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Dear reader,

Welcome to the second issue of Horizon Futures Watch, bringing you a fresh batch of articles revolving around the latest foresight developments in Horizon projects and beyond. Two new themes are treated in this issue: Tackling security concerns and the future of Science for Policy. The 'Tackling security concerns' section goes beyond the scope of the Futures4Europe platform foresight project on the 'interpenetration of criminal and lawful activities' and explores new needs that arise for fighting crime and countering hybrid threats as a result of rapid technological developments. The Science for Policy theme explores novel approaches taken to support the democratic process through evidence-based methods for policymaking.

We open this issue with an up-to-date selection of news on foresight projects and publications. The Foresight in the Field section presents the application of foresight in EUROPOL's European Innovation Lab to support law enforcement agencies around the EU.

The 'Tackling Security Concerns' section features:

EU-HYBNET: Bridging the Gaps for Enhanced European Security – The EU-funded security research project HYBNET explores approaches to tackling hybrid threats and implications for safeguarding democracies.

Shaping the Future of AI in Policing: ALIGNER's Pragmatic Approach – The EU-funded security research project ALIGNER re-evaluates foresight as a methodology in the context of criminal activities as fast paced developments pave the way for unpredictable futures and ethical implications.

The 'Foresight of Science for Policy' section explores:

Nature's Barcode: The Exciting Frontier of Plant Tracking– Project GUARDEN delves into the potential of pairing citizen-powered interactive maps with machine learning as vital decision-support tools for local policymaking.

Futureproofing Public Health Systems by Teaching Foresight – As a future thinking, capacity-building initiative, PHIRI invites policymakers to lend their ears to extreme and value-driven scenarios in post-pandemic population health.

Putting cities at the centre – An interview on how SPROUT's city-led policy response to urban transformation sparks innovative disruptions innovation in sustainable mobility.

To conclude, a selection of content from the Futures4Europe platform featuring Developing Context Scenarios for Future EU R&I policies and The EU in a Volatile New World: Challenge of Global Leadership And finally, don't miss out on these upcoming events from the world of foresight!

We hope you enjoy reading and using this newsletter.

Sincerely,

The Editorial Team of Foresight on Demand (Hywel Jones, Laura Galante, Emma Coroler, Alexandre Lotito, Giovanna Giuffré, Loredana Marmora, Valentina Malcotti)

NEWS BULLETIN

Title: 2023 Strategic Foresight Report – Sustainability and people's wellbeing at the heart of Europe's Open Strategic Autonomy
Date: 6 July 2023

Figure 1: Key challenges for the EU's sustainability transition

DEMAND FOR FUTURE SKILLS
Growing skill disparities and lack of adequate competencies could impede the twin transitions and adaptability of citizens

QUEST FOR NET-ZERO AND WELLBEING
The current economic model will require transformative changes to ensure sustainability and the wellbeing of Europeans

THREATS TO DEMOCRACY
Democracy as the main form of government to deal with social and economic issues is increasingly challenged

SUSTAINABILITY
OPEN STRATEGIC AUTONOMY

ERODING SOCIAL COHESION
Eroding social cohesion will threaten trust in governments and the viability of the transitions

PRESSURE ON FUNDING
The availability of funding is challenged by broadening policy priorities in contrast to rising capital costs

THE RISE OF GEOPOLITICS
A new geopolitical landscape will jeopardise Europe's economic security as well as global cooperation in the green transition

Image: 2023 Strategic Foresight Report, European Commission

The report examines the intersections between the socio-economic aspects of sustainability and the structural trends and dynamics affecting it. It builds on the Joint Research Centre's inclusive and participatory foresight exercise, which aimed to create alternative scenarios of the EU sustainable future by 2050. For each scenario, the current report derived sustainability transition pathways, allowing for the identification of alternative structures and practices by 2050. The report emphasizes the importance of funding and increasing private financial flows to support strategic investments for these transitions. It also identifies key areas of action across all policy domains to ensure a sustainable Europe in 2050. You can access the full report here.

Image : https://www.iom.int/

Title: Foresight & Migration: Perspectives and Limitations
Date: 28 June 2023

The field of predicting migration patterns has gained attention from various stakeholders, including policymakers, analysts, and researchers. Accurate knowledge of migration trends is crucial for effective policy design. Foresight studies provide valuable insights into this realm but also present ethical and data access challenges. In this podcast, Damien Jusselme from IOM's Global Migration Data Analysis Centre shares his expertise on utilizing foresight studies in migration analysis. You can find it here.
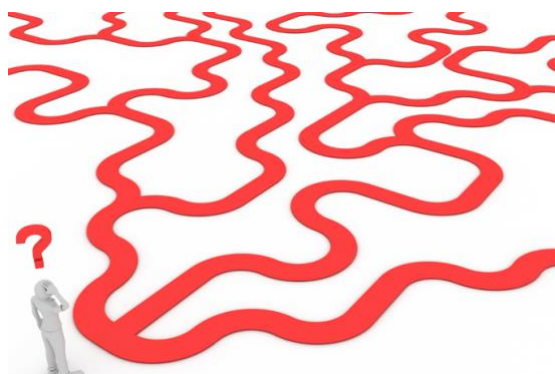

Image: www.epc.eu

Title: From foresight to forethought: No longer lost in translation?
Date: 15 June 2023

In the age of permacrisis, EU strategic foresight becomes vital yet challenging due to high uncertainty and volatility. To ensure its effectiveness, foresight must evolve into forethought, seamlessly integrating into European policymaking and adapting to the new environment. Read the commentary by Fabian Zuleeg and Ricardo Borges de Castro on the necessity for enhanced strategic anticipation in the European Union here.

