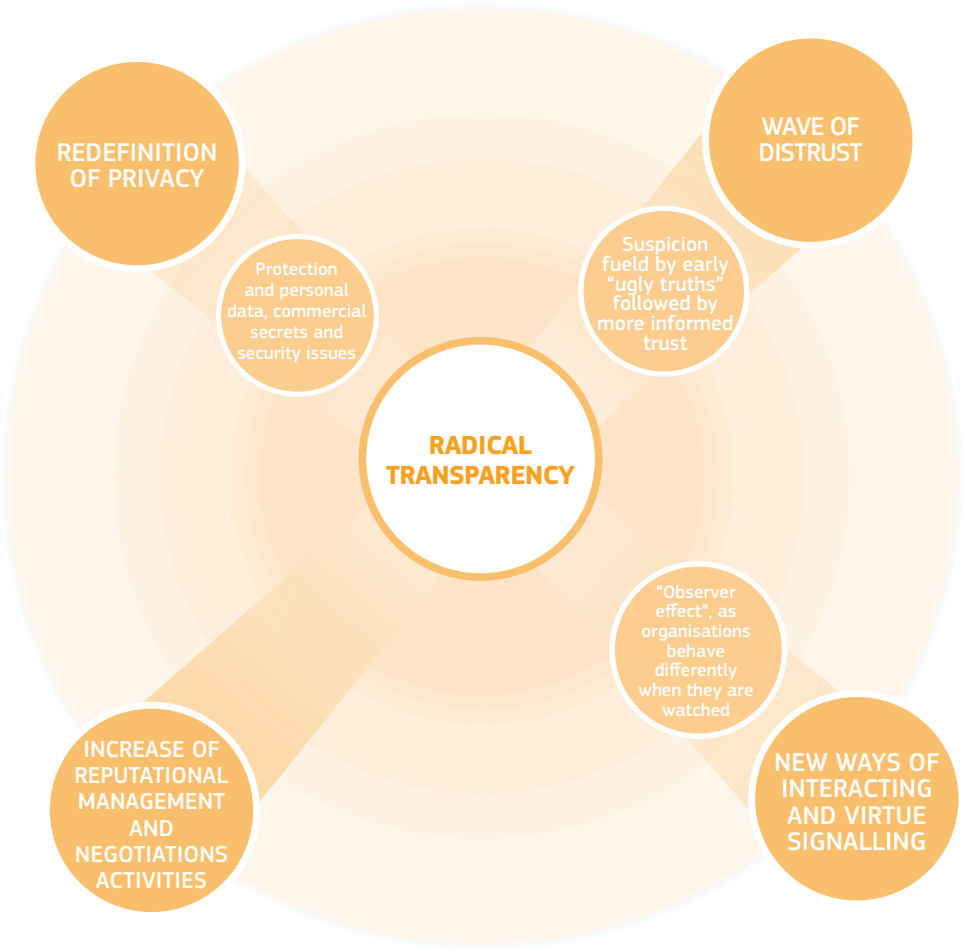
How can it change our optics?

Radical transparency could profoundly change the style of decision-making in public policies. These changes could go from focusing on the perceived speed, efficiency and complex negotiations of compromises to more deliberative, but also initially more conflictual approaches.

What is this relevant for?

Access to beneficiaries and documents (vaccine contracts, Recovery and Resilience Facility), dis- and misinformation (media freedom), transparency in negotiations.

Futures Wheel: An indication of potential consequences



What if the EU...?

...were to promote radical transparency and make it work well? The EU could develop a very large "EU evidence platform" providing a very broad but rigorous evidence landscape rather than targeted impact assessment - designed to be very widely accessible and with powerful tools to make it usable. This would also require the development of horizontal protocols that would allow users to access data from multiple sources and the treatment of data as public good.

