

PANEL FOR THE FUTURE OF SCIENCE AND TECHNOLOGY (STOA)

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Highlight | [Annual Lecture - the future of technology](#)

This year, STOA's [Annual Lecture](#) focused on critical technologies that, with the roll-out of artificial intelligence (AI) and the dramatic increase of new capabilities and online solutions, are bound to have an unprecedented effect on the life of EU citizens. The event investigated the problem of how to optimise communication efficiency and resources over wireless networks to leverage massive distributed data and computation resources.

The Annual Lecture was moderated by STOA Chair Eva KAILI (S&D, Greece), who highlighted the European commitment to developing critical technologies and the relevance of semiconductors for achieving strategic autonomy for Europe in the future geopolitical arena. Following these opening remarks, the European Commissioner for Internal Market, Thierry Breton, delivered a scene-setting speech on the subject of edge computing, 6G and satellite communications.

The keynote speaker was Professor Vincent Poor from Princeton University. He explained the motivation behind 6G and its new requirements. The event continued with short interventions from renowned experts in the field: Yuanyuan Yang, US National Science Foundation/Stony Brook University, Eleni Diamanti, French National Centre for Scientific Research (CNRS), and Gerhard Fettweis, TU Dresden and coordinator of the 5G lab in Germany.



Event | [Academic freedom in Europe](#)

The scope for EU action in response to challenges concerning academic freedom is not always clear. This was addressed at a [STOA conference](#) on 9 November 2021. It was organised with the support of the European University Association and looked for ways of building on several European initiatives focussing on academic freedom (such as Article 13 of the [EU Charter for Fundamental Rights](#), the [Bonn Declaration on Freedom of Scientific Research](#), and the League of European Research Universities (LERU) advice paper '[Academic freedom as a fundamental right](#)'). The event, held online, sought to clarify the definition of academic freedom, to frame the challenges in an EU context and to examine possible legal bases for addressing them.

In addition to the conference, an official STOA mission to Budapest took place on 3-5 November 2021. Taking place in the context of the on going discussions, this mission included visits to Central European University and meetings with the Hungarian academic community to learn about their current operating conditions and activities.

Highlights | [Health data and International Brain Initiative](#)

Health data are crucial for informed policy choices and a better EU response to public health crises. According to the study '[Health data centre and a common data strategy for public health](#)', the Covid-19 pandemic revealed that the EU lacks clear architecture and harmonisation when it comes to health data, its availability and comparability. An EU-level centre for data analysis could be a solution, the study experts say. In order to function effectively, this EU health data centre could use advanced technologies such as AI. Health data were also discussed at a [STOA event](#) on 21 September 2021 about eHealth and the EU Health Data Space.

Sharing health data also lies at the basis of cross-border initiatives such as the International Brain Initiative (IBI). To improve research, it coordinates efforts across national and regional brain initiatives. At a [STOA workshop](#) on 12 October 2021, IBI representatives described their approach to shaping the future of neuroscience, with the aim to provide a robust forum for global information sharing and resources. The event was opened with a talk by the 2014 Nobel Prize winner in Physiology or Medicine, [Professor Edvard Moser](#).



Study | 5G

Recent decades have experienced an unparalleled development in wireless communication technologies (mobile telephony, Wi-Fi). The imminent introduction of 5G technology across the EU is expected to bring new opportunities for citizens and businesses, through faster internet browsing, streaming and downloading, as well as through better connectivity. However, 5G, along with 3G and 4G, with which it will operate in parallel for several years, may also pose threats to human health and the environment. The STOA studies '[Health impact of 5G](#)' and '[Environmental impacts of 5G](#)' aim to contribute to the ongoing discussions concerning our present understanding of health and environmental effects of 5G.

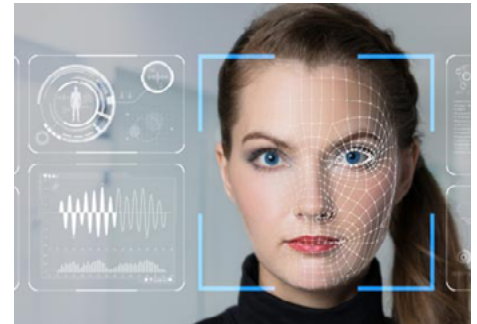
« The STOA studies aim to contribute to the ongoing discussions concerning our present understanding of health and environmental effects of 5G. »

Study | Tackling deepfakes in European policy

Deepfakes are hyper-realistic media products created through AI techniques that manipulate how people look and the things that they appear to say or do. STOA commissioned a study to examine the relevant technologies and trends, and to develop and assess a range of policy options for addressing the emerging challenges.

The [study](#) sets out the key features of deepfake technologies, their technical, societal and regulatory context, and their impacts at individual, group and societal levels. It identifies five dimensions of the deepfake lifecycle that policy-makers could take into account to prevent and address their adverse impacts. These are the creation, circulation, target and audience dimensions, as well as the overarching institutional and organisational dimension.

The policy options, which are also presented in the accompanying [STOA Options Brief](#), focus upon two legislative proposals that are currently under debate at the European Parliament, the AI Act and Digital Services Act. The study was [presented](#) to the STOA Panel in October. STOA also produced a '[What if](#)' and a [video](#) on the subject.



Study | Decarbonising the European industry

Given the vast potential for renewable electricity generation, the production of renewable hydrogen is a promising option for the hard-to-decarbonise energy-intensive industry sectors. A growing hydrogen sector will also result in job creation and economic growth while fostering innovation and reducing pollution.