Image: sciencebusiness.net

Title: The EIT Food 2023 Annual Event: Transforming Food Systems Together
Date: 27-28 June, 2023

EIT Food hosted the 5th edition of the EIT Food Annual Event "Transforming Food Systems" on 27-28 June 2023 in Riga, Latvia. The event gathered stakeholders' interest in the future of food systems to learn, connect, and amplify their impacts. Delegates who attended the event also received more details on EIT Food's mission-based funding plans which will launch after the summer. You can find more information about the Event here.

Image: weforum.org

Title: World Economic Forum Future of Jobs Report 2023
Date: 30 April, 2023

The World Economic Forum published its fourth edition of the Future of Jobs Report. The report aims to offer new perspectives on how the interplay of socio-economic and technology will influence the future of the workplace. Discover how economic and geopolitical trends have impacted labour markets in 2023 and how technology adoption will drive business transformation in the next five years. You can find the report here.

Image: cifs.dk

Title: "THE FUTURE OF THE METAVERSE"

Date: 21 April 2023
The Copenhagen Institute for Future Studies is running a project focused on the Metaverse. Within this project, the Institute recently released the results of a Delphi Study on the development of the Metaverse towards 2030. You can download it here.

FORESIGHT IN THE FIELD

How Europol uses Foresight to anticipate the criminals of the future

By Laura Galante

With the rise of new digital technologies, crime is evolving in new and unpredictable directions. To reduce their impact, it is becoming increasingly vital to anticipate their course.

The Observatory of the Europol Innovation Lab (EIL) monitors technological developments, anticipates potential future scenarios, and performs foresight with the intent to foster innovative practices in law enforcement. Horizon Future Watch asked Mark Wittfoth, who is responsible for the Observatory, and his colleague, Diederik Don, for their views on the role of foresight for the future of law enforcement.

This image was generated with the help of GPT-3.

How does strategic foresight fit into the work of the Europol Innovation Lab and Europol as a whole?

Mark: The mandate of the Innovation Lab is to identify, promote, and develop concrete innovative solutions that benefit EU law enforcement. Our team was set up to help anticipate and detect relevant emerging technological developments, so that we can identify weak signals and help Europol and the wider EU law enforcement better prepare as the developments occur.

What kind of research is the EIL currently undertaking in the field of strategic foresight?

Mark: One of the things we do is technology scanning; we look at emerging technologies and try to assess the impact they will have on the law enforcement community, both in terms of the benefits as well as the threats from criminal abuse. Our most recent in-depth report was on the impact of large language models such as ChatGPT. Together with our operational experts we tried to assess the impact that this type of technology can have on law enforcement, how they might use it, how criminals can abuse it, and this will likely keep us busy for the coming years as the technology progresses. We are planning to do a more in-depth technology scan in the second half of the year, where we try to and rank technological developments based on the impact that we anticipate that they will have on law enforcement.

How do these technologies make us rethink about the way we define crime and how to tackle it?

Diederik: I think the most important thing to note is that crime itself is as old as humanity, but the technology and the way in which it is committed is different. We try to apply our understanding of the approach to crimes with what these new technologies might enable.

Mark: Historically, criminals have always been among the earliest adopters of new technologies. Criminals are not bound by regulation or restrictions. They are very creative and looking for new ways, as Diederik said, to carry out the same types of crime just in different contexts or facilitated by technology. Again, using the ChatGPT example, within weeks after publication of the tool, there were some criminals already posting on dark web forums how one can use ChatGPT to carry out some basic cyber-criminal activity. This shows how quickly these technologies are applied. Importantly, we need to understand the technology to grasp how it can be abused, but at the same time, we also need to be able to use the same technology to investigate crimes, to analyse our data and become more effective, to keep up with changing landscapes.

What are some of the most salient trends that have been identified in your strategic foresight activities that you believe will have an impact on your work until 2030?

Mark: I think we will move away from AI being considered a singular technology, but something that really enhances and facilitates many other types of technological developments. In terms of how we can use it for law enforcement, there are numerous use cases that AI can help us with, but also how criminals might be able to abuse AI tools and new advances in, for example the area of generative AI, such as deepfakes. Another

area that is not clearly defined is mixed reality, and we see that recently there is quite a lot of movement in that market. The tech sector is still investing a lot of money into this technology, and I personally believe all it takes is one breakthrough like we saw with ChatGPT and it becomes something that you know will become universal in society and consequently the demand will increase.

What mechanisms does the Innovation Lab have in place to engage with various stakeholders?