Rights-based approach to resources and environment

In October 2021 the UN Human Rights Council passed a resolution recognising access to a healthy and sustainable environment as a universal right. In addition, at the COP26, civil society organisations have pushed strongly for a right-based approach to climate change. Similar approaches have been proposed for food, energy and water but also for technology governance. Rights-based approaches focus on the human dimension of the governance of resources, acknowledge the human rights obligations of states and private parties in the governance, and give access to judicial or administrative recourse. A further trend relates to giving rights to nature by assigning legal personality to natural entities, such as rivers.

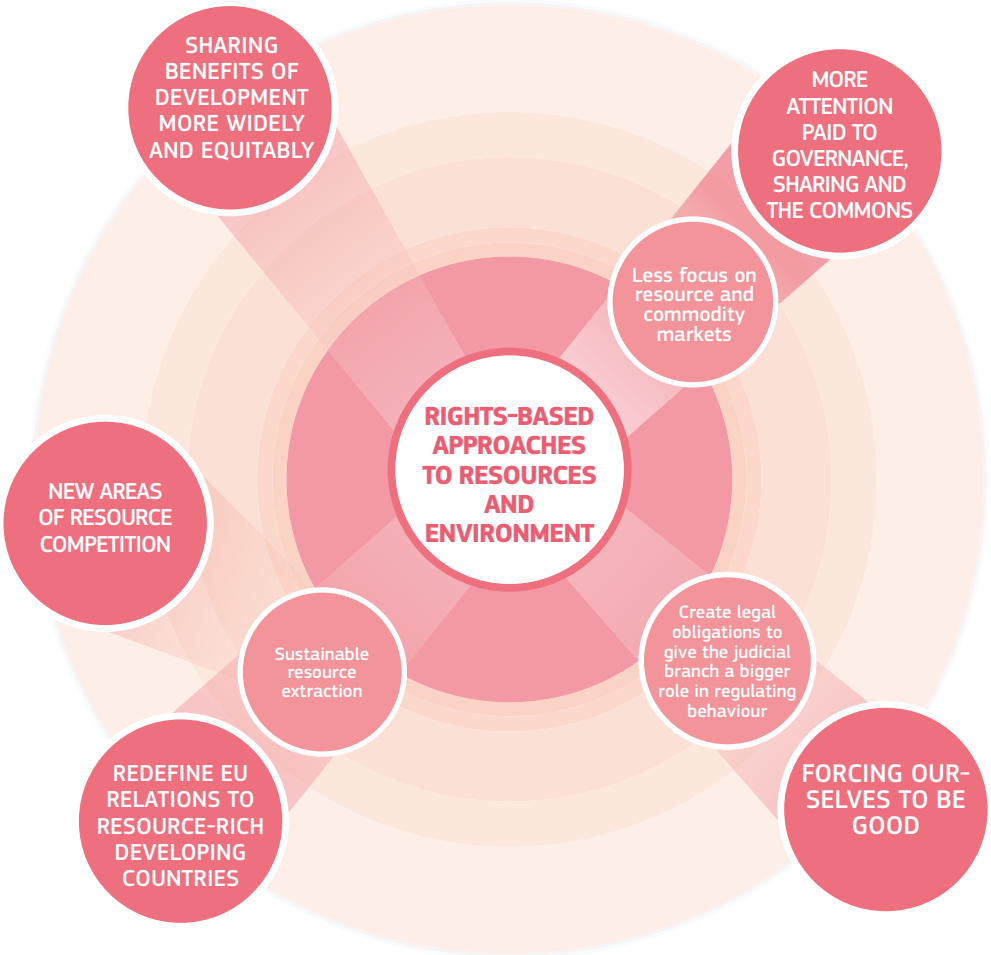
How can it change our optics?

Treating access to resources as a basic human rights and recognising the rights of Nature moves beyond the economic and anthropocentric focus on resources. The role of public institutions would focus on access rather than availability the development of infrastructure, objectives and targets that are more human-centred and on more accountability.

What is this relevant for?

Different approach on Sustainable Development Goals, growing scepticism of environmental, social, and governance (ESG) criteria, paradigm shift from “ecosystem services” to “nature’s contribution to people”.

Futures Wheel: An indication of potential consequences



What if the EU...?