The European Commission published its Hydrogen Strategy in 2020 with the aim to boost hydrogen use in the EU while promoting the uptake of renewable hydrogen production. Recent activities, such as the launch of the European Clean Hydrogen Alliance and the EU Innovation Fund, the formation of Hydrogen Valleys and the promotion of Important Projects of Common European Interest (IPCEIs), provide promising first steps to foster a European hydrogen economy.

As already mentioned in the previous edition of this newsletter, STOA engaged in a series of activities on this topic over the last months. A [new study](#) takes stock of the situation with respect to the realisation of the EU Hydrogen Strategy and identifies policy options to address gaps in the current landscape.



Highlights | European Science-Media Hub (ESMH)

On 8 October 2021, during [EYE2021](#), the ESMH organised a [workshop](#) entitled 'Telling Stories on climate change: Has the corona crisis changed the debate?' Held within the EU Generation Media Labs session, the workshop replaced the annual ESMH Summer School (cancelled due to the pandemic). It focused on the impact of the pandemic on reporting on climate change and featured talks by communication experts on science and the environment, whom the ESMH also interviewed: [Alok Jha](#), correspondent of 'The Economist'; [Simon Clark](#), You-Tuber, and [Joachim Allgaier](#), researcher on Science Communication and Misinformation. The event was opened by STOA Panel member Tiemo Wölken. Around 60 scientists, journalists and science communicators from all over Europe debated how to produce quality stories and sound, trustful reporting.

On top of this, the ESMH published [numerous articles and interviews](#) on current science and technology topics for example with Nobel-Prize winner [Edvard Moser](#) on brain research and [Jakob Wachsmuth](#), senior researcher at Fraunhofer ISI Institute on hydrogen.





Study | [Horizon scanning](#)

Horizon scanning is a tool for foresight intelligence. The STOA study '[A framework for technology foresight intelligence](#)' explains what it is and includes a set of five horizon-scanning reports or 'radars', built with the resources of Futures Platform. They cover the world after Covid-19, disruptive futures, the Green Deal, food, and geoengineering.

[Futures Platform](#) is a professional trends knowledge platform that collects and analyses information on phenomena such as technology, trends and signals, using AI-based tools and a team of foresight experts to anticipate future developments. The STOA study used these trends and signals to build a set of trend radars with a view to testing the feasibility of adding horizon scanning activities to STOA's methodological toolbox.



Study | [STOA stakeholder engagement project](#)

The [second part](#) of the STOA study 'A framework for technology foresight intelligence' deals with stakeholder engagement for strategic and practical purposes of the STOA Panel's activities.

It analyses online engagement methods and tools and their suitability for brainstorming meetings, and for technology assessment and foresight projects. To gain insight and experience in the use of online methods for stakeholder engagement, these were implemented in one ongoing STOA project.

For this purpose, STOA selected a typical foresight study, investigating a complex issue that is the subject of controversy: genome-editing techniques for the future of farming in Europe. Experts from the Danish Board of Technology Foundation guided the STOA team in setting up and running the procedure for this project.

This paper assesses the efficiency of online alternatives for foresight brainstorming meetings with colleagues, MEPs, experts and selected stakeholders. These alternatives include traditional surveys (to ascertain societal concerns about possible future technological developments) and simple variants of Delphi-type surveys.

« A foresight-based approach helps to investigate the issue holistically. »

Study | [Guidelines for foresight-based policy analysis](#)

Policy analysis examines and assesses problems to determine possible courses for policy action (policy options). In highly complex or controversial contexts, evidence-based policy options might not be socially acceptable. Here, policy analysis can benefit from a foresight-based approach, which helps investigate the issue holistically and assess considered evidence-based policy options against societal concerns.

This is especially important in a parliamentary setting, as it enables analysts to consider stakeholder views, societal expectations and concerns, as well as geographical differences when assessing policy options.

This [manual](#) provides a methodology for the foresight process and foresight-informed policy analysis. It offers four guidelines and six basic components for foresight-based policy analysis.

STOA (Panel for the Future of Science and Technology), an integral part of the European Parliament's structure, is tasked with carrying out expert, independent assessments of the impact of new technologies and identifying long-term, strategic policy options useful to the Parliament's committees in their policy-making role.

PANEL FOR THE FUTURE OF SCIENCE AND TECHNOLOGY (STOA)

The STOA Panel is composed of 27 Members of the European Parliament (MEPs), including the EP Vice-President responsible for STOA and 26 MEPs appointed by eleven parliamentary committees. With the input of committees and individual Members, the STOA Panel, on the recommendation of its Bureau, decides on projects and other activities in the field of science and technology. Each STOA project is overseen by one or more Panel members.

STOA Panel

The STOA Panel includes Members from the following committees:

- Industry, Research and Energy (ITRE):** six Members
- Agriculture and Rural Development (AGRI):** three Members
- Employment and Social Affairs (EMPL):** three Members
- Environment, Public Health & Food Safety (ENVI):** three Members
- Internal Market and Consumer Protection (IMCO):** three Members
- Transport and Tourism (TRAN):** three Members
- Culture and Education (CULT):** one Member
- International Trade (INTA):** one member
- Legal Affairs (JURI):** one Member
- Civil Liberties, Justice and Home Affairs (LIBE):** one Member
- Regional Development (REGI):** one member

STOA Bureau

- Ewa Kopacz**, EP Vice-President responsible for STOA
- Eva Kaili**, STOA Chair
- Christian Ehler**, STOA First Vice-Chair
- Ivars Ijabs**, STOA Second Vice-Chair

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