Mark: We work very closely with the Member States across the entire range of our tasks, liaising with key subject matter experts from the national competent authorities. As such, we are working with experts from law enforcement on issues such as horizon scanning and foresight, in which we can learn from each other's expertise and pool resources. In addition, the Europol Innovation Lab is part of the EU innovation Hub for International Security. From there, we talk to other agencies such as Frontex, the JRC, the Asylum Agency, Eurojust, and the European Commission, so it is key for us to foster this collaborative aspect. The various stakeholders that we work with in foresight help to anticipate both positive as well as negative developments. We also maintain communication and collaboration with other entities in the internal security domain. Although we observe similar issues, our perspectives and priorities may differ, enriching our collective understanding and approach. This is a key added benefit of working within this network of different networks. If we identify a joint priority, then we might have a foresight report on it, for example innovative developments in the area of encryption or in privacy enhancing technologies. Then, each member contributes to the collective foresight thinking with their own work. So, we really try to share information, build up expertise collectively, and ensure that not everyone is doing the same thing separately.

As technologies become increasingly accessible, the risks of criminal misuse may also rise. How does the Europol Innovation Lab collaborate with law enforcement and security agencies to pre-emptively mitigate risks?

Mark: Our aim is to anticipate potential threats so that we can already today take the necessary steps to prevent or mitigate undesirable future scenarios. But we are also working on the more strategic level. For example, we discuss the ethical use of technology, not just the risks from criminals, but also how we as law enforcement can ensure that we consider all necessary ethical considerations when we're using technology. Our mandate is to serve the public, and for us to do so efficiently, we need to ensure that the public trusts us to protect their fundamental rights. So, it's important for us to make sure that the ethical component has a really strong role, both in how we use technology but also in how we talk about technology. We encourage these types of debates and we try to be also role models in terms of having these on top of our agenda in the law enforcement community.

Diederik: Foresight is only really useful if you really do something with the outcomes. You have the information, but you need to make it actionable, and this is one of the challenges. We're lucky that we have a network of experts that are doing foresight in the Member States. Our mission is then to concretise the work and try to implement the future scenarios that we anticipate. That can only be done if we work together.

TACKLING SECURITY CONCERNS

EU-HYBNET: Bridging the Gaps for Enhanced European Security

By Emma Coroler

The world of hybrid threats presents a complex and ever-evolving landscape where traditional and non-traditional methods intertwine. With the rise of these multifaceted challenges, safeguarding the integrity of European democracies has become an urgent imperative.

Picture a scenario in which malicious actors orchestrate a sophisticated influence campaign. In the civic space, they disseminate propaganda, manipulate narratives, and wage disinformation campaigns. Concurrently, cyber-attacks are launched, targeting critical infrastructure and government systems, seeking to disrupt operations and compromise sensitive information. At first glance, these activities may appear disconnected. But looking closely, there is an underlying influence campaign at play. This is the modus operandi of hybrid threats, which are addressed as part of the European Commission's new EU Security Union Strategy for 2020-2025, focussing on priority areas to support Member States in fostering security.

Image : channelfutures.com

Hybrid threats can best be characterised as "coordinated and synchronised actions that deliberately target democratic vulnerabilities of EU States and Institutions"[1]. These threats are becoming more powerful as the security environment changes, new tools and technologies emerge, and vulnerabilities are exploited in different areas in ways we haven't seen before. They employ a variety of tools, ranging from familiar ones (physical operations against infrastructure, cyber-espionage, disinformation campaigns and propaganda) to unexpected and covert methods (misuse of foreign direct investment or territorial water violation).

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Addressing such threats requires a focus on early identification and on gaps in prevention and response measures. The Horizon 2020 security research project EU-HYBNET aims to build a sustainable pan-European network of security stakeholders, especially security practitioners, to collaborate with each other and increase the capacity at European level to counter hybrid threats. The EU-HYBNET Network focusses on monitoring relevant developments in research and innovation with respect to countering hybrid threats, including recommendations for sound and promising technological and non-technological (e.g. training, Standard operating measures) innovations uptake and industrialisation and definition of common European requirements. The network will run until 2025 and will then be hosted by the European Centre of Excellence for Countering Hybrid Threats (Hybrid CoE).

Hybrid threats may be deployed to erode public trust in democratic institutions, intensify social division or impact political leaders' decision-making. Due to their multi-faceted nature, hybrid threats can be difficult to identify and attribute to a source. As Päivi Mattila, coordinator of the project, says, "The challenge in hybrid threats is to connect the dots together".

The EU-HYBNET project uses the conceptual model developed by the Joint Research Centre (JRC) and Hybrid CoE in 2021 to characterize Hybrid Threats. The model provides a way to analyse different kind of actors and understand their motives and doctrines. By gaining a thorough understanding of their objectives, the model serves as a valuable tool for foreseeing and predicting future malicious activities.

Recently, EU-HYBNET used "Core Model" methodology in pan-European security practitioners' and other relevant actors gaps and needs to counter hybrid threats analysis – the Core Model was developed by the JRC and the Hybrid CoE. This new model adopts a holistic approach encompassing various societal spaces (governance, civic, service) at different levels (international, national, local). It emphasizes the interactions among these societal spaces and offers means to visualise the strategies employed by different actors, the specific tools utilised, and the targeted domains.