... were global leader in a rights-based approach? Just as international law has evolved from regulating relations between states to addressing individuals as subjects – the EU could champion the progressive creation of the international “Law of the Planet” – a comprehensive set of rights and obligations with respect to Nature.

ANNEX : OTHER PRIORITISED SIGNALS

GEOPOLITICS OF QUANTUM COMPUTING

Quantum computing has been steadily progressing. Only in November 2022, IBM unveiled its Eagle quantum processor, with 127 qubits. The company Quantinuum started offering a first-ever quantum-created encryption key generator and the company IonQ plans to use barium ions as qubits aiming to improve the stability and reliability of quantum computers. This technology is also increasingly part of geopolitical competition. The United States has recently signed an agreement on "quantum dialogue" with the UK and Australia at senior official level.

GEOGRAPHY OF CRYPTO-MINING

As cryptocurrencies gain in popularity, their "mining" (process to generate new cryptocurrency and verify new transactions) becomes a very specialised and lucrative business with impact on countries' energy and climate policies. When China (accounting for most of worldwide mining) banned the activity in mid-2021, many operations moved to neighbouring Kazakhstan, where there is a permissive regulatory environment and cheap energy. Weak power infrastructure and growing electricity demand led to more frequent power shortages and strain on prices – adding to the energy sector unrest. As the US (accounting now for the majority of mining) and EU reflect on restricting or banning mining, more relocations are coming – to Kosovo, Iran and Abkhazia.

REVERSE GLOCALISATION

The initial understanding of the term "glocalisation" (a portmanteau of globalisation and localisation) focused mostly on transnational companies' adaptation of their global model to local conditions. However now with the development of global supply chains and digitalisation, most successful "local businesses" have many global dimensions as regards sourcing, but also a remote client base and even remote staff. In the face of increasing supply chain risks (economic, environmental and geopolitical), increasing protectionism and technologies allowing more distributed production and logistics,has meant that companies are starting to rebalance their local and global activities. This will have implications for supply chains, logistics and place-based approaches and policies.

SCALABLE WORKFORCE

With new ways of working and forms of employment, organisations are developing "on demand," "liquid" workforces that can expand or contract as they adapt to their increasingly volatile environment. Workers' approaches to gig work differs – some are "searchers" (temporary solutions looking for permanent job), "lifers" (a career choice), "short timers" (to finance a specific goal) and long-rangers (second job or supplemental family income) – and the issues around job-crafting and organisational commitment of this decentralised workforce will come to the fore. Job fragmentation and platform work are slowly making this trend possible, but they evoke images of autonomy and digital nomadism, and precariousness and alienation, equally.

CLIMATE DELAY DISCOURSES

The recently released IPCC Working Group II report entitled 'Climate Change 2022: Impacts, Adaptation and Vulnerability', warns that "any further delay in concerted anticipatory global action on adaptation and mitigation will miss a brief and rapidly closing window of opportunity to secure a liveable and sustainable future for all." Climate delay discourses, distinct from those of denial or scepticism, focus mostly on negative social effects and doubts about possibility of mitigation. The most common logic of delay discourse is to redirect responsibility, push for non-transformative solutions, emphasise downsides of climate policies or surrender to climate change.

METHANE EMISSIONS' UNDERESTIMATED IMPACT

Methane is a primary energy source fuelling a quarter of the modern economy and a greenhouse gas with a high global warming potential. The IEA Global Methane Tracker 2022 shows that methane emissions from the energy sector are on the rise, but also that they are 70% higher than official figures. More generally, methane emissions are under-estimated, significantly accelerating since 2014 and could potentially further increase due to climate change. Climate scientists are calling for a change in how the potency of the gas is measured that would entail separating emissions targets for methane. This change would encourage governments towards more action beyond the voluntary Global Methane Pledge.