Given the evolving nature of Hybrid Threats, thorough trend analysis is key. The EU-HYBNET project also has a focus on identifying the future trends of hybrid threats and addresses them in working cycles that culminate in many project's events, especially in Future Trends Workshops. Throughout these event s and project's working cycles, foresight exercises contribute to the initial identification of gaps and needs, as well as, in the final stage, formulating recommendations for possible innovations and solutions uptake and standardisation. Mattila explains "Our main objective is to assist European security practitioners in analysing the gaps and needs to counter hybrid threats. We aim to identify what they see as vulnerabilities and challenges in their daily working life to find technological or non-technological solutions".

When examining future trends in hybrid threats, an aspect of concern within hybrid threat landscapes is the interplay between economic transactions and covert operations. A specific aspect that has received thorough scrutiny is the utilization of Foreign Direct Investment (FDI) to acquire land and properties in strategically significant areas, raising apprehensions regarding potential implications. According to Mattila, a significant concern revolves around understanding the processes involved in purchasing premises or land in critical areas, and how these properties can be activated for malicious activities. As Mattila underlines, the project focusses "on who is behind the money, getting control of this premise and how this can be used to foster illegal activities". This underscores the urgency of not only understanding such threats but also developing robust countermeasures to safeguard strategic assets and curb illicit financial activities.

When considering the future development of criminal and unlawful activities, Mattila highlights the ongoing competition between security practitioners and malicious actors. Positive signs of success would be e.g. a reduction in the number of cyber-attacks and malicious actions and that "security practitioners would be well ahead of malicious actors in developing cyber-offensive and other capabilities". Making this happen means creating the conditions for security practitioners to collaborate and be aware of various types of threats that go beyond conventional cyber and physical security, including vigilance against threats from unconventional domains.

Shaping the Future of AI in Policing: ALIGNER's Pragmatic Approach
by Laura Galante

ALIGNER aspires to rally European stakeholders anxious about AI's role in law enforcement. The project's goal is to create a unified front to identify strategies that will not only bolster the strength of law enforcement agencies through AI but also ensure public benefit. But how far into the future is it useful to look?

In a world where technological advancement is swift and relentless, the EU-funded security research project ALIGNER focusses on the integration and implications of Artificial Intelligence (AI) in law enforcement, looking at a more immediate, shorter-term time frame.

Project Coordinator Daniel Lückerath is pragmatic: "The rapid developments in AI technologies and their increasing public availability, as well as permeation throughout many aspects of society – from your fridge to your smartphone – make reliable foresight very far ahead almost impossible". Hence, ALIGNER bases its strategies on the imminent needs, challenges, and opportunities that law enforcement confronts, considering both the potential misuse of AI and also its constructive use by police and law enforcement in societal contexts.

ALIGNER focuses on a not-too-distant "future scenario" where AI is an integral part of daily life, and plays a pivotal role in

This image was generated with the help of GPT-3.

policing and law enforcement. This approach, enriched by input from advisory boards and research collaborations, has earmarked significant areas where AI's potential criminal usage might be prominent. These areas include disinformation and social manipulation, cybercrimes against individuals and organisations, and the application in vehicles, robots, and drones.

ALIGNER has identified sectors where AI could revolutionise policymaking and law enforcement practices. Promising applications include data handling processes, such as incident and crime reporting, digital forensics for obtaining digital evidence, improving incident reaction and response mechanisms, crime detection, and the use of AI in vehicles, robots, and drones.

Based on these identified sectors, ALIGNER works along four distinct "narratives" or topical scenarios, intertwining different aspects across these highlighted categories, giving guidance to the related work in the project. "For each 'narrative' that ALIGNER works on, we identify suitable AI technologies." Lückerath explains. "These are briefly described in so-called scenario cards that summarise the relevant information – what the technology is about, how effective it is, and how robust." The narratives as discussed thus far have revolved around disinformation and social manipulation, cybercrime against individuals using chatbots, and one on AI-enabled malware, with the fourth one currently being in discussion within the project team. Based on these topical scenarios, assessment methods for the technical, organisational, as well as ethical and legal implications were developed.

As an example, the first 'narrative', dealing with disinformation and social manipulation, assumes that criminals use AI for phishing attacks to gather personal data. Through phishing attempts, they identify and attack high-value targets ('tailored phishing or spear phishing'). The goal of these attacks is to manipulate or coerce targets to gain unauthorised access to computer networks, e.g., of election campaigns, large research companies, or industry organizations. Phishing attacks may involve online attempts to persuade or trick individuals into divulging passwords or access codes or, if the opportunity arises, using harvested data to subject them to blackmail or coercive threats. Besides targeted phishing attacks and data harvesting, criminals may disseminate selective misinformation and disinformation apparently emanating from official or well-informed sources. Disinformation uses artificially generated videos, images, text, and sound, including deep fakes of public figures, and is generated by AI-fuelled 'bots'. To counter the threat of phishing, law enforcement agencies also bring AI: They use veracity assessment methods to detect disinformation, then employ

deanonymisation techniques like authorship attribution and the geolocation of images to identify from where the disinformation originated. This is supported by techniques for the detection of synthetic images and videos.

In the second 'narrative', a crypto romance scam, a criminal contacts a victim via an online chat, grooming the victim into believing the scammer is a genuine 'friend' and subsequently extracting crypto currency out of the victim. These scams might be supported by generative AI models like ChatGPT, Dall-e, or Midjourney, creating fake profile pictures, voices, and videos, or automating text generation in multiple languages. In the future, the creation of profiles, targeting of individuals, generation of fake crypto currency company sites, and grooming might even become highly automated. To address these threats, law enforcement agencies themselves need to deploy AI-based models to detect generative content, to support automatic detection of scammer profiles as well as scamming victims, to detect voice clones, or to detect crypto currency laundering.

ALIGNER collaborates with professionals from policing, academia, research, industry, and policymaking, including legal and ethics experts, organised in two advisory boards: one for law enforcement expertise, and the other gathering research, industry, and ethics authorities. "To receive a reliable assessment, we need many different experts from different European countries to ensure that we reflect a broad view on these emerging technologies and scenarios. This takes time, especially considering different languages and expertise" Lückerath says.

While AI can be misused by criminals, it also greatly aids law enforcement in combating crime, such as by reducing errors, automating time consuming tasks, identifying potentially suspicious behaviours, and even speeding up legal procedures by predicting possible outcomes based on past cases. However, care must be exercised to avoid AI creating biases and discrimination, as certain geographic areas or groups might be unfairly targeted, leading to a disproportionate increase in arrests.

This is why ALIGNER has developed the [Aligner Fundamental Rights Impact Assessment](#) (AFRIA) tool to enable law enforcement authorities to further enhance their already existing legal and ethical governance systems. This is a method designed to help law enforcement follow ethical guidelines and respect basic rights when using AI systems in their work. It consists of a fundamental rights impact assessment template and an AI System Governance template that help authorities identify, explain, and record possible measures to mitigate any potential negative impact the AI system may have on ethical principles. While in the EU there is no legal obligation to perform such assessments, the AFRIA complements already existing or potential legal and ethical governance systems, such as the forthcoming 2021 AI Act proposed by the European Commission. Depending on the results of negotiations during trialogues, Lückerath explains, "ALIGNER would like to see a practicable and sensible AI regulation that…enables law enforcement agencies to use AI in an ethical, legal, and socially acceptable way, and still allows us to make use of AI technologies for the betterment of society."

Lückerath envisions a future in which established national centres across Europe support law enforcement agencies with ethical, legal, and socially acceptable implementation and deployment of AI technologies, as well as oversight bodies that would use a harmonised framework to assess AI technologies before, during, and after their deployment. In this envisaged future, a harmonious blend of technology and ethics may very well redefine the contours of law enforcement, empowering agencies with the tools of AI while maintaining steadfast commitment to ethical and legal standards.

FORESIGHT ON SCIENCE FOR POLICY

Nature's Barcode: The Exciting Frontier of Plant Tracking
By Valentina Malcotti and Giovanna Giuffré

Under Pl@ntNet's polar star, GUARDEN brings citizen science and predictive machine learning together to support decision-making in biodiversity conservation.

Credits: Freepic

Do plant-spotting, birdwatching, or sky-gazing make you a scientist? Partly! By documenting and recording the presence of a certain plant, bird or celestial body on citizen science platforms, your sightings enrich the databases researchers use to monitor biodiversity, track bird migration patterns, and map the universe. Paired with machine learning and AI, citizen-powered interactive maps can support local decision making in biodiversity governance.

Combining citizen geolocalisation activities with Earth observation (satellite images, time series, soil data, etc.), Deep Learning (training computers to interpret data and find patterns), and predictive hybrid modelling can be a powerful way to track biodiversity loss. The GUARDEN project develops, enhances and engages with citizen science tools, allowing for environmental observation. Ecological data collected and retrieved through these channels can inform and inspire decisions to safeguard critical ecosystems.

By October 2025, GUARDEN will deliver a forward-looking decision support application to help ecology stakeholders expand their holistic understanding of ecosystem functioning and biodiversity loss. Identifying drivers in biodiversity transformation will enhance the assessment of ecological and societal impacts of alternative policy decisions.

Led by CIRAD (French Agricultural Research Centre for International Development), this Horizon Europe-funded multi-stakeholder partnership aims to transform bottom-up datasets about ecosystems into evidence-based insights to improve the monitoring and governance of biodiversity. GUARDEN aims to assist decision-making by using integrated data to predict future challenges to biodiversity and ecosystems from new pressures and drivers. These drivers may include human disturbance, climate change, or land management.

The GUARDEN project coordinator, Pierre Bonnet, botanist and tropical ecology expert at CIRAD, and project partner Alexis Joly, computer scientist at INRIA, both explain: "Plants don't move! This makes them key players in characterising local ecosystems".