DECENTRALISED AUTONOMOUS ORGANISATIONS AND SMART CONTRACTS

A decentralised autonomous organization (DAO) is a member-owned organization with no centralised leadership, where each decision is taken by voting and executed through rules encoded as a computer program (smart contracts) that is transparent and verifiable by anyone. A DAO's financial transaction record and program rules are maintained on a blockchain. The DAOs will allow decentralised movements to have easier governance and financing possibilities. Right now, most publicised examples relate to crowdfunding. The Constitution DAO in the USA collected over 40 million USD in an (unsuccessful) bid for a copy of the United States Constitution; however, other use cases have since developed. The Constitution DAO is also a good example of the limitations of such an approach as it struggles to return the funds to those parties involved and has already spent a significant portion of the funds.

CONSUMER-TRADERS

Consumers are not only becoming producers (or prosumers) in a more do-it-yourself, circular and side-job economy, but they increasingly take on the role of traders. Second-hand resale has been increasing significantly in the sharing-economy platforms and social marketplaces with sustainability objectives and particularly with regard to second-hand fashion. Investment trading apps have opened up the possibility of trading stocks, currencies and crypto assets at a small scale to a broad group of people. Finally, new business models are created based on resale of energy – for example, Vehicle-to-grid (V2G) systems facilitate the feeding of the energy stored in an electric car's battery back to the electricity network.

NEW BILATERALISM AND MINILATERALISM IN EU

Member States are increasingly building inter-governmental agreements and cooperation to create the capacity to form alliances and to share and formulate ideas about EU policies beyond Brussels. The renewal of the Franco-German cooperation in the Aachen Treaty and the new Franco-Italian Quirinale Treaty, signed in November 2021, are the most developed examples. This "embedded bilateralism" is argued to be the force behind the EU recovery package, likely to add more complexity to decision-making, and lead to a steady increase in acceptance of enhanced cooperation. In European foreign and security policy, the minilateralism approach has been present for some time, e.g. the Western Balkan Contact Group, the Iran nuclear negotiations, or the 'Normandy format'.

NEUROECONOMIC EVIDENCE FOR POLICY

Neuroeconomics and social neuroscience based on brain imaging provides an insight into the neural mechanisms underlying decision-making processes and social behaviour, and as such aims to address questions that are vital to implementation of policies. Neuroeconomic data can characterise both the choices at individual level and population level or market-wide, contributing to developing new neurocomputational models of decision-making processes. This approach has been applied to examine the factors influencing climate change risk assessment, social preferences and individual and collective actions in environmental or energy policies.

WEB 3.0

Trends to decentralise the internet with the use of blockchain are accelerating. Web 3.0 is the popular name given to trends leading to more distributed services based on digital assets (cryptocurrencies and tokens) in opposition to web 2.0, where user-generated context is centralised in digital platforms. The new decentralised applications, "dapps", are mostly now in the domains of games and DeFI (decentralised finance), but others are slowly following suit (crowdsourcing, privacy, social media). These are however coming under increased scrutiny from law enforcement and tax authorities due to their use for criminal activities (including terrorism), money laundering and tax evasion.

GREEN TRANSITION POLICIES FOR THE 1%

During the COP26 meeting, Oxfam published a report with projections that by 2030 the per capita emissions of the richest 1% of the populations will exceed 30-fold the per-capita emissions necessary to remain below 1.5^{0}C goal of the Paris Agreement. It is argued that focusing on the lifestyles of the mega-rich could be particularly effective (through e.g. taxing carbon-heavy luxury goods and services, compulsory restriction of individual emissions, specific building code obligations for large houses). This proposal is related to their carbon footprint, but also their roles in shaping the consumption norms.

PERSUASIVE DESIGN TECHNOLOGIES FOR POLICIES

As changing individual habits and behaviours are increasingly seen as a major factor in the effectiveness of policies, and digital tools are increasingly used in policy delivery, using a persuasive design is a logical next step. Persuasive technology refers to computing systems, devices, or applications designed to change a person's attitudes or behaviour based on psychological and social theories. Although it was developed in the context of user experience research to make apps more addictive, in the last decade health-related uses have increased with noted results in tackling obesity and encouraging physical activity. While successful where individual wellbeing is concerned, there are also potential applications for social welfare - regarding energy use, sustainability-enhancing behaviour etc. However, there are ethical questions regarding the potential manipulation, autonomy or way in which user interests are taken into account. The use of AI further enhances the potential of such technologies ("automated influence").