Bonnet and Joly are also coordinators of Pl@ntNet, one of the world's largest citizen science projects for automatic plant identification. They have thus taken on the GUARDEN challenge by building on existing partnerships and expertise on the topic of plant tracking.

Pl@ntNet is both a website and a mobile application with more than 20 million users worldwide which allows people to share the occurrence of plants in given areas through the automated identification of photographs. "Citizen data coming from Pl@ntNet is then merged with data from other European data infrastructures, programmers, and GEO initiatives to feed predictive AI modelling", explains Joly.

Guided by Pl@ntNet's experience, GUARDEN aims to refine the current scale, bringing geolocalisation to a higher resolution (up to 100 m^2), and provide a set of complementary ecological indicators for local ecological monitoring and management.

"GUARDEN will extend the resolution of existing tools, adding layers and indicators to extract information," explains Joly – "Beyond plant occurrence, also habitat features (pollinators, birds, mammals, etc.) and species interactions will be monitored to conduct deep species distribution modelling".

The GUARDEN team is working on a mock-up: the [GeoPl@ntNet](#) prototype offers a finer resolution and the chance to access factsheets with multiple ecological indicators representative of a specific area. Scale is an issue, though. According to Bonnet, determining indicator certainty is challenging due to potential geographical bias: "Local indicators may not be shareable with the same level of precision on the European scale".

"The local angle is what makes GUARDEN original and distinctive from other macro-scale geolocalisation tools available" – confirms Bonnet – "A greater awareness of local eco-systems can also influence citizens' perceptions of local biodiversity management and mitigate reactions to disruptive decisions".

When it comes to ecological conservation and restoration, conflicting interests are at stake and trade-offs must be considered (e.g., between conservation policies and development agendas). GUARDEN explores these tensions by broadly involving all land management actors in assessing adaptive ecological scenarios.

Four heterogeneous local pilots (including a tropical, non-EU, setting) will address critical challenges in biodiversity governance. [Case studies](#) will consider the impacts on biodiversity and ecosystems of urban coastal management actions (in Barcelona), energy infrastructure (expansion of energy centre in Cyprus and construction of windfarms in Greece), and development of transport infrastructures (France and Madagascar).

GUARDEN recognises the complexity of managing raw data and therefore places a high priority on data transparency and trust. This helps face the scepticism due to a dual "prejudice" involving both the perceived contribution of citizen science to research and the use of deep learning models. Joly points to how "even if AI-based methods are deeply present in our everyday activities, mistrust in these tools is a big challenge".

A responsible and transparent use of AI has the potential to enhance the value of citizen science in the realm of ecology. Safeguarding AI-mediated citizen science may support the development of increasingly precise predictive ecological models and help identify forward-looking biodiversity conservation policies. Promoting the acceptability of these approaches, also through the elaboration of computational standards on the use of hybrid biodiversity data, can boost further research and innovation in the field of biodiversity protection.

Futureproofing Public Health Systems by Teaching Foresight
by Giovanna Giuffrè & Valentina Malcotti

Future thinking capacity-building initiatives like PHIRI invite policymakers to lend their ears to extreme and value-driven scenarios in post-pandemic population health.

In the throes of the pandemic, 'unprecedented' became an overused descriptor. But it is a misnomer for COVID-19. Despite its novel nature, the potential for such a health crisis wasn't entirely unforeseen. Foresight studies have contemplated the possibility of a global pandemic, but even a future-thinking veteran like Henk Hilderink admits COVID-19 was a 'reality check' for everyone.

It was not so much that a pandemic was unexpected, but more about anticipating its specific features. "Although it was always included in public health forecasts as a red flag, not even the foresight community was really able to conceptualise what a global pandemic would actually look like: face masks, confinement rules, the hesitation of science…", comments Hilderink.

Witnessing that kind of science fiction plot coming to life, highlights the importance of contemplating also extreme scenarios: "People, including policymakers, have a tendency to think mainstream and dismiss the worst-case outcomes", notes Hilderink. Black swans (foresight jargon for random, unexpected, but high-impact events) are usually of less interest than the "usual suspects", such as ageing, technology and economic growth. According to Hilderink, raising awareness about extreme events is one of the duties of the foresight community, along with the assessment of more predictable uncertainties.

COVID-19 caught us unprepared and brought attention to the value of foresight methodologies in developing resilient public health systems for the future. "The momentum to invest in foresight is there and capacity-building is key to promote foresight practices across Europe and lead to the institutionalisation of future thinking in public health", observes Hilderink.

Thirty years in the field make Hilderink one of the most experienced strategic foresight experts in Europe. At Dutch national level, he led the last two editions of the quadrennial public health foresight report published by the National Institute for Public Health and the Environment (RIVM). At European level, Hilderink is involved in several foresight-driven projects and is president of the Foresight Section of EUPHA, European Public Health Association.

A wealth of knowledge Hilderink is eager to disseminate. "At RIVM we are always looking for ways to transfer our foresight experience via capacity building initiatives and structured collaboration with other National Public Health institutes". RIVM's specific expertise has brought them to guide foresight activities for the Horizon-sponsored PHIRI project, a joint venture of 41 partners across 30 European countries.