MAINSTREAMING NEUROMORPHIC ENGINEERING

Neuromorphic engineering is the design of computing technology that draws inspiration from biological neural processing systems. Neuromorphic computing implements aspects of biological neural networks as analogue or digital copies on electronic circuits, allowing the implementation of deep-learning algorithms. Its key advantages are energy efficiency, execution speed, robustness against local failures and the ability to learn. Beyond electronic devices, neural network hardware could be developed from any controllable physical system (optical, mechanic).

METAVERSE

A combination of Augmented/Extended/Virtual Reality technologies will increasingly shape our digital realities and redefine interactions. The metaverse, spatial internet or phygital world are some of the terms used to describe it. The technology allows creating exclusive immersive experiences around the products, services and activities - from virtual tours of factories or farms, to virtual events, by altering reality around us through projections. It can be offered to anyone. Following the pandemic, people have heightened needs for meaningful encounters and new types of online spaces that are more social, interactive, and engaging are proliferating.

OPEN OCEAN INDUSTRIALISATION

The fast growth of marine economy results in growing numbers and intensity of economic activities ("the blue acceleration") and increasing the pressures (acidification, marine heatwaves, plastic pollution, and ecological connectivity. These activities (oil and gas extraction, renewable energy production, pipelines and cables, shipping, tourism, fisheries, aquaculture and blue biotechnology, sand and mineral extraction) are often in conflict, although sometimes mutually beneficial, with various forms of marine spatial planning and governance. In addition, new aquaculture techniques, deep water fishing and mining and even geoengineering ideas will strengthen the pressures.

COMPUTER-DESIGNED ORGANISMS

In 2020, a method was invented that designs biological machines from the ground up. AI automatically designs diverse candidate lifeforms to perform some desired function, and transferable designs are then created using a cell-based construction toolkit to create living systems with the predicted behaviours. First such organisms, xenobots, were derived from cells harvested from Xenopus laevis embryos. In a recent report, the team showed that such robots could replicate by combining loose cells into self-copies. The developments in synthetic morphogenesis have applications in biomedicine and bioengineering.

DEVELOPMENT IN FUSION ENERGY

Fusion energy is produced when nuclei of lighter atoms, such as hydrogen, collide and fuse together to produce nuclei of heavier atoms, such as helium, and release vast amounts of energy in the process. A series of recent research advancements and breakthroughs as well as increased private investment may bring us closer to a new source of safe, low carbon energy within next decade. As the perspectives become more tangible, research is starting into the commercialisation of fusion energy.

PERSONAL RESOURCE QUOTAS/ALLOWANCES

With the growing climate change crisis and increasing resource scarcity, the emission and resource (water, energy etc.) restrictions or quotas for businesses are an increasingly popular tool. A recurring idea from late 1990s is to introduce similar quotas or allowances for individuals, especially personal carbon trading, but this was usually not taken up due to costs of the system, lack of public acceptance and low receptivity among decision-makers. Recent research argues that technology tools can increase cost-efficiency and feasibility of such schemes. In 2020, a pilot voluntary scheme was tested for mobility in Lahti, Finland, but was interrupted due to COVID.

GENERALISED POPULATION DECLINE

After a long spell of fast population growth, the world is entering a new phase of a slower growth than expected. While the UN 2019 World Population Prospects projects world population to increase to 9.7 billion in 2050 and peak at 11 billion at the end of the century, other reports suggest that the peak may come earlier (around 2070-2080). A slowdown in population growth and reaching peak numbers is consistent with earlier projections on the matter. The US and China 2020 census data showed historically low population growth level and India's fertility rate dropped for the first time below replacement levels. Population decline, once limited mostly to Europe and parts of Asia, is thus likely to increasingly become a global problem. This will have an effect on global economy, social systems, immigration, environment, etc.