Launched in November 2020, in the midst of COVID-19's second wave, PHIRI (Population Health Information Research Infrastructure) sets out to facilitate cross-border sharing of population health data impacted by the pandemic.

Hilderink explains how "our concern in PHIRI was not only to identify the direct impacts of the pandemic but also the indirect ones". These include the long-term effects of lower levels of care (reduced access to preventive scanning, follow-ups, and care for chronic conditions), changing lifestyles (less physical activity and increased smoking and alcohol consumption), and mental health issues (fear, stress, and loneliness of social isolation).

PHIRI's foresight capacity-building course trained about 70 actors from across Europe through a mix of lectures, exercises, and activities. As a practical application of the vision-building training, a dozen EU Countries took part in case studies and were supported in initiating their own national foresight study on a selected public health topic, such as non-communicable diseases, long-term care, mental health and suicide prevention, and digitalisation of healthcare.

Expertise in foresight is quite hard to build and not all member states make place for foresight studies in budget allocations. "In the Netherlands, for example, a legal Act stipulates the production, every 4 years of a report about the future of health", considers Hilderink.

Behind 'teaching' structured and participatory ways of looking at possible futures is the empowering goal to inspire evidence-based policymaking in public health.

"Foresight experts are not policy advisors", says Hilderink. More like landscape painters, they sketch possible futures: "There is no such thing as risk-free policymaking" – he suggests – "but the foresight community is there to outline those risks and mark uncertainties en route".

The foresight process should not only anticipate knowledge-driven trends, but also create awareness about harder-to-monitor factors. "We have to consider value-driven aspects as well," warns Hilderink, "and account for values that influence scenarios which are challenging to investigate but can have huge impacts on society".

Ultimately, the outcomes of public health will depend on which 'normative' aspects will be valued more in societal debate and echoed in policymaking. Will we privilege the economic aspects in healthcare expenditure or concentrate on safeguarding equality in health provision? What impact will value-driven choices have on life expectancy, burden of disease, and social inequalities?

INTERVIEW

Putting Cities at the Centre
by Giovanna Giuffrè & Valentina Malcotti

SPROUT empowers cities to face urban transformation and disruptive innovation in sustainable mobility through the co-creation of resilient mobility policies.

Credits: Freepic

How do cities envision mobility in 10-20 years? What innovations are reshaping urban transportation for passengers and goods? What key policy recommendations should be included in future mobility planning?

Project SPROUT (Sustainable Policy RespOnse to Urban mobility Transition) aimed at envisioning future mobility scenarios, developed an interactive toolbox for urban policymaking and issued recommendations to aid cities' transition to sustainable mobility and handle disruptive innovations in the sector.

SPROUT adopted scenario-building techniques, assessments of replication potentials, and policy compliance checks to make sense of the rapidly changing urban mobility environment influenced by societal challenges.

Horizon Futures Watch asked the SPROUT project coordinator, Maria Teresa de la Cruz Eiriz (Zaragoza Logistics Center), to expand on SPROUT's city-led, forward-looking approach and explain how the project used the lens of foresight to create an understanding of the current state of urban mobility and identify the main drivers of future change.

What was the foresight component of your project?

One of SPROUT's objectives was to trace the parameters driving urban mobility transition and foresee their impacts. Urban mobility transition drivers were identified following the PESTEL approach (Social, Technological, Economic, Environmental, Political) to trend analysis. This activity, along with the exploration of the current state of mobility, provided the basis for the creation of "do-nothing" scenarios (absence of specific mobility policy interventions) for the SPROUT pilot cities in the 2030-time horizon. Local stakeholders were invited to join workshops (Local Innovation Forums) to envision city-specific narratives in the event of no policymaking actions to manage local urban mobility.

What kind of stakeholders/community did you engage with? Is your approach to science-policy-citizens dialogue replicable at EU levels and for different policy fields?

SPROUT set up a community of cities organized in three layers (pilot, validation and associated cities), collaborating together towards more sustainable and innovative policymaking on urban mobility. On top of the scenario-building activities, SPROUT analysed the implementation of ten different mobility solutions (for freight and passengers) in 15 cities.

Stakeholders were identified jointly with the cities considering the specific mobility solution based on the question: 'Who affects or is affected by the urban mobility transition'? Generally speaking, the main stakeholder groups were public administration, conventional public transport operators and "new mobility" providers, technology companies, energy providers, logistics operators, users, residents, and local businesses.

Such city-led approaches can be successful if awareness and engagement among stakeholders is high. Lately, participatory techniques and co-creation have become buzzwords, but results depend very much on the

methodology applied. Science-policy-citizens dialogue must be very well structured and expertly led to ensure inclusivity, avoid bias and make the most of co-creation activities.

What key results have you obtained?

The lack of policy-mediated approaches in the so-called 'no intervention' urban mobility scenarios helped convey the message that transition in urban mobility is essential to embrace the change towards sustainable transport. But the 'how' mattered the most to SPROUT. The concept of city-led innovation empowered city leaders and decision-makers to develop policies able to steer the introduction of innovative solutions and accompany these solutions for an impactful (and more legitimate) implementation. Based on this approach, we have developed an urban policy model to enhance evidence-based local policymaking and capacity-building tools and recommendations to support cities in urban policy design and Sustainable Urban Mobility Plans (SUMPs).

What key elements from your project do you think could improve science-policy-stakeholders dialogue in practice?

The development of local communities and their involvement in the planning process is an important success factor both to identify the appropriate policy and for it to be widely accepted by all local city stakeholders. SPROUT's outcomes highlighted the need for creating Open Innovation Communities as innovative crowdsourcing models promoting knowledge generation, debate, and consensus building among local and EU-level stakeholders.

If things go well, how would you expect urban and mobility policy to develop in the next 20 years and what would be the signs of success?

Uncertainty lingers. The post-COVID-19 mobility landscape is bound to depend greatly on the evolution of the energy market in Europe and how it impacts the political agenda. Data-driven and flexible mobility policies are the way forward to achieve sustainability goals and accommodate the market of new mobility solutions. Ideally, cities should have a co-created vision for the future and build a stable roadmap towards it; one that doesn't change every few years due to its dependency on politics!

FROM THE FUTURES4EUROPE PLATFORM: SELECTED CONTENT

These blog posts were originally published on the Futures4Europe platform. You can find these and other posts here.

Developing Context Scenarios for Future EU R&I policies

By Attila Havas

What types of EU R&I policies would be effective in the years to come? How shall these policies help us explore and respond to the uncertainties of the future? Finding answers to these questions requires first of all imagining the context, in which future EU R&I policies might be situated. For doing this, we need to explore developments both at global level and within the European Union.

Why multi-level context scenarios?
Several recent developments strongly suggest that a new 'world order' is evolving, replacing the relatively short period characterised by US dominance, which, in turn, followed the bipolar world (the cold war between the blocs led by the US and the USSR) that existed for several decades after WW2. This new world order will be a multipolar one, but we cannot know yet how these 'poles' would behave. Thus, it is an imperative to consider several options.

To do so, we propose exploring three different types of multipolar worlds:

A) 'poles' genuinely collaborating when tackling global challenges,
B) antagonistic groups of countries that are nevertheless willing to engage in limited co-operation, and
C) at least one 'pole' is openly hostile towards others.
The EU might also evolve along different paths, and thus we have enriched these multipolar scenarios at global level by also exploring two variants of how the EU might evolve in each of the global scenarios. The two variants of EU development we consider are i) a dynamic and resilient variant and ii) a destabilised and thus vulnerable variant. Preferably, the EU will be strong, dynamic and resilient, but we cannot be sure about this, and thus need to consider a possible weakening of the EU's position in the world.

Read more here.

The EU in a Volatile New World: The Challenge of Global Leadership

By Susanne Giesecke

The Russian invasion of Ukraine has turned the post-cold war world order upside down, and we are witnessing new global power constellations, block-building, and uncertainties that affect not only issues of military, deterrence, and defense but also the global economy, prosperity, and the social situation of the people. In the midst of this turmoil, the EU is confronted with finding a proper position and redefining its policies, its foreign, as well as internal relations. There is a chance for a proactive new neighbourhood policy. Will the EU seize the momentum?

In 2022, the post-cold war world order, which very much determined the inner state of European affairs as well as the EU's position on the geopolitical scene, appears to be shaken by the Russian invasion of Ukraine. A new divide is tearing the European continent apart: the EU and its allies in defense of democratic and pluralistic values on the one side and an authoritarian and autocratic regime threatening these values on the other. This disruption might even go beyond Europe if new international blocs and confrontations emerge. The threat concerns not only traditional values but also lives and material prosperity. Moreover, not only do these sudden changes push the EU to take a military stance by providing weapons to Ukraine and reconsidering its own defense capabilities but they must also be seen against the background of an accelerating climate crisis.

Read more here.

UPCOMING EVENTS

Zero Pollution and Foresight: building a Zero Pollution future

Date: 11 July, 2023
Time: 10:30 – 11:30 CEST
Format: Online
This talk will look at the topic of strategic foresight in EU policymaking, focussing on how to embed foresight in developing transition pathways and preparing for future challenges. It will examine lessons learned from recently conducted EU Foresight exercises and discuss how they can inform policies for a Zero Pollution future. More information and registration [here](#).

Conference: 2023 CTI- EU Conference powered by ENISA

Date: September 13, 2023
Time: 09:30 AM to 05:30 PM
Place: Technopolis, Athens

This is the fifth edition of the CTI-EU event and a great opportunity for the cyber threat intelligence Community to review the most relevant topics on the domain. The main objective of the CTI-EU event is to bring experts, researchers, practitioners and academics together to promote the dialogue and envision the future of Cyber Threat Intelligence for Europe.
More information and free registration [here](#).

WHO Global Health Foresight: looking forward to best harness the power of science and research

Speakers: Marion Laumonier and Anna Laura Ross (World Health Organisation)
Date: 22 September, 2023
Time: from 11:00 to 12:00 CET
Format: online
Topic: Monitoring scientific advances with a global health perspective
Format: online
You can register [here](#) for this event.

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